LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 40

2018

Bate Stamp Numbers
00896634 – 00897992

Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976 – 2018

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX

VOLUME 40

2018

A. Title: Report (cont'd) – Final Technical Memorandum Semi-Annual Groundwater Sampling Methodology and Analytical Results for Year 1 (Oct 2015-Apr 2016), Year 2 (Oct 2016 & Apr 2017), and Year 3 (Nov 2017 & Apr 2018), Site LHAAP-02, Vacuum Truck and Overnight Parking
Author(s): Department of the Army
Recipient: Texas Commission on Environmental Quality
Date: August 21, 2018
Bate Stamp: 00896634 – 00897581

B. Title: Letter – Letter to Regulator (EPA) Draft Revised Proposed Plan for LHAAP-29, Former TNT Production Area, Group 2, August 2018
Author(s): Department of the Army
Recipient: Environmental Protection Agency
Date: August 27, 2018
Bate Stamp: 00897582 – 00897582

C. Title: Letter – Letter to Regulator (TCEQ) Draft Revised Proposed Plan for LHAAP-29, Former TNT Production Area, Group 2, August 2018
Author(s): Department of the Army
Recipient: Texas Commission on Environmental Quality
Date: August 27, 2018
Bate Stamp: 00897583 – 00897583

D. Title: Report – Draft Final Remedial Action Completion Report, Contingency Remedy for Western Plume LHAAP-35A (58), Shops Area, Group 4
Author(s): Department of the Army
Recipient: Environmental Protection Agency
Date: August 27, 2018
Bate Stamp: 00897584 – 00897899

E. Title: Minutes – Final Minutes, Monthly Manager's Meeting (MMM), August 15, 2018
Author(s): Department of the Army
Recipient: Environmental Protection Agency
Date: August 29, 2018
Bate Stamp: 00897900 – 00897935

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX

VOLUME 40 (cont'd)

2018

F. Title: Report – Environmental Condition of Property VII (ECP VII), August 2018
Author(s): Department of the Army
Recipient: Environmental Protection Agency
Date: August 31, 2018
Bate Stamp: 00897936 – 00897992

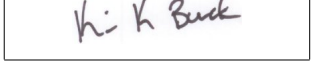
Sample Name: L1610063801 Acquired: 10/17/2016 20:12:08 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00005**	**.02495**	**-.00105**	**.04369**	**.55409**	**-.00001**	**24.275**	**.00038**
Stddev	.00038	.00050	.00336	.00231	.00254	.00003	.126	.00024
%RSD	778.41	2.0008	318.93	5.2872	.45866	555.82	.52052	62.872
#1	-.00036	.02544	.00135	.04142	.55117	.00003	24.155	.00013
#2	.00012	.02445	.00038	.04359	.55581	-.00003	24.262	.00060
#3	.00038	.02497	-.00490	.04604	.55529	-.00001	24.407	.00042
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00021**	**.00078**	**.00176**	**2.8139**	**.90060**	**.01145**	**4.6350**	**.10432**
Stddev	.00026	.00065	.00070	.0210	.04634	.00066	.0377	.00215
%RSD	126.02	83.112	39.752	.74705	5.1454	5.7457	.81402	2.0654
#1	.00049	.00019	.00125	2.8076	.94978	.01215	4.5935	.10204
#2	.00016	.00148	.00255	2.8373	.85776	.01138	4.6672	.10633
#3	-.00003	.00068	.00146	2.7967	.89426	.01083	4.6443	.10458
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00059**	**44.117**	**.00067**	**.01302**	**-.00264**	**.00257**	**.00013**	**4.6774**
Stddev	.00050	.267	.00055	.00410	.00067	.00245	.00440	.0040
%RSD	84.316	.60450	82.504	31.492	25.467	95.549	3492.9	.08602
#1	-.00010	43.856	.00075	.01621	-.00336	-.00025	.00407	4.6731
#2	-.00109	44.106	.00118	.00840	-.00255	.00376	.00093	4.6781
#3	-.00058	44.389	.00008	.01446	-.00202	.00419	-.00462	4.6811
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016



Sample Name: L1610063801 Acquired: 10/17/2016 20:12:08 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00040**	**.33834**	**.00435**	**-.00279**	**-.00038**	**.00268**	**-.00043**
Stddev	.00141	.00082	.00202	.00076	.00090	.00011	.00010
%RSD	351.14	.24368	46.368	27.342	236.55	4.1088	22.772
#1	.00055	.33741	.00398	-.00219	.00042	.00266	-.00052
#2	-.00203	.33862	.00254	-.00365	-.00135	.00259	-.00033
#3	.00027	.33899	.00652	-.00254	-.00021	.00280	-.00043
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9712.7**	**108130.**	**12182.**
Stddev	36.7	324.	82.
%RSD	.37786	.29942	.66918
#1	9730.3	107820.	12272.
#2	9737.3	108110.	12162.
#3	9670.5	108470.	12112.

Approved: October 18, 2016

Kristi K Buck

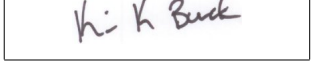
Sample Name: L1610063802 Acquired: 10/17/2016 20:15:50 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00046**	**.11066**	**.00131**	**.00757**	**.04068**	**.00001**	**36.122**	**-.00005**
Stddev	.00120	.00183	.00030	.00170	.00034	.00005	.165	.00021
%RSD	259.40	1.6556	23.166	22.441	.83660	822.64	.45740	434.00
#1	-.00169	.10856	.00106	.00581	.04031	.00006	36.267	.00017
#2	.00071	.11151	.00165	.00770	.04076	-.00001	35.942	-.00024
#3	-.00041	.11192	.00122	.00921	.04097	-.00003	36.159	-.00008
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00017**	**.00078**	**.00072**	**.07484**	**.38588**	**.00328**	**2.9873**	**.00260**
Stddev	.00028	.00042	.00165	.00167	.09935	.00119	.0508	.00204
%RSD	171.80	54.131	230.20	2.2382	25.746	36.378	1.7004	78.445
#1	-.00012	.00029	-.00102	.07293	.40446	.00190	3.0455	.00494
#2	.00010	.00105	.00091	.07550	.27855	.00393	2.9518	.00171
#3	-.00047	.00100	.00226	.07608	.47462	.00401	2.9646	.00116
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00005**	**1.5215**	**.00162**	**.01938**	**-.00126**	**-.00136**	**-.00145**	**2.8633**
Stddev	.00045	.0262	.00134	.00723	.00283	.00240	.00427	.0053
%RSD	867.50	1.7215	82.393	37.307	224.30	177.15	294.30	.18649
#1	-.00024	1.5015	.00063	.02624	-.00424	-.00407	-.00095	2.8588
#2	-.00038	1.5511	.00109	.02007	-.00094	.00051	-.00595	2.8619
#3	.00046	1.5118	.00314	.01183	.00139	-.00052	.00254	2.8692
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016



Sample Name: L1610063802 Acquired: 10/17/2016 20:15:50 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00017**	**.07482**	**-.00029**	**-.00408**	**.00059**	**.00269**	**-.00031**
Stddev	.00111	.00032	.00352	.00321	.00011	.00010	.00014
%RSD	637.48	.43027	1227.5	78.835	18.289	3.6064	44.048
#1	.00103	.07514	.00211	-.00445	.00070	.00274	-.00032
#2	.00056	.07481	.00136	-.00709	.00048	.00258	-.00017
#3	-.00107	.07450	-.00433	-.00069	.00059	.00276	-.00044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9743.4**	**111100.**	**12384.**
Stddev	150.7	492.	114.
%RSD	1.5470	.44295	.91716
#1	9569.8	111310.	12402.
#2	9841.4	111440.	12487.
#3	9819.0	110530.	12262.

Approved: October 18, 2016

Kristi K Buck

Sample Name: CCV Acquired: 10/17/2016 20:19:31 Type: QC
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.39998**	**10.207**	**.40915**	**.50591**	**.99515**	**.05125**	**10.026**	**.05149**
Stddev	.00213	.034	.00107	.00305	.00257	.00017	.045	.00029
%RSD	.53326	.32845	.26065	.60359	.25807	.32302	.44931	.55505
#1	.39872	10.168	.40828	.50271	.99659	.05135	10.078	.05181
#2	.39878	10.225	.40882	.50880	.99218	.05106	9.9950	.05142
#3	.40244	10.227	.41034	.50620	.99667	.05134	10.005	.05125
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20594**	**.51308**	**.51518**	**4.1418**	**47.752**	**.94726**	**10.428**	**.51305**
Stddev	.00032	.00075	.00236	.0201	.114	.00104	.057	.00264
%RSD	.15684	.14624	.45737	.48435	.23951	.10985	.55027	.51402
#1	.20608	.51222	.51759	4.1218	47.872	.94843	10.475	.51473
#2	.20557	.51345	.51288	4.1419	47.644	.94691	10.364	.51440
#3	.20617	.51358	.51507	4.1619	47.739	.94644	10.446	.51001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0151**	**48.289**	**.51336**	**10.253**	**.52002**	**1.2287**	**.41531**	**5.1234**
Stddev	.0036	.193	.00152	.038	.00147	.0053	.00747	.0147
%RSD	.35875	.39987	.29603	.37272	.28185	.42874	1.7998	.28693
#1	1.0162	48.459	.51174	10.291	.52102	1.2249	.41998	5.1330
#2	1.0181	48.079	.51475	10.254	.51834	1.2347	.41927	5.1307
#3	1.0111	48.329	.51359	10.215	.52070	1.2263	.40669	5.1065
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Approved: October 18, 2016
Kristi K Buck

Sample Name: CCV Acquired: 10/17/2016 20:19:31 Type: QC
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0214**	**1.0151**	**1.0132**	**.52150**	**1.0237**	**1.0305**	**.97756**
Stddev	.0049	.0026	.0014	.00388	.0041	.0033	.00826
%RSD	.47598	.25850	.13342	.74428	.39766	.32375	.84530
#1	1.0241	1.0163	1.0147	.52470	1.0255	1.0326	.98557
#2	1.0243	1.0121	1.0130	.51718	1.0190	1.0323	.96906
#3	1.0158	1.0169	1.0120	.52262	1.0266	1.0267	.97806
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9629.1**	**107400.**	**12347.**
Stddev	33.6	151.	96.
%RSD	.34905	.14050	.77667
#1	9623.5	107530.	12256.
#2	9598.7	107420.	12447.
#3	9665.2	107240.	12337.

Approved: October 18, 2016
Kim K Buck

Sample Name: CCB Acquired: 10/17/2016 20:22:58 Type: Blank
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00086**	**.00148**	**.00014**	**.00040**	**.00001**	**.00005**	**.00827**	**-.00006**
Stddev	.00098	.00242	.00160	.00081	.00039	.00002	.02739	.00017
%RSD	113.93	164.05	1165.3	202.45	3662.3	45.728	331.38	302.40
#1	-.00021	.00077	.00100	.00081	.00017	.00004	-.00007	.00003
#2	-.00199	.00418	.00112	.00092	.00029	.00008	.03886	-.00025
#3	-.00039	-.00051	-.00171	-.00053	-.00043	.00003	-.01399	.00005
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00013**	**.00101**	**-.00102**	**.01201**	**.01080**	**.00510**	**.09582**	**.00280**
Stddev	.00020	.00096	.00043	.00909	.03617	.00206	.01038	.00077
%RSD	154.34	94.441	42.056	75.715	335.00	40.332	10.837	27.482
#1	.00036	.00202	-.00127	.02150	.01833	.00713	.09719	.00300
#2	.00006	.00090	-.00053	.00337	.04261	.00302	.10546	.00345
#3	-.00003	.00012	-.00128	.01115	-.02855	.00515	.08482	.00195
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00045**	**-.01961**	**-.00025**	**-.00003**	**-.00233**	**-.00112**	**.00344**	**.00241**
Stddev	.00037	.01758	.00034	.00570	.00686	.00384	.00176	.00284
%RSD	83.168	89.633	135.90	16471.	294.55	344.50	51.102	117.96
#1	-.00008	-.00202	-.00048	.00522	-.00488	-.00323	.00504	.00290
#2	-.00044	-.03717	.00014	.00076	.00544	.00332	.00370	.00498
#3	-.00083	-.01964	-.00040	-.00609	-.00754	-.00343	.00156	-.00065
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Kristi K Buck

Sample Name: CCB Acquired: 10/17/2016 20:22:58 Type: Blank
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00044**	**-.00015**	**.00245**	**.00006**	**-.00047**	**-.00087**	**-.00024**
Stddev	.00016	.00024	.00671	.00232	.00034	.00016	.00021
%RSD	35.907	164.24	274.02	4134.0	71.977	18.384	88.686
#1	-.00026	-.00042	.00679	-.00134	-.00086	-.00082	-.00024
#2	-.00057	.00004	.00582	-.00123	-.00022	-.00104	-.00003
#3	-.00049	-.00006	-.00528	.00274	-.00033	-.00074	-.00045
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9764.8**	**111290.**	**12291.**
Stddev	16.2	227.	58.
%RSD	.16552	.20430	.47532
#1	9747.7	111430.	12358.
#2	9779.9	111420.	12250.
#3	9766.6	111030.	12265.

Approved: October 18, 2016

Kim K Buck

Sample Name: L1610063901 Acquired: 10/17/2016 20:26:42 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00060**	**.15178**	**-.00106**	**.04577**	**.05300**	**-.00002**	**36.483**	**.00034**
Stddev	.00053	.00457	.00191	.00135	.00035	.00002	.100	.00014
%RSD	88.439	3.0130	180.16	2.9531	.65168	109.84	.27313	42.060
#1	.00005	.14721	-.00036	.04495	.05294	.00001	36.425	.00037
#2	.00065	.15178	.00040	.04502	.05338	-.00003	36.598	.00047
#3	.00110	.15636	-.00323	.04733	.05269	-.00003	36.426	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00034**	**.00193**	**.00196**	**.14590**	**1.6320**	**.00724**	**7.2351**	**.00756**
Stddev	.00049	.00047	.00144	.02027	.0555	.00336	.0212	.00142
%RSD	140.85	24.257	73.726	13.890	3.3999	46.427	.29253	18.750
#1	.00020	.00166	.00257	.15091	1.6579	.00613	7.2110	.00874
#2	-.00052	.00167	.00299	.12360	1.5683	.00457	7.2504	.00599
#3	-.00072	.00248	.00031	.16320	1.6697	.01102	7.2440	.00797
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00112**	**38.724**	**.00267**	**.04015**	**.00034**	**.00861**	**.00153**	**3.6747**
Stddev	.00049	.117	.00115	.00342	.00232	.00413	.00773	.0102
%RSD	43.549	.30307	42.999	8.5132	686.85	47.960	506.63	.27771
#1	.00107	38.623	.00400	.03908	-.00092	.01330	-.00534	3.6650
#2	.00164	38.852	.00211	.04397	.00302	.00552	.00990	3.6853
#3	.00066	38.696	.00191	.03739	-.00109	.00702	.00002	3.6738
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Kristi K Buck

Sample Name: L1610063901 Acquired: 10/17/2016 20:26:42 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00046**	**.19654**	**.00360**	**-.00251**	**.00007**	**.00207**	**-.00037**
Stddev	.00125	.00040	.00348	.00260	.00041	.00017	.00022
%RSD	273.69	.20171	96.710	103.50	547.10	8.4192	60.217
#1	.00092	.19631	.00553	-.00108	.00010	.00190	-.00043
#2	-.00077	.19631	.00568	-.00095	-.00035	.00208	-.00055
#3	-.00152	.19700	-.00042	-.00551	.00047	.00225	-.00012
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9486.4**	**106940.**	**12244.**
Stddev	33.2	387.	42.
%RSD	.35031	.36176	.34336
#1	9449.6	107390.	12285.
#2	9495.5	106750.	12201.
#3	9514.2	106690.	12246.

Approved: October 18, 2016

Ki K Buck

Sample Name: L1610064001 Acquired: 10/17/2016 20:30:23 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00012**	**.07511**	**.00091**	**.09622**	**.03025**	**-.00001**	**.45673**	**.00009**
Stddev	.00081	.00458	.00331	.00222	.00048	.00003	.00719	.00012
%RSD	678.38	6.1009	363.76	2.3093	1.6022	237.23	1.5732	133.77
#1	.00019	.07185	-.00234	.09588	.02971	-.00004	.46439	-.00005
#2	-.00104	.07312	.00428	.09419	.03066	.00001	.45566	.00015
#3	.00049	.08034	.00079	.09860	.03037	-.00000	.45014	.00016
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00023**	**-.00004**	**.00090**	**.10073**	**.33792**	**.00657**	**.16740**	**.00396**
Stddev	.00010	.00064	.00125	.01692	.09669	.00297	.07527	.00080
%RSD	45.061	1531.2	138.42	16.797	28.613	45.143	44.965	20.224
#1	.00011	-.00028	-.00015	.11906	.23311	.00999	.20297	.00304
#2	.00029	-.00053	.00227	.09745	.42364	.00501	.21830	.00451
#3	.00029	.00068	.00058	.08570	.35701	.00471	.08094	.00432
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.02027**	**174.61**	**.00044**	**.01351**	**-.00215**	**.00524**	**-.00307**	**1.8288**
Stddev	.00037	.66	.00082	.00287	.00413	.00799	.00580	.0035
%RSD	1.8270	.37769	184.86	21.221	191.80	152.44	189.01	.19101
#1	.02068	175.36	.00133	.01373	.00006	.00110	-.00562	1.8269
#2	.02018	174.10	-.00028	.01054	-.00692	.01444	-.00715	1.8328
#3	.01996	174.37	.00027	.01626	.00040	.00017	.00357	1.8266
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Kristi K Buck

Sample Name: L1610064001 Acquired: 10/17/2016 20:30:23 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00056**	**.03015**	**.00402**	**-.00100**	**.00020**	**.00307**	**-.00007**
Stddev	.00019	.00003	.00171	.00169	.00118	.00005	.00032
%RSD	33.731	.09064	42.478	169.68	598.34	1.5098	462.50
#1	-.00072	.03013	.00481	-.00116	.00011	.00308	.00006
#2	-.00035	.03018	.00520	.00077	.00141	.00302	.00017
#3	-.00062	.03015	.00206	-.00260	-.00093	.00311	-.00044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9562.4**	**107480.**	**12510.**
Stddev	21.6	186.	84.
%RSD	.22606	.17266	.67252
#1	9546.9	107370.	12538.
#2	9553.3	107370.	12578.
#3	9587.1	107690.	12416.

Approved: October 18, 2016

Kristi K Buck

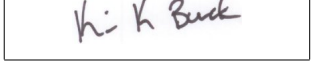
Sample Name: L1610064002 Acquired: 10/17/2016 20:34:06 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00020**	**.14921**	**.00084**	**.02345**	**.09032**	**.00001**	**40.536**	**.00027**
Stddev	.00064	.00367	.00307	.00109	.00038	.00003	.128	.00008
%RSD	312.48	2.4575	367.30	4.6296	.42604	283.95	.31498	29.738
#1	.00013	.15052	-.00171	.02464	.09011	.00002	40.669	.00027
#2	-.00094	.14507	-.00002	.02319	.09008	.00004	40.526	.00035
#3	.00020	.15205	.00424	.02252	.09076	-.00002	40.414	.00019
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**.00143**	**.00206**	**.14376**	**3.4439**	**.00469**	**6.3640**	**.00425**
Stddev	.00008	.00127	.00109	.01426	.0173	.00412	.0790	.00100
%RSD	75.184	88.776	52.826	9.9187	.50332	87.798	1.2414	23.579
#1	.00019	.00033	.00199	.14278	3.4409	-.00006	6.2820	.00391
#2	.00009	.00281	.00319	.13002	3.4626	.00686	6.4397	.00538
#3	.00003	.00113	.00101	.15848	3.4283	.00727	6.3702	.00346
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00141**	**7.4874**	**.00176**	**.04214**	**-.00225**	**.00581**	**.01152**	**2.9594**
Stddev	.00035	.0050	.00149	.00140	.00409	.00271	.00162	.0079
%RSD	24.957	.06750	84.481	3.3121	181.74	46.567	14.107	.26566
#1	.00128	7.4870	.00101	.04055	-.00540	.00679	.01103	2.9665
#2	.00181	7.4927	.00080	.04270	-.00372	.00275	.01019	2.9510
#3	.00115	7.4826	.00348	.04317	.00237	.00790	.01333	2.9607
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016



Sample Name: L1610064002 Acquired: 10/17/2016 20:34:06 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00014**	**.17889**	**.00418**	**-.00113**	**-.00002**	**.00437**	**.00002**
Stddev	.00026	.00055	.00554	.00457	.00052	.00016	.00031
%RSD	184.99	.30626	132.55	403.10	3315.2	3.7683	1350.8
#1	.00029	.17947	-.00210	.00386	-.00062	.00430	.00001
#2	.00029	.17881	.00625	-.00511	.00030	.00426	-.00028
#3	-.00016	.17839	.00838	-.00216	.00027	.00456	.00033
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9825.0**	**111220.**	**12296.**
Stddev	10.4	803.	256.
%RSD	.10534	.72233	2.0830
#1	9830.7	110300.	12003.
#2	9813.1	111780.	12474.
#3	9831.3	111590.	12413.

Approved: October 18, 2016

Kristi K Buck

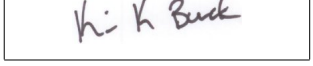
Sample Name: L1610064601 Acquired: 10/17/2016 20:37:47 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG587623-01

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00071**	**5.1234**	**-.00005**	**.17278**	**.00493**	**.00282**	**21.692**	**.00241**
Stddev	.00157	.0302	.00336	.00128	.00086	.00005	.034	.00037
%RSD	221.63	.58885	6278.3	.74205	17.359	1.9275	.15650	15.134
#1	-.00251	5.1057	-.00392	.17335	.00443	.00288	21.728	.00220
#2	.00038	5.1582	.00163	.17131	.00592	.00282	21.661	.00220
#3	.00000	5.1063	.00213	.17368	.00444	.00278	21.688	.00283
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.03797**	**.00516**	**.02024**	**.02128**	**.02053**	**.08120**	**3.2399**	**.09330**
Stddev	.00048	.00057	.00070	.00774	.07293	.00217	.0734	.00216
%RSD	1.2763	11.030	3.4446	36.347	355.21	2.6711	2.2652	2.3131
#1	.03847	.00558	.01981	.01630	-.02059	.07937	3.1870	.09132
#2	.03750	.00540	.02105	.01736	.10474	.08062	3.3237	.09560
#3	.03794	.00451	.01987	.03020	-.02255	.08360	3.2090	.09297
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00011**	**75.008**	**.08158**	**.00034**	**.00151**	**.00176**	**.00211**	**.13743**
Stddev	.00036	.079	.00083	.00519	.00286	.00252	.00566	.00250
%RSD	335.38	.10572	1.0196	1511.6	189.46	142.96	268.70	1.8221
#1	.00008	75.099	.08245	.00174	.00007	.00467	.00794	.13988
#2	.00048	74.954	.08151	-.00540	.00481	.00018	.00175	.13487
#3	-.00024	74.971	.08079	.00469	-.00035	.00044	-.00337	.13753
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016



Sample Name: L1610064601 Acquired: 10/17/2016 20:37:47 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG587623-01

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00032**	**.18411**	**.00094**	**.00199**	**.00071**	**.33181**	**-.00001**
Stddev	.00072	.00042	.00177	.00102	.00045	.00064	.00021
%RSD	224.35	.22863	187.36	51.296	63.321	.19316	2388.6
#1	-.00097	.18407	.00258	.00298	.00049	.33226	-.00024
#2	-.00044	.18372	-.00093	.00204	.00041	.33210	.00005
#3	.00045	.18456	.00118	.00094	.00122	.33108	.00017
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9863.1**	**111840.**	**12740.**
Stddev	8.8	981.	148.
%RSD	.08895	.87751	1.1638
#1	9853.7	112850.	12619.
#2	9864.5	110890.	12695.
#3	9871.0	111770.	12906.

Approved: October 18, 2016

Kristi K Buck

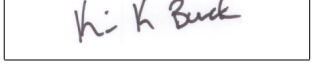
Sample Name: L1610064601MS Acquired: 10/17/2016 20:41:28 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG587623-04

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.18665**	**9.9487**	**.20237**	**1.1064**	**.49177**	**.02738**	**27.016**	**.02698**
Stddev	.00196	.0355	.00097	.0056	.00089	.00017	.040	.00008
%RSD	1.0521	.35700	.47729	.50952	.18084	.61401	.14731	.29443
#1	.18817	9.9815	.20266	1.1123	.49176	.02757	26.999	.02706
#2	.18735	9.9537	.20317	1.1056	.49089	.02732	26.988	.02698
#3	.18444	9.9110	.20130	1.1012	.49267	.02726	27.062	.02690
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.13727**	**.25158**	**.26618**	**2.0424**	**23.367**	**.54160**	**8.2431**	**.34425**
Stddev	.00062	.00144	.00180	.0155	.052	.00211	.0521	.00211
%RSD	.45032	.57318	.67511	.75853	.22439	.39008	.63237	.61309
#1	.13795	.25317	.26577	2.0460	23.358	.54030	8.2174	.34529
#2	.13674	.25037	.26815	2.0558	23.320	.54404	8.3031	.34182
#3	.13712	.25120	.26463	2.0254	23.423	.54047	8.2088	.34563
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49624**	**99.454**	**.32959**	**4.8727**	**.25031**	**.59055**	**.19481**	**2.6474**
Stddev	.00077	.213	.00172	.0130	.00195	.00277	.00595	.0021
%RSD	.15481	.21409	.52224	.26744	.77824	.46892	3.0562	.08019
#1	.49649	99.498	.32929	4.8665	.25131	.59315	.19423	2.6449
#2	.49537	99.222	.33145	4.8639	.24807	.59086	.20103	2.6483
#3	.49685	99.641	.32805	4.8876	.25156	.58764	.18916	2.6489
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016



Sample Name: L1610064601MS Acquired: 10/17/2016 20:41:28 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG587623-04

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.48978**	**.68391**	**.49726**	**.24416**	**.49795**	**.82859**	**.00041**
Stddev	.00194	.00143	.00362	.00215	.00275	.00212	.00011
%RSD	.39680	.20979	.72792	.87883	.55158	.25589	26.571
#1	.48769	.68545	.50027	.24169	.50109	.82635	.00051
#2	.49012	.68367	.49325	.24520	.49671	.82884	.00043
#3	.49153	.68261	.49828	.24559	.49604	.83057	.00029
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9769.9**	**109840.**	**12427.**
Stddev	18.1	667.	73.
%RSD	.18503	.60709	.58410
#1	9781.7	109070.	12349.
#2	9749.1	110190.	12437.
#3	9778.9	110260.	12493.

Approved: October 18, 2016

Kristi K Buck

Sample Name: L1610064601MSD Acquired: 10/17/2016 20:44:58 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG587623-05

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.18067**	**9.5831**	**.19430**	**1.0631**	**.46688**	**.02622**	**25.766**	**.02595**
Stddev	.00186	.0359	.00081	.0029	.00188	.00003	.124	.00015
%RSD	1.0300	.37468	.41731	.27294	.40322	.11340	.47940	.56836
#1	.18029	9.5418	.19337	1.0598	.46474	.02619	25.624	.02583
#2	.17902	9.5999	.19470	1.0644	.46829	.02624	25.848	.02611
#3	.18269	9.6075	.19483	1.0651	.46762	.02623	25.827	.02590
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.13182**	**.24053**	**.25645**	**1.9251**	**22.092**	**.51381**	**7.9039**	**.32606**
Stddev	.00049	.00175	.00058	.0121	.082	.00367	.0470	.00224
%RSD	.37164	.72604	.22803	.62903	.37040	.71408	.59454	.68757
#1	.13173	.23864	.25687	1.9380	22.011	.51796	7.8667	.32570
#2	.13235	.24089	.25578	1.9235	22.090	.51099	7.8883	.32846
#3	.13139	.24207	.25669	1.9140	22.175	.51248	7.9567	.32402
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.47706**	**94.865**	**.31500**	**4.6623**	**.23982**	**.56275**	**.18555**	**2.5164**
Stddev	.00036	.482	.00092	.0019	.00268	.00152	.00137	.0060
%RSD	.07486	.50850	.29202	.04079	1.1188	.26937	.73705	.23761
#1	.47685	94.389	.31577	4.6604	.23957	.56328	.18464	2.5137
#2	.47748	95.353	.31398	4.6622	.24262	.56393	.18488	2.5232
#3	.47686	94.854	.31526	4.6642	.23727	.56104	.18712	2.5121
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Kristi K Buck

Sample Name: L1610064601MSD Acquired: 10/17/2016 20:44:58 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG587623-05

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.47191**	**.64975**	**.47299**	**.23444**	**.47703**	**.79731**	**.00037**
Stddev	.00133	.00202	.00748	.00356	.00207	.00102	.00038
%RSD	.28116	.31024	1.5805	1.5170	.43341	.12764	101.20
#1	.47142	.64758	.46532	.23041	.47923	.79813	.00046
#2	.47342	.65157	.48025	.23712	.47513	.79765	-.00004
#3	.47090	.65008	.47340	.23581	.47672	.79617	.00069
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9552.3**	**107960.**	**12666.**
Stddev	47.9	546.	49.
%RSD	.50137	.50602	.38520
#1	9504.8	108510.	12689.
#2	9551.6	107950.	12699.
#3	9600.6	107420.	12610.

Approved: October 18, 2016

Kristi K Burck

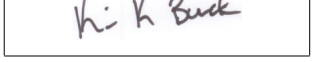
Sample Name: CCV Acquired: 10/17/2016 20:48:28 Type: QC
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.39751**	**10.127**	**.41330**	**.50427**	**.99565**	**.05117**	**9.9969**	**.05151**
Stddev	.00215	.046	.00105	.00381	.00270	.00006	.0548	.00036
%RSD	.53976	.45091	.25407	.75638	.27143	.10751	.54779	.69321
#1	.39516	10.080	.41321	.50023	.99474	.05119	9.9439	.05115
#2	.39799	10.130	.41230	.50479	.99351	.05121	9.9936	.05152
#3	.39937	10.171	.41440	.50781	.99869	.05110	10.053	.05186
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20680**	**.51193**	**.51840**	**4.1736**	**47.785**	**.94803**	**10.374**	**.51634**
Stddev	.00044	.00030	.00094	.0100	.056	.00275	.109	.00345
%RSD	.21416	.05849	.18059	.23839	.11742	.28992	1.0486	.66772
#1	.20638	.51194	.51929	4.1802	47.747	.94685	10.257	.51260
#2	.20726	.51163	.51742	4.1785	47.850	.95117	10.392	.51703
#3	.20675	.51222	.51850	4.1622	47.759	.94607	10.472	.51939
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0204**	**48.019**	**.51483**	**10.278**	**.51784**	**1.2349**	**.41772**	**5.1542**
Stddev	.0012	.167	.00048	.008	.00184	.0045	.00724	.0038
%RSD	.11902	.34699	.09381	.07577	.35581	.36360	1.7343	.07292
#1	1.0190	47.847	.51466	10.278	.51584	1.2401	.40956	5.1499
#2	1.0207	48.031	.51537	10.271	.51819	1.2323	.42020	5.1569
#3	1.0214	48.179	.51445	10.286	.51947	1.2323	.42340	5.1558
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Approved: October 18, 2016



Sample Name: CCV Acquired: 10/17/2016 20:48:28 Type: QC
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0237**	**1.0141**	**1.0141**	**.51950**	**1.0219**	**1.0329**	**.97584**
Stddev	.0012	.0026	.0047	.00404	.0009	.0006	.00610
%RSD	.11518	.25520	.46570	.77739	.08474	.05831	.62464
#1	1.0229	1.0116	1.0092	.52045	1.0209	1.0331	.96905
#2	1.0232	1.0141	1.0146	.52298	1.0223	1.0322	.97763
#3	1.0251	1.0168	1.0186	.51507	1.0224	1.0334	.98084
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9683.5**	**108070.**	**12435.**
Stddev	36.9	281.	80.
%RSD	.38064	.25968	.64645
#1	9691.8	108240.	12528.
#2	9715.5	107750.	12385.
#3	9643.2	108230.	12392.

Approved: October 18, 2016
Kim K Buck

Sample Name: CCB Acquired: 10/17/2016 20:51:54 Type: Blank
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00162**	**.00409**	**-.00222**	**.00388**	**-.00044**	**.00003**	**.00398**	**.00006**
Stddev	.00250	.00653	.00250	.00111	.00036	.00002	.01536	.00006
%RSD	154.22	159.85	112.54	28.693	81.971	66.120	386.10	114.47
#1	-.00261	-.00286	-.00298	.00261	-.00081	.00003	.00784	-.00001
#2	.00122	.00501	-.00424	.00466	-.00041	.00001	-.01295	.00011
#3	-.00347	.01012	.00057	.00437	-.00009	.00005	.01705	.00007
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00023**	**.00015**	**-.00218**	**.00459**	**.02912**	**.00505**	**.13266**	**.00377**
Stddev	.00005	.00076	.00093	.01018	.08559	.00166	.05495	.00095
%RSD	22.369	503.98	42.919	221.70	293.90	32.889	41.427	25.129
#1	.00020	.00030	-.00206	-.00714	.11421	.00321	.17329	.00272
#2	.00028	.00082	-.00130	.01107	-.05695	.00645	.07013	.00456
#3	.00019	-.00067	-.00316	.00986	.03011	.00550	.15454	.00404
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00038**	**-.00937**	**.00069**	**-.00102**	**-.00182**	**.00355**	**.00123**	**.00219**
Stddev	.00046	.00943	.00088	.00528	.00231	.00033	.00308	.00002
%RSD	118.41	100.65	126.87	519.15	127.33	9.4186	250.19	.92870
#1	-.00009	-.00868	.00088	-.00671	.00012	.00353	-.00145	.00216
#2	-.00091	-.01914	-.00027	-.00006	-.00119	.00323	.00055	.00220
#3	-.00016	-.00031	.00145	.00372	-.00437	.00390	.00459	.00219
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Sample Name: CCB Acquired: 10/17/2016 20:51:54 Type: Blank
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00067**	**-.00009**	**.00288**	**-.00143**	**.00009**	**-.00072**	**-.00031**
Stddev	.00076	.00024	.00386	.00313	.00047	.00022	.00015
%RSD	113.41	279.33	134.10	219.23	525.06	31.069	47.363
#1	-.00076	.00000	.00727	-.00482	-.00035	-.00047	-.00030
#2	.00013	.00010	.00138	.00135	.00058	-.00078	-.00017
#3	-.00139	-.00036	-.00001	-.00082	.00004	-.00091	-.00046
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9552.1**	**108390.**	**12364.**
Stddev	48.5	590.	58.
%RSD	.50735	.54422	.47225
#1	9511.6	109060.	12406.
#2	9539.0	107950.	12389.
#3	9605.8	108160.	12297.

Approved: October 18, 2016

Kristi K Buck

Sample Name: LLCCV Acquired: 10/17/2016 20:55:38 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00886**	**.18586**	**.00867**	**.07998**	**.00811**	**.00163**	**.42752**	**.00104**
Stddev	.00127	.00500	.00230	.00125	.00037	.00002	.03009	.00021
%RSD	14.327	2.6908	26.469	1.5571	4.5690	1.2731	7.0377	20.094
#1	.00833	.19119	.00655	.07896	.00783	.00161	.45086	.00099
#2	.00794	.18511	.01111	.08137	.00797	.00165	.43814	.00087
#3	.01031	.18127	.00836	.07962	.00853	.00164	.39356	.00127
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00434**	**.00482**	**.00351**	**.09200**	**.84476**	**.08485**	**.51489**	**.00999**
Stddev	.00038	.00066	.00096	.01147	.03470	.00389	.04155	.00143
%RSD	8.6871	13.603	27.383	12.470	4.1077	4.5819	8.0696	14.366
#1	.00395	.00476	.00365	.10034	.85730	.08484	.52169	.01157
#2	.00438	.00550	.00440	.09676	.80554	.08097	.47037	.00877
#3	.00470	.00420	.00249	.07892	.87145	.08874	.55263	.00962
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00757**	**.40246**	**.01838**	**.81575**	**.00699**	**.08706**	**.01893**	**.82905**
Stddev	.00078	.00885	.00126	.00192	.00120	.00380	.00557	.00468
%RSD	10.366	2.1994	6.8737	.23548	17.176	4.3596	29.421	.56404
#1	.00708	.40598	.01812	.81494	.00724	.08781	.01811	.82372
#2	.00715	.40901	.01726	.81795	.00568	.09042	.01381	.83244
#3	.00847	.39239	.01975	.81437	.00804	.08295	.02486	.83101
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016
Kristi K Buck

Sample Name: LLCCV Acquired: 10/17/2016 20:55:38 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.42767**	**.04154**	**.02600**	**.16932**	**.00840**	**.01903**	**.03947**
Stddev	.00074	.00030	.00303	.00207	.00045	.00019	.00067
%RSD	.17211	.72104	11.668	1.2202	5.3531	.98691	1.7041
#1	.42794	.04138	.02751	.16726	.00788	.01896	.03871
#2	.42823	.04189	.02799	.16929	.00872	.01925	.03976
#3	.42684	.04136	.02251	.17140	.00860	.01889	.03996
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9896.7**	**109870.**	**12298.**
Stddev	22.2	981.	190.
%RSD	.22464	.89296	1.5427
#1	9891.2	109240.	12512.
#2	9921.1	109370.	12150.
#3	9877.7	111000.	12233.

Approved: October 18, 2016

Kristi K Buck

Sample Name: LLCCV Acquired: 10/17/2016 20:59:21 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00927**	**.22295**	**.00781**	**.09720**	**.00977**	**.00205**	**.52052**	**.00138**
Stddev	.00126	.00340	.00212	.00259	.00042	.00006	.00717	.00023
%RSD	13.626	1.5246	27.118	2.6678	4.2752	2.7298	1.3775	16.337
#1	.00934	.22487	.00633	.10014	.01021	.00202	.51728	.00131
#2	.00798	.21903	.01024	.09623	.00970	.00201	.52874	.00163
#3	.01050	.22496	.00687	.09523	.00938	.00211	.51555	.00120
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00526**	**.00518**	**.00584**	**.12219**	**.98380**	**.10157**	**.58498**	**.01066**
Stddev	.00040	.00041	.00124	.00490	.05699	.00274	.08938	.00091
%RSD	7.6521	7.8930	21.156	4.0130	5.7924	2.6969	15.279	8.5581
#1	.00533	.00539	.00442	.11814	1.0496	.09860	.57791	.00982
#2	.00482	.00544	.00641	.12764	.94981	.10210	.67769	.01053
#3	.00562	.00471	.00669	.12080	.95201	.10400	.49935	.01163
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00981**	**.47764**	**.02325**	**1.0118**	**.01049**	**.10771**	**.01833**	**1.0237**
Stddev	.00064	.01116	.00039	.0086	.00297	.00501	.00827	.0026
%RSD	6.5366	2.3361	1.6888	.85144	28.346	4.6479	45.089	.25516
#1	.01053	.46761	.02287	1.0117	.00828	.11345	.02718	1.0209
#2	.00960	.47565	.02324	1.0033	.01387	.10550	.01080	1.0243
#3	.00931	.48966	.02365	1.0205	.00932	.10420	.01702	1.0260
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Kristi K Buck

Sample Name: LLCCV Acquired: 10/17/2016 20:59:21 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.52649**	**.05221**	**.03432**	**.21003**	**.00983**	**.02387**	**.04990**
Stddev	.00114	.00010	.00608	.00215	.00063	.00002	.00061
%RSD	.21597	.19412	17.707	1.0256	6.4500	.06743	1.2259
#1	.52645	.05232	.02799	.21013	.00999	.02389	.05060
#2	.52538	.05219	.03486	.21214	.01037	.02386	.04948
#3	.52765	.05212	.04011	.20783	.00913	.02387	.04961
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9858.6**	**112440.**	**12452.**
Stddev	38.3	613.	166.
%RSD	.38815	.54474	1.3299
#1	9898.5	112530.	12292.
#2	9822.2	113000.	12622.
#3	9855.0	111790.	12443.

Approved: October 18, 2016
Ki K Buck

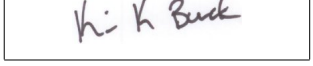
Sample Name: PBW AF Acquired: 10/17/2016 21:03:03 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG586734-02

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00087**	**.00403**	**-.00243**	**-.00021**	**.00013**	**-.00001**	**.01626**	**.00017**
Stddev	.00149	.00170	.00084	.00087	.00041	.00003	.03012	.00049
%RSD	171.57	42.167	34.513	408.89	305.50	462.25	185.24	281.45
#1	.00258	.00447	-.00332	-.00075	.00007	-.00004	-.01162	.00031
#2	-.00005	.00216	-.00229	-.00068	-.00024	.00002	.01220	.00057
#3	.00007	.00547	-.00167	.00079	.00057	-.00000	.04820	-.00037
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00033**	**.00024**	**-.00115**	**.01903**	**-.02416**	**.00733**	**.00822**	**.00245**
Stddev	.00010	.00021	.00203	.01089	.04030	.00346	.03973	.00096
%RSD	31.452	89.278	176.82	57.218	166.83	47.157	483.54	39.189
#1	-.00045	.00047	-.00314	.01916	-.01722	.00458	-.00861	.00135
#2	-.00026	.00016	-.00120	.02986	-.06748	.01122	.05359	.00288
#3	-.00027	.00007	.00091	.00808	.01222	.00620	-.02033	.00313
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00026**	**-.00518**	**.00127**	**-.00501**	**-.00446**	**.00276**	**.00180**	**.00170**
Stddev	.00010	.01412	.00112	.00860	.00235	.00214	.00335	.00345
%RSD	36.879	272.61	87.528	171.76	52.702	77.453	186.39	203.64
#1	-.00029	-.00355	.00001	.00324	-.00618	.00491	.00178	-.00227
#2	-.00015	.00805	.00169	-.01393	-.00543	.00064	-.00155	.00336
#3	-.00033	-.02004	.00212	-.00433	-.00178	.00273	.00516	.00400
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016



Sample Name: PBW AF Acquired: 10/17/2016 21:03:03 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG586734-02

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00031**	**-.00013**	**-.00190**	**-.00654**	**.00021**	**.00154**	**-.00019**
Stddev	.00033	.00008	.00549	.00064	.00074	.00003	.00025
%RSD	103.92	57.605	289.58	9.7442	354.53	2.1687	126.97
#1	.00013	-.00018	-.00800	-.00702	.00028	.00158	.00008
#2	.00069	-.00004	.00266	-.00679	-.00056	.00153	-.00028
#3	.00012	-.00017	-.00036	-.00582	.00090	.00152	-.00039
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9910.7**	**113740.**	**12451.**
Stddev	17.9	318.	22.
%RSD	.18081	.27946	.17578
#1	9894.5	113680.	12427.
#2	9907.6	114090.	12468.
#3	9929.9	113460.	12460.

Approved: October 18, 2016

Kristi K Burck

Sample Name: LCSW AF Acquired: 10/17/2016 21:06:47 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG586734-03

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19105**	**4.9943**	**.19383**	**.91840**	**.48397**	**.02405**	**4.8766**	**.02459**
Stddev	.00118	.0220	.00383	.00200	.00279	.00004	.0143	.00024
%RSD	.61632	.44024	1.9752	.21825	.57546	.15567	.29336	.98697
#1	.19236	4.9704	.19114	.91987	.48301	.02409	4.8604	.02442
#2	.19009	5.0136	.19214	.91922	.48179	.02402	4.8819	.02487
#3	.19068	4.9989	.19821	.91612	.48711	.02404	4.8874	.02450
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.10016**	**.24691**	**.25032**	**2.0490**	**23.106**	**.46678**	**5.1133**	**.25098**
Stddev	.00050	.00100	.00303	.0131	.067	.00327	.0420	.00087
%RSD	.49774	.40309	1.2094	.63685	.29139	.69950	.82104	.34713
#1	.09963	.24699	.24692	2.0552	23.150	.46319	5.0759	.25179
#2	.10063	.24588	.25131	2.0578	23.139	.46761	5.1054	.25006
#3	.10021	.24787	.25273	2.0340	23.028	.46956	5.1587	.25110
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49514**	**23.491**	**.24951**	**4.7462**	**.25248**	**.58882**	**.19050**	**2.4585**
Stddev	.00109	.110	.00075	.0031	.00215	.00153	.00457	.0018
%RSD	.21991	.46684	.29879	.06547	.85044	.25971	2.4014	.07350
#1	.49578	23.405	.25024	4.7426	.25438	.58806	.18763	2.4580
#2	.49575	23.452	.24875	4.7483	.25015	.59058	.19577	2.4570
#3	.49388	23.614	.24955	4.7476	.25291	.58781	.18809	2.4605
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Kristi K Buck

Sample Name: LCSW AF Acquired: 10/17/2016 21:06:47 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment: WG586734-03

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.49449**	**.49244**	**.49195**	**.25261**	**.49265**	**.49222**	**.44094**
Stddev	.00165	.00193	.00206	.00827	.00116	.00065	.00434
%RSD	.33292	.39249	.41942	3.2735	.23535	.13300	.98431
#1	.49261	.49225	.49415	.24898	.49179	.49287	.44589
#2	.49523	.49061	.49164	.26207	.49397	.49156	.43779
#3	.49564	.49446	.49006	.24678	.49218	.49222	.43914
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9776.5**	**110670.**	**12479.**
Stddev	32.8	404.	83.
%RSD	.33541	.36463	.66252
#1	9745.4	111030.	12393.
#2	9773.4	110240.	12558.
#3	9810.8	110740.	12486.

Approved: October 18, 2016

Kristi K Burck

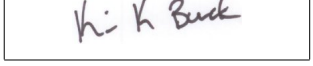
Sample Name: L1610000201 Acquired: 10/17/2016 21:10:18 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00345**	**.09162**	**.00594**	**.03704**	**.00685**	**.00075**	**.21930**	**.00052**
Stddev	.00070	.00479	.00186	.00221	.00066	.00006	.00769	.00025
%RSD	20.210	5.2294	31.294	5.9621	9.6468	7.5245	3.5083	47.637
#1	.00410	.09113	.00478	.03875	.00639	.00082	.22799	.00078
#2	.00271	.09664	.00496	.03782	.00655	.00071	.21336	.00029
#3	.00355	.08710	.00808	.03455	.00761	.00073	.21656	.00049
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00223**	**.00249**	**.00250**	**.06066**	**.37553**	**.04068**	**.20261**	**.00571**
Stddev	.00035	.00086	.00075	.01421	.03731	.00129	.05842	.00133
%RSD	15.672	34.328	30.128	23.417	9.9353	3.1786	28.833	23.378
#1	.00198	.00151	.00285	.04476	.38304	.04218	.23175	.00688
#2	.00208	.00289	.00301	.06514	.33504	.03990	.24073	.00426
#3	.00263	.00308	.00163	.07209	.40852	.03997	.13536	.00599
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00367**	**.16474**	**.00950**	**.36611**	**-.00033**	**.04135**	**.00633**	**.38260**
Stddev	.00029	.02864	.00178	.00344	.00088	.00249	.00387	.00142
%RSD	7.9657	17.386	18.696	.93991	269.65	6.0285	61.055	.37072
#1	.00341	.19300	.00774	.36867	-.00109	.04363	.00224	.38102
#2	.00399	.16548	.01129	.36747	.00064	.04173	.00993	.38306
#3	.00363	.13573	.00948	.36220	-.00053	.03869	.00683	.38374
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016



Sample Name: L1610000201 Acquired: 10/17/2016 21:10:18 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.19826**	**.01978**	**.01626**	**.07633**	**.00417**	**.00895**	**.01900**
Stddev	.00092	.00029	.00383	.00315	.00073	.00001	.00024
%RSD	.46515	1.4662	23.556	4.1258	17.493	.14269	1.2807
#1	.19898	.01987	.01963	.07636	.00416	.00896	.01923
#2	.19722	.02002	.01209	.07317	.00344	.00894	.01904
#3	.19859	.01946	.01706	.07947	.00490	.00896	.01874
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9967.8**	**113500.**	**12478.**
Stddev	10.4	195.	54.
%RSD	.10450	.17193	.43637
#1	9966.6	113400.	12538.
#2	9978.8	113730.	12465.
#3	9958.1	113380.	12431.

Approved: October 18, 2016

Kristi K Buck

Sample Name: L1610000401 Acquired: 10/17/2016 21:14:02 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00672**	**.17302**	**.00719**	**.06926**	**.00786**	**.00148**	**.41148**	**.00108**
Stddev	.00130	.00163	.00247	.00025	.00015	.00008	.01372	.00026
%RSD	19.362	.94133	34.310	.36413	1.9518	5.0819	3.3348	24.441
#1	.00714	.17229	.00518	.06904	.00784	.00157	.41848	.00082
#2	.00775	.17489	.00995	.06922	.00772	.00146	.39567	.00109
#3	.00526	.17189	.00645	.06954	.00802	.00142	.42029	.00134
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00411**	**.00524**	**.00476**	**.09992**	**.78447**	**.07553**	**.43579**	**.00876**
Stddev	.00033	.00048	.00174	.01846	.05794	.00174	.01554	.00088
%RSD	8.0757	9.2445	36.454	18.473	7.3860	2.3013	3.5657	9.9888
#1	.00447	.00550	.00629	.09872	.72730	.07753	.44066	.00950
#2	.00382	.00468	.00512	.08210	.78296	.07472	.44832	.00779
#3	.00403	.00553	.00288	.11895	.84315	.07435	.41840	.00900
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00738**	**.36039**	**.01641**	**.71751**	**.00429**	**.08067**	**.01534**	**.74592**
Stddev	.00060	.00852	.00172	.00305	.00308	.00166	.00590	.00494
%RSD	8.1060	2.3636	10.508	.42538	71.676	2.0605	38.439	.66184
#1	.00672	.35474	.01840	.71461	.00325	.08018	.01429	.74063
#2	.00788	.37019	.01546	.72070	.00187	.07931	.02169	.74674
#3	.00756	.35623	.01537	.71723	.00776	.08252	.01003	.75040
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Kristi K Buck

Sample Name: L1610000401 Acquired: 10/17/2016 21:14:02 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.39094**	**.03903**	**.02442**	**.15164**	**.00766**	**.01662**	**.03650**
Stddev	.00131	.00025	.00378	.00503	.00043	.00013	.00032
%RSD	.33384	.64252	15.465	3.3161	5.6651	.75896	.86425
#1	.38961	.03891	.02007	.14735	.00772	.01654	.03680
#2	.39222	.03886	.02690	.15717	.00720	.01676	.03617
#3	.39098	.03932	.02628	.15039	.00806	.01655	.03652
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9688.6**	**110680.**	**12386.**
Stddev	125.5	608.	163.
%RSD	1.2948	.54940	1.3129
#1	9833.4	111350.	12425.
#2	9615.0	110520.	12525.
#3	9617.3	110160.	12207.

Approved: October 18, 2016

Kristi K Buck

Sample Name: L1610000409 Acquired: 10/17/2016 21:17:45 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00745**	**.17254**	**.00508**	**.06888**	**.00776**	**.00149**	**.38912**	**.00093**
Stddev	.00097	.00359	.00168	.00130	.00012	.00001	.01843	.00007
%RSD	12.978	2.0815	33.001	1.8854	1.5376	.66729	4.7371	7.2272
#1	.00838	.17164	.00660	.06760	.00772	.00148	.36842	.00101
#2	.00752	.17650	.00538	.07020	.00790	.00149	.40375	.00091
#3	.00645	.16949	.00328	.06884	.00767	.00150	.39520	.00089
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00409**	**.00464**	**.00366**	**.08367**	**.71289**	**.08065**	**.44646**	**.00996**
Stddev	.00037	.00018	.00043	.00249	.02603	.00283	.07704	.00068
%RSD	9.0819	3.8634	11.837	2.9787	3.6515	3.5146	17.257	6.8505
#1	.00366	.00448	.00414	.08598	.68285	.08049	.42903	.00983
#2	.00428	.00483	.00331	.08400	.72874	.07790	.53072	.01070
#3	.00432	.00460	.00351	.08103	.72708	.08356	.37962	.00935
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00707**	**.35178**	**.01617**	**.71783**	**.00777**	**.08365**	**.01545**	**.74782**
Stddev	.00054	.02056	.00070	.00391	.00257	.00479	.00157	.00159
%RSD	7.5823	5.8440	4.3105	.54474	33.075	5.7317	10.156	.21209
#1	.00706	.33501	.01695	.71443	.00895	.07970	.01623	.74813
#2	.00654	.37472	.01561	.72210	.00955	.08899	.01647	.74610
#3	.00761	.34562	.01596	.71697	.00482	.08228	.01364	.74922
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

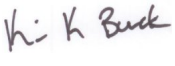
Kristi K Buck

Sample Name: L1610000409 Acquired: 10/17/2016 21:17:45 Type: Unk
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.39032**	**.03874**	**.02425**	**.15096**	**.00723**	**.01820**	**.03700**
Stddev	.00074	.00014	.00102	.00208	.00054	.00011	.00048
%RSD	.18916	.35353	4.2107	1.3789	7.4490	.58812	1.2849
#1	.39117	.03870	.02340	.15229	.00726	.01827	.03649
#2	.38992	.03863	.02539	.15204	.00775	.01808	.03743
#3	.38986	.03890	.02398	.14856	.00668	.01826	.03709
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9947.0**	**114170.**	**12659.**
Stddev	10.0	462.	83.
%RSD	.10083	.40459	.65496
#1	9947.0	113640.	12704.
#2	9957.1	114410.	12710.
#3	9937.0	114460.	12564.

Approved: October 18, 2016



Sample Name: CCV Acquired: 10/17/2016 21:21:28 Type: QC
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.39750**	**10.167**	**.41180**	**.50165**	**.99373**	**.05105**	**9.9657**	**.05154**
Stddev	.00138	.029	.00291	.00388	.00118	.00007	.0010	.00017
%RSD	.34662	.28892	.70624	.77326	.11885	.12875	.00993	.33418
#1	.39867	10.150	.41067	.50379	.99308	.05108	9.9646	.05149
#2	.39786	10.150	.41511	.49717	.99302	.05109	9.9660	.05140
#3	.39598	10.201	.40963	.50398	.99510	.05097	9.9666	.05173
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.20623**	**.51183**	**.51909**	**4.1651**	**47.509**	**.94178**	**10.436**	**.51756**
Stddev	.00029	.00164	.00186	.0189	.100	.00341	.138	.00364
%RSD	.14291	.31965	.35928	.45331	.21152	.36185	1.3240	.70336
#1	.20597	.51027	.52102	4.1698	47.516	.93990	10.577	.51463
#2	.20655	.51354	.51730	4.1443	47.406	.93973	10.301	.52163
#3	.20617	.51169	.51894	4.1812	47.606	.94572	10.430	.51641
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0172**	**47.910**	**.51343**	**10.268**	**.51970**	**1.2324**	**.41792**	**5.1401**
Stddev	.0011	.080	.00316	.017	.00515	.0006	.00721	.0062
%RSD	.10468	.16664	.61527	.16391	.99153	.04538	1.7264	.11992
#1	1.0182	47.850	.51588	10.249	.52027	1.2318	.42129	5.1341
#2	1.0160	48.001	.50986	10.272	.51428	1.2327	.42282	5.1397
#3	1.0173	47.879	.51454	10.282	.52454	1.2328	.40963	5.1464
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value								
Range								

Approved: October 18, 2016
Kristi K Buck

Sample Name: CCV Acquired: 10/17/2016 21:21:28 Type: QC
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**1.0216**	**1.0133**	**1.0097**	**.52200**	**1.0212**	**1.0343**	**.97416**
Stddev	.0020	.0012	.0046	.00070	.0008	.0007	.00367
%RSD	.19364	.12241	.45167	.13354	.07341	.06614	.37690
#1	1.0193	1.0127	1.0078	.52271	1.0205	1.0341	.97030
#2	1.0222	1.0125	1.0063	.52132	1.0212	1.0336	.97760
#3	1.0231	1.0147	1.0149	.52196	1.0220	1.0350	.97459
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
Value							
Range							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9508.3**	**107520.**	**12374.**
Stddev	22.0	296.	64.
%RSD	.23087	.27573	.51876
#1	9529.4	107780.	12444.
#2	9485.6	107600.	12363.
#3	9509.9	107200.	12317.

Approved: October 18, 2016
Kristi K Buck

Sample Name: CCB Acquired: 10/17/2016 21:24:53 Type: Blank
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Ag3280	Al3082	As1890	B_2496	Ba4554	Be3131	Ca4226	Cd2288
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00025**	**.00724**	**-.00201**	**-.00046**	**.00035**	**.00007**	**.00421**	**.00017**
Stddev	.00107	.00596	.00507	.00194	.00030	.00000	.01320	.00033
%RSD	437.47	82.284	251.76	420.37	86.852	4.1966	313.60	197.75
#1	.00026	.01052	.00374	.00154	.00043	.00007	-.01041	-.00004
#2	-.00148	.00036	-.00582	-.00234	.00001	.00007	.00780	-.00000
#3	.00048	.01083	-.00395	-.00058	.00060	.00006	.01524	.00054
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Co2286	Cr2677	Cu2247	Fe2611	K_7664	Li6707	Mg2790	Mn2576
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00001**	**.00054**	**-.00109**	**.00519**	**.01241**	**.00207**	**.03848**	**.00245**
Stddev	.00039	.00082	.00065	.01067	.04411	.00423	.05900	.00253
%RSD	3893.0	153.65	60.153	205.73	355.50	204.44	153.32	103.38
#1	-.00003	.00041	-.00038	.01661	.00348	.00387	.01189	.00506
#2	.00039	-.00022	-.00122	-.00452	-.02656	-.00276	-.00254	.00228
#3	-.00039	.00142	-.00167	.00346	.06029	.00509	.10610	.00001
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Elem	Mo2020	Na5895	Ni2316	P_2149	Pb2203	Sb2068	Se1960	Si2124
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**-.00071**	**-.00327**	**.00150**	**-.00633**	**-.00496**	**.00076**	**-.00374**	**.00166**
Stddev	.00016	.01499	.00024	.00486	.00432	.00180	.00530	.00280
%RSD	22.552	458.65	15.963	76.791	87.116	236.34	141.94	168.33
#1	-.00069	-.00311	.00129	-.01083	.00002	-.00094	.00127	.00059
#2	-.00088	-.01833	.00145	-.00698	-.00766	.00057	-.00319	.00485
#3	-.00057	.01164	.00176	-.00118	-.00725	.00265	-.00929	-.00044
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit								
Low Limit								

Approved: October 18, 2016

Sample Name: CCB Acquired: 10/17/2016 21:24:53 Type: Blank
Method: ICP-THERMO4_6010_200.7WATER_3YLINES(v116) Mode: CONC Corr. Factor: 1.00000(
User: KKB Custom ID1: Custom ID2: Custom ID3:
Comment:

Elem	Sn1899	Sr4077	Ti3372	Tl1908	V_2924	Zn2062	Zr3391
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Avg	**.00008**	**-.00003**	**.00191**	**-.00387**	**-.00089**	**-.00069**	**-.00032**
Stddev	.00094	.00028	.00085	.00218	.00072	.00008	.00035
%RSD	1102.7	1007.4	44.643	56.195	81.523	11.038	110.09
#1	-.00092	-.00034	.00098	-.00318	-.00024	-.00063	-.00053
#2	.00094	.00006	.00265	-.00631	-.00076	-.00078	.00009
#3	.00023	.00019	.00211	-.00212	-.00167	-.00066	-.00050
Check ?	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass	Chk Pass
High Limit							
Low Limit							

Int. Std.	Y_2243	Y_3600	Y_3774
Units	Cts/S	Cts/S	Cts/S
Avg	**9484.1**	**108150.**	**12001.**
Stddev	67.2	996.	80.
%RSD	.70866	.92063	.66653
#1	9482.8	107540.	11943.
#2	9417.6	107620.	12092.
#3	9552.0	109300.	11968.

Approved: October 18, 2016

Kim K Buck

2.1.2 Metals ICP-MS Data

2.1.2.1 Summary Data

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-01	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13F-100616	**Prep Method:**	3015	**Prep Date:**	10/13/2016 10:10
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	10/20/2016 09:11
Workgroup #:	WG588304	**Analyst:**	JYH	**Run Date:**	10/20/2016 13:10
Collect Date:	10/06/2016 08:30	**Dilution:**	1	**File ID:**	NI.102016.131024
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Antimony, Total	7440-36-0	0.00100	U	0.00200	0.00100	0.000500
Arsenic, Total	7440-38-2	0.00173	J	0.00200	0.00100	0.000500
Barium, Total	7440-39-3	0.0295		0.00600	0.00300	0.00150
Cadmium, Total	7440-43-9	0.000600	U	0.00120	0.000600	0.000300
Chromium, Total	7440-47-3	0.00191	J	0.00400	0.00200	0.00100
Cobalt, Total	7440-48-4	0.00268		0.00200	0.00100	0.000500
Copper, Total	7440-50-8	0.00161	J	0.00400	0.00200	0.00100
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500
Nickel, Total	7440-02-0	0.00777	J	0.00800	0.00400	0.00200
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
Thallium, Total	7440-28-0	0.000200	U	0.000400	0.000200	0.000100
Vanadium, Total	7440-62-2	0.000621	J	0.00200	0.00100	0.000500
Zinc, Total	7440-66-6	0.0713		0.0500	0.0250	0.0125

J	Estimated value ; the analyte concentration was less than the LOQ.
J	Estimated value ; the analyte concentration was greater than the highest standard
U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-01	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13F-100616	**Prep Method:**	3015	**Prep Date:**	10/13/2016 10:10
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	10/20/2016 09:11
Workgroup #:	WG588304	**Analyst:**	JYH	**Run Date:**	10/20/2016 13:47
Collect Date:	10/06/2016 08:30	**Dilution:**	20	**File ID:**	NI.102016.134728
Sample Tag:	DL01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Manganese, Total	7439-96-5	0.348		0.0800	0.0400	0.0200

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-02	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13FDF-100616	**Prep Method:**	3015	**Prep Date:**	10/13/2016 10:10
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	10/20/2016 09:11
Workgroup #:	WG588304	**Analyst:**	JYH	**Run Date:**	10/20/2016 13:13
Collect Date:	10/06/2016 08:30	**Dilution:**	1	**File ID:**	NI.102016.131323
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Antimony, Total	7440-36-0	0.00100	U	0.00200	0.00100	0.000500
Arsenic, Total	7440-38-2	0.00173	J	0.00200	0.00100	0.000500
Barium, Total	7440-39-3	0.0300		0.00600	0.00300	0.00150
Cadmium, Total	7440-43-9	0.000600	U	0.00120	0.000600	0.000300
Chromium, Total	7440-47-3	0.00186	J	0.00400	0.00200	0.00100
Cobalt, Total	7440-48-4	0.00262		0.00200	0.00100	0.000500
Copper, Total	7440-50-8	0.00200	U	0.00400	0.00200	0.00100
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500
Nickel, Total	7440-02-0	0.00779	J	0.00800	0.00400	0.00200
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
Thallium, Total	7440-28-0	0.000200	U	0.000400	0.000200	0.000100
Vanadium, Total	7440-62-2	0.000506	J	0.00200	0.00100	0.000500
Zinc, Total	7440-66-6	0.0250	U	0.0500	0.0250	0.0125

J	Estimated value ; the analyte concentration was less than the LOQ.
J	Estimated value ; the analyte concentration was greater than the highest standard
U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-02	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13FDF-100616	**Prep Method:**	3015	**Prep Date:**	10/13/2016 10:10
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	10/20/2016 09:11
Workgroup #:	WG588304	**Analyst:**	JYH	**Run Date:**	10/20/2016 13:50
Collect Date:	10/06/2016 08:30	**Dilution:**	20	**File ID:**	NI.102016.135028
Sample Tag:	DL01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Manganese, Total	7439-96-5	0.353		0.0800	0.0400	0.0200

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-03	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13MSF-100616	**Prep Method:**	3015	**Prep Date:**	10/13/2016 10:10
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	10/20/2016 09:11
Workgroup #:	WG588304	**Analyst:**	JYH	**Run Date:**	10/20/2016 13:16
Collect Date:	10/06/2016 08:30	**Dilution:**	1	**File ID:**	NI.102016.131623
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Antimony, Total	7440-36-0	0.00100	U	0.00200	0.00100	0.000500
Arsenic, Total	7440-38-2	0.00192	J	0.00200	0.00100	0.000500
Barium, Total	7440-39-3	0.0285		0.00600	0.00300	0.00150
Cadmium, Total	7440-43-9	0.000600	U	0.00120	0.000600	0.000300
Chromium, Total	7440-47-3	0.00180	J	0.00400	0.00200	0.00100
Cobalt, Total	7440-48-4	0.00261		0.00200	0.00100	0.000500
Copper, Total	7440-50-8	0.00200	U	0.00400	0.00200	0.00100
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500
Nickel, Total	7440-02-0	0.00774	J	0.00800	0.00400	0.00200
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
Thallium, Total	7440-28-0	0.000200	U	0.000400	0.000200	0.000100
Vanadium, Total	7440-62-2	0.000510	J	0.00200	0.00100	0.000500
Zinc, Total	7440-66-6	0.0250	U	0.0500	0.0250	0.0125

J	Estimated value ; the analyte concentration was less than the LOQ.
J	Estimated value ; the analyte concentration was greater than the highest standard
U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-03	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13MSF-100616	**Prep Method:**	3015	**Prep Date:**	10/13/2016 10:10
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	10/20/2016 09:11
Workgroup #:	WG588304	**Analyst:**	JYH	**Run Date:**	10/20/2016 13:53
Collect Date:	10/06/2016 08:30	**Dilution:**	20	**File ID:**	NI.102016.135327
Sample Tag:	DL01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Manganese, Total	7439-96-5	0.346		0.0800	0.0400	0.0200

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-04	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13MSDF-100616	**Prep Method:**	3015	**Prep Date:**	10/13/2016 10:10
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	10/20/2016 09:11
Workgroup #:	WG588304	**Analyst:**	JYH	**Run Date:**	10/20/2016 13:19
Collect Date:	10/06/2016 08:30	**Dilution:**	1	**File ID:**	NI.102016.131923
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Antimony, Total	7440-36-0	0.00100	U	0.00200	0.00100	0.000500
Arsenic, Total	7440-38-2	0.00172	J	0.00200	0.00100	0.000500
Barium, Total	7440-39-3	0.0274		0.00600	0.00300	0.00150
Cadmium, Total	7440-43-9	0.000600	U	0.00120	0.000600	0.000300
Chromium, Total	7440-47-3	0.00206	J	0.00400	0.00200	0.00100
Cobalt, Total	7440-48-4	0.00254		0.00200	0.00100	0.000500
Copper, Total	7440-50-8	0.00200	U	0.00400	0.00200	0.00100
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500
Nickel, Total	7440-02-0	0.00758	J	0.00800	0.00400	0.00200
Silver, Total	7440-22-4	0.00100	U	0.00200	0.00100	0.000500
Thallium, Total	7440-28-0	0.000200	U	0.000400	0.000200	0.000100
Vanadium, Total	7440-62-2	0.00100	U	0.00200	0.00100	0.000500
Zinc, Total	7440-66-6	0.0250	U	0.0500	0.0250	0.0125

J	Estimated value ; the analyte concentration was less than the LOQ.
J	Estimated value ; the analyte concentration was greater than the highest standard
U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-04	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13MSDF-100616	**Prep Method:**	3015	**Prep Date:**	10/13/2016 10:10
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	10/20/2016 09:11
Workgroup #:	WG588304	**Analyst:**	JYH	**Run Date:**	10/20/2016 13:56
Collect Date:	10/06/2016 08:30	**Dilution:**	20	**File ID:**	NI.102016.135626
Sample Tag:	DL01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Manganese, Total	7439-96-5	0.307		0.0800	0.0400	0.0200

J	Estimated value ; the analyte concentration was less than the LOQ.
U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

2.1.2.2 QC Summary Data

Example 6020 Calculations
Perkin Elmer NexION 300X

1.0 Initial Calibration (ICAL) Parameters
The system performs linear regression from data consisting of a blank and three standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (ug/L)	0.1
Vf = Final volume	100
Vi = Initial volume	40
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in (ug/L)	0.25

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (ug/L)	0.1
Vf = Final volume	200
Vi = Initial volume	0.5
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in (ug/kg)	40

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:	**Example:**
Cx = Concentration calculated as received (wet basis)	40
Px = Percent solids of sample (%wt)	80
$Cdry$ = Concentration calculated as dry weight (ug/kg)	50

50 ug/kg = 0.050 mg/kg

Perkin Elmer NexION ICP/MS

STANDARDS KEY

QC Std 1 - ICV
QC Std 2 - ICB
QC Std 3 - LLICV
QC Std 4 - ICSA
QC Std 5 - ICSAB
QC Std 6 - CCV
QC Std 7 - CCB
QC Std 8 - LLCCV

Calibration Solutions

Analyte	Stock Conc. (mg/L)	S1 (mg/L)	S2 (mg/L)	S3 (mg/L)	S4 (mg/L)
Al	10	0	0.00005	0.05	0.1
Sb	10	0	0.00005	0.05	0.1
As	10	0	0.00005	0.05	0.1
Ba	10	0	0.00005	0.05	0.1
Be	10	0	0.00005	0.05	0.1
Ca	1000	0	0.005	5	10
Cd	10	0	0.0005	0.05	0.1
Cr	10	0	0.0005	0.05	0.1
Co	10	0	0.0005	0.05	0.1
Cu	10	0	0.0005	0.05	0.1
Fe	1000	0	0.005	5	10
Pb	10	0	0.00005	0.05	0.1
Mg	1000	0	0.005	5	10
Mn	10	0	0.00005	0.05	0.1
Ni	10	0	0.00005	0.05	0.1
K	1000	0	0.005	5	10
Se	10	0	0.00005	0.05	0.1
Ag	10	0	0.00005	0.05	0.1
Na	1000	0	0.005	5	10
Tl	10	0	0.00005	0.05	0.1
V	10	0	0.00005	0.05	0.1
U	1000	0	0.00005	0.05	0.1
Zn	10	0	0.00005	0.05	0.1

Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG587446
Analyst: VC
Spike Analyst: VC
Run Date: 10/13/2016 10:10
Method: 3015
Balance: BAL016
Instrument: MW-3
Instrument Start: 10/13/2016 10:14

SOP: ME407 Revison 19
Spike Solution: STD78216
Spike Witness: ERP
40 & 50 ML. DIGESTION TU: COA18987
HNO3 Lot #: COA19196
MS Filters- fisher-Lot#R: RGT37258

	SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG587446-02	BLANK	1	20 mL	50 mL	182.757 g	182.726 g		
2	WG587446-03	LCS	1	20 mL	50 mL	182.604 g	182.575 g	.25 mL	
3	WG587446-01	REF	1	20 mL	50 mL	183.37 g	183.341 g		
4	L16100267-02	RS02	1	20 mL	50 mL	183.37 g	183.341 g		10/20/16
5	WG587446-04	MS	1	20 mL	50 mL	184.406 g	184.359 g	.25 mL	
6	L16100267-05	MS02	1	20 mL	50 mL	184.406 g	184.359 g	.25 mL	10/20/16
7	WG587446-05	MSD	1	20 mL	50 mL	184.434 g	184.417 g	.25 mL	
8	L16100267-08	SD02	1	20 mL	50 mL	184.434 g	184.417 g	.25 mL	10/20/16
9	L16100267-11	SAMP	1	20 mL	50 mL	182.347 g	182.328 g		10/20/16
10	L16100267-14	SAMP	1	20 mL	50 mL	182.993 g	182.986 g		10/20/16
11	L16100267-17	SAMP	1	20 mL	50 mL	181.103 g	181.113 g		10/20/16
12	L16100267-20	SAMP	1	20 mL	50 mL	180.509 g	180.5 g		10/20/16
13	L16100267-23	SAMP	1	20 mL	50 mL	183.455 g	183.442 g		10/20/16
14	L16100408-01	SAMP	1	20 mL	50 mL	180.603 g	180.591 g		10/18/16
15	L16100408-02	SAMP	1	20 mL	50 mL	184.525 g	184.526 g		10/18/16
16	L16100408-03	SAMP	1	20 mL	50 mL	181.842 g	181.829 g		10/18/16
17	L16100408-04	SAMP	1	20 mL	50 mL	182.697 g	182.685 g		10/18/16
18	L16100456-02	SAMP	1	20 mL	50 mL	183.57 g	183.568 g		10/24/16
19	L16100456-04	SAMP	1	20 mL	50 mL	184.591 g	184.581 g		10/24/16
20	L16100512-01	SAMP	1	20 mL	50 mL	181.968 g	181.947 g		10/21/16
21	L16100544-01	SAMP	1	20 mL	50 mL	184.395 g	184.372 g		10/21/16
22	L16100544-02	SAMP	1	20 mL	50 mL	184.633 g	184.629 g		10/21/16
23	L16100544-03	SAMP	1	20 mL	50 mL	184.461 g	184.449 g		10/21/16

Analyst: Vicki Collins

Reviewer: Erin Potter

MW_DIG - Modified 09/30/2009
PDF ID: 4973938
Report generated: 10/13/2016 11:39

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 102016C.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD78212 ICV Std: STD78221 Post Spike: STD76567
ICSA: STD78569 ICSAB: STD78570 Int. Std: RGT38094
CCV: STD78220 LLCCV: STD78575 Tuning Sol : STD77874
Stannous : Hydroxylamine :

Workgroups: 588301,588306,588303,588230,588304,588224,587692,588260,5884

Comments: Additional Workgroups:588423,588103,588306

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	NI.102016.085906	Blank	Blank		1		10/20/16 08:59
2	NI.102016.090206	WG588410-01	Calibration Point		1		10/20/16 09:02
3	NI.102016.090506	WG588410-02	Calibration Point		1		10/20/16 09:05
4	NI.102016.090805	WG588410-03	Calibration Point		1		10/20/16 09:08
5	NI.102016.091105	WG588410-04	Calibration Point		1		10/20/16 09:11
6	NI.102016.091406	WG588410-05	Initial Calibration Verification		1		10/20/16 09:14
7	NI.102016.091707	WG588410-06	Initial Calib Blank		1		10/20/16 09:17
8	NI.102016.092008	WG588410-07	Low Level Initial Calibration V		1		10/20/16 09:20
9	NI.102016.092307	WG588410-08	Interference Check		1		10/20/16 09:23
10	NI.102016.093030	WG588410-09	Interference Check		1		10/20/16 09:30
11	NI.102016.093331	WG588410-10	CCV		1		10/20/16 09:33
12	NI.102016.093630	WG588410-11	CCB		1		10/20/16 09:36
13	NI.102016.093931	WG587411-02	Method/Prep Blank	.25/100	1		10/20/16 09:39
14	NI.102016.094230	WG587411-03	Laboratory Control S	.25/100	1		10/20/16 09:42
15	NI.102016.094530	WG587411-01	Reference Sample		1	L16100401-02	10/20/16 09:45
16	NI.102016.094829	WG587411-04	Matrix Spike	.25/100	1	L16100401-02	10/20/16 09:48
17	NI.102016.095129	WG587411-05	Matrix Spike Duplica	.256/100	1	L16100401-02	10/20/16 09:51
18	NI.102016.095427	L16100401-01	ED-240-HB13-S02	.251/100	1		10/20/16 09:54
19	NI.102016.095726	WG588301-01	Post Digestion Spike		1	L16100401-01	10/20/16 09:57
20	NI.102016.100025	WG588301-02	Serial Dilution		5	L16100401-01	10/20/16 10:00
21	NI.102016.100324	WG588301-02	Serial Dilution		25	L16100401-01	10/20/16 10:03
22	NI.102016.100625	WG588410-12	CCV		1		10/20/16 10:06
23	NI.102016.100925	WG588410-13	CCB		1		10/20/16 10:09
24	NI.102016.101226	WG588218-02	Method/Prep Blank	.25/100	1		10/20/16 10:12
25	NI.102016.101525	WG588218-03	Laboratory Control S	.25/100	1		10/20/16 10:15
26	NI.102016.101825	WG588218-01	Reference Sample		1	L16100913-01	10/20/16 10:18
27	NI.102016.102125	WG588218-04	Matrix Spike	.257/100	1	L16100913-01	10/20/16 10:21
28	NI.102016.102424	WG588218-05	Matrix Spike Duplica	.252/100	1	L16100913-01	10/20/16 10:24
29	NI.102016.102724	L16100910-01	QC LOT\# D090-540	.255/100	10		10/20/16 10:27
30	NI.102016.103023	WG588306-01	Post Digestion Spike		10	L16100910-01	10/20/16 10:30
31	NI.102016.103322	WG588306-02	Serial Dilution		50	L16100910-01	10/20/16 10:33
32	NI.102016.103622	WG588306-02	Serial Dilution		250	L16100910-01	10/20/16 10:36
33	NI.102016.103923	WG588410-14	CCV		1		10/20/16 10:39
34	NI.102016.104222	WG588410-15	CCB		1		10/20/16 10:42

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Instrument Run Log

Instrument: ICP-MS2 Dataset: 102016C.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD78212 ICV Std: STD78221 Post Spike: STD76567
ICSA: STD78569 ICSAB: STD78570 Int. Std: RGT38094
CCV: STD78220 LLCCV: STD78575 Tuning Sol : STD77874
Stannous : Hydroxylamine :

Workgroups: 588301,588306,588303,588230,588304,588224,587692,588260,5884

Comments: Additional Workgroups:588423,588103,588306

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
35	NI.102016.104554	WG588218-01	Reference Sample		100	L16100913-01	10/20/16 10:45
36	NI.102016.104853	WG588218-04	Matrix Spike	.257/100	100	L16100913-01	10/20/16 10:48
37	NI.102016.105153	WG588218-05	Matrix Spike Duplica	.252/100	100	L16100913-01	10/20/16 10:51
38	NI.102016.105454	WG588410-16	CCV		1		10/20/16 10:54
39	NI.102016.105753	WG588410-17	CCB		1		10/20/16 10:57
40	NI.102016.110054	WG588219-02	Method/Prep Blank	.25/100	1		10/20/16 11:00
41	NI.102016.110354	WG588219-03	Laboratory Control S	.25/100	1		10/20/16 11:03
42	NI.102016.110653	WG588219-01	Reference Sample		1	L16100930-01	10/20/16 11:06
43	NI.102016.111001	WG588219-04	Matrix Spike	.25/100	1	L16100930-01	10/20/16 11:10
44	NI.102016.111300	WG588219-05	Matrix Spike Duplica	.253/100	1	L16100930-01	10/20/16 11:13
45	NI.102016.111600	L16100913-01	BP-GS081B-01-ES	.251/100	1	WG588218-01	10/20/16 11:16
46	NI.102016.111859	WG588303-01	Post Digestion Spike		1	L16100913-01	10/20/16 11:18
47	NI.102016.112159	WG588303-02	Serial Dilution		5	L16100913-01	10/20/16 11:21
48	NI.102016.112458	WG588303-02	Serial Dilution		25	L16100913-01	10/20/16 11:24
49	NI.102016.112759	WG588410-18	CCV		1		10/20/16 11:27
50	NI.102016.113058	WG588410-19	QC Std 7		1		10/20/16 11:30
51	NI.102016.113412	WG588410-20	CCB		1		10/20/16 11:34
52	NI.102016.113752	WG588149-02	Method/Prep Blank	20/50	1		10/20/16 11:37
53	NI.102016.114052	WG588149-03	Laboratory Control S	20/50	1		10/20/16 11:40
54	NI.102016.114350	WG588149-01	Reference Sample		1	L16100644-04	10/20/16 11:43
55	NI.102016.114650	WG588149-04	Matrix Spike	20/50	1	L16100644-04	10/20/16 11:46
56	NI.102016.114950	WG588149-05	Matrix Spike Duplica	20/50	1	L16100644-04	10/20/16 11:49
57	NI.102016.115249	L16100661-01	1610106-01	20/50	1		10/20/16 11:52
58	NI.102016.115548	L16100661-02	1610106-02	20/50	1		10/20/16 11:55
59	NI.102016.115847	WG588230-01	Post Digestion Spike		1	L16100661-02	10/20/16 11:58
60	NI.102016.120147	WG588230-02	Serial Dilution		5	L16100661-02	10/20/16 12:01
61	NI.102016.120446	WG588230-02	Serial Dilution		25	L16100661-02	10/20/16 12:04
62	NI.102016.120748	WG588410-21	CCV		1		10/20/16 12:07
63	NI.102016.121047	WG588410-22	CCB		1		10/20/16 12:10
64	NI.102016.122531	WG587446-02	Method/Prep Blank	20/50	1		10/20/16 12:25
65	NI.102016.122829	WG587446-02	Method/Prep Blank	20/50	1		10/20/16 12:28
66	NI.102016.123129	WG587446-01	Reference Sample		1	L16100267-02	10/20/16 12:31
67	NI.102016.123428	WG587446-04	Matrix Spike	20/50	1	L16100267-02	10/20/16 12:34
68	NI.102016.123728	WG587446-05	Matrix Spike Duplica	20/50	1	L16100267-02	10/20/16 12:37

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Instrument Run Log

Instrument: ICP-MS2 Dataset: 102016C.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD78212 ICV Std: STD78221 Post Spike: STD76567
ICSA: STD78569 ICSAB: STD78570 Int. Std: RGT38094
CCV: STD78220 LLCCV: STD78575 Tuning Sol : STD77874
Stannous : Hydroxylamine :

Workgroups: 588301,588306,588303,588230,588304,588224,587692,588260,5884

Comments: Additional Workgroups:588423,588103,588306

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
69	NI.102016.124027	L16100267-11	SW2A-326A-14	20/50	1		10/20/16 12:40
70	NI.102016.124326	L16100267-14	SW2B-326A-14	20/50	1		10/20/16 12:43
71	NI.102016.124626	WG588304-01	Post Digestion Spike		1	L16100267-14	10/20/16 12:46
72	NI.102016.124925	WG588304-02	Serial Dilution		5	L16100267-14	10/20/16 12:49
73	NI.102016.125225	WG588304-02	Serial Dilution		25	L16100267-14	10/20/16 12:52
74	NI.102016.125526	WG588410-23	CCV		1		10/20/16 12:55
75	NI.102016.125826	WG588410-24	CCB		1		10/20/16 12:58
76	NI.102016.130127	L16100267-17	SW3A-326A-14	20/50	1		10/20/16 13:01
77	NI.102016.130426	L16100267-20	SW4A-326A-14	20/50	1		10/20/16 13:04
78	NI.102016.130725	L16100267-23	SW5A-326A-14	20/50	1		10/20/16 13:07
79	NI.102016.131024	L16100408-01	35AWW13F-100616	20/50	1		10/20/16 13:10
80	NI.102016.131323	L16100408-02	35AWW13FDF-100616	20/50	1		10/20/16 13:13
81	NI.102016.131623	L16100408-03	35AWW13MSF-100616	20/50	1		10/20/16 13:16
82	NI.102016.131923	L16100408-04	35AWW13MSDF-100616	20/50	1		10/20/16 13:19
83	NI.102016.132222	L16100456-02	LF6MW10016	20/50	1		10/20/16 13:22
84	NI.102016.132521	L16100456-04	LF6MW0316	20/50	1		10/20/16 13:25
85	NI.102016.132821	L16100512-01	LH18/24-SP140-7400-GRAB	20/50	1		10/20/16 13:28
86	NI.102016.133122	WG588410-25	CCV		1		10/20/16 13:31
87	NI.102016.133421	WG588410-26	CCB		1		10/20/16 13:34
88	NI.102016.133722	L16100544-01	GW2H15-MW-47	20/50	1		10/20/16 13:37
89	NI.102016.134021	L16100544-02	GW2H15-MW-16	20/50	1		10/20/16 13:40
90	NI.102016.134320	L16100544-03	FB-101116	20/50	1		10/20/16 13:43
91	NI.102016.134728	L16100408-01	35AWW13F-100616	20/50	20		10/20/16 13:47
92	NI.102016.135028	L16100408-02	35AWW13FDF-100616	20/50	20		10/20/16 13:50
93	NI.102016.135327	L16100408-03	35AWW13MSF-100616	20/50	20		10/20/16 13:53
94	NI.102016.135626	L16100408-04	35AWW13MSDF-100616	20/50	20		10/20/16 13:56
95	NI.102016.135926	L16100512-01	LH18/24-SP140-7400-GRAB	20/50	20		10/20/16 13:59
96	NI.102016.140227	WG588410-27	CCV		1		10/20/16 14:02
97	NI.102016.140527	WG588410-28	CCB		1		10/20/16 14:05
98	NI.102016.140827	WG588410-29	Low Level Continuing Calibra		1		10/20/16 14:08
99	NI.102016.141813	L16100420-01	IS-1A	.253/100	100		10/20/16 14:18
100	NI.102016.142112	WG588224-01	Post Digestion Spike		100	L16100420-01	10/20/16 14:21
101	NI.102016.142411	WG588224-02	Serial Dilution		500	L16100420-01	10/20/16 14:24
102	NI.102016.142711	L16100420-02	IS-1B	.251/100	100		10/20/16 14:27

Page: 3 Approved: October 24, 2016

Microbac

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 102016C.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD78212 ICV Std: STD78221 Post Spike: STD76567
ICSA: STD78569 ICSAB: STD78570 Int. Std: RGT38094
CCV: STD78220 LLCCV: STD78575 Tuning Sol : STD77874
Stannous : Hydroxylamine :

Workgroups: 588301,588306,588303,588230,588304,588224,587692,588260,5884

Comments: Additional Workgroups:588423,588103,588306

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
103	NI.102016.143010	L16100420-03	IS-1C	.252/100	100		10/20/16 14:30
104	NI.102016.143310	L16100420-06	IS-2	.252/100	100		10/20/16 14:33
105	NI.102016.143609	L16100420-10	GP-1 4-6'	.253/100	100		10/20/16 14:36
106	NI.102016.143908	WG587692-03	Post Digestion Spike		100	L16100420-10	10/20/16 14:39
107	NI.102016.144207	WG587692-04	Serial Dilution		500	L16100420-10	10/20/16 14:42
108	NI.102016.144508	WG588410-30	CCV		1		10/20/16 14:45
109	NI.102016.144808	WG588410-31	CCB		1		10/20/16 14:48
110	NI.102016.145108	L16100420-11	GP-2 0-2'	.252/100	100		10/20/16 14:51
111	NI.102016.145649	L16100716-01	GH53 SUMP	.257/100	100		10/20/16 14:56
112	NI.102016.145948	WG588260-01	Post Digestion Spike		100	L16100716-01	10/20/16 14:59
113	NI.102016.150248	WG588260-02	Serial Dilution		500	L16100716-01	10/20/16 15:02
114	NI.102016.150549	WG588410-32	CCV		1		10/20/16 15:05
115	NI.102016.150848	WG588410-33	CCB		1		10/20/16 15:08
116	NI.102016.151149	WG587431-02	Method/Prep Blank	40/50	50		10/20/16 15:11
117	NI.102016.152147	WG587431-03	Laboratory Control S	40/50	50		10/20/16 15:21
118	NI.102016.152625	WG587345-01	Fluid Blank 2		50		10/20/16 15:26
119	NI.102016.152924	WG587431-01	Reference Sample		50	L16100267-02	10/20/16 15:29
120	NI.102016.153224	WG587431-04	Matrix Spike	40/50	50	L16100267-02	10/20/16 15:32
121	NI.102016.153523	WG587431-05	Matrix Spike Duplica	40/50	50	L16100267-02	10/20/16 15:35
122	NI.102016.153823	L16100598-01	AWV 22 BAGS	5/50	50		10/20/16 15:38
123	NI.102016.154122	WG588423-01	Post Digestion Spike		50	L16100598-01	10/20/16 15:41
124	NI.102016.154422	WG588423-02	Serial Dilution		250	L16100598-01	10/20/16 15:44
125	NI.102016.154721	WG588019-02	Method/Prep Blank	40/50	50		10/20/16 15:47
126	NI.102016.155021	WG588410-34	CCV		1		10/20/16 15:50
127	NI.102016.155321	WG588410-35	CCB		1		10/20/16 15:53
128	NI.102016.155621	WG588019-03	Laboratory Control S	40/50	50		10/20/16 15:56
129	NI.102016.155921	WG587809-01	Fluid Blank 1		50		10/20/16 15:59
130	NI.102016.160220	WG587809-02	Fluid Blank 2		50		10/20/16 16:02
131	NI.102016.160519	WG588019-01	Reference Sample		50	L16100685-01	10/20/16 16:05
132	NI.102016.160817	WG588019-04	Matrix Spike	5/50	50	L16100685-01	10/20/16 16:08
133	NI.102016.161117	WG588019-05	Matrix Spike Duplica	5/50	50	L16100685-01	10/20/16 16:11
134	NI.102016.161417	L16100698-01	KAISER 9 BAGS	5/50	50		10/20/16 16:14
135	NI.102016.161716	WG588103-01	Post Digestion Spike		50	L16100698-01	10/20/16 16:17
136	NI.102016.162016	WG588103-02	Serial Dilution		250	L16100698-01	10/20/16 16:20

Page: 4 Approved: October 24, 2016

Microbac

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 102016C.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD78212 ICV Std: STD78221 Post Spike: STD76567
ICSA: STD78569 ICSAB: STD78570 Int. Std: RGT38094
CCV: STD78220 LLCCV: STD78575 Tuning Sol : STD77874
Stannous : Hydroxylamine :

Workgroups: 588301,588306,588303,588230,588304,588224,587692,588260,5884

Comments: Additional Workgroups:588423,588103,588306

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
137	NI.102016.162314	L16100699-01	RAV 6 BAGS	5/50	50		10/20/16 16:23
138	NI.102016.162615	WG588410-36	CCV		1		10/20/16 16:26
139	NI.102016.162914	WG588410-37	CCB		1		10/20/16 16:29
140	NI.102016.163215	L16100855-01	SCF-WS01-101716	.251/100	1		10/20/16 16:32
141	NI.102016.172455	L16100855-02	SCF-WS02-101716	.25/100	1		10/20/16 17:24
142	NI.102016.172754	L16100855-03	SCF-WS03-101716	.255/100	1		10/20/16 17:27
143	NI.102016.173053	L16100855-04	SCF-WS04-101716	.256/100	1		10/20/16 17:30
144	NI.102016.173353	L16100855-05	SCF-WS05-101716	.257/100	1		10/20/16 17:33
145	NI.102016.173652	L16100855-06	SCF-WS06-101716	.255/100	1		10/20/16 17:36
146	NI.102016.173952	L16100855-07	SCF-WS07-101716	.25/100	1		10/20/16 17:39
147	NI.102016.174306	L16100855-08	SCF-WS08-101716	.252/100	1		10/20/16 17:43
148	NI.102016.174605	L16100855-09	SCF-WS09-101716	.252/100	1		10/20/16 17:46
149	NI.102016.174938	L16100855-10	SCF-WS10-101716	.25/100	1		10/20/16 17:49
150	NI.102016.175239	WG588410-38	CCV		1		10/20/16 17:52
151	NI.102016.175538	WG588410-39	CCB		1		10/20/16 17:55
152	NI.102016.175839	L16100855-10	SCF-WS10-101716	.25/100	10		10/20/16 17:58
153	NI.102016.180140	WG588410-40	Interference Check		1		10/20/16 18:01
154	NI.102016.180440	WG588410-41	Interference Check		1		10/20/16 18:04
155	NI.102016.180741	WG588410-42	CCV		1		10/20/16 18:07
156	NI.102016.181041	WG588410-43	CCB		1		10/20/16 18:10
157	NI.102016.181341	L16091060-03	CO-123-Y1-VEG 1	.253/100	5		10/20/16 18:13
158	NI.102016.181640	L16091060-04	CO-123-Y1-VEG 2	.254/100	5		10/20/16 18:16
159	NI.102016.182013	L16091060-05	CO-123-Y1-VEG 3	.255/100	5		10/20/16 18:20
160	NI.102016.182433	L16091060-09	CO-140-VEG 3	.25/100	5		10/20/16 18:24
161	NI.102016.182757	L16091060-10	CO-141-VEG 1	.25/100	5		10/20/16 18:27
162	NI.102016.183057	L16091060-11	CO-141-VEG 2	.251/100	5		10/20/16 18:30
163	NI.102016.183356	L16091060-12	CO-141-VEG 3	.25/100	5		10/20/16 18:33
164	NI.102016.183657	WG588410-44	CCV		1		10/20/16 18:36
165	NI.102016.183957	WG588410-45	CCB		1		10/20/16 18:39

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Microbac Laboratories Inc.

Data Checklist

Date: 20-OCT-2016
Analyst: JYH
Analyst: NA
Method: 6020/6020A
Instrument: ICP-MS2
Curve Workgroup: 588410
Runlog ID: 78193
Analytical Workgroups: 588301,588306,588303,588230,588304,588224,587692

Additional Workgroups	588260,588423,588103,588306
STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	X
Client Forms	X
Level X	
Level 3	855
Level 4	408,456,512,661
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	BKT
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
24-OCT-2016

Secondary Reviewer:
24-OCT-2016

CHECKLIST1 - Modified 03/05/2008
Generated: OCT-24-2016 14:27:50

Microbac Laboratories Inc.

HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 6020A AAB#: WG588304

Login Number: L16100408

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
35AWW13F-100616	01	10/06/16					10/13/2016	7.1	180		10/20/16	14.2	180	
35AWW13F-100616	01	10/06/16					10/13/2016	7.1	180		10/20/16	14.2	180	
35AWW13FDF-100616	02	10/06/16					10/13/2016	7.1	180		10/20/16	14.2	180	
35AWW13FDF-100616	02	10/06/16					10/13/2016	7.1	180		10/20/16	14.2	180	
35AWW13MSF-100616	03	10/06/16					10/13/2016	7.1	180		10/20/16	14.2	180	
35AWW13MSF-100616	03	10/06/16					10/13/2016	7.1	180		10/20/16	14.2	180	
35AWW13MSDF-100616	04	10/06/16					10/13/2016	7.1	180		10/20/16	14.2	180	
35AWW13MSDF-100616	04	10/06/16					10/13/2016	7.1	180		10/20/16	14.2	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 4987287
Report generated 10/21/2016 11:52

METHOD BLANK SUMMARY

Login Number: L16100408
Blank File ID: NI.102016.122531
Prep Date: 10/13/16 10:10
Analyzed Date: 10/20/16 12:25
Analyst: JYH

Work Group: WG588304
Blank Sample ID: WG587446-02
Instrument ID: ICP-MS2
Method: 6020A

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG587446-03	NI.102016.122829	10/20/16 12:28	01
35AWW13F-100616	L16100408-01	NI.102016.131024	10/20/16 13:10	01
35AWW13FDF-100616	L16100408-02	NI.102016.131323	10/20/16 13:13	01
35AWW13MSF-100616	L16100408-03	NI.102016.131623	10/20/16 13:16	01
35AWW13MSDF-100616	L16100408-04	NI.102016.131923	10/20/16 13:19	01
35AWW13F-100616	L16100408-01	NI.102016.134728	10/20/16 13:47	DL01
35AWW13FDF-100616	L16100408-02	NI.102016.135028	10/20/16 13:50	DL01
35AWW13MSF-100616	L16100408-03	NI.102016.135327	10/20/16 13:53	DL01
35AWW13MSDF-100616	L16100408-04	NI.102016.135626	10/20/16 13:56	DL01

Report Name: BLANK_SUMMARY
PDF File ID: 4987288
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number:L16100408 Prep Date:10/13/16 10:10 Sample ID:WG587446-02
Instrument ID:ICP-MS2 Run Date:10/20/16 12:25 Prep Method:3015
File ID:NI.102016.122531 Analyst:JYH Method:6020A
Workgroup (AAB#):WG588304 Matrix:Water Units:mg/L
Contract #: Cal ID:ICP-MS-20-OCT-16

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Antimony, Total	0.000500	0.00200	0.000684	1	J
Arsenic, Total	0.000500	0.00200	0.000500	1	U
Barium, Total	0.00150	0.00600	0.00150	1	U
Cadmium, Total	0.000300	0.00120	0.000300	1	U
Chromium, Total	0.00100	0.00400	0.00131	1	J
Cobalt, Total	0.000500	0.00200	0.000500	1	U
Copper, Total	0.00100	0.00400	0.00100	1	U
Lead, Total	0.000500	0.00200	0.000500	1	U
Manganese, Total	0.00100	0.00400	0.00100	1	U
Nickel, Total	0.00200	0.00800	0.00200	1	U
Silver, Total	0.000500	0.00200	0.000500	1	U
Thallium, Total	0.000100	0.000400	0.000100	1	U
Vanadium, Total	0.000500	0.00200	0.000500	1	U
Zinc, Total	0.0125	0.0500	0.0125	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name:BLANK
PDF ID: 4987289
21-OCT-2016 11:52

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG587446-03
Instrument ID: ICP-MS2 Run Time: 12:28 Prep Method: 3015
File ID: NI.102016.122829 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG588304 Matrix: Water Units: mg/L
QC Key: DOD4 Lot#: STD78216 Cal ID: ICP-MS-20-OCT-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Antimony, Total	0.125	0.123	98.5	80 - 120	
Arsenic, Total	0.125	0.124	98.9	80 - 120	
Barium, Total	0.125	0.124	99.2	80 - 120	
Cadmium, Total	0.125	0.126	100	80 - 120	
Chromium, Total	0.125	0.125	100	80 - 120	
Cobalt, Total	0.125	0.122	97.8	80 - 120	
Copper, Total	0.125	0.124	99.0	80 - 120	
Lead, Total	0.125	0.122	97.4	80 - 120	
Manganese, Total	0.125	0.120	96.3	80 - 120	
Nickel, Total	0.125	0.124	99.6	80 - 120	
Silver, Total	0.125	0.120	95.8	80 - 120	
Thallium, Total	0.125	0.124	98.9	80 - 120	
Vanadium, Total	0.125	0.124	98.8	80 - 120	
Zinc, Total	0.125	0.122	97.7	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 4987290
Report generated: 10/21/2016 11:52

Microbac Laboratories Inc.
MATRIX SPIKE AND MATRIX SPIKE DUP (MS/MSD)

Loginnum:L16100408 Cal ID:ICP-MS2- Worknum:WG588304
Instrument ID:ICP-MS2 Contract #: Method:6020A
Parent ID:WG587446-01 File ID:NI.102016.123129 Dil:1 Matrix:WATER
Sample ID:WG587446-04 MS File ID:NI.102016.123428 Dil:1 Units:mg/L
Sample ID:WG587446-05 MSD File ID:NI.102016.123728 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Antimony	0.00129	0.125	0.119	93.9	0.125	0.120	95.1	1.22	80 - 120	20	
Arsenic	ND	0.125	0.121	96.7	0.125	0.122	97.4	0.740	80 - 120	20	
Barium	0.0108	0.125	0.131	95.8	0.125	0.131	96.5	0.638	80 - 120	20	
Cadmium	ND	0.125	0.125	99.9	0.125	0.125	99.7	0.210	80 - 120	20	
Chromium	0.00170	0.125	0.121	95.4	0.125	0.125	98.6	3.24	80 - 120	20	
Cobalt	ND	0.125	0.119	94.8	0.125	0.123	98.4	3.70	80 - 120	20	
Copper	ND	0.125	0.122	97.9	0.125	0.123	98.6	0.758	80 - 120	20	
Lead	ND	0.125	0.119	95.2	0.125	0.121	96.7	1.48	80 - 120	20	
Manganese	0.00731	0.125	0.124	93.2	0.125	0.128	96.8	3.58	80 - 120	20	
Nickel	ND	0.125	0.121	97.0	0.125	0.123	98.6	1.64	80 - 120	20	
Silver	ND	0.125	0.117	93.7	0.125	0.118	94.8	1.17	80 - 120	20	
Thallium	ND	0.125	0.120	95.9	0.125	0.122	97.9	1.99	80 - 120	20	
Vanadium	ND	0.125	0.118	94.5	0.125	0.122	97.9	3.49	80 - 120	20	
Zinc	ND	0.125	0.122	97.8	0.125	0.124	99.2	1.36	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

WG_MS_MSD_DRYWT - Modified 05/26/2011
PDF File ID: 4987291
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.
Serial Dilution Report

Login: L16100408 **Worknum:** WG588304
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG588304-02 **File ID:** NI.102016.124925 **Dil:** 5 **Units:** ug/L
Sample: L16100267-14 **File ID:** NI.102016.124326 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Antimony	ND	U	1.33	F	707.00	
Arsenic	ND	U	ND	U		
Barium	3.58	X	3.67	F	2.34	
Cadmium	ND	U	ND	U		
Chromium	0.597	F	ND	U		
Cobalt	ND	U	ND	U		
Copper	ND	U	ND	U		
Lead	ND	U	ND	U		
Manganese	3.73	X	4.07	F	9.13	
Nickel	ND	U	ND	U		
Silver	ND	U	ND	U		
Thallium	ND	U	ND	U		
Vanadium	ND	U	ND	U		
Zinc	ND	U	ND	U		

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 100 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008
PDF File ID: 4987285
10/21/2016 11:52

Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16100408 **Worknum:** WG588304
Instrument ID: ICP-MS2 **Method:** 6020A
Post Spike ID: WG588304-01 **File ID:** NI.102016.124626 **Dil:** 1 **Units:** ug/L
Sample ID: L16100267-14 **File ID:** NI.102016.124326 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ANTIMONY	51.6		0	U	50	103.2	75 - 125	
ARSENIC	51.1		0	U	50	102.2	75 - 125	
BARIUM	54.3		3.58		50	101.5	75 - 125	
CADMIUM	52.1		0	U	50	104.2	75 - 125	
CHROMIUM	50.9		0.597	F	50	100.7	75 - 125	
COBALT	50.0		0	U	50	100.1	75 - 125	
COPPER	52.2		0	U	50	104.3	75 - 125	
LEAD	50.7		0	U	50	101.5	75 - 125	
MANGANESE	53.1		3.73		50	98.7	75 - 125	
NICKEL	50.5		0	U	50	100.9	75 - 125	
SILVER	52.2		0	U	50	104.4	75 - 125	
THALLIUM	50.3		0	U	50	100.6	75 - 125	
VANADIUM	49.6		0	U	50	99.2	75 - 125	
ZINC	52.1		0	U	50	104.2	75 - 125	

N = % Recovery exceeds control limits
F = Result is between MDL and RL
U = Sample result is below MDL. A value of zero is used in the calculation

POST_SPIKE - Modified 03/06/2008
PDF File ID: 4987286
Report generated: 10/21/2016 11:52

Microbac Laboratories Inc.
Initial Calibration Summary

Login:	**L16100408**	Workgroup (AAB#):	**WG588304**
Analytical Method:	**6020A**	Instrument ID:	**ICP-MS2**
ICAL Worknum:	**WG588410**	Initial Calibration Date:	**20-OCT-2016 09:11**

	WG588410-01		WG588410-02		WG588410-03		WG588410-04			
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	R	Q
ANTIMONY	0	588	.4	637	50	271000	100	541000	.999939	
ARSENIC	0	-33.5	.4	-10.2	50	51700	100	104000	.999994	
BARIUM	0	156	.4	281	50	146000	100	292000	.999963	
CADMIUM	0	10.2	.4	122	50	104000	100	208000	.999959	
CHROMIUM	0	8320	.4	8330	50	342000	100	691000	.999931	
COBALT	0	290	.4	785	50	473000	100	959000	.999969	
COPPER	0	156	.4	226	50	101000	100	201000	1	
LEAD	0	3250	.4	3620	50	1740000	100	3450000	.999999	
MANGANESE	0	1190	.4	1540	50	571000	100	1150000	.999987	
NICKEL	0	86.0	.4	189	50	102000	100	207000	.999974	
SILVER	0	120	.4	515	50	369000	100	696000	.999228	
THALLIUM	0	36.0	.4	632	50	577000	100	1150000	1	
VANADIUM	0	1640	.4	1980	50	361000	100	737000	.999927	
ZINC	0	327	.4	241	50	52200	100	103000	.999986	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 4987294
Report generated: 21-OCT-2016 11:52

Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-06
Instrument ID: ICP-MS2 Run Time: 09:17 Method: 6020A
File ID: NI.102016.091707 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG588304 Cal ID: ICP-MS2 - 20-OCT-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
SILVER	.2	.8	.2	U
ARSENIC	.2	.8	.2	U
BARIUM	.6	2.4	.6	U
CADMIUM	.12	.48	.12	U
COBALT	.2	.8	.2	U
CHROMIUM	.4	1.6	.4	U
COPPER	.4	1.6	.4	U
MANGANESE	.4	1.6	.4	U
NICKEL	.8	3.2	.8	U
LEAD	.2	.8	.2	U
ANTIMONY	.2	.8	.221	F
THALLIUM	.04	.16	.04	U
VANADIUM	.2	.8	.2	U
ZINC	5	20	5	U

U = Result is less than 2 x MDL
F = Result is between MDL and 2 x MDL
* = Result is above 2 x MDL

ICB - Modified 07/14/2009
PDF File ID: 4987296
Report generated 10/21/2016 11:52

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-11
Instrument ID: ICP-MS2 Run Time: 09:36 Method: 6020A
File ID: NI.102016.093630 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.206	F
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Copper	0.400	1.60	0.400	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 4987299
Report generated 10/21/2016 11:52

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-22
Instrument ID: ICP-MS2 Run Time: 12:10 Method: 6020A
File ID: NI.102016.121047 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Copper	0.400	1.60	0.400	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 4987299
Report generated 10/21/2016 11:52

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16100408 | Run Date: 10/20/2016 | Sample ID: WG588410-24
Instrument ID: ICP-MS2 | Run Time: 12:58 | Method: 6020A
File ID: NI.102016.125826 | Analyst: JYH | Units: ug/L
Workgroup (AAB#): WG588304 | Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER | QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Copper	0.400	1.60	0.400	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 4987299
Report generated 10/21/2016 11:52

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CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-26

Instrument ID: ICP-MS2 Run Time: 13:34 Method: 6020A

File ID: NI.102016.133421 Analyst: JYH Units: ug/L

Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16

Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Copper	0.400	1.60	0.400	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 4987299
Report generated 10/21/2016 11:52

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-28
Instrument ID: ICP-MS2 Run Time: 14:05 Method: 6020A
File ID: NI.102016.140527 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Antimony	0.200	0.800	0.200	U
Arsenic	0.200	0.800	0.200	U
Barium	0.600	2.40	0.600	U
Cadmium	0.120	0.480	0.120	U
Chromium	0.400	1.60	0.400	U
Cobalt	0.200	0.800	0.200	U
Copper	0.400	1.60	0.400	U
Lead	0.200	0.800	0.200	U
Manganese	0.400	1.60	0.400	U
Nickel	0.800	3.20	0.800	U
Silver	0.200	0.800	0.200	U
Thallium	0.0400	0.160	0.0400	U
Vanadium	0.200	0.800	0.200	U
Zinc	5.00	20.0	5.00	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 4987299
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.

INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-05
Instrument ID: ICP-MS2 Run Time: 09:14 Method: 6020A
File ID: NI.102016.091406 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
QC Key: DOD4

Analyte		Expected	Found	%REC	LIMITS	Q
Antimony		50	51.9	104	90 - 110	
Arsenic		50	50.2	100	90 - 110	
Barium		50	50.5	101	90 - 110	
Cadmium		50	50.8	102	90 - 110	
Chromium		50	50.7	101	90 - 110	
Cobalt		50	49.8	99.6	90 - 110	
Copper		50	49.9	99.7	90 - 110	
Lead		50	50.7	101	90 - 110	
Manganese		50	49.8	99.7	90 - 110	
Nickel		50	50.0	100	90 - 110	
Silver		50	50.7	101	90 - 110	
Thallium		50	51.0	102	90 - 110	
Vanadium		50	50.3	101	90 - 110	
Zinc		50	50.4	101	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 4987295
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-10

Instrument ID: ICP-MS2 Run Time: 09:33 Method: 6020A

File ID: NI.102016.093331 Analyst: JYH QC Key: DOD4

Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Antimony		0.0500	0.0529	mg/L	106	90 - 110		
Arsenic		0.0500	0.0511	mg/L	102	90 - 110		
Barium		0.0500	0.0506	mg/L	101	90 - 110		
Cadmium		0.0500	0.0513	mg/L	103	90 - 110		
Chromium		0.0500	0.0495	mg/L	99.0	90 - 110		
Cobalt		0.0500	0.0498	mg/L	99.6	90 - 110		
Copper		0.0500	0.0507	mg/L	101	90 - 110		
Lead		0.0500	0.0511	mg/L	102	90 - 110		
Manganese		0.0500	0.0492	mg/L	98.4	90 - 110		
Nickel		0.0500	0.0502	mg/L	100	90 - 110		
Silver		0.0500	0.0539	mg/L	108	90 - 110		
Thallium		0.0500	0.0513	mg/L	103	90 - 110		
Vanadium		0.0500	0.0490	mg/L	97.9	90 - 110		
Zinc		0.0500	0.0512	mg/L	102	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 4987298

Report generated 10/21/2016 11:52

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-21
Instrument ID: ICP-MS2 Run Time: 12:07 Method: 6020A
File ID: NI.102016.120748 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Antimony		0.0500	0.0508	mg/L	102	90 - 110		
Arsenic		0.0500	0.0505	mg/L	101	90 - 110		
Barium		0.0500	0.0493	mg/L	98.6	90 - 110		
Cadmium		0.0500	0.0503	mg/L	101	90 - 110		
Chromium		0.0500	0.0502	mg/L	100	90 - 110		
Cobalt		0.0500	0.0503	mg/L	101	90 - 110		
Copper		0.0500	0.0499	mg/L	99.7	90 - 110		
Lead		0.0500	0.0497	mg/L	99.4	90 - 110		
Manganese		0.0500	0.0496	mg/L	99.2	90 - 110		
Nickel		0.0500	0.0502	mg/L	100	90 - 110		
Silver		0.0500	0.0505	mg/L	101	90 - 110		
Thallium		0.0500	0.0493	mg/L	98.5	90 - 110		
Vanadium		0.0500	0.0497	mg/L	99.5	90 - 110		
Zinc		0.0500	0.0500	mg/L	100	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 4987298
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.

CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-23

Instrument ID: ICP-MS2 Run Time: 12:55 Method: 6020A

File ID: NI.102016.125526 Analyst: JYH QC Key: DOD4

Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16

Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Antimony		0.0500	0.0502	mg/L	100	90 - 110		
Arsenic		0.0500	0.0502	mg/L	100	90 - 110		
Barium		0.0500	0.0492	mg/L	98.5	90 - 110		
Cadmium		0.0500	0.0497	mg/L	99.4	90 - 110		
Chromium		0.0500	0.0500	mg/L	99.9	90 - 110		
Cobalt		0.0500	0.0501	mg/L	100	90 - 110		
Copper		0.0500	0.0499	mg/L	99.7	90 - 110		
Lead		0.0500	0.0499	mg/L	99.8	90 - 110		
Manganese		0.0500	0.0502	mg/L	100	90 - 110		
Nickel		0.0500	0.0496	mg/L	99.2	90 - 110		
Silver		0.0500	0.0508	mg/L	102	90 - 110		
Thallium		0.0500	0.0496	mg/L	99.1	90 - 110		
Vanadium		0.0500	0.0499	mg/L	99.8	90 - 110		
Zinc		0.0500	0.0498	mg/L	99.5	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008

PDF File ID: 4987298

Report generated 10/21/2016 11:52

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-25
Instrument ID: ICP-MS2 Run Time: 13:31 Method: 6020A
File ID: NI.102016.133122 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Antimony		0.0500	0.0504	mg/L	101	90 - 110		
Arsenic		0.0500	0.0504	mg/L	101	90 - 110		
Barium		0.0500	0.0466	mg/L	93.3	90 - 110		
Cadmium		0.0500	0.0507	mg/L	101	90 - 110		
Chromium		0.0500	0.0503	mg/L	101	90 - 110		
Cobalt		0.0500	0.0494	mg/L	98.9	90 - 110		
Copper		0.0500	0.0495	mg/L	99.0	90 - 110		
Lead		0.0500	0.0502	mg/L	100	90 - 110		
Manganese		0.0500	0.0497	mg/L	99.4	90 - 110		
Nickel		0.0500	0.0498	mg/L	99.6	90 - 110		
Silver		0.0500	0.0474	mg/L	94.8	90 - 110		
Thallium		0.0500	0.0492	mg/L	98.3	90 - 110		
Vanadium		0.0500	0.0493	mg/L	98.7	90 - 110		
Zinc		0.0500	0.0500	mg/L	100	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 4987298
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-27
Instrument ID: ICP-MS2 Run Time: 14:02 Method: 6020A
File ID: NI.102016.140227 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Antimony		0.0500	0.0512	mg/L	102	90 - 110		
Arsenic		0.0500	0.0512	mg/L	102	90 - 110		
Barium		0.0500	0.0457	mg/L	91.4	90 - 110		
Cadmium		0.0500	0.0518	mg/L	104	90 - 110		
Chromium		0.0500	0.0498	mg/L	99.6	90 - 110		
Cobalt		0.0500	0.0498	mg/L	99.5	90 - 110		
Copper		0.0500	0.0496	mg/L	99.2	90 - 110		
Lead		0.0500	0.0500	mg/L	100	90 - 110		
Manganese		0.0500	0.0493	mg/L	98.6	90 - 110		
Nickel		0.0500	0.0501	mg/L	100	90 - 110		
Silver		0.0500	0.0470	mg/L	93.9	90 - 110		
Thallium		0.0500	0.0500	mg/L	100	90 - 110		
Vanadium		0.0500	0.0492	mg/L	98.4	90 - 110		
Zinc		0.0500	0.0512	mg/L	102	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 4987298
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-07
Instrument ID: ICP-MS2 Run Time: 09:20 Method: 6020A
File ID: NI.102016.092008 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Antimony		0.400	0.557	ug/L	139	70 - 130		*
Arsenic		0.400	0.398	ug/L	99.6	70 - 130		
Barium		0.750	0.682	ug/L	91.0	70 - 130		
Cadmium		0.240	0.226	ug/L	94.0	70 - 130		
Chromium		0.800	0.668	ug/L	83.4	70 - 130		
Cobalt		0.400	0.369	ug/L	92.2	70 - 130		
Copper		0.800	0.808	ug/L	101	70 - 130		
Lead		0.200	0.205	ug/L	102	70 - 130		
Manganese		0.500	0.526	ug/L	105	70 - 130		
Nickel		1.60	1.49	ug/L	93.1	70 - 130		
Silver		0.400	0.364	ug/L	90.9	70 - 130		
Thallium		0.0800	0.0780	ug/L	97.5	70 - 130		
Vanadium		0.400	0.343	ug/L	85.7	70 - 130		
Zinc		6.25	6.31	ug/L	101	70 - 130		

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 4987300
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number: L16100408 Run Date: 10/20/2016 Sample ID: WG588410-29
Instrument ID: ICP-MS2 Run Time: 14:08 Method: 6020A
File ID: NI.102016.140827 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG588304 Cal ID: ICP-MS - 20-OCT-16
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Antimony		0.400	0.500	ug/L	125	70 - 130		
Arsenic		0.400	0.407	ug/L	102	70 - 130		
Barium		0.750	0.633	ug/L	84.4	70 - 130		
Cadmium		0.240	0.242	ug/L	101	70 - 130		
Chromium		0.800	0.644	ug/L	80.5	70 - 130		
Cobalt		0.400	0.379	ug/L	94.7	70 - 130		
Copper		0.800	0.787	ug/L	98.3	70 - 130		
Lead		0.200	0.199	ug/L	99.7	70 - 130		
Manganese		0.500	0.687	ug/L	137	70 - 130		*
Nickel		1.60	1.53	ug/L	95.5	70 - 130		
Silver		0.400	0.338	ug/L	84.5	70 - 130		
Thallium		0.0800	0.0735	ug/L	91.9	70 - 130		
Vanadium		0.400	0.335	ug/L	83.7	70 - 130		
Zinc		6.25	8.60	ug/L	138	70 - 130		*

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 4987300
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L16100408 **Workgroup (AAB#):** WG588304
Instrument ID: ICP-MS2 **Method:** 6020A
Sol. A : WG588410-08 **File ID:** NI.102016.092307 **Units:** ug/L
Sol. AB : WG588410-09 **File ID:** NI.102016.093030 **Matrix:** Water

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Antimony	NS	0.0529	NS	100	103	103	
Arsenic	NS	-0.000200	NS	100	100	100	
Barium	NS	-0.0147	NS	100	100	100	
Cadmium	NS	-0.0219	NS	100	99.1	99.1	
Chromium	NS	-0.291	NS	100	96.3	96.3	
Cobalt	NS	0.0106	NS	100	96.1	96.1	
Copper	NS	0.0929	NS	100	97.8	97.8	
Lead	NS	0.0738	NS	100	98.7	98.7	
Manganese	NS	0.0299	NS	100	94.2	94.2	
Nickel	NS	0.205	NS	100	96.0	96.0	
Silver	NS	0.00650	NS	100	90.7	90.7	
Thallium	NS	0.0346	NS	100	97.8	97.8	
Vanadium	NS	-0.0525	NS	100	96.5	96.5	
Zinc	NS	0.475	NS	100	100	100	

NS = Not spiked
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
 # = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).
+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.

ICS - Modified 03/06/2008
PDF File ID: 4987297
Report generated 10/21/2016 11:52

Microbac Laboratories Inc.

INTERNAL STANDARD REPORT

Login: L16100408 **Analytical Method:** 6020
Analytical Workgroup: WG588304 **Matrix:** 1
Instrument: ICP-MS2 **Analyst:** JYH
ICAL Date: 20-OCT-2016 09:02

			BISMUTH	GERMANIUM	INDIUM
Sample	Type	Run Date	% Rec	% Rec	% Rec
L16100267-14	SAMP	20-OCT-2016 12:43	95.885	93.606	99.948
L16100408-01	SAMP	20-OCT-2016 13:10	93.417	97.882	101.703
L16100408-01	SAMP	20-OCT-2016 13:47	99.991	89.223	112.105
L16100408-02	SAMP	20-OCT-2016 13:13	93.65	96.262	102.085
L16100408-02	SAMP	20-OCT-2016 13:50	97.384	86.289	108.854
L16100408-03	SAMP	20-OCT-2016 13:16	94.658	95.068	104.598
L16100408-03	SAMP	20-OCT-2016 13:53	94.245	82.989	102.739
L16100408-04	SAMP	20-OCT-2016 13:19	94.716	93.326	106.987
L16100408-04	SAMP	20-OCT-2016 13:56	98.743	86.633	106.742
WG587446-02	BLANK	20-OCT-2016 12:25	96.984	92.962	95.898
WG587446-03	LCS	20-OCT-2016 12:28	101.385	97.925	102.546
WG588304-01	PSPK	20-OCT-2016 12:46	97.762	96.895	102.707
WG588304-02	SERIAL	20-OCT-2016 12:49	91.447	89.351	91.576
WG588410-05	ICV	20-OCT-2016 09:14	98.108	99.528	102.877
WG588410-06	ICB	20-OCT-2016 09:17	93.065	91.091	91.595
WG588410-07	LLICV	20-OCT-2016 09:20	95.673	95	97.756
WG588410-08	ICS	20-OCT-2016 09:23	86.434	88.615	83.347
WG588410-09	ICS	20-OCT-2016 09:30	91.835	94.612	93.655
WG588410-10	CCV	20-OCT-2016 09:33	93.981	95.199	98.225
WG588410-11	CCB	20-OCT-2016 09:36	91.009	88.448	90.386
WG588410-21	CCV	20-OCT-2016 12:07	98.629	96.626	104.257
WG588410-22	CCB	20-OCT-2016 12:10	93.01	88.02	93.858
WG588410-23	CCV	20-OCT-2016 12:55	98.953	100.933	106.388
WG588410-24	CCB	20-OCT-2016 12:58	89.602	89.515	90.405
WG588410-25	CCV	20-OCT-2016 13:31	105.071	97.073	116.104
WG588410-26	CCB	20-OCT-2016 13:34	91.912	83.656	95.585
WG588410-27	CCV	20-OCT-2016 14:02	107.754	97.027	**123.269**
WG588410-28	CCB	20-OCT-2016 14:05	101.643	89.861	111.937
WG588410-29	LLCCV	20-OCT-2016 14:08	101.992	91.656	112.017

Acceptance criteria: 30% - 120% Underlined recoveries are out of range
Acceptance criteria for CCVs and CCBs for method SW846-6020: 80% - 120%

INT_STD_ICPMS - Modified 07/28/2010
PDF File ID: 4987293
Report generated: 10/21/2016 11:52

Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L16100408 **Date:** 07/08/2016
Insturment ID: ICP-MS2 **Method:** 6020A

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Antimony	1.00	100.0
Arsenic	1.00	100.0
Barium	1.00	100.0
Cadmium	1.00	100.0
Chromium	1.00	100.0
Cobalt	1.00	100.0
Copper	1.00	100.0
Lead	1.00	100.0
Manganese	1.00	100.0
Nickel	1.00	100.0
Selenium	1.00	100.0
Silver	1.00	100.0
Thallium	1.00	100.0
Uranium	1.00	100.0
Vanadium	1.00	100.0
Zinc	1.00	100.0

Comments:
All analytes passed acceptance criteria at the specified concentration.

LINEAR_RANGE - Modified 03/06/2008
PDF File ID: 4987292
Report generated: 10/21/2016 11:52

2.1.2.3 Raw Data

MassCal File Name

Mass Calibration File Name
MassCal File Path C:\NexION Data\MassCal\
Peak Search Window: 1.00

Sample Information

Sample Date/Time: Thursday, October 20, 2016 07:42:05

Mass Calibration and Resolution

Analyte	E Mass	Meas Mass	Mass C DAC Val	Res DAC Value	Meas Peak W	Custom Res
Li	7.016	6.975	1340	2024	0.722	
Mg	23.985	23.975	4499	2020	0.689	
Co	58.933	58.925	11688	2022	0.693	
In	114.904	114.925	22867	2027	0.686	
U	238.050	238.075	47463	2042	0.688	

Relative Std. Dev.

Mass	Meas. Intens. RSD
5.525	3.556
5.575	3.530
5.625	1.673
5.675	3.081
5.725	2.437
5.775	2.631
5.825	3.102
5.875	1.480
5.925	2.280
5.975	2.454
6.025	2.161
6.075	2.577
6.125	10.815
6.175	40.745
6.225	71.261
6.275	39.123
6.325	78.174
6.375	46.710
6.425	9.419
6.475	6.803
6.525	6.270
6.575	3.120
6.625	3.475
6.675	3.286
6.725	2.999
6.775	2.925
6.825	2.659

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6.875	3.077
6.925	3.063
6.975	2.862
7.025	3.919
7.075	1.615
7.125	2.877
7.175	1.715
7.225	6.518
7.275	81.441
7.325	38.030
7.375	70.711
7.425	46.481
7.475	103.652
7.525	39.123
7.575	69.722
7.625	69.722
7.675	91.287
7.725	104.583
7.775	129.603
7.825	122.475
7.875	70.711
7.925	113.855
7.975	149.071
8.025	63.888
8.075	100.000
8.125	55.902
8.175	55.902
8.225	34.233
8.275	223.607
8.325	94.786
8.375	108.653
8.425	108.653
8.475	81.441
22.525	223.607
22.575	55.902
22.625	50.000
22.675	67.748
22.725	40.745
22.775	52.705
22.825	57.601
22.875	50.461
22.925	32.969
22.975	37.268
23.025	31.672
23.075	21.066
23.125	54.006
23.175	30.110

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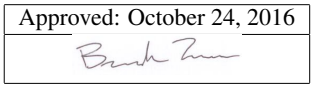

23.225	40.966
23.275	42.592
23.325	38.401
23.375	32.439
23.425	53.638
23.475	35.028
23.525	7.037
23.575	1.505
23.625	1.620
23.675	1.164
23.725	1.440
23.775	1.508
23.825	2.176
23.875	1.964
23.925	2.212
23.975	2.128
24.025	2.433
24.075	2.580
24.125	2.608
24.175	2.991
24.225	2.415
24.275	2.872
24.325	17.175
24.375	50.302
24.425	11.572
24.475	6.996
24.525	3.491
24.575	1.582
24.625	0.799
24.675	1.903
24.725	1.943
24.775	2.004
24.825	1.851
24.875	2.501
24.925	1.779
24.975	2.218
25.025	2.511
25.075	2.478
25.125	1.722
25.175	2.186
25.225	2.447
25.275	6.204
25.325	45.644
25.375	24.495
25.425	13.074
25.475	7.940
57.525	21.250

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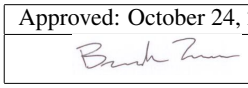

57.575	5.289
57.625	3.883
57.675	4.298
57.725	2.115
57.775	3.483
57.825	2.412
57.875	1.353
57.925	1.624
57.975	2.117
58.025	1.469
58.075	4.663
58.125	2.099
58.175	3.422
58.225	4.138
58.275	9.400
58.325	17.635
58.375	25.573
58.425	47.075
58.475	21.482
58.525	5.882
58.575	4.668
58.625	4.498
58.675	1.376
58.725	1.402
58.775	2.618
58.825	2.624
58.875	1.477
58.925	1.515
58.975	3.191
59.025	2.017
59.075	2.364
59.125	2.660
59.175	1.477
59.225	4.442
59.275	22.272
59.325	60.858
59.375	51.602
59.425	53.033
59.475	31.819
59.525	14.013
59.575	2.824
59.625	2.525
59.675	3.768
59.725	2.722
59.775	6.239
59.825	4.624
59.875	4.396

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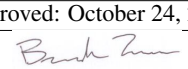

59.925	5.059
59.975	3.552
60.025	3.739
60.075	3.857
60.125	5.235
60.175	4.774
60.225	4.414
60.275	20.233
60.325	63.191
60.375	34.233
60.425	24.845
60.475	33.535
113.525	10.146
113.575	6.660
113.625	4.364
113.675	5.297
113.725	2.656
113.775	6.486
113.825	3.419
113.875	2.570
113.925	4.818
113.975	4.943
114.025	2.199
114.075	3.040
114.125	2.764
114.175	3.650
114.225	12.028
114.275	8.717
114.325	22.978
114.375	27.794
114.425	27.462
114.475	7.260
114.525	3.869
114.575	2.094
114.625	2.720
114.675	3.217
114.725	1.846
114.775	2.381
114.825	2.980
114.875	1.946
114.925	3.129
114.975	2.396
115.025	2.252
115.075	3.514
115.125	2.134
115.175	2.161
115.225	4.711

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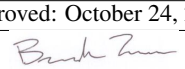

115.275	7.232
115.325	15.798
115.375	29.881
115.425	51.618
115.475	19.921
115.525	17.287
115.575	13.960
115.625	7.190
115.675	7.675
115.725	5.057
115.775	4.660
115.825	3.140
115.875	7.922
115.925	2.583
115.975	5.706
116.025	5.610
116.075	3.805
116.125	8.032
116.175	9.290
116.225	6.339
116.275	35.856
116.325	59.266
116.375	37.268
116.425	29.881
116.475	56.845
236.525	223.607
236.575	39.929
236.625	28.384
236.675	27.809
236.725	23.697
236.775	34.401
236.825	78.588
236.875	39.491
236.925	37.268
236.975	67.823
237.025	40.161
237.075	43.853
237.125	21.815
237.175	18.109
237.225	15.408
237.275	17.815
237.325	28.022
237.375	48.914
237.425	22.934
237.475	18.190
237.525	26.299
237.575	9.904

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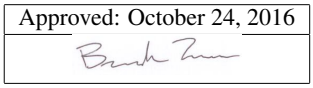

237.625	5.169
237.675	4.062
237.725	2.657
237.775	1.675
237.825	1.283
237.875	1.869
237.925	1.517
237.975	0.974
238.025	1.231
238.075	0.694
238.125	1.026
238.175	1.856
238.225	1.059
238.275	0.821
238.325	2.943
238.375	2.795
238.425	2.979
238.475	7.315
238.525	18.951
238.575	18.672
238.625	17.496
238.675	17.653
238.725	62.828
238.775	24.661
238.825	32.401
238.875	41.211
238.925	71.261
238.975	24.164
239.025	31.672
239.075	11.907
239.125	46.147
239.175	37.797
239.225	18.254
239.275	15.901
239.325	23.903
239.375	24.993
239.425	53.123
239.475	48.445

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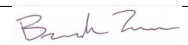

SmartTune Wizard - Summary

Optimization Summary

SmartTune file: C:\NexIONData\Wizard\SmartTune\ESI SmartTune Fullmicrobac.swz

Start Time: 10/20/2016 7:52:57 AM
End Time: 10/20/2016 7:55:19 AM

Daily Performance Check - [Passed] Optimum value(s): N/A
Obtained Intensity (Be 9.0122): 13675.71
Obtained Intensity (Mg 23.985): 257076.72
Obtained Intensity (In 114.904): 75171.88
Obtained Intensity (U 238.05): 95282.98
Obtained Intensity (Bkgd 220): 1.07
Obtained Formula (CeO 155.9 / Ce 139.905): 0.016 (=5128.27 / 316132.15)
Obtained Formula (Ce++ 69.9527 / Ce 139.905): 0.003 (=1030.64 / 316132.15)

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SmartTune Wizard - Details

```
Optimization Details

SmartTune file: C:\NexIONData\Wizard\SmartTune\ESI SmartTune Fullmicrobac.swz

Optimization Status

Start Time: 10/20/2016 7:52:57 AM

Daily Performance Check
        Optimization Settings:
                Method: C:\NexIONData\Method\ESI Daily Performance.mth.
                Intensity Criterion: Be 9.0122 > 2000
                Intensity Criterion: Mg 23.985 > 15000
                Intensity Criterion: In 114.904 > 40000
                Intensity Criterion: U 238.05 > 30000
                Intensity Criterion: Bkgd 220 <= 5
                Formula Criterion: CeO 155.9 / Ce 139.905 <= 0.025
                Formula Criterion: Ce++ 69.9527 / Ce 139.905 <= 0.03

        Optimization Results:
        Initial Try
                Obtained Intensity (Be 9.0122): 13675.71
                Obtained Intensity (Mg 23.985): 257076.72
                Obtained Intensity (In 114.904): 75171.88
                Obtained Intensity (U 238.05): 95282.98
                Obtained Intensity (Bkgd 220): 1.07
                Obtained Formula (CeO 155.9 / Ce 139.905): 0.016 (=5128.27 / 316132.15)
                Obtained Formula (Ce++ 69.9527 / Ce 139.905): 0.003 (=1030.64 / 316132.15)
[Passed]  Optimum value(s): N/A

End Time: 10/20/2016 7:55:19 AM
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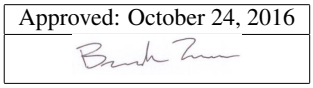
Approved: October 24, 2016



Method 6020 - Summary Report

Sample ID: Blank
Sample Date/Time: Thursday, October 20, 2016 08:17:37
Number of Replicates: 3
Autosampler Position: 1
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	73133.1	5.3				ug/L		Standard
	Be	9	6.7	114.6				ug/L		Standard
	Al	27	341.7	31.1				ug/L		Standard
	Sc	45	22800.5	2.4				ug/L		Standard
	Ti	47	29.3	7.9				ug/L		Standard
	V	51	1785.8	7.9				ug/L		Standard
	Cr	52	8717.5	5.7				ug/L		Standard
	Cr	53	1028.4	5.2				ug/L		Standard
	Mn	55	1085.7	0.4				ug/L		Standard
	Co	59	415.7	7.1				ug/L		Standard
	Ni	60	62.7	3.7				ug/L		Standard
	Cu	65	111.7	13.2				ug/L		Standard
	Zn	66	168.0	7.7				ug/L		Standard
>	**Ge**	72	485773.4	0.4				ug/L		Standard
	As	75	-43.5	61.0				ug/L		Standard
	Se	82	21.7	24.8				ug/L		Standard
	Se-1	77	89.0	15.7				ug/L		Standard
>	**Ga**	71	18.3	56.8				mg/L		Standard
	Rb	85	23.3	53.9				ug/L		Standard
	Y	89	389511.6	0.5				ug/L		Standard
>	**Rh**	103	11.7	49.5				ug/L		Standard
	Mo	98	26.5	43.2				ug/L		Standard
	Ag	107	92.0	12.8				ug/L		Standard
	Cd	111	6.3	51.3				mg/L		Standard
	Cd	114	25.4	80.3				ug/L		Standard
>	**In**	115	634091.3	1.4				ug/L		Standard
	Sn	118	108.3	16.8				ug/L		Standard
	Sb	123	202.8	34.0				ug/L		Standard
	Ba	135	37.7	10.7				ug/L		Standard
	Ce	140	121.7	28.0				ug/L		Standard
>	**Tb**	159	1326588.9	2.6				ug/L		Standard
	Ho	165	16.7	45.8				ug/L		Standard
	Tl	203	10.7	10.8				ug/L		Standard
	Tl	205	33.3	22.9				ug/L		Standard
	Pb	206	464.3	1.3				ug/L		Standard
	Pb	207	384.0	3.5				ug/L		Standard
	Pb	208	1774.0	1.1				ug/L		Standard
	U	238	27.7	24.6				ug/L		Standard
>	**Bi**	209	678864.3	1.0				ug/L		Standard

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Na	23	1.7	173.2	mg/L	Standard
Mg	24	85.0	32.8	mg/L	Standard
K	39	11.7	65.5	mg/L	Standard
Ca	43	28.3	36.7	mg/L	Standard
Fe	54	107.6	29.7	mg/L	Standard
Fe	57	285.0	6.3	mg/L	Standard
Sc-1	45	22800.5	2.4	mg/L	Standard
Cl	35	6.7	34.6	ug/L	Standard
Kr	83	2.0	50.0	ug/L	Standard
Br	81	1503.4	14.8	ug/L	Standard
P	31	100.0	8.7	ug/L	Standard
S	34	56.7	5.1	ug/L	Standard
Sr	88	130.0	16.8	ug/L	Standard
C	12	330.0	6.1	mg/L	Standard
N	14	0.0		mg/L	Standard
Hg	202	6.7	173.2	mg/L	Standard
Dy	164	12.7	46.9	mg/L	Standard
Ho-1	165	16.7	45.8	mg/L	Standard
Er	166	13.3	114.6	mg/L	Standard
I	127	3277.0	3.7	mg/L	Standard

QC Calculated Values

Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
Li	6			
Be	9			
Al	27			
Sc	45			
Ti	47			
V	51			
Cr	52			
Cr	53			
Mn	55			
Co	59			
Ni	60			
Cu	65			
Zn	66			
Ge	72			
As	75			
Se	82			
Se-1	77			
Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: Blank
Report Date/Time: Thursday, October 20, 2016 08:19:41
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Method 6020 - Summary Report

Sample ID: Standard 1
Sample Date/Time: Thursday, October 20, 2016 08:20:36
Number of Replicates: 3
Autosampler Position: 1
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79511.7	4.8				ug/L	73133	Standard
	Be	9	13.3	78.1				ug/L	7	Standard
	Al	27	343.3	11.9				ug/L	342	Standard
	Sc	45	24237.7	2.2				ug/L	22800	Standard
	Ti	47	25.0	26.2				ug/L	29	Standard
	V	51	1769.6	4.7				ug/L	1786	Standard
	Cr	52	8902.9	2.1				ug/L	8718	Standard
	Cr	53	1090.0	7.1				ug/L	1028	Standard
	Mn	55	1059.0	0.4				ug/L	1086	Standard
	Co	59	366.0	5.2				ug/L	416	Standard
	Ni	60	66.0	10.6				ug/L	63	Standard
	Cu	65	133.7	4.6				ug/L	112	Standard
	Zn	66	196.0	9.4				ug/L	168	Standard
>	Ge	72	516517.4	2.0				ug/L	485773	Standard
	As	75	-66.2	58.7				ug/L	-44	Standard
	Se	82	14.8	69.0				ug/L	22	Standard
	Se-1	77	81.7	10.0				ug/L	89	Standard
>	Ga	71	28.3	50.9				mg/L	18	Standard
	Rb	85	26.7	65.8				ug/L	23	Standard
	Y	89	419496.4	0.5				ug/L	389512	Standard
>	Rh	103	13.3	78.1				ug/L	12	Standard
	Mo	98	18.2	24.2				ug/L	26	Standard
	Ag	107	100.0	6.6				ug/L	92	Standard
	Cd	111	10.3	24.5				mg/L	6	Standard
	Cd	114	27.1	64.1				ug/L	25	Standard
>	In	115	676585.9	1.2				ug/L	634091	Standard
	Sn	118	108.0	1.6				ug/L	108	Standard
	Sb	123	100.5	46.2				ug/L	203	Standard
	Ba	135	85.7	7.6				ug/L	38	Standard
	Ce	140	171.7	52.2				ug/L	122	Standard
>	Tb	159	1437130.4	1.8				ug/L	1326589	Standard
	Ho	165	18.3	56.8				ug/L	17	Standard
	Tl	203	8.7	37.1				ug/L	11	Standard
	Tl	205	26.7	47.2				ug/L	33	Standard
	Pb	206	490.3	2.9				ug/L	464	Standard
	Pb	207	396.0	1.5				ug/L	384	Standard
	Pb	208	1876.0	2.6				ug/L	1774	Standard
	U	238	14.3	10.7				ug/L	28	Standard
>	Bi	209	708201.4	1.3				ug/L	678864	Standard

Sample ID: Standard 1
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Na	23	0.0		mg/L	2	Standard
Mg	24	53.3	65.8	mg/L	85	Standard
K	39	11.7	24.7	mg/L	12	Standard
Ca	43	31.7	55.5	mg/L	28	Standard
Fe	54	119.1	22.1	mg/L	108	Standard
Fe	57	296.7	7.6	mg/L	285	Standard
Sc-1	45	24237.7	2.2	mg/L	22800	Standard
Cl	35	6.0	33.3	ug/L	7	Standard
Kr	83	3.0	88.2	ug/L	2	Standard
Br	81	1323.4	11.0	ug/L	1503	Standard
P	31	101.7	38.2	ug/L	100	Standard
S	34	51.7	36.6	ug/L	57	Standard
Sr	88	161.7	9.4	ug/L	130	Standard
C	12	340.0	12.8	mg/L	330	Standard
N	14	0.0		mg/L	0	Standard
Hg	202	3.3	173.2	mg/L	7	Standard
Dy	164	22.9	27.1	mg/L	13	Standard
Ho-1	165	18.3	56.8	mg/L	17	Standard
Er	166	10.0	100.0	mg/L	13	Standard
I	127	3428.7	5.0	mg/L	3277	Standard

QC Calculated Values

Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
Li	6			
Be	9			
Al	27			
Sc	45			
Ti	47			
V	51			
Cr	52			
Cr	53			
Mn	55			
Co	59			
Ni	60			
Cu	65			
Zn	66			
Ge	72			
As	75			
Se	82			
Se-1	77			
Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: Standard 2
Sample Date/Time: Thursday, October 20, 2016 08:23:36
Number of Replicates: 3
Autosampler Position: 2
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	77596.8	4.8				ug/L	73133	Standard
	Be	9	311.7	6.5				ug/L	7	Standard
	Al	27	31469.4	5.6				ug/L	342	Standard
	Sc	45	24032.4	1.9				ug/L	22800	Standard
	Ti	47	134.3	9.8				ug/L	29	Standard
	V	51	3691.7	5.2				ug/L	1786	Standard
	Cr	52	10545.3	2.7				ug/L	8718	Standard
	Cr	53	1363.4	2.8				ug/L	1028	Standard
	Mn	55	4046.9	2.7				ug/L	1086	Standard
	Co	59	2819.3	0.8				ug/L	416	Standard
	Ni	60	612.0	5.2				ug/L	63	Standard
	Cu	65	665.3	4.1				ug/L	112	Standard
	Zn	66	394.0	3.3				ug/L	168	Standard
>	Ge	72	508069.9	1.3				ug/L	485773	Standard
	As	75	203.0	24.3				ug/L	-44	Standard
	Se	82	42.1	5.8				ug/L	22	Standard
	Se-1	77	105.7	13.3				ug/L	89	Standard
>	Ga	71	28.3	27.0				mg/L	18	Standard
	Rb	85	36.7	28.4				ug/L	23	Standard
	Y	89	418457.5	3.4				ug/L	389512	Standard
>	Rh	103	10.0	50.0				ug/L	12	Standard
	Mo	98	1972.4	3.2				ug/L	26	Standard
	Ag	107	2054.1	5.5				ug/L	92	Standard
	Cd	111	549.8	2.2				mg/L	6	Standard
	Cd	114	1393.5	7.8				ug/L	25	Standard
>	In	115	663400.0	1.9				ug/L	634091	Standard
	Sn	118	429.3	2.6				ug/L	108	Standard
	Sb	123	1266.6	4.4				ug/L	203	Standard
	Ba	135	793.7	5.3				ug/L	38	Standard
	Ce	140	71.7	42.6				ug/L	122	Standard
>	Tb	159	1403498.2	1.2				ug/L	1326589	Standard
	Ho	165	23.3	49.5				ug/L	17	Standard
	Tl	203	3091.3	1.7				ug/L	11	Standard
	Tl	205	7431.8	2.9				ug/L	33	Standard
	Pb	206	2827.3	4.3				ug/L	464	Standard
	Pb	207	2443.5	3.4				ug/L	384	Standard
	Pb	208	11187.3	3.0				ug/L	1774	Standard
	U	238	7959.4	2.2				ug/L	28	Standard
>	Bi	209	705184.5	2.7				ug/L	678864	Standard

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Na	23	0.0		mg/L	2	Standard
Mg	24	56.7	28.4	mg/L	85	Standard
K	39	11.7	65.5	mg/L	12	Standard
Ca	43	48.3	23.9	mg/L	28	Standard
Fe	54	155.3	11.7	mg/L	108	Standard
Fe	57	290.0	0.0	mg/L	285	Standard
Sc-1	45	24032.4	1.9	mg/L	22800	Standard
Cl	35	3.3	91.7	ug/L	7	Standard
Kr	83	3.3	69.3	ug/L	2	Standard
Br	81	1586.7	5.4	ug/L	1503	Standard
P	31	100.0	30.0	ug/L	100	Standard
S	34	53.3	19.5	ug/L	57	Standard
Sr	88	140.0	25.0	ug/L	130	Standard
C	12	380.0	2.6	mg/L	330	Standard
N	14	0.0		mg/L	0	Standard
Hg	202	3.3	173.2	mg/L	7	Standard
Dy	164	18.9	53.0	mg/L	13	Standard
Ho-1	165	23.3	49.5	mg/L	17	Standard
Er	166	23.3	24.7	mg/L	13	Standard
I	127	3555.4	5.9	mg/L	3277	Standard

QC Calculated Values

Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
Li	6			
Be	9			
Al	27			
Sc	45			
Ti	47			
V	51			
Cr	52			
Cr	53			
Mn	55			
Co	59			
Ni	60			
Cu	65			
Zn	66			
Ge	72			
As	75			
Se	82			
Se-1	77			
Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: Standard 2
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Method 6020 - Summary Report

Sample ID: Standard 3
Sample Date/Time: Thursday, October 20, 2016 08:26:36
Number of Replicates: 3
Autosampler Position: 3
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75038.9	3.7				ug/L	73133	Standard
	Be	9	53872.3	1.2	**50.0000**	1.828	3.7	ug/L	7	Standard
	Al	27	6429602.5	1.5	**50.0000**	1.699	3.4	ug/L	342	Standard
	Sc	45	23247.8	0.5				ug/L	22800	Standard
	Ti	47	21408.5	2.2	**100.0000**	2.318	2.3	ug/L	29	Standard
	V	51	375900.1	0.6	**50.0000**	0.498	1.0	ug/L	1786	Standard
	Cr	52	360094.9	1.3	**50.0000**	0.841	1.7	ug/L	8718	Standard
	Cr	53	46161.9	1.2	**50.0000**	0.654	1.3	ug/L	1028	Standard
	Mn	55	594213.0	0.8	**50.0000**	0.453	0.9	ug/L	1086	Standard
	Co	59	496106.8	0.7	**50.0000**	0.531	1.1	ug/L	416	Standard
	Ni	60	107833.4	0.6	**50.0000**	0.351	0.7	ug/L	63	Standard
	Cu	65	104983.1	0.6	**50.0000**	0.222	0.4	ug/L	112	Standard
	Zn	66	53305.9	0.9	**50.0000**	0.407	0.8	ug/L	168	Standard
>	Ge	72	511846.0	0.4				ug/L	485773	Standard
	As	75	52806.2	1.0	**50.0000**	0.329	0.7	ug/L	-44	Standard
	Se	82	5110.2	1.7	**50.0000**	0.670	1.3	ug/L	22	Standard
	Se-1	77	3443.4	0.9	**50.0000**	0.671	1.3	ug/L	89	Standard
>	Ga	71	51.7	14.8				mg/L	18	Standard
	Rb	85	658.3	3.5				ug/L	23	Standard
	Y	89	412932.2	1.6				ug/L	389512	Standard
>	Rh	103	56.7	5.1				ug/L	12	Standard
	Mo	98	386303.3	2.1	**100.0000**	2.490	2.5	ug/L	26	Standard
	Ag	107	378133.7	1.0	**50.0000**	0.890	1.8	ug/L	92	Standard
	Cd	111	105018.1	0.6	**50.0000**	0.150	0.3	mg/L	6	Standard
	Cd	114	273110.3	2.3	**50.0000**	1.364	2.7	ug/L	25	Standard
>	In	115	667357.9	0.9				ug/L	634091	Standard
	Sn	118	64775.5	1.3	**50.0000**	1.078	2.2	ug/L	108	Standard
	Sb	123	272520.8	1.4	**50.0000**	0.268	0.5	ug/L	203	Standard
	Ba	135	150508.0	1.7	**50.0000**	1.223	2.4	ug/L	38	Standard
	Ce	140	215.0	15.2				ug/L	122	Standard
>	Tb	159	1410925.2	2.4				ug/L	1326589	Standard
	Ho	165	50.0	17.3				ug/L	17	Standard
	Tl	203	589827.6	0.6	**50.0000**	0.665	1.3	ug/L	11	Standard
	Tl	205	1394238.7	2.0	**50.0000**	1.326	2.7	ug/L	33	Standard
	Pb	206	447963.1	0.4	**50.0000**	0.466	0.9	ug/L	464	Standard
	Pb	207	391878.1	0.3	**50.0000**	0.350	0.7	ug/L	384	Standard
	Pb	208	1790672.0	0.4	**50.0000**	0.418	0.8	ug/L	1774	Standard
	U	238	1560708.3	1.5	**50.0000**	0.725	1.4	ug/L	28	Standard
>	Bi	209	683424.6	0.8				ug/L	678864	Standard

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	Na	23	31.7	9.1	**5.0000**	0.453	9.1	mg/L	2	Standard
	Mg	24	3540.4	2.2	**5.0000**	0.089	1.8	mg/L	85	Standard
	K	39	550.0	10.1	**5.0000**	0.543	10.9	mg/L	12	Standard
	Ca	43	36.7	7.9	**5.0000**	1.349	27.0	mg/L	28	Standard
	Fe	54	4842.8	3.7	**5.0000**	0.193	3.9	mg/L	108	Standard
	Fe	57	1556.7	2.4	**5.0000**	0.144	2.9	mg/L	285	Standard
>	**Sc-1**	45	23247.8	0.5				mg/L	22800	Standard
	Cl	35	4.0	50.0				ug/L	7	Standard
	Kr	83	1.0	100.0				ug/L	2	Standard
	Br	81	1453.4	2.9				ug/L	1503	Standard
	P	31	101.7	10.2				ug/L	100	Standard
	S	34	75.0	17.6				ug/L	57	Standard
	Sr	88	120.0	31.5				ug/L	130	Standard
	C	12	323.3	12.5				mg/L	330	Standard
	N	14	0.0					mg/L	0	Standard
	Hg	202	3.3	173.2				mg/L	7	Standard
	Dy	164	47.4	20.2				mg/L	13	Standard
	Ho-1	165	50.0	17.3				mg/L	17	Standard
	Er	166	53.3	47.2				mg/L	13	Standard
	I	127	3693.8	6.9				mg/L	3277	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72			
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: Standard 3
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Method 6020 - Summary Report

Sample ID: Standard 4
Sample Date/Time: Thursday, October 20, 2016 08:29:35
Number of Replicates: 3
Autosampler Position: 4
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	35500.8	39.1				ug/L	73133	Standard
	Be	9	5.0	173.2	-0.5010	0.024	4.7	ug/L	7	Standard
	Al	27	251.7	82.7	-0.4189	0.003	0.8	ug/L	342	Standard
	Sc	45	12379.0	41.1				ug/L	22800	Standard
	Ti	47	19.7	22.9	-0.8551	0.102	11.9	ug/L	29	Standard
	V	51	523.2	62.4	-0.7338	0.072	9.9	ug/L	1786	Standard
	Cr	52	2369.9	37.2	-1.8915	0.160	8.4	ug/L	8718	Standard
	Cr	53	543.3	24.2	-0.9556	0.449	47.0	ug/L	1028	Standard
	Mn	55	664.7	77.8	-0.4785	0.046	9.7	ug/L	1086	Standard
	Co	59	254.3	26.8	-0.4347	0.043	9.8	ug/L	416	Standard
	Ni	60	35.0	43.2	-0.4733	0.007	1.4	ug/L	63	Standard
	Cu	65	65.3	51.3	-0.4950	0.002	0.3	ug/L	112	Standard
	Zn	66	105.7	39.4	-0.3717	0.077	20.8	ug/L	168	Standard
>	Ge	72	323153.4	49.6				ug/L	485773	Standard
	As	75	15.9	352.6	-0.3346	0.132	39.4	ug/L	-44	Standard
	Se	82	35.8	91.3	0.1990	0.447	224.5	ug/L	22	Standard
	Se-1	77	62.3	6.1	0.2371	1.295	546.4	ug/L	89	Standard
>	Ga	71	16.7	91.7				mg/L	18	Standard
	Rb	85	18.3	31.5				ug/L	23	Standard
	Y	89	249918.6	53.0				ug/L	389512	Standard
>	Rh	103	8.3	34.6				ug/L	12	Standard
	Mo	98	172.9	73.1	-0.7873	0.056	7.2	ug/L	26	Standard
	Ag	107	88.7	50.2	-0.4599	0.007	1.5	ug/L	92	Standard
	Cd	111	7.1	75.4	-0.4690	0.007	1.5	mg/L	6	Standard
	Cd	114	15.1	62.8	-0.4565	0.007	1.5	ug/L	25	Standard
>	In	115	377561.5	34.1				ug/L	634091	Standard
	Sn	118	57.3	85.7	-0.4805	0.074	15.4	ug/L	108	Standard
	Sb	123	566.5	51.4	-0.0640	0.088	137.3	ug/L	203	Standard
	Ba	135	18.0	68.3	-0.4641	0.008	1.6	ug/L	38	Standard
	Ce	140	60.0	82.1				ug/L	122	Standard
>	Tb	159	889096.7	6.5				ug/L	1326589	Standard
	Ho	165	18.3	31.5				ug/L	17	Standard
	Tl	203	60.7	53.6	-0.4427	0.009	2.0	ug/L	11	Standard
	Tl	205	150.0	52.9	-0.4506	0.009	2.0	ug/L	33	Standard
	Pb	206	288.3	14.4	-0.4446	0.008	1.8	ug/L	464	Standard
	Pb	207	236.0	17.9	-0.4460	0.008	1.8	ug/L	384	Standard
	Pb	208	1113.7	11.4	-0.4425	0.004	0.9	ug/L	1774	Standard
	U	238	59.0	68.1	-0.4407	0.004	1.0	ug/L	28	Standard
>	Bi	209	363360.6	11.7				ug/L	678864	Standard

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⌈	**Na**	23	1.7	173.2	**1.2428**	2.144	172.5	mg/L	2	Standard
|	**Mg**	24	16.7	17.3	**-0.0579**	0.019	33.1	mg/L	85	Standard
|	**K**	39	3.3	173.2	**-0.0533**	0.260	486.9	mg/L	12	Standard
|	**Ca**	43	26.7	39.0	**-35.1239**	96.587	275.0	mg/L	28	Standard
|	**Fe**	54	88.1	95.6	**-0.0074**	0.177	2383.0	mg/L	108	Standard
|	**Fe**	57	260.0	3.8	**1.8074**	1.183	65.5	mg/L	285	Standard
⌊>	**Sc-1**	45	12379.0	41.1				mg/L	22800	Standard
	Cl	35	2.0	100.0				ug/L	7	Standard
	Kr	83	2.3	99.0				ug/L	2	Standard
	Br	81	443.3	13.6				ug/L	1503	Standard
	P	31	31.7	48.2				ug/L	100	Standard
	S	34	28.3	27.0				ug/L	57	Standard
	Sr	88	120.0	22.0				ug/L	130	Standard
	C	12	166.7	30.8				mg/L	330	Standard
	N	14	0.0					mg/L	0	Standard
	Hg	202	0.0					mg/L	7	Standard
	Dy	164	19.0	53.8				mg/L	13	Standard
	Ho-1	165	18.3	31.5				mg/L	17	Standard
	Er	166	20.0	50.0				mg/L	13	Standard
	I	127	481.7	47.4				mg/L	3277	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72			
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85
⌈	Y	89
⌊>	Rh	103
⌈	Mo	98
|	Ag	107
|	Cd	111
|	Cd	114
|>	In	115
|	Sn	118
|	Sb	123
⌊	Ba	135
⌈	Ce	140
⌊>	Tb	159
⌈	Ho	165
|	Tl	203
|	Tl	205
|	Pb	206
|	Pb	207
|	Pb	208
|	U	238
⌊>	Bi	209
⌈	Na	23
|	Mg	24
|	K	39
|	Ca	43
|	Fe	54
|	Fe	57
⌊>	Sc-1	45
	Cl	35
	Kr	83
	Br	81
	P	31
	S	34
	Sr	88
	C	12
	N	14
	Hg	202
	Dy	164
	Ho-1	165
	Er	166
	I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Corr. Coef.	Be	9	Correlation coefficient < 0.998
Corr. Coef.	Al	27	Correlation coefficient < 0.998
Corr. Coef.	Ti	47	Correlation coefficient < 0.998

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Corr. Coef.	V	51	Correlation coefficient < 0.998
Corr. Coef.	Cr	52	Correlation coefficient < 0.998
Corr. Coef.	Cr	53	Correlation coefficient < 0.998
Corr. Coef.	Mn	55	Correlation coefficient < 0.998
Corr. Coef.	Co	59	Correlation coefficient < 0.998
Corr. Coef.	Ni	60	Correlation coefficient < 0.998
Corr. Coef.	Cu	65	Correlation coefficient < 0.998
Corr. Coef.	Zn	66	Correlation coefficient < 0.998
Corr. Coef.	As	75	Correlation coefficient < 0.998
Corr. Coef.	Se	82	Correlation coefficient < 0.998
Corr. Coef.	Se-1	77	Correlation coefficient < 0.998
Corr. Coef.	Mo	98	Correlation coefficient < 0.998
Corr. Coef.	Ag	107	Correlation coefficient < 0.998
Corr. Coef.	Cd	111	Correlation coefficient < 0.998
Corr. Coef.	Sn	118	Correlation coefficient < 0.998
Corr. Coef.	Sb	123	Correlation coefficient < 0.998
Corr. Coef.	Ba	135	Correlation coefficient < 0.998
Corr. Coef.	Tl	203	Correlation coefficient < 0.998
Corr. Coef.	Pb	208	Correlation coefficient < 0.998
Corr. Coef.	U	238	Correlation coefficient < 0.998
Corr. Coef.	Na	23	Correlation coefficient < 0.998
Corr. Coef.	Mg	24	Correlation coefficient < 0.998
Corr. Coef.	K	39	Correlation coefficient < 0.998
Corr. Coef.	Ca	43	Correlation coefficient < 0.998
Corr. Coef.	Fe	54	Correlation coefficient < 0.998
Corr. Coef.	Fe	57	Correlation coefficient < 0.998

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Method 6020 - Summary Report

Sample ID: Blank
Sample Date/Time: Thursday, October 20, 2016 08:35:20
Number of Replicates: 3
Autosampler Position: 1
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	80146.8	5.2				ug/L		Standard
	Be	9	6.7	114.6				ug/L		Standard
	Al	27	571.7	40.2				ug/L		Standard
	Sc	45	24027.4	4.7				ug/L		Standard
	Ti	47	30.7	33.3				ug/L		Standard
	V	51	1533.7	3.7				ug/L		Standard
	Cr	52	8192.5	2.1				ug/L		Standard
	Cr	53	1030.0	8.6				ug/L		Standard
	Mn	55	1047.4	5.9				ug/L		Standard
	Co	59	298.3	6.6				ug/L		Standard
	Ni	60	65.0	18.1				ug/L		Standard
	Cu	65	142.3	10.6				ug/L		Standard
	Zn	66	181.3	5.9				ug/L		Standard
>	Ge	72	502197.9	3.1				ug/L		Standard
	As	75	-31.3	84.6				ug/L		Standard
	Se	82	22.3	25.5				ug/L		Standard
	Se-1	77	91.0	13.0				ug/L		Standard
>	Ga	71	16.7	75.5				mg/L		Standard
	Rb	85	11.7	65.5				ug/L		Standard
	Y	89	419486.8	2.6				ug/L		Standard
>	Rh	103	15.0	88.2				ug/L		Standard
	Mo	98	231.6	4.5				ug/L		Standard
	Ag	107	123.3	13.1				ug/L		Standard
	Cd	111	10.4	40.3				mg/L		Standard
	Cd	114	41.7	75.6				ug/L		Standard
>	In	115	674382.9	4.1				ug/L		Standard
	Sn	118	184.7	20.3				ug/L		Standard
	Sb	123	1254.1	47.8				ug/L		Standard
	Ba	135	161.7	7.9				ug/L		Standard
	Ce	140	76.7	21.0				ug/L		Standard
>	Tb	159	1400383.4	1.1				ug/L		Standard
	Ho	165	18.3	56.8				ug/L		Standard
	Tl	203	64.3	28.9				ug/L		Standard
	Tl	205	160.0	28.6				ug/L		Standard
	Pb	206	465.7	11.7				ug/L		Standard
	Pb	207	422.7	10.7				ug/L		Standard
	Pb	208	1910.0	10.1				ug/L		Standard
	U	238	158.0	24.9				ug/L		Standard
>	Bi	209	696798.2	3.4				ug/L		Standard

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	Na	23	0.0		mg/L	Standard
	Mg	24	51.7	14.8	mg/L	Standard
	K	39	6.7	114.6	mg/L	Standard
	Ca	43	40.0		mg/L	Standard
	Fe	54	107.7	19.0	mg/L	Standard
	Fe	57	295.0	14.5	mg/L	Standard
>	**Sc-1**	45	24027.4	4.7	mg/L	Standard
	Cl	35	2.0	0.0	ug/L	Standard
	Kr	83	4.3	58.1	ug/L	Standard
	Br	81	1583.4	8.7	ug/L	Standard
	P	31	111.7	9.3	ug/L	Standard
	S	34	76.7	33.5	ug/L	Standard
	Sr	88	165.0	10.5	ug/L	Standard
	C	12	393.3	12.8	mg/L	Standard
	N	14	0.0		mg/L	Standard
	Hg	202	3.3	173.2	mg/L	Standard
	Dy	164	15.2	43.5	mg/L	Standard
	Ho-1	165	18.3	56.8	mg/L	Standard
	Er	166	30.0	66.7	mg/L	Standard
	I	127	3348.7	1.4	mg/L	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72			
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: Standard 1
Sample Date/Time: Thursday, October 20, 2016 08:38:20
Number of Replicates: 3
Autosampler Position: 1
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79624.0	4.7				ug/L	80147	Standard
	Be	9	11.7	24.7				ug/L	7	Standard
	Al	27	368.3	7.0				ug/L	572	Standard
	Sc	45	23756.9	0.9				ug/L	24027	Standard
	Ti	47	23.3	8.9				ug/L	31	Standard
	V	51	1735.6	4.5				ug/L	1534	Standard
	Cr	52	8418.3	0.4				ug/L	8193	Standard
	Cr	53	1041.7	9.5				ug/L	1030	Standard
	Mn	55	1021.0	2.4				ug/L	1047	Standard
	Co	59	286.0	1.3				ug/L	298	Standard
	Ni	60	60.0	2.9				ug/L	65	Standard
	Cu	65	133.7	1.9				ug/L	142	Standard
	Zn	66	181.7	13.5				ug/L	181	Standard
>	Ge	72	509559.0	3.7				ug/L	502198	Standard
	As	75	-22.9	156.7				ug/L	-31	Standard
	Se	82	25.3	28.8				ug/L	22	Standard
	Se-1	77	93.0	14.5				ug/L	91	Standard
>	Ga	71	21.7	81.0				mg/L	17	Standard
	Rb	85	28.3	36.7				ug/L	12	Standard
	Y	89	410323.4	3.0				ug/L	419487	Standard
>	Rh	103	10.0	100.0				ug/L	15	Standard
	Mo	98	83.3	4.5				ug/L	232	Standard
	Ag	107	105.0	7.4				ug/L	123	Standard
	Cd	111	6.9	43.5				mg/L	10	Standard
	Cd	114	26.7	57.1				ug/L	42	Standard
>	In	115	683791.6	2.9				ug/L	674383	Standard
	Sn	118	123.0	14.6				ug/L	185	Standard
	Sb	123	539.4	51.6				ug/L	1254	Standard
	Ba	135	187.0	11.1				ug/L	162	Standard
	Ce	140	71.7	17.6				ug/L	77	Standard
>	Tb	159	1384284.2	1.8				ug/L	1400383	Standard
	Ho	165	16.7	75.5				ug/L	18	Standard
	Tl	203	29.0	39.8				ug/L	64	Standard
	Tl	205	65.0	35.3				ug/L	160	Standard
	Pb	206	480.7	1.3				ug/L	466	Standard
	Pb	207	411.3	9.9				ug/L	423	Standard
	Pb	208	1862.4	5.0				ug/L	1910	Standard
	U	238	45.7	27.2				ug/L	158	Standard
>	Bi	209	689075.0	3.1				ug/L	696798	Standard

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	Na	23	1.7	173.2	mg/L	0	Standard
	Mg	24	85.0	44.4	mg/L	52	Standard
	K	39	6.7	43.3	mg/L	7	Standard
	Ca	43	36.7	34.3	mg/L	40	Standard
	Fe	54	130.8	34.9	mg/L	108	Standard
	Fe	57	275.0	13.1	mg/L	295	Standard
>	**Sc-1**	45	23756.9	0.9	mg/L	24027	Standard
	Cl	35	3.3	34.6	ug/L	2	Standard
	Kr	83	4.7	44.6	ug/L	4	Standard
	Br	81	1793.4	31.7	ug/L	1583	Standard
	P	31	106.7	19.5	ug/L	112	Standard
	S	34	78.3	13.3	ug/L	77	Standard
	Sr	88	135.0	24.3	ug/L	165	Standard
	C	12	316.7	20.5	mg/L	393	Standard
	N	14	0.0		mg/L	0	Standard
	Hg	202	3.3	173.2	mg/L	3	Standard
	Dy	164	12.5	48.9	mg/L	15	Standard
	Ho-1	165	16.7	75.5	mg/L	18	Standard
	Er	166	16.7	124.9	mg/L	30	Standard
	I	127	3302.0	0.7	mg/L	3349	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72			
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: Standard 1
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Method 6020 - Summary Report

Sample ID: Standard 2
Sample Date/Time: Thursday, October 20, 2016 08:41:19
Number of Replicates: 3
Autosampler Position: 2
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79608.8	4.0				ug/L	80147	Standard
	Be	9	271.7	10.1				ug/L	7	Standard
	Al	27	32910.8	4.6				ug/L	572	Standard
	Sc	45	24039.1	1.1				ug/L	24027	Standard
	Ti	47	143.0	2.1				ug/L	31	Standard
	V	51	3644.4	5.3				ug/L	1534	Standard
	Cr	52	10479.6	1.2				ug/L	8193	Standard
	Cr	53	1218.4	4.2				ug/L	1030	Standard
	Mn	55	3953.8	2.8				ug/L	1047	Standard
	Co	59	2848.9	2.6				ug/L	298	Standard
	Ni	60	607.0	1.9				ug/L	65	Standard
	Cu	65	654.0	3.6				ug/L	142	Standard
	Zn	66	417.7	0.5				ug/L	181	Standard
>	Ge	72	516213.9	2.1				ug/L	502198	Standard
	As	75	215.0	17.7				ug/L	-31	Standard
	Se	82	45.7	21.0				ug/L	22	Standard
	Se-1	77	106.3	9.5				ug/L	91	Standard
>	Ga	71	21.7	48.0				mg/L	17	Standard
	Rb	85	20.0	43.3				ug/L	12	Standard
	Y	89	423543.4	4.7				ug/L	419487	Standard
>	Rh	103	15.0	33.3				ug/L	15	Standard
	Mo	98	2001.7	3.6				ug/L	232	Standard
	Ag	107	2121.1	4.6				ug/L	123	Standard
	Cd	111	566.4	3.9				mg/L	10	Standard
	Cd	114	1544.3	6.9				ug/L	42	Standard
>	In	115	692757.6	2.8				ug/L	674383	Standard
	Sn	118	464.3	1.1				ug/L	185	Standard
	Sb	123	1596.5	7.1				ug/L	1254	Standard
	Ba	135	818.0	6.5				ug/L	162	Standard
	Ce	140	58.3	32.5				ug/L	77	Standard
>	Tb	159	1448007.2	3.0				ug/L	1400383	Standard
	Ho	165	16.7	17.3				ug/L	18	Standard
	Tl	203	3114.0	4.4				ug/L	64	Standard
	Tl	205	7476.8	5.1				ug/L	160	Standard
	Pb	206	2831.9	2.2				ug/L	466	Standard
	Pb	207	2405.9	4.1				ug/L	423	Standard
	Pb	208	11221.6	2.6				ug/L	1910	Standard
	U	238	8282.9	3.4				ug/L	158	Standard
>	Bi	209	707700.1	2.6				ug/L	696798	Standard

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Na	23	0.0		mg/L	0	Standard
Mg	24	76.7	37.7	mg/L	52	Standard
K	39	11.7	24.7	mg/L	7	Standard
Ca	43	45.0	0.0	mg/L	40	Standard
Fe	54	120.8	27.4	mg/L	108	Standard
Fe	57	288.3	5.3	mg/L	295	Standard
Sc-1	45	24039.1	1.1	mg/L	24027	Standard
Cl	35	5.3	78.1	ug/L	2	Standard
Kr	83	2.0	0.0	ug/L	4	Standard
Br	81	1483.4	11.1	ug/L	1583	Standard
P	31	95.0	10.5	ug/L	112	Standard
S	34	80.0	21.7	ug/L	77	Standard
Sr	88	130.0	7.7	ug/L	165	Standard
C	12	323.3	14.6	mg/L	393	Standard
N	14	0.0		mg/L	0	Standard
Hg	202	6.7	86.6	mg/L	3	Standard
Dy	164	19.4	50.4	mg/L	15	Standard
Ho-1	165	16.7	17.3	mg/L	18	Standard
Er	166	13.3	43.3	mg/L	30	Standard
I	127	3273.7	0.6	mg/L	3349	Standard

QC Calculated Values

Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
Li	6			
Be	9			
Al	27			
Sc	45			
Ti	47			
V	51			
Cr	52			
Cr	53			
Mn	55			
Co	59			
Ni	60			
Cu	65			
Zn	66			
Ge	72			
As	75			
Se	82			
Se-1	77			
Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: Standard 2
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Method 6020 - Summary Report

Sample ID: Standard 3
Sample Date/Time: Thursday, October 20, 2016 08:44:19
Number of Replicates: 3
Autosampler Position: 3
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75622.3	7.4				ug/L	80147	Standard
	Be	9	52007.6	4.6	**50.0000**	2.923	5.8	ug/L	7	Standard
	Al	27	6092558.5	4.6	**50.0000**	1.575	3.2	ug/L	572	Standard
	Sc	45	23045.9	4.9				ug/L	24027	Standard
	Ti	47	20580.0	5.7	**100.0000**	2.685	2.7	ug/L	31	Standard
	V	51	363167.2	4.9	**50.0000**	1.171	2.3	ug/L	1534	Standard
	Cr	52	344069.2	4.6	**50.0000**	0.664	1.3	ug/L	8193	Standard
	Cr	53	44232.9	3.4	**50.0000**	0.547	1.1	ug/L	1030	Standard
	Mn	55	574703.9	4.8	**50.0000**	0.784	1.6	ug/L	1047	Standard
	Co	59	480077.9	4.9	**50.0000**	0.873	1.7	ug/L	298	Standard
	Ni	60	103106.3	5.2	**50.0000**	0.808	1.6	ug/L	65	Standard
	Cu	65	100958.7	4.5	**50.0000**	0.549	1.1	ug/L	142	Standard
	Zn	66	51092.5	5.2	**50.0000**	0.796	1.6	ug/L	181	Standard
>	Ge	72	493556.7	3.6				ug/L	502198	Standard
	As	75	51327.0	3.6	**50.0000**	0.609	1.2	ug/L	-31	Standard
	Se	82	4940.0	4.0	**50.0000**	0.296	0.6	ug/L	22	Standard
	Se-1	77	3519.4	2.9	**50.0000**	0.753	1.5	ug/L	91	Standard
>	Ga	71	73.3	37.6				mg/L	17	Standard
	Rb	85	685.0	14.6				ug/L	12	Standard
	Y	89	403035.2	0.5				ug/L	419487	Standard
>	Rh	103	33.3	43.3				ug/L	15	Standard
	Mo	98	375025.5	4.0	**100.0000**	0.642	0.6	ug/L	232	Standard
	Ag	107	373986.3	3.0	**50.0000**	0.249	0.5	ug/L	123	Standard
	Cd	111	103930.0	3.1	**50.0000**	0.267	0.5	mg/L	10	Standard
	Cd	114	269612.7	0.8	**50.0000**	1.407	2.8	ug/L	42	Standard
>	In	115	657464.4	3.4				ug/L	674383	Standard
	Sn	118	63117.3	3.2	**50.0000**	0.833	1.7	ug/L	185	Standard
	Sb	123	270914.4	3.7	**50.0000**	0.494	1.0	ug/L	1254	Standard
	Ba	135	146687.2	2.3	**50.0000**	0.721	1.4	ug/L	162	Standard
	Ce	140	185.0	44.2				ug/L	77	Standard
>	Tb	159	1341442.3	2.6				ug/L	1400383	Standard
	Ho	165	56.7	18.4				ug/L	18	Standard
	Tl	203	585124.9	1.9	**50.0000**	0.823	1.6	ug/L	64	Standard
	Tl	205	1365074.1	3.0	**50.0000**	2.197	4.4	ug/L	160	Standard
	Pb	206	444354.6	1.9	**50.0000**	0.895	1.8	ug/L	466	Standard
	Pb	207	388341.3	2.8	**50.0000**	0.171	0.3	ug/L	423	Standard
	Pb	208	1760034.9	2.7	**50.0000**	0.271	0.5	ug/L	1910	Standard
	U	238	1533313.9	2.1	**50.0000**	0.526	1.1	ug/L	158	Standard
>	Bi	209	667912.7	3.2				ug/L	696798	Standard

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	Na	23	15.0	66.7	**5.0000**	3.306	66.1	mg/L	0	Standard
	Mg	24	3520.4	4.4	**5.0000**	0.089	1.8	mg/L	52	Standard
	K	39	501.7	6.5	**5.0000**	0.096	1.9	mg/L	7	Standard
	Ca	43	50.0	55.7	**5.0000**	19.997	399.9	mg/L	40	Standard
	Fe	54	4866.9	0.6	**5.0000**	0.223	4.5	mg/L	108	Standard
	Fe	57	1503.4	10.9	**5.0000**	0.415	8.3	mg/L	295	Standard
>	**Sc-1**	45	23045.9	4.9				mg/L	24027	Standard
	Cl	35	3.3	69.3				ug/L	2	Standard
	Kr	83	1.3	114.6				ug/L	4	Standard
	Br	81	1400.1	6.1				ug/L	1583	Standard
	P	31	113.3	10.2				ug/L	112	Standard
	S	34	83.3	19.3				ug/L	77	Standard
	Sr	88	141.7	11.3				ug/L	165	Standard
	C	12	303.3	16.3				mg/L	393	Standard
	N	14	0.0					mg/L	0	Standard
	Hg	202	6.7	86.6				mg/L	3	Standard
	Dy	164	55.1	13.3				mg/L	15	Standard
	Ho-1	165	56.7	18.4				mg/L	18	Standard
	Er	166	33.3	96.4				mg/L	30	Standard
	I	127	3530.4	3.4				mg/L	3349	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72			
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: Standard 4
Sample Date/Time: Thursday, October 20, 2016 08:47:19
Number of Replicates: 3
Autosampler Position: 4
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79803.1	2.9				ug/L	80147	Standard
	Be	9	110753.4	1.8	**100.4532**	2.769	2.8	ug/L	7	Standard
	Al	27	13171636.2	3.2	**101.2338**	1.768	1.7	ug/L	572	Standard
	Sc	45	24783.6	1.8				ug/L	24027	Standard
	Ti	47	43891.8	0.7	**201.2093**	7.016	3.5	ug/L	31	Standard
	V	51	779627.7	0.4	**100.9941**	3.041	3.0	ug/L	1534	Standard
	Cr	52	728560.8	0.7	**100.8116**	3.341	3.3	ug/L	8193	Standard
	Cr	53	91814.0	1.1	**99.7096**	2.989	3.0	ug/L	1030	Standard
	Mn	55	1213796.6	1.7	**100.0951**	2.750	2.7	ug/L	1047	Standard
	Co	59	1015928.8	0.4	**100.1742**	2.640	2.6	ug/L	298	Standard
	Ni	60	217604.2	0.8	**100.0389**	2.134	2.1	ug/L	65	Standard
	Cu	65	209776.1	1.3	**99.2584**	1.567	1.6	ug/L	142	Standard
	Zn	66	105595.7	1.1	**99.0454**	2.443	2.5	ug/L	181	Standard
>	Ge	72	522039.8	2.9				ug/L	502198	Standard
	As	75	107787.4	0.9	**99.7269**	1.987	2.0	ug/L	-31	Standard
	Se	82	10322.8	0.2	**99.6162**	3.119	3.1	ug/L	22	Standard
	Se-1	77	7021.6	2.3	**97.7440**	1.794	1.8	ug/L	91	Standard
>	Ga	71	103.3	22.9				mg/L	17	Standard
	Rb	85	1291.7	3.9				ug/L	12	Standard
	Y	89	423528.0	2.2				ug/L	419487	Standard
>	Rh	103	55.0	45.5				ug/L	15	Standard
	Mo	98	806329.6	0.9	**202.6343**	4.317	2.1	ug/L	232	Standard
	Ag	107	735092.0	0.8	**96.8184**	1.684	1.7	ug/L	123	Standard
	Cd	111	216899.8	1.0	**99.8133**	1.507	1.5	mg/L	10	Standard
	Cd	114	568082.5	0.1	**100.2759**	1.981	2.0	ug/L	42	Standard
>	In	115	690110.0	1.9				ug/L	674383	Standard
	Sn	118	131795.7	2.7	**99.8844**	2.960	3.0	ug/L	185	Standard
	Sb	123	565994.1	1.3	**99.8807**	0.950	1.0	ug/L	1254	Standard
	Ba	135	307171.6	0.9	**99.9743**	1.017	1.0	ug/L	162	Standard
	Ce	140	353.3	10.6				ug/L	77	Standard
>	Tb	159	1420667.7	1.7				ug/L	1400383	Standard
	Ho	165	88.3	8.6				ug/L	18	Standard
	Tl	203	1196043.5	0.6	**100.0724**	2.500	2.5	ug/L	64	Standard
	Tl	205	2987942.3	1.2	**103.4923**	3.736	3.6	ug/L	160	Standard
	Pb	206	910259.6	0.2	**100.2133**	3.356	3.3	ug/L	466	Standard
	Pb	207	800468.2	0.1	**100.5291**	3.050	3.0	ug/L	423	Standard
	Pb	208	3616634.3	0.4	**100.3730**	2.740	2.7	ug/L	1910	Standard
	U	238	3394220.4	1.4	**104.0580**	1.736	1.7	ug/L	158	Standard
>	Bi	209	683162.2	3.0				ug/L	696798	Standard

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	Na	23	35.0	62.3	**10.3293**	6.253	60.5	mg/L	0	Standard
	Mg	24	7220.1	1.4	**9.8093**	0.037	0.4	mg/L	52	Standard
	K	39	1061.7	16.2	**9.9670**	1.461	14.7	mg/L	7	Standard
	Ca	43	75.0	37.1	**12.6859**	12.295	96.9	mg/L	40	Standard
	Fe	54	10055.6	5.2	**9.8482**	0.511	5.2	mg/L	108	Standard
	Fe	57	2952.0	0.4	**10.0389**	0.160	1.6	mg/L	295	Standard
>	**Sc-1**	45	24783.6	1.8				mg/L	24027	Standard
	Cl	35	4.7	24.7				ug/L	2	Standard
	Kr	83	3.3	69.3				ug/L	4	Standard
	Br	81	1426.7	11.9				ug/L	1583	Standard
	P	31	115.0	11.5				ug/L	112	Standard
	S	34	83.3	33.0				ug/L	77	Standard
	Sr	88	111.7	20.2				ug/L	165	Standard
	C	12	396.7	5.2				mg/L	393	Standard
	N	14	0.0					mg/L	0	Standard
	Hg	202	13.3	86.6				mg/L	3	Standard
	Dy	164	23.0	109.7				mg/L	15	Standard
	Ho-1	165	88.3	8.6				mg/L	18	Standard
	Er	166	6.7	173.2				mg/L	30	Standard
	I	127	6071.2	3.5				mg/L	3349	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72			
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85
⌈	Y	89
⌊>	Rh	103
⌈	Mo	98
|	Ag	107
|	Cd	111
|	Cd	114
|>	In	115
|	Sn	118
|	Sb	123
⌊	Ba	135
⌈	Ce	140
⌊>	Tb	159
⌈	Ho	165
|	Tl	203
|	Tl	205
|	Pb	206
|	Pb	207
|	Pb	208
|	U	238
⌊>	Bi	209
⌈	Na	23
|	Mg	24
|	K	39
|	Ca	43
|	Fe	54
|	Fe	57
⌊>	Sc-1	45
	Cl	35
	Kr	83
	Br	81
	P	31
	S	34
	Sr	88
	C	12
	N	14
	Hg	202
	Dy	164
	Ho-1	165
	Er	166
	I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Corr. Coef.	Ca	43	Correlation coefficient < 0.998

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Method 6020 - Summary Report

Sample ID: QC Std 1
Sample Date/Time: Thursday, October 20, 2016 08:50:20
Number of Replicates: 3
Autosampler Position: 201
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	77370.9	6.4				ug/L	80147	Standard
	Be	9	55961.8	7.2	**52.2899**	3.545	6.8	ug/L	7	Standard
	Al	27	6311985.6	8.1	**49.8983**	1.169	2.3	ug/L	572	Standard
	Sc	45	23439.8	5.2				ug/L	24027	Standard
	Ti	47	21523.7	6.5	**101.4934**	3.308	3.3	ug/L	31	Standard
	V	51	385229.8	5.4	**51.2711**	0.216	0.4	ug/L	1534	Standard
	Cr	52	367951.8	5.8	**51.8270**	0.434	0.8	ug/L	8193	Standard
	Cr	53	46793.9	5.0	**51.8218**	0.871	1.7	ug/L	1030	Standard
	Mn	55	598118.8	4.7	**50.7661**	0.554	1.1	ug/L	1047	Standard
	Co	59	500627.9	5.1	**50.8177**	0.100	0.2	ug/L	298	Standard
	Ni	60	108610.0	4.1	**51.4294**	0.602	1.2	ug/L	65	Standard
	Cu	65	104319.1	2.8	**50.8560**	1.401	2.8	ug/L	142	Standard
	Zn	66	52909.3	3.1	**51.0805**	1.281	2.5	ug/L	181	Standard
>	Ge	72	505718.7	5.3				ug/L	502198	Standard
	As	75	53477.3	3.9	**51.0068**	0.745	1.5	ug/L	-31	Standard
	Se	82	5169.7	2.7	**51.3253**	1.407	2.7	ug/L	22	Standard
	Se-1	77	3543.1	5.9	**50.2015**	1.492	3.0	ug/L	91	Standard
>	Ga	71	40.0	43.3				mg/L	17	Standard
	Rb	85	851.7	7.6				ug/L	12	Standard
	Y	89	403707.8	5.9				ug/L	419487	Standard
>	Rh	103	41.7	18.3				ug/L	15	Standard
	Mo	98	390122.3	5.6	**100.3081**	2.610	2.6	ug/L	232	Standard
	Ag	107	365542.6	5.9	**49.2391**	1.059	2.2	ug/L	123	Standard
	Cd	111	109899.9	5.3	**51.7583**	1.379	2.7	mg/L	10	Standard
	Cd	114	286142.2	5.8	**51.6674**	1.134	2.2	ug/L	42	Standard
>	In	115	673832.0	7.9				ug/L	674383	Standard
	Sn	118	65988.1	6.7	**51.0984**	0.787	1.5	ug/L	185	Standard
	Sb	123	292309.6	6.8	**52.7467**	0.618	1.2	ug/L	1254	Standard
	Ba	135	151811.2	5.9	**50.5492**	1.375	2.7	ug/L	162	Standard
	Ce	140	135.0	17.0				ug/L	77	Standard
>	Tb	159	1393209.0	6.0				ug/L	1400383	Standard
	Ho	165	11.7	99.0				ug/L	18	Standard
	Tl	203	606781.1	5.5	**50.6504**	0.354	0.7	ug/L	64	Standard
	Tl	205	1446339.2	3.8	**49.9988**	1.107	2.2	ug/L	160	Standard
	Pb	206	455494.9	5.5	**49.9937**	0.456	0.9	ug/L	466	Standard
	Pb	207	401101.6	5.7	**50.2240**	0.416	0.8	ug/L	423	Standard
	Pb	208	1815204.0	5.9	**50.2242**	0.645	1.3	ug/L	1910	Standard
	U	238	1584676.2	5.8	**48.4623**	0.470	1.0	ug/L	158	Standard
>	Bi	209	682947.6	4.9				ug/L	696798	Standard

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⌈	**Na**	23	28.3	10.2	**8.8784**	0.460	5.2	mg/L	0	Standard
|	**Mg**	24	3497.1	5.0	**4.9741**	0.111	2.2	mg/L	52	Standard
|	**K**	39	510.0	7.8	**5.0348**	0.612	12.1	mg/L	7	Standard
|	**Ca**	43	51.7	20.1	**3.7500**	5.251	140.0	mg/L	40	Standard
|	**Fe**	54	4964.9	10.1	**5.0756**	0.278	5.5	mg/L	108	Standard
|	**Fe**	57	1678.4	2.0	**5.6026**	0.440	7.9	mg/L	295	Standard
⌊>	**Sc-1**	45	23439.8	5.2				mg/L	24027	Standard
	Cl	35	3.3	34.6				ug/L	2	Standard
	Kr	83	3.3	17.3				ug/L	4	Standard
	Br	81	1386.7	17.9				ug/L	1583	Standard
	P	31	98.3	29.4				ug/L	112	Standard
	S	34	85.0	20.4				ug/L	77	Standard
	Sr	88	105.0	31.2				ug/L	165	Standard
	C	12	466.7	17.3				mg/L	393	Standard
	N	14	3.3	173.2				mg/L	0	Standard
	Hg	202	6.7	86.6				mg/L	3	Standard
	Dy	164	21.9	32.1				mg/L	15	Standard
	Ho-1	165	11.7	99.0				mg/L	18	Standard
	Er	166	30.0	88.2				mg/L	30	Standard
	I	127	3350.4	12.2				mg/L	3349	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	104.580		
⌊	Al	27	99.797		
⌈	Sc	45			
|	Ti	47	101.493		
|	V	51	102.542		
|	Cr	52	103.654		
|	Cr	53			
|	Mn	55	101.532		
|	Co	59	101.635		
|	Ni	60	102.859		
|	Cu	65	101.712		
|	Zn	66	102.161		
|>	Ge	72		100.701	
|	As	75	102.014		
|	Se	82	102.651		
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	100.308		
Ag	107	98.478		
Cd	111	103.517		
Cd	114			
In	115			99.918
Sn	118	102.197		
Sb	123	105.493		
Ba	135	101.098		
Ce	140			
Tb	159			
Ho	165			
Tl	203	101.301		
Tl	205			
Pb	206	99.987		
Pb	207	100.448		
Pb	208	100.448		
U	238	96.925		
Bi	209			98.012
Na	23	177.567		
Mg	24	99.483		
K	39	100.695		
Ca	43	75.001		
Fe	54	101.512		
Fe	57	112.051		
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 1	Na	23	
QC Std 1	Ca	43	
QC Std 1	Fe	57	

Sample ID: QC Std 1
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Method 6020 - Summary Report

Sample ID: QC Std 2
Sample Date/Time: Thursday, October 20, 2016 08:53:21
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	69577.1	9.8				ug/L	80147	Standard
	Be	9	16.7	62.4	-0.1799	0.011	6.1	ug/L	7	Standard
	Al	27	1193.4	66.8	-0.1939	0.006	3.0	ug/L	572	Standard
	Sc	45	21517.0	8.5				ug/L	24027	Standard
	Ti	47	23.0	45.8	-0.4502	0.047	10.5	ug/L	31	Standard
	V	51	1315.4	22.0	-0.2427	0.032	13.1	ug/L	1534	Standard
	Cr	52	6420.1	23.0	-0.4545	0.167	36.8	ug/L	8193	Standard
	Cr	53	835.0	26.6	-0.3045	0.204	67.1	ug/L	1030	Standard
	Mn	55	846.4	32.1	-0.2044	0.020	9.7	ug/L	1047	Standard
	Co	59	316.7	27.5	-0.2005	0.007	3.7	ug/L	298	Standard
	Ni	60	76.3	33.8	-0.1946	0.010	5.4	ug/L	65	Standard
	Cu	65	153.0	13.3	-0.1836	0.015	8.1	ug/L	142	Standard
	Zn	66	202.3	24.7	-0.1369	0.060	43.7	ug/L	181	Standard
>	Ge	72	475540.8	6.0				ug/L	502198	Standard
	As	75	16.8	144.6	-0.1348	0.023	17.1	ug/L	-31	Standard
	Se	82	32.0	8.9	-0.0568	0.022	39.4	ug/L	22	Standard
	Se-1	77	76.3	3.0	-0.2843	0.034	11.8	ug/L	91	Standard
>	Ga	71	25.0	34.6				mg/L	17	Standard
	Rb	85	13.3	43.3				ug/L	12	Standard
	Y	89	376858.6	6.5				ug/L	419487	Standard
>	Rh	103	6.7	114.6				ug/L	15	Standard
	Mo	98	304.0	57.7	-0.3190	0.042	13.2	ug/L	232	Standard
	Ag	107	151.7	24.8	-0.2067	0.003	1.7	ug/L	123	Standard
	Cd	111	17.6	25.2	-0.2014	0.002	0.8	mg/L	10	Standard
	Cd	114	65.3	55.3	-0.2097	0.006	2.9	ug/L	42	Standard
>	In	115	619372.8	8.6				ug/L	674383	Standard
	Sn	118	113.7	46.6	-0.2072	0.039	18.6	ug/L	185	Standard
	Sb	123	654.7	78.8	-0.1067	0.094	88.0	ug/L	1254	Standard
	Ba	135	48.3	45.0	-0.1984	0.006	3.1	ug/L	162	Standard
	Ce	140	61.7	54.0				ug/L	77	Standard
>	Tb	159	1289708.0	9.2				ug/L	1400383	Standard
	Ho	165	16.7	34.6				ug/L	18	Standard
	Tl	203	105.7	47.1	-0.1926	0.004	2.0	ug/L	64	Standard
	Tl	205	255.0	55.9	-0.1910	0.005	2.4	ug/L	160	Standard
	Pb	206	520.0	13.9	-0.1910	0.005	2.5	ug/L	466	Standard
	Pb	207	438.3	17.9	-0.1839	0.007	3.7	ug/L	423	Standard
	Pb	208	2031.1	14.6	-0.1916	0.005	2.6	ug/L	1910	Standard
	U	238	246.3	70.6	-0.1877	0.005	2.7	ug/L	158	Standard
>	Bi	209	644607.8	5.9				ug/L	696798	Standard

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⌈	**Na**	23	0.0		**0.0050**			mg/L	0	Standard
|	**Mg**	24	58.3	13.1	**-0.0112**	0.009	81.7	mg/L	52	Standard
|	**K**	39	10.0	50.0	**0.0034**	0.062	1802.1	mg/L	7	Standard
|	**Ca**	43	35.0	14.3	**-2.7451**	1.377	50.2	mg/L	40	Standard
|	**Fe**	54	87.7	85.9	**-0.0227**	0.074	327.6	mg/L	108	Standard
|	**Fe**	57	273.3	20.6	**0.0778**	0.281	360.9	mg/L	295	Standard
⌊>	**Sc-1**	45	21517.0	8.5				mg/L	24027	Standard
	Cl	35	6.0	115.5				ug/L	2	Standard
	Kr	83	2.3	49.5				ug/L	4	Standard
	Br	81	1396.7	3.0				ug/L	1583	Standard
	P	31	81.7	65.5				ug/L	112	Standard
	S	34	75.0	20.0				ug/L	77	Standard
	Sr	88	133.3	15.6				ug/L	165	Standard
	C	12	286.7	14.5				mg/L	393	Standard
	N	14	0.0					mg/L	0	Standard
	Hg	202	0.0					mg/L	3	Standard
	Dy	164	12.1	90.1				mg/L	15	Standard
	Ho-1	165	16.7	34.6				mg/L	18	Standard
	Er	166	26.7	57.3				mg/L	30	Standard
	I	127	3088.6	7.4				mg/L	3349	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.692	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	91.843
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	92.510
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 2	Be	9	
QC Std 2	Ti	47	
QC Std 2	Cd	111	

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QC Std 2	Tl	203
QC Std 2	Ca	43

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Method 6020 - Summary Report

Sample ID: Blank
Sample Date/Time: Thursday, October 20, 2016 08:59:06
Number of Replicates: 3
Autosampler Position: 1
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	76335.3	3.6				ug/L		Standard
	Be	9	18.3	68.6				ug/L		Standard
	Al	27	810.0	18.8				ug/L		Standard
	Sc	45	22700.3	2.4				ug/L		Standard
	Ti	47	24.7	6.2				ug/L		Standard
	V	51	1541.5	7.3				ug/L		Standard
	Cr	52	7881.0	1.5				ug/L		Standard
	Cr	53	931.7	7.3				ug/L		Standard
	Mn	55	1508.1	17.0				ug/L		Standard
	Co	59	282.3	3.1				ug/L		Standard
	Ni	60	91.0	16.2				ug/L		Standard
	Cu	65	204.7	13.5				ug/L		Standard
	Zn	66	369.0	2.7				ug/L		Standard
>	Ge	72	496734.0	1.2				ug/L		Standard
	As	75	-45.0	34.2				ug/L		Standard
	Se	82	17.6	41.5				ug/L		Standard
	Se-1	77	82.7	9.8				ug/L		Standard
>	Ga	71	30.0	16.7				mg/L		Standard
	Rb	85	23.3	44.6				ug/L		Standard
	Y	89	405333.3	3.7				ug/L		Standard
>	Rh	103	16.7	45.8				ug/L		Standard
	Mo	98	135.0	17.5				ug/L		Standard
	Ag	107	122.7	6.9				ug/L		Standard
	Cd	111	11.2	10.1				mg/L		Standard
	Cd	114	56.3	10.2				ug/L		Standard
>	In	115	634401.3	3.9				ug/L		Standard
	Sn	118	136.7	20.8				ug/L		Standard
	Sb	123	906.7	49.9				ug/L		Standard
	Ba	135	166.0	4.8				ug/L		Standard
	Ce	140	56.7	48.6				ug/L		Standard
>	Tb	159	1347539.8	4.1				ug/L		Standard
	Ho	165	23.3	24.7				ug/L		Standard
	Tl	203	45.3	18.8				ug/L		Standard
	Tl	205	111.7	32.4				ug/L		Standard
	Pb	206	825.4	6.6				ug/L		Standard
	Pb	207	679.0	6.6				ug/L		Standard
	Pb	208	3166.5	4.0				ug/L		Standard
	U	238	119.3	31.1				ug/L		Standard
>	Bi	209	668024.5	1.5				ug/L		Standard

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Na	23	0.0		mg/L	Standard
Mg	24	48.3	15.8	mg/L	Standard
K	39	8.3	124.9	mg/L	Standard
Ca	43	26.7	57.3	mg/L	Standard
Fe	54	120.8	11.7	mg/L	Standard
Fe	57	305.0	15.6	mg/L	Standard
Sc-1	45	22700.3	2.4	mg/L	Standard
Cl	35	3.3	34.6	ug/L	Standard
Kr	83	5.3	10.8	ug/L	Standard
Br	81	1366.7	7.6	ug/L	Standard
P	31	66.7	45.2	ug/L	Standard
S	34	55.0	9.1	ug/L	Standard
Sr	88	113.3	15.5	ug/L	Standard
C	12	366.7	6.3	mg/L	Standard
N	14	3.3	173.2	mg/L	Standard
Hg	202	10.0		mg/L	Standard
Dy	164	18.1	63.2	mg/L	Standard
Ho-1	165	23.3	24.7	mg/L	Standard
Er	166	40.0	75.0	mg/L	Standard
I	127	3235.3	4.4	mg/L	Standard

QC Calculated Values

Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
Li	6			
Be	9			
Al	27			
Sc	45			
Ti	47			
V	51			
Cr	52			
Cr	53			
Mn	55			
Co	59			
Ni	60			
Cu	65			
Zn	66			
Ge	72			
As	75			
Se	82			
Se-1	77			
Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: Blank
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Method 6020 - Summary Report

Sample ID: Standard 1
Sample Date/Time: Thursday, October 20, 2016 09:02:06
Number of Replicates: 3
Autosampler Position: 1
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75976.8	3.4				ug/L	76335	Standard
	Be	9	8.3	34.6				ug/L	18	Standard
	Al	27	621.7	1.7				ug/L	810	Standard
	Sc	45	24524.8	2.8				ug/L	22700	Standard
	Ti	47	32.0	21.7				ug/L	25	Standard
	V	51	1635.5	8.9				ug/L	1541	Standard
	Cr	52	8323.3	1.7				ug/L	7881	Standard
	Cr	53	945.0	8.2				ug/L	932	Standard
	Mn	55	1194.0	6.2				ug/L	1508	Standard
	Co	59	289.7	2.5				ug/L	282	Standard
	Ni	60	86.0	3.1				ug/L	91	Standard
	Cu	65	156.0	5.6				ug/L	205	Standard
	Zn	66	327.3	10.3				ug/L	369	Standard
>	Ge	72	507086.0	2.3				ug/L	496734	Standard
	As	75	-33.5	168.2				ug/L	-45	Standard
	Se	82	28.3	13.8				ug/L	18	Standard
	Se-1	77	93.3	14.6				ug/L	83	Standard
>	Ga	71	28.3	44.4				mg/L	30	Standard
	Rb	85	20.0	43.3				ug/L	23	Standard
	Y	89	417888.0	2.3				ug/L	405333	Standard
>	Rh	103	18.3	63.0				ug/L	17	Standard
	Mo	98	78.7	15.4				ug/L	135	Standard
	Ag	107	120.0	7.3				ug/L	123	Standard
	Cd	111	10.2	22.4				mg/L	11	Standard
	Cd	114	58.7	41.5				ug/L	56	Standard
>	In	115	674756.9	2.2				ug/L	634401	Standard
	Sn	118	111.0	31.7				ug/L	137	Standard
	Sb	123	587.6	48.8				ug/L	907	Standard
	Ba	135	156.0	11.2				ug/L	166	Standard
	Ce	140	58.3	32.5				ug/L	57	Standard
>	Tb	159	1393811.7	2.0				ug/L	1347540	Standard
	Ho	165	15.0	0.0				ug/L	23	Standard
	Tl	203	36.0	17.3				ug/L	45	Standard
	Tl	205	73.3	31.5				ug/L	112	Standard
	Pb	206	850.7	4.3				ug/L	825	Standard
	Pb	207	675.0	1.9				ug/L	679	Standard
	Pb	208	3250.5	2.1				ug/L	3166	Standard
	U	238	78.7	11.1				ug/L	119	Standard
>	Bi	209	696596.1	1.1				ug/L	668024	Standard

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Na	23	0.0		mg/L	0	Standard
Mg	24	51.7	36.6	mg/L	48	Standard
K	39	8.3	91.7	mg/L	8	Standard
Ca	43	28.3	20.4	mg/L	27	Standard
Fe	54	126.1	22.5	mg/L	121	Standard
Fe	57	283.3	3.7	mg/L	305	Standard
Sc-1	45	24524.8	2.8	mg/L	22700	Standard
Cl	35	4.7	65.5	ug/L	3	Standard
Kr	83	4.0	0.0	ug/L	5	Standard
Br	81	1350.1	9.5	ug/L	1367	Standard
P	31	113.3	9.2	ug/L	67	Standard
S	34	90.0	14.7	ug/L	55	Standard
Sr	88	108.3	14.1	ug/L	113	Standard
C	12	300.0	26.5	mg/L	367	Standard
N	14	0.0		mg/L	3	Standard
Hg	202	6.7	86.6	mg/L	10	Standard
Dy	164	25.5	60.3	mg/L	18	Standard
Ho-1	165	15.0	0.0	mg/L	23	Standard
Er	166	23.3	65.5	mg/L	40	Standard
I	127	3365.4	1.2	mg/L	3235	Standard

QC Calculated Values

Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
Li	6			
Be	9			
Al	27			
Sc	45			
Ti	47			
V	51			
Cr	52			
Cr	53			
Mn	55			
Co	59			
Ni	60			
Cu	65			
Zn	66			
Ge	72			
As	75			
Se	82			
Se-1	77			
Ga	71			

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⌊	Rb	85
⌈	Y	89
⌊>	Rh	103
⌈	Mo	98
|	Ag	107
|	Cd	111
|	Cd	114
| >	In	115
|	Sn	118
|	Sb	123
⌊	Ba	135
⌈	Ce	140
⌊>	Tb	159
⌈	Ho	165
|	Tl	203
|	Tl	205
|	Pb	206
|	Pb	207
|	Pb	208
|	U	238
⌊>	Bi	209
⌈	Na	23
|	Mg	24
|	K	39
|	Ca	43
|	Fe	54
|	Fe	57
⌊>	Sc-1	45
	Cl	35
	Kr	83
	Br	81
	P	31
	S	34
	Sr	88
	C	12
	N	14
	Hg	202
	Dy	164
	Ho-1	165
	Er	166
	I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: Standard 1
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Method 6020 - Summary Report

Sample ID: Standard 2
Sample Date/Time: Thursday, October 20, 2016 09:05:06
Number of Replicates: 3
Autosampler Position: 2
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	74097.6	3.9				ug/L	76335	Standard
	Be	9	56.7	20.4				ug/L	18	Standard
	Al	27	6548.1	7.2				ug/L	810	Standard
	Sc	45	22750.4	2.7				ug/L	22700	Standard
	Ti	47	49.7	19.8				ug/L	25	Standard
	V	51	1981.6	1.6				ug/L	1541	Standard
	Cr	52	8327.0	2.3				ug/L	7881	Standard
	Cr	53	970.0	12.4				ug/L	932	Standard
	Mn	55	1537.1	4.8				ug/L	1508	Standard
	Co	59	784.7	5.2				ug/L	282	Standard
	Ni	60	189.3	4.3				ug/L	91	Standard
	Cu	65	226.0	1.3				ug/L	205	Standard
	Zn	66	240.7	3.2				ug/L	369	Standard
>	Ge	72	497585.2	2.1				ug/L	496734	Standard
	As	75	-10.2	402.3				ug/L	-45	Standard
	Se	82	24.6	28.6				ug/L	18	Standard
	Se-1	77	80.3	23.1				ug/L	83	Standard
>	Ga	71	16.7	75.5				mg/L	30	Standard
	Rb	85	11.7	49.5				ug/L	23	Standard
	Y	89	400623.7	2.9				ug/L	405333	Standard
>	Rh	103	20.0	66.1				ug/L	17	Standard
	Mo	98	453.9	5.7				ug/L	135	Standard
	Ag	107	515.0	2.5				ug/L	123	Standard
	Cd	111	122.1	9.2				mg/L	11	Standard
	Cd	114	302.4	2.5				ug/L	56	Standard
>	In	115	648271.1	2.5				ug/L	634401	Standard
	Sn	118	158.7	4.2				ug/L	137	Standard
	Sb	123	636.8	25.5				ug/L	907	Standard
	Ba	135	281.0	1.3				ug/L	166	Standard
	Ce	140	40.0	12.5				ug/L	57	Standard
>	Tb	159	1346235.1	2.4				ug/L	1347540	Standard
	Ho	165	16.7	69.3				ug/L	23	Standard
	Tl	203	632.3	3.3				ug/L	45	Standard
	Tl	205	1450.1	4.2				ug/L	112	Standard
	Pb	206	915.4	4.7				ug/L	825	Standard
	Pb	207	762.4	2.3				ug/L	679	Standard
	Pb	208	3624.8	2.3				ug/L	3166	Standard
	U	238	1622.4	2.6				ug/L	119	Standard
>	Bi	209	661189.0	2.4				ug/L	668024	Standard

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Na	23	0.0		mg/L	0	Standard
Mg	24	68.3	23.5	mg/L	48	Standard
K	39	13.3	57.3	mg/L	8	Standard
Ca	43	33.3	74.0	mg/L	27	Standard
Fe	54	127.7	9.9	mg/L	121	Standard
Fe	57	340.0	6.7	mg/L	305	Standard
Sc-1	45	22750.4	2.7	mg/L	22700	Standard
Cl	35	2.0	100.0	ug/L	3	Standard
Kr	83	5.3	47.2	ug/L	5	Standard
Br	81	1373.4	3.3	ug/L	1367	Standard
P	31	113.3	28.4	ug/L	67	Standard
S	34	83.3	9.2	ug/L	55	Standard
Sr	88	110.0	19.8	ug/L	113	Standard
C	12	283.3	10.8	mg/L	367	Standard
N	14	0.0		mg/L	3	Standard
Hg	202	10.0		mg/L	10	Standard
Dy	164	22.5	89.7	mg/L	18	Standard
Ho-1	165	16.7	69.3	mg/L	23	Standard
Er	166	16.7	91.7	mg/L	40	Standard
I	127	3083.6	2.9	mg/L	3235	Standard

QC Calculated Values

Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
Li	6			
Be	9			
Al	27			
Sc	45			
Ti	47			
V	51			
Cr	52			
Cr	53			
Mn	55			
Co	59			
Ni	60			
Cu	65			
Zn	66			
Ge	72			
As	75			
Se	82			
Se-1	77			
Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: Standard 2
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Method 6020 - Summary Report

Sample ID: Standard 3
Sample Date/Time: Thursday, October 20, 2016 09:08:05
Number of Replicates: 3
Autosampler Position: 3
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73206.5	2.1				ug/L	76335	Standard
	Be	9	53464.3	4.1	**50.0000**	2.334	4.7	ug/L	18	Standard
	Al	27	5998725.5	3.5	**50.0000**	2.634	5.3	ug/L	810	Standard
	Sc	45	22631.9	1.2				ug/L	22700	Standard
	Ti	47	20614.7	2.2	**100.0000**	1.184	1.2	ug/L	25	Standard
	V	51	361112.1	3.4	**50.0000**	1.085	2.2	ug/L	1541	Standard
	Cr	52	342327.9	2.5	**50.0000**	0.382	0.8	ug/L	7881	Standard
	Cr	53	43557.5	1.1	**50.0000**	0.390	0.8	ug/L	932	Standard
	Mn	55	570876.4	2.8	**50.0000**	0.534	1.1	ug/L	1508	Standard
	Co	59	473011.8	1.8	**50.0000**	0.372	0.7	ug/L	282	Standard
	Ni	60	102271.5	2.8	**50.0000**	0.601	1.2	ug/L	91	Standard
	Cu	65	101122.8	2.6	**50.0000**	0.431	0.9	ug/L	205	Standard
	Zn	66	52188.1	2.1	**50.0000**	0.279	0.6	ug/L	369	Standard
>	Ge	72	498907.6	1.8				ug/L	496734	Standard
	As	75	51708.9	1.9	**50.0000**	0.185	0.4	ug/L	-45	Standard
	Se	82	4990.9	3.7	**50.0000**	1.261	2.5	ug/L	18	Standard
	Se-1	77	3422.7	0.3	**50.0000**	0.761	1.5	ug/L	83	Standard
>	Ga	71	63.3	9.1				mg/L	30	Standard
	Rb	85	646.7	3.9				ug/L	23	Standard
	Y	89	398326.4	0.5				ug/L	405333	Standard
>	Rh	103	26.7	57.3				ug/L	17	Standard
	Mo	98	372381.8	2.1	**100.0000**	1.038	1.0	ug/L	135	Standard
	Ag	107	369470.8	2.1	**50.0000**	0.536	1.1	ug/L	123	Standard
	Cd	111	103641.2	0.8	**50.0000**	0.595	1.2	mg/L	11	Standard
	Cd	114	267456.5	1.3	**50.0000**	0.465	0.9	ug/L	56	Standard
>	In	115	644905.6	1.1				ug/L	634401	Standard
	Sn	118	62551.5	1.7	**50.0000**	1.053	2.1	ug/L	137	Standard
	Sb	123	271388.1	2.6	**50.0000**	0.808	1.6	ug/L	907	Standard
	Ba	135	145602.7	1.5	**50.0000**	0.239	0.5	ug/L	166	Standard
	Ce	140	200.0	13.2				ug/L	57	Standard
>	Tb	159	1340719.2	1.1				ug/L	1347540	Standard
	Ho	165	26.7	47.2				ug/L	23	Standard
	Tl	203	577381.5	2.4	**50.0000**	0.426	0.9	ug/L	45	Standard
	Tl	205	1339190.2	1.8	**50.0000**	0.735	1.5	ug/L	112	Standard
	Pb	206	431570.2	2.3	**50.0000**	0.345	0.7	ug/L	825	Standard
	Pb	207	382550.9	3.6	**50.0000**	0.667	1.3	ug/L	679	Standard
	Pb	208	1738089.7	2.7	**50.0000**	0.258	0.5	ug/L	3166	Standard
	U	238	1515767.7	3.4	**50.0000**	0.572	1.1	ug/L	119	Standard
>	Bi	209	659924.3	2.3				ug/L	668024	Standard

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	Na	23	16.7	34.6	**5.0000**	1.766	35.3	mg/L	0	Standard
	Mg	24	3432.1	3.3	**5.0000**	0.111	2.2	mg/L	48	Standard
	K	39	506.7	7.5	**5.0000**	0.379	7.6	mg/L	8	Standard
	Ca	43	45.0	50.9	**5.0000**	9.248	185.0	mg/L	27	Standard
	Fe	54	4862.9	4.6	**5.0000**	0.179	3.6	mg/L	121	Standard
	Fe	57	1563.4	8.1	**5.0000**	0.498	10.0	mg/L	305	Standard
>	**Sc-1**	45	22631.9	1.2				mg/L	22700	Standard
	Cl	35	4.0	86.6				ug/L	3	Standard
	Kr	83	3.0	57.7				ug/L	5	Standard
	Br	81	1320.1	3.0				ug/L	1367	Standard
	P	31	125.0	16.0				ug/L	67	Standard
	S	34	106.7	16.5				ug/L	55	Standard
	Sr	88	148.3	29.5				ug/L	113	Standard
	C	12	296.7	29.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	16.7	69.3				mg/L	10	Standard
	Dy	164	22.2	89.2				mg/L	18	Standard
	Ho-1	165	26.7	47.2				mg/L	23	Standard
	Er	166	23.3	89.2				mg/L	40	Standard
	I	127	3287.0	3.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72			
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85
Y	89
Rh	103
Mo	98
Ag	107
Cd	111
Cd	114
In	115
Sn	118
Sb	123
Ba	135
Ce	140
Tb	159
Ho	165
Tl	203
Tl	205
Pb	206
Pb	207
Pb	208
U	238
Bi	209
Na	23
Mg	24
K	39
Ca	43
Fe	54
Fe	57
Sc-1	45
Cl	35
Kr	83
Br	81
P	31
S	34
Sr	88
C	12
N	14
Hg	202
Dy	164
Ho-1	165
Er	166
I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: Standard 4
Sample Date/Time: Thursday, October 20, 2016 09:11:05
Number of Replicates: 3
Autosampler Position: 4
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	74640.2	2.9				ug/L	76335	Standard
	Be	9	106461.5	4.2	**98.8292**	5.260	5.3	ug/L	18	Standard
	Al	27	12048733.5	1.5	**99.2563**	4.398	4.4	ug/L	810	Standard
	Sc	45	22952.4	2.9				ug/L	22700	Standard
	Ti	47	42375.5	2.0	**202.9847**	2.428	1.2	ug/L	25	Standard
	V	51	736820.6	2.1	**101.2069**	1.260	1.2	ug/L	1541	Standard
	Cr	52	691308.3	2.7	**101.1741**	2.033	2.0	ug/L	7881	Standard
	Cr	53	87611.2	4.0	**100.9072**	3.265	3.2	ug/L	932	Standard
	Mn	55	1150531.1	1.9	**100.5174**	1.104	1.1	ug/L	1508	Standard
	Co	59	959182.5	3.9	**100.7886**	3.320	3.3	ug/L	282	Standard
	Ni	60	207018.1	2.0	**100.7146**	1.297	1.3	ug/L	91	Standard
	Cu	65	201490.7	1.3	**99.9378**	1.001	1.0	ug/L	205	Standard
	Zn	66	102903.7	1.6	**99.4684**	0.862	0.9	ug/L	369	Standard
>	Ge	72	498020.9	0.8				ug/L	496734	Standard
	As	75	104041.8	2.0	**100.3573**	1.170	1.2	ug/L	-45	Standard
	Se	82	9944.3	1.6	**100.0055**	0.842	0.8	ug/L	18	Standard
	Se-1	77	6731.5	3.6	**99.8011**	3.190	3.2	ug/L	83	Standard
>	Ga	71	95.0	5.3				mg/L	30	Standard
	Rb	85	1245.1	1.4				ug/L	23	Standard
	Y	89	408817.2	3.8				ug/L	405333	Standard
>	Rh	103	51.7	49.7				ug/L	17	Standard
	Mo	98	761236.3	2.0	**200.2585**	5.221	2.6	ug/L	135	Standard
	Ag	107	696336.3	1.1	**96.0715**	1.614	1.7	ug/L	123	Standard
	Cd	111	207569.3	1.2	**99.0925**	1.125	1.1	mg/L	11	Standard
	Cd	114	539157.6	1.6	**99.4224**	2.035	2.0	ug/L	56	Standard
>	In	115	657651.6	0.6				ug/L	634401	Standard
	Sn	118	125544.5	2.2	**99.2359**	2.739	2.8	ug/L	137	Standard
	Sb	123	541035.0	0.4	**98.9009**	0.783	0.8	ug/L	907	Standard
	Ba	135	291751.9	0.6	**99.1417**	1.092	1.1	ug/L	166	Standard
	Ce	140	276.7	5.8				ug/L	57	Standard
>	Tb	159	1391617.2	0.3				ug/L	1347540	Standard
	Ho	165	65.0	30.8				ug/L	23	Standard
	Tl	203	1150768.3	1.9	**100.0531**	0.617	0.6	ug/L	45	Standard
	Tl	205	2889107.3	0.1	**104.0155**	2.319	2.2	ug/L	112	Standard
	Pb	206	867956.9	1.7	**100.5305**	0.531	0.5	ug/L	825	Standard
	Pb	207	758805.7	2.3	**99.8427**	0.175	0.2	ug/L	679	Standard
	Pb	208	3448213.5	1.9	**99.8495**	0.374	0.4	ug/L	3166	Standard
	U	238	3209695.3	2.9	**103.0787**	0.775	0.8	ug/L	119	Standard
>	Bi	209	657007.0	2.2				ug/L	668024	Standard

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	Na	23	41.7	25.0	**11.0268**	2.779	25.2	mg/L	0	Standard
	Mg	24	7013.3	2.3	**10.0870**	0.082	0.8	mg/L	48	Standard
	K	39	948.4	4.8	**9.6583**	0.474	4.9	mg/L	8	Standard
	Ca	43	68.3	53.9	**11.6647**	11.649	99.9	mg/L	27	Standard
	Fe	54	9681.2	2.8	**9.9740**	0.411	4.1	mg/L	121	Standard
	Fe	57	3095.3	4.2	**10.5062**	0.192	1.8	mg/L	305	Standard
>	**Sc-1**	45	22952.4	2.9				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	5.0	69.3				ug/L	5	Standard
	Br	81	1406.7	20.3				ug/L	1367	Standard
	P	31	131.7	22.9				ug/L	67	Standard
	S	34	93.3	18.8				ug/L	55	Standard
	Sr	88	133.3	5.7				ug/L	113	Standard
	C	12	356.7	25.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	173.2				mg/L	10	Standard
	Dy	164	42.5	29.4				mg/L	18	Standard
	Ho-1	165	65.0	30.8				mg/L	23	Standard
	Er	166	16.7	124.9				mg/L	40	Standard
	I	127	5386.0	2.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72			
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85
⌈	Y	89
⌊>	Rh	103
⌈	Mo	98
|	Ag	107
|	Cd	111
|	Cd	114
| >	In	115
|	Sn	118
|	Sb	123
⌊	Ba	135
⌈	Ce	140
⌊>	Tb	159
⌈	Ho	165
|	Tl	203
|	Tl	205
|	Pb	206
|	Pb	207
|	Pb	208
|	U	238
⌊>	Bi	209
⌈	Na	23
|	Mg	24
|	K	39
|	Ca	43
|	Fe	54
|	Fe	57
⌊>	Sc-1	45
	Cl	35
	Kr	83
	Br	81
	P	31
	S	34
	Sr	88
	C	12
	N	14
	Hg	202
	Dy	164
	Ho-1	165
	Er	166
	I	127

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Corr. Coef.	Na	23	Correlation coefficient < 0.998
Corr. Coef.	Ca	43	Correlation coefficient < 0.998

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Method 6020 - Summary Report

Sample ID: QC Std 1
Sample Date/Time: Thursday, October 20, 2016 09:14:06
Number of Replicates: 3
Autosampler Position: 201
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	74226.4	1.1				ug/L	76335	Standard
	Be	9	52497.5	3.8	**48.9641**	1.336	2.7	ug/L	18	Standard
	Al	27	5990881.4	5.2	**49.5681**	2.049	4.1	ug/L	810	Standard
	Sc	45	23012.5	6.3				ug/L	22700	Standard
	Ti	47	20748.9	3.0	**100.0541**	1.980	2.0	ug/L	25	Standard
	V	51	364415.8	3.1	**50.3156**	1.253	2.5	ug/L	1541	Standard
	Cr	52	347490.1	3.2	**50.6516**	1.390	2.7	ug/L	7881	Standard
	Cr	53	43052.8	2.1	**49.4202**	1.090	2.2	ug/L	932	Standard
	Mn	55	566769.6	1.3	**49.8465**	0.471	0.9	ug/L	1508	Standard
	Co	59	470498.8	1.1	**49.7988**	0.500	1.0	ug/L	282	Standard
	Ni	60	102072.4	1.0	**50.0126**	0.572	1.1	ug/L	91	Standard
	Cu	65	99844.9	1.1	**49.8622**	0.517	1.0	ug/L	205	Standard
	Zn	66	51825.8	1.1	**50.3846**	0.758	1.5	ug/L	369	Standard
>	Ge	72	494388.2	2.1				ug/L	496734	Standard
	As	75	51632.1	1.0	**50.2114**	0.748	1.5	ug/L	-45	Standard
	Se	82	5068.3	0.7	**51.2621**	0.981	1.9	ug/L	18	Standard
	Se-1	77	3431.1	1.6	**50.7017**	1.459	2.9	ug/L	83	Standard
>	Ga	71	56.7	13.5				mg/L	30	Standard
	Rb	85	678.3	1.1				ug/L	23	Standard
	Y	89	396181.7	4.1				ug/L	405333	Standard
>	Rh	103	26.7	39.0				ug/L	17	Standard
	Mo	98	374873.0	1.8	**99.3601**	1.112	1.1	ug/L	135	Standard
	Ag	107	364403.3	1.1	**50.6553**	0.659	1.3	ug/L	123	Standard
	Cd	111	105494.8	1.1	**50.7589**	1.238	2.4	mg/L	11	Standard
	Cd	114	275188.8	2.0	**51.1503**	1.828	3.6	ug/L	56	Standard
>	In	115	652652.7	2.1				ug/L	634401	Standard
	Sn	118	64597.1	1.1	**51.4288**	1.488	2.9	ug/L	137	Standard
	Sb	123	281786.0	0.9	**51.8826**	0.939	1.8	ug/L	907	Standard
	Ba	135	147465.2	0.8	**50.4790**	0.685	1.4	ug/L	166	Standard
	Ce	140	166.7	39.0				ug/L	57	Standard
>	Tb	159	1347746.6	2.1				ug/L	1347540	Standard
	Ho	165	36.7	7.9				ug/L	23	Standard
	Tl	203	584583.0	0.4	**50.9581**	0.831	1.6	ug/L	45	Standard
	Tl	205	1393922.2	2.0	**50.2979**	0.975	1.9	ug/L	112	Standard
	Pb	206	439513.6	0.3	**51.0157**	1.053	2.1	ug/L	825	Standard
	Pb	207	384777.5	1.0	**50.7384**	0.730	1.4	ug/L	679	Standard
	Pb	208	1748593.4	0.9	**50.7390**	0.671	1.3	ug/L	3166	Standard
	U	238	1525579.4	1.3	**49.1250**	0.502	1.0	ug/L	119	Standard
>	Bi	209	655384.2	2.0				ug/L	668024	Standard

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⌈	**Na**	23	26.7	39.0	**6.9613**	2.491	35.8	mg/L	0	Standard
|	**Mg**	24	3357.0	6.3	**4.7660**	0.108	2.3	mg/L	48	Standard
|	**K**	39	451.7	9.4	**4.5479**	0.739	16.3	mg/L	8	Standard
|	**Ca**	43	56.7	35.7	**8.2177**	8.004	97.4	mg/L	27	Standard
|	**Fe**	54	4853.9	4.6	**4.9419**	0.543	11.0	mg/L	121	Standard
|	**Fe**	57	1560.1	4.5	**4.6607**	0.630	13.5	mg/L	305	Standard
⌊>	**Sc-1**	45	23012.5	6.3				mg/L	22700	Standard
	Cl	35	1.3	173.2				ug/L	3	Standard
	Kr	83	2.0	50.0				ug/L	5	Standard
	Br	81	1393.4	9.6				ug/L	1367	Standard
	P	31	133.3	31.2				ug/L	67	Standard
	S	34	83.3	21.1				ug/L	55	Standard
	Sr	88	120.0	31.5				ug/L	113	Standard
	C	12	330.0	29.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	173.2				mg/L	10	Standard
	Dy	164	19.4	1.4				mg/L	18	Standard
	Ho-1	165	36.7	7.9				mg/L	23	Standard
	Er	166	13.3	43.3				mg/L	40	Standard
	I	127	3120.3	1.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	97.928		
⌊	Al	27	99.136		
⌈	Sc	45			
|	Ti	47	100.054		
|	V	51	100.631		
|	Cr	52	101.303		
|	Cr	53			
|	Mn	55	99.693		
|	Co	59	99.598		
|	Ni	60	100.025		
|	Cu	65	99.724		
|	Zn	66	100.769		
|>	Ge	72		99.528	
|	As	75	100.423		
|	Se	82	102.524		
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85		
	Y	89		
>	Rh	103		
	Mo	98	99.360	
	Ag	107	101.311	
	Cd	111	101.518	
	Cd	114		
>	In	115		102.877
	Sn	118	102.858	
	Sb	123	103.765	
	Ba	135	100.958	
	Ce	140		
>	Tb	159		
	Ho	165		
	Tl	203	101.916	
	Tl	205		
	Pb	206	102.031	
	Pb	207	101.477	
	Pb	208	101.478	
	U	238	98.250	
>	Bi	209		98.108
	Na	23	139.226	
	Mg	24	95.320	
	K	39	90.958	
	Ca	43	164.354	
	Fe	54	98.838	
	Fe	57	93.214	
>	Sc-1	45		
	Cl	35		
	Kr	83		
	Br	81		
	P	31		
	S	34		
	Sr	88		
	C	12		
	N	14		
	Hg	202		
	Dy	164		
	Ho-1	165		
	Er	166		
	I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 1	Na	23	
QC Std 1	Ca	43	

Sample ID: QC Std 1
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Method 6020 - Summary Report

Sample ID: QC Std 2
Sample Date/Time: Thursday, October 20, 2016 09:17:07
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	64340.8	11.4				ug/L	76335	Standard
	Be	9	8.3	91.7	**0.0058**	0.008	145.7	ug/L	18	Standard
	Al	27	801.7	21.6	**0.0033**	0.001	38.1	ug/L	810	Standard
	Sc	45	20699.2	8.1				ug/L	22700	Standard
	Ti	47	18.7	50.9	**-0.0407**	0.046	112.3	ug/L	25	Standard
	V	51	1265.7	13.6	**-0.0319**	0.016	51.1	ug/L	1541	Standard
	Cr	52	6092.6	22.4	**-0.1963**	0.176	89.5	ug/L	7881	Standard
	Cr	53	710.0	15.3	**-0.1735**	0.123	70.9	ug/L	932	Standard
	Mn	55	789.0	20.9	**-0.0088**	0.013	151.1	ug/L	1508	Standard
	Co	59	279.3	6.4	**-0.0002**	0.001	224.6	ug/L	282	Standard
	Ni	60	70.3	14.9	**-0.0045**	0.006	132.7	ug/L	91	Standard
	Cu	65	144.0	17.7	**0.0168**	0.017	100.9	ug/L	205	Standard
	Zn	66	190.7	12.3	**0.0209**	0.034	162.3	ug/L	369	Standard
>	Ge	72	452479.4	4.9				ug/L	496734	Standard
	As	75	-37.3	30.2	**0.0199**	0.012	59.2	ug/L	-45	Standard
	Se	82	9.1	75.2	**-0.1006**	0.069	68.7	ug/L	18	Standard
	Se-1	77	72.3	18.9	**0.0362**	0.171	472.2	ug/L	83	Standard
>	Ga	71	18.3	56.8				mg/L	30	Standard
	Rb	85	16.7	17.3				ug/L	23	Standard
	Y	89	361049.5	8.2				ug/L	405333	Standard
>	Rh	103	16.7	17.3				ug/L	17	Standard
	Mo	98	300.5	48.6	**0.0668**	0.038	56.9	ug/L	135	Standard
	Ag	107	120.7	1.9	**-0.0033**	0.001	36.8	ug/L	123	Standard
	Cd	111	15.9	37.6	**-0.0006**	0.003	465.5	mg/L	11	Standard
	Cd	114	45.2	40.2	**0.0027**	0.003	117.0	ug/L	56	Standard
>	In	115	581081.2	6.2				ug/L	634401	Standard
	Sn	118	117.0	48.0	**0.0257**	0.046	178.2	ug/L	137	Standard
	Sb	123	1432.1	78.5	**0.2208**	0.226	102.2	ug/L	907	Standard
	Ba	135	36.7	4.2	**-0.0328**	0.001	2.2	ug/L	166	Standard
	Ce	140	38.3	27.2				ug/L	57	Standard
>	Tb	159	1249695.1	6.8				ug/L	1347540	Standard
	Ho	165	20.0	43.3				ug/L	23	Standard
	Tl	203	81.0	12.5	**0.0028**	0.001	25.2	ug/L	45	Standard
	Tl	205	196.7	19.1	**0.0056**	0.001	21.6	ug/L	112	Standard
	Pb	206	486.3	4.2	**0.0042**	0.002	46.1	ug/L	825	Standard
	Pb	207	392.3	12.4	**0.0047**	0.004	76.9	ug/L	679	Standard
	Pb	208	1859.0	6.1	**0.0026**	0.001	28.1	ug/L	3166	Standard
	U	238	169.0	10.3	**0.0039**	0.001	14.9	ug/L	119	Standard
>	Bi	209	621695.5	6.2				ug/L	668024	Standard

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	Na	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
	Mg	24	45.0	58.8	**-0.0234**	0.041	176.0	mg/L	48	Standard
	K	39	11.7	24.7	**-0.0000**	0.022	287441.7	mg/L	8	Standard
	Ca	43	25.0	34.6	**-1.9625**	2.836	144.5	mg/L	27	Standard
	Fe	54	94.3	27.2	**-0.0213**	0.025	115.4	mg/L	121	Standard
	Fe	57	338.3	14.5	**0.1246**	0.104	83.3	mg/L	305	Standard
>	**Sc-1**	45	20699.2	8.1				mg/L	22700	Standard
	Cl	35	3.3	91.7				ug/L	3	Standard
	Kr	83	2.3	24.7				ug/L	5	Standard
	Br	81	1180.0	12.0				ug/L	1367	Standard
	P	31	55.0	103.3				ug/L	67	Standard
	S	34	73.3	21.9				ug/L	55	Standard
	Sr	88	138.3	24.1				ug/L	113	Standard
	C	12	296.7	17.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	22.1	51.1				mg/L	18	Standard
	Ho-1	165	20.0	43.3				mg/L	23	Standard
	Er	166	26.7	43.3				mg/L	40	Standard
	I	127	2748.6	9.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		91.091	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	91.595
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	93.065
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 2	Sb	123	
QC Std 2	Ca	43	
QC Std 2	Fe	57	

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Method 6020 - Summary Report

Sample ID: QC Std 3
Sample Date/Time: Thursday, October 20, 2016 09:20:08
Number of Replicates: 3
Autosampler Position: 202
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	67572.4	6.4				ug/L	76335	Standard
	Be	9	193.3	6.5	**0.1952**	0.003	1.7	ug/L	18	Standard
	Al	27	1016.7	9.0	**0.0049**	0.000	8.8	ug/L	810	Standard
	Sc	45	21480.2	3.1				ug/L	22700	Standard
	Ti	47	26.3	14.4	**-0.0047**	0.019	405.5	ug/L	25	Standard
	V	51	3894.2	1.9	**0.3429**	0.013	3.9	ug/L	1541	Standard
	Cr	52	11848.3	3.2	**0.6675**	0.006	0.9	ug/L	7881	Standard
	Cr	53	1458.4	7.7	**0.7081**	0.080	11.4	ug/L	932	Standard
	Mn	55	6619.8	4.3	**0.5263**	0.005	0.9	ug/L	1508	Standard
	Co	59	3615.1	3.7	**0.3686**	0.006	1.8	ug/L	282	Standard
	Ni	60	2981.3	4.0	**1.4890**	0.009	0.6	ug/L	91	Standard
	Cu	65	1661.1	2.9	**0.8079**	0.015	1.8	ug/L	205	Standard
	Zn	66	6356.3	2.7	**6.3146**	0.092	1.5	ug/L	369	Standard
>	Ge	72	471899.6	3.5				ug/L	496734	Standard
	As	75	332.9	12.6	**0.3982**	0.043	10.7	ug/L	-45	Standard
	Se	82	47.6	18.4	**0.3076**	0.092	29.9	ug/L	18	Standard
	Se-1	77	99.0	3.0	**0.4163**	0.103	24.7	ug/L	83	Standard
>	Ga	71	15.0	57.7				mg/L	30	Standard
	Rb	85	26.7	60.3				ug/L	23	Standard
	Y	89	381749.1	4.6				ug/L	405333	Standard
>	Rh	103	16.7	45.8				ug/L	17	Standard
	Mo	98	172.2	8.6	**0.0270**	0.005	19.0	ug/L	135	Standard
	Ag	107	2632.6	1.6	**0.3636**	0.016	4.5	ug/L	123	Standard
	Cd	111	463.5	6.9	**0.2256**	0.015	6.4	mg/L	11	Standard
	Cd	114	1259.2	12.8	**0.2400**	0.034	14.0	ug/L	56	Standard
>	In	115	620164.6	4.8				ug/L	634401	Standard
	Sn	118	155.0	13.8	**0.0522**	0.012	23.9	ug/L	137	Standard
	Sb	123	3234.6	23.4	**0.5570**	0.136	24.4	ug/L	907	Standard
	Ba	135	2022.5	5.0	**0.6824**	0.026	3.7	ug/L	166	Standard
	Ce	140	58.3	40.5				ug/L	57	Standard
>	Tb	159	1282996.9	6.0				ug/L	1347540	Standard
	Ho	165	18.3	83.3				ug/L	23	Standard
	Tl	203	925.7	9.4	**0.0780**	0.004	5.4	ug/L	45	Standard
	Tl	205	2091.8	7.3	**0.0755**	0.004	4.7	ug/L	112	Standard
	Pb	206	2235.8	4.3	**0.2110**	0.003	1.3	ug/L	825	Standard
	Pb	207	1879.5	4.3	**0.2047**	0.006	3.1	ug/L	679	Standard
	Pb	208	8696.0	3.6	**0.2047**	0.005	2.4	ug/L	3166	Standard
	U	238	11384.6	4.2	**0.3741**	0.003	0.9	ug/L	119	Standard
>	Bi	209	639121.7	4.5				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	66.7	17.3	**0.0080**	0.018	229.0	mg/L	48	Standard
|	**K**	39	5.0	173.2	**-0.0791**	0.093	117.0	mg/L	8	Standard
|	**Ca**	43	36.7	20.8	**2.0108**	2.715	135.0	mg/L	27	Standard
|	**Fe**	54	103.6	24.1	**-0.0143**	0.026	179.3	mg/L	121	Standard
|	**Fe**	57	286.7	22.4	**-0.1294**	0.294	227.3	mg/L	305	Standard
⌊>	**Sc-1**	45	21480.2	3.1				mg/L	22700	Standard
	Cl	35	4.7	24.7				ug/L	3	Standard
	Kr	83	3.3	62.4				ug/L	5	Standard
	Br	81	1290.1	12.5				ug/L	1367	Standard
	P	31	88.3	3.3				ug/L	67	Standard
	S	34	60.0	22.0				ug/L	55	Standard
	Sr	88	130.0	11.5				ug/L	113	Standard
	C	12	246.7	16.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	2.2	268.8				mg/L	18	Standard
	Ho-1	165	18.3	83.3				mg/L	23	Standard
	Er	166	23.3	65.5				mg/L	40	Standard
	I	127	2843.6	3.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	97.576		
⌊	Al	27	0.489		
⌈	Sc	45			
|	Ti	47			
|	V	51	85.725		
|	Cr	52	83.438		
|	Cr	53			
|	Mn	55	105.263		
|	Co	59	92.141		
|	Ni	60	93.061		
|	Cu	65	100.994		
|	Zn	66	101.034		
|>	Ge	72		95.000	
|	As	75	99.561		
|	Se	82	76.890		
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85			
Y	89			
> Rh	103			
Mo	98			
Ag	107	90.894		
Cd	111	94.000		
Cd	114			
> In	115			97.756
Sn	118			
Sb	123	139.242		
Ba	135	90.987		
Ce	140			
> Tb	159			
Ho	165			
Tl	203	97.501		
Tl	205			
Pb	206			
Pb	207			
Pb	208	102.358		
U	238	93.533		
> Bi	209			95.673
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
> Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 3	Al	27	
QC Std 3	Sb	123	

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Method 6020 - Summary Report

Sample ID: QC Std 4
Sample Date/Time: Thursday, October 20, 2016 09:23:07
Number of Replicates: 3
Autosampler Position: 203
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	55969.9	2.5				ug/L	76335	Standard
	Be	9	15.0	88.2	**0.0156**	0.017	106.5	ug/L	18	Standard
	Al	27	4343934.8	2.2	**47.7019**	1.738	3.6	ug/L	810	Standard
	Sc	45	19671.1	4.5				ug/L	22700	Standard
	Ti	47	2164.2	3.4	**11.6005**	0.432	3.7	ug/L	25	Standard
	V	51	1095.2	14.6	**-0.0525**	0.026	48.7	ug/L	1541	Standard
	Cr	52	5329.6	0.3	**-0.2913**	0.003	1.0	ug/L	7881	Standard
	Cr	53	1296.7	5.9	**0.6257**	0.095	15.2	ug/L	932	Standard
	Mn	55	1156.0	4.5	**0.0299**	0.006	18.6	ug/L	1508	Standard
	Co	59	362.3	4.7	**0.0106**	0.002	20.1	ug/L	282	Standard
	Ni	60	448.7	10.9	**0.2049**	0.028	13.6	ug/L	91	Standard
	Cu	65	276.3	4.2	**0.0929**	0.006	6.9	ug/L	205	Standard
	Zn	66	601.0	4.5	**0.4752**	0.032	6.8	ug/L	369	Standard
>	Ge	72	440178.5	0.4				ug/L	496734	Standard
	As	75	-54.8	73.6	**-0.0002**	0.044	17662.3	ug/L	-45	Standard
	Se	82	13.2	22.3	**-0.0487**	0.034	69.3	ug/L	18	Standard
	Se-1	77	180.3	8.6	**1.9063**	0.251	13.2	ug/L	83	Standard
>	Ga	71	48.3	33.3				mg/L	30	Standard
	Rb	85	2320.2	7.1				ug/L	23	Standard
	Y	89	340077.6	0.4				ug/L	405333	Standard
>	Rh	103	5.0	100.0				ug/L	17	Standard
	Mo	98	243728.7	3.7	**79.7230**	2.732	3.4	ug/L	135	Standard
	Ag	107	167.0	11.5	**0.0065**	0.003	53.0	ug/L	123	Standard
	Cd	111	-21.4	106.5	**-0.0219**	0.014	62.2	mg/L	11	Standard
	Cd	114	588.2	14.8	**0.1282**	0.019	14.8	ug/L	56	Standard
>	In	115	528756.7	0.7				ug/L	634401	Standard
	Sn	118	67.3	24.1	**-0.0111**	0.016	147.2	ug/L	137	Standard
	Sb	123	533.7	35.9	**0.0529**	0.044	83.3	ug/L	907	Standard
	Ba	135	76.3	10.6	**-0.0147**	0.004	24.7	ug/L	166	Standard
	Ce	140	1426.7	9.3				ug/L	57	Standard
>	Tb	159	1151245.1	1.8				ug/L	1347540	Standard
	Ho	165	18.3	15.7				ug/L	23	Standard
	Tl	203	396.7	11.5	**0.0346**	0.005	13.2	ug/L	45	Standard
	Tl	205	988.4	10.9	**0.0386**	0.005	11.8	ug/L	112	Standard
	Pb	206	999.0	2.9	**0.0763**	0.004	5.1	ug/L	825	Standard
	Pb	207	825.7	2.0	**0.0740**	0.003	3.9	ug/L	679	Standard
	Pb	208	3886.9	3.0	**0.0738**	0.004	5.7	ug/L	3166	Standard
	U	238	102.3	25.7	**0.0019**	0.001	50.1	ug/L	119	Standard
>	Bi	209	577401.7	0.4				ug/L	668024	Standard

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⌈	**Na**	23	45.0	55.6	**13.7970**	7.270	52.7	mg/L	0	Standard
|	**Mg**	24	6421.4	5.5	**10.7821**	0.361	3.3	mg/L	48	Standard
|	**K**	39	471.7	13.3	**5.5371**	0.588	10.6	mg/L	8	Standard
|	**Ca**	43	65.0	27.7	**14.2621**	6.108	42.8	mg/L	27	Standard
|	**Fe**	54	4163.2	2.0	**4.9411**	0.130	2.6	mg/L	121	Standard
|	**Fe**	57	1406.7	3.8	**4.9761**	0.521	10.5	mg/L	305	Standard
⌊>	**Sc-1**	45	19671.1	4.5				mg/L	22700	Standard
	Cl	35	2.7	43.3				ug/L	3	Standard
	Kr	83	3.7	15.7				ug/L	5	Standard
	Br	81	993.4	10.3				ug/L	1367	Standard
	P	31	43.3	13.3				ug/L	67	Standard
	S	34	65.0	26.6				ug/L	55	Standard
	Sr	88	120.0	12.5				ug/L	113	Standard
	C	12	373.3	17.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	11.6	55.9				mg/L	18	Standard
	Ho-1	165	18.3	15.7				mg/L	23	Standard
	Er	166	36.7	41.7				mg/L	40	Standard
	I	127	2540.2	6.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27	0.954		
⌈	Sc	45			
|	Ti	47	11.601		
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		88.615	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	79.723		
Ag	107			
Cd	111			
Cd	114			
In	115			83.347
Sn	118			
Sb	123			
Ba	135			
Ce	140			
Tb	159			
Ho	165			
Tl	203			
Tl	205			
Pb	206			
Pb	207			
Pb	208			
U	238			
Bi	209			86.434
Na	23	110.376		
Mg	24	215.641		
K	39	110.743		
Ca	43	95.080		
Fe	54	39.529		
Fe	57	39.809		
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 4	Al	27	
QC Std 4	Ti	47	
QC Std 4	Mo	98	

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QC Std 4	Mg	24
QC Std 4	Fe	54
QC Std 4	Fe	57

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Method 6020 - Summary Report

Sample ID: QC Std 5
Sample Date/Time: Thursday, October 20, 2016 09:30:30
Number of Replicates: 3
Autosampler Position: 204
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68092.9	5.0				ug/L	76335	Standard
	Be	9	96390.7	1.8	**98.1338**	3.482	3.5	ug/L	18	Standard
	Al	27	5108954.9	4.0	**46.1072**	0.470	1.0	ug/L	810	Standard
	Sc	45	21388.4	4.4				ug/L	22700	Standard
	Ti	47	18738.6	1.4	**95.0626**	0.954	1.0	ug/L	25	Standard
	V	51	662665.5	1.8	**96.4599**	1.248	1.3	ug/L	1541	Standard
	Cr	52	621054.1	1.1	**96.2843**	1.110	1.2	ug/L	7881	Standard
	Cr	53	79338.9	2.3	**96.8043**	0.259	0.3	ug/L	932	Standard
	Mn	55	1017424.8	1.6	**94.2059**	1.176	1.2	ug/L	1508	Standard
	Co	59	863118.5	0.4	**96.1455**	1.868	1.9	ug/L	282	Standard
	Ni	60	186271.6	2.0	**96.0407**	1.075	1.1	ug/L	91	Standard
	Cu	65	186029.4	2.1	**97.7780**	0.586	0.6	ug/L	205	Standard
	Zn	66	97940.2	1.2	**100.3413**	1.040	1.0	ug/L	369	Standard
>	Ge	72	469971.8	2.2				ug/L	496734	Standard
	As	75	98130.8	2.0	**100.3134**	0.205	0.2	ug/L	-45	Standard
	Se	82	9323.5	3.4	**99.3443**	1.472	1.5	ug/L	18	Standard
	Se-1	77	6328.0	0.9	**99.4507**	2.246	2.3	ug/L	83	Standard
>	Ga	71	106.7	18.9				mg/L	30	Standard
	Rb	85	813.4	4.9				ug/L	23	Standard
	Y	89	381055.3	2.2				ug/L	405333	Standard
>	Rh	103	58.3	19.8				ug/L	17	Standard
	Mo	98	324718.1	2.3	**94.5275**	1.653	1.7	ug/L	135	Standard
	Ag	107	593799.5	9.5	**90.7148**	9.185	10.1	ug/L	123	Standard
	Cd	111	187507.4	0.7	**99.0839**	0.848	0.9	mg/L	11	Standard
	Cd	114	475328.5	2.4	**97.0097**	1.929	2.0	ug/L	56	Standard
>	In	115	594150.5	0.7				ug/L	634401	Standard
	Sn	118	128.0	19.4	**0.0347**	0.022	64.5	ug/L	137	Standard
	Sb	123	508745.4	1.5	**102.9346**	0.825	0.8	ug/L	907	Standard
	Ba	135	266805.8	1.1	**100.3499**	0.518	0.5	ug/L	166	Standard
	Ce	140	163.3	52.5				ug/L	57	Standard
>	Tb	159	1263971.5	2.8				ug/L	1347540	Standard
	Ho	165	100.0	48.2				ug/L	23	Standard
	Tl	203	1049908.5	0.9	**97.7543**	0.123	0.1	ug/L	45	Standard
	Tl	205	2602532.2	1.3	**100.3115**	0.644	0.6	ug/L	112	Standard
	Pb	206	798081.2	0.9	**98.9883**	0.420	0.4	ug/L	825	Standard
	Pb	207	701606.8	1.7	**98.8630**	1.087	1.1	ug/L	679	Standard
	Pb	208	3183684.2	1.6	**98.7227**	0.907	0.9	ug/L	3166	Standard
	U	238	2937128.2	0.5	**101.0312**	0.602	0.6	ug/L	119	Standard
>	Bi	209	613481.3	0.8				ug/L	668024	Standard

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⌈	**Na**	23	45.0	19.2	**12.7515**	2.128	16.7	mg/L	0	Standard
|	**Mg**	24	7090.0	4.5	**10.9494**	0.005	0.0	mg/L	48	Standard
|	**K**	39	346.7	13.1	**3.7089**	0.482	13.0	mg/L	8	Standard
|	**Ca**	43	65.0	7.7	**12.4553**	2.861	23.0	mg/L	27	Standard
|	**Fe**	54	10287.7	2.8	**11.4098**	0.834	7.3	mg/L	121	Standard
|	**Fe**	57	2952.0	1.9	**10.8084**	0.781	7.2	mg/L	305	Standard
⌊>	**Sc-1**	45	21388.4	4.4				mg/L	22700	Standard
	Cl	35	3.3	91.7				ug/L	3	Standard
	Kr	83	4.7	53.9				ug/L	5	Standard
	Br	81	1336.7	13.4				ug/L	1367	Standard
	P	31	85.0	44.4				ug/L	67	Standard
	S	34	76.7	13.6				ug/L	55	Standard
	Sr	88	130.0	24.0				ug/L	113	Standard
	C	12	583.3	13.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	20.0	50.0				mg/L	10	Standard
	Dy	164	8.9	112.6				mg/L	18	Standard
	Ho-1	165	100.0	48.2				mg/L	23	Standard
	Er	166	23.3	24.7				mg/L	40	Standard
	I	127	2713.6	6.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	98.134		
⌊	Al	27	0.922		
⌈	Sc	45			
|	Ti	47	95.063		
|	V	51	96.460		
|	Cr	52	96.284		
|	Cr	53			
|	Mn	55	94.206		
|	Co	59	96.145		
|	Ni	60	96.041		
|	Cu	65	97.778		
|	Zn	66	100.341		
|>	Ge	72		94.612	
|	As	75	100.313		
|	Se	82	99.344		
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	94.528		
Ag	107	90.715		
Cd	111	99.084		
Cd	114			
In	115			93.655
Sn	118			
Sb	123	102.935		
Ba	135	100.350		
Ce	140			
Tb	159			
Ho	165			
Tl	203	97.754		
Tl	205			
Pb	206			
Pb	207			
Pb	208	98.723		
U	238	101.031		
Bi	209			91.835
Na	23	102.012		
Mg	24	218.988		
K	39	74.178		
Ca	43	83.036		
Fe	54	91.278		
Fe	57	86.467		
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 5	Al	27	
QC Std 5	Mg	24	
QC Std 5	K	39	

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QC Std 5	Ca	43

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 09:33:31
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68347.7	7.2				ug/L	76335	Standard
	Be	9	49576.0	2.6	**50.3521**	2.848	5.7	ug/L	18	Standard
	Al	27	5564340.9	2.6	**50.1347**	2.703	5.4	ug/L	810	Standard
	Sc	45	21083.0	5.7				ug/L	22700	Standard
	Ti	47	19241.9	0.7	**97.0966**	3.907	4.0	ug/L	25	Standard
	V	51	338955.6	1.1	**48.9571**	1.618	3.3	ug/L	1541	Standard
	Cr	52	324588.1	0.7	**49.4848**	2.124	4.3	ug/L	7881	Standard
	Cr	53	41994.8	2.5	**50.4295**	1.017	2.0	ug/L	932	Standard
	Mn	55	534561.7	0.6	**49.1805**	1.515	3.1	ug/L	1508	Standard
	Co	59	449717.5	1.5	**49.7840**	1.197	2.4	ug/L	282	Standard
	Ni	60	97959.4	1.3	**50.2042**	1.436	2.9	ug/L	91	Standard
	Cu	65	97095.8	0.9	**50.7276**	1.723	3.4	ug/L	205	Standard
	Zn	66	50343.2	0.4	**51.2013**	1.643	3.2	ug/L	369	Standard
>	Ge	72	472884.7	3.6				ug/L	496734	Standard
	As	75	50282.0	1.1	**51.1485**	1.632	3.2	ug/L	-45	Standard
	Se	82	4816.4	1.5	**50.9408**	1.058	2.1	ug/L	18	Standard
	Se-1	77	3263.0	1.7	**50.4291**	1.925	3.8	ug/L	83	Standard
>	Ga	71	60.0	28.9				mg/L	30	Standard
	Rb	85	608.3	16.5				ug/L	23	Standard
	Y	89	376727.8	3.4				ug/L	405333	Standard
>	Rh	103	45.0	19.2				ug/L	17	Standard
	Mo	98	360255.3	1.3	**100.0052**	1.317	1.3	ug/L	135	Standard
	Ag	107	370080.4	1.4	**53.8724**	0.134	0.2	ug/L	123	Standard
	Cd	111	101796.2	1.1	**51.2887**	0.878	1.7	mg/L	11	Standard
	Cd	114	266575.1	2.1	**51.8729**	0.847	1.6	ug/L	56	Standard
>	In	115	623141.7	1.2				ug/L	634401	Standard
	Sn	118	62097.3	0.5	**51.7646**	0.587	1.1	ug/L	137	Standard
	Sb	123	274273.5	1.0	**52.8854**	0.846	1.6	ug/L	907	Standard
	Ba	135	141188.1	0.2	**50.6152**	0.682	1.3	ug/L	166	Standard
	Ce	140	160.0	19.0				ug/L	57	Standard
>	Tb	159	1301820.9	2.8				ug/L	1347540	Standard
	Ho	165	66.7	11.5				ug/L	23	Standard
	Tl	203	563299.0	0.7	**51.2786**	1.711	3.3	ug/L	45	Standard
	Tl	205	1287217.7	4.0	**48.5077**	2.421	5.0	ug/L	112	Standard
	Pb	206	423120.0	1.0	**51.2862**	1.735	3.4	ug/L	825	Standard
	Pb	207	371611.1	1.3	**51.1709**	1.527	3.0	ug/L	679	Standard
	Pb	208	1684993.9	0.7	**51.0558**	1.338	2.6	ug/L	3166	Standard
	U	238	1462121.7	1.6	**49.1564**	0.865	1.8	ug/L	119	Standard
>	Bi	209	627817.6	2.7				ug/L	668024	Standard

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⌈	**Na**	23	13.3	21.7	**3.8274**	0.696	18.2	mg/L	0	Standard
|	**Mg**	24	3167.0	1.4	**4.9180**	0.220	4.5	mg/L	48	Standard
|	**K**	39	400.0	3.8	**4.3692**	0.243	5.6	mg/L	8	Standard
|	**Ca**	43	41.7	36.7	**4.0245**	5.387	133.8	mg/L	27	Standard
|	**Fe**	54	4714.3	5.3	**5.2310**	0.331	6.3	mg/L	121	Standard
|	**Fe**	57	1481.7	2.8	**4.8598**	0.197	4.1	mg/L	305	Standard
⌊>	**Sc-1**	45	21083.0	5.7				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	5.0	121.7				ug/L	5	Standard
	Br	81	1313.4	5.8				ug/L	1367	Standard
	P	31	115.0	23.0				ug/L	67	Standard
	S	34	76.7	33.5				ug/L	55	Standard
	Sr	88	140.0	10.7				ug/L	113	Standard
	C	12	296.7	24.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	35.2	57.5				mg/L	18	Standard
	Ho-1	165	66.7	11.5				mg/L	23	Standard
	Er	166	30.0	57.7				mg/L	40	Standard
	I	127	3323.7	6.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	100.704		
⌊	Al	27	100.269		
⌈	Sc	45			
|	Ti	47	97.097		
|	V	51	97.914		
|	Cr	52	98.970		
|	Cr	53			
|	Mn	55	98.361		
|	Co	59	99.568		
|	Ni	60	100.408		
|	Cu	65	101.455		
|	Zn	66	102.403		
|>	Ge	72		95.199	
|	As	75	102.297		
|	Se	82	101.882		
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	100.005		
Ag	107	107.745		
Cd	111	102.577		
Cd	114			
In	115			98.225
Sn	118	103.529		
Sb	123	105.771		
Ba	135	101.230		
Ce	140			
Tb	159			
Ho	165			
Tl	203	102.557		
Tl	205			
Pb	206			
Pb	207			
Pb	208	102.112		
U	238	98.313		
Bi	209			93.981
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 09:36:30
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	63256.4	12.4				ug/L	76335	Standard
	Be	9	5.0	100.0	**0.0027**	0.006	228.2	ug/L	18	Standard
	Al	27	515.0	57.8	**0.0005**	0.002	460.4	ug/L	810	Standard
	Sc	45	19861.4	7.2				ug/L	22700	Standard
	Ti	47	22.7	12.7	**-0.0147**	0.015	101.3	ug/L	25	Standard
	V	51	1253.7	11.0	**-0.0279**	0.014	49.6	ug/L	1541	Standard
	Cr	52	5866.2	19.3	**-0.2031**	0.155	76.3	ug/L	7881	Standard
	Cr	53	725.0	15.9	**-0.1285**	0.115	89.7	ug/L	932	Standard
	Mn	55	765.0	25.5	**-0.0091**	0.016	181.4	ug/L	1508	Standard
	Co	59	266.7	14.4	**-0.0008**	0.003	410.3	ug/L	282	Standard
	Ni	60	68.3	21.2	**-0.0047**	0.007	148.2	ug/L	91	Standard
	Cu	65	139.7	14.1	**0.0166**	0.013	80.6	ug/L	205	Standard
	Zn	66	192.7	16.4	**0.0292**	0.043	146.3	ug/L	369	Standard
>	Ge	72	439348.9	4.1				ug/L	496734	Standard
	As	75	-41.0	117.5	**0.0156**	0.052	334.5	ug/L	-45	Standard
	Se	82	16.0	33.5	**-0.0153**	0.062	405.0	ug/L	18	Standard
	Se-1	77	76.7	8.3	**0.1546**	0.163	105.6	ug/L	83	Standard
>	Ga	71	16.7	69.3				mg/L	30	Standard
	Rb	85	15.0	66.7				ug/L	23	Standard
	Y	89	352956.9	7.0				ug/L	405333	Standard
>	Rh	103	11.7	65.5				ug/L	17	Standard
	Mo	98	260.8	65.2	**0.0557**	0.047	83.5	ug/L	135	Standard
	Ag	107	215.3	31.4	**0.0116**	0.009	74.7	ug/L	123	Standard
	Cd	111	10.7	39.5	**-0.0034**	0.002	61.8	mg/L	11	Standard
	Cd	114	31.2	48.7	**-0.0000**	0.003	9698.9	ug/L	56	Standard
>	In	115	573407.2	6.1				ug/L	634401	Standard
	Sn	118	81.0	34.4	**-0.0047**	0.021	439.8	ug/L	137	Standard
	Sb	123	1356.2	96.7	**0.2055**	0.259	126.0	ug/L	907	Standard
	Ba	135	28.0	43.4	**-0.0361**	0.004	11.5	ug/L	166	Standard
	Ce	140	28.3	10.2				ug/L	57	Standard
>	Tb	159	1178501.2	4.2				ug/L	1347540	Standard
	Ho	165	8.3	34.6				ug/L	23	Standard
	Tl	203	46.0	52.8	**-0.0004**	0.002	579.9	ug/L	45	Standard
	Tl	205	128.3	68.1	**0.0031**	0.003	103.9	ug/L	112	Standard
	Pb	206	472.3	11.2	**0.0036**	0.004	99.4	ug/L	825	Standard
	Pb	207	380.0	16.0	**0.0041**	0.006	145.1	ug/L	679	Standard
	Pb	208	1803.4	12.1	**0.0020**	0.004	202.9	ug/L	3166	Standard
	U	238	89.0	86.7	**0.0012**	0.003	205.9	ug/L	119	Standard
>	Bi	209	607965.0	5.3				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4867**	0.834	171.4	mg/L	0	Standard
|	**Mg**	24	60.0	22.0	**0.0047**	0.016	350.3	mg/L	48	Standard
|	**K**	39	10.0		**-0.0128**	0.009	69.7	mg/L	8	Standard
|	**Ca**	43	30.0	33.3	**0.4902**	3.687	752.2	mg/L	27	Standard
|	**Fe**	54	62.6	57.6	**-0.0552**	0.039	70.4	mg/L	121	Standard
|	**Fe**	57	300.0	15.3	**0.0161**	0.135	838.4	mg/L	305	Standard
⌊>	**Sc-1**	45	19861.4	7.2				mg/L	22700	Standard
	Cl	35	3.3	69.3				ug/L	3	Standard
	Kr	83	4.3	74.2				ug/L	5	Standard
	Br	81	1176.7	7.3				ug/L	1367	Standard
	P	31	76.7	32.8				ug/L	67	Standard
	S	34	66.7	30.3				ug/L	55	Standard
	Sr	88	130.0	6.7				ug/L	113	Standard
	C	12	380.0	9.5				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	16.0	35.2				mg/L	18	Standard
	Ho-1	165	8.3	34.6				mg/L	23	Standard
	Er	166	13.3	43.3				mg/L	40	Standard
	I	127	2763.6	5.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		88.448	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	90.386
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	91.009
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	

Sample ID: QC Std 7
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Method 6020 - Summary Report

Sample ID: PBS 14 WG587411-02
Sample Date/Time: Thursday, October 20, 2016 09:39:31
Number of Replicates: 3
Autosampler Position: 205
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	66499.4	6.8				ug/L	76335	Standard
	Be	9	10.0	50.0	**0.0073**	0.005	66.3	ug/L	18	Standard
	Al	27	17772.1	5.3	**0.1600**	0.003	1.8	ug/L	810	Standard
	Sc	45	20255.2	1.6				ug/L	22700	Standard
	Ti	47	105.3	7.1	**0.4136**	0.041	9.9	ug/L	25	Standard
	V	51	-8301.4	28.5	**-1.4717**	0.359	24.4	ug/L	1541	Standard
	Cr	52	12933.2	5.0	**0.9078**	0.117	12.8	ug/L	7881	Standard
	Cr	53	41477.7	16.4	**51.6924**	8.907	17.2	ug/L	932	Standard
	Mn	55	5349.6	3.1	**0.4265**	0.019	4.4	ug/L	1508	Standard
	Co	59	407.7	12.0	**0.0143**	0.006	40.8	ug/L	282	Standard
	Ni	60	512.3	3.5	**0.2301**	0.009	3.9	ug/L	91	Standard
	Cu	65	1184.7	0.8	**0.5799**	0.009	1.5	ug/L	205	Standard
	Zn	66	1722.1	1.9	**1.6381**	0.045	2.8	ug/L	369	Standard
>	Ge	72	456014.4	0.6				ug/L	496734	Standard
	As	75	-256.2	66.3	**-0.2103**	0.179	85.3	ug/L	-45	Standard
	Se	82	17.0	58.8	**-0.0117**	0.109	934.6	ug/L	18	Standard
	Se-1	77	3661.8	8.6	**58.8459**	5.464	9.3	ug/L	83	Standard
>	Ga	71	110.0	24.1				mg/L	30	Standard
	Rb	85	193.3	9.8				ug/L	23	Standard
	Y	89	344083.4	1.0				ug/L	405333	Standard
>	Rh	103	10.0	50.0				ug/L	17	Standard
	Mo	98	165.8	26.9	**0.0332**	0.014	40.9	ug/L	135	Standard
	Ag	107	189.3	7.0	**0.0106**	0.002	22.9	ug/L	123	Standard
	Cd	111	14.5	24.5	**-0.0005**	0.002	430.4	mg/L	11	Standard
	Cd	114	66.6	49.2	**0.0088**	0.008	87.5	ug/L	56	Standard
>	In	115	525688.2	2.6				ug/L	634401	Standard
	Sn	118	127.3	21.1	**0.0482**	0.023	47.7	ug/L	137	Standard
	Sb	123	977.5	47.9	**0.1534**	0.101	66.0	ug/L	907	Standard
	Ba	135	480.3	6.3	**0.1572**	0.008	5.0	ug/L	166	Standard
	Ce	140	1293.4	4.3				ug/L	57	Standard
>	Tb	159	1208825.6	1.2				ug/L	1347540	Standard
	Ho	165	25.0	52.9				ug/L	23	Standard
	Tl	203	237.0	1.1	**0.0183**	0.000	1.3	ug/L	45	Standard
	Tl	205	555.0	14.8	**0.0204**	0.004	17.5	ug/L	112	Standard
	Pb	206	1990.8	3.8	**0.2011**	0.010	5.2	ug/L	825	Standard
	Pb	207	1720.8	2.0	**0.2021**	0.006	2.8	ug/L	679	Standard
	Pb	208	7775.1	0.7	**0.1960**	0.003	1.4	ug/L	3166	Standard
	U	238	110.3	21.3	**0.0021**	0.001	38.0	ug/L	119	Standard
>	Bi	209	591110.6	1.2				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	75.0	26.7	**0.0276**	0.031	112.3	mg/L	48	Standard
|	**K**	39	20.0	86.6	**0.0997**	0.198	198.6	mg/L	8	Standard
|	**Ca**	43	41.7	68.2	**4.7869**	11.059	231.0	mg/L	27	Standard
|	**Fe**	54	132.0	14.7	**0.0267**	0.026	95.8	mg/L	121	Standard
|	**Fe**	57	316.7	1.8	**0.0666**	0.036	53.4	mg/L	305	Standard
⌊>	**Sc-1**	45	20255.2	1.6				mg/L	22700	Standard
	Cl	35	5.3	114.6				ug/L	3	Standard
	Kr	83	5.0	52.9				ug/L	5	Standard
	Br	81	1233.4	3.3				ug/L	1367	Standard
	P	31	76.7	48.9				ug/L	67	Standard
	S	34	55.0	50.6				ug/L	55	Standard
	Sr	88	156.7	24.8				ug/L	113	Standard
	C	12	356.7	11.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	54.8	56.7				mg/L	18	Standard
	Ho-1	165	25.0	52.9				mg/L	23	Standard
	Er	166	40.0	25.0				mg/L	40	Standard
	I	127	3205.3	4.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		87.115	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		91.803	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	82.864
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	88.486
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
V 51 Lower	V	51	

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Method 6020 - Summary Report

Sample ID: LCSS 14 WG587411-03
Sample Date/Time: Thursday, October 20, 2016 09:42:30
Number of Replicates: 3
Autosampler Position: 206
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	82768.9	2.3				ug/L	76335	Standard
	Be	9	29425.2	1.9	**24.6309**	1.022	4.2	ug/L	18	Standard
	Al	27	12640.3	5.0	**0.0895**	0.005	6.0	ug/L	810	Standard
	Sc	45	21346.7	1.7				ug/L	22700	Standard
	Ti	47	60.0	10.0	**0.1763**	0.029	16.7	ug/L	25	Standard
	V	51	142980.9	1.6	**21.2939**	0.564	2.6	ug/L	1541	Standard
	Cr	52	182846.3	3.0	**28.4104**	0.970	3.4	ug/L	7881	Standard
	Cr	53	129010.5	2.7	**163.1231**	5.945	3.6	ug/L	932	Standard
	Mn	55	254202.9	2.9	**24.2134**	0.827	3.4	ug/L	1508	Standard
	Co	59	220476.8	1.7	**25.3018**	0.563	2.2	ug/L	282	Standard
	Ni	60	48726.6	2.3	**25.8810**	0.672	2.6	ug/L	91	Standard
	Cu	65	47136.2	0.9	**25.5072**	0.337	1.3	ug/L	205	Standard
	Zn	66	24503.5	1.2	**25.7549**	0.501	1.9	ug/L	369	Standard
>	Ge	72	455682.5	1.3				ug/L	496734	Standard
	As	75	23414.4	1.6	**24.7314**	0.403	1.6	ug/L	-45	Standard
	Se	82	2205.0	1.2	**24.0856**	0.031	0.1	ug/L	18	Standard
	Se-1	77	10732.1	3.3	**174.8007**	6.805	3.9	ug/L	83	Standard
>	Ga	71	208.3	23.7				mg/L	30	Standard
	Rb	85	76.7	33.5				ug/L	23	Standard
	Y	89	351512.6	0.8				ug/L	405333	Standard
>	Rh	103	38.3	32.8				ug/L	17	Standard
	Mo	98	227.4	13.1	**0.0550**	0.010	18.9	ug/L	135	Standard
	Ag	107	144225.2	1.0	**25.3070**	0.334	1.3	ug/L	123	Standard
	Cd	111	39376.1	1.2	**23.9178**	0.407	1.7	mg/L	11	Standard
	Cd	114	102888.2	1.7	**24.1400**	0.401	1.7	ug/L	56	Standard
>	In	115	516751.7	0.7				ug/L	634401	Standard
	Sn	118	188.3	16.7	**0.1123**	0.033	29.2	ug/L	137	Standard
	Sb	123	112826.3	1.6	**26.1996**	0.581	2.2	ug/L	907	Standard
	Ba	135	59076.0	1.4	**25.5137**	0.418	1.6	ug/L	166	Standard
	Ce	140	130.0	15.4				ug/L	57	Standard
>	Tb	159	1149259.5	1.3				ug/L	1347540	Standard
	Ho	165	28.3	10.2				ug/L	23	Standard
	Tl	203	248321.9	1.1	**24.2923**	0.625	2.6	ug/L	45	Standard
	Tl	205	581248.1	2.4	**23.5448**	0.927	3.9	ug/L	112	Standard
	Pb	206	188329.9	0.9	**24.5032**	0.518	2.1	ug/L	825	Standard
	Pb	207	159060.0	1.6	**23.5156**	0.696	3.0	ug/L	679	Standard
	Pb	208	736251.1	1.3	**23.9485**	0.524	2.2	ug/L	3166	Standard
	U	238	641861.4	0.8	**23.1958**	0.350	1.5	ug/L	119	Standard
>	Bi	209	584008.3	2.2				ug/L	668024	Standard

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⌈	**Na**	23	3.3	173.2	**0.9582**	1.651	172.3	mg/L	0	Standard
|	**Mg**	24	85.0	15.6	**0.0372**	0.021	55.6	mg/L	48	Standard
|	**K**	39	10.0	50.0	**-0.0209**	0.057	273.1	mg/L	8	Standard
|	**Ca**	43	36.7	31.5	**2.0578**	3.953	192.1	mg/L	27	Standard
|	**Fe**	54	153.0	3.3	**0.0421**	0.007	17.1	mg/L	121	Standard
|	**Fe**	57	310.0	7.4	**-0.0298**	0.114	383.7	mg/L	305	Standard
⌊>	**Sc-1**	45	21346.7	1.7				mg/L	22700	Standard
	Cl	35	6.0	33.3				ug/L	3	Standard
	Kr	83	7.3	7.9				ug/L	5	Standard
	Br	81	1153.4	13.6				ug/L	1367	Standard
	P	31	83.3	15.1				ug/L	67	Standard
	S	34	60.0	22.0				ug/L	55	Standard
	Sr	88	161.7	7.8				ug/L	113	Standard
	C	12	690.0	6.6				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	16.7	124.9				mg/L	10	Standard
	Dy	164	22.1	53.1				mg/L	18	Standard
	Ho-1	165	28.3	10.2				mg/L	23	Standard
	Er	166	26.7	57.3				mg/L	40	Standard
	I	127	2090.1	1.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		108.428	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		91.736	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	81.455
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	87.423
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Cr 53 Upper, S, EEE	Cr	53	
Se-1 77 Upper, S, EEE	Se-1	77	

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Method 6020 - Summary Report

Sample ID: L1610040102 WG587411-01
Sample Date/Time: Thursday, October 20, 2016 09:45:30
Number of Replicates: 3
Autosampler Position: 207
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	93640.4	3.6				ug/L	76335	Standard
	Be	9	1180.0	8.9	**0.8691**	0.059	6.8	ug/L	18	Standard
	Al	27	20849247.1	1.0	**136.9017**	4.933	3.6	ug/L	810	Standard
	Sc	45	26964.0	0.8				ug/L	22700	Standard
	Ti	47	35858.7	0.3	**186.3614**	1.619	0.9	ug/L	25	Standard
	V	51	414174.0	0.5	**61.6386**	0.432	0.7	ug/L	1541	Standard
	Cr	52	148799.8	0.6	**22.7217**	0.264	1.2	ug/L	7881	Standard
	Cr	53	53998.2	8.9	**67.0968**	5.538	8.3	ug/L	932	Standard
	Mn	55	6935152.8	1.9	**657.8020**	5.980	0.9	ug/L	1508	Standard
	Co	59	82049.6	2.1	**9.3245**	0.094	1.0	ug/L	282	Standard
	Ni	60	33319.9	1.1	**17.5552**	0.379	2.2	ug/L	91	Standard
	Cu	65	35875.4	1.2	**19.2568**	0.399	2.1	ug/L	205	Standard
	Zn	66	60871.7	0.4	**63.7774**	0.871	1.4	ug/L	369	Standard
>	**Ge**	72	459055.3	1.1				ug/L	496734	Standard
	As	75	5603.9	5.0	**5.9233**	0.358	6.0	ug/L	-45	Standard
	Se	82	69.4	21.1	**0.5588**	0.152	27.3	ug/L	18	Standard
	Se-1	77	7285.4	5.9	**117.3627**	6.082	5.2	ug/L	83	Standard
>	**Ga**	71	33126.2	1.7				mg/L	30	Standard
	Rb	85	443444.2	0.8				ug/L	23	Standard
	Y	89	602024.0	2.1				ug/L	405333	Standard
>	**Rh**	103	275.0	9.6				ug/L	17	Standard
	Mo	98	1167.2	2.4	**0.3598**	0.009	2.4	ug/L	135	Standard
	Ag	107	784.4	2.2	**0.1122**	0.004	3.5	ug/L	123	Standard
	Cd	111	249.8	5.8	**0.1388**	0.008	5.5	mg/L	11	Standard
	Cd	114	710.9	5.4	**0.1561**	0.009	5.9	ug/L	56	Standard
>	**In**	115	530087.4	0.8				ug/L	634401	Standard
	Sn	118	1208.7	2.5	**1.1087**	0.030	2.7	ug/L	137	Standard
	Sb	123	6821.2	8.5	**1.4789**	0.122	8.3	ug/L	907	Standard
	Ba	135	595912.9	1.1	**251.3135**	4.297	1.7	ug/L	166	Standard
	Ce	140	2239709.8	1.3				ug/L	57	Standard
>	**Tb**	159	1189139.9	1.3				ug/L	1347540	Standard
	Ho	165	25055.7	2.3				ug/L	23	Standard
	Tl	203	2986.6	6.5	**0.3034**	0.018	5.8	ug/L	45	Standard
	Tl	205	6991.6	10.1	**0.2967**	0.028	9.4	ug/L	112	Standard
	Pb	206	80847.2	2.3	**11.0619**	0.162	1.5	ug/L	825	Standard
	Pb	207	63263.8	0.8	**9.8340**	0.007	0.1	ug/L	679	Standard
	Pb	208	303405.0	0.9	**10.3772**	0.019	0.2	ug/L	3166	Standard
	U	238	238402.1	1.1	**9.0852**	0.034	0.4	ug/L	119	Standard
>	**Bi**	209	553619.6	0.8				ug/L	668024	Standard

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⌈	**Na**	23	1325.1	10.4	**298.4945**	33.064	11.1	mg/L	0	Standard
|	**Mg**	24	668.3	5.1	**0.7307**	0.049	6.7	mg/L	48	Standard
|	**K**	39	510.0	9.4	**4.3481**	0.416	9.6	mg/L	8	Standard
|	**Ca**	43	740.0	4.7	**202.0723**	8.318	4.1	mg/L	27	Standard
|	**Fe**	54	21301.4	2.2	**18.7857**	0.540	2.9	mg/L	121	Standard
|	**Fe**	57	6718.2	2.3	**20.5197**	0.497	2.4	mg/L	305	Standard
⌊>	**Sc-1**	45	26964.0	0.8				mg/L	22700	Standard
	Cl	35	6.7	75.5				ug/L	3	Standard
	Kr	83	3.3	34.6				ug/L	5	Standard
	Br	81	1866.8	2.4				ug/L	1367	Standard
	P	31	86.7	12.0				ug/L	67	Standard
	S	34	68.3	29.6				ug/L	55	Standard
	Sr	88	405.0	7.7				ug/L	113	Standard
	C	12	1046.7	10.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	283.3	19.4				mg/L	10	Standard
	Dy	164	40078.4	3.9				mg/L	18	Standard
	Ho-1	165	25055.7	2.3				mg/L	23	Standard
	Er	166	23678.5	4.4				mg/L	40	Standard
	I	127	291531.7	7.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		122.670	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		92.415	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	83.557
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	82.874
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Li 6 Int Std for sample	Li	6	Rerun sample
Al 27 Upper, S, EEE	Al	27	
Ti 47 Upper, S, EEE	Ti	47	

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Mn 55 Upper, S, EEE	Mn	55
Se-1 77 Upper, S, EEE	Se-1	77
Ba 135 Upper, S, EEE	Ba	135

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Method 6020 - Summary Report

Sample ID: L1610040102S WG587411-04
Sample Date/Time: Thursday, October 20, 2016 09:48:29
Number of Replicates: 3
Autosampler Position: 208
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	89163.5	4.1				ug/L	76335	Standard
	Be	9	28364.9	5.9	**22.0359**	1.203	5.5	ug/L	18	Standard
	Al	27	16993347.5	4.9	**117.0979**	3.675	3.1	ug/L	810	Standard
	Sc	45	25421.3	5.1				ug/L	22700	Standard
	Ti	47	24873.1	2.2	**130.6474**	1.541	1.2	ug/L	25	Standard
	V	51	474289.2	3.4	**71.3779**	0.249	0.3	ug/L	1541	Standard
	Cr	52	253586.2	3.2	**39.9946**	0.167	0.4	ug/L	7881	Standard
	Cr	53	71339.7	6.6	**89.9523**	3.800	4.2	ug/L	932	Standard
	Mn	55	6263070.3	3.5	**600.4710**	3.154	0.5	ug/L	1508	Standard
	Co	59	274807.5	3.6	**31.6462**	0.271	0.9	ug/L	282	Standard
	Ni	60	70845.4	3.3	**37.7722**	0.289	0.8	ug/L	91	Standard
	Cu	65	71257.6	2.4	**38.7294**	0.593	1.5	ug/L	205	Standard
	Zn	66	68360.6	1.6	**72.4415**	1.209	1.7	ug/L	369	Standard
>	**Ge**	72	454139.6	3.2				ug/L	496734	Standard
	As	75	28884.3	2.0	**30.6205**	1.280	4.2	ug/L	-45	Standard
	Se	82	2139.0	2.7	**23.4409**	0.142	0.6	ug/L	18	Standard
	Se-1	77	9168.4	3.3	**149.6459**	1.780	1.2	ug/L	83	Standard
>	**Ga**	71	21532.0	1.5				mg/L	30	Standard
	Rb	85	339378.5	2.4				ug/L	23	Standard
	Y	89	535261.7	4.0				ug/L	405333	Standard
>	**Rh**	103	190.0	18.4				ug/L	17	Standard
	Mo	98	990.0	4.1	**0.3151**	0.003	0.9	ug/L	135	Standard
	Ag	107	132056.1	3.4	**23.5140**	0.479	2.0	ug/L	123	Standard
	Cd	111	37818.2	3.9	**23.3111**	0.610	2.6	mg/L	11	Standard
	Cd	114	97819.9	5.5	**23.2898**	1.023	4.4	ug/L	56	Standard
>	**In**	115	509346.4	4.1				ug/L	634401	Standard
	Sn	118	767.7	6.6	**0.7063**	0.031	4.3	ug/L	137	Standard
	Sb	123	107058.2	3.8	**25.2222**	0.498	2.0	ug/L	907	Standard
	Ba	135	664711.7	3.3	**291.8245**	5.421	1.9	ug/L	166	Standard
	Ce	140	1800306.3	4.1				ug/L	57	Standard
>	**Tb**	159	1172981.3	2.7				ug/L	1347540	Standard
	Ho	165	21678.8	2.2				ug/L	23	Standard
	Tl	203	234613.9	3.1	**24.6559**	0.125	0.5	ug/L	45	Standard
	Tl	205	561035.4	1.8	**24.4157**	0.219	0.9	ug/L	112	Standard
	Pb	206	238017.5	2.1	**33.2956**	0.205	0.6	ug/L	825	Standard
	Pb	207	197982.4	3.4	**31.4584**	0.250	0.8	ug/L	679	Standard
	Pb	208	921204.6	2.4	**32.2149**	0.067	0.2	ug/L	3166	Standard
	U	238	803312.6	2.6	**31.1945**	0.268	0.9	ug/L	119	Standard
>	**Bi**	209	543402.6	2.6				ug/L	668024	Standard

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⌈	**Na**	23	1088.4	5.4	**260.2227**	16.147	6.2	mg/L	0	Standard
|	**Mg**	24	548.3	8.9	**0.6244**	0.072	11.5	mg/L	48	Standard
|	**K**	39	451.7	3.6	**4.0879**	0.351	8.6	mg/L	8	Standard
|	**Ca**	43	693.3	7.1	**201.1403**	17.913	8.9	mg/L	27	Standard
|	**Fe**	54	14173.6	4.5	**13.2258**	0.448	3.4	mg/L	121	Standard
|	**Fe**	57	5052.5	9.2	**16.0806**	0.724	4.5	mg/L	305	Standard
⌊>	**Sc-1**	45	25421.3	5.1				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	5.7	20.4				ug/L	5	Standard
	Br	81	1643.4	2.3				ug/L	1367	Standard
	P	31	86.7	12.0				ug/L	67	Standard
	S	34	63.3	31.9				ug/L	55	Standard
	Sr	88	378.3	5.5				ug/L	113	Standard
	C	12	750.0	17.6				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	246.7	26.1				mg/L	10	Standard
	Dy	164	34114.5	6.6				mg/L	18	Standard
	Ho-1	165	21678.8	2.2				mg/L	23	Standard
	Er	166	19472.5	1.9				mg/L	40	Standard
	I	127	244556.4	8.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		116.805	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		91.425	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	80.288
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	81.345
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Ti 47 Upper, S, EEE	Ti	47	
Mn 55 Upper, S, EEE	Mn	55	

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Se-1 77 Upper, S, EEE	Se-1	77
Ba 135 Upper, S, EEE	Ba	135

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Method 6020 - Summary Report

Sample ID: L1610040102SD WG587411-05
Sample Date/Time: Thursday, October 20, 2016 09:51:29
Number of Replicates: 3
Autosampler Position: 209
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	89250.5	1.9				ug/L	76335	Standard
	Be	9	28774.0	4.6	**22.3170**	0.706	3.2	ug/L	18	Standard
	Al	27	21844661.2	4.3	**150.3397**	4.502	3.0	ug/L	810	Standard
	Sc	45	26311.2	3.3				ug/L	22700	Standard
	Ti	47	44261.9	1.9	**235.3118**	1.850	0.8	ug/L	25	Standard
	V	51	581199.7	1.5	**88.5799**	1.838	2.1	ug/L	1541	Standard
	Cr	52	299294.4	1.3	**48.0022**	0.835	1.7	ug/L	7881	Standard
	Cr	53	81245.7	2.2	**103.9076**	2.946	2.8	ug/L	932	Standard
	Mn	55	7916784.5	1.2	**768.1724**	5.229	0.7	ug/L	1508	Standard
	Co	59	289636.5	0.4	**33.7592**	0.329	1.0	ug/L	282	Standard
	Ni	60	77975.5	1.3	**42.0763**	0.285	0.7	ug/L	91	Standard
	Cu	65	78462.6	0.4	**43.1554**	0.427	1.0	ug/L	205	Standard
	Zn	66	82469.8	1.1	**88.4619**	1.868	2.1	ug/L	369	Standard
>	Ge	72	448781.1	1.4				ug/L	496734	Standard
	As	75	29242.5	2.2	**31.3528**	1.034	3.3	ug/L	-45	Standard
	Se	82	2134.7	1.9	**23.6770**	0.654	2.8	ug/L	18	Standard
	Se-1	77	10122.7	3.0	**167.3575**	5.907	3.5	ug/L	83	Standard
>	Ga	71	34160.2	2.9				mg/L	30	Standard
	Rb	85	436351.6	1.5				ug/L	23	Standard
	Y	89	594592.9	3.1				ug/L	405333	Standard
>	Rh	103	256.7	6.0				ug/L	17	Standard
	Mo	98	1101.0	1.8	**0.3585**	0.014	3.8	ug/L	135	Standard
	Ag	107	131619.4	2.2	**23.7793**	0.502	2.1	ug/L	123	Standard
	Cd	111	37491.2	1.3	**23.4507**	0.500	2.1	mg/L	11	Standard
	Cd	114	96658.3	1.1	**23.3588**	0.721	3.1	ug/L	56	Standard
>	In	115	502024.9	3.4				ug/L	634401	Standard
	Sn	118	1153.7	3.3	**1.1187**	0.047	4.2	ug/L	137	Standard
	Sb	123	108115.2	1.1	**25.8526**	0.614	2.4	ug/L	907	Standard
	Ba	135	612094.1	2.0	**272.6366**	3.850	1.4	ug/L	166	Standard
	Ce	140	2324766.7	1.7				ug/L	57	Standard
>	Tb	159	1150084.9	3.9				ug/L	1347540	Standard
	Ho	165	25962.2	3.1				ug/L	23	Standard
	Tl	203	232983.1	2.0	**25.4015**	0.508	2.0	ug/L	45	Standard
	Tl	205	545794.0	2.6	**24.6319**	0.294	1.2	ug/L	112	Standard
	Pb	206	249296.7	1.1	**36.1775**	0.351	1.0	ug/L	825	Standard
	Pb	207	203955.4	1.4	**33.6247**	0.239	0.7	ug/L	679	Standard
	Pb	208	951519.7	1.4	**34.5195**	0.230	0.7	ug/L	3166	Standard
	U	238	846759.3	0.7	**34.1116**	0.530	1.6	ug/L	119	Standard
>	Bi	209	523903.5	2.0				ug/L	668024	Standard

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⌈	**Na**	23	1255.1	4.8	**289.6459**	12.538	4.3	mg/L	0	Standard
|	**Mg**	24	603.3	4.2	**0.6687**	0.023	3.4	mg/L	48	Standard
|	**K**	39	516.7	11.3	**4.5232**	0.563	12.4	mg/L	8	Standard
|	**Ca**	43	793.4	9.2	**222.8694**	13.703	6.1	mg/L	27	Standard
|	**Fe**	54	20933.0	2.6	**18.9250**	0.542	2.9	mg/L	121	Standard
|	**Fe**	57	6956.6	4.7	**21.8765**	1.444	6.6	mg/L	305	Standard
⌊>	**Sc-1**	45	26311.2	3.3				mg/L	22700	Standard
	Cl	35	6.7	62.4				ug/L	3	Standard
	Kr	83	5.3	28.6				ug/L	5	Standard
	Br	81	1783.4	3.6				ug/L	1367	Standard
	P	31	113.3	12.7				ug/L	67	Standard
	S	34	80.0	21.7				ug/L	55	Standard
	Sr	88	393.3	15.9				ug/L	113	Standard
	C	12	940.0	4.3				mg/L	367	Standard
	N	14	10.0	100.0				mg/L	3	Standard
	Hg	202	216.7	18.7				mg/L	10	Standard
	Dy	164	41176.8	4.6				mg/L	18	Standard
	Ho-1	165	25962.2	3.1				mg/L	23	Standard
	Er	166	23915.5	1.6				mg/L	40	Standard
	I	127	301100.5	5.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		116.919	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		90.346	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	79.134
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	78.426
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Ti 47 Upper, S, EEE	Ti	47	
Cr 53 Upper, S, EEE	Cr	53	

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Mn 55 Upper, S, EEE	Mn	55
Se-1 77 Upper, S, EEE	Se-1	77
Ba 135 Upper, S, EEE	Ba	135

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Method 6020 - Summary Report

Sample ID: L1610040101
Sample Date/Time: Thursday, October 20, 2016 09:54:27
Number of Replicates: 3
Autosampler Position: 210
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	89565.9	3.9				ug/L	76335	Standard
	Be	9	1090.0	4.1	**0.8397**	0.004	0.5	ug/L	18	Standard
	Al	27	21186498.3	4.3	**145.3935**	6.074	4.2	ug/L	810	Standard
	Sc	45	27857.3	2.4				ug/L	22700	Standard
	Ti	47	39731.1	3.0	**207.7914**	3.563	1.7	ug/L	25	Standard
	V	51	415220.9	3.4	**62.1827**	1.482	2.4	ug/L	1541	Standard
	Cr	52	165880.3	1.8	**25.6352**	0.277	1.1	ug/L	7881	Standard
	Cr	53	60082.2	1.5	**75.3177**	2.158	2.9	ug/L	932	Standard
	Mn	55	7039105.8	2.7	**671.9480**	12.011	1.8	ug/L	1508	Standard
	Co	59	80894.8	1.9	**9.2524**	0.063	0.7	ug/L	282	Standard
	Ni	60	35130.0	2.0	**18.6278**	0.302	1.6	ug/L	91	Standard
	Cu	65	35323.5	1.6	**19.0792**	0.127	0.7	ug/L	205	Standard
	Zn	66	62375.2	1.7	**65.7708**	0.336	0.5	ug/L	369	Standard
>	Ge	72	456130.9	1.7				ug/L	496734	Standard
	As	75	6099.7	4.2	**6.4807**	0.271	4.2	ug/L	-45	Standard
	Se	82	62.3	10.3	**0.4857**	0.060	12.3	ug/L	18	Standard
	Se-1	77	7597.9	2.5	**123.3224**	5.113	4.1	ug/L	83	Standard
>	Ga	71	35546.7	2.0				mg/L	30	Standard
	Rb	85	453675.3	0.2				ug/L	23	Standard
	Y	89	579459.8	0.8				ug/L	405333	Standard
>	Rh	103	245.0	12.2				ug/L	17	Standard
	Mo	98	1134.6	3.9	**0.3639**	0.012	3.3	ug/L	135	Standard
	Ag	107	662.3	4.3	**0.0958**	0.005	5.4	ug/L	123	Standard
	Cd	111	235.9	2.1	**0.1362**	0.004	3.0	mg/L	11	Standard
	Cd	114	729.1	5.0	**0.1669**	0.008	4.9	ug/L	56	Standard
>	In	115	509743.1	0.8				ug/L	634401	Standard
	Sn	118	1153.0	2.5	**1.0994**	0.038	3.4	ug/L	137	Standard
	Sb	123	5854.2	2.9	**1.3132**	0.050	3.8	ug/L	907	Standard
	Ba	135	525434.9	2.3	**230.3948**	3.745	1.6	ug/L	166	Standard
	Ce	140	2111017.7	5.8				ug/L	57	Standard
>	Tb	159	1154186.4	2.3				ug/L	1347540	Standard
	Ho	165	24085.8	2.3				ug/L	23	Standard
	Tl	203	2756.6	3.3	**0.2896**	0.008	2.7	ug/L	45	Standard
	Tl	205	6804.9	4.1	**0.2987**	0.009	3.0	ug/L	112	Standard
	Pb	206	74650.2	2.6	**10.5621**	0.153	1.5	ug/L	825	Standard
	Pb	207	58480.4	2.4	**9.3998**	0.127	1.4	ug/L	679	Standard
	Pb	208	280688.3	1.9	**9.9273**	0.070	0.7	ug/L	3166	Standard
	U	238	229477.5	2.1	**9.0451**	0.087	1.0	ug/L	119	Standard
>	Bi	209	535231.1	1.3				ug/L	668024	Standard

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⌈	**Na**	23	1148.4	2.0	**250.4012**	9.614	3.8	mg/L	0	Standard
|	**Mg**	24	671.7	12.3	**0.7067**	0.080	11.3	mg/L	48	Standard
|	**K**	39	616.7	9.7	**5.1084**	0.447	8.8	mg/L	8	Standard
|	**Ca**	43	750.0	2.4	**198.2054**	9.476	4.8	mg/L	27	Standard
|	**Fe**	54	22066.1	2.1	**18.8419**	0.639	3.4	mg/L	121	Standard
|	**Fe**	57	6974.9	5.2	**20.6188**	0.702	3.4	mg/L	305	Standard
⌊>	**Sc-1**	45	27857.3	2.4				mg/L	22700	Standard
	Cl	35	6.0	33.3				ug/L	3	Standard
	Kr	83	6.7	43.3				ug/L	5	Standard
	Br	81	1750.1	9.0				ug/L	1367	Standard
	P	31	133.3	57.4				ug/L	67	Standard
	S	34	90.0	38.9				ug/L	55	Standard
	Sr	88	468.3	9.2				ug/L	113	Standard
	C	12	826.7	10.1				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	236.7	34.4				mg/L	10	Standard
	Dy	164	37859.8	1.3				mg/L	18	Standard
	Ho-1	165	24085.8	2.3				mg/L	23	Standard
	Er	166	22480.0	2.1				mg/L	40	Standard
	I	127	289117.7	4.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		117.332	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		91.826	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	80.350
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	80.121
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Ti 47 Upper, S, EEE	Ti	47	
Mn 55 Upper, S, EEE	Mn	55	

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Se-1 77 Upper, S, EEE	Se-1	77
Ba 135 Upper, S, EEE	Ba	135

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Method 6020 - Summary Report

Sample ID: L1610040101PS WG588301-01
Sample Date/Time: Thursday, October 20, 2016 09:57:26
Number of Replicates: 3
Autosampler Position: 211
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	130038.1	8.1				ug/L	76335	Standard
	Be	9	80505.2	4.0	**42.9906**	2.613	6.1	ug/L	18	Standard
	Al	27	28310701.7	5.4	**134.2700**	11.920	8.9	ug/L	810	Standard
	Sc	45	32815.6	6.6				ug/L	22700	Standard
	Ti	47	46722.1	5.6	**226.2271**	2.456	1.1	ug/L	25	Standard
	V	51	913980.2	5.2	**126.9627**	0.466	0.4	ug/L	1541	Standard
	Cr	52	584058.4	5.2	**86.2335**	0.395	0.5	ug/L	7881	Standard
	Cr	53	121870.3	3.7	**142.4151**	1.895	1.3	ug/L	932	Standard
	Mn	55	8846345.4	4.3	**782.0674**	8.809	1.1	ug/L	1508	Standard
	Co	59	603580.9	4.9	**64.1169**	1.200	1.9	ug/L	282	Standard
	Ni	60	149219.1	5.1	**73.3755**	0.658	0.9	ug/L	91	Standard
	Cu	65	137272.6	4.8	**68.8140**	0.887	1.3	ug/L	205	Standard
	Zn	66	115211.7	3.5	**112.6580**	1.568	1.4	ug/L	369	Standard
>	**Ge**	72	492640.5	4.8				ug/L	496734	Standard
	As	75	59070.2	3.2	**57.6589**	0.954	1.7	ug/L	-45	Standard
	Se	82	4780.2	5.2	**48.4908**	0.288	0.6	ug/L	18	Standard
	Se-1	77	11360.6	4.8	**171.1003**	1.035	0.6	ug/L	83	Standard
>	**Ga**	71	37591.7	5.2				mg/L	30	Standard
	Rb	85	499640.1	6.5				ug/L	23	Standard
	Y	89	638886.0	4.8				ug/L	405333	Standard
>	**Rh**	103	316.7	17.7				ug/L	17	Standard
	Mo	98	1268.1	6.4	**0.3519**	0.014	4.0	ug/L	135	Standard
	Ag	107	324022.8	5.2	**49.9757**	0.377	0.8	ug/L	123	Standard
	Cd	111	95094.4	3.6	**50.7930**	1.249	2.5	mg/L	11	Standard
	Cd	114	238358.2	4.1	**49.1671**	1.017	2.1	ug/L	56	Standard
>	**In**	115	588269.5	5.8				ug/L	634401	Standard
	Sn	118	1352.1	3.3	**1.1196**	0.043	3.8	ug/L	137	Standard
	Sb	123	262149.1	2.3	**53.6175**	2.050	3.8	ug/L	907	Standard
	Ba	135	700408.4	5.5	**266.1914**	3.394	1.3	ug/L	166	Standard
	Ce	140	2372599.8	6.0				ug/L	57	Standard
>	**Tb**	159	1271414.6	3.6				ug/L	1347540	Standard
	Ho	165	26625.1	2.9				ug/L	23	Standard
	Tl	203	523145.2	4.2	**51.2257**	1.269	2.5	ug/L	45	Standard
	Tl	205	1213389.4	4.9	**49.1755**	1.091	2.2	ug/L	112	Standard
	Pb	206	463105.6	4.3	**60.3884**	1.520	2.5	ug/L	825	Standard
	Pb	207	400403.2	4.6	**59.3182**	1.714	2.9	ug/L	679	Standard
	Pb	208	1833441.0	4.3	**59.7813**	1.967	3.3	ug/L	3166	Standard
	U	238	1664769.0	4.4	**60.2175**	1.228	2.0	ug/L	119	Standard
>	**Bi**	209	583636.9	5.4				ug/L	668024	Standard

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⌈	**Na**	23	1665.1	2.1	**308.6940**	15.222	4.9	mg/L	0	Standard
|	**Mg**	24	901.7	6.1	**0.8250**	0.114	13.8	mg/L	48	Standard
|	**K**	39	563.3	7.2	**3.9337**	0.083	2.1	mg/L	8	Standard
|	**Ca**	43	886.7	7.4	**199.0259**	13.911	7.0	mg/L	27	Standard
|	**Fe**	54	24357.9	2.6	**17.6755**	0.845	4.8	mg/L	121	Standard
|	**Fe**	57	7273.4	4.9	**18.1287**	0.592	3.3	mg/L	305	Standard
⌊>	**Sc-1**	45	32815.6	6.6				mg/L	22700	Standard
	Cl	35	6.7	34.6				ug/L	3	Standard
	Kr	83	5.3	39.0				ug/L	5	Standard
	Br	81	1930.1	12.2				ug/L	1367	Standard
	P	31	146.7	10.4				ug/L	67	Standard
	S	34	101.7	15.8				ug/L	55	Standard
	Sr	88	408.3	7.2				ug/L	113	Standard
	C	12	1320.1	14.5				mg/L	367	Standard
	N	14	6.7	86.6				mg/L	3	Standard
	Hg	202	273.3	15.2				mg/L	10	Standard
	Dy	164	42547.0	5.8				mg/L	18	Standard
	Ho-1	165	26625.1	2.9				mg/L	23	Standard
	Er	166	24623.4	6.3				mg/L	40	Standard
	I	127	336201.1	8.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		170.351	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		99.176	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115	92.728	
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209	87.368	
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Li 6 Int Std for sample	Li	6	Rerun sample
Al 27 Upper, S, EEE	Al	27	
Ti 47 Upper, S, EEE	Ti	47	

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V 51 Upper, S, EEE	V	51
Cr 53 Upper, S, EEE	Cr	53
Mn 55 Upper, S, EEE	Mn	55
Zn 66 Upper, S, EEE	Zn	66
Se-1 77 Upper, S, EEE	Se-1	77
Ba 135 Upper, S, EEE	Ba	135

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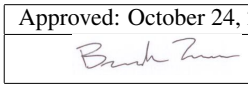

Method 6020 - Summary Report

Sample ID: L1610040101SDL WG588301-02
Sample Date/Time: Thursday, October 20, 2016 10:00:25
Number of Replicates: 3
Autosampler Position: 212
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	81176.1	7.7				ug/L	76335	Standard
	Be	9	286.7	21.8	**0.2414**	0.051	21.0	ug/L	18	Standard
	Al	27	4498048.8	6.8	**34.0793**	1.723	5.1	ug/L	810	Standard
	Sc	45	25045.7	3.6				ug/L	22700	Standard
	Ti	47	8445.0	4.8	**43.5629**	1.571	3.6	ug/L	25	Standard
	V	51	86786.6	5.1	**12.6744**	0.529	4.2	ug/L	1541	Standard
	Cr	52	40716.4	4.6	**5.3247**	0.235	4.4	ug/L	7881	Standard
	Cr	53	17690.4	7.4	**21.1431**	1.287	6.1	ug/L	932	Standard
	Mn	55	1457661.8	4.4	**137.5062**	3.825	2.8	ug/L	1508	Standard
	Co	59	17106.0	4.9	**1.9087**	0.071	3.7	ug/L	282	Standard
	Ni	60	7658.9	5.5	**3.9813**	0.159	4.0	ug/L	91	Standard
	Cu	65	7767.7	4.0	**4.0994**	0.112	2.7	ug/L	205	Standard
	Zn	66	14606.7	3.0	**15.0886**	0.242	1.6	ug/L	369	Standard
>	Ge	72	461240.3	1.8				ug/L	496734	Standard
	As	75	1341.5	7.0	**1.4553**	0.084	5.8	ug/L	-45	Standard
	Se	82	33.8	2.8	**0.1688**	0.004	2.5	ug/L	18	Standard
	Se-1	77	1593.1	5.3	**24.6411**	1.166	4.7	ug/L	83	Standard
>	Ga	71	7390.1	6.9				mg/L	30	Standard
	Rb	85	91190.5	3.6				ug/L	23	Standard
	Y	89	403160.6	2.6				ug/L	405333	Standard
>	Rh	103	70.0	21.4				ug/L	17	Standard
	Mo	98	247.7	1.3	**0.0596**	0.001	2.4	ug/L	135	Standard
	Ag	107	215.7	7.7	**0.0147**	0.002	14.6	ug/L	123	Standard
	Cd	111	58.3	8.6	**0.0254**	0.004	14.4	mg/L	11	Standard
	Cd	114	204.5	14.5	**0.0402**	0.008	19.1	ug/L	56	Standard
>	In	115	530829.0	2.0				ug/L	634401	Standard
	Sn	118	266.3	13.6	**0.1841**	0.041	22.3	ug/L	137	Standard
	Sb	123	2529.9	20.2	**0.5061**	0.126	24.9	ug/L	907	Standard
	Ba	135	113931.1	1.3	**47.9442**	0.462	1.0	ug/L	166	Standard
	Ce	140	449174.7	1.2				ug/L	57	Standard
>	Tb	159	1223056.1	3.0				ug/L	1347540	Standard
	Ho	165	5449.3	4.6				ug/L	23	Standard
	Tl	203	727.0	6.2	**0.0661**	0.003	4.8	ug/L	45	Standard
	Tl	205	1673.4	8.2	**0.0656**	0.005	7.9	ug/L	112	Standard
	Pb	206	16915.1	3.1	**2.1391**	0.031	1.5	ug/L	825	Standard
	Pb	207	13396.3	4.6	**1.9240**	0.042	2.2	ug/L	679	Standard
	Pb	208	64030.2	3.1	**2.0223**	0.016	0.8	ug/L	3166	Standard
	U	238	48637.3	2.3	**1.7473**	0.019	1.1	ug/L	119	Standard
>	Bi	209	586866.8	2.8				ug/L	668024	Standard

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⌈	**Na**	23	225.0	19.8	**54.7352**	11.948	21.8	mg/L	0	Standard
|	**Mg**	24	166.7	17.3	**0.1268**	0.042	33.3	mg/L	48	Standard
|	**K**	39	126.7	28.6	**1.0620**	0.326	30.7	mg/L	8	Standard
|	**Ca**	43	206.7	10.1	**53.0751**	8.388	15.8	mg/L	27	Standard
|	**Fe**	54	4804.3	1.7	**4.4680**	0.225	5.0	mg/L	121	Standard
|	**Fe**	57	1838.4	4.4	**5.1267**	0.193	3.8	mg/L	305	Standard
⌊>	**Sc-1**	45	25045.7	3.6				mg/L	22700	Standard
	Cl	35	5.3	43.3				ug/L	3	Standard
	Kr	83	2.7	78.1				ug/L	5	Standard
	Br	81	1350.1	10.0				ug/L	1367	Standard
	P	31	70.0	7.1				ug/L	67	Standard
	S	34	80.0	21.7				ug/L	55	Standard
	Sr	88	198.3	1.5				ug/L	113	Standard
	C	12	346.7	4.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	53.3	47.2				mg/L	10	Standard
	Dy	164	8121.7	4.4				mg/L	18	Standard
	Ho-1	165	5449.3	4.6				mg/L	23	Standard
	Er	166	4744.1	5.6				mg/L	40	Standard
	I	127	82455.5	2.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		106.341	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		92.855	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	83.674
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	87.851
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	

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Method 6020 - Summary Report

Sample ID: L1610040101SDL WG588301-02
Sample Date/Time: Thursday, October 20, 2016 10:03:24
Number of Replicates: 3
Autosampler Position: 213
Sample Description: 25
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	74856.5	5.2				ug/L	76335	Standard
	Be	9	58.3	32.5	**0.0511**	0.018	34.9	ug/L	18	Standard
	Al	27	850980.5	2.9	**6.9858**	0.175	2.5	ug/L	810	Standard
	Sc	45	23763.6	3.6				ug/L	22700	Standard
	Ti	47	1654.8	2.2	**8.1681**	0.039	0.5	ug/L	25	Standard
	V	51	17632.9	2.5	**2.3188**	0.037	1.6	ug/L	1541	Standard
	Cr	52	13563.1	2.5	**0.9188**	0.028	3.1	ug/L	7881	Standard
	Cr	53	6371.3	6.1	**6.6829**	0.376	5.6	ug/L	932	Standard
	Mn	55	292254.4	0.5	**26.6811**	0.368	1.4	ug/L	1508	Standard
	Co	59	3694.1	3.0	**0.3741**	0.005	1.3	ug/L	282	Standard
	Ni	60	1590.4	5.4	**0.7683**	0.039	5.1	ug/L	91	Standard
	Cu	65	1714.1	0.1	**0.8287**	0.016	1.9	ug/L	205	Standard
	Zn	66	3735.5	2.9	**3.6048**	0.084	2.3	ug/L	369	Standard
>	Ge	72	475592.0	1.8				ug/L	496734	Standard
	As	75	267.0	6.6	**0.3287**	0.013	4.0	ug/L	-45	Standard
	Se	82	27.4	44.6	**0.0891**	0.125	140.5	ug/L	18	Standard
	Se-1	77	443.7	7.9	**5.8133**	0.497	8.5	ug/L	83	Standard
>	Ga	71	1583.4	7.8				mg/L	30	Standard
	Rb	85	18756.6	1.6				ug/L	23	Standard
	Y	89	374297.9	4.5				ug/L	405333	Standard
>	Rh	103	13.3	57.3				ug/L	17	Standard
	Mo	98	75.9	20.4	**0.0031**	0.006	181.0	ug/L	135	Standard
	Ag	107	123.7	20.2	**-0.0015**	0.004	252.5	ug/L	123	Standard
	Cd	111	19.6	28.1	**0.0022**	0.004	158.1	mg/L	11	Standard
	Cd	114	57.7	70.7	**0.0062**	0.009	144.5	ug/L	56	Standard
>	In	115	542620.9	2.8				ug/L	634401	Standard
	Sn	118	86.0	6.0	**0.0050**	0.003	54.3	ug/L	137	Standard
	Sb	123	583.3	23.7	**0.0611**	0.033	54.8	ug/L	907	Standard
	Ba	135	22993.4	1.7	**9.4294**	0.149	1.6	ug/L	166	Standard
	Ce	140	89854.1	2.8				ug/L	57	Standard
>	Tb	159	1238714.7	3.1				ug/L	1347540	Standard
	Ho	165	1081.7	6.6				ug/L	23	Standard
	Tl	203	286.7	2.3	**0.0224**	0.001	3.5	ug/L	45	Standard
	Tl	205	728.4	12.1	**0.0266**	0.003	11.0	ug/L	112	Standard
	Pb	206	3811.5	0.6	**0.4243**	0.008	1.9	ug/L	825	Standard
	Pb	207	3081.6	5.0	**0.3907**	0.015	3.8	ug/L	679	Standard
	Pb	208	14573.7	1.6	**0.4042**	0.004	1.0	ug/L	3166	Standard
	U	238	9908.2	3.9	**0.3437**	0.007	2.1	ug/L	119	Standard
>	Bi	209	605033.4	1.9				ug/L	668024	Standard

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⌈	**Na**	23	36.7	31.5	**9.3858**	2.997	31.9	mg/L	0	Standard
|	**Mg**	24	91.7	11.4	**0.0329**	0.012	37.6	mg/L	48	Standard
|	**K**	39	46.7	22.3	**0.3315**	0.096	28.9	mg/L	8	Standard
|	**Ca**	43	60.0	30.0	**8.2549**	5.152	62.4	mg/L	27	Standard
|	**Fe**	54	911.7	9.4	**0.7877**	0.054	6.8	mg/L	121	Standard
|	**Fe**	57	663.3	12.6	**1.1441**	0.323	28.2	mg/L	305	Standard
⌊>	**Sc-1**	45	23763.6	3.6				mg/L	22700	Standard
	Cl	35	4.7	65.5				ug/L	3	Standard
	Kr	83	4.3	26.6				ug/L	5	Standard
	Br	81	1133.4	6.6				ug/L	1367	Standard
	P	31	61.7	16.9				ug/L	67	Standard
	S	34	78.3	19.5				ug/L	55	Standard
	Sr	88	173.3	11.7				ug/L	113	Standard
	C	12	236.7	4.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	20.0	0.0				mg/L	10	Standard
	Dy	164	1754.9	0.7				mg/L	18	Standard
	Ho-1	165	1081.7	6.6				mg/L	23	Standard
	Er	166	943.4	16.5				mg/L	40	Standard
	I	127	24688.5	6.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		98.063	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		95.744	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	85.533
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	90.571
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 10:06:25
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	85055.3	5.9				ug/L	76335	Standard
	Be	9	62093.7	2.3	**50.6251**	1.905	3.8	ug/L	18	Standard
	Al	27	6796527.9	4.3	**49.1269**	1.298	2.6	ug/L	810	Standard
	Sc	45	26491.5	2.7				ug/L	22700	Standard
	Ti	47	23546.0	2.8	**105.8441**	2.064	2.0	ug/L	25	Standard
	V	51	404659.3	0.4	**52.0939**	0.556	1.1	ug/L	1541	Standard
	Cr	52	386350.5	1.1	**52.5386**	0.140	0.3	ug/L	7881	Standard
	Cr	53	50900.4	3.0	**54.5646**	1.286	2.4	ug/L	932	Standard
	Mn	55	627378.9	1.9	**51.4353**	1.068	2.1	ug/L	1508	Standard
	Co	59	516643.6	1.3	**50.9734**	0.863	1.7	ug/L	282	Standard
	Ni	60	111402.1	0.5	**50.8800**	0.626	1.2	ug/L	91	Standard
	Cu	65	107900.9	0.9	**50.2310**	0.903	1.8	ug/L	205	Standard
	Zn	66	54771.8	0.8	**49.6315**	0.773	1.6	ug/L	369	Standard
>	Ge	72	530339.4	0.9				ug/L	496734	Standard
	As	75	54510.3	0.6	**49.4124**	0.659	1.3	ug/L	-45	Standard
	Se	82	5105.9	0.9	**48.1223**	0.842	1.8	ug/L	18	Standard
	Se-1	77	3711.8	1.5	**51.1312**	1.193	2.3	ug/L	83	Standard
>	Ga	71	73.3	30.7				mg/L	30	Standard
	Rb	85	735.0	2.7				ug/L	23	Standard
	Y	89	419835.5	3.7				ug/L	405333	Standard
>	Rh	103	40.0	21.7				ug/L	17	Standard
	Mo	98	376314.4	1.7	**101.6263**	1.389	1.4	ug/L	135	Standard
	Ag	107	372935.1	1.4	**52.8243**	1.227	2.3	ug/L	123	Standard
	Cd	111	101609.0	0.5	**49.8095**	1.044	2.1	mg/L	11	Standard
	Cd	114	266807.8	1.0	**50.5169**	0.986	2.0	ug/L	56	Standard
>	In	115	640629.1	2.6				ug/L	634401	Standard
	Sn	118	61245.2	1.6	**49.6665**	0.991	2.0	ug/L	137	Standard
	Sb	123	267371.0	0.2	**50.1591**	1.192	2.4	ug/L	907	Standard
	Ba	135	144317.5	3.1	**50.3270**	1.428	2.8	ug/L	166	Standard
	Ce	140	356.7	3.5				ug/L	57	Standard
>	Tb	159	1431611.1	2.7				ug/L	1347540	Standard
	Ho	165	50.0	36.1				ug/L	23	Standard
	Tl	203	578574.9	0.8	**49.3905**	0.686	1.4	ug/L	45	Standard
	Tl	205	1380170.3	3.4	**48.7807**	1.958	4.0	ug/L	112	Standard
	Pb	206	434503.7	0.8	**49.3859**	0.674	1.4	ug/L	825	Standard
	Pb	207	383513.1	0.5	**49.5240**	0.105	0.2	ug/L	679	Standard
	Pb	208	1738301.0	0.3	**49.3959**	0.294	0.6	ug/L	3166	Standard
	U	238	1512743.4	1.0	**47.7051**	0.240	0.5	ug/L	119	Standard
>	Bi	209	669124.5	0.6				ug/L	668024	Standard

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	Na	23	23.3	49.5	**5.3629**	2.671	49.8	mg/L	0	Standard
	Mg	24	3993.9	2.0	**4.9308**	0.197	4.0	mg/L	48	Standard
	K	39	513.3	6.5	**4.4549**	0.187	4.2	mg/L	8	Standard
	Ca	43	61.7	32.8	**6.7715**	5.499	81.2	mg/L	27	Standard
	Fe	54	5209.7	2.3	**4.5819**	0.213	4.6	mg/L	121	Standard
	Fe	57	1625.1	7.9	**4.0760**	0.511	12.5	mg/L	305	Standard
>	**Sc-1**	45	26491.5	2.7				mg/L	22700	Standard
	Cl	35	6.0	33.3				ug/L	3	Standard
	Kr	83	5.0	40.0				ug/L	5	Standard
	Br	81	1553.4	6.4				ug/L	1367	Standard
	P	31	105.0	8.2				ug/L	67	Standard
	S	34	81.7	28.9				ug/L	55	Standard
	Sr	88	153.3	32.7				ug/L	113	Standard
	C	12	396.7	8.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	13.3	173.2				mg/L	10	Standard
	Dy	164	38.7	2.6				mg/L	18	Standard
	Ho-1	165	50.0	36.1				mg/L	23	Standard
	Er	166	26.7	78.1				mg/L	40	Standard
	I	127	7958.8	6.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	101.250		
	Al	27	98.254		
	Sc	45			
	Ti	47	105.844		
	V	51	104.188		
	Cr	52	105.077		
	Cr	53			
	Mn	55	102.871		
	Co	59	101.947		
	Ni	60	101.760		
	Cu	65	100.462		
	Zn	66	99.263		
>	Ge	72		106.765	
	As	75	98.825		
	Se	82	96.245		
	Se-1	77			
>	Ga	71			

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⌊	Rb	85		
⌈	Y	89		
⌊>	Rh	103		
⌈	Mo	98	101.626	
|	Ag	107	105.649	
|	Cd	111	99.619	
|	Cd	114		
|>	In	115		100.982
|	Sn	118	99.333	
|	Sb	123	100.318	
⌊	Ba	135	100.654	
⌈	Ce	140		
⌊>	Tb	159		
⌈	Ho	165		
|	Tl	203	98.781	
|	Tl	205		
|	Pb	206		
|	Pb	207		
|	Pb	208	98.792	
|	U	238	95.410	
⌊>	Bi	209		100.165
⌈	Na	23		
|	Mg	24		
|	K	39		
|	Ca	43		
|	Fe	54		
|	Fe	57		
⌊>	Sc-1	45		
	Cl	35		
	Kr	83		
	Br	81		
	P	31		
	S	34		
	Sr	88		
	C	12		
	N	14		
	Hg	202		
	Dy	164		
	Ho-1	165		
	Er	166		
	I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 6
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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 10:09:25
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	72248.5	17.2				ug/L	76335	Standard
	Be	9	11.7	49.5	**0.0082**	0.006	68.8	ug/L	18	Standard
	Al	27	2098.5	59.0	**0.0147**	0.013	90.8	ug/L	810	Standard
	Sc	45	22763.9	12.8				ug/L	22700	Standard
	Ti	47	31.0	11.2	**0.0211**	0.027	128.3	ug/L	25	Standard
	V	51	991.6	7.0	**-0.0772**	0.020	25.4	ug/L	1541	Standard
	Cr	52	6947.0	22.0	**-0.0987**	0.156	158.1	ug/L	7881	Standard
	Cr	53	2381.9	18.5	**1.8483**	0.330	17.8	ug/L	932	Standard
	Mn	55	1490.7	38.5	**0.0560**	0.062	110.0	ug/L	1508	Standard
	Co	59	327.7	16.9	**0.0043**	0.007	175.9	ug/L	282	Standard
	Ni	60	75.7	6.1	**-0.0029**	0.005	163.5	ug/L	91	Standard
	Cu	65	162.3	25.3	**0.0246**	0.027	111.4	ug/L	205	Standard
	Zn	66	196.7	19.4	**0.0214**	0.053	245.9	ug/L	369	Standard
>	Ge	72	468792.0	7.3				ug/L	496734	Standard
	As	75	-26.9	95.2	**0.0316**	0.028	87.6	ug/L	-45	Standard
	Se	82	19.6	35.5	**0.0091**	0.060	665.3	ug/L	18	Standard
	Se-1	77	145.0	5.9	**1.1592**	0.068	5.9	ug/L	83	Standard
>	Ga	71	21.7	13.3				mg/L	30	Standard
	Rb	85	48.3	31.6				ug/L	23	Standard
	Y	89	378280.5	9.4				ug/L	405333	Standard
>	Rh	103	13.3	57.3				ug/L	17	Standard
	Mo	98	188.3	66.2	**0.0341**	0.032	93.0	ug/L	135	Standard
	Ag	107	154.0	13.4	**0.0025**	0.004	168.8	ug/L	123	Standard
	Cd	111	14.4	28.2	**-0.0012**	0.002	173.8	mg/L	11	Standard
	Cd	114	72.6	31.6	**0.0090**	0.006	61.6	ug/L	56	Standard
>	In	115	570264.6	8.7				ug/L	634401	Standard
	Sn	118	88.7	36.2	**0.0022**	0.022	975.0	ug/L	137	Standard
	Sb	123	986.0	116.3	**0.1267**	0.217	171.0	ug/L	907	Standard
	Ba	135	61.7	30.4	**-0.0223**	0.009	42.0	ug/L	166	Standard
	Ce	140	171.7	34.7				ug/L	57	Standard
>	Tb	159	1288963.2	6.8				ug/L	1347540	Standard
	Ho	165	16.7	34.6				ug/L	23	Standard
	Tl	203	144.0	15.7	**0.0085**	0.001	16.2	ug/L	45	Standard
	Tl	205	346.7	32.5	**0.0112**	0.004	31.6	ug/L	112	Standard
	Pb	206	499.7	11.7	**0.0056**	0.005	88.0	ug/L	825	Standard
	Pb	207	413.7	6.1	**0.0077**	0.002	21.1	ug/L	679	Standard
	Pb	208	1912.0	6.1	**0.0040**	0.000	12.0	ug/L	3166	Standard
	U	238	141.3	24.7	**0.0030**	0.001	44.5	ug/L	119	Standard
>	Bi	209	623235.9	5.3				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4596**	0.787	171.3	mg/L	0	Standard
|	**Mg**	24	60.0	8.3	**-0.0061**	0.018	302.9	mg/L	48	Standard
|	**K**	39	6.7	114.6	**-0.0584**	0.092	156.9	mg/L	8	Standard
|	**Ca**	43	33.3	22.9	**0.4108**	3.612	879.3	mg/L	27	Standard
|	**Fe**	54	96.1	39.0	**-0.0305**	0.026	85.4	mg/L	121	Standard
|	**Fe**	57	330.0	9.2	**-0.0288**	0.065	224.7	mg/L	305	Standard
⌊>	**Sc-1**	45	22763.9	12.8				mg/L	22700	Standard
	Cl	35	4.0	86.6				ug/L	3	Standard
	Kr	83	5.0	52.9				ug/L	5	Standard
	Br	81	1260.1	13.5				ug/L	1367	Standard
	P	31	90.0	55.6				ug/L	67	Standard
	S	34	116.7	38.7				ug/L	55	Standard
	Sr	88	155.0	18.0				ug/L	113	Standard
	C	12	356.7	30.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	18.7	3.9				mg/L	18	Standard
	Ho-1	165	16.7	34.6				mg/L	23	Standard
	Er	166	26.7	57.3				mg/L	40	Standard
	I	127	5432.6	11.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.375	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	89.890
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	93.295
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 7
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Method 6020 - Summary Report

Sample ID: PBS H2 WG588218-02
Sample Date/Time: Thursday, October 20, 2016 10:12:26
Number of Replicates: 3
Autosampler Position: 214
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78380.6	2.1				ug/L	76335	Standard
	Be	9	13.3	108.3	**0.0088**	0.013	144.7	ug/L	18	Standard
	Al	27	8205.6	6.4	**0.0600**	0.004	6.6	ug/L	810	Standard
	Sc	45	23242.8	2.2				ug/L	22700	Standard
	Ti	47	27.0	16.1	**-0.0081**	0.020	243.1	ug/L	25	Standard
	V	51	1383.1	9.6	**-0.0322**	0.017	51.9	ug/L	1541	Standard
	Cr	52	9938.9	2.5	**0.2927**	0.023	7.7	ug/L	7881	Standard
	Cr	53	2568.6	5.5	**1.9183**	0.138	7.2	ug/L	932	Standard
	Mn	55	1887.1	11.3	**0.0813**	0.020	25.2	ug/L	1508	Standard
	Co	59	430.0	8.8	**0.0129**	0.004	34.4	ug/L	282	Standard
	Ni	60	587.0	4.6	**0.2445**	0.014	5.6	ug/L	91	Standard
	Cu	65	249.3	4.2	**0.0619**	0.005	8.8	ug/L	205	Standard
	Zn	66	1003.0	3.8	**0.7915**	0.038	4.8	ug/L	369	Standard
>	Ge	72	496237.2	1.0				ug/L	496734	Standard
	As	75	-21.8	21.1	**0.0383**	0.004	11.0	ug/L	-45	Standard
	Se	82	20.2	31.8	**0.0052**	0.065	1240.4	ug/L	18	Standard
	Se-1	77	127.7	7.8	**0.7697**	0.171	22.2	ug/L	83	Standard
>	Ga	71	30.0	44.1				mg/L	30	Standard
	Rb	85	60.0	30.0				ug/L	23	Standard
	Y	89	392730.0	1.0				ug/L	405333	Standard
>	Rh	103	16.7	75.5				ug/L	17	Standard
	Mo	98	132.1	5.8	**0.0164**	0.002	11.0	ug/L	135	Standard
	Ag	107	133.3	5.0	**-0.0023**	0.001	54.2	ug/L	123	Standard
	Cd	111	21.5	39.5	**0.0019**	0.004	227.9	mg/L	11	Standard
	Cd	114	73.8	16.2	**0.0081**	0.003	31.4	ug/L	56	Standard
>	In	115	608941.7	1.2				ug/L	634401	Standard
	Sn	118	106.7	23.0	**0.0138**	0.022	157.9	ug/L	137	Standard
	Sb	123	1041.4	50.1	**0.1372**	0.104	76.0	ug/L	907	Standard
	Ba	135	367.3	6.3	**0.0879**	0.008	9.0	ug/L	166	Standard
	Ce	140	271.7	28.9				ug/L	57	Standard
>	Tb	159	1329505.6	1.9				ug/L	1347540	Standard
	Ho	165	23.3	24.7				ug/L	23	Standard
	Tl	203	168.3	24.8	**0.0101**	0.004	37.9	ug/L	45	Standard
	Tl	205	351.7	21.6	**0.0109**	0.003	26.4	ug/L	112	Standard
	Pb	206	587.0	2.2	**0.0130**	0.002	17.4	ug/L	825	Standard
	Pb	207	519.0	1.3	**0.0189**	0.001	5.2	ug/L	679	Standard
	Pb	208	2285.7	1.8	**0.0122**	0.002	14.7	ug/L	3166	Standard
	U	238	229.3	23.1	**0.0056**	0.002	31.7	ug/L	119	Standard
>	Bi	209	653996.7	1.1				ug/L	668024	Standard

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⌈	**Na**	23	5.0	100.0	**1.2920**	1.277	98.9	mg/L	0	Standard
|	**Mg**	24	58.3	30.1	**-0.0120**	0.024	203.5	mg/L	48	Standard
|	**K**	39	8.3	69.3	**-0.0475**	0.059	124.0	mg/L	8	Standard
|	**Ca**	43	28.3	56.7	**-1.7619**	5.437	308.6	mg/L	27	Standard
|	**Fe**	54	117.7	12.6	**-0.0083**	0.016	187.7	mg/L	121	Standard
|	**Fe**	57	335.0	4.5	**-0.0411**	0.028	69.2	mg/L	305	Standard
⌊>	**Sc-1**	45	23242.8	2.2				mg/L	22700	Standard
	Cl	35	6.0	120.2				ug/L	3	Standard
	Kr	83	3.7	15.7				ug/L	5	Standard
	Br	81	1453.4	7.8				ug/L	1367	Standard
	P	31	98.3	28.9				ug/L	67	Standard
	S	34	65.0	38.5				ug/L	55	Standard
	Sr	88	143.3	7.3				ug/L	113	Standard
	C	12	343.3	23.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	23.3	65.5				mg/L	10	Standard
	Dy	164	32.9	35.2				mg/L	18	Standard
	Ho-1	165	23.3	24.7				mg/L	23	Standard
	Er	166	10.0	100.0				mg/L	40	Standard
	I	127	4063.9	3.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		102.679	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		99.900	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
> Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
> In	115	95.987
Sn	118	
Sb	123	
Ba	135	
Ce	140	
> Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
> Bi	209	97.900
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
> Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: LCSS H2 WG588218-03
Sample Date/Time: Thursday, October 20, 2016 10:15:25
Number of Replicates: 3
Autosampler Position: 215
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	84961.0	2.5				ug/L	76335	Standard
	Be	9	30811.3	2.2	**25.1120**	0.268	1.1	ug/L	18	Standard
	Al	27	10919.0	8.5	**0.0746**	0.006	7.4	ug/L	810	Standard
	Sc	45	24770.2	3.7				ug/L	22700	Standard
	Ti	47	31.0	9.7	**0.0042**	0.015	360.7	ug/L	25	Standard
	V	51	200650.1	1.3	**26.1709**	0.416	1.6	ug/L	1541	Standard
	Cr	52	197833.3	1.4	**26.8051**	0.230	0.9	ug/L	7881	Standard
	Cr	53	25875.4	3.3	**27.7014**	0.868	3.1	ug/L	932	Standard
	Mn	55	307028.8	3.3	**25.5658**	0.735	2.9	ug/L	1508	Standard
	Co	59	258147.0	1.9	**25.8961**	0.391	1.5	ug/L	282	Standard
	Ni	60	58243.4	2.4	**27.0430**	0.523	1.9	ug/L	91	Standard
	Cu	65	54636.7	1.7	**25.8449**	0.177	0.7	ug/L	205	Standard
	Zn	66	28104.4	2.0	**25.8203**	0.320	1.2	ug/L	369	Standard
>	Ge	72	521243.3	1.0				ug/L	496734	Standard
	As	75	26802.4	0.8	**24.7481**	0.098	0.4	ug/L	-45	Standard
	Se	82	2554.7	2.7	**24.4002**	0.729	3.0	ug/L	18	Standard
	Se-1	77	1850.1	1.9	**25.3628**	0.683	2.7	ug/L	83	Standard
>	Ga	71	30.0	33.3				mg/L	30	Standard
	Rb	85	88.3	18.2				ug/L	23	Standard
	Y	89	416400.1	4.5				ug/L	405333	Standard
>	Rh	103	18.3	56.8				ug/L	17	Standard
	Mo	98	143.9	9.0	**0.0177**	0.004	24.5	ug/L	135	Standard
	Ag	107	180698.3	1.5	**25.5181**	0.322	1.3	ug/L	123	Standard
	Cd	111	52616.7	1.8	**25.7205**	0.189	0.7	mg/L	11	Standard
	Cd	114	132100.0	2.5	**24.9540**	1.002	4.0	ug/L	56	Standard
>	In	115	642168.1	2.4				ug/L	634401	Standard
	Sn	118	133.3	14.7	**0.0309**	0.019	60.9	ug/L	137	Standard
	Sb	123	137244.3	2.1	**25.6433**	0.181	0.7	ug/L	907	Standard
	Ba	135	73714.3	2.4	**25.6179**	0.195	0.8	ug/L	166	Standard
	Ce	140	278.3	42.3				ug/L	57	Standard
>	Tb	159	1417066.2	1.6				ug/L	1347540	Standard
	Ho	165	38.3	19.9				ug/L	23	Standard
	Tl	203	308223.2	2.6	**25.8602**	0.640	2.5	ug/L	45	Standard
	Tl	205	723791.3	3.1	**25.1467**	0.990	3.9	ug/L	112	Standard
	Pb	206	232943.6	2.3	**25.9987**	0.604	2.3	ug/L	825	Standard
	Pb	207	196148.2	1.0	**24.8763**	0.520	2.1	ug/L	679	Standard
	Pb	208	904020.1	1.6	**25.2242**	0.332	1.3	ug/L	3166	Standard
	U	238	757788.3	1.3	**23.4932**	0.543	2.3	ug/L	119	Standard
>	Bi	209	680859.8	2.7				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	75.0	17.6	**0.0058**	0.021	361.3	mg/L	48	Standard
|	**K**	39	15.0	88.2	**0.0082**	0.123	1504.9	mg/L	8	Standard
|	**Ca**	43	23.3	53.9	**-3.8890**	4.125	106.1	mg/L	27	Standard
|	**Fe**	54	142.4	23.1	**0.0087**	0.036	416.0	mg/L	121	Standard
|	**Fe**	57	375.0	9.3	**0.0256**	0.155	607.5	mg/L	305	Standard
⌊>	**Sc-1**	45	24770.2	3.7				mg/L	22700	Standard
	Cl	35	0.7	173.2				ug/L	3	Standard
	Kr	83	3.7	15.7				ug/L	5	Standard
	Br	81	1443.4	3.5				ug/L	1367	Standard
	P	31	100.0	21.8				ug/L	67	Standard
	S	34	81.7	40.8				ug/L	55	Standard
	Sr	88	160.0	24.8				ug/L	113	Standard
	C	12	243.3	30.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0					mg/L	10	Standard
	Dy	164	28.9	58.1				mg/L	18	Standard
	Ho-1	165	38.3	19.9				mg/L	23	Standard
	Er	166	23.3	49.5				mg/L	40	Standard
	I	127	3563.8	2.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		111.300	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		104.934	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	101.224
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	101.921
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610091301 WG588218-01
Sample Date/Time: Thursday, October 20, 2016 10:18:25
Number of Replicates: 3
Autosampler Position: 216
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	85063.1	1.5				ug/L	76335	Standard
	Be	9	586.7	4.9	**0.4747**	0.025	5.2	ug/L	18	Standard
	Al	27	5321588.7	3.4	**38.4427**	1.634	4.3	ug/L	810	Standard
	Sc	45	29844.4	2.9				ug/L	22700	Standard
	Ti	47	11170.5	2.4	**49.8309**	0.713	1.4	ug/L	25	Standard
	V	51	104981.3	1.6	**13.2648**	0.171	1.3	ug/L	1541	Standard
	Cr	52	84639.8	2.4	**10.5125**	0.268	2.5	ug/L	7881	Standard
	Cr	53	11567.7	1.0	**11.4879**	0.184	1.6	ug/L	932	Standard
	Mn	55	6735576.7	1.8	**549.5657**	5.753	1.0	ug/L	1508	Standard
	Co	59	80262.1	2.6	**7.8416**	0.182	2.3	ug/L	282	Standard
	Ni	60	28866.1	1.8	**13.0693**	0.103	0.8	ug/L	91	Standard
	Cu	65	34921.5	2.4	**16.1113**	0.252	1.6	ug/L	205	Standard
	Zn	66	64289.1	1.2	**57.9197**	0.071	0.1	ug/L	369	Standard
>	Ge	72	533646.8	1.1				ug/L	496734	Standard
	As	75	5554.6	1.6	**5.0568**	0.026	0.5	ug/L	-45	Standard
	Se	82	67.4	10.3	**0.4351**	0.065	15.0	ug/L	18	Standard
	Se-1	77	201.7	14.0	**1.6726**	0.424	25.4	ug/L	83	Standard
>	Ga	71	8849.3	5.9				mg/L	30	Standard
	Rb	85	52233.2	2.2				ug/L	23	Standard
	Y	89	695942.1	3.1				ug/L	405333	Standard
>	Rh	103	25.0	0.0				ug/L	17	Standard
	Mo	98	4424.3	1.9	**1.0770**	0.018	1.6	ug/L	135	Standard
	Ag	107	430.7	11.2	**0.0339**	0.006	18.0	ug/L	123	Standard
	Cd	111	536.6	0.4	**0.2326**	0.006	2.5	mg/L	11	Standard
	Cd	114	1310.8	4.1	**0.2214**	0.006	2.5	ug/L	56	Standard
>	In	115	697132.6	2.1				ug/L	634401	Standard
	Sn	118	159.0	9.4	**0.0413**	0.012	29.2	ug/L	137	Standard
	Sb	123	1369.8	33.0	**0.1679**	0.080	47.6	ug/L	907	Standard
	Ba	135	119064.5	2.4	**38.1370**	0.326	0.9	ug/L	166	Standard
	Ce	140	1770204.7	2.9				ug/L	57	Standard
>	Tb	159	1506407.8	1.4				ug/L	1347540	Standard
	Ho	165	32065.6	1.6				ug/L	23	Standard
	Tl	203	3055.0	2.8	**0.2474**	0.007	2.9	ug/L	45	Standard
	Tl	205	7473.5	4.2	**0.2534**	0.011	4.2	ug/L	112	Standard
	Pb	206	173498.8	1.4	**19.0246**	0.436	2.3	ug/L	825	Standard
	Pb	207	135936.2	2.1	**16.9333**	0.476	2.8	ug/L	679	Standard
	Pb	208	647409.4	1.1	**17.7452**	0.344	1.9	ug/L	3166	Standard
	U	238	25969.6	1.9	**0.7897**	0.019	2.4	ug/L	119	Standard
>	Bi	209	692406.2	0.9				ug/L	668024	Standard

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⌈	**Na**	23	33.3	8.7	**6.7953**	0.708	10.4	mg/L	0	Standard
|	**Mg**	24	83.3	9.2	**-0.0025**	0.006	239.7	mg/L	48	Standard
|	**K**	39	31.7	24.1	**0.1201**	0.069	57.0	mg/L	8	Standard
|	**Ca**	43	65.0	23.1	**5.6896**	3.882	68.2	mg/L	27	Standard
|	**Fe**	54	15235.5	1.6	**12.0977**	0.352	2.9	mg/L	121	Standard
|	**Fe**	57	4280.6	4.2	**11.2581**	0.306	2.7	mg/L	305	Standard
⌊>	**Sc-1**	45	29844.4	2.9				mg/L	22700	Standard
	Cl	35	5.3	114.6				ug/L	3	Standard
	Kr	83	2.3	24.7				ug/L	5	Standard
	Br	81	1976.8	9.9				ug/L	1367	Standard
	P	31	125.0	20.0				ug/L	67	Standard
	S	34	105.0	25.2				ug/L	55	Standard
	Sr	88	163.3	14.1				ug/L	113	Standard
	C	12	470.0	12.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	83.3	36.7				mg/L	10	Standard
	Dy	164	49566.2	3.5				mg/L	18	Standard
	Ho-1	165	32065.6	1.6				mg/L	23	Standard
	Er	166	28376.6	1.9				mg/L	40	Standard
	I	127	26918.9	4.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		111.434	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		107.431	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115	109.888	
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209	103.650	
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	

Sample ID: L1610091301 WG588218-01
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Method 6020 - Summary Report

Sample ID: L1610091301S WG588218-04
Sample Date/Time: Thursday, October 20, 2016 10:21:25
Number of Replicates: 3
Autosampler Position: 217
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	84826.8	0.6				ug/L	76335	Standard
	Be	9	29991.3	0.6	**24.4812**	0.279	1.1	ug/L	18	Standard
	Al	27	4292504.2	1.1	**31.0846**	0.220	0.7	ug/L	810	Standard
	Sc	45	28578.6	2.1				ug/L	22700	Standard
	Ti	47	18178.6	1.3	**80.4466**	0.720	0.9	ug/L	25	Standard
	V	51	318831.6	1.4	**40.3661**	0.317	0.8	ug/L	1541	Standard
	Cr	52	269447.6	0.9	**35.7124**	0.184	0.5	ug/L	7881	Standard
	Cr	53	34719.7	2.1	**36.2994**	0.684	1.9	ug/L	932	Standard
	Mn	55	5063475.8	1.3	**409.3588**	1.852	0.5	ug/L	1508	Standard
	Co	59	314981.4	0.5	**30.5894**	0.270	0.9	ug/L	282	Standard
	Ni	60	86864.6	0.5	**39.0570**	0.214	0.5	ug/L	91	Standard
	Cu	65	89967.0	1.0	**41.2284**	0.238	0.6	ug/L	205	Standard
	Zn	66	106018.0	0.4	**94.7652**	0.636	0.7	ug/L	369	Standard
>	**Ge**	72	538553.4	1.0				ug/L	496734	Standard
	As	75	34603.9	1.1	**30.9094**	0.213	0.7	ug/L	-45	Standard
	Se	82	2380.2	1.3	**21.9805**	0.147	0.7	ug/L	18	Standard
	Se-1	77	1768.4	0.7	**23.3766**	0.391	1.7	ug/L	83	Standard
>	**Ga**	71	10810.5	0.8				mg/L	30	Standard
	Rb	85	71545.3	2.7				ug/L	23	Standard
	Y	89	619844.3	1.3				ug/L	405333	Standard
>	**Rh**	103	31.7	24.1				ug/L	17	Standard
	Mo	98	8040.7	1.5	**1.9112**	0.043	2.3	ug/L	135	Standard
	Ag	107	181600.9	1.2	**22.8679**	0.287	1.3	ug/L	123	Standard
	Cd	111	56638.0	2.5	**24.6864**	0.169	0.7	mg/L	11	Standard
	Cd	114	143571.9	1.3	**24.1759**	0.192	0.8	ug/L	56	Standard
>	**In**	115	720054.7	1.8				ug/L	634401	Standard
	Sn	118	132.3	12.9	**0.0181**	0.010	58.0	ug/L	137	Standard
	Sb	123	15569.1	4.4	**2.5322**	0.098	3.9	ug/L	907	Standard
	Ba	135	191979.5	1.7	**59.5684**	0.985	1.7	ug/L	166	Standard
	Ce	140	1343668.6	2.4				ug/L	57	Standard
>	**Tb**	159	1531986.5	1.6				ug/L	1347540	Standard
	Ho	165	22049.4	1.3				ug/L	23	Standard
	Tl	203	303898.4	1.1	**24.2587**	0.421	1.7	ug/L	45	Standard
	Tl	205	725147.6	1.9	**23.9610**	0.089	0.4	ug/L	112	Standard
	Pb	206	380790.1	0.5	**40.4702**	0.937	2.3	ug/L	825	Standard
	Pb	207	315345.6	0.8	**38.0760**	0.868	2.3	ug/L	679	Standard
	Pb	208	1475883.0	1.1	**39.2090**	0.481	1.2	ug/L	3166	Standard
	U	238	793652.3	1.5	**23.4053**	0.350	1.5	ug/L	119	Standard
>	**Bi**	209	715592.6	2.0				ug/L	668024	Standard

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⌈	**Na**	23	20.0	50.0	**4.2509**	2.090	49.2	mg/L	0	Standard
|	**Mg**	24	93.3	22.3	**0.0131**	0.022	171.8	mg/L	48	Standard
|	**K**	39	36.7	7.9	**0.1713**	0.020	11.9	mg/L	8	Standard
|	**Ca**	43	68.3	4.2	**7.3302**	0.412	5.6	mg/L	27	Standard
|	**Fe**	54	17707.0	1.8	**14.7098**	0.501	3.4	mg/L	121	Standard
|	**Fe**	57	4895.8	5.1	**13.7119**	0.981	7.2	mg/L	305	Standard
⌊>	**Sc-1**	45	28578.6	2.1				mg/L	22700	Standard
	Cl	35	4.7	49.5				ug/L	3	Standard
	Kr	83	3.3	45.8				ug/L	5	Standard
	Br	81	1893.5	6.6				ug/L	1367	Standard
	P	31	101.7	18.6				ug/L	67	Standard
	S	34	78.3	9.8				ug/L	55	Standard
	Sr	88	133.3	7.8				ug/L	113	Standard
	C	12	460.0	17.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	90.0	29.4				mg/L	10	Standard
	Dy	164	35863.6	0.6				mg/L	18	Standard
	Ho-1	165	22049.4	1.3				mg/L	23	Standard
	Er	166	20273.6	3.2				mg/L	40	Standard
	I	127	16021.8	2.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		111.124	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		108.419	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	113.501
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	107.121
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	

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Method 6020 - Summary Report

Sample ID: L1610091301SD WG588218-05
Sample Date/Time: Thursday, October 20, 2016 10:24:24
Number of Replicates: 3
Autosampler Position: 218
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	81592.8	4.7				ug/L	76335	Standard
	Be	9	29712.4	1.1	**25.2424**	0.926	3.7	ug/L	18	Standard
	Al	27	3009005.1	4.3	**22.6552**	0.104	0.5	ug/L	810	Standard
	Sc	45	27762.1	3.1				ug/L	22700	Standard
	Ti	47	12905.5	2.7	**57.2215**	1.144	2.0	ug/L	25	Standard
	V	51	261240.9	2.6	**33.1244**	0.772	2.3	ug/L	1541	Standard
	Cr	52	231911.0	2.9	**30.6577**	0.830	2.7	ug/L	7881	Standard
	Cr	53	30881.4	1.0	**32.2593**	0.461	1.4	ug/L	932	Standard
	Mn	55	5276142.5	1.6	**427.7129**	4.881	1.1	ug/L	1508	Standard
	Co	59	311875.4	3.1	**30.3630**	0.563	1.9	ug/L	282	Standard
	Ni	60	69395.0	3.9	**31.2705**	0.858	2.7	ug/L	91	Standard
	Cu	65	65561.2	1.1	**30.1095**	0.327	1.1	ug/L	205	Standard
	Zn	66	50086.7	1.8	**44.7907**	0.261	0.6	ug/L	369	Standard
>	Ge	72	537113.5	1.4				ug/L	496734	Standard
	As	75	24281.9	1.6	**21.7648**	0.136	0.6	ug/L	-45	Standard
	Se	82	1498.0	2.5	**13.7970**	0.238	1.7	ug/L	18	Standard
	Se-1	77	1118.0	1.5	**14.3955**	0.166	1.2	ug/L	83	Standard
>	Ga	71	5152.5	2.8				mg/L	30	Standard
	Rb	85	39840.7	2.5				ug/L	23	Standard
	Y	89	612577.6	2.9				ug/L	405333	Standard
>	Rh	103	36.7	7.9				ug/L	17	Standard
	Mo	98	2362.6	1.5	**0.5501**	0.006	1.1	ug/L	135	Standard
	Ag	107	184360.6	2.3	**23.3598**	0.224	1.0	ug/L	123	Standard
	Cd	111	57484.5	2.6	**25.2142**	0.162	0.6	mg/L	11	Standard
	Cd	114	143779.6	1.5	**24.3644**	0.243	1.0	ug/L	56	Standard
>	In	115	715588.1	2.5				ug/L	634401	Standard
	Sn	118	168.3	6.0	**0.0449**	0.006	12.8	ug/L	137	Standard
	Sb	123	30533.9	2.0	**5.0651**	0.061	1.2	ug/L	907	Standard
	Ba	135	179528.9	2.7	**56.0428**	0.207	0.4	ug/L	166	Standard
	Ce	140	1170143.6	3.0				ug/L	57	Standard
>	Tb	159	1495909.4	3.3				ug/L	1347540	Standard
	Ho	165	21653.8	3.3				ug/L	23	Standard
	Tl	203	304689.1	1.9	**24.6341**	0.255	1.0	ug/L	45	Standard
	Tl	205	720529.8	3.6	**24.1107**	0.263	1.1	ug/L	112	Standard
	Pb	206	383889.4	3.1	**41.3107**	0.337	0.8	ug/L	825	Standard
	Pb	207	319542.6	2.0	**39.0760**	0.549	1.4	ug/L	679	Standard
	Pb	208	1480462.2	2.7	**39.8321**	0.152	0.4	ug/L	3166	Standard
	U	238	782929.7	2.6	**23.3840**	0.147	0.6	ug/L	119	Standard
>	Bi	209	706489.9	2.5				ug/L	668024	Standard

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⌈	**Na**	23	35.0	28.6	**7.6720**	2.284	29.8	mg/L	0	Standard
|	**Mg**	24	66.7	56.8	**-0.0152**	0.046	304.9	mg/L	48	Standard
|	**K**	39	16.7	45.8	**0.0098**	0.066	675.4	mg/L	8	Standard
|	**Ca**	43	58.3	26.2	**5.0058**	3.737	74.7	mg/L	27	Standard
|	**Fe**	54	7595.3	1.3	**6.4259**	0.281	4.4	mg/L	121	Standard
|	**Fe**	57	2228.5	0.3	**5.7322**	0.222	3.9	mg/L	305	Standard
⌊>	**Sc-1**	45	27762.1	3.1				mg/L	22700	Standard
	Cl	35	4.0	50.0				ug/L	3	Standard
	Kr	83	2.3	24.7				ug/L	5	Standard
	Br	81	1793.4	10.8				ug/L	1367	Standard
	P	31	100.0	8.7				ug/L	67	Standard
	S	34	75.0	6.7				ug/L	55	Standard
	Sr	88	143.3	14.1				ug/L	113	Standard
	C	12	436.7	9.5				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	136.7	27.7				mg/L	10	Standard
	Dy	164	34511.3	1.8				mg/L	18	Standard
	Ho-1	165	21653.8	3.3				mg/L	23	Standard
	Er	166	18788.3	4.6				mg/L	40	Standard
	I	127	13597.8	3.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		106.887	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		108.129	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		112.797
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		105.758
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	

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Method 6020 - Summary Report

Sample ID: L1610091001
Sample Date/Time: Thursday, October 20, 2016 10:27:24
Number of Replicates: 3
Autosampler Position: 219
Sample Description: 10
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	60398.6	3.4				ug/L	76335	Standard
	Be	9	24958.9	3.0	**28.6159**	0.314	1.1	ug/L	18	Standard
	Al	27	292813.1	6.4	**2.9722**	0.094	3.2	ug/L	810	Standard
	Sc	45	19873.0	2.2				ug/L	22700	Standard
	Ti	47	733.4	20.4	**3.7904**	0.687	18.1	ug/L	25	Standard
	V	51	133338.3	3.3	**20.3522**	0.204	1.0	ug/L	1541	Standard
	Cr	52	146471.5	3.5	**23.1268**	0.408	1.8	ug/L	7881	Standard
	Cr	53	19277.3	1.7	**24.0826**	0.351	1.5	ug/L	932	Standard
	Mn	55	835745.2	1.5	**81.8595**	1.515	1.9	ug/L	1508	Standard
	Co	59	221243.1	2.1	**26.0425**	0.290	1.1	ug/L	282	Standard
	Ni	60	72989.8	2.2	**39.7872**	0.543	1.4	ug/L	91	Standard
	Cu	65	49297.7	1.5	**27.3704**	0.421	1.5	ug/L	205	Standard
	Zn	66	55339.9	1.3	**59.9096**	1.037	1.7	ug/L	369	Standard
>	Ge	72	444301.1	2.9				ug/L	496734	Standard
	As	75	25361.6	2.3	**27.4707**	0.367	1.3	ug/L	-45	Standard
	Se	82	3961.5	3.1	**44.5596**	1.363	3.1	ug/L	18	Standard
	Se-1	77	2738.6	2.2	**44.8962**	0.683	1.5	ug/L	83	Standard
>	Ga	71	908.4	3.5				mg/L	30	Standard
	Rb	85	11354.3	4.3				ug/L	23	Standard
	Y	89	377380.5	2.5				ug/L	405333	Standard
>	Rh	103	25.0	20.0				ug/L	17	Standard
	Mo	98	59330.5	3.7	**17.7993**	0.303	1.7	ug/L	135	Standard
	Ag	107	48822.9	3.0	**7.6710**	0.117	1.5	ug/L	123	Standard
	Cd	111	40807.3	3.3	**22.2392**	0.505	2.3	mg/L	11	Standard
	Cd	114	103076.4	2.2	**21.7032**	0.483	2.2	ug/L	56	Standard
>	In	115	576055.3	3.7				ug/L	634401	Standard
	Sn	118	12627.9	4.1	**11.3248**	0.058	0.5	ug/L	137	Standard
	Sb	123	8828.6	3.9	**1.7751**	0.034	1.9	ug/L	907	Standard
	Ba	135	180091.8	3.5	**69.8575**	1.000	1.4	ug/L	166	Standard
	Ce	140	278704.9	3.1				ug/L	57	Standard
>	Tb	159	1208301.7	2.7				ug/L	1347540	Standard
	Ho	165	3083.6	5.5				ug/L	23	Standard
	Tl	203	269125.7	6.3	**25.7869**	1.223	4.7	ug/L	45	Standard
	Tl	205	644710.1	4.7	**25.5798**	0.830	3.2	ug/L	112	Standard
	Pb	206	197918.9	2.8	**25.2345**	0.332	1.3	ug/L	825	Standard
	Pb	207	163098.2	3.4	**23.6241**	0.440	1.9	ug/L	679	Standard
	Pb	208	758980.4	2.8	**24.1923**	0.336	1.4	ug/L	3166	Standard
	U	238	525743.4	2.5	**18.6188**	0.184	1.0	ug/L	119	Standard
>	Bi	209	595761.4	1.6				ug/L	668024	Standard

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⌈	**Na**	23	11.7	89.2	**3.5403**	3.171	89.6	mg/L	0	Standard
|	**Mg**	24	65.0	27.7	**0.0134**	0.029	218.8	mg/L	48	Standard
|	**K**	39	25.0	52.9	**0.1663**	0.159	95.8	mg/L	8	Standard
|	**Ca**	43	28.3	53.9	**-0.1276**	6.046	4739.9	mg/L	27	Standard
|	**Fe**	54	971.6	1.2	**1.0411**	0.014	1.4	mg/L	121	Standard
|	**Fe**	57	515.0	4.9	**0.9665**	0.089	9.2	mg/L	305	Standard
⌊>	**Sc-1**	45	19873.0	2.2				mg/L	22700	Standard
	Cl	35	2.0	100.0				ug/L	3	Standard
	Kr	83	3.3	62.4				ug/L	5	Standard
	Br	81	1310.1	7.5				ug/L	1367	Standard
	P	31	41.7	38.6				ug/L	67	Standard
	S	34	70.0	18.9				ug/L	55	Standard
	Sr	88	155.0	11.2				ug/L	113	Standard
	C	12	263.3	7.9				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	14740.5	4.1				mg/L	10	Standard
	Dy	164	4885.6	1.5				mg/L	18	Standard
	Ho-1	165	3083.6	5.5				mg/L	23	Standard
	Er	166	2893.6	9.5				mg/L	40	Standard
	I	127	6783.2	3.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		79.123	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		89.444	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	90.803
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	89.183
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610091001PS WG588306-01
Sample Date/Time: Thursday, October 20, 2016 10:30:23
Number of Replicates: 3
Autosampler Position: 220
Sample Description: 10
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	58189.9	1.1				ug/L	76335	Standard
	Be	9	74006.0	7.6	**88.0509**	6.332	7.2	ug/L	18	Standard
	Al	27	297314.0	6.1	**3.1344**	0.179	5.7	ug/L	810	Standard
	Sc	45	19744.5	4.2				ug/L	22700	Standard
	Ti	47	680.3	3.6	**3.6116**	0.087	2.4	ug/L	25	Standard
	V	51	462398.6	6.3	**72.9357**	3.338	4.6	ug/L	1541	Standard
	Cr	52	456790.7	5.3	**76.5603**	2.775	3.6	ug/L	7881	Standard
	Cr	53	58218.4	2.9	**76.8495**	0.915	1.2	ug/L	932	Standard
	Mn	55	1384663.5	4.2	**139.1029**	3.515	2.5	ug/L	1508	Standard
	Co	59	668165.2	4.0	**80.7129**	1.880	2.3	ug/L	282	Standard
	Ni	60	172222.2	3.7	**96.3241**	1.964	2.0	ug/L	91	Standard
	Cu	65	150189.6	2.2	**85.6428**	0.470	0.5	ug/L	205	Standard
	Zn	66	114123.7	2.5	**126.8896**	0.981	0.8	ug/L	369	Standard
>	Ge	72	433116.1	1.7				ug/L	496734	Standard
	As	75	80891.3	3.0	**89.7194**	1.252	1.4	ug/L	-45	Standard
	Se	82	9647.2	2.2	**111.5789**	0.984	0.9	ug/L	18	Standard
	Se-1	77	6593.4	3.6	**112.5344**	2.352	2.1	ug/L	83	Standard
>	Ga	71	961.7	7.0				mg/L	30	Standard
	Rb	85	11929.7	2.4				ug/L	23	Standard
	Y	89	362763.4	1.2				ug/L	405333	Standard
>	Rh	103	56.7	18.4				ug/L	17	Standard
	Mo	98	63748.1	3.5	**20.2686**	0.425	2.1	ug/L	135	Standard
	Ag	107	406944.3	3.8	**67.9135**	1.541	2.3	ug/L	123	Standard
	Cd	111	146507.7	4.4	**84.5955**	1.532	1.8	mg/L	11	Standard
	Cd	114	367730.2	3.8	**82.0188**	0.594	0.7	ug/L	56	Standard
>	In	115	543700.2	3.8				ug/L	634401	Standard
	Sn	118	13602.4	2.5	**12.9416**	0.216	1.7	ug/L	137	Standard
	Sb	123	258197.8	1.4	**57.1031**	1.790	3.1	ug/L	907	Standard
	Ba	135	326947.0	3.3	**134.4201**	1.368	1.0	ug/L	166	Standard
	Ce	140	296895.4	5.0				ug/L	57	Standard
>	Tb	159	1154860.6	3.6				ug/L	1347540	Standard
	Ho	165	3042.0	4.0				ug/L	23	Standard
	Tl	203	827256.6	2.3	**82.2606**	1.583	1.9	ug/L	45	Standard
	Tl	205	1915115.0	2.0	**78.8349**	1.168	1.5	ug/L	112	Standard
	Pb	206	616856.2	4.2	**81.6613**	0.765	0.9	ug/L	825	Standard
	Pb	207	528907.4	4.9	**79.5339**	1.214	1.5	ug/L	679	Standard
	Pb	208	2414127.4	4.5	**79.8942**	0.883	1.1	ug/L	3166	Standard
	U	238	1962576.7	8.6	**71.9901**	3.787	5.3	ug/L	119	Standard
>	Bi	209	574622.8	3.5				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5318**	0.912	171.6	mg/L	0	Standard
|	**Mg**	24	91.7	52.4	**0.0589**	0.082	139.1	mg/L	48	Standard
|	**K**	39	21.7	53.3	**0.1239**	0.125	100.6	mg/L	8	Standard
|	**Ca**	43	18.3	56.8	**-4.0029**	4.251	106.2	mg/L	27	Standard
|	**Fe**	54	993.6	4.6	**1.0754**	0.040	3.8	mg/L	121	Standard
|	**Fe**	57	501.7	4.0	**0.9225**	0.008	0.8	mg/L	305	Standard
⌊>	**Sc-1**	45	19744.5	4.2				mg/L	22700	Standard
	Cl	35	4.0	86.6				ug/L	3	Standard
	Kr	83	1.0	100.0				ug/L	5	Standard
	Br	81	1266.7	12.7				ug/L	1367	Standard
	P	31	50.0	20.0				ug/L	67	Standard
	S	34	66.7	15.6				ug/L	55	Standard
	Sr	88	135.0	33.9				ug/L	113	Standard
	C	12	243.3	26.7				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	15624.7	3.7				mg/L	10	Standard
	Dy	164	5150.7	4.5				mg/L	18	Standard
	Ho-1	165	3042.0	4.0				mg/L	23	Standard
	Er	166	3067.0	6.7				mg/L	40	Standard
	I	127	6973.3	2.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		76.229	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		87.193	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	85.703
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	86.018
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	
Zn 66 Upper, S, EEE	Zn	66	
Se 82 Upper, S, EEE	Se	82	

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Se-1 77 Upper, S, EEE	Se-1	77
Ba 135 Upper, S, EEE	Ba	135

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Method 6020 - Summary Report

Sample ID: L1610091001SDL WG588306-02
Sample Date/Time: Thursday, October 20, 2016 10:33:22
Number of Replicates: 3
Autosampler Position: 221
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	54390.8	2.3				ug/L	76335	Standard
	Be	9	4360.6	4.4	**5.5470**	0.115	2.1	ug/L	18	Standard
	Al	27	52134.6	3.2	**0.5845**	0.012	2.0	ug/L	810	Standard
	Sc	45	18104.2	3.5				ug/L	22700	Standard
	Ti	47	133.0	2.6	**0.6184**	0.039	6.3	ug/L	25	Standard
	V	51	24461.9	0.5	**3.7699**	0.114	3.0	ug/L	1541	Standard
	Cr	52	29893.5	1.0	**4.0636**	0.113	2.8	ug/L	7881	Standard
	Cr	53	4278.9	4.0	**4.8232**	0.233	4.8	ug/L	932	Standard
	Mn	55	153539.8	1.5	**15.8305**	0.208	1.3	ug/L	1508	Standard
	Co	59	40407.5	2.8	**5.0022**	0.099	2.0	ug/L	282	Standard
	Ni	60	13280.8	2.8	**7.6185**	0.023	0.3	ug/L	91	Standard
	Cu	65	9340.5	1.2	**5.4335**	0.123	2.3	ug/L	205	Standard
	Zn	66	11112.1	1.3	**12.5731**	0.174	1.4	ug/L	369	Standard
>	Ge	72	420229.1	2.6				ug/L	496734	Standard
	As	75	4640.9	1.6	**5.3628**	0.059	1.1	ug/L	-45	Standard
	Se	82	742.2	1.6	**8.6662**	0.123	1.4	ug/L	18	Standard
	Se-1	77	580.7	10.6	**9.1538**	0.816	8.9	ug/L	83	Standard
>	Ga	71	168.3	8.6				mg/L	30	Standard
	Rb	85	2131.8	5.4				ug/L	23	Standard
	Y	89	325394.8	3.5				ug/L	405333	Standard
>	Rh	103	13.3	108.3				ug/L	17	Standard
	Mo	98	10372.0	0.5	**3.4364**	0.101	3.0	ug/L	135	Standard
	Ag	107	9054.4	2.3	**1.5605**	0.021	1.4	ug/L	123	Standard
	Cd	111	7293.4	2.3	**4.4015**	0.050	1.1	mg/L	11	Standard
	Cd	114	18427.7	3.0	**4.2971**	0.032	0.7	ug/L	56	Standard
>	In	115	519333.0	3.4				ug/L	634401	Standard
	Sn	118	1995.1	11.2	**1.9268**	0.286	14.8	ug/L	137	Standard
	Sb	123	3500.8	23.9	**0.7386**	0.168	22.8	ug/L	907	Standard
	Ba	135	33111.8	2.8	**14.2098**	0.095	0.7	ug/L	166	Standard
	Ce	140	50184.7	1.7				ug/L	57	Standard
>	Tb	159	1113562.8	1.5				ug/L	1347540	Standard
	Ho	165	571.7	13.2				ug/L	23	Standard
	Tl	203	51317.1	1.0	**5.3126**	0.151	2.8	ug/L	45	Standard
	Tl	205	120992.9	1.8	**5.1870**	0.116	2.2	ug/L	112	Standard
	Pb	206	36997.8	2.3	**5.0519**	0.031	0.6	ug/L	825	Standard
	Pb	207	29651.0	2.1	**4.6013**	0.113	2.5	ug/L	679	Standard
	Pb	208	140396.9	1.7	**4.7916**	0.042	0.9	ug/L	3166	Standard
	U	238	96352.8	1.9	**3.6850**	0.006	0.2	ug/L	119	Standard
>	Bi	209	551498.2	1.9				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5752**	0.988	171.7	mg/L	0	Standard
|	**Mg**	24	36.7	15.7	**-0.0281**	0.010	35.1	mg/L	48	Standard
|	**K**	39	8.3	69.3	**-0.0225**	0.078	348.8	mg/L	8	Standard
|	**Ca**	43	41.7	59.2	**6.7503**	10.990	162.8	mg/L	27	Standard
|	**Fe**	54	200.7	38.4	**0.1340**	0.092	68.9	mg/L	121	Standard
|	**Fe**	57	350.0	15.1	**0.3877**	0.223	57.6	mg/L	305	Standard
⌊>	**Sc-1**	45	18104.2	3.5				mg/L	22700	Standard
	Cl	35	6.7	62.4				ug/L	3	Standard
	Kr	83	3.0	33.3				ug/L	5	Standard
	Br	81	1166.7	3.6				ug/L	1367	Standard
	P	31	41.7	42.1				ug/L	67	Standard
	S	34	53.3	14.3				ug/L	55	Standard
	Sr	88	115.0	8.7				ug/L	113	Standard
	C	12	223.3	18.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	2947.0	3.5				mg/L	10	Standard
	Dy	164	889.1	8.9				mg/L	18	Standard
	Ho-1	165	571.7	13.2				mg/L	23	Standard
	Er	166	506.7	9.1				mg/L	40	Standard
	I	127	4200.6	5.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		71.253	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		84.598	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	81.862
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	82.557
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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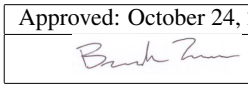

Method 6020 - Summary Report

Sample ID: L1610091001SDL WG588306-02
Sample Date/Time: Thursday, October 20, 2016 10:36:22
Number of Replicates: 3
Autosampler Position: 222
Sample Description: 250
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	53909.4	7.5				ug/L	76335	Standard
	Be	9	908.4	3.7	**1.1675**	0.085	7.3	ug/L	18	Standard
	Al	27	10933.9	1.1	**0.1206**	0.008	6.5	ug/L	810	Standard
	Sc	45	18349.4	1.9				ug/L	22700	Standard
	Ti	47	40.0	8.7	**0.0901**	0.021	22.9	ug/L	25	Standard
	V	51	5748.7	4.8	**0.7174**	0.030	4.2	ug/L	1541	Standard
	Cr	52	9943.3	1.8	**0.5661**	0.009	1.6	ug/L	7881	Standard
	Cr	53	1753.4	0.9	**1.3449**	0.023	1.7	ug/L	932	Standard
	Mn	55	31523.1	0.9	**3.1928**	0.030	0.9	ug/L	1508	Standard
	Co	59	8342.6	2.2	**1.0100**	0.006	0.6	ug/L	282	Standard
	Ni	60	2792.3	2.5	**1.5735**	0.034	2.2	ug/L	91	Standard
	Cu	65	1908.8	3.7	**1.0637**	0.024	2.2	ug/L	205	Standard
	Zn	66	2824.3	1.4	**3.0682**	0.018	0.6	ug/L	369	Standard
>	Ge	72	418924.1	1.6				ug/L	496734	Standard
	As	75	940.2	4.7	**1.1373**	0.058	5.1	ug/L	-45	Standard
	Se	82	173.9	5.5	**1.8864**	0.148	7.9	ug/L	18	Standard
	Se-1	77	193.3	6.8	**2.2925**	0.188	8.2	ug/L	83	Standard
>	Ga	71	28.3	53.9				mg/L	30	Standard
	Rb	85	451.7	13.1				ug/L	23	Standard
	Y	89	328838.0	2.3				ug/L	405333	Standard
>	Rh	103	11.7	137.8				ug/L	17	Standard
	Mo	98	1909.9	8.0	**0.6005**	0.030	5.0	ug/L	135	Standard
	Ag	107	1948.5	5.1	**0.3107**	0.007	2.2	ug/L	123	Standard
	Cd	111	1461.6	3.6	**0.8552**	0.014	1.7	mg/L	11	Standard
	Cd	114	3770.1	5.8	**0.8546**	0.045	5.3	ug/L	56	Standard
>	In	115	530970.2	3.1				ug/L	634401	Standard
	Sn	118	323.3	16.6	**0.2387**	0.044	18.5	ug/L	137	Standard
	Sb	123	1079.4	33.6	**0.1772**	0.087	48.9	ug/L	907	Standard
	Ba	135	6738.5	3.2	**2.7907**	0.052	1.9	ug/L	166	Standard
	Ce	140	9147.8	5.2				ug/L	57	Standard
>	Tb	159	1136283.3	3.5				ug/L	1347540	Standard
	Ho	165	93.3	8.2				ug/L	23	Standard
	Tl	203	10537.7	4.4	**1.0609**	0.006	0.5	ug/L	45	Standard
	Tl	205	25059.0	2.2	**1.0477**	0.020	1.9	ug/L	112	Standard
	Pb	206	7322.4	4.8	**0.9313**	0.013	1.4	ug/L	825	Standard
	Pb	207	5948.2	3.5	**0.8612**	0.012	1.4	ug/L	679	Standard
	Pb	208	28049.2	5.1	**0.8905**	0.012	1.4	ug/L	3166	Standard
	U	238	16661.2	8.3	**0.6199**	0.026	4.2	ug/L	119	Standard
>	Bi	209	564906.5	4.2				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**1.1199**	0.966	86.2	mg/L	0	Standard
|	**Mg**	24	58.3	21.6	**0.0104**	0.023	219.1	mg/L	48	Standard
|	**K**	39	6.7	86.6	**-0.0468**	0.074	158.6	mg/L	8	Standard
|	**Ca**	43	25.0	20.0	**-0.6355**	2.286	359.7	mg/L	27	Standard
|	**Fe**	54	42.3	28.7	**-0.0741**	0.017	22.6	mg/L	121	Standard
|	**Fe**	57	326.7	14.7	**0.2563**	0.231	90.1	mg/L	305	Standard
⌊>	**Sc-1**	45	18349.4	1.9				mg/L	22700	Standard
	Cl	35	1.3	173.2				ug/L	3	Standard
	Kr	83	3.0	88.2				ug/L	5	Standard
	Br	81	1086.7	9.8				ug/L	1367	Standard
	P	31	43.3	52.0				ug/L	67	Standard
	S	34	53.3	14.3				ug/L	55	Standard
	Sr	88	148.3	15.2				ug/L	113	Standard
	C	12	183.3	8.3				mg/L	367	Standard
	N	14	6.7	86.6				mg/L	3	Standard
	Hg	202	623.3	10.3				mg/L	10	Standard
	Dy	164	200.3	20.9				mg/L	18	Standard
	Ho-1	165	93.3	8.2				mg/L	23	Standard
	Er	166	133.3	24.1				mg/L	40	Standard
	I	127	3985.5	4.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		70.622	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		84.336	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	83.696
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	84.564
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610091001SDL WG588306-02
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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 10:39:23
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68153.2	5.0				ug/L	76335	Standard
	Be	9	50343.6	3.2	**51.1834**	1.174	2.3	ug/L	18	Standard
	Al	27	5578045.8	5.7	**50.2796**	1.321	2.6	ug/L	810	Standard
	Sc	45	21957.6	1.3				ug/L	22700	Standard
	Ti	47	19546.6	4.0	**97.1339**	1.038	1.1	ug/L	25	Standard
	V	51	345844.9	4.3	**49.1985**	0.280	0.6	ug/L	1541	Standard
	Cr	52	328222.8	3.5	**49.2776**	0.541	1.1	ug/L	7881	Standard
	Cr	53	40806.6	4.2	**48.2356**	0.176	0.4	ug/L	932	Standard
	Mn	55	533417.5	5.8	**48.3169**	1.140	2.4	ug/L	1508	Standard
	Co	59	452233.3	4.2	**49.3194**	0.654	1.3	ug/L	282	Standard
	Ni	60	96875.8	4.4	**48.9017**	0.425	0.9	ug/L	91	Standard
	Cu	65	96165.8	3.3	**49.4912**	0.289	0.6	ug/L	205	Standard
	Zn	66	49590.9	5.6	**49.6525**	0.865	1.7	ug/L	369	Standard
>	Ge	72	479739.7	3.9				ug/L	496734	Standard
	As	75	50434.9	3.7	**50.5386**	0.264	0.5	ug/L	-45	Standard
	Se	82	4804.7	3.9	**50.0621**	0.019	0.0	ug/L	18	Standard
	Se-1	77	3334.7	2.5	**50.7870**	0.783	1.5	ug/L	83	Standard
>	Ga	71	55.0	41.7				mg/L	30	Standard
	Rb	85	646.7	7.0				ug/L	23	Standard
	Y	89	395336.6	1.1				ug/L	405333	Standard
>	Rh	103	41.7	25.0				ug/L	17	Standard
	Mo	98	362527.1	3.9	**99.9950**	0.955	1.0	ug/L	135	Standard
	Ag	107	358869.9	3.5	**51.9186**	0.813	1.6	ug/L	123	Standard
	Cd	111	101755.5	4.7	**50.9297**	0.757	1.5	mg/L	11	Standard
	Cd	114	259098.0	5.1	**50.0897**	1.211	2.4	ug/L	56	Standard
>	In	115	627020.8	3.2				ug/L	634401	Standard
	Sn	118	61647.5	2.3	**51.0809**	0.935	1.8	ug/L	137	Standard
	Sb	123	268225.3	2.8	**51.3973**	0.442	0.9	ug/L	907	Standard
	Ba	135	140273.7	4.1	**49.9646**	0.898	1.8	ug/L	166	Standard
	Ce	140	271.7	9.4				ug/L	57	Standard
>	Tb	159	1296643.2	4.7				ug/L	1347540	Standard
	Ho	165	43.3	24.0				ug/L	23	Standard
	Tl	203	586699.4	6.3	**53.6738**	1.924	3.6	ug/L	45	Standard
	Tl	205	1374858.3	7.3	**52.0520**	2.020	3.9	ug/L	112	Standard
	Pb	206	411782.6	5.4	**50.1576**	0.748	1.5	ug/L	825	Standard
	Pb	207	367511.1	3.9	**50.8825**	0.490	1.0	ug/L	679	Standard
	Pb	208	1648831.2	4.1	**50.2299**	0.380	0.8	ug/L	3166	Standard
	U	238	1431078.0	3.5	**48.3907**	0.467	1.0	ug/L	119	Standard
>	Bi	209	624123.4	3.9				ug/L	668024	Standard

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	Na	23	18.3	41.7	**5.0573**	2.055	40.6	mg/L	0	Standard
	Mg	24	3255.4	3.8	**4.8438**	0.157	3.2	mg/L	48	Standard
	K	39	400.0	29.6	**4.1913**	1.325	31.6	mg/L	8	Standard
	Ca	43	56.7	53.9	**8.8663**	11.049	124.6	mg/L	27	Standard
	Fe	54	4910.2	1.2	**5.2249**	0.113	2.2	mg/L	121	Standard
	Fe	57	1458.4	1.7	**4.5158**	0.173	3.8	mg/L	305	Standard
>	**Sc-1**	45	21957.6	1.3				mg/L	22700	Standard
	Cl	35	5.3	57.3				ug/L	3	Standard
	Kr	83	3.7	63.0				ug/L	5	Standard
	Br	81	1423.4	4.2				ug/L	1367	Standard
	P	31	85.0	35.3				ug/L	67	Standard
	S	34	83.3	6.9				ug/L	55	Standard
	Sr	88	128.3	17.6				ug/L	113	Standard
	C	12	306.7	30.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	43.3	35.3				mg/L	10	Standard
	Dy	164	31.9	71.1				mg/L	18	Standard
	Ho-1	165	43.3	24.0				mg/L	23	Standard
	Er	166	30.0	57.7				mg/L	40	Standard
	I	127	3160.3	7.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	102.367		
	Al	27	100.559		
	Sc	45			
	Ti	47	97.134		
	V	51	98.397		
	Cr	52	98.555		
	Cr	53			
	Mn	55	96.634		
	Co	59	98.639		
	Ni	60	97.803		
	Cu	65	98.982		
	Zn	66	99.305		
>	Ge	72		96.579	
	As	75	101.077		
	Se	82	100.124		
	Se-1	77			
>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	99.995		
Ag	107	103.837		
Cd	111	101.859		
Cd	114			
In	115			98.837
Sn	118	102.162		
Sb	123	102.795		
Ba	135	99.929		
Ce	140			
Tb	159			
Ho	165			
Tl	203	107.348		
Tl	205			
Pb	206			
Pb	207			
Pb	208	100.460		
U	238	96.781		
Bi	209			93.428
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 10:42:22
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68219.9	2.2				ug/L	76335	Standard
	Be	9	11.7	65.5	**0.0089**	0.008	88.9	ug/L	18	Standard
	Al	27	1185.0	21.0	**0.0063**	0.002	38.0	ug/L	810	Standard
	Sc	45	21991.0	2.3				ug/L	22700	Standard
	Ti	47	20.3	17.3	**-0.0358**	0.018	50.3	ug/L	25	Standard
	V	51	1484.9	8.6	**-0.0094**	0.013	136.8	ug/L	1541	Standard
	Cr	52	7653.6	0.7	**0.0028**	0.038	1380.3	ug/L	7881	Standard
	Cr	53	1178.4	15.1	**0.3535**	0.213	60.2	ug/L	932	Standard
	Mn	55	1114.4	9.0	**0.0175**	0.009	52.3	ug/L	1508	Standard
	Co	59	353.0	4.7	**0.0063**	0.001	19.3	ug/L	282	Standard
	Ni	60	106.7	7.0	**0.0121**	0.004	34.8	ug/L	91	Standard
	Cu	65	126.3	13.5	**0.0032**	0.007	219.1	ug/L	205	Standard
	Zn	66	151.7	6.3	**-0.0294**	0.013	45.1	ug/L	369	Standard
>	Ge	72	475772.6	2.6				ug/L	496734	Standard
	As	75	-31.8	153.8	**0.0266**	0.050	186.5	ug/L	-45	Standard
	Se	82	24.9	42.8	**0.0615**	0.104	168.9	ug/L	18	Standard
	Se-1	77	108.3	4.4	**0.5474**	0.052	9.5	ug/L	83	Standard
>	Ga	71	21.7	70.5				mg/L	30	Standard
	Rb	85	30.0	44.1				ug/L	23	Standard
	Y	89	388537.3	1.0				ug/L	405333	Standard
>	Rh	103	13.3	78.1				ug/L	17	Standard
	Mo	98	433.6	5.8	**0.0992**	0.007	7.0	ug/L	135	Standard
	Ag	107	154.3	3.3	**0.0003**	0.001	228.3	ug/L	123	Standard
	Cd	111	25.8	18.0	**0.0039**	0.002	62.3	mg/L	11	Standard
	Cd	114	89.3	35.2	**0.0107**	0.006	53.8	ug/L	56	Standard
>	In	115	623162.5	2.2				ug/L	634401	Standard
	Sn	118	274.7	43.3	**0.1511**	0.097	64.4	ug/L	137	Standard
	Sb	123	4414.5	41.0	**0.7803**	0.341	43.7	ug/L	907	Standard
	Ba	135	53.7	9.6	**-0.0277**	0.002	6.6	ug/L	166	Standard
	Ce	140	96.7	6.0				ug/L	57	Standard
>	Tb	159	1280059.2	1.1				ug/L	1347540	Standard
	Ho	165	8.3	34.6				ug/L	23	Standard
	Tl	203	8710.9	46.3	**0.7742**	0.364	47.0	ug/L	45	Standard
	Tl	205	20611.0	46.5	**0.7607**	0.358	47.0	ug/L	112	Standard
	Pb	206	543.0	7.8	**0.0094**	0.006	60.1	ug/L	825	Standard
	Pb	207	440.3	8.1	**0.0100**	0.005	53.3	ug/L	679	Standard
	Pb	208	2050.1	7.7	**0.0068**	0.005	74.2	ug/L	3166	Standard
	U	238	307.7	15.1	**0.0084**	0.001	15.2	ug/L	119	Standard
>	Bi	209	638214.9	3.2				ug/L	668024	Standard

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⌈	**Na**	23	3.3	173.2	**0.9281**	1.599	172.3	mg/L	0	Standard
|	**Mg**	24	45.0	29.4	**-0.0272**	0.020	74.9	mg/L	48	Standard
|	**K**	39	11.7	89.2	**-0.0079**	0.112	1417.2	mg/L	8	Standard
|	**Ca**	43	35.0	37.8	**1.1951**	4.917	411.4	mg/L	27	Standard
|	**Fe**	54	132.8	17.8	**0.0153**	0.028	185.9	mg/L	121	Standard
|	**Fe**	57	321.7	19.7	**-0.0210**	0.259	1229.3	mg/L	305	Standard
⌊>	**Sc-1**	45	21991.0	2.3				mg/L	22700	Standard
	Cl	35	5.3	57.3				ug/L	3	Standard
	Kr	83	2.7	21.7				ug/L	5	Standard
	Br	81	1326.7	6.3				ug/L	1367	Standard
	P	31	91.7	25.2				ug/L	67	Standard
	S	34	58.3	17.8				ug/L	55	Standard
	Sr	88	131.7	12.2				ug/L	113	Standard
	C	12	286.7	5.3				mg/L	367	Standard
	N	14	10.0	100.0				mg/L	3	Standard
	Hg	202	43.3	13.3				mg/L	10	Standard
	Dy	164	19.5	53.7				mg/L	18	Standard
	Ho-1	165	8.3	34.6				mg/L	23	Standard
	Er	166	10.0	100.0				mg/L	40	Standard
	I	127	3105.3	6.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		95.780	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
> Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
> In	115		98.228
Sn	118		
Sb	123		
Ba	135		
Ce	140		
> Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
> Bi	209		95.538
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
> Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	
QC Std 7	Tl	203	

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Method 6020 - Summary Report

Sample ID: L1610091301 WG588218-01
Sample Date/Time: Thursday, October 20, 2016 10:45:54
Number of Replicates: 3
Autosampler Position: 301
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	54902.6	1.6				ug/L	76335	Standard
	Be	9	16.7	62.4	**0.0181**	0.013	73.6	ug/L	18	Standard
	Al	27	38650.9	2.7	**0.4282**	0.011	2.7	ug/L	810	Standard
	Sc	45	18090.8	4.7				ug/L	22700	Standard
	Ti	47	102.3	8.3	**0.4400**	0.040	9.0	ug/L	25	Standard
	V	51	1900.2	4.4	**0.0851**	0.009	10.2	ug/L	1541	Standard
	Cr	52	5436.3	0.4	**-0.2351**	0.012	5.3	ug/L	7881	Standard
	Cr	53	931.7	7.0	**0.1978**	0.111	56.4	ug/L	932	Standard
	Mn	55	53203.3	1.3	**5.4011**	0.125	2.3	ug/L	1508	Standard
	Co	59	890.0	1.2	**0.0778**	0.001	1.0	ug/L	282	Standard
	Ni	60	286.7	1.9	**0.1223**	0.005	4.0	ug/L	91	Standard
	Cu	65	435.3	3.9	**0.1924**	0.007	3.7	ug/L	205	Standard
	Zn	66	1232.4	3.4	**1.2241**	0.063	5.2	ug/L	369	Standard
>	Ge	72	422457.3	1.7				ug/L	496734	Standard
	As	75	17.9	174.5	**0.0800**	0.036	44.4	ug/L	-45	Standard
	Se	82	14.9	59.8	**-0.0214**	0.109	509.4	ug/L	18	Standard
	Se-1	77	85.7	10.6	**0.3602**	0.139	38.4	ug/L	83	Standard
>	Ga	71	120.0	11.0				mg/L	30	Standard
	Rb	85	460.0	5.8				ug/L	23	Standard
	Y	89	339333.5	1.7				ug/L	405333	Standard
>	Rh	103	16.7	45.8				ug/L	17	Standard
	Mo	98	121.7	14.3	**0.0190**	0.006	30.8	ug/L	135	Standard
	Ag	107	108.7	10.3	**-0.0034**	0.002	54.8	ug/L	123	Standard
	Cd	111	21.5	30.0	**0.0037**	0.004	106.0	mg/L	11	Standard
	Cd	114	51.6	34.2	**0.0054**	0.004	77.1	ug/L	56	Standard
>	In	115	524725.5	1.2				ug/L	634401	Standard
	Sn	118	64.0	15.4	**-0.0139**	0.010	74.7	ug/L	137	Standard
	Sb	123	335.6	35.2	**0.0084**	0.028	328.4	ug/L	907	Standard
	Ba	135	1084.0	2.5	**0.4149**	0.006	1.5	ug/L	166	Standard
	Ce	140	15487.9	1.0				ug/L	57	Standard
>	Tb	159	1117065.2	1.7				ug/L	1347540	Standard
	Ho	165	270.0	14.5				ug/L	23	Standard
	Tl	203	127.3	9.5	**0.0083**	0.001	13.5	ug/L	45	Standard
	Tl	205	290.0	6.0	**0.0104**	0.001	6.0	ug/L	112	Standard
	Pb	206	1888.8	4.0	**0.2008**	0.007	3.6	ug/L	825	Standard
	Pb	207	1543.1	2.6	**0.1881**	0.003	1.8	ug/L	679	Standard
	Pb	208	7129.3	3.9	**0.1874**	0.007	3.6	ug/L	3166	Standard
	U	238	329.3	10.2	**0.0106**	0.001	10.6	ug/L	119	Standard
>	Bi	209	561164.8	1.2				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5943**	1.021	171.7	mg/L	0	Standard
|	**Mg**	24	51.7	29.6	**-0.0009**	0.025	2868.8	mg/L	48	Standard
|	**K**	39	10.0	50.0	**0.0000**	0.07	172935.0	mg/L	8	Standard
|	**Ca**	43	31.7	39.7	**2.4082**	5.442	226.0	mg/L	27	Standard
|	**Fe**	54	177.6	13.1	**0.1066**	0.042	39.0	mg/L	121	Standard
|	**Fe**	57	315.0	12.4	**0.2299**	0.263	114.4	mg/L	305	Standard
⌊>	**Sc-1**	45	18090.8	4.7				mg/L	22700	Standard
	Cl	35	3.3	91.7				ug/L	3	Standard
	Kr	83	4.0	50.0				ug/L	5	Standard
	Br	81	1050.0	5.3				ug/L	1367	Standard
	P	31	50.0	40.0				ug/L	67	Standard
	S	34	68.3	30.5				ug/L	55	Standard
	Sr	88	126.7	19.9				ug/L	113	Standard
	C	12	226.7	25.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0					mg/L	10	Standard
	Dy	164	424.9	9.4				mg/L	18	Standard
	Ho-1	165	270.0	14.5				mg/L	23	Standard
	Er	166	246.7	23.1				mg/L	40	Standard
	I	127	4442.3	4.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		71.923	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		85.047	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	82.712
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	84.004
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610091301S WG588218-04
Sample Date/Time: Thursday, October 20, 2016 10:48:53
Number of Replicates: 3
Autosampler Position: 302
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	54849.2	3.8				ug/L	76335	Standard
	Be	9	201.7	7.2	**0.2514**	0.010	4.1	ug/L	18	Standard
	Al	27	20285.2	3.7	**0.2230**	0.008	3.6	ug/L	810	Standard
	Sc	45	18299.4	2.1				ug/L	22700	Standard
	Ti	47	103.7	11.2	**0.4481**	0.059	13.2	ug/L	25	Standard
	V	51	3156.9	5.1	**0.2896**	0.023	7.9	ug/L	1541	Standard
	Cr	52	6645.5	1.4	**-0.0230**	0.013	58.3	ug/L	7881	Standard
	Cr	53	1023.4	8.9	**0.3226**	0.102	31.5	ug/L	932	Standard
	Mn	55	38062.1	1.2	**3.8431**	0.033	0.8	ug/L	1508	Standard
	Co	59	2548.5	1.2	**0.2837**	0.008	2.8	ug/L	282	Standard
	Ni	60	586.7	5.5	**0.2947**	0.018	6.1	ug/L	91	Standard
	Cu	65	665.0	5.6	**0.3270**	0.016	4.9	ug/L	205	Standard
	Zn	66	1040.7	1.4	**1.0061**	0.027	2.7	ug/L	369	Standard
>	Ge	72	422060.7	1.7				ug/L	496734	Standard
	As	75	179.5	12.7	**0.2633**	0.023	8.8	ug/L	-45	Standard
	Se	82	34.2	23.5	**0.2064**	0.089	43.0	ug/L	18	Standard
	Se-1	77	96.3	17.4	**0.5548**	0.319	57.5	ug/L	83	Standard
>	Ga	71	60.0	36.3				mg/L	30	Standard
	Rb	85	283.3	10.0				ug/L	23	Standard
	Y	89	332431.3	1.7				ug/L	405333	Standard
>	Rh	103	11.7	65.5				ug/L	17	Standard
	Mo	98	68.3	24.0	**0.0011**	0.005	431.1	ug/L	135	Standard
	Ag	107	1540.1	4.8	**0.2422**	0.006	2.5	ug/L	123	Standard
	Cd	111	443.3	4.8	**0.2541**	0.005	1.8	mg/L	11	Standard
	Cd	114	1132.2	3.2	**0.2536**	0.018	7.0	ug/L	56	Standard
>	In	115	528643.1	4.0				ug/L	634401	Standard
	Sn	118	44.3	31.6	**-0.0340**	0.013	37.3	ug/L	137	Standard
	Sb	123	438.1	25.0	**0.0305**	0.022	71.3	ug/L	907	Standard
	Ba	135	1390.4	2.3	**0.5413**	0.010	1.8	ug/L	166	Standard
	Ce	140	8984.3	3.0				ug/L	57	Standard
>	Tb	159	1096817.5	3.5				ug/L	1347540	Standard
	Ho	165	173.3	15.9				ug/L	23	Standard
	Tl	203	2375.2	2.6	**0.2341**	0.005	2.0	ug/L	45	Standard
	Tl	205	5781.1	1.7	**0.2387**	0.003	1.3	ug/L	112	Standard
	Pb	206	3302.7	0.8	**0.3872**	0.004	0.9	ug/L	825	Standard
	Pb	207	2784.3	1.1	**0.3741**	0.002	0.5	ug/L	679	Standard
	Pb	208	12863.1	1.6	**0.3765**	0.005	1.4	ug/L	3166	Standard
	U	238	5916.5	1.5	**0.2179**	0.004	1.9	ug/L	119	Standard
>	Bi	209	568201.0	0.6				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**1.1136**	0.961	86.3	mg/L	0	Standard
|	**Mg**	24	40.0	37.5	**-0.0224**	0.029	127.9	mg/L	48	Standard
|	**K**	39	8.3	34.6	**-0.0245**	0.038	154.4	mg/L	8	Standard
|	**Ca**	43	26.7	65.8	**0.1540**	7.715	5009.9	mg/L	27	Standard
|	**Fe**	54	94.6	42.2	**-0.0052**	0.055	1068.5	mg/L	121	Standard
|	**Fe**	57	301.7	8.5	**0.1430**	0.154	108.0	mg/L	305	Standard
⌊>	**Sc-1**	45	18299.4	2.1				mg/L	22700	Standard
	Cl	35	4.0	100.0				ug/L	3	Standard
	Kr	83	4.0	25.0				ug/L	5	Standard
	Br	81	1033.4	17.9				ug/L	1367	Standard
	P	31	60.0	16.7				ug/L	67	Standard
	S	34	56.7	18.4				ug/L	55	Standard
	Sr	88	156.7	9.8				ug/L	113	Standard
	C	12	173.3	14.5				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	13.3	86.6				mg/L	10	Standard
	Dy	164	286.5	26.4				mg/L	18	Standard
	Ho-1	165	173.3	15.9				mg/L	23	Standard
	Er	166	143.3	8.1				mg/L	40	Standard
	I	127	4459.0	2.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		71.853	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		84.967	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	83.329
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	85.057
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610091301SD WG588218-05
Sample Date/Time: Thursday, October 20, 2016 10:51:53
Number of Replicates: 3
Autosampler Position: 303
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	56602.3	3.2				ug/L	76335	Standard
	Be	9	205.0	17.1	**0.2471**	0.036	14.6	ug/L	18	Standard
	Al	27	29841.0	3.3	**0.3197**	0.014	4.4	ug/L	810	Standard
	Sc	45	19185.5	4.1				ug/L	22700	Standard
	Ti	47	134.0	3.3	**0.6025**	0.020	3.4	ug/L	25	Standard
	V	51	3603.1	2.0	**0.3486**	0.008	2.3	ug/L	1541	Standard
	Cr	52	7113.7	2.6	**0.0300**	0.023	76.0	ug/L	7881	Standard
	Cr	53	1060.0	3.7	**0.3402**	0.043	12.5	ug/L	932	Standard
	Mn	55	36597.2	1.8	**3.6045**	0.047	1.3	ug/L	1508	Standard
	Co	59	2617.9	1.2	**0.2847**	0.006	2.1	ug/L	282	Standard
	Ni	60	765.4	6.3	**0.3872**	0.029	7.4	ug/L	91	Standard
	Cu	65	817.4	1.5	**0.4054**	0.011	2.7	ug/L	205	Standard
	Zn	66	1554.1	3.6	**1.5518**	0.071	4.6	ug/L	369	Standard
>	Ge	72	432024.0	0.8				ug/L	496734	Standard
	As	75	279.2	8.1	**0.3697**	0.025	6.9	ug/L	-45	Standard
	Se	82	43.8	17.1	**0.3104**	0.089	28.8	ug/L	18	Standard
	Se-1	77	92.7	4.5	**0.4487**	0.062	13.9	ug/L	83	Standard
>	Ga	71	111.7	17.0				mg/L	30	Standard
	Rb	85	570.0	20.5				ug/L	23	Standard
	Y	89	336139.7	1.1				ug/L	405333	Standard
>	Rh	103	15.0	33.3				ug/L	17	Standard
	Mo	98	107.0	18.4	**0.0134**	0.006	45.8	ug/L	135	Standard
	Ag	107	1539.4	2.0	**0.2385**	0.006	2.4	ug/L	123	Standard
	Cd	111	446.2	2.4	**0.2523**	0.006	2.5	mg/L	11	Standard
	Cd	114	1133.9	3.1	**0.2500**	0.008	3.4	ug/L	56	Standard
>	In	115	535911.7	0.7				ug/L	634401	Standard
	Sn	118	41.7	5.5	**-0.0370**	0.002	6.1	ug/L	137	Standard
	Sb	123	321.0	23.8	**0.0033**	0.017	503.8	ug/L	907	Standard
	Ba	135	1535.1	4.3	**0.5934**	0.025	4.3	ug/L	166	Standard
	Ce	140	10847.2	3.2				ug/L	57	Standard
>	Tb	159	1153068.8	4.2				ug/L	1347540	Standard
	Ho	165	226.7	5.6				ug/L	23	Standard
	Tl	203	2469.2	1.1	**0.2389**	0.003	1.1	ug/L	45	Standard
	Tl	205	5822.8	3.9	**0.2360**	0.012	5.2	ug/L	112	Standard
	Pb	206	3434.1	1.1	**0.3960**	0.010	2.5	ug/L	825	Standard
	Pb	207	2786.6	1.3	**0.3664**	0.011	2.9	ug/L	679	Standard
	Pb	208	13046.8	0.8	**0.3744**	0.009	2.4	ug/L	3166	Standard
	U	238	6167.6	2.2	**0.2229**	0.008	3.4	ug/L	119	Standard
>	Bi	209	579289.2	1.3				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5201**	0.892	171.5	mg/L	0	Standard
|	**Mg**	24	43.3	52.0	**-0.0211**	0.037	175.0	mg/L	48	Standard
|	**K**	39	6.7	86.6	**-0.0491**	0.072	147.5	mg/L	8	Standard
|	**Ca**	43	36.7	47.9	**3.4590**	6.679	193.1	mg/L	27	Standard
|	**Fe**	54	204.2	16.1	**0.1264**	0.050	39.9	mg/L	121	Standard
|	**Fe**	57	341.7	15.4	**0.2644**	0.303	114.5	mg/L	305	Standard
⌊>	**Sc-1**	45	19185.5	4.1				mg/L	22700	Standard
	Cl	35	4.7	99.0				ug/L	3	Standard
	Kr	83	2.3	99.0				ug/L	5	Standard
	Br	81	1153.4	11.3				ug/L	1367	Standard
	P	31	46.7	34.4				ug/L	67	Standard
	S	34	63.3	18.2				ug/L	55	Standard
	Sr	88	118.3	21.3				ug/L	113	Standard
	C	12	183.3	36.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	290.4	23.9				mg/L	18	Standard
	Ho-1	165	226.7	5.6				mg/L	23	Standard
	Er	166	200.0	37.7				mg/L	40	Standard
	I	127	4434.0	2.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		74.150	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		86.973	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	84.475
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	86.717
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 10:54:54
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68503.0	3.3				ug/L	76335	Standard
	Be	9	48312.0	3.5	**48.8377**	1.031	2.1	ug/L	18	Standard
	Al	27	5536442.6	6.4	**49.6182**	1.651	3.3	ug/L	810	Standard
	Sc	45	21982.6	4.5				ug/L	22700	Standard
	Ti	47	19650.4	5.5	**100.3651**	1.623	1.6	ug/L	25	Standard
	V	51	338922.4	3.5	**49.5850**	0.493	1.0	ug/L	1541	Standard
	Cr	52	319813.5	3.1	**49.3735**	0.542	1.1	ug/L	7881	Standard
	Cr	53	40012.8	4.7	**48.6333**	0.369	0.8	ug/L	932	Standard
	Mn	55	527425.0	3.8	**49.1465**	0.724	1.5	ug/L	1508	Standard
	Co	59	443282.7	2.9	**49.7225**	0.838	1.7	ug/L	282	Standard
	Ni	60	94675.0	3.0	**49.1546**	0.438	0.9	ug/L	91	Standard
	Cu	65	94106.6	3.3	**49.7974**	0.527	1.1	ug/L	205	Standard
	Zn	66	49207.8	3.4	**50.6886**	0.429	0.8	ug/L	369	Standard
>	Ge	72	466591.7	3.9				ug/L	496734	Standard
	As	75	49592.2	3.9	**51.0911**	0.264	0.5	ug/L	-45	Standard
	Se	82	4784.7	3.8	**51.2647**	0.142	0.3	ug/L	18	Standard
	Se-1	77	3252.0	4.2	**50.9106**	1.122	2.2	ug/L	83	Standard
>	Ga	71	55.0	39.6				mg/L	30	Standard
	Rb	85	610.0	10.7				ug/L	23	Standard
	Y	89	377300.5	4.9				ug/L	405333	Standard
>	Rh	103	35.0	42.9				ug/L	17	Standard
	Mo	98	350783.2	3.4	**98.5749**	2.602	2.6	ug/L	135	Standard
	Ag	107	349871.2	4.0	**51.5464**	0.941	1.8	ug/L	123	Standard
	Cd	111	99019.5	5.2	**50.4649**	0.326	0.6	mg/L	11	Standard
	Cd	114	254237.7	7.7	**50.0098**	1.453	2.9	ug/L	56	Standard
>	In	115	616106.5	5.7				ug/L	634401	Standard
	Sn	118	60868.2	5.1	**51.3280**	0.617	1.2	ug/L	137	Standard
	Sb	123	261649.5	4.3	**51.0471**	0.728	1.4	ug/L	907	Standard
	Ba	135	138274.4	4.0	**50.1688**	1.240	2.5	ug/L	166	Standard
	Ce	140	231.7	16.2				ug/L	57	Standard
>	Tb	159	1280921.3	3.3				ug/L	1347540	Standard
	Ho	165	40.0	21.7				ug/L	23	Standard
	Tl	203	537109.8	3.6	**49.4700**	0.193	0.4	ug/L	45	Standard
	Tl	205	1267536.3	4.3	**48.3238**	0.432	0.9	ug/L	112	Standard
	Pb	206	403194.5	3.2	**49.4497**	0.310	0.6	ug/L	825	Standard
	Pb	207	355957.7	3.5	**49.5974**	0.087	0.2	ug/L	679	Standard
	Pb	208	1609686.3	3.4	**49.3561**	0.257	0.5	ug/L	3166	Standard
	U	238	1404247.6	3.3	**47.7855**	0.230	0.5	ug/L	119	Standard
>	Bi	209	620120.6	3.5				ug/L	668024	Standard

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	Na	23	18.3	41.7	**5.0612**	2.127	42.0	mg/L	0	Standard
	Mg	24	3238.7	4.5	**4.8143**	0.107	2.2	mg/L	48	Standard
	K	39	436.7	2.9	**4.5758**	0.100	2.2	mg/L	8	Standard
	Ca	43	41.7	18.3	**3.5638**	3.221	90.4	mg/L	27	Standard
	Fe	54	4851.0	3.3	**5.1591**	0.252	4.9	mg/L	121	Standard
	Fe	57	1563.4	6.7	**4.9238**	0.228	4.6	mg/L	305	Standard
>	**Sc-1**	45	21982.6	4.5				mg/L	22700	Standard
	Cl	35	4.7	65.5				ug/L	3	Standard
	Kr	83	3.3	75.5				ug/L	5	Standard
	Br	81	1370.1	12.0				ug/L	1367	Standard
	P	31	81.7	30.8				ug/L	67	Standard
	S	34	55.0	24.1				ug/L	55	Standard
	Sr	88	138.3	18.2				ug/L	113	Standard
	C	12	283.3	7.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	23.3	89.2				mg/L	10	Standard
	Dy	164	41.4	58.8				mg/L	18	Standard
	Ho-1	165	40.0	21.7				mg/L	23	Standard
	Er	166	40.0	66.1				mg/L	40	Standard
	I	127	2906.9	1.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	97.675		
	Al	27	99.236		
	Sc	45			
	Ti	47	100.365		
	V	51	99.170		
	Cr	52	98.747		
	Cr	53			
	Mn	55	98.293		
	Co	59	99.445		
	Ni	60	98.309		
	Cu	65	99.595		
	Zn	66	101.377		
>	Ge	72		93.932	
	As	75	102.182		
	Se	82	102.529		
	Se-1	77			
>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	98.575		
Ag	107	103.093		
Cd	111	100.930		
Cd	114			
In	115			97.116
Sn	118	102.656		
Sb	123	102.094		
Ba	135	100.338		
Ce	140			
Tb	159			
Ho	165			
Tl	203	98.940		
Tl	205			
Pb	206			
Pb	207			
Pb	208	98.712		
U	238	95.571		
Bi	209			92.829
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 6
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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 10:57:53
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	63527.9	13.7				ug/L	76335	Standard
	Be	9	20.0	43.3	**0.0183**	0.006	33.1	ug/L	18	Standard
	Al	27	1068.4	44.8	**0.0057**	0.003	53.0	ug/L	810	Standard
	Sc	45	20717.6	11.0				ug/L	22700	Standard
	Ti	47	19.7	21.2	**-0.0376**	0.020	53.8	ug/L	25	Standard
	V	51	1305.5	18.1	**-0.0324**	0.025	77.1	ug/L	1541	Standard
	Cr	52	6267.4	26.1	**-0.2055**	0.173	84.2	ug/L	7881	Standard
	Cr	53	933.4	23.4	**0.0653**	0.171	262.5	ug/L	932	Standard
	Mn	55	881.4	28.9	**-0.0033**	0.017	495.7	ug/L	1508	Standard
	Co	59	282.7	23.2	**-0.0011**	0.005	454.1	ug/L	282	Standard
	Ni	60	90.0	38.7	**0.0036**	0.014	384.8	ug/L	91	Standard
	Cu	65	144.3	10.4	**0.0143**	0.010	72.7	ug/L	205	Standard
	Zn	66	191.7	20.7	**0.0171**	0.055	320.0	ug/L	369	Standard
>	Ge	72	467938.9	8.0				ug/L	496734	Standard
	As	75	-31.1	56.9	**0.0268**	0.020	75.9	ug/L	-45	Standard
	Se	82	16.6	50.4	**-0.0238**	0.082	345.5	ug/L	18	Standard
	Se-1	77	82.0	16.8	**0.1500**	0.116	77.6	ug/L	83	Standard
>	Ga	71	16.7	75.5				mg/L	30	Standard
	Rb	85	21.7	70.5				ug/L	23	Standard
	Y	89	370376.0	9.7				ug/L	405333	Standard
>	Rh	103	15.0	57.7				ug/L	17	Standard
	Mo	98	199.6	75.1	**0.0347**	0.038	109.6	ug/L	135	Standard
	Ag	107	127.0	11.9	**-0.0029**	0.001	32.0	ug/L	123	Standard
	Cd	111	15.7	63.2	**-0.0011**	0.005	414.2	mg/L	11	Standard
	Cd	114	52.5	50.3	**0.0039**	0.005	122.0	ug/L	56	Standard
>	In	115	597650.8	7.5				ug/L	634401	Standard
	Sn	118	93.3	62.7	**0.0016**	0.044	2661.2	ug/L	137	Standard
	Sb	123	1063.1	116.3	**0.1340**	0.226	168.8	ug/L	907	Standard
	Ba	135	48.0	30.7	**-0.0292**	0.004	13.9	ug/L	166	Standard
	Ce	140	58.3	48.7				ug/L	57	Standard
>	Tb	159	1255644.3	7.7				ug/L	1347540	Standard
	Ho	165	5.0	100.0				ug/L	23	Standard
	Tl	203	209.0	93.2	**0.0141**	0.016	115.1	ug/L	45	Standard
	Tl	205	521.7	100.7	**0.0174**	0.018	104.2	ug/L	112	Standard
	Pb	206	468.0	13.3	**0.0028**	0.003	108.3	ug/L	825	Standard
	Pb	207	408.0	15.4	**0.0078**	0.004	51.6	ug/L	679	Standard
	Pb	208	1863.4	14.8	**0.0035**	0.004	105.0	ug/L	3166	Standard
	U	238	138.7	60.1	**0.0029**	0.002	83.7	ug/L	119	Standard
>	Bi	209	610587.4	8.2				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	61.7	63.0	**0.0002**	0.050	20009.0	mg/L	48	Standard
|	**K**	39	6.7	114.6	**-0.0614**	0.077	124.7	mg/L	8	Standard
|	**Ca**	43	26.7	21.7	**-1.0210**	3.092	302.9	mg/L	27	Standard
|	**Fe**	54	87.6	61.5	**-0.0307**	0.055	180.2	mg/L	121	Standard
|	**Fe**	57	298.3	9.7	**-0.0362**	0.137	379.0	mg/L	305	Standard
⌊>	**Sc-1**	45	20717.6	11.0				mg/L	22700	Standard
	Cl	35	6.0	33.3				ug/L	3	Standard
	Kr	83	4.7	24.7				ug/L	5	Standard
	Br	81	1456.7	17.7				ug/L	1367	Standard
	P	31	53.3	61.0				ug/L	67	Standard
	S	34	78.3	47.9				ug/L	55	Standard
	Sr	88	163.3	7.7				ug/L	113	Standard
	C	12	303.3	24.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	30.0	66.7				mg/L	10	Standard
	Dy	164	19.4	90.9				mg/L	18	Standard
	Ho-1	165	5.0	100.0				mg/L	23	Standard
	Er	166	13.3	43.3				mg/L	40	Standard
	I	127	2901.9	7.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.203	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	94.207
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	91.402
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: PBS J3 WG588219-02
Sample Date/Time: Thursday, October 20, 2016 11:00:54
Number of Replicates: 3
Autosampler Position: 223
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	76171.0	1.1				ug/L	76335	Standard
	Be	9	28.3	53.9	**0.0229**	0.014	62.2	ug/L	18	Standard
	Al	27	10151.2	71.5	**0.0779**	0.060	76.7	ug/L	810	Standard
	Sc	45	21388.4	4.3				ug/L	22700	Standard
	Ti	47	91.0	10.5	**0.3211**	0.050	15.7	ug/L	25	Standard
	V	51	-24956.7	12.5	**-3.8395**	0.483	12.6	ug/L	1541	Standard
	Cr	52	13762.2	1.1	**0.9591**	0.032	3.4	ug/L	7881	Standard
	Cr	53	101967.7	5.7	**123.8261**	8.224	6.6	ug/L	932	Standard
	Mn	55	3340.8	58.1	**0.2229**	0.179	80.3	ug/L	1508	Standard
	Co	59	413.0	57.8	**0.0132**	0.027	201.2	ug/L	282	Standard
	Ni	60	317.3	16.5	**0.1202**	0.027	22.7	ug/L	91	Standard
	Cu	65	338.7	14.3	**0.1144**	0.025	21.6	ug/L	205	Standard
	Zn	66	1407.4	2.4	**1.2500**	0.026	2.1	ug/L	369	Standard
>	Ge	72	473542.5	0.9				ug/L	496734	Standard
	As	75	-480.8	38.5	**-0.4273**	0.184	43.1	ug/L	-45	Standard
	Se	82	14.2	34.7	**-0.0489**	0.052	106.5	ug/L	18	Standard
	Se-1	77	5609.4	4.9	**87.3562**	5.102	5.8	ug/L	83	Standard
>	Ga	71	120.0	30.0				mg/L	30	Standard
	Rb	85	210.0	152.6				ug/L	23	Standard
	Y	89	368323.6	1.3				ug/L	405333	Standard
>	Rh	103	16.7	62.4				ug/L	17	Standard
	Mo	98	432.2	122.3	**0.1132**	0.164	144.8	ug/L	135	Standard
	Ag	107	599.0	130.2	**0.0755**	0.127	167.9	ug/L	123	Standard
	Cd	111	136.8	151.3	**0.0679**	0.116	171.4	mg/L	11	Standard
	Cd	114	289.6	138.6	**0.0565**	0.087	154.5	ug/L	56	Standard
>	In	115	554342.9	1.1				ug/L	634401	Standard
	Sn	118	202.3	26.5	**0.1122**	0.049	43.4	ug/L	137	Standard
	Sb	123	1275.4	51.1	**0.2071**	0.139	67.3	ug/L	907	Standard
	Ba	135	480.3	115.0	**0.1461**	0.221	151.4	ug/L	166	Standard
	Ce	140	1025.1	139.0				ug/L	57	Standard
>	Tb	159	1203512.8	1.1				ug/L	1347540	Standard
	Ho	165	21.7	48.0				ug/L	23	Standard
	Tl	203	868.4	74.6	**0.0794**	0.063	79.8	ug/L	45	Standard
	Tl	205	2095.2	72.7	**0.0820**	0.062	75.2	ug/L	112	Standard
	Pb	206	1154.4	35.9	**0.0932**	0.055	58.8	ug/L	825	Standard
	Pb	207	981.0	44.4	**0.0938**	0.065	69.4	ug/L	679	Standard
	Pb	208	4440.3	40.0	**0.0886**	0.059	66.1	ug/L	3166	Standard
	U	238	824.1	156.8	**0.0278**	0.046	167.2	ug/L	119	Standard
>	Bi	209	592769.4	1.1				ug/L	668024	Standard

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	Na	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
	Mg	24	95.0	9.1	**0.0525**	0.011	21.6	mg/L	48	Standard
	K	39	5.0	100.0	**-0.0756**	0.058	77.2	mg/L	8	Standard
	Ca	43	26.7	10.8	**-1.5635**	0.899	57.5	mg/L	27	Standard
	Fe	54	120.2	24.2	**0.0061**	0.039	644.2	mg/L	121	Standard
	Fe	57	335.0	6.8	**0.0732**	0.155	211.9	mg/L	305	Standard
>	**Sc-1**	45	21388.4	4.3				mg/L	22700	Standard
	Cl	35	6.7	34.6				ug/L	3	Standard
	Kr	83	3.3	69.3				ug/L	5	Standard
	Br	81	1183.4	7.1				ug/L	1367	Standard
	P	31	71.7	4.0				ug/L	67	Standard
	S	34	76.7	10.0				ug/L	55	Standard
	Sr	88	161.7	30.5				ug/L	113	Standard
	C	12	313.3	4.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	38.2	41.4				mg/L	18	Standard
	Ho-1	165	21.7	48.0				mg/L	23	Standard
	Er	166	36.7	110.2				mg/L	40	Standard
	I	127	2735.2	5.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		99.785	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		95.331	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		87.380
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		88.735
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
V 51 Lower	V	51	
Cr 53 Upper, S, EEE	Cr	53	
As 75 Lower	As	75	

Sample ID: PBS J3 WG588219-02
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Method 6020 - Summary Report

Sample ID: LCSS J3 WG588219-03
Sample Date/Time: Thursday, October 20, 2016 11:03:54
Number of Replicates: 3
Autosampler Position: 224
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	92892.4	3.1				ug/L	76335	Standard
	Be	9	32581.7	2.7	**24.2934**	0.674	2.8	ug/L	18	Standard
	Al	27	11681.2	3.4	**0.0730**	0.004	5.0	ug/L	810	Standard
	Sc	45	23404.7	2.3				ug/L	22700	Standard
	Ti	47	1595.4	5.0	**7.6129**	0.247	3.2	ug/L	25	Standard
	V	51	137259.4	4.2	**18.9461**	1.085	5.7	ug/L	1541	Standard
	Cr	52	192193.2	1.7	**27.6703**	0.307	1.1	ug/L	7881	Standard
	Cr	53	183754.6	2.2	**215.8122**	0.969	0.4	ug/L	932	Standard
	Mn	55	279527.5	1.3	**24.6982**	0.156	0.6	ug/L	1508	Standard
	Co	59	237825.8	1.0	**25.3174**	0.253	1.0	ug/L	282	Standard
	Ni	60	52646.3	0.8	**25.9409**	0.382	1.5	ug/L	91	Standard
	Cu	65	50119.4	1.1	**25.1613**	0.522	2.1	ug/L	205	Standard
	Zn	66	25963.2	1.3	**25.3096**	0.145	0.6	ug/L	369	Standard
>	Ge	72	491225.9	1.8				ug/L	496734	Standard
	As	75	24739.5	1.3	**24.2472**	0.667	2.7	ug/L	-45	Standard
	Se	82	2338.7	1.9	**23.6949**	0.356	1.5	ug/L	18	Standard
	Se-1	77	11580.4	1.8	**174.9586**	3.604	2.1	ug/L	83	Standard
>	Ga	71	215.0	12.3				mg/L	30	Standard
	Rb	85	135.0	26.7				ug/L	23	Standard
	Y	89	383360.1	1.7				ug/L	405333	Standard
>	Rh	103	25.0	20.0				ug/L	17	Standard
	Mo	98	149.2	26.5	**0.0241**	0.012	48.2	ug/L	135	Standard
	Ag	107	155489.6	1.5	**24.7525**	0.652	2.6	ug/L	123	Standard
	Cd	111	43170.2	0.8	**23.7859**	0.133	0.6	mg/L	11	Standard
	Cd	114	110580.1	1.7	**23.5366**	0.506	2.1	ug/L	56	Standard
>	In	115	569674.8	1.3				ug/L	634401	Standard
	Sn	118	262.3	9.6	**0.1620**	0.021	12.8	ug/L	137	Standard
	Sb	123	121178.8	0.6	**25.5239**	0.399	1.6	ug/L	907	Standard
	Ba	135	63985.5	0.4	**25.0676**	0.313	1.2	ug/L	166	Standard
	Ce	140	308.3	13.8				ug/L	57	Standard
>	Tb	159	1245642.8	0.5				ug/L	1347540	Standard
	Ho	165	31.7	39.7				ug/L	23	Standard
	Tl	203	262299.4	0.9	**24.5151**	0.524	2.1	ug/L	45	Standard
	Tl	205	613343.7	1.0	**23.7346**	0.624	2.6	ug/L	112	Standard
	Pb	206	199286.1	1.0	**24.7719**	0.362	1.5	ug/L	825	Standard
	Pb	207	169422.4	1.0	**23.9279**	0.279	1.2	ug/L	679	Standard
	Pb	208	779736.6	1.4	**24.2304**	0.276	1.1	ug/L	3166	Standard
	U	238	675504.9	1.1	**23.3226**	0.223	1.0	ug/L	119	Standard
>	Bi	209	611222.0	1.9				ug/L	668024	Standard

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⌈	**Na**	23	6.7	86.6	**1.7493**	1.511	86.4	mg/L	0	Standard
|	**Mg**	24	98.3	15.5	**0.0449**	0.025	56.2	mg/L	48	Standard
|	**K**	39	11.7	107.9	**-0.0126**	0.131	1038.5	mg/L	8	Standard
|	**Ca**	43	30.0	50.0	**-1.3473**	4.839	359.2	mg/L	27	Standard
|	**Fe**	54	137.8	7.2	**0.0115**	0.011	97.3	mg/L	121	Standard
|	**Fe**	57	303.3	10.6	**-0.1684**	0.108	64.3	mg/L	305	Standard
⌊>	**Sc-1**	45	23404.7	2.3				mg/L	22700	Standard
	Cl	35	6.0					ug/L	3	Standard
	Kr	83	7.0	14.3				ug/L	5	Standard
	Br	81	1656.8	6.2				ug/L	1367	Standard
	P	31	118.3	21.7				ug/L	67	Standard
	S	34	103.3	5.6				ug/L	55	Standard
	Sr	88	140.0	21.7				ug/L	113	Standard
	C	12	493.3	26.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	16.7	69.3				mg/L	10	Standard
	Dy	164	15.5	101.0				mg/L	18	Standard
	Ho-1	165	31.7	39.7				mg/L	23	Standard
	Er	166	23.3	49.5				mg/L	40	Standard
	I	127	2246.8	0.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		121.690	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		98.891	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		89.797
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		91.497
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Li 6 Int Std for sample	Li	6	Rerun sample
Cr 53 Upper, S, EEE	Cr	53	
Se-1 77 Upper, S, EEE	Se-1	77	

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Method 6020 - Summary Report

Sample ID: L1610093001 WG588219-01
Sample Date/Time: Thursday, October 20, 2016 11:06:53
Number of Replicates: 3
Autosampler Position: 225
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	86074.1	4.3				ug/L	76335	Standard
	Be	9	391.7	13.7	**0.3130**	0.050	15.9	ug/L	18	Standard
	Al	27	2264335.2	2.8	**16.1653**	0.262	1.6	ug/L	810	Standard
	Sc	45	24324.5	3.5				ug/L	22700	Standard
	Ti	47	15419.2	3.1	**76.9349**	1.936	2.5	ug/L	25	Standard
	V	51	42728.8	9.9	**5.9045**	0.501	8.5	ug/L	1541	Standard
	Cr	52	56743.1	3.1	**7.5762**	0.169	2.2	ug/L	7881	Standard
	Cr	53	114633.0	6.0	**138.0783**	7.755	5.6	ug/L	932	Standard
	Mn	55	2211049.2	2.5	**201.5039**	1.934	1.0	ug/L	1508	Standard
	Co	59	18059.4	3.8	**1.9470**	0.061	3.1	ug/L	282	Standard
	Ni	60	8274.6	2.2	**4.1574**	0.068	1.6	ug/L	91	Standard
	Cu	65	16561.0	0.7	**8.5093**	0.095	1.1	ug/L	205	Standard
	Zn	66	52243.9	1.1	**52.5777**	0.454	0.9	ug/L	369	Standard
>	Ge	72	477619.4	1.8				ug/L	496734	Standard
	As	75	3219.5	6.0	**3.2984**	0.244	7.4	ug/L	-45	Standard
	Se	82	51.1	8.6	**0.3380**	0.037	10.8	ug/L	18	Standard
	Se-1	77	8375.0	6.6	**129.7723**	7.063	5.4	ug/L	83	Standard
>	Ga	71	5932.8	3.4				mg/L	30	Standard
	Rb	85	40885.1	1.3				ug/L	23	Standard
	Y	89	401223.8	1.6				ug/L	405333	Standard
>	Rh	103	53.3	75.2				ug/L	17	Standard
	Mo	98	3071.3	1.9	**0.9476**	0.017	1.7	ug/L	135	Standard
	Ag	107	322.7	10.4	**0.0313**	0.006	19.5	ug/L	123	Standard
	Cd	111	618.4	1.1	**0.3449**	0.003	1.0	mg/L	11	Standard
	Cd	114	1695.1	6.7	**0.3684**	0.029	7.8	ug/L	56	Standard
>	In	115	548509.3	1.0				ug/L	634401	Standard
	Sn	118	1368.4	6.6	**1.2198**	0.073	6.0	ug/L	137	Standard
	Sb	123	2746.1	14.4	**0.5331**	0.081	15.3	ug/L	907	Standard
	Ba	135	93519.8	1.2	**38.0729**	0.381	1.0	ug/L	166	Standard
	Ce	140	573285.4	2.0				ug/L	57	Standard
>	Tb	159	1222554.6	3.3				ug/L	1347540	Standard
	Ho	165	3310.4	5.3				ug/L	23	Standard
	Tl	203	1035.7	5.4	**0.0952**	0.007	7.3	ug/L	45	Standard
	Tl	205	2391.9	4.9	**0.0935**	0.004	4.0	ug/L	112	Standard
	Pb	206	408983.2	1.2	**52.4642**	0.869	1.7	ug/L	825	Standard
	Pb	207	330302.9	2.1	**48.1308**	0.713	1.5	ug/L	679	Standard
	Pb	208	1552528.3	2.0	**49.7825**	0.462	0.9	ug/L	3166	Standard
	U	238	6687.5	2.3	**0.2362**	0.003	1.1	ug/L	119	Standard
>	Bi	209	593059.5	2.8				ug/L	668024	Standard

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	Na	23	31.7	32.9	**7.8548**	2.374	30.2	mg/L	0	Standard
	Mg	24	106.7	11.8	**0.0504**	0.013	26.5	mg/L	48	Standard
	K	39	23.3	32.7	**0.0963**	0.081	84.3	mg/L	8	Standard
	Ca	43	50.0	34.6	**4.6759**	5.220	111.6	mg/L	27	Standard
	Fe	54	6222.3	4.6	**5.9932**	0.107	1.8	mg/L	121	Standard
	Fe	57	1923.5	6.7	**5.6218**	0.360	6.4	mg/L	305	Standard
>	**Sc-1**	45	24324.5	3.5				mg/L	22700	Standard
	Cl	35	6.7	75.5				ug/L	3	Standard
	Kr	83	4.0	50.0				ug/L	5	Standard
	Br	81	1570.1	6.7				ug/L	1367	Standard
	P	31	121.7	27.4				ug/L	67	Standard
	S	34	101.7	7.5				ug/L	55	Standard
	Sr	88	168.3	24.0				ug/L	113	Standard
	C	12	936.7	14.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	133.3	37.7				mg/L	10	Standard
	Dy	164	5719.6	3.2				mg/L	18	Standard
	Ho-1	165	3310.4	5.3				mg/L	23	Standard
	Er	166	3023.6	1.6				mg/L	40	Standard
	I	127	12633.6	4.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		112.758	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		96.152	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	86.461
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	88.778
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Cr 53 Upper, S, EEE	Cr	53	
Mn 55 Upper, S, EEE	Mn	55	
Se-1 77 Upper, S, EEE	Se-1	77	

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Method 6020 - Summary Report

Sample ID: L1610093002S WG588219-04
Sample Date/Time: Thursday, October 20, 2016 11:10:01
Number of Replicates: 3
Autosampler Position: 226
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	89126.7	4.6				ug/L	76335	Standard
	Be	9	33996.5	5.6	**26.4097**	0.865	3.3	ug/L	18	Standard
	Al	27	2127507.4	8.5	**14.6518**	0.872	5.9	ug/L	810	Standard
	Sc	45	24623.3	3.6				ug/L	22700	Standard
	Ti	47	19749.9	4.5	**98.4809**	0.933	0.9	ug/L	25	Standard
	V	51	248281.5	4.8	**35.3839**	0.831	2.3	ug/L	1541	Standard
	Cr	52	292274.0	3.5	**43.9081**	0.145	0.3	ug/L	7881	Standard
	Cr	53	158902.8	3.1	**191.7074**	2.400	1.3	ug/L	932	Standard
	Mn	55	2779175.2	3.8	**253.1045**	0.135	0.1	ug/L	1508	Standard
	Co	59	271472.9	4.5	**29.6945**	0.217	0.7	ug/L	282	Standard
	Ni	60	190328.9	4.5	**96.4574**	1.210	1.3	ug/L	91	Standard
	Cu	65	118958.7	4.2	**61.4400**	0.283	0.5	ug/L	205	Standard
	Zn	66	103869.6	4.2	**104.6047**	0.478	0.5	ug/L	369	Standard
>	Ge	72	478024.7	3.8				ug/L	496734	Standard
	As	75	30063.1	4.6	**30.2483**	0.303	1.0	ug/L	-45	Standard
	Se	82	2371.6	3.1	**24.7043**	0.346	1.4	ug/L	18	Standard
	Se-1	77	12175.2	2.7	**189.2144**	6.602	3.5	ug/L	83	Standard
>	Ga	71	7778.7	3.6				mg/L	30	Standard
	Rb	85	57258.1	4.3				ug/L	23	Standard
	Y	89	406441.8	5.6				ug/L	405333	Standard
>	Rh	103	50.0	0.0				ug/L	17	Standard
	Mo	98	4123.8	4.3	**1.3031**	0.022	1.7	ug/L	135	Standard
	Ag	107	156495.2	5.3	**26.3299**	0.468	1.8	ug/L	123	Standard
	Cd	111	44260.0	4.3	**25.7837**	0.215	0.8	mg/L	11	Standard
	Cd	114	116647.0	3.6	**26.2534**	0.140	0.5	ug/L	56	Standard
>	In	115	538742.9	3.9				ug/L	634401	Standard
	Sn	118	2278.8	5.5	**2.1221**	0.041	1.9	ug/L	137	Standard
	Sb	123	122234.0	3.7	**27.2280**	0.278	1.0	ug/L	907	Standard
	Ba	135	184375.4	4.9	**76.4516**	1.093	1.4	ug/L	166	Standard
	Ce	140	561028.6	5.6				ug/L	57	Standard
>	Tb	159	1224720.8	3.9				ug/L	1347540	Standard
	Ho	165	3682.1	1.2				ug/L	23	Standard
	Tl	203	267435.3	3.7	**25.7618**	0.314	1.2	ug/L	45	Standard
	Tl	205	625962.3	4.1	**24.9635**	0.504	2.0	ug/L	112	Standard
	Pb	206	784299.5	3.2	**100.6682**	1.038	1.0	ug/L	825	Standard
	Pb	207	648712.2	4.2	**94.5721**	1.111	1.2	ug/L	679	Standard
	Pb	208	3026438.8	3.9	**97.1013**	0.924	1.0	ug/L	3166	Standard
	U	238	686894.6	3.8	**24.4459**	0.282	1.2	ug/L	119	Standard
>	Bi	209	592887.7	3.5				ug/L	668024	Standard

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⌈	**Na**	23	20.0	43.3	**4.9607**	2.200	44.3	mg/L	0	Standard
|	**Mg**	24	120.0	25.3	**0.0661**	0.036	54.9	mg/L	48	Standard
|	**K**	39	38.3	60.2	**0.2334**	0.212	90.7	mg/L	8	Standard
|	**Ca**	43	50.0	26.5	**4.6485**	4.834	104.0	mg/L	27	Standard
|	**Fe**	54	8378.7	6.1	**8.0164**	0.380	4.7	mg/L	121	Standard
|	**Fe**	57	2458.5	8.8	**7.4312**	0.474	6.4	mg/L	305	Standard
⌊>	**Sc-1**	45	24623.3	3.6				mg/L	22700	Standard
	Cl	35	3.3	69.3				ug/L	3	Standard
	Kr	83	5.7	20.4				ug/L	5	Standard
	Br	81	1916.8	18.6				ug/L	1367	Standard
	P	31	138.3	22.1				ug/L	67	Standard
	S	34	75.0	24.0				ug/L	55	Standard
	Sr	88	163.3	9.4				ug/L	113	Standard
	C	12	1243.4	12.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	123.3	28.5				mg/L	10	Standard
	Dy	164	6513.0	3.6				mg/L	18	Standard
	Ho-1	165	3682.1	1.2				mg/L	23	Standard
	Er	166	3447.1	0.9				mg/L	40	Standard
	I	127	15561.3	4.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		116.757	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		96.234	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	84.921
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	88.752
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Cr 53 Upper, S, EEE	Cr	53	
Mn 55 Upper, S, EEE	Mn	55	
Zn 66 Upper, S, EEE	Zn	66	

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Se-1 77 Upper, S, EEE	Se-1	77
Pb 206 Upper, S, EEE	Pb	206

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Method 6020 - Summary Report

Sample ID: L1610093003SD WG588219-05
Sample Date/Time: Thursday, October 20, 2016 11:13:00
Number of Replicates: 3
Autosampler Position: 227
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	93319.4	8.0				ug/L	76335	Standard
	Be	9	35264.3	2.9	**26.2414**	1.512	5.8	ug/L	18	Standard
	Al	27	1522006.1	5.1	**10.0317**	0.321	3.2	ug/L	810	Standard
	Sc	45	24456.4	6.0				ug/L	22700	Standard
	Ti	47	18771.6	3.6	**92.8408**	0.766	0.8	ug/L	25	Standard
	V	51	237164.7	6.4	**33.4987**	1.305	3.9	ug/L	1541	Standard
	Cr	52	243011.2	2.2	**36.0125**	0.838	2.3	ug/L	7881	Standard
	Cr	53	167121.0	4.2	**200.0030**	6.553	3.3	ug/L	932	Standard
	Mn	55	2740438.6	2.9	**247.5630**	2.524	1.0	ug/L	1508	Standard
	Co	59	256262.2	2.5	**27.8090**	0.149	0.5	ug/L	282	Standard
	Ni	60	60668.3	2.6	**30.4753**	0.207	0.7	ug/L	91	Standard
	Cu	65	72591.2	2.4	**37.1729**	0.449	1.2	ug/L	205	Standard
	Zn	66	87323.3	2.4	**87.2164**	0.537	0.6	ug/L	369	Standard
>	Ge	72	481939.2	3.0				ug/L	496734	Standard
	As	75	28744.0	3.0	**28.6967**	0.361	1.3	ug/L	-45	Standard
	Se	82	2307.1	4.6	**23.8184**	0.410	1.7	ug/L	18	Standard
	Se-1	77	12915.8	2.5	**199.0633**	3.161	1.6	ug/L	83	Standard
>	Ga	71	6039.5	4.3				mg/L	30	Standard
	Rb	85	36806.4	3.6				ug/L	23	Standard
	Y	89	399514.3	1.4				ug/L	405333	Standard
>	Rh	103	35.0	14.3				ug/L	17	Standard
	Mo	98	3208.6	3.3	**0.9945**	0.007	0.7	ug/L	135	Standard
	Ag	107	153065.6	4.4	**25.3874**	0.367	1.4	ug/L	123	Standard
	Cd	111	43230.5	2.5	**24.8304**	0.147	0.6	mg/L	11	Standard
	Cd	114	111035.0	3.8	**24.6302**	0.404	1.6	ug/L	56	Standard
>	In	115	546514.5	2.9				ug/L	634401	Standard
	Sn	118	1403.7	3.2	**1.2586**	0.005	0.4	ug/L	137	Standard
	Sb	123	118529.0	3.6	**26.0183**	0.180	0.7	ug/L	907	Standard
	Ba	135	170477.2	2.9	**69.6960**	0.307	0.4	ug/L	166	Standard
	Ce	140	536705.8	3.0				ug/L	57	Standard
>	Tb	159	1200828.4	3.8				ug/L	1347540	Standard
	Ho	165	3087.0	5.3				ug/L	23	Standard
	Tl	203	256508.3	2.5	**24.9234**	0.154	0.6	ug/L	45	Standard
	Tl	205	605710.6	2.7	**24.3666**	0.378	1.6	ug/L	112	Standard
	Pb	206	770041.8	3.2	**99.6744**	1.122	1.1	ug/L	825	Standard
	Pb	207	633031.9	2.6	**93.1017**	1.093	1.2	ug/L	679	Standard
	Pb	208	2961739.1	2.7	**95.8538**	0.685	0.7	ug/L	3166	Standard
	U	238	666859.0	3.0	**23.9375**	0.244	1.0	ug/L	119	Standard
>	Bi	209	587765.5	2.1				ug/L	668024	Standard

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⌈	**Na**	23	25.0	52.9	**6.1572**	3.108	50.5	mg/L	0	Standard
|	**Mg**	24	85.0	41.2	**0.0226**	0.056	250.1	mg/L	48	Standard
|	**K**	39	21.7	35.3	**0.0779**	0.073	93.4	mg/L	8	Standard
|	**Ca**	43	31.7	50.8	**-1.2721**	4.663	366.5	mg/L	27	Standard
|	**Fe**	54	7063.9	2.1	**6.8070**	0.550	8.1	mg/L	121	Standard
|	**Fe**	57	2013.5	4.4	**5.9381**	0.767	12.9	mg/L	305	Standard
⌊>	**Sc-1**	45	24456.4	6.0				mg/L	22700	Standard
	Cl	35	2.7	43.3				ug/L	3	Standard
	Kr	83	7.3	20.8				ug/L	5	Standard
	Br	81	1713.4	5.0				ug/L	1367	Standard
	P	31	120.0	16.7				ug/L	67	Standard
	S	34	98.3	23.5				ug/L	55	Standard
	Sr	88	166.7	21.7				ug/L	113	Standard
	C	12	1083.4	5.4				mg/L	367	Standard
	N	14	6.7	173.2				mg/L	3	Standard
	Hg	202	160.0	33.1				mg/L	10	Standard
	Dy	164	5365.0	5.5				mg/L	18	Standard
	Ho-1	165	3087.0	5.3				mg/L	23	Standard
	Er	166	2770.3	7.5				mg/L	40	Standard
	I	127	14533.6	4.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		122.249	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		97.022	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		86.146
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		87.986
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Li 6 Int Std for sample	Li	6	Rerun sample
Cr 53 Upper, S, EEE	Cr	53	
Mn 55 Upper, S, EEE	Mn	55	

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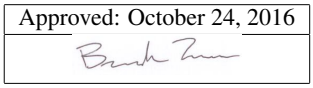

Se-1 77 Upper, S, EEE	Se-1	77	

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Method 6020 - Summary Report

Sample ID: L1610091301
Sample Date/Time: Thursday, October 20, 2016 11:16:00
Number of Replicates: 3
Autosampler Position: 228
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	93559.8	2.5				ug/L	76335	Standard
	Be	9	626.7	12.1	**0.4601**	0.045	9.8	ug/L	18	Standard
	Al	27	4992477.6	1.5	**32.7863**	0.470	1.4	ug/L	810	Standard
	Sc	45	28662.1	0.9				ug/L	22700	Standard
	Ti	47	38035.4	2.2	**191.1778**	4.284	2.2	ug/L	25	Standard
	V	51	138380.6	5.4	**19.7603**	0.894	4.5	ug/L	1541	Standard
	Cr	52	113130.5	0.5	**16.3935**	0.121	0.7	ug/L	7881	Standard
	Cr	53	139533.3	3.0	**169.4067**	6.144	3.6	ug/L	932	Standard
	Mn	55	4598880.7	0.9	**421.8759**	2.992	0.7	ug/L	1508	Standard
	Co	59	72745.3	2.4	**7.9906**	0.112	1.4	ug/L	282	Standard
	Ni	60	37777.7	2.5	**19.2493**	0.331	1.7	ug/L	91	Standard
	Cu	65	40950.6	1.9	**21.2616**	0.250	1.2	ug/L	205	Standard
	Zn	66	86913.9	1.1	**88.1383**	1.282	1.5	ug/L	369	Standard
>	Ge	72	474650.6	1.1				ug/L	496734	Standard
	As	75	10618.5	4.1	**10.7991**	0.370	3.4	ug/L	-45	Standard
	Se	82	56.6	21.4	**0.3995**	0.129	32.3	ug/L	18	Standard
	Se-1	77	11644.5	2.7	**182.1194**	5.931	3.3	ug/L	83	Standard
>	Ga	71	11886.3	2.8				mg/L	30	Standard
	Rb	85	80334.1	1.4				ug/L	23	Standard
	Y	89	560768.6	4.2				ug/L	405333	Standard
>	Rh	103	26.7	47.2				ug/L	17	Standard
	Mo	98	12267.7	1.9	**3.9764**	0.051	1.3	ug/L	135	Standard
	Ag	107	328.7	5.8	**0.0341**	0.004	12.5	ug/L	123	Standard
	Cd	111	350.2	9.5	**0.1979**	0.018	9.3	mg/L	11	Standard
	Cd	114	1011.4	14.3	**0.2246**	0.035	15.6	ug/L	56	Standard
>	In	115	530954.4	1.8				ug/L	634401	Standard
	Sn	118	571.0	4.6	**0.4818**	0.016	3.3	ug/L	137	Standard
	Sb	123	3162.5	8.2	**0.6476**	0.053	8.1	ug/L	907	Standard
	Ba	135	91561.9	2.2	**38.5087**	0.559	1.5	ug/L	166	Standard
	Ce	140	1341031.1	3.6				ug/L	57	Standard
>	Tb	159	1208118.9	1.4				ug/L	1347540	Standard
	Ho	165	21076.3	0.8				ug/L	23	Standard
	Tl	203	2968.6	5.0	**0.2870**	0.019	6.7	ug/L	45	Standard
	Tl	205	7158.4	2.7	**0.2890**	0.003	1.0	ug/L	112	Standard
	Pb	206	124828.9	2.0	**16.2768**	0.328	2.0	ug/L	825	Standard
	Pb	207	99524.6	2.0	**14.7442**	0.360	2.4	ug/L	679	Standard
	Pb	208	472670.7	1.7	**15.4073**	0.284	1.8	ug/L	3166	Standard
	U	238	25056.4	0.9	**0.9069**	0.012	1.4	ug/L	119	Standard
>	Bi	209	581998.3	2.2				ug/L	668024	Standard

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⌈	**Na**	23	38.3	49.4	**8.1449**	4.083	50.1	mg/L	0	Standard
|	**Mg**	24	131.7	9.6	**0.0576**	0.015	26.8	mg/L	48	Standard
|	**K**	39	45.0	33.3	**0.2389**	0.121	50.7	mg/L	8	Standard
|	**Ca**	43	45.0	22.2	**0.9419**	2.628	279.1	mg/L	27	Standard
|	**Fe**	54	18682.8	1.4	**15.4773**	0.336	2.2	mg/L	121	Standard
|	**Fe**	57	5245.9	0.7	**14.7281**	0.130	0.9	mg/L	305	Standard
⌊>	**Sc-1**	45	28662.1	0.9				mg/L	22700	Standard
	Cl	35	6.7	69.3				ug/L	3	Standard
	Kr	83	5.0	40.0				ug/L	5	Standard
	Br	81	1456.7	11.1				ug/L	1367	Standard
	P	31	121.7	20.3				ug/L	67	Standard
	S	34	78.3	19.5				ug/L	55	Standard
	Sr	88	148.3	24.8				ug/L	113	Standard
	C	12	560.0	3.6				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	90.0	61.9				mg/L	10	Standard
	Dy	164	33648.8	2.8				mg/L	18	Standard
	Ho-1	165	21076.3	0.8				mg/L	23	Standard
	Er	166	19706.1	1.5				mg/L	40	Standard
	I	127	20675.8	2.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		122.564	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		95.554	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		83.694
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		87.122
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Li 6 Int Std for sample	Li	6	Rerun sample
Ti 47 Upper, S, EEE	Ti	47	
Cr 53 Upper, S, EEE	Cr	53	

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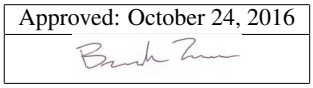

Mn 55 Upper, S, EEE	Mn	55
Se-1 77 Upper, S, EEE	Se-1	77

Approved: October 24, 2016

Method 6020 - Summary Report

Sample ID: L1610091301PS WG588303-01
Sample Date/Time: Thursday, October 20, 2016 11:18:59
Number of Replicates: 3
Autosampler Position: 229
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	94677.0	10.4				ug/L	76335	Standard
	Be	9	69745.2	1.8	**51.3068**	4.284	8.4	ug/L	18	Standard
	Al	27	5197163.8	6.8	**33.8039**	1.263	3.7	ug/L	810	Standard
	Sc	45	28443.4	4.4				ug/L	22700	Standard
	Ti	47	37938.5	3.4	**188.1699**	4.177	2.2	ug/L	25	Standard
	V	51	519278.5	3.0	**73.7989**	1.262	1.7	ug/L	1541	Standard
	Cr	52	469811.1	2.3	**70.8531**	0.631	0.9	ug/L	7881	Standard
	Cr	53	186146.9	2.4	**223.3442**	2.789	1.2	ug/L	932	Standard
	Mn	55	5233445.1	1.5	**473.8290**	1.537	0.3	ug/L	1508	Standard
	Co	59	561051.2	2.0	**61.0436**	0.502	0.8	ug/L	282	Standard
	Ni	60	142241.7	1.5	**71.6551**	0.500	0.7	ug/L	91	Standard
	Cu	65	141625.7	2.0	**72.7235**	0.431	0.6	ug/L	205	Standard
	Zn	66	137473.3	1.8	**137.6868**	1.373	1.0	ug/L	369	Standard
>	**Ge**	72	480912.5	1.4				ug/L	496734	Standard
	As	75	62598.4	1.0	**62.5585**	0.361	0.6	ug/L	-45	Standard
	Se	82	4788.4	2.6	**49.7653**	0.647	1.3	ug/L	18	Standard
	Se-1	77	15208.3	2.3	**235.0512**	3.620	1.5	ug/L	83	Standard
>	**Ga**	71	12278.3	3.9				mg/L	30	Standard
	Rb	85	80863.6	0.8				ug/L	23	Standard
	Y	89	548182.2	3.7				ug/L	405333	Standard
>	**Rh**	103	46.7	32.7				ug/L	17	Standard
	Mo	98	12308.8	2.9	**3.9463**	0.073	1.8	ug/L	135	Standard
	Ag	107	326455.5	3.0	**55.1658**	0.355	0.6	ug/L	123	Standard
	Cd	111	85551.5	2.9	**50.0318**	0.342	0.7	mg/L	11	Standard
	Cd	114	221634.3	3.1	**50.0623**	0.149	0.3	ug/L	56	Standard
>	**In**	115	536812.3	2.9				ug/L	634401	Standard
	Sn	118	605.3	4.7	**0.5090**	0.010	2.1	ug/L	137	Standard
	Sb	123	238542.6	1.8	**53.4025**	0.848	1.6	ug/L	907	Standard
	Ba	135	217023.4	2.3	**90.3525**	0.739	0.8	ug/L	166	Standard
	Ce	140	1355707.2	1.9				ug/L	57	Standard
>	**Tb**	159	1223819.5	1.8				ug/L	1347540	Standard
	Ho	165	21218.2	3.6				ug/L	23	Standard
	Tl	203	509947.6	3.4	**49.7099**	0.146	0.3	ug/L	45	Standard
	Tl	205	1218553.4	2.5	**49.1895**	0.885	1.8	ug/L	112	Standard
	Pb	206	508027.7	3.3	**65.9592**	0.471	0.7	ug/L	825	Standard
	Pb	207	436898.1	2.2	**64.4613**	0.909	1.4	ug/L	679	Standard
	Pb	208	1994630.6	2.7	**64.7553**	0.817	1.3	ug/L	3166	Standard
	U	238	1398989.7	3.0	**50.3884**	0.512	1.0	ug/L	119	Standard
>	**Bi**	209	585920.5	3.3				ug/L	668024	Standard

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⌈	**Na**	23	40.0	37.5	**8.5144**	3.139	36.9	mg/L	0	Standard
|	**Mg**	24	135.0	11.1	**0.0624**	0.011	17.1	mg/L	48	Standard
|	**K**	39	56.7	33.4	**0.3445**	0.175	50.8	mg/L	8	Standard
|	**Ca**	43	55.0	77.7	**3.5736**	11.003	307.9	mg/L	27	Standard
|	**Fe**	54	19187.2	6.3	**16.0249**	0.888	5.5	mg/L	121	Standard
|	**Fe**	57	5357.6	0.9	**15.2185**	0.820	5.4	mg/L	305	Standard
⌊>	**Sc-1**	45	28443.4	4.4				mg/L	22700	Standard
	Cl	35	9.3	68.9				ug/L	3	Standard
	Kr	83	4.7	53.9				ug/L	5	Standard
	Br	81	1350.1	15.5				ug/L	1367	Standard
	P	31	131.7	17.9				ug/L	67	Standard
	S	34	105.0	51.5				ug/L	55	Standard
	Sr	88	161.7	22.8				ug/L	113	Standard
	C	12	606.7	22.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	110.0	24.1				mg/L	10	Standard
	Dy	164	32608.8	2.6				mg/L	18	Standard
	Ho-1	165	21218.2	3.6				mg/L	23	Standard
	Er	166	19168.8	1.4				mg/L	40	Standard
	I	127	20335.3	5.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		124.028	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		96.815	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		84.617
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		87.709
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Li 6 Int Std for sample	Li	6	Rerun sample
Ti 47 Upper, S, EEE	Ti	47	
Cr 53 Upper, S, EEE	Cr	53	

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Mn 55 Upper, S, EEE	Mn	55
Zn 66 Upper, S, EEE	Zn	66
Se-1 77 Upper, S, EEE	Se-1	77

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Method 6020 - Summary Report

Sample ID: L1610091301SDL WG588303-02
Sample Date/Time: Thursday, October 20, 2016 11:21:59
Number of Replicates: 3
Autosampler Position: 230
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	67240.5	0.5				ug/L	76335	Standard
	Be	9	131.7	12.2	**0.1326**	0.016	12.2	ug/L	18	Standard
	Al	27	796104.3	1.6	**7.2694**	0.079	1.1	ug/L	810	Standard
	Sc	45	21852.4	0.7				ug/L	22700	Standard
	Ti	47	6528.4	1.8	**34.9225**	0.417	1.2	ug/L	25	Standard
	V	51	22415.1	2.7	**3.2335**	0.044	1.4	ug/L	1541	Standard
	Cr	52	24171.9	2.8	**2.8254**	0.071	2.5	ug/L	7881	Standard
	Cr	53	37361.0	3.4	**47.6453**	1.231	2.6	ug/L	932	Standard
	Mn	55	800479.4	1.6	**78.3370**	1.035	1.3	ug/L	1508	Standard
	Co	59	13313.5	0.9	**1.5356**	0.022	1.4	ug/L	282	Standard
	Ni	60	6983.9	1.9	**3.7661**	0.059	1.6	ug/L	91	Standard
	Cu	65	8041.8	2.1	**4.4091**	0.077	1.7	ug/L	205	Standard
	Zn	66	19154.1	1.3	**20.5981**	0.095	0.5	ug/L	369	Standard
>	Ge	72	444550.4	1.6				ug/L	496734	Standard
	As	75	2090.3	8.1	**2.3157**	0.150	6.5	ug/L	-45	Standard
	Se	82	27.9	24.7	**0.1164**	0.081	69.4	ug/L	18	Standard
	Se-1	77	2690.6	2.7	**44.0516**	0.779	1.8	ug/L	83	Standard
>	Ga	71	2206.8	3.0				mg/L	30	Standard
	Rb	85	15010.8	2.7				ug/L	23	Standard
	Y	89	372132.9	0.6				ug/L	405333	Standard
>	Rh	103	23.3	65.5				ug/L	17	Standard
	Mo	98	2259.9	1.9	**0.7801**	0.019	2.5	ug/L	135	Standard
	Ag	107	158.7	17.5	**0.0074**	0.006	74.8	ug/L	123	Standard
	Cd	111	72.1	12.6	**0.0372**	0.005	14.4	mg/L	11	Standard
	Cd	114	241.3	6.4	**0.0535**	0.005	10.0	ug/L	56	Standard
>	In	115	488107.6	2.5				ug/L	634401	Standard
	Sn	118	138.3	11.5	**0.0698**	0.014	19.7	ug/L	137	Standard
	Sb	123	1685.4	28.1	**0.3454**	0.110	32.0	ug/L	907	Standard
	Ba	135	17884.9	1.0	**8.1475**	0.140	1.7	ug/L	166	Standard
	Ce	140	259546.0	1.2				ug/L	57	Standard
>	Tb	159	1141812.9	1.6				ug/L	1347540	Standard
	Ho	165	4073.9	5.7				ug/L	23	Standard
	Tl	203	709.3	3.6	**0.0680**	0.003	3.8	ug/L	45	Standard
	Tl	205	1616.8	4.6	**0.0666**	0.003	4.1	ug/L	112	Standard
	Pb	206	24251.4	1.5	**3.2527**	0.022	0.7	ug/L	825	Standard
	Pb	207	19224.2	2.1	**2.9293**	0.040	1.4	ug/L	679	Standard
	Pb	208	91547.1	0.9	**3.0678**	0.008	0.3	ug/L	3166	Standard
	U	238	4860.1	1.5	**0.1820**	0.001	0.7	ug/L	119	Standard
>	Bi	209	558128.2	1.1				ug/L	668024	Standard

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⌈	**Na**	23	6.7	43.3	**1.8538**	0.787	42.5	mg/L	0	Standard
|	**Mg**	24	68.3	4.2	**0.0087**	0.005	57.7	mg/L	48	Standard
|	**K**	39	16.7	91.7	**0.0475**	0.165	346.4	mg/L	8	Standard
|	**Ca**	43	30.0	28.9	**-0.5902**	3.039	514.9	mg/L	27	Standard
|	**Fe**	54	3643.6	0.4	**3.8622**	0.021	0.5	mg/L	121	Standard
|	**Fe**	57	1346.7	5.1	**4.0937**	0.238	5.8	mg/L	305	Standard
⌊>	**Sc-1**	45	21852.4	0.7				mg/L	22700	Standard
	Cl	35	3.3	69.3				ug/L	3	Standard
	Kr	83	4.7	32.7				ug/L	5	Standard
	Br	81	1146.7	13.5				ug/L	1367	Standard
	P	31	56.7	36.7				ug/L	67	Standard
	S	34	75.0	20.0				ug/L	55	Standard
	Sr	88	150.0	12.0				ug/L	113	Standard
	C	12	250.0	25.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	6601.1	5.6				mg/L	18	Standard
	Ho-1	165	4073.9	5.7				mg/L	23	Standard
	Er	166	3697.1	7.6				mg/L	40	Standard
	I	127	6834.9	2.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		88.086	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		89.495	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	76.940
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	83.549
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610091301SDL WG588303-02
Sample Date/Time: Thursday, October 20, 2016 11:24:58
Number of Replicates: 3
Autosampler Position: 231
Sample Description: 25
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	61262.0	1.6				ug/L	76335	Standard
	Be	9	28.3	44.4	**0.0292**	0.015	50.3	ug/L	18	Standard
	Al	27	152231.0	1.1	**1.5224**	0.013	0.8	ug/L	810	Standard
	Sc	45	21063.0	1.6				ug/L	22700	Standard
	Ti	47	1276.4	4.4	**6.6986**	0.198	3.0	ug/L	25	Standard
	V	51	3949.7	13.9	**0.3840**	0.077	20.0	ug/L	1541	Standard
	Cr	52	8671.8	2.5	**0.2509**	0.020	8.0	ug/L	7881	Standard
	Cr	53	11561.1	5.7	**13.9721**	1.061	7.6	ug/L	932	Standard
	Mn	55	160441.2	1.8	**15.5967**	0.238	1.5	ug/L	1508	Standard
	Co	59	2841.9	1.4	**0.3014**	0.008	2.5	ug/L	282	Standard
	Ni	60	1416.7	2.6	**0.7287**	0.028	3.8	ug/L	91	Standard
	Cu	65	1737.8	0.5	**0.9018**	0.017	1.9	ug/L	205	Standard
	Zn	66	4545.7	0.9	**4.7374**	0.067	1.4	ug/L	369	Standard
>	Ge	72	445617.4	2.0				ug/L	496734	Standard
	As	75	355.5	11.5	**0.4428**	0.048	10.9	ug/L	-45	Standard
	Se	82	18.1	12.9	**0.0051**	0.031	602.4	ug/L	18	Standard
	Se-1	77	772.4	6.0	**11.8074**	1.059	9.0	ug/L	83	Standard
>	Ga	71	525.0	13.5				mg/L	30	Standard
	Rb	85	2963.6	5.2				ug/L	23	Standard
	Y	89	343828.0	1.5				ug/L	405333	Standard
>	Rh	103	20.0	25.0				ug/L	17	Standard
	Mo	98	426.5	5.7	**0.1278**	0.006	4.8	ug/L	135	Standard
	Ag	107	93.3	12.3	**-0.0050**	0.002	40.8	ug/L	123	Standard
	Cd	111	19.8	14.5	**0.0034**	0.002	52.7	mg/L	11	Standard
	Cd	114	55.2	13.8	**0.0070**	0.002	29.0	ug/L	56	Standard
>	In	115	495100.3	1.9				ug/L	634401	Standard
	Sn	118	53.0	11.5	**-0.0216**	0.007	33.8	ug/L	137	Standard
	Sb	123	414.9	31.8	**0.0320**	0.032	99.5	ug/L	907	Standard
	Ba	135	3661.4	3.1	**1.6062**	0.019	1.2	ug/L	166	Standard
	Ce	140	53507.7	2.2				ug/L	57	Standard
>	Tb	159	1150960.5	3.0				ug/L	1347540	Standard
	Ho	165	830.0	6.9				ug/L	23	Standard
	Tl	203	269.0	8.7	**0.0224**	0.002	8.9	ug/L	45	Standard
	Tl	205	560.0	12.1	**0.0215**	0.003	13.9	ug/L	112	Standard
	Pb	206	5367.6	4.0	**0.6647**	0.021	3.2	ug/L	825	Standard
	Pb	207	4211.3	2.8	**0.5922**	0.011	1.8	ug/L	679	Standard
	Pb	208	19952.1	2.0	**0.6149**	0.005	0.8	ug/L	3166	Standard
	U	238	954.0	2.6	**0.0337**	0.001	1.6	ug/L	119	Standard
>	Bi	209	567384.8	1.3				ug/L	668024	Standard

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	Na	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
	Mg	24	45.0	29.4	**-0.0241**	0.022	90.8	mg/L	48	Standard
	K	39	10.0	86.6	**-0.0201**	0.097	482.1	mg/L	8	Standard
	Ca	43	46.7	52.9	**6.0679**	9.441	155.6	mg/L	27	Standard
	Fe	54	774.3	11.5	**0.7496**	0.088	11.7	mg/L	121	Standard
	Fe	57	435.0	14.1	**0.5085**	0.283	55.7	mg/L	305	Standard
>	**Sc-1**	45	21063.0	1.6				mg/L	22700	Standard
	Cl	35	3.3	69.3				ug/L	3	Standard
	Kr	83	3.0	33.3				ug/L	5	Standard
	Br	81	1106.7	7.8				ug/L	1367	Standard
	P	31	58.3	38.7				ug/L	67	Standard
	S	34	81.7	41.7				ug/L	55	Standard
	Sr	88	125.0	12.0				ug/L	113	Standard
	C	12	206.7	20.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	20.0	86.6				mg/L	10	Standard
	Dy	164	1291.8	4.9				mg/L	18	Standard
	Ho-1	165	830.0	6.9				mg/L	23	Standard
	Er	166	730.0	14.8				mg/L	40	Standard
	I	127	3945.5	5.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		80.254	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		89.709	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	78.042
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	84.935
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 11:27:59
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71445.4	7.5				ug/L	76335	Standard
	Be	9	50836.8	2.7	**49.4365**	3.578	7.2	ug/L	18	Standard
	Al	27	5572096.2	6.6	**47.9853**	2.716	5.7	ug/L	810	Standard
	Sc	45	22702.0	1.5				ug/L	22700	Standard
	Ti	47	19654.4	6.0	**100.1744**	6.703	6.7	ug/L	25	Standard
	V	51	336740.3	7.4	**49.1327**	3.907	8.0	ug/L	1541	Standard
	Cr	52	319326.5	6.2	**49.1579**	3.413	6.9	ug/L	7881	Standard
	Cr	53	43535.9	5.9	**52.8853**	3.558	6.7	ug/L	932	Standard
	Mn	55	525664.1	5.1	**48.8484**	2.734	5.6	ug/L	1508	Standard
	Co	59	442777.8	4.9	**49.5246**	2.818	5.7	ug/L	282	Standard
	Ni	60	95521.2	6.0	**49.4618**	3.372	6.8	ug/L	91	Standard
	Cu	65	94132.8	4.0	**49.6775**	2.447	4.9	ug/L	205	Standard
	Zn	66	48660.4	4.2	**49.9859**	2.462	4.9	ug/L	369	Standard
>	Ge	72	467931.6	1.3				ug/L	496734	Standard
	As	75	48635.3	4.2	**49.9749**	2.424	4.9	ug/L	-45	Standard
	Se	82	4667.5	4.2	**49.8704**	2.397	4.8	ug/L	18	Standard
	Se-1	77	3348.4	7.5	**52.3197**	4.389	8.4	ug/L	83	Standard
>	Ga	71	71.7	4.0				mg/L	30	Standard
	Rb	85	615.0	8.6				ug/L	23	Standard
	Y	89	374049.3	0.6				ug/L	405333	Standard
>	Rh	103	36.7	7.9				ug/L	17	Standard
	Mo	98	339374.7	3.5	**102.5767**	4.443	4.3	ug/L	135	Standard
	Ag	107	334837.4	3.1	**53.0745**	2.166	4.1	ug/L	123	Standard
	Cd	111	91275.5	3.4	**50.0694**	2.137	4.3	mg/L	11	Standard
	Cd	114	242318.8	4.8	**51.3416**	2.759	5.4	ug/L	56	Standard
>	In	115	572448.7	1.3				ug/L	634401	Standard
	Sn	118	55609.3	3.1	**50.4730**	2.168	4.3	ug/L	137	Standard
	Sb	123	242712.8	4.6	**50.9521**	2.708	5.3	ug/L	907	Standard
	Ba	135	130579.6	3.1	**50.9663**	2.041	4.0	ug/L	166	Standard
	Ce	140	196.7	26.5				ug/L	57	Standard
>	Tb	159	1282844.5	0.9				ug/L	1347540	Standard
	Ho	165	58.3	26.2				ug/L	23	Standard
	Tl	203	521371.5	4.4	**48.3993**	1.983	4.1	ug/L	45	Standard
	Tl	205	1257963.2	5.2	**48.3573**	2.773	5.7	ug/L	112	Standard
	Pb	206	396447.9	3.6	**49.0053**	1.788	3.6	ug/L	825	Standard
	Pb	207	344563.1	5.2	**48.3824**	2.285	4.7	ug/L	679	Standard
	Pb	208	1563340.8	4.2	**48.3076**	1.794	3.7	ug/L	3166	Standard
	U	238	1377441.5	4.5	**47.2362**	1.865	3.9	ug/L	119	Standard
>	Bi	209	615390.5	2.7				ug/L	668024	Standard

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	Na	23	11.7	24.7	**3.1207**	0.741	23.8	mg/L	0	Standard
	Mg	24	3280.4	7.2	**4.7213**	0.384	8.1	mg/L	48	Standard
	K	39	428.3	5.4	**4.3402**	0.310	7.2	mg/L	8	Standard
	Ca	43	33.3	34.6	**0.1236**	3.818	3087.7	mg/L	27	Standard
	Fe	54	4484.8	3.6	**4.6015**	0.218	4.7	mg/L	121	Standard
	Fe	57	1436.7	2.6	**4.2414**	0.191	4.5	mg/L	305	Standard
>	**Sc-1**	45	22702.0	1.5				mg/L	22700	Standard
	Cl	35	2.7	86.6				ug/L	3	Standard
	Kr	83	2.3	65.5				ug/L	5	Standard
	Br	81	1090.0	2.8				ug/L	1367	Standard
	P	31	123.3	6.2				ug/L	67	Standard
	S	34	75.0	41.6				ug/L	55	Standard
	Sr	88	150.0	5.8				ug/L	113	Standard
	C	12	333.3	21.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	18.7	45.8				mg/L	18	Standard
	Ho-1	165	58.3	26.2				mg/L	23	Standard
	Er	166	26.7	114.6				mg/L	40	Standard
	I	127	2673.6	8.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	98.873		
	Al	27	95.971		
	Sc	45			
	Ti	47	100.174		
	V	51	98.265		
	Cr	52	98.316		
	Cr	53			
	Mn	55	97.697		
	Co	59	99.049		
	Ni	60	98.924		
	Cu	65	99.355		
	Zn	66	99.972		
>	Ge	72		94.202	
	As	75	99.950		
	Se	82	99.741		
	Se-1	77			
>	Ga	71			

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	Rb	85		
	Y	89		
>	Rh	103		
	Mo	98	102.577	
	Ag	107	106.149	
	Cd	111	100.139	
	Cd	114		
>	In	115		90.234
	Sn	118	100.946	
	Sb	123	101.904	
	Ba	135	101.933	
	Ce	140		
>	Tb	159		
	Ho	165		
	Tl	203	96.799	
	Tl	205		
	Pb	206		
	Pb	207		
	Pb	208	96.615	
	U	238	94.472	
>	Bi	209		92.121
	Na	23		
	Mg	24		
	K	39		
	Ca	43		
	Fe	54		
	Fe	57		
>	Sc-1	45		
	Cl	35		
	Kr	83		
	Br	81		
	P	31		
	S	34		
	Sr	88		
	C	12		
	N	14		
	Hg	202		
	Dy	164		
	Ho-1	165		
	Er	166		
	I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 11:30:58
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	63462.8	3.9				ug/L	76335	Standard
	Be	9	78.3	125.5	**0.0798**	0.102	127.9	ug/L	18	Standard
	Al	27	11268.9	150.7	**0.1007**	0.157	155.8	ug/L	810	Standard
	Sc	45	20206.8	2.0				ug/L	22700	Standard
	Ti	47	69.0	93.2	**0.2362**	0.347	146.7	ug/L	25	Standard
	V	51	1645.5	90.1	**0.0325**	0.230	707.3	ug/L	1541	Standard
	Cr	52	6111.6	17.9	**-0.1603**	0.185	115.2	ug/L	7881	Standard
	Cr	53	2783.6	15.3	**2.5885**	0.601	23.2	ug/L	932	Standard
	Mn	55	6187.8	149.3	**0.5254**	0.910	173.2	ug/L	1508	Standard
	Co	59	831.7	107.0	**0.0661**	0.105	159.4	ug/L	282	Standard
	Ni	60	211.0	93.3	**0.0738**	0.108	146.0	ug/L	91	Standard
	Cu	65	261.3	73.1	**0.0840**	0.107	126.9	ug/L	205	Standard
	Zn	66	318.0	52.7	**0.1640**	0.182	110.8	ug/L	369	Standard
>	Ge	72	440538.7	3.7				ug/L	496734	Standard
	As	75	35.7	245.4	**0.0989**	0.095	95.6	ug/L	-45	Standard
	Se	82	16.4	76.1	**-0.0143**	0.141	981.3	ug/L	18	Standard
	Se-1	77	180.3	8.9	**1.9032**	0.225	11.8	ug/L	83	Standard
>	Ga	71	25.0	103.9				mg/L	30	Standard
	Rb	85	76.7	140.7				ug/L	23	Standard
	Y	89	355719.0	0.5				ug/L	405333	Standard
>	Rh	103	10.0	50.0				ug/L	17	Standard
	Mo	98	234.6	33.0	**0.0507**	0.025	49.6	ug/L	135	Standard
	Ag	107	224.3	85.7	**0.0138**	0.031	225.4	ug/L	123	Standard
	Cd	111	58.7	118.1	**0.0234**	0.039	165.3	mg/L	11	Standard
	Cd	114	134.8	95.4	**0.0224**	0.028	124.1	ug/L	56	Standard
>	In	115	568773.0	3.3				ug/L	634401	Standard
	Sn	118	69.0	23.9	**-0.0141**	0.016	116.0	ug/L	137	Standard
	Sb	123	426.1	68.0	**0.0227**	0.064	282.8	ug/L	907	Standard
	Ba	135	129.0	112.9	**0.0040**	0.058	1445.9	ug/L	166	Standard
	Ce	140	383.3	154.0				ug/L	57	Standard
>	Tb	159	1205557.9	0.8				ug/L	1347540	Standard
	Ho	165	8.3	34.6				ug/L	23	Standard
	Tl	203	266.0	80.9	**0.0209**	0.021	98.7	ug/L	45	Standard
	Tl	205	678.4	77.0	**0.0251**	0.021	82.5	ug/L	112	Standard
	Pb	206	658.0	42.3	**0.0286**	0.035	123.8	ug/L	825	Standard
	Pb	207	552.3	43.3	**0.0304**	0.035	114.0	ug/L	679	Standard
	Pb	208	2560.4	47.1	**0.0273**	0.038	140.4	ug/L	3166	Standard
	U	238	517.3	102.0	**0.0165**	0.019	113.1	ug/L	119	Standard
>	Bi	209	596366.9	0.5				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	41.7	6.9	**-0.0268**	0.004	14.4	mg/L	48	Standard
|	**K**	39	13.3	21.7	**0.0240**	0.035	145.0	mg/L	8	Standard
|	**Ca**	43	36.7	28.4	**2.8850**	4.114	142.6	mg/L	27	Standard
|	**Fe**	54	54.7	31.5	**-0.0645**	0.022	34.0	mg/L	121	Standard
|	**Fe**	57	320.0	13.9	**0.0867**	0.221	254.4	mg/L	305	Standard
⌊>	**Sc-1**	45	20206.8	2.0				mg/L	22700	Standard
	Cl	35	4.7	49.5				ug/L	3	Standard
	Kr	83	3.7	63.0				ug/L	5	Standard
	Br	81	1203.4	19.0				ug/L	1367	Standard
	P	31	46.7	6.2				ug/L	67	Standard
	S	34	68.3	48.7				ug/L	55	Standard
	Sr	88	125.0	8.0				ug/L	113	Standard
	C	12	330.0	24.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	22.4	182.5				mg/L	18	Standard
	Ho-1	165	8.3	34.6				mg/L	23	Standard
	Er	166	20.0	50.0				mg/L	40	Standard
	I	127	2485.2	19.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		88.687	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	89.655
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	89.273
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Mn	55	

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 11:34:12
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73816.4	5.7				ug/L	76335	Standard
	Be	9	11.7	65.5	**0.0077**	0.006	83.4	ug/L	18	Standard
	Al	27	623.3	3.8	**0.0008**	0.000	44.7	ug/L	810	Standard
	Sc	45	23176.0	0.8				ug/L	22700	Standard
	Ti	47	20.0	10.0	**-0.0417**	0.009	20.7	ug/L	25	Standard
	V	51	1266.9	10.3	**-0.0481**	0.016	32.8	ug/L	1541	Standard
	Cr	52	8096.5	1.2	**0.0203**	0.029	140.7	ug/L	7881	Standard
	Cr	53	2673.6	1.2	**2.0451**	0.069	3.4	ug/L	932	Standard
	Mn	55	979.7	2.9	**0.0016**	0.003	161.3	ug/L	1508	Standard
	Co	59	275.3	9.7	**-0.0035**	0.002	71.3	ug/L	282	Standard
	Ni	60	108.7	8.9	**0.0108**	0.004	38.6	ug/L	91	Standard
	Cu	65	108.0	19.7	**-0.0084**	0.011	130.0	ug/L	205	Standard
	Zn	66	146.3	4.9	**-0.0410**	0.007	16.5	ug/L	369	Standard
>	Ge	72	495787.3	1.4				ug/L	496734	Standard
	As	75	-28.8	126.9	**0.0312**	0.035	113.4	ug/L	-45	Standard
	Se	82	21.1	37.3	**0.0145**	0.077	534.7	ug/L	18	Standard
	Se-1	77	143.7	9.9	**1.0135**	0.243	24.0	ug/L	83	Standard
>	Ga	71	16.7	75.5				mg/L	30	Standard
	Rb	85	21.7	70.5				ug/L	23	Standard
	Y	89	403945.7	0.8				ug/L	405333	Standard
>	Rh	103	13.3	21.7				ug/L	17	Standard
	Mo	98	126.5	36.4	**0.0121**	0.012	97.4	ug/L	135	Standard
	Ag	107	101.0	25.4	**-0.0082**	0.003	40.9	ug/L	123	Standard
	Cd	111	8.8	29.5	**-0.0049**	0.001	24.2	mg/L	11	Standard
	Cd	114	27.9	29.1	**-0.0014**	0.002	113.5	ug/L	56	Standard
>	In	115	655132.8	1.4				ug/L	634401	Standard
	Sn	118	139.7	13.6	**0.0334**	0.014	40.8	ug/L	137	Standard
	Sb	123	1823.9	47.1	**0.2654**	0.156	58.8	ug/L	907	Standard
	Ba	135	34.0	14.7	**-0.0353**	0.002	5.3	ug/L	166	Standard
	Ce	140	41.7	18.3				ug/L	57	Standard
>	Tb	159	1390262.1	1.9				ug/L	1347540	Standard
	Ho	165	20.0	25.0				ug/L	23	Standard
	Tl	203	147.0	19.2	**0.0080**	0.003	32.8	ug/L	45	Standard
	Tl	205	343.3	13.5	**0.0104**	0.002	18.9	ug/L	112	Standard
	Pb	206	477.0	0.7	**-0.0009**	0.001	107.0	ug/L	825	Standard
	Pb	207	395.0	4.0	**0.0015**	0.001	70.0	ug/L	679	Standard
	Pb	208	1869.4	2.8	**-0.0010**	0.001	80.0	ug/L	3166	Standard
	U	238	58.3	15.9	**0.0001**	0.000	569.8	ug/L	119	Standard
>	Bi	209	666901.8	2.4				ug/L	668024	Standard

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Method 6020 - Summary Report

Sample ID: PBW 4W WG588149-02
Sample Date/Time: Thursday, October 20, 2016 11:37:52
Number of Replicates: 3
Autosampler Position: 232
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71732.8	2.8				ug/L	76335	Standard
	Be	9	10.0	50.0	**0.0066**	0.005	72.1	ug/L	18	Standard
	Al	27	15566.3	2.5	**0.1291**	0.006	4.8	ug/L	810	Standard
	Sc	45	22084.4	1.7				ug/L	22700	Standard
	Ti	47	25.0	6.9	**-0.0135**	0.009	63.8	ug/L	25	Standard
	V	51	1231.3	3.9	**-0.0472**	0.007	13.8	ug/L	1541	Standard
	Cr	52	10729.5	2.0	**0.4648**	0.036	7.7	ug/L	7881	Standard
	Cr	53	2631.9	2.6	**2.0982**	0.085	4.1	ug/L	932	Standard
	Mn	55	1596.1	1.7	**0.0604**	0.002	3.6	ug/L	1508	Standard
	Co	59	309.7	3.4	**0.0013**	0.001	95.8	ug/L	282	Standard
	Ni	60	267.0	8.6	**0.0926**	0.012	12.9	ug/L	91	Standard
	Cu	65	403.3	0.4	**0.1455**	0.001	0.5	ug/L	205	Standard
	Zn	66	1391.1	2.2	**1.2148**	0.032	2.6	ug/L	369	Standard
>	Ge	72	479838.3	0.2				ug/L	496734	Standard
	As	75	-46.5	146.2	**0.0129**	0.068	526.8	ug/L	-45	Standard
	Se	82	12.3	81.2	**-0.0703**	0.104	148.5	ug/L	18	Standard
	Se-1	77	120.0	3.6	**0.7149**	0.072	10.0	ug/L	83	Standard
>	Ga	71	36.7	28.4				mg/L	30	Standard
	Rb	85	35.0	42.9				ug/L	23	Standard
	Y	89	395092.3	2.7				ug/L	405333	Standard
>	Rh	103	11.7	137.8				ug/L	17	Standard
	Mo	98	69.6	12.3	**-0.0019**	0.002	108.9	ug/L	135	Standard
	Ag	107	93.7	15.0	**-0.0085**	0.002	23.9	ug/L	123	Standard
	Cd	111	7.2	55.8	**-0.0055**	0.002	37.0	mg/L	11	Standard
	Cd	114	50.2	34.3	**0.0031**	0.003	102.7	ug/L	56	Standard
>	In	115	624783.0	1.5				ug/L	634401	Standard
	Sn	118	117.7	11.0	**0.0205**	0.009	45.3	ug/L	137	Standard
	Sb	123	778.9	50.5	**0.0807**	0.073	91.0	ug/L	907	Standard
	Ba	135	94.0	10.3	**-0.0133**	0.004	27.4	ug/L	166	Standard
	Ce	140	101.7	31.6				ug/L	57	Standard
>	Tb	159	1313509.0	1.1				ug/L	1347540	Standard
	Ho	165	13.3	57.3				ug/L	23	Standard
	Tl	203	116.3	8.6	**0.0058**	0.001	15.6	ug/L	45	Standard
	Tl	205	215.0	26.2	**0.0061**	0.002	34.5	ug/L	112	Standard
	Pb	206	544.3	2.0	**0.0096**	0.001	5.6	ug/L	825	Standard
	Pb	207	446.3	5.3	**0.0108**	0.003	27.0	ug/L	679	Standard
	Pb	208	2108.1	2.2	**0.0085**	0.001	7.1	ug/L	3166	Standard
	U	238	40.7	19.9	**-0.0005**	0.000	56.7	ug/L	119	Standard
>	Bi	209	637814.4	1.3				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	70.0	18.9	**0.0100**	0.019	187.3	mg/L	48	Standard
|	**K**	39	6.7	43.3	**-0.0606**	0.032	53.5	mg/L	8	Standard
|	**Ca**	43	26.7	28.6	**-1.8785**	2.592	138.0	mg/L	27	Standard
|	**Fe**	54	145.6	23.8	**0.0287**	0.040	140.4	mg/L	121	Standard
|	**Fe**	57	315.0	3.2	**-0.0536**	0.039	72.8	mg/L	305	Standard
⌊>	**Sc-1**	45	22084.4	1.7				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	3.0	33.3				ug/L	5	Standard
	Br	81	1370.1	6.7				ug/L	1367	Standard
	P	31	98.3	20.5				ug/L	67	Standard
	S	34	73.3	3.9				ug/L	55	Standard
	Sr	88	140.0	12.9				ug/L	113	Standard
	C	12	280.0	16.4				mg/L	367	Standard
	N	14	6.7	86.6				mg/L	3	Standard
	Hg	202	6.7	173.2				mg/L	10	Standard
	Dy	164	12.2	45.2				mg/L	18	Standard
	Ho-1	165	13.3	57.3				mg/L	23	Standard
	Er	166	23.3	49.5				mg/L	40	Standard
	I	127	2656.9	6.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		93.971	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		96.599	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	98.484
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	95.478
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: LCSW 4W WG588149-03
Sample Date/Time: Thursday, October 20, 2016 11:40:52
Number of Replicates: 3
Autosampler Position: 233
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73191.4	1.7				ug/L	76335	Standard
	Be	9	52713.3	3.6	**49.8850**	2.181	4.4	ug/L	18	Standard
	Al	27	9508.0	2.4	**0.0755**	0.002	2.5	ug/L	810	Standard
	Sc	45	22515.1	1.1				ug/L	22700	Standard
	Ti	47	28.7	31.5	**0.0014**	0.046	3265.1	ug/L	25	Standard
	V	51	357549.0	3.6	**49.4974**	1.598	3.2	ug/L	1541	Standard
	Cr	52	345819.5	3.2	**50.5390**	1.289	2.5	ug/L	7881	Standard
	Cr	53	44649.0	1.9	**51.4273**	0.295	0.6	ug/L	932	Standard
	Mn	55	554277.5	2.7	**48.8712**	0.847	1.7	ug/L	1508	Standard
	Co	59	470854.7	1.9	**49.9670**	0.625	1.3	ug/L	282	Standard
	Ni	60	104366.6	1.7	**51.2698**	0.249	0.5	ug/L	91	Standard
	Cu	65	102241.6	2.6	**51.1872**	0.348	0.7	ug/L	205	Standard
	Zn	66	51745.2	2.5	**50.4300**	0.279	0.6	ug/L	369	Standard
>	Ge	72	493064.4	2.1				ug/L	496734	Standard
	As	75	50412.8	2.4	**49.1477**	0.389	0.8	ug/L	-45	Standard
	Se	82	4969.9	3.3	**50.3854**	1.283	2.5	ug/L	18	Standard
	Se-1	77	3455.7	3.8	**51.1921**	1.368	2.7	ug/L	83	Standard
>	Ga	71	30.0	72.6				mg/L	30	Standard
	Rb	85	71.7	29.0				ug/L	23	Standard
	Y	89	404803.2	3.2				ug/L	405333	Standard
>	Rh	103	21.7	13.3				ug/L	17	Standard
	Mo	98	67.0	16.2	**-0.0036**	0.003	69.4	ug/L	135	Standard
	Ag	107	357569.1	2.7	**49.1492**	0.449	0.9	ug/L	123	Standard
	Cd	111	108299.8	3.2	**51.5165**	0.715	1.4	mg/L	11	Standard
	Cd	114	265605.9	3.0	**48.8021**	0.592	1.2	ug/L	56	Standard
>	In	115	659852.3	1.9				ug/L	634401	Standard
	Sn	118	126.0	11.3	**0.0219**	0.011	50.0	ug/L	137	Standard
	Sb	123	273438.5	1.6	**49.7841**	0.172	0.3	ug/L	907	Standard
	Ba	135	146269.2	2.2	**49.5117**	0.253	0.5	ug/L	166	Standard
	Ce	140	136.7	7.6				ug/L	57	Standard
>	Tb	159	1349934.1	0.4				ug/L	1347540	Standard
	Ho	165	53.3	10.8				ug/L	23	Standard
	Tl	203	581545.5	2.0	**50.0447**	0.166	0.3	ug/L	45	Standard
	Tl	205	1393848.5	2.8	**49.6527**	0.551	1.1	ug/L	112	Standard
	Pb	206	442643.8	2.6	**50.7156**	0.489	1.0	ug/L	825	Standard
	Pb	207	379119.6	3.0	**49.3499**	0.764	1.5	ug/L	679	Standard
	Pb	208	1738837.7	2.7	**49.8079**	0.519	1.0	ug/L	3166	Standard
	U	238	1464923.1	3.1	**46.5669**	0.647	1.4	ug/L	119	Standard
>	Bi	209	663715.0	1.8				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	70.0	12.4	**0.0082**	0.013	165.1	mg/L	48	Standard
|	**K**	39	5.0	100.0	**-0.0799**	0.053	66.3	mg/L	8	Standard
|	**Ca**	43	21.7	35.3	**-3.7901**	2.546	67.2	mg/L	27	Standard
|	**Fe**	54	111.7	30.6	**-0.0109**	0.036	325.6	mg/L	121	Standard
|	**Fe**	57	298.3	3.5	**-0.1423**	0.046	32.6	mg/L	305	Standard
⌊>	**Sc-1**	45	22515.1	1.1				mg/L	22700	Standard
	Cl	35	2.7	114.6				ug/L	3	Standard
	Kr	83	2.7	57.3				ug/L	5	Standard
	Br	81	1336.7	6.3				ug/L	1367	Standard
	P	31	100.0	21.8				ug/L	67	Standard
	S	34	88.3	18.2				ug/L	55	Standard
	Sr	88	133.3	11.5				ug/L	113	Standard
	C	12	230.0	24.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	20.0	100.0				mg/L	10	Standard
	Dy	164	8.9	112.8				mg/L	18	Standard
	Ho-1	165	53.3	10.8				mg/L	23	Standard
	Er	166	23.3	49.5				mg/L	40	Standard
	I	127	2336.8	8.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		95.881	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		99.261	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	104.012
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	99.355
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: LCSW 4W WG588149-03
Report Date/Time: Thursday, October 20, 2016 11:42:56
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Method 6020 - Summary Report

Sample ID: L1610064404 WG588149-01
Sample Date/Time: Thursday, October 20, 2016 11:43:50
Number of Replicates: 3
Autosampler Position: 234
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	70262.6	2.2				ug/L	76335	Standard
	Be	9	40.0	57.3	**0.0366**	0.023	63.6	ug/L	18	Standard
	Al	27	415260.0	2.0	**3.6279**	0.112	3.1	ug/L	810	Standard
	Sc	45	21862.4	3.3				ug/L	22700	Standard
	Ti	47	300.7	4.0	**1.3932**	0.070	5.0	ug/L	25	Standard
	V	51	2391.1	5.9	**0.1264**	0.020	15.4	ug/L	1541	Standard
	Cr	52	11158.4	3.2	**0.5708**	0.061	10.7	ug/L	7881	Standard
	Cr	53	2605.2	4.8	**2.1395**	0.159	7.4	ug/L	932	Standard
	Mn	55	39592.7	1.6	**3.5926**	0.044	1.2	ug/L	1508	Standard
	Co	59	892.4	6.6	**0.0671**	0.006	9.4	ug/L	282	Standard
	Ni	60	1477.1	3.2	**0.7214**	0.029	4.0	ug/L	91	Standard
	Cu	65	783.4	4.3	**0.3507**	0.019	5.4	ug/L	205	Standard
	Zn	66	2602.6	0.0	**2.4936**	0.020	0.8	ug/L	369	Standard
>	Ge	72	468908.2	0.7				ug/L	496734	Standard
	As	75	57.0	22.9	**0.1178**	0.013	11.4	ug/L	-45	Standard
	Se	82	23.9	23.2	**0.0577**	0.061	106.5	ug/L	18	Standard
	Se-1	77	128.0	5.1	**0.8863**	0.119	13.4	ug/L	83	Standard
>	Ga	71	93.3	13.5				mg/L	30	Standard
	Rb	85	4619.0	7.8				ug/L	23	Standard
	Y	89	383097.4	2.0				ug/L	405333	Standard
>	Rh	103	18.3	41.7				ug/L	17	Standard
	Mo	98	82.3	13.3	**0.0018**	0.003	171.7	ug/L	135	Standard
	Ag	107	147.3	12.3	**-0.0006**	0.002	383.9	ug/L	123	Standard
	Cd	111	29.9	37.7	**0.0059**	0.006	93.4	mg/L	11	Standard
	Cd	114	83.8	31.2	**0.0098**	0.005	50.6	ug/L	56	Standard
>	In	115	621067.5	1.1				ug/L	634401	Standard
	Sn	118	230.3	6.7	**0.1155**	0.012	10.8	ug/L	137	Standard
	Sb	123	3836.6	40.2	**0.6755**	0.301	44.5	ug/L	907	Standard
	Ba	135	12200.2	0.7	**4.3454**	0.066	1.5	ug/L	166	Standard
	Ce	140	12084.8	2.8				ug/L	57	Standard
>	Tb	159	1302038.1	2.1				ug/L	1347540	Standard
	Ho	165	153.3	27.7				ug/L	23	Standard
	Tl	203	287.3	7.8	**0.0216**	0.002	9.7	ug/L	45	Standard
	Tl	205	621.7	1.7	**0.0216**	0.000	2.0	ug/L	112	Standard
	Pb	206	1305.4	7.3	**0.1030**	0.009	8.9	ug/L	825	Standard
	Pb	207	1081.4	3.4	**0.0994**	0.003	2.9	ug/L	679	Standard
	Pb	208	4965.6	5.1	**0.0963**	0.005	5.6	ug/L	3166	Standard
	U	238	599.3	25.3	**0.0183**	0.005	26.1	ug/L	119	Standard
>	Bi	209	627032.3	1.6				ug/L	668024	Standard

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⌈	**Na**	23	6.7	114.6	**1.8183**	2.071	113.9	mg/L	0	Standard
|	**Mg**	24	441.7	14.2	**0.5760**	0.075	13.0	mg/L	48	Standard
|	**K**	39	33.3	37.7	**0.2289**	0.134	58.7	mg/L	8	Standard
|	**Ca**	43	30.0	76.4	**-0.5873**	8.005	1362.8	mg/L	27	Standard
|	**Fe**	54	281.0	9.9	**0.1784**	0.032	18.1	mg/L	121	Standard
|	**Fe**	57	385.0	9.1	**0.2436**	0.194	79.6	mg/L	305	Standard
⌊>	**Sc-1**	45	21862.4	3.3				mg/L	22700	Standard
	Cl	35	4.0	0.0				ug/L	3	Standard
	Kr	83	4.7	32.7				ug/L	5	Standard
	Br	81	2240.2	9.4				ug/L	1367	Standard
	P	31	96.7	3.0				ug/L	67	Standard
	S	34	55.0	24.1				ug/L	55	Standard
	Sr	88	143.3	8.8				ug/L	113	Standard
	C	12	250.0	28.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	13.3	43.3				mg/L	10	Standard
	Dy	164	270.9	25.3				mg/L	18	Standard
	Ho-1	165	153.3	27.7				mg/L	23	Standard
	Er	166	190.0	24.1				mg/L	40	Standard
	I	127	17073.0	6.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		92.045	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.398	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	97.898
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	93.864
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610064404 WG588149-01
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Method 6020 - Summary Report

Sample ID: L1610064405S WG588149-04
Sample Date/Time: Thursday, October 20, 2016 11:46:50
Number of Replicates: 3
Autosampler Position: 235
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	76295.1	3.8				ug/L	76335	Standard
	Be	9	52241.7	4.3	**47.4071**	0.238	0.5	ug/L	18	Standard
	Al	27	436395.2	4.5	**3.5095**	0.068	1.9	ug/L	810	Standard
	Sc	45	22413.3	4.2				ug/L	22700	Standard
	Ti	47	347.7	4.2	**1.5791**	0.104	6.6	ug/L	25	Standard
	V	51	347885.2	2.6	**49.0744**	0.303	0.6	ug/L	1541	Standard
	Cr	52	331917.3	3.0	**49.4039**	0.485	1.0	ug/L	7881	Standard
	Cr	53	44403.4	3.6	**52.1290**	1.100	2.1	ug/L	932	Standard
	Mn	55	581661.8	2.6	**52.2727**	0.723	1.4	ug/L	1508	Standard
	Co	59	451559.8	2.9	**48.8289**	0.605	1.2	ug/L	282	Standard
	Ni	60	99829.9	2.5	**49.9749**	0.392	0.8	ug/L	91	Standard
	Cu	65	98034.6	2.5	**50.0197**	0.256	0.5	ug/L	205	Standard
	Zn	66	50821.8	3.0	**50.4752**	0.494	1.0	ug/L	369	Standard
>	**Ge**	72	483796.2	2.0				ug/L	496734	Standard
	As	75	50672.5	2.2	**50.3480**	0.476	0.9	ug/L	-45	Standard
	Se	82	4762.7	2.7	**49.2020**	0.475	1.0	ug/L	18	Standard
	Se-1	77	3365.4	1.9	**50.8079**	0.475	0.9	ug/L	83	Standard
>	**Ga**	71	141.7	11.3				mg/L	30	Standard
	Rb	85	4715.7	2.7				ug/L	23	Standard
	Y	89	396518.7	4.7				ug/L	405333	Standard
>	**Rh**	103	43.3	13.3				ug/L	17	Standard
	Mo	98	145.8	5.7	**0.0177**	0.001	7.1	ug/L	135	Standard
	Ag	107	348415.8	5.1	**48.7311**	1.383	2.8	ug/L	123	Standard
	Cd	111	105879.2	5.3	**51.2511**	1.666	3.3	mg/L	11	Standard
	Cd	114	261832.1	4.0	**48.9619**	0.847	1.7	ug/L	56	Standard
>	**In**	115	648292.8	2.5				ug/L	634401	Standard
	Sn	118	125.0	11.6	**0.0228**	0.010	42.6	ug/L	137	Standard
	Sb	123	264964.1	3.1	**49.0938**	0.304	0.6	ug/L	907	Standard
	Ba	135	155878.0	3.5	**53.7023**	0.675	1.3	ug/L	166	Standard
	Ce	140	12586.9	5.9				ug/L	57	Standard
>	**Tb**	159	1339444.8	3.4				ug/L	1347540	Standard
	Ho	165	205.0	17.6				ug/L	23	Standard
	Tl	203	576889.4	3.6	**50.2182**	0.843	1.7	ug/L	45	Standard
	Tl	205	1346470.4	5.4	**48.5341**	2.465	5.1	ug/L	112	Standard
	Pb	206	433985.0	3.5	**50.3050**	1.022	2.0	ug/L	825	Standard
	Pb	207	368980.3	3.3	**48.5913**	0.766	1.6	ug/L	679	Standard
	Pb	208	1687828.6	3.4	**48.9138**	1.001	2.0	ug/L	3166	Standard
	U	238	1439829.4	4.1	**46.2997**	0.866	1.9	ug/L	119	Standard
>	**Bi**	209	656104.2	2.9				ug/L	668024	Standard

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⌈	**Na**	23	8.3	34.6	**2.2433**	0.709	31.6	mg/L	0	Standard
|	**Mg**	24	508.3	8.2	**0.6615**	0.076	11.5	mg/L	48	Standard
|	**K**	39	26.7	28.6	**0.1484**	0.075	50.7	mg/L	8	Standard
|	**Ca**	43	28.3	79.6	**-1.3424**	7.782	579.7	mg/L	27	Standard
|	**Fe**	54	260.8	10.0	**0.1489**	0.024	15.8	mg/L	121	Standard
|	**Fe**	57	321.7	11.2	**-0.0437**	0.161	367.3	mg/L	305	Standard
⌊>	**Sc-1**	45	22413.3	4.2				mg/L	22700	Standard
	Cl	35	2.7	86.6				ug/L	3	Standard
	Kr	83	3.3	75.5				ug/L	5	Standard
	Br	81	3093.7	10.5				ug/L	1367	Standard
	P	31	110.0	20.8				ug/L	67	Standard
	S	34	55.0	24.1				ug/L	55	Standard
	Sr	88	128.3	14.8				ug/L	113	Standard
	C	12	313.3	10.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	300.1	4.1				mg/L	18	Standard
	Ho-1	165	205.0	17.6				mg/L	23	Standard
	Er	166	206.7	22.9				mg/L	40	Standard
	I	127	18317.8	8.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		99.947	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		97.395	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	102.190
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	98.216
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610064405S WG588149-04
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Method 6020 - Summary Report

Sample ID: L1610064406SD WG588149-05
Sample Date/Time: Thursday, October 20, 2016 11:49:50
Number of Replicates: 3
Autosampler Position: 236
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78317.0	3.3				ug/L	76335	Standard
	Be	9	53960.9	1.7	**47.7271**	0.827	1.7	ug/L	18	Standard
	Al	27	445568.7	1.0	**3.4934**	0.114	3.2	ug/L	810	Standard
	Sc	45	22878.9	3.6				ug/L	22700	Standard
	Ti	47	311.0	5.0	**1.3726**	0.079	5.8	ug/L	25	Standard
	V	51	351934.3	1.7	**48.8583**	0.598	1.2	ug/L	1541	Standard
	Cr	52	341860.2	1.1	**50.0990**	0.514	1.0	ug/L	7881	Standard
	Cr	53	44846.3	0.7	**51.8155**	0.479	0.9	ug/L	932	Standard
	Mn	55	592511.7	0.9	**52.4062**	0.670	1.3	ug/L	1508	Standard
	Co	59	463306.9	0.9	**49.3105**	0.619	1.3	ug/L	282	Standard
	Ni	60	102784.1	0.3	**50.6408**	0.340	0.7	ug/L	91	Standard
	Cu	65	101774.7	1.6	**51.1104**	0.931	1.8	ug/L	205	Standard
	Zn	66	52160.6	0.7	**50.9907**	0.164	0.3	ug/L	369	Standard
>	Ge	72	491599.2	0.5				ug/L	496734	Standard
	As	75	51523.8	0.7	**50.3806**	0.143	0.3	ug/L	-45	Standard
	Se	82	4890.0	1.6	**49.7196**	0.613	1.2	ug/L	18	Standard
	Se-1	77	3428.7	2.9	**50.9397**	1.279	2.5	ug/L	83	Standard
>	Ga	71	111.7	27.4				mg/L	30	Standard
	Rb	85	4704.1	2.7				ug/L	23	Standard
	Y	89	403742.1	2.4				ug/L	405333	Standard
>	Rh	103	36.7	15.7				ug/L	17	Standard
	Mo	98	107.6	9.7	**0.0063**	0.003	48.5	ug/L	135	Standard
	Ag	107	358446.2	1.8	**47.9899**	1.072	2.2	ug/L	123	Standard
	Cd	111	110015.3	2.6	**50.9624**	0.306	0.6	mg/L	11	Standard
	Cd	114	268829.7	5.1	**48.0772**	1.155	2.4	ug/L	56	Standard
>	In	115	677737.8	2.8				ug/L	634401	Standard
	Sn	118	126.3	8.1	**0.0195**	0.007	34.5	ug/L	137	Standard
	Sb	123	280327.8	0.9	**49.7080**	0.982	2.0	ug/L	907	Standard
	Ba	135	159116.5	1.0	**52.4621**	0.991	1.9	ug/L	166	Standard
	Ce	140	12343.4	0.7				ug/L	57	Standard
>	Tb	159	1379983.0	2.4				ug/L	1347540	Standard
	Ho	165	198.3	7.3				ug/L	23	Standard
	Tl	203	583179.0	1.5	**50.5050**	0.528	1.0	ug/L	45	Standard
	Tl	205	1370256.4	1.5	**49.1258**	0.166	0.3	ug/L	112	Standard
	Pb	206	443770.2	1.2	**51.1766**	0.861	1.7	ug/L	825	Standard
	Pb	207	375343.2	2.1	**49.1703**	0.531	1.1	ug/L	679	Standard
	Pb	208	1724086.2	0.7	**49.7072**	0.540	1.1	ug/L	3166	Standard
	U	238	1467085.5	1.0	**46.9400**	0.295	0.6	ug/L	119	Standard
>	Bi	209	659549.2	1.4				ug/L	668024	Standard

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	Na	23	1.7	173.2	**0.4392**	0.752	171.2	mg/L	0	Standard
	Mg	24	476.7	17.4	**0.5988**	0.117	19.5	mg/L	48	Standard
	K	39	26.7	21.7	**0.1424**	0.051	35.8	mg/L	8	Standard
	Ca	43	51.7	5.6	**6.3055**	0.806	12.8	mg/L	27	Standard
	Fe	54	263.6	14.7	**0.1460**	0.035	24.3	mg/L	121	Standard
	Fe	57	341.7	8.6	**0.0045**	0.091	2026.2	mg/L	305	Standard
>	**Sc-1**	45	22878.9	3.6				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	1.0	100.0				ug/L	5	Standard
	Br	81	1886.8	5.4				ug/L	1367	Standard
	P	31	118.3	12.9				ug/L	67	Standard
	S	34	53.3	5.4				ug/L	55	Standard
	Sr	88	126.7	16.0				ug/L	113	Standard
	C	12	290.0	24.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	304.2	8.7				mg/L	18	Standard
	Ho-1	165	198.3	7.3				mg/L	23	Standard
	Er	166	190.0	32.9				mg/L	40	Standard
	I	127	18059.1	5.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		102.596	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		98.966	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	106.831
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	98.731
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610064406SD WG588149-05
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Method 6020 - Summary Report

Sample ID: L1610066101
Sample Date/Time: Thursday, October 20, 2016 11:52:49
Number of Replicates: 3
Autosampler Position: 237
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	72146.5	3.4				ug/L	76335	Standard
	Be	9	20.0	100.0	**0.0167**	0.020	119.5	ug/L	18	Standard
	Al	27	11129747.4	0.8	**94.8419**	3.144	3.3	ug/L	810	Standard
	Sc	45	21785.7	2.4				ug/L	22700	Standard
	Ti	47	302.3	7.2	**1.4053**	0.078	5.5	ug/L	25	Standard
	V	51	2732.1	9.5	**0.1774**	0.032	18.3	ug/L	1541	Standard
	Cr	52	11819.6	3.5	**0.6804**	0.020	2.9	ug/L	7881	Standard
	Cr	53	2355.2	12.0	**1.8351**	0.274	14.9	ug/L	932	Standard
	Mn	55	153751.7	2.0	**14.2450**	0.327	2.3	ug/L	1508	Standard
	Co	59	3009.6	2.3	**0.3046**	0.003	0.8	ug/L	282	Standard
	Ni	60	3030.6	2.4	**1.5296**	0.020	1.3	ug/L	91	Standard
	Cu	65	733.7	9.7	**0.3253**	0.030	9.2	ug/L	205	Standard
	Zn	66	2799.3	2.8	**2.7057**	0.076	2.8	ug/L	369	Standard
>	Ge	72	467389.0	2.5				ug/L	496734	Standard
	As	75	246.0	34.0	**0.3114**	0.082	26.5	ug/L	-45	Standard
	Se	82	80.1	26.7	**0.6598**	0.219	33.2	ug/L	18	Standard
	Se-1	77	161.7	5.2	**1.4296**	0.081	5.7	ug/L	83	Standard
>	Ga	71	51.7	39.1				mg/L	30	Standard
	Rb	85	3873.8	0.5				ug/L	23	Standard
	Y	89	387636.6	1.3				ug/L	405333	Standard
>	Rh	103	25.0	72.1				ug/L	17	Standard
	Mo	98	556.5	4.4	**0.1339**	0.007	5.4	ug/L	135	Standard
	Ag	107	118.3	4.7	**-0.0048**	0.001	18.0	ug/L	123	Standard
	Cd	111	25.9	26.2	**0.0040**	0.003	86.0	mg/L	11	Standard
	Cd	114	121.8	49.8	**0.0172**	0.012	69.0	ug/L	56	Standard
>	In	115	621030.7	0.4				ug/L	634401	Standard
	Sn	118	119.7	2.9	**0.0228**	0.003	14.7	ug/L	137	Standard
	Sb	123	4613.4	35.7	**0.8244**	0.316	38.3	ug/L	907	Standard
	Ba	135	28772.6	0.6	**10.3116**	0.067	0.7	ug/L	166	Standard
	Ce	140	5029.2	6.0				ug/L	57	Standard
>	Tb	159	1279406.2	2.1				ug/L	1347540	Standard
	Ho	165	125.0	21.2				ug/L	23	Standard
	Tl	203	453.7	9.5	**0.0372**	0.004	10.4	ug/L	45	Standard
	Tl	205	1021.7	16.1	**0.0371**	0.006	16.6	ug/L	112	Standard
	Pb	206	1226.0	3.6	**0.0952**	0.005	5.8	ug/L	825	Standard
	Pb	207	1006.0	5.6	**0.0906**	0.008	9.2	ug/L	679	Standard
	Pb	208	4726.6	2.7	**0.0908**	0.004	4.7	ug/L	3166	Standard
	U	238	19542.9	0.5	**0.6634**	0.006	0.9	ug/L	119	Standard
>	Bi	209	620019.7	0.3				ug/L	668024	Standard

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⌈	**Na**	23	140.0	12.9	**39.0867**	5.765	14.8	mg/L	0	Standard
|	**Mg**	24	2983.6	4.7	**4.4663**	0.119	2.7	mg/L	48	Standard
|	**K**	39	51.7	11.2	**0.4304**	0.074	17.3	mg/L	8	Standard
|	**Ca**	43	131.7	11.6	**35.7775**	5.941	16.6	mg/L	27	Standard
|	**Fe**	54	293.8	4.6	**0.1934**	0.018	9.4	mg/L	121	Standard
|	**Fe**	57	503.3	8.0	**0.7240**	0.211	29.1	mg/L	305	Standard
⌊>	**Sc-1**	45	21785.7	2.4				mg/L	22700	Standard
	Cl	35	4.7	65.5				ug/L	3	Standard
	Kr	83	3.7	31.5				ug/L	5	Standard
	Br	81	2500.2	2.4				ug/L	1367	Standard
	P	31	128.3	13.7				ug/L	67	Standard
	S	34	86.7	32.8				ug/L	55	Standard
	Sr	88	173.3	17.4				ug/L	113	Standard
	C	12	270.0	23.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	227.3	26.5				mg/L	18	Standard
	Ho-1	165	125.0	21.2				mg/L	23	Standard
	Er	166	126.7	31.9				mg/L	40	Standard
	I	127	6904.9	1.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		94.513	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.092	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	97.892
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	92.814
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610066101
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Method 6020 - Summary Report

Sample ID: L1610066102
Sample Date/Time: Thursday, October 20, 2016 11:55:48
Number of Replicates: 3
Autosampler Position: 238
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78251.6	2.7				ug/L	76335	Standard
	Be	9	13.3	21.7	**0.0088**	0.003	30.0	ug/L	18	Standard
	Al	27	12055837.6	1.1	**94.6799**	1.768	1.9	ug/L	810	Standard
	Sc	45	22580.2	2.1				ug/L	22700	Standard
	Ti	47	58.3	35.1	**0.1493**	0.102	68.3	ug/L	25	Standard
	V	51	1899.0	6.7	**0.0453**	0.020	43.1	ug/L	1541	Standard
	Cr	52	11754.9	2.2	**0.6026**	0.050	8.3	ug/L	7881	Standard
	Cr	53	2115.1	0.6	**1.4455**	0.020	1.4	ug/L	932	Standard
	Mn	55	77240.4	1.6	**6.8490**	0.158	2.3	ug/L	1508	Standard
	Co	59	1983.8	2.3	**0.1815**	0.005	3.0	ug/L	282	Standard
	Ni	60	3114.0	2.1	**1.5134**	0.023	1.5	ug/L	91	Standard
	Cu	65	581.0	5.1	**0.2337**	0.017	7.1	ug/L	205	Standard
	Zn	66	1704.8	4.7	**1.5109**	0.070	4.7	ug/L	369	Standard
>	Ge	72	485199.3	0.7				ug/L	496734	Standard
	As	75	131.4	27.1	**0.1893**	0.035	18.2	ug/L	-45	Standard
	Se	82	82.5	7.9	**0.6540**	0.063	9.7	ug/L	18	Standard
	Se-1	77	171.7	3.8	**1.4893**	0.085	5.7	ug/L	83	Standard
>	Ga	71	18.3	41.7				mg/L	30	Standard
	Rb	85	3358.7	7.0				ug/L	23	Standard
	Y	89	393829.3	2.2				ug/L	405333	Standard
>	Rh	103	35.0	49.5				ug/L	17	Standard
	Mo	98	607.8	6.1	**0.1380**	0.011	8.1	ug/L	135	Standard
	Ag	107	110.0	10.5	**-0.0070**	0.002	23.9	ug/L	123	Standard
	Cd	111	22.2	27.2	**0.0014**	0.003	209.4	mg/L	11	Standard
	Cd	114	90.0	19.5	**0.0100**	0.003	34.5	ug/L	56	Standard
>	In	115	661097.0	1.4				ug/L	634401	Standard
	Sn	118	123.0	12.1	**0.0194**	0.012	61.5	ug/L	137	Standard
	Sb	123	1720.0	38.9	**0.2433**	0.117	48.3	ug/L	907	Standard
	Ba	135	30191.4	2.3	**10.1627**	0.112	1.1	ug/L	166	Standard
	Ce	140	403.3	8.7				ug/L	57	Standard
>	Tb	159	1365984.5	3.0				ug/L	1347540	Standard
	Ho	165	35.0	28.6				ug/L	23	Standard
	Tl	203	347.0	11.7	**0.0253**	0.004	13.9	ug/L	45	Standard
	Tl	205	820.0	16.8	**0.0274**	0.005	17.2	ug/L	112	Standard
	Pb	206	586.7	5.1	**0.0120**	0.004	32.5	ug/L	825	Standard
	Pb	207	499.3	1.9	**0.0154**	0.000	1.4	ug/L	679	Standard
	Pb	208	2270.7	2.0	**0.0109**	0.001	11.4	ug/L	3166	Standard
	U	238	20993.9	2.6	**0.6667**	0.010	1.4	ug/L	119	Standard
>	Bi	209	662695.5	1.8				ug/L	668024	Standard

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⌈	**Na**	23	160.0	24.8	**43.1131**	11.285	26.2	mg/L	0	Standard
|	**Mg**	24	3425.4	3.4	**4.9585**	0.101	2.0	mg/L	48	Standard
|	**K**	39	45.0	33.3	**0.3392**	0.157	46.3	mg/L	8	Standard
|	**Ca**	43	138.3	27.6	**36.4637**	13.738	37.7	mg/L	27	Standard
|	**Fe**	54	158.9	6.3	**0.0389**	0.011	27.0	mg/L	121	Standard
|	**Fe**	57	466.7	6.9	**0.5094**	0.161	31.5	mg/L	305	Standard
⌊>	**Sc-1**	45	22580.2	2.1				mg/L	22700	Standard
	Cl	35	6.7	45.8				ug/L	3	Standard
	Kr	83	3.7	41.7				ug/L	5	Standard
	Br	81	2876.9	4.4				ug/L	1367	Standard
	P	31	110.0	9.1				ug/L	67	Standard
	S	34	75.0	35.3				ug/L	55	Standard
	Sr	88	170.0	11.8				ug/L	113	Standard
	C	12	350.0	25.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	43.8	55.3				mg/L	18	Standard
	Ho-1	165	35.0	28.6				mg/L	23	Standard
	Er	166	60.0	33.3				mg/L	40	Standard
	I	127	6856.6	3.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		102.510	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		97.678	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	104.208
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	99.202
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610066102
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Method 6020 - Summary Report

Sample ID: L1610066102PS WG588230-01
Sample Date/Time: Thursday, October 20, 2016 11:58:47
Number of Replicates: 3
Autosampler Position: 239
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	77283.6	5.1				ug/L	76335	Standard
	Be	9	58136.5	5.5	**52.0989**	1.631	3.1	ug/L	18	Standard
	Al	27	11788398.8	4.4	**93.7374**	1.463	1.6	ug/L	810	Standard
	Sc	45	22762.1	4.7				ug/L	22700	Standard
	Ti	47	67.7	9.4	**0.2026**	0.046	22.9	ug/L	25	Standard
	V	51	364713.5	3.7	**52.2973**	0.984	1.9	ug/L	1541	Standard
	Cr	52	346517.1	2.3	**52.5050**	1.163	2.2	ug/L	7881	Standard
	Cr	53	45050.3	5.4	**53.7529**	0.867	1.6	ug/L	932	Standard
	Mn	55	625878.6	2.9	**57.1708**	0.769	1.3	ug/L	1508	Standard
	Co	59	466490.7	3.1	**51.2670**	0.552	1.1	ug/L	282	Standard
	Ni	60	101788.1	4.0	**51.7706**	0.099	0.2	ug/L	91	Standard
	Cu	65	97795.5	3.5	**50.7052**	0.380	0.8	ug/L	205	Standard
	Zn	66	51757.7	4.1	**52.2390**	0.769	1.5	ug/L	369	Standard
>	Ge	72	476224.1	4.1				ug/L	496734	Standard
	As	75	52124.2	3.0	**52.6273**	0.600	1.1	ug/L	-45	Standard
	Se	82	5014.3	3.7	**52.6491**	0.390	0.7	ug/L	18	Standard
	Se-1	77	3499.7	5.2	**53.7235**	0.659	1.2	ug/L	83	Standard
>	Ga	71	36.7	20.8				mg/L	30	Standard
	Rb	85	3427.1	4.7				ug/L	23	Standard
	Y	89	386172.6	4.0				ug/L	405333	Standard
>	Rh	103	55.0	41.7				ug/L	17	Standard
	Mo	98	662.0	4.0	**0.1538**	0.010	6.7	ug/L	135	Standard
	Ag	107	363000.0	2.5	**50.2545**	0.414	0.8	ug/L	123	Standard
	Cd	111	109249.9	3.3	**52.3360**	0.281	0.5	mg/L	11	Standard
	Cd	114	273077.3	3.4	**50.5287**	0.490	1.0	ug/L	56	Standard
>	In	115	655274.5	2.9				ug/L	634401	Standard
	Sn	118	129.3	11.9	**0.0251**	0.010	40.6	ug/L	137	Standard
	Sb	123	288988.6	4.3	**52.9786**	1.296	2.4	ug/L	907	Standard
	Ba	135	180131.6	4.1	**61.3998**	0.801	1.3	ug/L	166	Standard
	Ce	140	403.3	20.5				ug/L	57	Standard
>	Tb	159	1352907.4	4.9				ug/L	1347540	Standard
	Ho	165	63.3	35.6				ug/L	23	Standard
	Tl	203	588444.9	2.7	**51.7120**	0.340	0.7	ug/L	45	Standard
	Tl	205	1367234.0	3.9	**49.7316**	0.812	1.6	ug/L	112	Standard
	Pb	206	439827.2	3.4	**51.4578**	0.294	0.6	ug/L	825	Standard
	Pb	207	389584.7	4.1	**51.7795**	0.576	1.1	ug/L	679	Standard
	Pb	208	1763545.2	3.5	**51.5843**	0.374	0.7	ug/L	3166	Standard
	U	238	1586848.9	3.8	**51.5084**	0.510	1.0	ug/L	119	Standard
>	Bi	209	650053.0	3.4				ug/L	668024	Standard

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⌈	**Na**	23	150.0	31.8	**39.7068**	10.753	27.1	mg/L	0	Standard
|	**Mg**	24	3112.0	7.8	**4.4554**	0.142	3.2	mg/L	48	Standard
|	**K**	39	71.7	22.4	**0.6102**	0.136	22.3	mg/L	8	Standard
|	**Ca**	43	130.0	17.6	**33.1468**	7.630	23.0	mg/L	27	Standard
|	**Fe**	54	152.0	16.0	**0.0301**	0.021	71.2	mg/L	121	Standard
|	**Fe**	57	486.7	11.9	**0.5655**	0.140	24.7	mg/L	305	Standard
⌊>	**Sc-1**	45	22762.1	4.7				mg/L	22700	Standard
	Cl	35	6.7	17.3				ug/L	3	Standard
	Kr	83	5.3	57.3				ug/L	5	Standard
	Br	81	3010.3	6.0				ug/L	1367	Standard
	P	31	110.0	19.8				ug/L	67	Standard
	S	34	78.3	32.8				ug/L	55	Standard
	Sr	88	130.0	6.7				ug/L	113	Standard
	C	12	450.0	23.5				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	37.3	27.9				mg/L	18	Standard
	Ho-1	165	63.3	35.6				mg/L	23	Standard
	Er	166	56.7	66.8				mg/L	40	Standard
	I	127	6703.2	4.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		101.242	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		95.871	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

Sample ID: L1610066102PS WG588230-01
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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	103.290
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	97.310
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610066102PS WG588230-01
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Method 6020 - Summary Report

Sample ID: L1610066102SDL WG588230-02
Sample Date/Time: Thursday, October 20, 2016 12:01:47
Number of Replicates: 3
Autosampler Position: 240
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71652.4	2.1				ug/L	76335	Standard
	Be	9	10.0		**0.0067**	0.000	3.0	ug/L	18	Standard
	Al	27	2192199.2	3.9	**18.7880**	0.385	2.1	ug/L	810	Standard
	Sc	45	20904.4	4.7				ug/L	22700	Standard
	Ti	47	25.7	25.9	**-0.0048**	0.032	662.1	ug/L	25	Standard
	V	51	1627.0	12.4	**0.0201**	0.033	163.8	ug/L	1541	Standard
	Cr	52	7535.5	2.1	**0.0261**	0.014	55.0	ug/L	7881	Standard
	Cr	53	1381.7	11.1	**0.6617**	0.180	27.1	ug/L	932	Standard
	Mn	55	14714.8	1.9	**1.3113**	0.023	1.7	ug/L	1508	Standard
	Co	59	584.3	7.4	**0.0341**	0.004	10.8	ug/L	282	Standard
	Ni	60	624.3	6.9	**0.2876**	0.027	9.3	ug/L	91	Standard
	Cu	65	214.3	1.8	**0.0531**	0.003	5.1	ug/L	205	Standard
	Zn	66	905.4	1.8	**0.7679**	0.031	4.1	ug/L	369	Standard
>	Ge	72	459155.5	1.8				ug/L	496734	Standard
	As	75	-5.5	560.4	**0.0540**	0.032	58.5	ug/L	-45	Standard
	Se	82	27.6	38.7	**0.1039**	0.122	117.1	ug/L	18	Standard
	Se-1	77	115.7	9.1	**0.7268**	0.136	18.8	ug/L	83	Standard
>	Ga	71	20.0	66.1				mg/L	30	Standard
	Rb	85	686.7	7.3				ug/L	23	Standard
	Y	89	370093.7	2.3				ug/L	405333	Standard
>	Rh	103	21.7	58.1				ug/L	17	Standard
	Mo	98	123.9	6.8	**0.0139**	0.002	12.7	ug/L	135	Standard
	Ag	107	123.7	8.1	**-0.0038**	0.001	28.1	ug/L	123	Standard
	Cd	111	12.5	51.9	**-0.0028**	0.003	115.2	mg/L	11	Standard
	Cd	114	40.4	38.1	**0.0014**	0.003	208.2	ug/L	56	Standard
>	In	115	611795.6	2.3				ug/L	634401	Standard
	Sn	118	47.0	12.9	**-0.0374**	0.006	15.8	ug/L	137	Standard
	Sb	123	1791.7	35.4	**0.2856**	0.132	46.4	ug/L	907	Standard
	Ba	135	5689.1	0.8	**2.0327**	0.047	2.3	ug/L	166	Standard
	Ce	140	118.3	8.8				ug/L	57	Standard
>	Tb	159	1270576.0	1.5				ug/L	1347540	Standard
	Ho	165	20.0	43.3				ug/L	23	Standard
	Tl	203	189.7	10.2	**0.0124**	0.002	17.3	ug/L	45	Standard
	Tl	205	445.0	1.1	**0.0147**	0.001	4.0	ug/L	112	Standard
	Pb	206	495.3	7.5	**0.0037**	0.003	76.5	ug/L	825	Standard
	Pb	207	405.7	2.3	**0.0053**	0.001	12.1	ug/L	679	Standard
	Pb	208	1933.4	5.4	**0.0034**	0.002	54.0	ug/L	3166	Standard
	U	238	4092.2	4.9	**0.1337**	0.003	2.2	ug/L	119	Standard
>	Bi	209	637213.4	2.7				ug/L	668024	Standard

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⌈	**Na**	23	25.0	40.0	**7.2192**	2.767	38.3	mg/L	0	Standard
|	**Mg**	24	623.3	10.2	**0.8975**	0.077	8.5	mg/L	48	Standard
|	**K**	39	15.0	33.3	**0.0366**	0.053	145.3	mg/L	8	Standard
|	**Ca**	43	68.3	21.1	**14.0648**	4.368	31.1	mg/L	27	Standard
|	**Fe**	54	57.6	10.5	**-0.0633**	0.010	15.9	mg/L	121	Standard
|	**Fe**	57	348.3	15.3	**0.1515**	0.159	104.8	mg/L	305	Standard
⌊>	**Sc-1**	45	20904.4	4.7				mg/L	22700	Standard
	Cl	35	6.0	33.3				ug/L	3	Standard
	Kr	83	4.3	70.5				ug/L	5	Standard
	Br	81	1670.1	7.3				ug/L	1367	Standard
	P	31	45.0	22.2				ug/L	67	Standard
	S	34	83.3	27.1				ug/L	55	Standard
	Sr	88	136.7	9.2				ug/L	113	Standard
	C	12	200.0	13.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	25.5	23.8				mg/L	18	Standard
	Ho-1	165	20.0	43.3				mg/L	23	Standard
	Er	166	23.3	49.5				mg/L	40	Standard
	I	127	4947.5	4.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		93.865	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		92.435	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	96.437
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	95.388
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610066102SDL WG588230-02
Sample Date/Time: Thursday, October 20, 2016 12:04:46
Number of Replicates: 3
Autosampler Position: 241
Sample Description: 25
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	66375.1	2.1				ug/L	76335	Standard
	Be	9	20.0	90.1	**0.0179**	0.019	104.4	ug/L	18	Standard
	Al	27	449765.2	2.3	**4.1612**	0.183	4.4	ug/L	810	Standard
	Sc	45	18993.6	0.1				ug/L	22700	Standard
	Ti	47	20.7	10.1	**-0.0238**	0.011	45.9	ug/L	25	Standard
	V	51	1702.7	6.7	**0.0468**	0.017	35.7	ug/L	1541	Standard
	Cr	52	6527.4	2.8	**-0.0707**	0.028	39.1	ug/L	7881	Standard
	Cr	53	1118.4	4.6	**0.4178**	0.069	16.6	ug/L	932	Standard
	Mn	55	3416.7	1.5	**0.2597**	0.007	2.7	ug/L	1508	Standard
	Co	59	318.0	5.5	**0.0060**	0.002	37.7	ug/L	282	Standard
	Ni	60	157.0	2.5	**0.0458**	0.002	3.9	ug/L	91	Standard
	Cu	65	193.7	12.8	**0.0485**	0.015	30.2	ug/L	205	Standard
	Zn	66	787.4	6.5	**0.6948**	0.053	7.6	ug/L	369	Standard
>	Ge	72	432297.8	0.6				ug/L	496734	Standard
	As	75	-30.3	42.4	**0.0258**	0.014	54.8	ug/L	-45	Standard
	Se	82	19.5	24.2	**0.0274**	0.055	199.3	ug/L	18	Standard
	Se-1	77	87.3	5.9	**0.3557**	0.084	23.7	ug/L	83	Standard
>	Ga	71	15.0	33.3				mg/L	30	Standard
	Rb	85	148.3	15.9				ug/L	23	Standard
	Y	89	339846.4	1.6				ug/L	405333	Standard
>	Rh	103	10.0					ug/L	17	Standard
	Mo	98	38.2	24.0	**-0.0097**	0.003	28.5	ug/L	135	Standard
	Ag	107	92.0	5.4	**-0.0076**	0.001	10.2	ug/L	123	Standard
	Cd	111	9.0	19.5	**-0.0042**	0.001	22.6	mg/L	11	Standard
	Cd	114	15.7	18.2	**-0.0033**	0.001	18.9	ug/L	56	Standard
>	In	115	574323.5	0.5				ug/L	634401	Standard
	Sn	118	35.3	18.8	**-0.0454**	0.006	13.1	ug/L	137	Standard
	Sb	123	419.4	40.2	**0.0193**	0.036	185.1	ug/L	907	Standard
	Ba	135	1220.4	1.7	**0.4281**	0.009	2.2	ug/L	166	Standard
	Ce	140	48.3	6.0				ug/L	57	Standard
>	Tb	159	1196304.5	0.9				ug/L	1347540	Standard
	Ho	165	20.0	75.0				ug/L	23	Standard
	Tl	203	83.7	16.1	**0.0032**	0.001	39.4	ug/L	45	Standard
	Tl	205	198.3	27.7	**0.0059**	0.002	36.5	ug/L	112	Standard
	Pb	206	468.3	3.1	**0.0032**	0.002	57.0	ug/L	825	Standard
	Pb	207	376.3	5.5	**0.0038**	0.003	80.2	ug/L	679	Standard
	Pb	208	1758.0	2.1	**0.0006**	0.001	196.5	ug/L	3166	Standard
	U	238	879.7	3.8	**0.0287**	0.001	3.9	ug/L	119	Standard
>	Bi	209	608597.6	0.2				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	156.7	7.4	**0.1794**	0.020	11.4	mg/L	48	Standard
|	**K**	39	6.7	43.3	**-0.0494**	0.036	72.7	mg/L	8	Standard
|	**Ca**	43	38.3	39.8	**4.4368**	6.255	141.0	mg/L	27	Standard
|	**Fe**	54	51.1	22.6	**-0.0652**	0.015	22.4	mg/L	121	Standard
|	**Fe**	57	341.7	4.5	**0.2725**	0.069	25.3	mg/L	305	Standard
⌊>	**Sc-1**	45	18993.6	0.1				mg/L	22700	Standard
	Cl	35	3.3	91.7				ug/L	3	Standard
	Kr	83	3.3	96.4				ug/L	5	Standard
	Br	81	1230.1	5.1				ug/L	1367	Standard
	P	31	45.0	40.1				ug/L	67	Standard
	S	34	78.3	26.6				ug/L	55	Standard
	Sr	88	148.3	22.9				ug/L	113	Standard
	C	12	180.0	33.8				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	25.2	62.4				mg/L	18	Standard
	Ho-1	165	20.0	75.0				mg/L	23	Standard
	Er	166	30.0	33.3				mg/L	40	Standard
	I	127	4349.0	6.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		86.952	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		87.028	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	90.530
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	91.104
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610066102SDL WG588230-02
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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 12:07:48
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75149.3	1.6				ug/L	76335	Standard
	Be	9	54860.8	1.0	**50.5569**	0.867	1.7	ug/L	18	Standard
	Al	27	5960718.7	0.5	**48.7362**	0.926	1.9	ug/L	810	Standard
	Sc	45	21839.1	0.8				ug/L	22700	Standard
	Ti	47	20169.8	1.0	**100.2537**	2.721	2.7	ug/L	25	Standard
	V	51	349397.5	1.2	**49.7268**	1.693	3.4	ug/L	1541	Standard
	Cr	52	334284.5	2.1	**50.2095**	1.594	3.2	ug/L	7881	Standard
	Cr	53	43881.8	3.9	**51.9381**	1.213	2.3	ug/L	932	Standard
	Mn	55	547345.6	2.2	**49.6005**	1.070	2.2	ug/L	1508	Standard
	Co	59	461284.8	2.2	**50.3028**	0.770	1.5	ug/L	282	Standard
	Ni	60	99488.3	2.3	**50.2271**	1.198	2.4	ug/L	91	Standard
	Cu	65	96891.6	2.5	**49.8558**	1.194	2.4	ug/L	205	Standard
	Zn	66	49945.2	3.1	**50.0245**	1.386	2.8	ug/L	369	Standard
>	Ge	72	479973.0	3.8				ug/L	496734	Standard
	As	75	50427.5	2.7	**50.5214**	1.013	2.0	ug/L	-45	Standard
	Se	82	4934.8	3.6	**51.3995**	0.116	0.2	ug/L	18	Standard
	Se-1	77	3340.0	3.0	**50.8485**	1.550	3.0	ug/L	83	Standard
>	Ga	71	56.7	13.5				mg/L	30	Standard
	Rb	85	628.3	5.3				ug/L	23	Standard
	Y	89	394018.1	4.7				ug/L	405333	Standard
>	Rh	103	41.7	30.2				ug/L	17	Standard
	Mo	98	366388.5	3.1	**95.8169**	0.114	0.1	ug/L	135	Standard
	Ag	107	368328.3	2.2	**50.5233**	0.418	0.8	ug/L	123	Standard
	Cd	111	105921.9	3.6	**50.2688**	0.306	0.6	mg/L	11	Standard
	Cd	114	279564.5	3.7	**51.2830**	2.369	4.6	ug/L	56	Standard
>	In	115	661405.7	3.0				ug/L	634401	Standard
	Sn	118	63091.8	1.1	**49.5688**	1.336	2.7	ug/L	137	Standard
	Sb	123	279519.1	1.5	**50.7873**	0.840	1.7	ug/L	907	Standard
	Ba	135	145958.1	1.6	**49.3060**	0.738	1.5	ug/L	166	Standard
	Ce	140	176.7	9.9				ug/L	57	Standard
>	Tb	159	1379001.3	5.1				ug/L	1347540	Standard
	Ho	165	41.7	18.3				ug/L	23	Standard
	Tl	203	568105.2	2.2	**49.2660**	0.717	1.5	ug/L	45	Standard
	Tl	205	1334522.2	1.0	**47.9276**	1.417	3.0	ug/L	112	Standard
	Pb	206	431045.2	2.1	**49.7712**	0.742	1.5	ug/L	825	Standard
	Pb	207	381004.4	2.7	**49.9779**	0.493	1.0	ug/L	679	Standard
	Pb	208	1721429.2	1.9	**49.6977**	0.846	1.7	ug/L	3166	Standard
	U	238	1500554.0	1.5	**48.0844**	1.137	2.4	ug/L	119	Standard
>	Bi	209	658868.9	3.6				ug/L	668024	Standard

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	Na	23	18.3	31.5	**5.1033**	1.615	31.7	mg/L	0	Standard
	Mg	24	3532.1	3.1	**5.2927**	0.130	2.5	mg/L	48	Standard
	K	39	453.3	7.2	**4.7840**	0.329	6.9	mg/L	8	Standard
	Ca	43	41.7	6.9	**3.5810**	1.059	29.6	mg/L	27	Standard
	Fe	54	4768.1	5.9	**5.0983**	0.335	6.6	mg/L	121	Standard
	Fe	57	1573.4	5.1	**5.0090**	0.369	7.4	mg/L	305	Standard
>	**Sc-1**	45	21839.1	0.8				mg/L	22700	Standard
	Cl	35	5.3	57.3				ug/L	3	Standard
	Kr	83	3.7	15.7				ug/L	5	Standard
	Br	81	1350.1	7.7				ug/L	1367	Standard
	P	31	88.3	26.7				ug/L	67	Standard
	S	34	71.7	26.4				ug/L	55	Standard
	Sr	88	150.0	8.8				ug/L	113	Standard
	C	12	306.7	19.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	23.3	137.8				mg/L	18	Standard
	Ho-1	165	41.7	18.3				mg/L	23	Standard
	Er	166	0.0					mg/L	40	Standard
	I	127	2556.9	2.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	101.114		
	Al	27	97.472		
	Sc	45			
	Ti	47	100.254		
	V	51	99.454		
	Cr	52	100.419		
	Cr	53			
	Mn	55	99.201		
	Co	59	100.606		
	Ni	60	100.454		
	Cu	65	99.712		
	Zn	66	100.049		
>	Ge	72		96.626	
	As	75	101.043		
	Se	82	102.799		
	Se-1	77			
>	Ga	71			

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⌊	Rb	85		
⌈	Y	89		
⌊>	Rh	103		
⌈	Mo	98	95.817	
|	Ag	107	101.047	
|	Cd	111	100.538	
|	Cd	114		
|>	In	115		104.257
|	Sn	118	99.138	
|	Sb	123	101.575	
⌊	Ba	135	98.612	
⌈	Ce	140		
⌊>	Tb	159		
⌈	Ho	165		
|	Tl	203	98.532	
|	Tl	205		
|	Pb	206		
|	Pb	207		
|	Pb	208	99.395	
|	U	238	96.169	
⌊>	Bi	209		98.629
⌈	Na	23		
|	Mg	24		
|	K	39		
|	Ca	43		
|	Fe	54		
|	Fe	57		
⌊>	Sc-1	45		
	Cl	35		
	Kr	83		
	Br	81		
	P	31		
	S	34		
	Sr	88		
	C	12		
	N	14		
	Hg	202		
	Dy	164		
	Ho-1	165		
	Er	166		
	I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 12:10:47
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	65515.2	15.3				ug/L	76335	Standard
	Be	9	71.7	137.7	**0.0647**	0.087	134.6	ug/L	18	Standard
	Al	27	8057.2	155.3	**0.0616**	0.099	161.2	ug/L	810	Standard
	Sc	45	19874.7	7.7				ug/L	22700	Standard
	Ti	47	29.0	53.8	**0.0173**	0.072	416.2	ug/L	25	Standard
	V	51	1476.5	43.0	**0.0048**	0.081	1701.4	ug/L	1541	Standard
	Cr	52	5941.2	24.3	**-0.1894**	0.171	90.3	ug/L	7881	Standard
	Cr	53	1086.7	6.9	**0.3608**	0.087	24.2	ug/L	932	Standard
	Mn	55	1405.8	92.9	**0.0504**	0.117	231.2	ug/L	1508	Standard
	Co	59	452.3	67.4	**0.0203**	0.032	156.7	ug/L	282	Standard
	Ni	60	114.3	83.9	**0.0190**	0.047	248.9	ug/L	91	Standard
	Cu	65	179.7	24.8	**0.0385**	0.018	46.0	ug/L	205	Standard
	Zn	66	220.3	15.0	**0.0588**	0.019	32.4	ug/L	369	Standard
>	Ge	72	437227.3	7.2				ug/L	496734	Standard
	As	75	-59.5	78.6	**-0.0086**	0.055	644.0	ug/L	-45	Standard
	Se	82	12.2	77.2	**-0.0631**	0.103	162.9	ug/L	18	Standard
	Se-1	77	88.7	6.6	**0.3708**	0.196	52.8	ug/L	83	Standard
>	Ga	71	16.7	17.3				mg/L	30	Standard
	Rb	85	26.7	47.2				ug/L	23	Standard
	Y	89	361829.8	8.2				ug/L	405333	Standard
>	Rh	103	16.7	75.5				ug/L	17	Standard
	Mo	98	190.9	73.6	**0.0327**	0.035	107.8	ug/L	135	Standard
	Ag	107	167.3	33.2	**0.0031**	0.007	214.4	ug/L	123	Standard
	Cd	111	20.1	100.0	**0.0011**	0.009	893.8	mg/L	11	Standard
	Cd	114	69.8	101.4	**0.0071**	0.013	182.0	ug/L	56	Standard
>	In	115	595434.8	8.6				ug/L	634401	Standard
	Sn	118	71.0	48.4	**-0.0168**	0.024	145.6	ug/L	137	Standard
	Sb	123	738.5	116.7	**0.0723**	0.156	216.3	ug/L	907	Standard
	Ba	135	51.3	67.8	**-0.0282**	0.011	39.8	ug/L	166	Standard
	Ce	140	60.0	46.4				ug/L	57	Standard
>	Tb	159	1232885.1	7.4				ug/L	1347540	Standard
	Ho	165	15.0	88.2				ug/L	23	Standard
	Tl	203	232.3	103.3	**0.0157**	0.020	124.2	ug/L	45	Standard
	Tl	205	783.4	127.5	**0.0262**	0.034	130.6	ug/L	112	Standard
	Pb	206	750.7	65.9	**0.0338**	0.051	150.8	ug/L	825	Standard
	Pb	207	772.0	87.7	**0.0534**	0.082	153.8	ug/L	679	Standard
	Pb	208	3719.0	91.5	**0.0547**	0.091	166.7	ug/L	3166	Standard
	U	238	2164.1	164.1	**0.0658**	0.110	167.1	ug/L	119	Standard
>	Bi	209	621326.5	8.3				ug/L	668024	Standard

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⌈	**Na**	23	3.3	173.2	**0.9408**	1.621	172.3	mg/L	0	Standard
|	**Mg**	24	33.3	17.3	**-0.0392**	0.012	30.3	mg/L	48	Standard
|	**K**	39	13.3	78.1	**0.0296**	0.135	454.7	mg/L	8	Standard
|	**Ca**	43	38.3	7.5	**3.7781**	1.314	34.8	mg/L	27	Standard
|	**Fe**	54	77.8	16.1	**-0.0360**	0.012	32.1	mg/L	121	Standard
|	**Fe**	57	275.0	9.4	**-0.0830**	0.186	224.7	mg/L	305	Standard
⌊>	**Sc-1**	45	19874.7	7.7				mg/L	22700	Standard
	Cl	35	4.0	50.0				ug/L	3	Standard
	Kr	83	4.0	25.0				ug/L	5	Standard
	Br	81	1360.1	12.5				ug/L	1367	Standard
	P	31	75.0	72.1				ug/L	67	Standard
	S	34	111.7	17.0				ug/L	55	Standard
	Sr	88	150.0	3.3				ug/L	113	Standard
	C	12	223.3	36.5				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	18.9	55.5				mg/L	18	Standard
	Ho-1	165	15.0	88.2				mg/L	23	Standard
	Er	166	23.3	49.5				mg/L	40	Standard
	I	127	3182.0	14.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		88.020	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	93.858
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	93.010
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: PBW AA WG587446-02
Sample Date/Time: Thursday, October 20, 2016 12:25:31
Number of Replicates: 3
Autosampler Position: 242
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71885.2	1.6				ug/L	76335	Standard
	Be	9	10.0	50.0	**0.0067**	0.005	72.6	ug/L	18	Standard
	Al	27	9558.0	1.7	**0.0773**	0.001	1.2	ug/L	810	Standard
	Sc	45	21176.5	1.8				ug/L	22700	Standard
	Ti	47	31.7	17.4	**0.0261**	0.031	118.4	ug/L	25	Standard
	V	51	1599.4	10.4	**0.0141**	0.020	139.0	ug/L	1541	Standard
	Cr	52	10693.1	1.7	**0.5239**	0.029	5.4	ug/L	7881	Standard
	Cr	53	1418.4	5.9	**0.6994**	0.113	16.1	ug/L	932	Standard
	Mn	55	2829.9	5.6	**0.1823**	0.010	5.3	ug/L	1508	Standard
	Co	59	299.3	5.5	**0.0014**	0.002	136.7	ug/L	282	Standard
	Ni	60	251.7	3.9	**0.0899**	0.006	6.4	ug/L	91	Standard
	Cu	65	325.0	7.3	**0.1116**	0.010	8.7	ug/L	205	Standard
	Zn	66	1273.1	5.0	**1.1466**	0.069	6.0	ug/L	369	Standard
>	Ge	72	461772.0	2.6				ug/L	496734	Standard
	As	75	-84.4	11.1	**-0.0282**	0.007	26.2	ug/L	-45	Standard
	Se	82	14.8	48.0	**-0.0377**	0.078	206.9	ug/L	18	Standard
	Se-1	77	90.7	6.1	**0.3154**	0.123	39.1	ug/L	83	Standard
>	Ga	71	21.7	48.0				mg/L	30	Standard
	Rb	85	36.7	51.6				ug/L	23	Standard
	Y	89	380135.6	1.8				ug/L	405333	Standard
>	Rh	103	13.3	78.1				ug/L	17	Standard
	Mo	98	78.9	33.7	**0.0013**	0.008	598.1	ug/L	135	Standard
	Ag	107	103.3	5.9	**-0.0067**	0.001	11.0	ug/L	123	Standard
	Cd	111	10.2	39.8	**-0.0039**	0.002	54.7	mg/L	11	Standard
	Cd	114	70.1	31.3	**0.0074**	0.004	60.5	ug/L	56	Standard
>	In	115	608381.1	1.2				ug/L	634401	Standard
	Sn	118	306.0	14.2	**0.1843**	0.038	20.4	ug/L	137	Standard
	Sb	123	1731.8	47.1	**0.2737**	0.162	59.3	ug/L	907	Standard
	Ba	135	97.7	9.7	**-0.0111**	0.003	30.5	ug/L	166	Standard
	Ce	140	116.7	21.1				ug/L	57	Standard
>	Tb	159	1308540.9	2.0				ug/L	1347540	Standard
	Ho	165	16.7	96.4				ug/L	23	Standard
	Tl	203	34.0	26.1	**-0.0016**	0.001	49.8	ug/L	45	Standard
	Tl	205	86.7	17.6	**0.0013**	0.001	38.2	ug/L	112	Standard
	Pb	206	594.0	2.7	**0.0144**	0.003	17.4	ug/L	825	Standard
	Pb	207	470.0	1.5	**0.0130**	0.002	16.1	ug/L	679	Standard
	Pb	208	2220.7	1.6	**0.0109**	0.000	4.4	ug/L	3166	Standard
	U	238	36.3	31.9	**-0.0006**	0.000	60.0	ug/L	119	Standard
>	Bi	209	647875.5	2.3				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4844**	0.830	171.4	mg/L	0	Standard
|	**Mg**	24	66.7	17.3	**0.0095**	0.019	195.9	mg/L	48	Standard
|	**K**	39	5.0	100.0	**-0.0759**	0.057	74.9	mg/L	8	Standard
|	**Ca**	43	30.0	0.0	**-0.2376**	0.193	81.3	mg/L	27	Standard
|	**Fe**	54	114.3	15.7	**-0.0002**	0.022	11621.9	mg/L	121	Standard
|	**Fe**	57	306.7	11.1	**-0.0358**	0.121	339.8	mg/L	305	Standard
⌊>	**Sc-1**	45	21176.5	1.8				mg/L	22700	Standard
	Cl	35	4.0	86.6				ug/L	3	Standard
	Kr	83	3.7	68.6				ug/L	5	Standard
	Br	81	1253.4	9.7				ug/L	1367	Standard
	P	31	96.7	28.5				ug/L	67	Standard
	S	34	71.7	24.5				ug/L	55	Standard
	Sr	88	141.7	18.1				ug/L	113	Standard
	C	12	283.3	11.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	15.4	35.7				mg/L	18	Standard
	Ho-1	165	16.7	96.4				mg/L	23	Standard
	Er	166	26.7	21.7				mg/L	40	Standard
	I	127	1976.8	6.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		94.170	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		92.962	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	95.898
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	96.984
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: PBW AA WG587446-02
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Method 6020 - Summary Report

Sample ID: LCSW AA WG587446-02
Sample Date/Time: Thursday, October 20, 2016 12:28:29
Number of Replicates: 3
Autosampler Position: 243
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75713.9	4.3				ug/L	76335	Standard
	Be	9	54655.1	1.9	**50.0447**	2.297	4.6	ug/L	18	Standard
	Al	27	9849.9	1.7	**0.0756**	0.002	3.0	ug/L	810	Standard
	Sc	45	22184.6	1.6				ug/L	22700	Standard
	Ti	47	35.0	22.3	**0.0344**	0.042	121.4	ug/L	25	Standard
	V	51	352084.1	1.5	**49.4187**	1.342	2.7	ug/L	1541	Standard
	Cr	52	337831.0	1.6	**50.0372**	0.351	0.7	ug/L	7881	Standard
	Cr	53	43206.5	1.1	**50.4352**	1.089	2.2	ug/L	932	Standard
	Mn	55	538915.8	1.1	**48.1709**	0.510	1.1	ug/L	1508	Standard
	Co	59	454530.6	2.0	**48.8909**	0.384	0.8	ug/L	282	Standard
	Ni	60	99999.6	1.4	**49.7966**	0.437	0.9	ug/L	91	Standard
	Cu	65	97529.3	1.6	**49.5002**	0.520	1.0	ug/L	205	Standard
	Zn	66	49434.5	2.3	**48.8344**	0.758	1.6	ug/L	369	Standard
>	Ge	72	486427.0	2.1				ug/L	496734	Standard
	As	75	50057.7	1.5	**49.4728**	0.289	0.6	ug/L	-45	Standard
	Se	82	4800.5	3.6	**49.3185**	0.853	1.7	ug/L	18	Standard
	Se-1	77	3346.4	0.8	**50.2465**	1.054	2.1	ug/L	83	Standard
>	Ga	71	23.3	32.7				mg/L	30	Standard
	Rb	85	46.7	48.3				ug/L	23	Standard
	Y	89	389725.3	0.4				ug/L	405333	Standard
>	Rh	103	30.0	50.0				ug/L	17	Standard
	Mo	98	60.3	32.7	**-0.0052**	0.005	90.1	ug/L	135	Standard
	Ag	107	343515.1	2.3	**47.9027**	0.324	0.7	ug/L	123	Standard
	Cd	111	104075.3	2.6	**50.2286**	0.741	1.5	mg/L	11	Standard
	Cd	114	262674.6	2.8	**48.9615**	0.287	0.6	ug/L	56	Standard
>	In	115	650555.0	2.9				ug/L	634401	Standard
	Sn	118	149.7	14.1	**0.0420**	0.013	31.5	ug/L	137	Standard
	Sb	123	266804.5	2.6	**49.2717**	0.289	0.6	ug/L	907	Standard
	Ba	135	144391.6	1.8	**49.5876**	0.614	1.2	ug/L	166	Standard
	Ce	140	146.7	14.2				ug/L	57	Standard
>	Tb	159	1367347.3	2.3				ug/L	1347540	Standard
	Ho	165	46.7	6.2				ug/L	23	Standard
	Tl	203	586037.8	1.8	**49.4255**	0.193	0.4	ug/L	45	Standard
	Tl	205	1380056.1	3.1	**48.1759**	0.459	1.0	ug/L	112	Standard
	Pb	206	446123.9	1.8	**50.0979**	0.330	0.7	ug/L	825	Standard
	Pb	207	376979.9	1.9	**48.0954**	0.340	0.7	ug/L	679	Standard
	Pb	208	1735024.6	2.4	**48.7059**	0.146	0.3	ug/L	3166	Standard
	U	238	1468263.3	2.7	**45.7426**	0.241	0.5	ug/L	119	Standard
>	Bi	209	677274.3	2.2				ug/L	668024	Standard

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⌈	**Na**	23	3.3	173.2	**0.9063**	1.561	172.2	mg/L	0	Standard
|	**Mg**	24	50.0	20.0	**-0.0202**	0.016	79.4	mg/L	48	Standard
|	**K**	39	8.3	34.6	**-0.0438**	0.030	67.8	mg/L	8	Standard
|	**Ca**	43	36.7	43.8	**1.5522**	5.457	351.6	mg/L	27	Standard
|	**Fe**	54	130.5	27.8	**0.0117**	0.041	354.3	mg/L	121	Standard
|	**Fe**	57	263.3	7.2	**-0.2634**	0.073	27.6	mg/L	305	Standard
⌊>	**Sc-1**	45	22184.6	1.6				mg/L	22700	Standard
	Cl	35	2.7	43.3				ug/L	3	Standard
	Kr	83	1.3	173.2				ug/L	5	Standard
	Br	81	2283.5	4.4				ug/L	1367	Standard
	P	31	81.7	23.2				ug/L	67	Standard
	S	34	81.7	36.9				ug/L	55	Standard
	Sr	88	150.0	11.5				ug/L	113	Standard
	C	12	363.3	21.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	19.0	53.8				mg/L	18	Standard
	Ho-1	165	46.7	6.2				mg/L	23	Standard
	Er	166	20.0	50.0				mg/L	40	Standard
	I	127	3628.8	6.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		99.186	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		97.925	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	102.546
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	101.385
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: LCSW AA WG587446-02
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Approved: October 24, 2016

Method 6020 - Summary Report

Sample ID: L1610026702 WG587446-01
Sample Date/Time: Thursday, October 20, 2016 12:31:29
Number of Replicates: 3
Autosampler Position: 244
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79464.6	2.4				ug/L	76335	Standard
	Be	9	35.0	37.8	**0.0273**	0.011	40.0	ug/L	18	Standard
	Al	27	436051.0	4.7	**3.3657**	0.078	2.3	ug/L	810	Standard
	Sc	45	22550.1	4.5				ug/L	22700	Standard
	Ti	47	162.0	12.1	**0.6443**	0.083	12.9	ug/L	25	Standard
	V	51	2720.6	4.0	**0.1544**	0.007	4.7	ug/L	1541	Standard
	Cr	52	12501.8	4.1	**0.6819**	0.041	6.0	ug/L	7881	Standard
	Cr	53	1801.8	1.6	**1.0340**	0.077	7.4	ug/L	932	Standard
	Mn	55	34147.5	3.4	**2.9257**	0.035	1.2	ug/L	1508	Standard
	Co	59	791.7	5.2	**0.0514**	0.003	6.2	ug/L	282	Standard
	Ni	60	889.0	4.3	**0.3941**	0.017	4.4	ug/L	91	Standard
	Cu	65	465.0	4.5	**0.1703**	0.005	3.1	ug/L	205	Standard
	Zn	66	1893.5	2.4	**1.6654**	0.009	0.6	ug/L	369	Standard
>	Ge	72	493951.1	2.4				ug/L	496734	Standard
	As	75	52.8	60.5	**0.1102**	0.030	27.4	ug/L	-45	Standard
	Se	82	28.7	19.5	**0.0920**	0.052	56.2	ug/L	18	Standard
	Se-1	77	102.7	10.4	**0.3984**	0.142	35.6	ug/L	83	Standard
>	Ga	71	70.0	37.8				mg/L	30	Standard
	Rb	85	4365.6	2.7				ug/L	23	Standard
	Y	89	401845.2	2.9				ug/L	405333	Standard
>	Rh	103	16.7	34.6				ug/L	17	Standard
	Mo	98	88.6	7.9	**0.0019**	0.001	65.4	ug/L	135	Standard
	Ag	107	125.3	12.0	**-0.0050**	0.002	32.6	ug/L	123	Standard
	Cd	111	14.9	35.5	**-0.0021**	0.002	113.6	mg/L	11	Standard
	Cd	114	34.7	41.8	**-0.0003**	0.003	947.2	ug/L	56	Standard
>	In	115	663550.8	3.2				ug/L	634401	Standard
	Sn	118	136.7	9.7	**0.0296**	0.008	27.0	ug/L	137	Standard
	Sb	123	3242.4	41.6	**0.5147**	0.230	44.7	ug/L	907	Standard
	Ba	135	12944.2	3.4	**4.3144**	0.047	1.1	ug/L	166	Standard
	Ce	140	13908.1	4.4				ug/L	57	Standard
>	Tb	159	1367593.6	4.3				ug/L	1347540	Standard
	Ho	165	191.7	21.1				ug/L	23	Standard
	Tl	203	182.7	20.5	**0.0105**	0.003	25.5	ug/L	45	Standard
	Tl	205	403.3	19.5	**0.0120**	0.002	19.4	ug/L	112	Standard
	Pb	206	1390.4	1.2	**0.0992**	0.007	6.8	ug/L	825	Standard
	Pb	207	1135.7	1.3	**0.0936**	0.003	3.7	ug/L	679	Standard
	Pb	208	5464.7	2.9	**0.0974**	0.003	2.6	ug/L	3166	Standard
	U	238	370.3	8.2	**0.0096**	0.001	6.5	ug/L	119	Standard
>	Bi	209	685716.5	3.7				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**0.8962**	0.774	86.4	mg/L	0	Standard
|	**Mg**	24	563.3	11.0	**0.7404**	0.123	16.6	mg/L	48	Standard
|	**K**	39	26.7	57.3	**0.1451**	0.152	104.9	mg/L	8	Standard
|	**Ca**	43	40.0	12.5	**2.5070**	1.155	46.1	mg/L	27	Standard
|	**Fe**	54	262.6	20.1	**0.1484**	0.047	31.8	mg/L	121	Standard
|	**Fe**	57	268.3	6.5	**-0.2574**	0.113	43.9	mg/L	305	Standard
⌊>	**Sc-1**	45	22550.1	4.5				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	2.7	57.3				ug/L	5	Standard
	Br	81	2163.5	11.7				ug/L	1367	Standard
	P	31	105.0	12.6				ug/L	67	Standard
	S	34	75.0	29.1				ug/L	55	Standard
	Sr	88	141.7	25.5				ug/L	113	Standard
	C	12	386.7	20.9				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	279.1	33.7				mg/L	18	Standard
	Ho-1	165	191.7	21.1				mg/L	23	Standard
	Er	166	226.7	33.1				mg/L	40	Standard
	I	127	16881.1	5.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		104.099	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		99.440	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	104.595
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	102.648
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026705S WG587446-04
Sample Date/Time: Thursday, October 20, 2016 12:34:28
Number of Replicates: 3
Autosampler Position: 245
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	76558.0	3.1				ug/L	76335	Standard
	Be	9	52552.8	5.0	**47.6085**	3.831	8.0	ug/L	18	Standard
	Al	27	428756.1	1.6	**3.4392**	0.144	4.2	ug/L	810	Standard
	Sc	45	22646.9	1.0				ug/L	22700	Standard
	Ti	47	195.3	4.6	**0.8159**	0.035	4.3	ug/L	25	Standard
	V	51	338553.5	1.0	**47.2664**	0.490	1.0	ug/L	1541	Standard
	Cr	52	328552.1	1.8	**48.3848**	0.669	1.4	ug/L	7881	Standard
	Cr	53	41244.4	1.4	**47.8503**	1.006	2.1	ug/L	932	Standard
	Mn	55	556728.0	1.2	**49.5207**	0.805	1.6	ug/L	1508	Standard
	Co	59	443091.4	1.9	**47.4241**	0.483	1.0	ug/L	282	Standard
	Ni	60	97932.2	1.6	**48.5225**	0.275	0.6	ug/L	91	Standard
	Cu	65	96917.7	2.1	**48.9439**	0.677	1.4	ug/L	205	Standard
	Zn	66	49754.9	1.0	**48.9111**	0.283	0.6	ug/L	369	Standard
>	Ge	72	488807.2	1.3				ug/L	496734	Standard
	As	75	49180.6	2.1	**48.3636**	0.429	0.9	ug/L	-45	Standard
	Se	82	4687.6	0.9	**47.9318**	0.515	1.1	ug/L	18	Standard
	Se-1	77	3232.3	2.1	**48.2399**	0.760	1.6	ug/L	83	Standard
>	Ga	71	91.7	41.3				mg/L	30	Standard
	Rb	85	4554.0	3.4				ug/L	23	Standard
	Y	89	398051.6	2.7				ug/L	405333	Standard
>	Rh	103	40.0	12.5				ug/L	17	Standard
	Mo	98	101.9	3.7	**0.0058**	0.001	17.6	ug/L	135	Standard
	Ag	107	337728.2	1.2	**46.8399**	0.479	1.0	ug/L	123	Standard
	Cd	111	104053.7	2.1	**49.9402**	0.422	0.8	mg/L	11	Standard
	Cd	114	259238.7	1.8	**48.0606**	0.391	0.8	ug/L	56	Standard
>	In	115	654075.6	1.8				ug/L	634401	Standard
	Sn	118	153.3	2.9	**0.0445**	0.003	6.4	ug/L	137	Standard
	Sb	123	258496.2	0.6	**47.4876**	1.135	2.4	ug/L	907	Standard
	Ba	135	152941.7	0.9	**52.2370**	0.468	0.9	ug/L	166	Standard
	Ce	140	14595.4	0.6				ug/L	57	Standard
>	Tb	159	1354689.6	2.8				ug/L	1347540	Standard
	Ho	165	246.7	17.0				ug/L	23	Standard
	Tl	203	570948.5	0.8	**47.9741**	0.542	1.1	ug/L	45	Standard
	Tl	205	1341736.8	1.4	**46.6710**	0.580	1.2	ug/L	112	Standard
	Pb	206	434415.2	1.2	**48.5997**	0.690	1.4	ug/L	825	Standard
	Pb	207	368331.9	1.8	**46.8164**	0.930	2.0	ug/L	679	Standard
	Pb	208	1702711.3	1.3	**47.6240**	0.686	1.4	ug/L	3166	Standard
	U	238	1454483.1	0.2	**45.1500**	0.227	0.5	ug/L	119	Standard
>	Bi	209	679781.3	0.4				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4528**	0.776	171.3	mg/L	0	Standard
|	**Mg**	24	471.7	6.5	**0.5987**	0.049	8.1	mg/L	48	Standard
|	**K**	39	20.0	0.0	**0.0767**	0.002	2.7	mg/L	8	Standard
|	**Ca**	43	30.0	44.1	**-0.9840**	4.421	449.3	mg/L	27	Standard
|	**Fe**	54	223.9	14.8	**0.1070**	0.033	31.3	mg/L	121	Standard
|	**Fe**	57	333.3	6.1	**-0.0143**	0.065	456.3	mg/L	305	Standard
⌊>	**Sc-1**	45	22646.9	1.0				mg/L	22700	Standard
	Cl	35	4.7	89.2				ug/L	3	Standard
	Kr	83	2.7	21.7				ug/L	5	Standard
	Br	81	2060.1	7.3				ug/L	1367	Standard
	P	31	131.7	9.6				ug/L	67	Standard
	S	34	68.3	21.1				ug/L	55	Standard
	Sr	88	151.7	11.6				ug/L	113	Standard
	C	12	363.3	12.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	341.4	27.2				mg/L	18	Standard
	Ho-1	165	246.7	17.0				mg/L	23	Standard
	Er	166	180.0	14.7				mg/L	40	Standard
	I	127	17850.5	7.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		100.292	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		98.404	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	103.101
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	101.760
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610026705S WG587446-04
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Method 6020 - Summary Report

Sample ID: L1610026708SD WG587446-05
Sample Date/Time: Thursday, October 20, 2016 12:37:28
Number of Replicates: 3
Autosampler Position: 246
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79459.5	2.2				ug/L	76335	Standard
	Be	9	55162.0	3.5	**48.0621**	0.821	1.7	ug/L	18	Standard
	Al	27	470199.5	3.3	**3.6321**	0.134	3.7	ug/L	810	Standard
	Sc	45	23538.3	3.6				ug/L	22700	Standard
	Ti	47	254.0	11.6	**1.0495**	0.115	10.9	ug/L	25	Standard
	V	51	365938.6	3.8	**48.9450**	0.608	1.2	ug/L	1541	Standard
	Cr	52	354165.0	5.1	**49.9791**	0.428	0.9	ug/L	7881	Standard
	Cr	53	44562.2	3.5	**49.5594**	0.580	1.2	ug/L	932	Standard
	Mn	55	602998.9	6.9	**51.3277**	1.282	2.5	ug/L	1508	Standard
	Co	59	480156.2	5.1	**49.2123**	0.496	1.0	ug/L	282	Standard
	Ni	60	103967.2	5.3	**49.3236**	0.590	1.2	ug/L	91	Standard
	Cu	65	101990.4	5.3	**49.3165**	0.409	0.8	ug/L	205	Standard
	Zn	66	52667.8	4.6	**49.5833**	0.178	0.4	ug/L	369	Standard
>	Ge	72	510398.7	4.5				ug/L	496734	Standard
	As	75	51726.3	4.2	**48.7226**	0.154	0.3	ug/L	-45	Standard
	Se	82	4919.5	2.4	**48.2046**	1.098	2.3	ug/L	18	Standard
	Se-1	77	3374.4	5.5	**48.2189**	1.006	2.1	ug/L	83	Standard
>	Ga	71	150.0	23.3				mg/L	30	Standard
	Rb	85	5012.5	2.5				ug/L	23	Standard
	Y	89	411913.0	3.3				ug/L	405333	Standard
>	Rh	103	36.7	28.4				ug/L	17	Standard
	Mo	98	109.3	14.0	**0.0058**	0.003	44.0	ug/L	135	Standard
	Ag	107	365504.9	4.4	**47.3924**	0.384	0.8	ug/L	123	Standard
	Cd	111	111057.9	4.5	**49.8356**	0.288	0.6	mg/L	11	Standard
	Cd	114	280876.9	5.4	**48.6776**	1.127	2.3	ug/L	56	Standard
>	In	115	699721.2	5.1				ug/L	634401	Standard
	Sn	118	157.3	2.6	**0.0397**	0.007	16.8	ug/L	137	Standard
	Sb	123	279956.5	4.7	**48.0682**	0.321	0.7	ug/L	907	Standard
	Ba	135	164586.4	4.0	**52.5712**	1.333	2.5	ug/L	166	Standard
	Ce	140	14985.8	5.8				ug/L	57	Standard
>	Tb	159	1426538.5	4.9				ug/L	1347540	Standard
	Ho	165	300.0	57.7				ug/L	23	Standard
	Tl	203	599518.8	4.9	**48.9395**	1.058	2.2	ug/L	45	Standard
	Tl	205	1422357.2	3.6	**48.0817**	0.797	1.7	ug/L	112	Standard
	Pb	206	455808.9	4.5	**49.5448**	0.875	1.8	ug/L	825	Standard
	Pb	207	384393.9	4.9	**47.4657**	1.047	2.2	ug/L	679	Standard
	Pb	208	1778483.1	4.3	**48.3325**	0.740	1.5	ug/L	3166	Standard
	U	238	1528320.4	3.6	**46.1022**	0.455	1.0	ug/L	119	Standard
>	Bi	209	699427.0	2.8				ug/L	668024	Standard

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⌈	**Na**	23	13.3	57.3	**3.4942**	2.074	59.3	mg/L	0	Standard
|	**Mg**	24	568.3	11.3	**0.7096**	0.094	13.3	mg/L	48	Standard
|	**K**	39	28.3	36.7	**0.1540**	0.109	70.6	mg/L	8	Standard
|	**Ca**	43	33.3	43.3	**-0.2126**	4.875	2293.1	mg/L	27	Standard
|	**Fe**	54	273.5	6.4	**0.1484**	0.008	5.1	mg/L	121	Standard
|	**Fe**	57	313.3	13.6	**-0.1323**	0.199	150.4	mg/L	305	Standard
⌊>	**Sc-1**	45	23538.3	3.6				mg/L	22700	Standard
	Cl	35	6.7	17.3				ug/L	3	Standard
	Kr	83	3.7	103.3				ug/L	5	Standard
	Br	81	3333.7	11.4				ug/L	1367	Standard
	P	31	86.7	27.3				ug/L	67	Standard
	S	34	76.7	39.8				ug/L	55	Standard
	Sr	88	171.7	14.4				ug/L	113	Standard
	C	12	390.0	24.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	361.1	12.3				mg/L	18	Standard
	Ho-1	165	300.0	57.7				mg/L	23	Standard
	Er	166	186.7	25.3				mg/L	40	Standard
	I	127	23820.5	10.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		104.093	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		102.751	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	110.296
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	104.701
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026711
Sample Date/Time: Thursday, October 20, 2016 12:40:27
Number of Replicates: 3
Autosampler Position: 247
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	74241.5	0.8				ug/L	76335	Standard
	Be	9	35.0	49.5	**0.0296**	0.016	54.3	ug/L	18	Standard
	Al	27	417589.6	3.0	**3.4509**	0.074	2.1	ug/L	810	Standard
	Sc	45	22051.1	3.9				ug/L	22700	Standard
	Ti	47	195.3	8.2	**0.8235**	0.058	7.0	ug/L	25	Standard
	V	51	2516.9	1.2	**0.1331**	0.013	9.4	ug/L	1541	Standard
	Cr	52	11727.9	1.8	**0.6005**	0.011	1.9	ug/L	7881	Standard
	Cr	53	1655.1	8.7	**0.9014**	0.222	24.6	ug/L	932	Standard
	Mn	55	45483.9	2.7	**4.0023**	0.016	0.4	ug/L	1508	Standard
	Co	59	888.0	2.7	**0.0634**	0.004	6.4	ug/L	282	Standard
	Ni	60	786.4	7.3	**0.3508**	0.020	5.7	ug/L	91	Standard
	Cu	65	636.0	6.2	**0.2621**	0.019	7.1	ug/L	205	Standard
	Zn	66	2103.8	2.5	**1.9102**	0.010	0.5	ug/L	369	Standard
>	Ge	72	484652.4	2.4				ug/L	496734	Standard
	As	75	12.7	239.3	**0.0716**	0.030	41.7	ug/L	-45	Standard
	Se	82	19.2	40.9	**-0.0011**	0.077	7188.4	ug/L	18	Standard
	Se-1	77	105.0	11.7	**0.4633**	0.159	34.4	ug/L	83	Standard
>	Ga	71	98.3	12.8				mg/L	30	Standard
	Rb	85	4128.9	3.1				ug/L	23	Standard
	Y	89	391725.7	3.1				ug/L	405333	Standard
>	Rh	103	8.3	69.3				ug/L	17	Standard
	Mo	98	65.6	13.5	**-0.0038**	0.002	48.4	ug/L	135	Standard
	Ag	107	134.3	11.2	**-0.0035**	0.002	56.5	ug/L	123	Standard
	Cd	111	19.9	43.7	**0.0004**	0.004	1028.8	mg/L	11	Standard
	Cd	114	75.3	27.4	**0.0073**	0.003	46.7	ug/L	56	Standard
>	In	115	652245.6	3.3				ug/L	634401	Standard
	Sn	118	114.0	12.1	**0.0134**	0.010	71.5	ug/L	137	Standard
	Sb	123	3995.8	44.8	**0.6635**	0.318	47.9	ug/L	907	Standard
	Ba	135	11307.9	3.7	**3.8290**	0.055	1.4	ug/L	166	Standard
	Ce	140	11537.7	1.8				ug/L	57	Standard
>	Tb	159	1339169.4	3.1				ug/L	1347540	Standard
	Ho	165	181.7	4.2				ug/L	23	Standard
	Tl	203	171.0	20.5	**0.0100**	0.003	27.4	ug/L	45	Standard
	Tl	205	440.0	18.6	**0.0137**	0.003	19.1	ug/L	112	Standard
	Pb	206	1325.4	2.6	**0.0961**	0.001	1.0	ug/L	825	Standard
	Pb	207	1088.4	3.0	**0.0917**	0.006	6.9	ug/L	679	Standard
	Pb	208	5101.3	1.6	**0.0914**	0.003	3.2	ug/L	3166	Standard
	U	238	485.7	14.7	**0.0136**	0.002	14.4	ug/L	119	Standard
>	Bi	209	666120.1	2.2				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	538.3	15.3	**0.7163**	0.103	14.4	mg/L	48	Standard
|	**K**	39	41.7	18.3	**0.3169**	0.093	29.4	mg/L	8	Standard
|	**Ca**	43	23.3	44.6	**-3.0101**	3.772	125.3	mg/L	27	Standard
|	**Fe**	54	192.4	14.9	**0.0791**	0.027	34.5	mg/L	121	Standard
|	**Fe**	57	333.3	10.2	**0.0258**	0.184	713.5	mg/L	305	Standard
⌊>	**Sc-1**	45	22051.1	3.9				mg/L	22700	Standard
	Cl	35	0.7	173.2				ug/L	3	Standard
	Kr	83	2.7	78.1				ug/L	5	Standard
	Br	81	2490.2	14.0				ug/L	1367	Standard
	P	31	106.7	7.2				ug/L	67	Standard
	S	34	78.3	29.5				ug/L	55	Standard
	Sr	88	133.3	2.2				ug/L	113	Standard
	C	12	326.7	20.4				mg/L	367	Standard
	N	14	6.7	86.6				mg/L	3	Standard
	Hg	202	13.3	43.3				mg/L	10	Standard
	Dy	164	220.4	14.9				mg/L	18	Standard
	Ho-1	165	181.7	4.2				mg/L	23	Standard
	Er	166	130.0	38.5				mg/L	40	Standard
	I	127	16572.4	6.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		97.257	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		97.568	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	102.813
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	99.715
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026714
Sample Date/Time: Thursday, October 20, 2016 12:43:26
Number of Replicates: 3
Autosampler Position: 248
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71303.1	7.9				ug/L	76335	Standard
	Be	9	25.0	20.0	**0.0215**	0.006	29.8	ug/L	18	Standard
	Al	27	378373.0	7.4	**3.2578**	0.095	2.9	ug/L	810	Standard
	Sc	45	21653.9	9.1				ug/L	22700	Standard
	Ti	47	143.3	26.2	**0.5930**	0.154	26.0	ug/L	25	Standard
	V	51	2337.1	8.6	**0.1213**	0.020	16.9	ug/L	1541	Standard
	Cr	52	11235.5	6.0	**0.5972**	0.027	4.6	ug/L	7881	Standard
	Cr	53	1593.4	5.3	**0.9052**	0.068	7.6	ug/L	932	Standard
	Mn	55	40783.3	6.5	**3.7335**	0.076	2.0	ug/L	1508	Standard
	Co	59	815.7	5.7	**0.0593**	0.001	1.3	ug/L	282	Standard
	Ni	60	713.4	0.5	**0.3302**	0.019	5.8	ug/L	91	Standard
	Cu	65	416.7	5.5	**0.1592**	0.008	5.0	ug/L	205	Standard
	Zn	66	2403.5	5.9	**2.3090**	0.025	1.1	ug/L	369	Standard
>	Ge	72	464973.4	4.9				ug/L	496734	Standard
	As	75	-0.(150097.1		**0.0582**	0.054	91.9	ug/L	-45	Standard
	Se	82	17.0	33.8	**-0.0151**	0.065	433.4	ug/L	18	Standard
	Se-1	77	92.0	8.2	**0.3236**	0.067	20.7	ug/L	83	Standard
>	Ga	71	76.7	32.8				mg/L	30	Standard
	Rb	85	3638.8	5.2				ug/L	23	Standard
	Y	89	374584.5	5.5				ug/L	405333	Standard
>	Rh	103	13.3	43.3				ug/L	17	Standard
	Mo	98	63.3	24.5	**-0.0040**	0.003	80.1	ug/L	135	Standard
	Ag	107	132.7	19.2	**-0.0033**	0.002	67.6	ug/L	123	Standard
	Cd	111	24.9	8.0	**0.0033**	0.002	49.6	mg/L	11	Standard
	Cd	114	76.9	39.4	**0.0079**	0.005	58.2	ug/L	56	Standard
>	In	115	634073.7	7.5				ug/L	634401	Standard
	Sn	118	117.0	4.8	**0.0188**	0.005	26.3	ug/L	137	Standard
	Sb	123	1263.6	56.0	**0.1654**	0.116	70.3	ug/L	907	Standard
	Ba	135	10276.8	5.5	**3.5812**	0.116	3.2	ug/L	166	Standard
	Ce	140	10285.2	5.8				ug/L	57	Standard
>	Tb	159	1291794.2	6.6				ug/L	1347540	Standard
	Ho	165	180.0	14.7				ug/L	23	Standard
	Tl	203	128.7	22.7	**0.0068**	0.002	30.3	ug/L	45	Standard
	Tl	205	253.3	23.5	**0.0075**	0.002	29.5	ug/L	112	Standard
	Pb	206	1184.0	7.7	**0.0853**	0.005	5.7	ug/L	825	Standard
	Pb	207	991.0	7.2	**0.0840**	0.003	3.4	ug/L	679	Standard
	Pb	208	4586.3	4.9	**0.0819**	0.000	0.4	ug/L	3166	Standard
	U	238	383.0	19.9	**0.0108**	0.002	17.2	ug/L	119	Standard
>	Bi	209	640533.8	5.1				ug/L	668024	Standard

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⌈	**Na**	23	3.3	173.2	**0.8546**	1.472	172.2	mg/L	0	Standard
|	**Mg**	24	515.0	9.3	**0.6988**	0.069	9.9	mg/L	48	Standard
|	**K**	39	33.3	69.3	**0.2201**	0.212	96.1	mg/L	8	Standard
|	**Ca**	43	35.0	24.7	**1.4105**	3.466	245.7	mg/L	27	Standard
|	**Fe**	54	191.0	25.9	**0.0795**	0.037	46.7	mg/L	121	Standard
|	**Fe**	57	330.0	6.9	**0.0399**	0.168	420.3	mg/L	305	Standard
⌊>	**Sc-1**	45	21653.9	9.1				mg/L	22700	Standard
	Cl	35	4.0	100.0				ug/L	3	Standard
	Kr	83	2.3	24.7				ug/L	5	Standard
	Br	81	1903.5	1.7				ug/L	1367	Standard
	P	31	105.0	29.7				ug/L	67	Standard
	S	34	75.0	6.7				ug/L	55	Standard
	Sr	88	106.7	15.1				ug/L	113	Standard
	C	12	280.0	15.6				mg/L	367	Standard
	N	14	6.7	173.2				mg/L	3	Standard
	Hg	202	10.0					mg/L	10	Standard
	Dy	164	206.3	10.5				mg/L	18	Standard
	Ho-1	165	180.0	14.7				mg/L	23	Standard
	Er	166	146.7	14.2				mg/L	40	Standard
	I	127	15714.8	8.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		93.408	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.606	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

Sample ID: L1610026714
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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	99.948
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	95.885
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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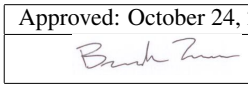

Method 6020 - Summary Report

Sample ID: L1610026714PS WG588304-01
Sample Date/Time: Thursday, October 20, 2016 12:46:26
Number of Replicates: 3
Autosampler Position: 249
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75261.9	6.3				ug/L	76335	Standard
	Be	9	54349.2	6.5	**50.0000**	0.623	1.2	ug/L	18	Standard
	Al	27	396246.7	6.8	**3.2313**	0.131	4.1	ug/L	810	Standard
	Sc	45	21430.2	2.9				ug/L	22700	Standard
	Ti	47	164.0	10.0	**0.6785**	0.114	16.8	ug/L	25	Standard
	V	51	349704.0	3.5	**49.5971**	0.210	0.4	ug/L	1541	Standard
	Cr	52	340158.4	3.3	**50.9444**	0.592	1.2	ug/L	7881	Standard
	Cr	53	43505.8	4.2	**51.3265**	0.344	0.7	ug/L	932	Standard
	Mn	55	587918.1	4.6	**53.1005**	0.394	0.7	ug/L	1508	Standard
	Co	59	460220.1	4.0	**50.0270**	0.132	0.3	ug/L	282	Standard
	Ni	60	100287.8	3.7	**50.4698**	0.363	0.7	ug/L	91	Standard
	Cu	65	101671.0	3.8	**52.1531**	0.552	1.1	ug/L	205	Standard
	Zn	66	52149.3	3.9	**52.0750**	0.321	0.6	ug/L	369	Standard
>	Ge	72	481310.8	3.9				ug/L	496734	Standard
	As	75	51170.8	3.9	**51.1055**	0.329	0.6	ug/L	-45	Standard
	Se	82	4917.2	5.6	**51.0488**	0.910	1.8	ug/L	18	Standard
	Se-1	77	3400.7	4.8	**51.6099**	0.482	0.9	ug/L	83	Standard
>	Ga	71	71.7	33.0				mg/L	30	Standard
	Rb	85	3723.8	2.9				ug/L	23	Standard
	Y	89	388614.4	3.5				ug/L	405333	Standard
>	Rh	103	31.7	9.1				ug/L	17	Standard
	Mo	98	73.5	20.4	**-0.0017**	0.004	208.5	ug/L	135	Standard
	Ag	107	374769.0	2.8	**52.1808**	0.656	1.3	ug/L	123	Standard
	Cd	111	108154.0	2.2	**52.1203**	0.603	1.2	mg/L	11	Standard
	Cd	114	266496.8	4.0	**49.5889**	0.780	1.6	ug/L	56	Standard
>	In	115	651577.1	3.2				ug/L	634401	Standard
	Sn	118	146.0	11.0	**0.0391**	0.011	27.5	ug/L	137	Standard
	Sb	123	279918.5	2.8	**51.6194**	0.817	1.6	ug/L	907	Standard
	Ba	135	158483.2	3.5	**54.3307**	0.572	1.1	ug/L	166	Standard
	Ce	140	10498.6	2.4				ug/L	57	Standard
>	Tb	159	1355085.5	4.2				ug/L	1347540	Standard
	Ho	165	173.3	14.8				ug/L	23	Standard
	Tl	203	574865.4	3.9	**50.2749**	0.652	1.3	ug/L	45	Standard
	Tl	205	1352368.7	3.0	**48.9754**	0.825	1.7	ug/L	112	Standard
	Pb	206	436878.1	2.8	**50.8850**	0.574	1.1	ug/L	825	Standard
	Pb	207	383348.7	3.0	**50.7318**	0.921	1.8	ug/L	679	Standard
	Pb	208	1742339.5	3.3	**50.7306**	0.293	0.6	ug/L	3166	Standard
	U	238	1498677.5	3.9	**48.4210**	0.558	1.2	ug/L	119	Standard
>	Bi	209	653071.6	3.5				ug/L	668024	Standard

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	Na	23	3.3	173.2	**0.9604**	1.655	172.3	mg/L	0	Standard
	Mg	24	510.0	7.7	**0.6971**	0.049	7.0	mg/L	48	Standard
	K	39	31.7	18.2	**0.2173**	0.062	28.4	mg/L	8	Standard
	Ca	43	35.0	14.3	**1.4564**	1.939	133.1	mg/L	27	Standard
	Fe	54	229.4	19.2	**0.1266**	0.049	38.7	mg/L	121	Standard
	Fe	57	380.0	20.7	**0.2569**	0.361	140.6	mg/L	305	Standard
>	**Sc-1**	45	21430.2	2.9				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	2.7	21.7				ug/L	5	Standard
	Br	81	1973.5	6.4				ug/L	1367	Standard
	P	31	101.7	5.7				ug/L	67	Standard
	S	34	66.7	35.4				ug/L	55	Standard
	Sr	88	165.0	3.0				ug/L	113	Standard
	C	12	426.7	27.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	16.7	34.6				mg/L	10	Standard
	Dy	164	261.9	20.7				mg/L	18	Standard
	Ho-1	165	173.3	14.8				mg/L	23	Standard
	Er	166	170.0	15.6				mg/L	40	Standard
	I	127	15332.8	6.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		98.594	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		96.895	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	102.707
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	97.762
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026714SDL WG588304-02
Sample Date/Time: Thursday, October 20, 2016 12:49:25
Number of Replicates: 3
Autosampler Position: 250
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	65058.0	6.0				ug/L	76335	Standard
	Be	9	18.3	15.7	**0.0167**	0.004	24.6	ug/L	18	Standard
	Al	27	71094.8	1.8	**0.6683**	0.033	5.0	ug/L	810	Standard
	Sc	45	19472.5	2.3				ug/L	22700	Standard
	Ti	47	45.0	17.4	**0.1036**	0.036	35.1	ug/L	25	Standard
	V	51	1514.2	3.6	**0.0107**	0.005	50.9	ug/L	1541	Standard
	Cr	52	6215.6	0.4	**-0.1512**	0.019	12.6	ug/L	7881	Standard
	Cr	53	931.7	2.7	**0.1357**	0.058	42.4	ug/L	932	Standard
	Mn	55	9165.1	2.8	**0.8149**	0.022	2.7	ug/L	1508	Standard
	Co	59	352.3	8.1	**0.0090**	0.002	27.5	ug/L	282	Standard
	Ni	60	198.7	1.9	**0.0663**	0.004	6.0	ug/L	91	Standard
	Cu	65	240.7	7.6	**0.0718**	0.010	14.5	ug/L	205	Standard
	Zn	66	1048.4	1.1	**0.9560**	0.014	1.4	ug/L	369	Standard
>	Ge	72	443839.2	2.1				ug/L	496734	Standard
	As	75	-29.5	30.5	**0.0274**	0.010	36.5	ug/L	-45	Standard
	Se	82	13.3	16.3	**-0.0479**	0.025	53.2	ug/L	18	Standard
	Se-1	77	79.7	10.1	**0.1898**	0.162	85.4	ug/L	83	Standard
>	Ga	71	20.0	25.0				mg/L	30	Standard
	Rb	85	676.7	11.3				ug/L	23	Standard
	Y	89	348743.3	1.4				ug/L	405333	Standard
>	Rh	103	10.0	50.0				ug/L	17	Standard
	Mo	98	21.6	46.6	**-0.0148**	0.003	19.9	ug/L	135	Standard
	Ag	107	170.7	12.1	**0.0045**	0.003	59.6	ug/L	123	Standard
	Cd	111	17.0	15.5	**0.0000**	0.001	14155.1	mg/L	11	Standard
	Cd	114	46.4	30.7	**0.0031**	0.003	95.5	ug/L	56	Standard
>	In	115	580962.3	3.0				ug/L	634401	Standard
	Sn	118	70.3	21.3	**-0.0146**	0.012	82.1	ug/L	137	Standard
	Sb	123	1631.5	38.3	**0.2668**	0.120	44.9	ug/L	907	Standard
	Ba	135	2026.5	3.8	**0.7330**	0.025	3.4	ug/L	166	Standard
	Ce	140	2053.5	7.6				ug/L	57	Standard
>	Tb	159	1204583.4	0.3				ug/L	1347540	Standard
	Ho	165	26.7	39.0				ug/L	23	Standard
	Tl	203	126.3	17.7	**0.0072**	0.002	27.0	ug/L	45	Standard
	Tl	205	273.3	28.5	**0.0087**	0.003	33.0	ug/L	112	Standard
	Pb	206	623.7	6.1	**0.0224**	0.005	21.9	ug/L	825	Standard
	Pb	207	512.3	4.2	**0.0228**	0.004	17.1	ug/L	679	Standard
	Pb	208	2400.4	3.1	**0.0204**	0.003	12.3	ug/L	3166	Standard
	U	238	227.3	16.4	**0.0060**	0.001	19.6	ug/L	119	Standard
>	Bi	209	610885.9	1.3				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**1.0564**	0.911	86.2	mg/L	0	Standard
|	**Mg**	24	133.3	14.2	**0.1332**	0.037	27.9	mg/L	48	Standard
|	**K**	39	8.3	91.7	**-0.0297**	0.095	319.4	mg/L	8	Standard
|	**Ca**	43	30.0	16.7	**0.7122**	1.889	265.3	mg/L	27	Standard
|	**Fe**	54	92.8	16.8	**-0.0158**	0.017	104.9	mg/L	121	Standard
|	**Fe**	57	268.3	5.7	**-0.0967**	0.042	43.0	mg/L	305	Standard
⌊>	**Sc-1**	45	19472.5	2.3				mg/L	22700	Standard
	Cl	35	4.7	99.0				ug/L	3	Standard
	Kr	83	2.7	21.7				ug/L	5	Standard
	Br	81	1303.4	4.4				ug/L	1367	Standard
	P	31	58.3	35.7				ug/L	67	Standard
	S	34	55.0	15.7				ug/L	55	Standard
	Sr	88	125.0	8.0				ug/L	113	Standard
	C	12	223.3	21.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	55.4	26.0				mg/L	18	Standard
	Ho-1	165	26.7	39.0				mg/L	23	Standard
	Er	166	26.7	78.1				mg/L	40	Standard
	I	127	6914.9	7.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		85.227	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		89.351	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	91.576
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	91.447
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026714SDL WG588304-02
Sample Date/Time: Thursday, October 20, 2016 12:52:25
Number of Replicates: 3
Autosampler Position: 251
Sample Description: 25
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	58849.2	4.3				ug/L	76335	Standard
	Be	9	18.3	15.7	**0.0186**	0.004	20.4	ug/L	18	Standard
	Al	27	14165.0	5.1	**0.1436**	0.006	4.0	ug/L	810	Standard
	Sc	45	18246.0	2.5				ug/L	22700	Standard
	Ti	47	20.7	22.3	**-0.0205**	0.029	139.6	ug/L	25	Standard
	V	51	1267.4	1.4	**-0.0170**	0.004	22.1	ug/L	1541	Standard
	Cr	52	5093.2	3.7	**-0.2936**	0.019	6.6	ug/L	7881	Standard
	Cr	53	836.7	6.2	**0.0675**	0.043	63.2	ug/L	932	Standard
	Mn	55	2030.5	3.4	**0.1252**	0.003	2.7	ug/L	1508	Standard
	Co	59	344.7	8.9	**0.0102**	0.003	30.5	ug/L	282	Standard
	Ni	60	88.0	17.6	**0.0082**	0.008	97.3	ug/L	91	Standard
	Cu	65	164.7	13.4	**0.0341**	0.011	30.9	ug/L	205	Standard
	Zn	66	697.0	4.9	**0.6136**	0.024	3.9	ug/L	369	Standard
>	Ge	72	421677.6	2.5				ug/L	496734	Standard
	As	75	-25.3	175.5	**0.0314**	0.050	158.7	ug/L	-45	Standard
	Se	82	15.7	35.7	**-0.0112**	0.070	623.2	ug/L	18	Standard
	Se-1	77	89.7	11.2	**0.4386**	0.215	49.1	ug/L	83	Standard
>	Ga	71	23.3	44.6				mg/L	30	Standard
	Rb	85	175.0	33.0				ug/L	23	Standard
	Y	89	332768.2	5.5				ug/L	405333	Standard
>	Rh	103	16.7	45.8				ug/L	17	Standard
	Mo	98	16.4	11.9	**-0.0159**	0.001	4.0	ug/L	135	Standard
	Ag	107	140.3	13.1	**0.0014**	0.003	225.9	ug/L	123	Standard
	Cd	111	19.6	20.6	**0.0023**	0.003	115.8	mg/L	11	Standard
	Cd	114	60.6	12.2	**0.0071**	0.002	29.2	ug/L	56	Standard
>	In	115	540880.5	3.5				ug/L	634401	Standard
	Sn	118	38.0	27.5	**-0.0406**	0.011	27.4	ug/L	137	Standard
	Sb	123	352.9	35.3	**0.0098**	0.028	285.9	ug/L	907	Standard
	Ba	135	455.3	3.9	**0.1415**	0.012	8.7	ug/L	166	Standard
	Ce	140	403.3	6.8				ug/L	57	Standard
>	Tb	159	1116399.6	1.8				ug/L	1347540	Standard
	Ho	165	20.0	25.0				ug/L	23	Standard
	Tl	203	92.7	28.4	**0.0046**	0.003	59.1	ug/L	45	Standard
	Tl	205	203.3	26.3	**0.0066**	0.002	35.8	ug/L	112	Standard
	Pb	206	483.0	4.0	**0.0088**	0.002	22.9	ug/L	825	Standard
	Pb	207	417.3	3.4	**0.0133**	0.002	12.2	ug/L	679	Standard
	Pb	208	1868.7	3.2	**0.0078**	0.001	15.4	ug/L	3166	Standard
	U	238	196.7	11.8	**0.0055**	0.001	16.2	ug/L	119	Standard
>	Bi	209	572598.0	2.0				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5660**	0.972	171.7	mg/L	0	Standard
|	**Mg**	24	61.7	23.4	**0.0176**	0.029	163.2	mg/L	48	Standard
|	**K**	39	3.3	173.2	**-0.0885**	0.076	86.2	mg/L	8	Standard
|	**Ca**	43	25.0	34.6	**-0.5371**	3.900	726.0	mg/L	27	Standard
|	**Fe**	54	34.4	52.0	**-0.0847**	0.022	26.2	mg/L	121	Standard
|	**Fe**	57	300.0	8.8	**0.1381**	0.140	101.4	mg/L	305	Standard
⌊>	**Sc-1**	45	18246.0	2.5				mg/L	22700	Standard
	Cl	35	4.0	86.6				ug/L	3	Standard
	Kr	83	4.0	66.1				ug/L	5	Standard
	Br	81	1236.7	16.6				ug/L	1367	Standard
	P	31	55.0	18.2				ug/L	67	Standard
	S	34	70.0	12.4				ug/L	55	Standard
	Sr	88	150.0	16.7				ug/L	113	Standard
	C	12	166.7	15.1				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	23.0	101.5				mg/L	18	Standard
	Ho-1	165	20.0	25.0				mg/L	23	Standard
	Er	166	6.7	86.6				mg/L	40	Standard
	I	127	5112.5	3.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		77.093	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		84.890	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	85.258
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	85.715
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 12:55:26
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	76334.0	6.2				ug/L	76335	Standard
	Be	9	54544.9	5.8	**49.5024**	1.547	3.1	ug/L	18	Standard
	Al	27	6295646.2	6.3	**50.6703**	1.061	2.1	ug/L	810	Standard
	Sc	45	22952.4	6.8				ug/L	22700	Standard
	Ti	47	21110.4	5.6	**100.3363**	2.457	2.4	ug/L	25	Standard
	V	51	366736.1	4.9	**49.9109**	0.908	1.8	ug/L	1541	Standard
	Cr	52	347989.3	6.2	**49.9717**	1.624	3.3	ug/L	7881	Standard
	Cr	53	44560.6	6.0	**50.4249**	1.411	2.8	ug/L	932	Standard
	Mn	55	579078.3	5.0	**50.1961**	0.860	1.7	ug/L	1508	Standard
	Co	59	479844.8	4.3	**50.0638**	0.527	1.1	ug/L	282	Standard
	Ni	60	102662.7	4.4	**49.5824**	0.507	1.0	ug/L	91	Standard
	Cu	65	101315.7	4.5	**49.8748**	0.825	1.7	ug/L	205	Standard
	Zn	66	51905.5	2.9	**49.7556**	0.628	1.3	ug/L	369	Standard
>	Ge	72	501368.1	3.3				ug/L	496734	Standard
	As	75	52352.2	3.5	**50.1924**	0.306	0.6	ug/L	-45	Standard
	Se	82	5027.1	3.6	**50.1185**	0.362	0.7	ug/L	18	Standard
	Se-1	77	3420.1	3.7	**49.8011**	0.969	1.9	ug/L	83	Standard
>	Ga	71	70.0	21.4				mg/L	30	Standard
	Rb	85	621.7	14.9				ug/L	23	Standard
	Y	89	402871.8	6.1				ug/L	405333	Standard
>	Rh	103	40.0	21.7				ug/L	17	Standard
	Mo	98	376233.3	3.5	**96.4593**	1.737	1.8	ug/L	135	Standard
	Ag	107	377820.2	4.3	**50.7933**	1.280	2.5	ug/L	123	Standard
	Cd	111	106760.9	3.7	**49.6753**	0.899	1.8	mg/L	11	Standard
	Cd	114	278544.3	3.0	**50.0675**	0.805	1.6	ug/L	56	Standard
>	In	115	674924.1	4.6				ug/L	634401	Standard
	Sn	118	63947.8	4.3	**49.2246**	1.348	2.7	ug/L	137	Standard
	Sb	123	282107.7	3.6	**50.2341**	1.061	2.1	ug/L	907	Standard
	Ba	135	148748.6	4.6	**49.2278**	0.273	0.6	ug/L	166	Standard
	Ce	140	191.7	10.9				ug/L	57	Standard
>	Tb	159	1379896.0	5.1				ug/L	1347540	Standard
	Ho	165	43.3	24.0				ug/L	23	Standard
	Tl	203	573795.4	4.9	**49.5722**	0.604	1.2	ug/L	45	Standard
	Tl	205	1371750.2	4.4	**49.0777**	1.184	2.4	ug/L	112	Standard
	Pb	206	437328.1	4.5	**50.3108**	0.132	0.3	ug/L	825	Standard
	Pb	207	384737.0	3.6	**50.3008**	0.425	0.8	ug/L	679	Standard
	Pb	208	1734100.1	4.2	**49.8805**	0.064	0.1	ug/L	3166	Standard
	U	238	1510641.4	4.1	**48.2256**	0.235	0.5	ug/L	119	Standard
>	Bi	209	661029.9	4.3				ug/L	668024	Standard

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⌈	**Na**	23	15.0	88.2	**3.8611**	3.168	82.0	mg/L	0	Standard
|	**Mg**	24	3510.4	4.9	**5.0075**	0.225	4.5	mg/L	48	Standard
|	**K**	39	523.3	7.2	**5.3027**	0.751	14.2	mg/L	8	Standard
|	**Ca**	43	36.7	70.0	**1.3348**	8.836	662.0	mg/L	27	Standard
|	**Fe**	54	4969.2	6.9	**5.0546**	0.147	2.9	mg/L	121	Standard
|	**Fe**	57	1553.4	7.4	**4.6244**	0.143	3.1	mg/L	305	Standard
⌊>	**Sc-1**	45	22952.4	6.8				mg/L	22700	Standard
	Cl	35	2.0	100.0				ug/L	3	Standard
	Kr	83	4.3	35.3				ug/L	5	Standard
	Br	81	1540.1	14.9				ug/L	1367	Standard
	P	31	101.7	25.2				ug/L	67	Standard
	S	34	71.7	31.5				ug/L	55	Standard
	Sr	88	125.0	13.9				ug/L	113	Standard
	C	12	316.7	7.3				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	13.3	43.3				mg/L	10	Standard
	Dy	164	28.6	57.8				mg/L	18	Standard
	Ho-1	165	43.3	24.0				mg/L	23	Standard
	Er	166	30.0	66.7				mg/L	40	Standard
	I	127	2665.2	7.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	99.005		
⌊	Al	27	101.341		
⌈	Sc	45			
|	Ti	47	100.336		
|	V	51	99.822		
|	Cr	52	99.943		
|	Cr	53			
|	Mn	55	100.392		
|	Co	59	100.128		
|	Ni	60	99.165		
|	Cu	65	99.750		
|	Zn	66	99.511		
|>	Ge	72		100.933	
|	As	75	100.385		
|	Se	82	100.237		
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	96.459		
Ag	107	101.587		
Cd	111	99.351		
Cd	114			
In	115		106.388	
Sn	118	98.449		
Sb	123	100.468		
Ba	135	98.456		
Ce	140			
Tb	159			
Ho	165			
Tl	203	99.144		
Tl	205			
Pb	206			
Pb	207			
Pb	208	99.761		
U	238	96.451		
Bi	209		98.953	
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 12:58:26
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	65230.5	6.6				ug/L	76335	Standard
	Be	9	23.3	81.1	**0.0213**	0.019	87.0	ug/L	18	Standard
	Al	27	750.0	22.8	**0.0027**	0.001	44.2	ug/L	810	Standard
	Sc	45	20028.2	1.8				ug/L	22700	Standard
	Ti	47	25.0	26.2	**-0.0031**	0.038	1246.1	ug/L	25	Standard
	V	51	1290.0	6.3	**-0.0241**	0.014	59.9	ug/L	1541	Standard
	Cr	52	5519.0	4.0	**-0.2691**	0.010	3.8	ug/L	7881	Standard
	Cr	53	780.0	7.6	**-0.0642**	0.088	137.3	ug/L	932	Standard
	Mn	55	757.7	20.3	**-0.0105**	0.013	119.5	ug/L	1508	Standard
	Co	59	283.0	4.9	**0.0008**	0.002	225.6	ug/L	282	Standard
	Ni	60	73.0	27.4	**-0.0027**	0.010	362.2	ug/L	91	Standard
	Cu	65	155.3	14.7	**0.0239**	0.010	42.3	ug/L	205	Standard
	Zn	66	237.3	13.8	**0.0735**	0.027	36.9	ug/L	369	Standard
>	Ge	72	444652.2	3.1				ug/L	496734	Standard
	As	75	-66.7	67.8	**-0.0136**	0.050	368.8	ug/L	-45	Standard
	Se	82	15.6	64.1	**-0.0251**	0.107	424.6	ug/L	18	Standard
	Se-1	77	88.7	23.2	**0.3361**	0.346	103.0	ug/L	83	Standard
>	Ga	71	13.3	78.1				mg/L	30	Standard
	Rb	85	15.0	33.3				ug/L	23	Standard
	Y	89	349959.5	1.7				ug/L	405333	Standard
>	Rh	103	5.0	100.0				ug/L	17	Standard
	Mo	98	137.6	17.3	**0.0204**	0.008	36.8	ug/L	135	Standard
	Ag	107	139.3	7.2	**-0.0001**	0.002	1713.0	ug/L	123	Standard
	Cd	111	16.8	30.7	**0.0001**	0.003	3581.4	mg/L	11	Standard
	Cd	114	46.3	16.5	**0.0032**	0.002	50.4	ug/L	56	Standard
>	In	115	573531.3	0.7				ug/L	634401	Standard
	Sn	118	76.0	3.5	**-0.0085**	0.002	22.4	ug/L	137	Standard
	Sb	123	480.0	30.7	**0.0320**	0.031	96.5	ug/L	907	Standard
	Ba	135	52.3	37.5	**-0.0265**	0.008	29.5	ug/L	166	Standard
	Ce	140	26.7	78.1				ug/L	57	Standard
>	Tb	159	1169288.1	0.9				ug/L	1347540	Standard
	Ho	165	11.7	89.2				ug/L	23	Standard
	Tl	203	89.3	28.3	**0.0039**	0.002	62.8	ug/L	45	Standard
	Tl	205	246.7	24.4	**0.0079**	0.002	30.9	ug/L	112	Standard
	Pb	206	489.7	8.7	**0.0069**	0.006	84.7	ug/L	825	Standard
	Pb	207	404.0	11.3	**0.0087**	0.007	81.1	ug/L	679	Standard
	Pb	208	1869.7	7.1	**0.0051**	0.005	91.5	ug/L	3166	Standard
	U	238	186.7	27.1	**0.0048**	0.002	38.1	ug/L	119	Standard
>	Bi	209	598563.1	0.9				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	50.0	36.1	**-0.0122**	0.030	247.6	mg/L	48	Standard
|	**K**	39	3.3	86.6	**-0.0927**	0.034	37.2	mg/L	8	Standard
|	**Ca**	43	25.0	34.6	**-1.5811**	3.188	201.6	mg/L	27	Standard
|	**Fe**	54	81.0	55.7	**-0.0333**	0.053	159.6	mg/L	121	Standard
|	**Fe**	57	311.7	16.1	**0.0577**	0.197	341.7	mg/L	305	Standard
⌊>	**Sc-1**	45	20028.2	1.8				mg/L	22700	Standard
	Cl	35	6.7	62.4				ug/L	3	Standard
	Kr	83	3.3	34.6				ug/L	5	Standard
	Br	81	1330.1	2.7				ug/L	1367	Standard
	P	31	80.0	45.1				ug/L	67	Standard
	S	34	88.3	8.6				ug/L	55	Standard
	Sr	88	135.0	16.1				ug/L	113	Standard
	C	12	250.0	28.8				mg/L	367	Standard
	N	14	6.7	173.2				mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	8.4	122.1				mg/L	18	Standard
	Ho-1	165	11.7	89.2				mg/L	23	Standard
	Er	166	33.3	45.8				mg/L	40	Standard
	I	127	2922.0	14.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		89.515	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	90.405
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	89.602
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026717
Sample Date/Time: Thursday, October 20, 2016 13:01:27
Number of Replicates: 3
Autosampler Position: 252
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79404.3	3.3				ug/L	76335	Standard
	Be	9	13.3	114.6	**0.0086**	0.013	156.3	ug/L	18	Standard
	Al	27	560105.3	0.9	**4.3320**	0.125	2.9	ug/L	810	Standard
	Sc	45	24519.8	1.8				ug/L	22700	Standard
	Ti	47	177.7	30.2	**0.6849**	0.248	36.2	ug/L	25	Standard
	V	51	2709.2	9.3	**0.1373**	0.034	24.9	ug/L	1541	Standard
	Cr	52	12490.5	1.4	**0.6030**	0.021	3.4	ug/L	7881	Standard
	Cr	53	1853.4	10.8	**1.0026**	0.219	21.8	ug/L	932	Standard
	Mn	55	73792.6	1.6	**6.1507**	0.070	1.1	ug/L	1508	Standard
	Co	59	889.4	0.9	**0.0578**	0.001	1.4	ug/L	282	Standard
	Ni	60	794.4	3.5	**0.3314**	0.015	4.5	ug/L	91	Standard
	Cu	65	606.0	5.9	**0.2283**	0.017	7.5	ug/L	205	Standard
	Zn	66	2450.2	4.1	**2.1093**	0.084	4.0	ug/L	369	Standard
>	Ge	72	515382.3	0.5				ug/L	496734	Standard
	As	75	29.4	95.3	**0.0868**	0.026	30.0	ug/L	-45	Standard
	Se	82	22.9	26.8	**0.0239**	0.059	246.0	ug/L	18	Standard
	Se-1	77	100.3	9.4	**0.3007**	0.132	43.8	ug/L	83	Standard
>	Ga	71	80.0	12.5				mg/L	30	Standard
	Rb	85	3768.8	1.6				ug/L	23	Standard
	Y	89	415691.9	2.2				ug/L	405333	Standard
>	Rh	103	11.7	24.7				ug/L	17	Standard
	Mo	98	168.5	13.3	**0.0212**	0.006	27.3	ug/L	135	Standard
	Ag	107	140.7	13.2	**-0.0036**	0.003	70.2	ug/L	123	Standard
	Cd	111	28.4	17.3	**0.0038**	0.002	59.6	mg/L	11	Standard
	Cd	114	98.4	3.2	**0.0108**	0.000	4.6	ug/L	56	Standard
>	In	115	688114.7	0.5				ug/L	634401	Standard
	Sn	118	184.7	8.9	**0.0622**	0.013	20.4	ug/L	137	Standard
	Sb	123	2239.2	48.4	**0.3226**	0.188	58.4	ug/L	907	Standard
	Ba	135	12734.0	1.7	**4.0904**	0.062	1.5	ug/L	166	Standard
	Ce	140	8852.6	4.8				ug/L	57	Standard
>	Tb	159	1432948.5	1.8				ug/L	1347540	Standard
	Ho	165	153.3	18.0				ug/L	23	Standard
	Tl	203	152.7	11.1	**0.0080**	0.002	21.0	ug/L	45	Standard
	Tl	205	378.3	16.3	**0.0111**	0.002	21.5	ug/L	112	Standard
	Pb	206	1086.0	6.1	**0.0642**	0.004	6.9	ug/L	825	Standard
	Pb	207	892.4	3.8	**0.0619**	0.003	5.1	ug/L	679	Standard
	Pb	208	4180.9	2.4	**0.0608**	0.002	3.4	ug/L	3166	Standard
	U	238	411.0	2.1	**0.0108**	0.000	3.5	ug/L	119	Standard
>	Bi	209	691139.5	2.4				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4215**	0.721	171.2	mg/L	0	Standard
|	**Mg**	24	696.7	4.6	**0.8511**	0.035	4.1	mg/L	48	Standard
|	**K**	39	45.0	19.2	**0.3034**	0.091	29.9	mg/L	8	Standard
|	**Ca**	43	28.3	36.7	**-2.2390**	3.425	153.0	mg/L	27	Standard
|	**Fe**	54	254.0	7.1	**0.1187**	0.022	18.3	mg/L	121	Standard
|	**Fe**	57	356.7	10.5	**-0.0274**	0.152	555.4	mg/L	305	Standard
⌊>	**Sc-1**	45	24519.8	1.8				mg/L	22700	Standard
	Cl	35	3.3	91.7				ug/L	3	Standard
	Kr	83	1.7	91.7				ug/L	5	Standard
	Br	81	2466.9	9.8				ug/L	1367	Standard
	P	31	115.0	22.6				ug/L	67	Standard
	S	34	63.3	4.6				ug/L	55	Standard
	Sr	88	135.0	28.9				ug/L	113	Standard
	C	12	360.0	10.0				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	224.1	15.3				mg/L	18	Standard
	Ho-1	165	153.3	18.0				mg/L	23	Standard
	Er	166	123.3	16.9				mg/L	40	Standard
	I	127	22440.0	4.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		104.020	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		103.754	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	108.467
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	103.460
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610026717
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Method 6020 - Summary Report

Sample ID: L1610026720
Sample Date/Time: Thursday, October 20, 2016 13:04:26
Number of Replicates: 3
Autosampler Position: 253
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78534.8	3.5				ug/L	76335	Standard
	Be	9	16.7	45.8	**0.0116**	0.006	53.5	ug/L	18	Standard
	Al	27	12620.3	2.0	**0.0944**	0.003	2.9	ug/L	810	Standard
	Sc	45	22969.1	2.2				ug/L	22700	Standard
	Ti	47	30.0	26.0	**0.0051**	0.039	758.6	ug/L	25	Standard
	V	51	1719.6	6.7	**0.0118**	0.013	112.5	ug/L	1541	Standard
	Cr	52	11488.0	0.8	**0.5045**	0.006	1.3	ug/L	7881	Standard
	Cr	53	1406.7	14.5	**0.5425**	0.222	40.9	ug/L	932	Standard
	Mn	55	2180.2	2.0	**0.1048**	0.005	4.8	ug/L	1508	Standard
	Co	59	338.7	5.4	**0.0028**	0.002	80.7	ug/L	282	Standard
	Ni	60	253.3	8.0	**0.0801**	0.010	12.1	ug/L	91	Standard
	Cu	65	585.0	1.6	**0.2260**	0.008	3.4	ug/L	205	Standard
	Zn	66	1569.1	3.7	**1.3249**	0.045	3.4	ug/L	369	Standard
>	Ge	72	501675.4	1.1				ug/L	496734	Standard
	As	75	-34.6	71.9	**0.0264**	0.024	89.3	ug/L	-45	Standard
	Se	82	16.4	24.8	**-0.0345**	0.040	116.9	ug/L	18	Standard
	Se-1	77	93.3	16.7	**0.2379**	0.246	103.5	ug/L	83	Standard
>	Ga	71	16.7	86.6				mg/L	30	Standard
	Rb	85	98.3	2.9				ug/L	23	Standard
	Y	89	408869.0	1.4				ug/L	405333	Standard
>	Rh	103	21.7	26.6				ug/L	17	Standard
	Mo	98	72.9	9.8	**-0.0024**	0.002	70.1	ug/L	135	Standard
	Ag	107	130.7	10.9	**-0.0046**	0.002	38.4	ug/L	123	Standard
	Cd	111	13.2	21.9	**-0.0030**	0.001	46.0	mg/L	11	Standard
	Cd	114	55.9	32.0	**0.0035**	0.003	96.9	ug/L	56	Standard
>	In	115	673991.3	1.7				ug/L	634401	Standard
	Sn	118	151.7	14.6	**0.0395**	0.015	38.6	ug/L	137	Standard
	Sb	123	976.6	45.9	**0.1051**	0.079	74.9	ug/L	907	Standard
	Ba	135	1074.7	0.5	**0.3096**	0.004	1.4	ug/L	166	Standard
	Ce	140	111.7	14.4				ug/L	57	Standard
>	Tb	159	1389103.3	0.8				ug/L	1347540	Standard
	Ho	165	10.0					ug/L	23	Standard
	Tl	203	67.3	9.7	**0.0010**	0.001	55.0	ug/L	45	Standard
	Tl	205	141.7	14.3	**0.0031**	0.001	22.5	ug/L	112	Standard
	Pb	206	564.3	2.9	**0.0078**	0.002	31.0	ug/L	825	Standard
	Pb	207	487.7	6.9	**0.0123**	0.005	40.7	ug/L	679	Standard
	Pb	208	2207.1	3.1	**0.0074**	0.003	35.9	ug/L	3166	Standard
	U	238	104.7	15.8	**0.0015**	0.001	38.2	ug/L	119	Standard
>	Bi	209	680539.2	1.2				ug/L	668024	Standard

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	Na	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
	Mg	24	541.7	10.7	**0.6913**	0.095	13.7	mg/L	48	Standard
	K	39	10.0	50.0	**-0.0297**	0.050	167.7	mg/L	8	Standard
	Ca	43	25.0	0.0	**-2.7891**	0.187	6.7	mg/L	27	Standard
	Fe	54	117.5	8.9	**-0.0070**	0.012	170.4	mg/L	121	Standard
	Fe	57	331.7	17.5	**-0.0367**	0.235	638.5	mg/L	305	Standard
>	**Sc-1**	45	22969.1	2.2				mg/L	22700	Standard
	Cl	35	5.3	78.1				ug/L	3	Standard
	Kr	83	3.0	33.3				ug/L	5	Standard
	Br	81	1623.4	3.0				ug/L	1367	Standard
	P	31	101.7	32.7				ug/L	67	Standard
	S	34	56.7	66.8				ug/L	55	Standard
	Sr	88	140.0	6.2				ug/L	113	Standard
	C	12	323.3	15.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	26.0	56.7				mg/L	18	Standard
	Ho-1	165	10.0					mg/L	23	Standard
	Er	166	13.3	86.6				mg/L	40	Standard
	I	127	2783.6	8.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		102.881	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		100.995	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	106.241
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	101.873
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026723
Sample Date/Time: Thursday, October 20, 2016 13:07:25
Number of Replicates: 3
Autosampler Position: 254
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	76279.9	0.5				ug/L	76335	Standard
	Be	9	18.3	78.7	**0.0136**	0.013	95.9	ug/L	18	Standard
	Al	27	17927.3	0.4	**0.1400**	0.001	0.8	ug/L	810	Standard
	Sc	45	21653.8	0.8				ug/L	22700	Standard
	Ti	47	40.3	24.5	**0.0596**	0.047	78.6	ug/L	25	Standard
	V	51	1778.8	4.1	**0.0274**	0.012	45.5	ug/L	1541	Standard
	Cr	52	11285.9	1.0	**0.5250**	0.018	3.5	ug/L	7881	Standard
	Cr	53	1658.4	3.2	**0.8930**	0.079	8.8	ug/L	932	Standard
	Mn	55	5348.9	2.0	**0.3939**	0.006	1.4	ug/L	1508	Standard
	Co	59	348.0	2.5	**0.0049**	0.001	22.3	ug/L	282	Standard
	Ni	60	289.7	3.2	**0.1019**	0.004	3.5	ug/L	91	Standard
	Cu	65	796.4	6.2	**0.3418**	0.021	6.3	ug/L	205	Standard
	Zn	66	1710.1	0.5	**1.5105**	0.018	1.2	ug/L	369	Standard
>	Ge	72	486944.1	0.9				ug/L	496734	Standard
	As	75	-50.0	22.9	**0.0100**	0.012	117.4	ug/L	-45	Standard
	Se	82	24.3	21.3	**0.0522**	0.055	105.7	ug/L	18	Standard
	Se-1	77	94.3	8.8	**0.2943**	0.134	45.4	ug/L	83	Standard
>	Ga	71	33.3	37.7				mg/L	30	Standard
	Rb	85	203.3	12.1				ug/L	23	Standard
	Y	89	392408.3	3.2				ug/L	405333	Standard
>	Rh	103	16.7	62.4				ug/L	17	Standard
	Mo	98	56.2	17.0	**-0.0060**	0.003	42.7	ug/L	135	Standard
	Ag	107	110.7	10.5	**-0.0065**	0.002	24.5	ug/L	123	Standard
	Cd	111	11.9	0.1	**-0.0033**	0.000	3.0	mg/L	11	Standard
	Cd	114	49.1	41.8	**0.0027**	0.004	146.7	ug/L	56	Standard
>	In	115	642858.5	1.7				ug/L	634401	Standard
	Sn	118	158.3	7.6	**0.0508**	0.012	23.0	ug/L	137	Standard
	Sb	123	671.3	45.6	**0.0570**	0.057	99.7	ug/L	907	Standard
	Ba	135	1210.4	1.3	**0.3741**	0.013	3.4	ug/L	166	Standard
	Ce	140	828.4	9.7				ug/L	57	Standard
>	Tb	159	1327449.7	5.0				ug/L	1347540	Standard
	Ho	165	18.3	41.7				ug/L	23	Standard
	Tl	203	49.3	19.7	**-0.0003**	0.001	333.5	ug/L	45	Standard
	Tl	205	98.3	15.5	**0.0017**	0.001	30.8	ug/L	112	Standard
	Pb	206	627.0	2.3	**0.0180**	0.002	10.2	ug/L	825	Standard
	Pb	207	540.3	2.7	**0.0221**	0.002	7.3	ug/L	679	Standard
	Pb	208	2491.1	2.2	**0.0186**	0.002	9.4	ug/L	3166	Standard
	U	238	84.0	16.5	**0.0009**	0.000	50.9	ug/L	119	Standard
>	Bi	209	650421.5	1.8				ug/L	668024	Standard

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⌈	**Na**	23	3.3	173.2	**0.9449**	1.628	172.3	mg/L	0	Standard
|	**Mg**	24	498.3	8.4	**0.6715**	0.067	10.0	mg/L	48	Standard
|	**K**	39	8.3	34.6	**-0.0414**	0.031	75.4	mg/L	8	Standard
|	**Ca**	43	26.7	28.6	**-1.6938**	2.656	156.8	mg/L	27	Standard
|	**Fe**	54	142.5	6.8	**0.0281**	0.012	41.9	mg/L	121	Standard
|	**Fe**	57	310.0	13.2	**-0.0497**	0.159	319.6	mg/L	305	Standard
⌊>	**Sc-1**	45	21653.8	0.8				mg/L	22700	Standard
	Cl	35	6.0					ug/L	3	Standard
	Kr	83	4.0	50.0				ug/L	5	Standard
	Br	81	1653.4	4.5				ug/L	1367	Standard
	P	31	98.3	11.7				ug/L	67	Standard
	S	34	81.7	12.7				ug/L	55	Standard
	Sr	88	115.0	30.4				ug/L	113	Standard
	C	12	383.3	31.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	22.9	89.6				mg/L	18	Standard
	Ho-1	165	18.3	41.7				mg/L	23	Standard
	Er	166	10.0	100.0				mg/L	40	Standard
	I	127	2806.9	6.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		99.927	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		98.029	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	101.333
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	97.365
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610040801
Sample Date/Time: Thursday, October 20, 2016 13:10:24
Number of Replicates: 3
Autosampler Position: 255
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	87773.8	3.9				ug/L	76335	Standard
	Be	9	18.3	15.7	**0.0114**	0.002	15.4	ug/L	18	Standard
	Al	27	25729214.0	2.3	**180.1802**	4.249	2.4	ug/L	810	Standard
	Sc	45	23232.8	0.4				ug/L	22700	Standard
	Ti	47	333.7	4.2	**1.5009**	0.064	4.3	ug/L	25	Standard
	V	51	3341.6	4.9	**0.2483**	0.027	10.9	ug/L	1541	Standard
	Cr	52	12848.8	2.8	**0.7647**	0.012	1.6	ug/L	7881	Standard
	Cr	53	6316.3	7.8	**6.4555**	0.645	10.0	ug/L	932	Standard
	Mn	55	1272856.6	3.2	**113.9276**	1.588	1.4	ug/L	1508	Standard
	Co	59	10270.1	2.5	**1.0735**	0.008	0.8	ug/L	282	Standard
	Ni	60	6314.3	2.6	**3.1065**	0.064	2.1	ug/L	91	Standard
	Cu	65	1388.1	4.2	**0.6441**	0.045	6.9	ug/L	205	Standard
	Zn	66	28918.2	2.3	**28.5085**	0.422	1.5	ug/L	369	Standard
>	Ge	72	486212.9	3.1				ug/L	496734	Standard
	As	75	640.3	13.9	**0.6905**	0.069	10.0	ug/L	-45	Standard
	Se	82	203.0	7.2	**1.8942**	0.087	4.6	ug/L	18	Standard
	Se-1	77	360.0	6.4	**4.3823**	0.426	9.7	ug/L	83	Standard
>	Ga	71	93.3	24.7				mg/L	30	Standard
	Rb	85	8620.8	2.1				ug/L	23	Standard
	Y	89	401795.2	1.5				ug/L	405333	Standard
>	Rh	103	210.0	27.0				ug/L	17	Standard
	Mo	98	434.6	4.1	**0.0955**	0.006	6.7	ug/L	135	Standard
	Ag	107	110.7	8.1	**-0.0066**	0.001	15.2	ug/L	123	Standard
	Cd	111	236.1	3.5	**0.1058**	0.004	3.8	mg/L	11	Standard
	Cd	114	634.6	8.9	**0.1126**	0.009	7.9	ug/L	56	Standard
>	In	115	645207.9	2.2				ug/L	634401	Standard
	Sn	118	139.3	8.7	**0.0349**	0.009	25.3	ug/L	137	Standard
	Sb	123	757.4	31.8	**0.0722**	0.044	60.6	ug/L	907	Standard
	Ba	135	34160.8	1.1	**11.7929**	0.192	1.6	ug/L	166	Standard
	Ce	140	9076.1	4.4				ug/L	57	Standard
>	Tb	159	1335743.5	1.0				ug/L	1347540	Standard
	Ho	165	103.3	27.9				ug/L	23	Standard
	Tl	203	385.0	5.0	**0.0306**	0.001	3.9	ug/L	45	Standard
	Tl	205	931.7	16.3	**0.0335**	0.006	18.1	ug/L	112	Standard
	Pb	206	698.7	4.9	**0.0299**	0.005	16.0	ug/L	825	Standard
	Pb	207	589.7	6.9	**0.0319**	0.004	12.0	ug/L	679	Standard
	Pb	208	2764.4	3.5	**0.0300**	0.002	6.4	ug/L	3166	Standard
	U	238	50103.1	1.9	**1.6925**	0.009	0.5	ug/L	119	Standard
>	Bi	209	624049.5	2.2				ug/L	668024	Standard

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⌈	**Na**	23	118.3	38.3	**30.9547**	11.962	38.6	mg/L	0	Standard
|	**Mg**	24	65797.6	0.5	**94.2703**	0.786	0.8	mg/L	48	Standard
|	**K**	39	20.0	132.3	**0.0715**	0.270	377.0	mg/L	8	Standard
|	**Ca**	43	88.3	19.9	**18.3014**	5.831	31.9	mg/L	27	Standard
|	**Fe**	54	225.5	7.3	**0.1028**	0.017	16.3	mg/L	121	Standard
|	**Fe**	57	503.3	19.1	**0.5954**	0.369	62.0	mg/L	305	Standard
⌊>	**Sc-1**	45	23232.8	0.4				mg/L	22700	Standard
	Cl	35	9.3	65.5				ug/L	3	Standard
	Kr	83	4.7	61.9				ug/L	5	Standard
	Br	81	52798.5	2.6				ug/L	1367	Standard
	P	31	195.0	11.2				ug/L	67	Standard
	S	34	63.3	19.9				ug/L	55	Standard
	Sr	88	436.7	3.5				ug/L	113	Standard
	C	12	933.4	0.6				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	213.3	7.6				mg/L	18	Standard
	Ho-1	165	103.3	27.9				mg/L	23	Standard
	Er	166	140.0	25.8				mg/L	40	Standard
	I	127	4172952.4	7.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		114.984	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		97.882	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	101.703
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	93.417
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Mn 55 Upper, S, EEE	Mn	55	

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Method 6020 - Summary Report

Sample ID: L1610040802
Sample Date/Time: Thursday, October 20, 2016 13:13:23
Number of Replicates: 3
Autosampler Position: 256
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	87714.8	1.0				ug/L	76335	Standard
	Be	9	30.0	16.7	**0.0207**	0.004	19.2	ug/L	18	Standard
	Al	27	26361580.3	1.2	**184.6442**	2.303	1.2	ug/L	810	Standard
	Sc	45	23077.6	1.6				ug/L	22700	Standard
	Ti	47	327.7	1.8	**1.4981**	0.032	2.2	ug/L	25	Standard
	V	51	2968.3	6.6	**0.2025**	0.028	13.9	ug/L	1541	Standard
	Cr	52	12500.2	1.4	**0.7437**	0.031	4.2	ug/L	7881	Standard
	Cr	53	7521.9	6.8	**8.0398**	0.634	7.9	ug/L	932	Standard
	Mn	55	1222627.4	1.0	**111.2696**	1.363	1.2	ug/L	1508	Standard
	Co	59	9860.5	1.0	**1.0471**	0.010	0.9	ug/L	282	Standard
	Ni	60	6231.9	2.7	**3.1171**	0.087	2.8	ug/L	91	Standard
	Cu	65	757.4	5.4	**0.3292**	0.021	6.3	ug/L	205	Standard
	Zn	66	2351.5	3.0	**2.1884**	0.065	3.0	ug/L	369	Standard
>	Ge	72	478164.0	0.3				ug/L	496734	Standard
	As	75	628.9	14.8	**0.6908**	0.093	13.4	ug/L	-45	Standard
	Se	82	207.6	3.1	**1.9797**	0.068	3.4	ug/L	18	Standard
	Se-1	77	418.0	2.6	**5.3765**	0.167	3.1	ug/L	83	Standard
>	Ga	71	76.7	39.3				mg/L	30	Standard
	Rb	85	8035.5	2.8				ug/L	23	Standard
	Y	89	402920.4	0.2				ug/L	405333	Standard
>	Rh	103	225.0	3.8				ug/L	17	Standard
	Mo	98	441.0	7.8	**0.0966**	0.007	7.7	ug/L	135	Standard
	Ag	107	108.3	6.3	**-0.0069**	0.001	17.7	ug/L	123	Standard
	Cd	111	177.4	12.7	**0.0769**	0.010	13.6	mg/L	11	Standard
	Cd	114	519.5	11.9	**0.0906**	0.011	11.9	ug/L	56	Standard
>	In	115	647628.7	1.9				ug/L	634401	Standard
	Sn	118	205.3	8.0	**0.0875**	0.013	15.0	ug/L	137	Standard
	Sb	123	634.3	25.5	**0.0489**	0.029	58.8	ug/L	907	Standard
	Ba	135	34846.7	0.9	**11.9849**	0.171	1.4	ug/L	166	Standard
	Ce	140	9928.3	2.7				ug/L	57	Standard
>	Tb	159	1395264.2	1.0				ug/L	1347540	Standard
	Ho	165	123.3	10.2				ug/L	23	Standard
	Tl	203	323.7	2.2	**0.0249**	0.001	2.8	ug/L	45	Standard
	Tl	205	843.4	17.6	**0.0300**	0.005	17.8	ug/L	112	Standard
	Pb	206	711.7	4.0	**0.0312**	0.004	12.9	ug/L	825	Standard
	Pb	207	554.3	3.7	**0.0269**	0.004	13.3	ug/L	679	Standard
	Pb	208	2622.4	1.5	**0.0254**	0.001	5.8	ug/L	3166	Standard
	U	238	53584.6	1.0	**1.8057**	0.001	0.1	ug/L	119	Standard
>	Bi	209	625603.0	1.0				ug/L	668024	Standard

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	Na	23	106.7	11.8	**28.1014**	3.743	13.3	mg/L	0	Standard
	Mg	24	66530.8	1.6	**95.9841**	2.525	2.6	mg/L	48	Standard
	K	39	16.7	45.8	**0.0379**	0.076	201.0	mg/L	8	Standard
	Ca	43	88.3	32.2	**18.4420**	9.275	50.3	mg/L	27	Standard
	Fe	54	194.0	25.2	**0.0716**	0.049	69.0	mg/L	121	Standard
	Fe	57	463.3	7.7	**0.4544**	0.109	23.9	mg/L	305	Standard
>	**Sc-1**	45	23077.6	1.6				mg/L	22700	Standard
	Cl	35	5.3	78.1				ug/L	3	Standard
	Kr	83	4.7	24.7				ug/L	5	Standard
	Br	81	50463.9	2.9				ug/L	1367	Standard
	P	31	195.0	14.3				ug/L	67	Standard
	S	34	71.7	14.5				ug/L	55	Standard
	Sr	88	461.7	2.5				ug/L	113	Standard
	C	12	1160.0	13.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	13.3	43.3				mg/L	10	Standard
	Dy	164	196.5	23.7				mg/L	18	Standard
	Ho-1	165	123.3	10.2				mg/L	23	Standard
	Er	166	143.3	26.4				mg/L	40	Standard
	I	127	4055746.1	5.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		114.907	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		96.262	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	102.085
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	93.650
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Mn 55 Upper, S, EEE	Mn	55	

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Method 6020 - Summary Report

Sample ID: L1610040803
Sample Date/Time: Thursday, October 20, 2016 13:16:23
Number of Replicates: 3
Autosampler Position: 257
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	89949.8	4.0				ug/L	76335	Standard
	Be	9	25.0	40.0	**0.0163**	0.008	47.7	ug/L	18	Standard
	Al	27	25551094.1	3.0	**174.6095**	5.178	3.0	ug/L	810	Standard
	Sc	45	22378.2	0.5				ug/L	22700	Standard
	Ti	47	344.7	5.5	**1.6039**	0.072	4.5	ug/L	25	Standard
	V	51	2945.8	15.2	**0.2040**	0.060	29.3	ug/L	1541	Standard
	Cr	52	12191.6	4.1	**0.7192**	0.053	7.4	ug/L	7881	Standard
	Cr	53	8057.1	3.6	**8.8126**	0.400	4.5	ug/L	932	Standard
	Mn	55	1212395.3	0.9	**111.7280**	0.827	0.7	ug/L	1508	Standard
	Co	59	9697.8	1.5	**1.0427**	0.016	1.6	ug/L	282	Standard
	Ni	60	6115.6	1.6	**3.0969**	0.007	0.2	ug/L	91	Standard
	Cu	65	790.4	6.1	**0.3512**	0.020	5.7	ug/L	205	Standard
	Zn	66	2615.6	0.9	**2.4882**	0.039	1.6	ug/L	369	Standard
>	Ge	72	472234.9	1.4				ug/L	496734	Standard
	As	75	698.0	4.3	**0.7694**	0.041	5.3	ug/L	-45	Standard
	Se	82	238.3	5.5	**2.3353**	0.176	7.5	ug/L	18	Standard
	Se-1	77	439.7	4.0	**5.8048**	0.383	6.6	ug/L	83	Standard
>	Ga	71	96.7	7.9				mg/L	30	Standard
	Rb	85	7723.6	7.8				ug/L	23	Standard
	Y	89	390398.4	3.0				ug/L	405333	Standard
>	Rh	103	198.3	10.2				ug/L	17	Standard
	Mo	98	430.5	0.8	**0.0911**	0.001	1.4	ug/L	135	Standard
	Ag	107	104.3	15.3	**-0.0079**	0.002	28.2	ug/L	123	Standard
	Cd	111	156.8	10.3	**0.0650**	0.008	11.5	mg/L	11	Standard
	Cd	114	493.5	6.7	**0.0836**	0.006	7.4	ug/L	56	Standard
>	In	115	663569.1	0.4				ug/L	634401	Standard
	Sn	118	179.7	3.1	**0.0634**	0.004	7.0	ug/L	137	Standard
	Sb	123	560.9	27.1	**0.0331**	0.028	84.7	ug/L	907	Standard
	Ba	135	34020.2	1.6	**11.4151**	0.130	1.1	ug/L	166	Standard
	Ce	140	9604.7	2.1				ug/L	57	Standard
>	Tb	159	1357578.2	0.9				ug/L	1347540	Standard
	Ho	165	153.3	1.9				ug/L	23	Standard
	Tl	203	338.7	7.1	**0.0260**	0.003	9.6	ug/L	45	Standard
	Tl	205	740.0	7.2	**0.0259**	0.002	9.6	ug/L	112	Standard
	Pb	206	855.0	2.5	**0.0476**	0.002	4.0	ug/L	825	Standard
	Pb	207	681.7	1.0	**0.0435**	0.003	6.0	ug/L	679	Standard
	Pb	208	3266.8	1.5	**0.0440**	0.000	0.8	ug/L	3166	Standard
	U	238	52174.4	1.5	**1.7395**	0.015	0.9	ug/L	119	Standard
>	Bi	209	632341.1	1.8				ug/L	668024	Standard

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	Na	23	106.7	5.4	**28.9374**	1.434	5.0	mg/L	0	Standard
	Mg	24	64467.0	3.4	**95.8857**	3.001	3.1	mg/L	48	Standard
	K	39	21.7	35.3	**0.0968**	0.080	83.1	mg/L	8	Standard
	Ca	43	100.0	13.2	**23.5029**	4.770	20.3	mg/L	27	Standard
	Fe	54	194.2	16.8	**0.0780**	0.034	43.7	mg/L	121	Standard
	Fe	57	455.0	11.9	**0.4777**	0.210	43.9	mg/L	305	Standard
>	**Sc-1**	45	22378.2	0.5				mg/L	22700	Standard
	Cl	35	6.0	57.7				ug/L	3	Standard
	Kr	83	3.0	100.0				ug/L	5	Standard
	Br	81	61642.0	5.2				ug/L	1367	Standard
	P	31	198.3	10.2				ug/L	67	Standard
	S	34	88.3	27.9				ug/L	55	Standard
	Sr	88	425.0	9.4				ug/L	113	Standard
	C	12	696.7	19.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	16.7	91.7				mg/L	10	Standard
	Dy	164	191.4	10.0				mg/L	18	Standard
	Ho-1	165	153.3	1.9				mg/L	23	Standard
	Er	166	110.0	31.5				mg/L	40	Standard
	I	127	4331207.7	3.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		117.835	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		95.068	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	104.598
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	94.658
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Mn 55 Upper, S, EEE	Mn	55	

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Method 6020 - Summary Report

Sample ID: L1610040804
Sample Date/Time: Thursday, October 20, 2016 13:19:23
Number of Replicates: 3
Autosampler Position: 258
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	90097.1	1.8				ug/L	76335	Standard
	Be	9	20.0	66.1	**0.0123**	0.010	81.6	ug/L	18	Standard
	Al	27	24990256.9	4.8	**170.3648**	6.081	3.6	ug/L	810	Standard
	Sc	45	21345.0	1.7				ug/L	22700	Standard
	Ti	47	322.7	8.3	**1.5244**	0.137	9.0	ug/L	25	Standard
	V	51	2705.3	4.3	**0.1776**	0.028	15.9	ug/L	1541	Standard
	Cr	52	12622.3	0.9	**0.8257**	0.081	9.8	ug/L	7881	Standard
	Cr	53	7962.1	1.0	**8.8838**	0.284	3.2	ug/L	932	Standard
	Mn	55	1170713.4	2.0	**109.9481**	2.359	2.1	ug/L	1508	Standard
	Co	59	9291.5	3.2	**1.0171**	0.019	1.9	ug/L	282	Standard
	Ni	60	5876.1	2.5	**3.0313**	0.041	1.4	ug/L	91	Standard
	Cu	65	680.0	4.0	**0.3008**	0.025	8.5	ug/L	205	Standard
	Zn	66	2638.9	2.5	**2.5630**	0.044	1.7	ug/L	369	Standard
>	Ge	72	463580.5	3.8				ug/L	496734	Standard
	As	75	608.9	12.8	**0.6887**	0.058	8.4	ug/L	-45	Standard
	Se	82	190.2	11.6	**1.8588**	0.206	11.1	ug/L	18	Standard
	Se-1	77	429.0	2.6	**5.7650**	0.295	5.1	ug/L	83	Standard
>	Ga	71	78.3	25.8				mg/L	30	Standard
	Rb	85	6846.5	5.6				ug/L	23	Standard
	Y	89	390055.8	4.7				ug/L	405333	Standard
>	Rh	103	205.0	16.0				ug/L	17	Standard
	Mo	98	387.7	5.8	**0.0776**	0.002	3.1	ug/L	135	Standard
	Ag	107	101.3	6.4	**-0.0086**	0.001	16.2	ug/L	123	Standard
	Cd	111	159.2	4.4	**0.0645**	0.004	5.7	mg/L	11	Standard
	Cd	114	443.4	5.1	**0.0727**	0.003	3.9	ug/L	56	Standard
>	In	115	678725.4	4.3				ug/L	634401	Standard
	Sn	118	184.7	14.7	**0.0637**	0.015	23.4	ug/L	137	Standard
	Sb	123	497.9	28.5	**0.0190**	0.022	113.8	ug/L	907	Standard
	Ba	135	33440.6	4.0	**10.9699**	0.117	1.1	ug/L	166	Standard
	Ce	140	8597.4	5.2				ug/L	57	Standard
>	Tb	159	1353160.2	2.6				ug/L	1347540	Standard
	Ho	165	128.3	34.0				ug/L	23	Standard
	Tl	203	349.0	4.5	**0.0269**	0.001	2.5	ug/L	45	Standard
	Tl	205	833.4	3.9	**0.0293**	0.000	1.7	ug/L	112	Standard
	Pb	206	713.7	4.3	**0.0305**	0.003	8.9	ug/L	825	Standard
	Pb	207	547.3	4.6	**0.0251**	0.001	3.7	ug/L	679	Standard
	Pb	208	2752.4	4.1	**0.0284**	0.001	3.7	ug/L	3166	Standard
	U	238	51571.7	3.6	**1.7181**	0.007	0.4	ug/L	119	Standard
>	Bi	209	632725.7	3.4				ug/L	668024	Standard

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⌈	**Na**	23	115.0	8.7	**32.7486**	3.376	10.3	mg/L	0	Standard
|	**Mg**	24	62856.9	3.3	**98.0074**	1.706	1.7	mg/L	48	Standard
|	**K**	39	28.3	44.4	**0.1824**	0.140	76.5	mg/L	8	Standard
|	**Ca**	43	93.3	8.2	**22.7571**	2.977	13.1	mg/L	27	Standard
|	**Fe**	54	178.6	12.7	**0.0706**	0.023	33.1	mg/L	121	Standard
|	**Fe**	57	460.0	9.3	**0.5845**	0.170	29.1	mg/L	305	Standard
⌊>	**Sc-1**	45	21345.0	1.7				mg/L	22700	Standard
	Cl	35	2.7	43.3				ug/L	3	Standard
	Kr	83	2.7	108.3				ug/L	5	Standard
	Br	81	46939.5	6.8				ug/L	1367	Standard
	P	31	210.0	22.7				ug/L	67	Standard
	S	34	61.7	26.1				ug/L	55	Standard
	Sr	88	376.7	5.4				ug/L	113	Standard
	C	12	1466.7	16.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0					mg/L	10	Standard
	Dy	164	154.9	22.7				mg/L	18	Standard
	Ho-1	165	128.3	34.0				mg/L	23	Standard
	Er	166	106.7	14.3				mg/L	40	Standard
	I	127	4284692.4	6.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		118.028	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		93.326	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	106.987
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	94.716
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Mn 55 Upper, S, EEE	Mn	55	

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Method 6020 - Summary Report

Sample ID: L1610045602
Sample Date/Time: Thursday, October 20, 2016 13:22:22
Number of Replicates: 3
Autosampler Position: 259
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	85340.2	5.7				ug/L	76335	Standard
	Be	9	15.0	33.3	**0.0091**	0.003	37.3	ug/L	18	Standard
	Al	27	30194835.6	6.0	**217.3833**	4.722	2.2	ug/L	810	Standard
	Sc	45	21007.9	3.3				ug/L	22700	Standard
	Ti	47	73.7	19.4	**0.2343**	0.063	26.7	ug/L	25	Standard
	V	51	2701.6	5.6	**0.1701**	0.022	12.7	ug/L	1541	Standard
	Cr	52	11795.3	2.5	**0.6626**	0.024	3.6	ug/L	7881	Standard
	Cr	53	1780.1	4.6	**1.1085**	0.060	5.4	ug/L	932	Standard
	Mn	55	30166.7	3.3	**2.7042**	0.017	0.6	ug/L	1508	Standard
	Co	59	1046.7	5.9	**0.0837**	0.004	4.6	ug/L	282	Standard
	Ni	60	4382.0	4.5	**2.2120**	0.043	1.9	ug/L	91	Standard
	Cu	65	1215.4	1.2	**0.5760**	0.028	4.8	ug/L	205	Standard
	Zn	66	2669.6	3.8	**2.5499**	0.070	2.7	ug/L	369	Standard
>	Ge	72	471120.6	3.5				ug/L	496734	Standard
	As	75	223.0	11.7	**0.2872**	0.032	11.2	ug/L	-45	Standard
	Se	82	73.3	3.6	**0.5823**	0.033	5.7	ug/L	18	Standard
	Se-1	77	133.3	6.1	**0.9625**	0.149	15.5	ug/L	83	Standard
>	Ga	71	26.7	28.6				mg/L	30	Standard
	Rb	85	7226.7	3.7				ug/L	23	Standard
	Y	89	394916.8	4.9				ug/L	405333	Standard
>	Rh	103	811.7	9.4				ug/L	17	Standard
	Mo	98	45465.3	3.3	**11.1825**	0.263	2.4	ug/L	135	Standard
	Ag	107	121.0	5.8	**-0.0065**	0.001	11.6	ug/L	123	Standard
	Cd	111	13.3	74.0	**-0.0031**	0.004	142.7	mg/L	11	Standard
	Cd	114	163.2	11.4	**0.0216**	0.003	14.2	ug/L	56	Standard
>	In	115	701980.2	1.0				ug/L	634401	Standard
	Sn	118	191.7	13.0	**0.0647**	0.019	29.2	ug/L	137	Standard
	Sb	123	8899.1	0.8	**1.4564**	0.008	0.6	ug/L	907	Standard
	Ba	135	23008.1	2.5	**7.2803**	0.111	1.5	ug/L	166	Standard
	Ce	140	685.0	20.1				ug/L	57	Standard
>	Tb	159	1366086.4	2.1				ug/L	1347540	Standard
	Ho	165	38.3	32.8				ug/L	23	Standard
	Tl	203	817.4	6.3	**0.0701**	0.004	5.4	ug/L	45	Standard
	Tl	205	1931.8	5.2	**0.0713**	0.003	3.9	ug/L	112	Standard
	Pb	206	762.0	2.8	**0.0376**	0.004	10.4	ug/L	825	Standard
	Pb	207	620.0	5.5	**0.0362**	0.005	13.3	ug/L	679	Standard
	Pb	208	2919.8	0.2	**0.0347**	0.001	3.5	ug/L	3166	Standard
	U	238	32754.4	1.5	**1.1055**	0.008	0.7	ug/L	119	Standard
>	Bi	209	624240.2	1.5				ug/L	668024	Standard

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⌈	**Na**	23	125.0	17.4	**36.1778**	6.580	18.2	mg/L	0	Standard
|	**Mg**	24	17326.6	4.8	**27.3763**	0.413	1.5	mg/L	48	Standard
|	**K**	39	70.0	51.5	**0.6487**	0.378	58.2	mg/L	8	Standard
|	**Ca**	43	126.7	27.7	**35.8322**	13.779	38.5	mg/L	27	Standard
|	**Fe**	54	152.8	27.5	**0.0438**	0.044	100.3	mg/L	121	Standard
|	**Fe**	57	510.0	7.7	**0.8220**	0.119	14.5	mg/L	305	Standard
⌊>	**Sc-1**	45	21007.9	3.3				mg/L	22700	Standard
	Cl	35	12.7	39.7				ug/L	3	Standard
	Kr	83	4.0	25.0				ug/L	5	Standard
	Br	81	8135.5	7.7				ug/L	1367	Standard
	P	31	75.0	6.7				ug/L	67	Standard
	S	34	110.0	18.2				ug/L	55	Standard
	Sr	88	1251.7	8.7				ug/L	113	Standard
	C	12	570.0	9.8				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	42.1	34.4				mg/L	18	Standard
	Ho-1	165	38.3	32.8				mg/L	23	Standard
	Er	166	26.7	78.1				mg/L	40	Standard
	I	127	152896.4	29.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		111.796	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.844	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	110.652
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	93.446
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	

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Method 6020 - Summary Report

Sample ID: L1610045604
Sample Date/Time: Thursday, October 20, 2016 13:25:21
Number of Replicates: 3
Autosampler Position: 260
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	87591.0	3.8				ug/L	76335	Standard
	Be	9	23.3	44.6	**0.0155**	0.009	55.4	ug/L	18	Standard
	Al	27	33480559.2	4.7	**234.9344**	10.884	4.6	ug/L	810	Standard
	Sc	45	20024.9	3.6				ug/L	22700	Standard
	Ti	47	197.7	9.6	**0.8816**	0.090	10.2	ug/L	25	Standard
	V	51	3494.3	4.4	**0.2945**	0.016	5.5	ug/L	1541	Standard
	Cr	52	14800.6	1.8	**1.1745**	0.026	2.2	ug/L	7881	Standard
	Cr	53	2595.2	2.4	**2.1706**	0.112	5.2	ug/L	932	Standard
	Mn	55	43186.8	2.3	**3.9795**	0.016	0.4	ug/L	1508	Standard
	Co	59	3538.4	3.4	**0.3677**	0.006	1.8	ug/L	282	Standard
	Ni	60	3132.7	5.2	**1.5979**	0.051	3.2	ug/L	91	Standard
	Cu	65	3055.6	5.1	**1.5691**	0.053	3.4	ug/L	205	Standard
	Zn	66	10569.0	1.4	**10.8328**	0.097	0.9	ug/L	369	Standard
>	Ge	72	462775.7	2.1				ug/L	496734	Standard
	As	75	195.9	42.3	**0.2636**	0.089	33.9	ug/L	-45	Standard
	Se	82	115.5	10.9	**1.0556**	0.163	15.5	ug/L	18	Standard
	Se-1	77	179.7	10.9	**1.7433**	0.260	14.9	ug/L	83	Standard
>	Ga	71	155.0	14.8				mg/L	30	Standard
	Rb	85	7410.1	6.0				ug/L	23	Standard
	Y	89	399515.5	3.9				ug/L	405333	Standard
>	Rh	103	763.4	7.2				ug/L	17	Standard
	Mo	98	41896.7	3.3	**10.3260**	0.252	2.4	ug/L	135	Standard
	Ag	107	124.3	11.4	**-0.0060**	0.002	31.5	ug/L	123	Standard
	Cd	111	147.3	4.7	**0.0569**	0.003	4.7	mg/L	11	Standard
	Cd	114	449.7	10.0	**0.0713**	0.009	12.0	ug/L	56	Standard
>	In	115	700438.7	0.9				ug/L	634401	Standard
	Sn	118	321.0	3.3	**0.1609**	0.006	3.5	ug/L	137	Standard
	Sb	123	4629.5	0.5	**0.7265**	0.010	1.4	ug/L	907	Standard
	Ba	135	54224.2	1.8	**17.2602**	0.154	0.9	ug/L	166	Standard
	Ce	140	28760.6	2.9				ug/L	57	Standard
>	Tb	159	1371407.2	0.5				ug/L	1347540	Standard
	Ho	165	378.3	15.2				ug/L	23	Standard
	Tl	203	791.0	1.4	**0.0682**	0.002	2.5	ug/L	45	Standard
	Tl	205	1916.8	5.9	**0.0712**	0.005	6.9	ug/L	112	Standard
	Pb	206	5531.7	2.0	**0.6229**	0.012	1.9	ug/L	825	Standard
	Pb	207	4466.0	1.4	**0.5724**	0.012	2.0	ug/L	679	Standard
	Pb	208	20836.9	1.6	**0.5844**	0.006	1.0	ug/L	3166	Standard
	U	238	32149.1	1.1	**1.0908**	0.006	0.6	ug/L	119	Standard
>	Bi	209	620935.1	1.0				ug/L	668024	Standard

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⌈	**Na**	23	185.0	11.8	**56.0198**	5.369	9.6	mg/L	0	Standard
|	**Mg**	24	20315.3	0.7	**33.7309**	1.010	3.0	mg/L	48	Standard
|	**K**	39	88.3	22.9	**0.9078**	0.201	22.1	mg/L	8	Standard
|	**Ca**	43	136.7	14.8	**42.0318**	9.603	22.8	mg/L	27	Standard
|	**Fe**	54	665.3	9.4	**0.6654**	0.060	9.0	mg/L	121	Standard
|	**Fe**	57	616.7	19.3	**1.3970**	0.541	38.7	mg/L	305	Standard
⌊>	**Sc-1**	45	20024.9	3.6				mg/L	22700	Standard
	Cl	35	14.0	62.3				ug/L	3	Standard
	Kr	83	3.7	15.7				ug/L	5	Standard
	Br	81	10487.0	4.1				ug/L	1367	Standard
	P	31	118.3	6.5				ug/L	67	Standard
	S	34	93.3	22.3				ug/L	55	Standard
	Sr	88	1125.0	4.4				ug/L	113	Standard
	C	12	580.0	12.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	492.1	24.4				mg/L	18	Standard
	Ho-1	165	378.3	15.2				mg/L	23	Standard
	Er	166	303.3	10.6				mg/L	40	Standard
	I	127	91215.7	4.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		114.745	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.164	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	110.409
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	92.951
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	

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Method 6020 - Summary Report

Sample ID: L1610051201
Sample Date/Time: Thursday, October 20, 2016 13:28:21
Number of Replicates: 3
Autosampler Position: 301
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	86075.7	3.8				ug/L	76335	Standard
	Be	9	20.0	50.0	**0.0130**	0.008	58.1	ug/L	18	Standard
	Al	27	23064608.6	4.5	**164.6045**	2.657	1.6	ug/L	810	Standard
	Sc	45	21380.1	1.7				ug/L	22700	Standard
	Ti	47	324.0	5.0	**1.5168**	0.063	4.2	ug/L	25	Standard
	V	51	-1396.8	53.0	**-0.4274**	0.107	25.0	ug/L	1541	Standard
	Cr	52	16933.1	0.6	**1.4880**	0.027	1.8	ug/L	7881	Standard
	Cr	53	15394.5	4.8	**18.0137**	0.718	4.0	ug/L	932	Standard
	Mn	55	174469.2	1.3	**16.1735**	0.042	0.3	ug/L	1508	Standard
	Co	59	3833.2	1.9	**0.3970**	0.011	2.8	ug/L	282	Standard
	Ni	60	3304.0	3.5	**1.6712**	0.042	2.5	ug/L	91	Standard
	Cu	65	1032.4	1.4	**0.4837**	0.003	0.7	ug/L	205	Standard
	Zn	66	3212.3	0.7	**3.1320**	0.021	0.7	ug/L	369	Standard
>	Ge	72	467340.5	1.3				ug/L	496734	Standard
	As	75	781.4	3.7	**0.8622**	0.029	3.4	ug/L	-45	Standard
	Se	82	258.5	2.4	**2.5773**	0.050	1.9	ug/L	18	Standard
	Se-1	77	860.7	11.4	**12.5930**	1.418	11.3	ug/L	83	Standard
>	Ga	71	28.3	40.8				mg/L	30	Standard
	Rb	85	9307.9	2.6				ug/L	23	Standard
	Y	89	399439.7	2.0				ug/L	405333	Standard
>	Rh	103	101.7	18.6				ug/L	17	Standard
	Mo	98	580.5	3.7	**0.1250**	0.004	3.3	ug/L	135	Standard
	Ag	107	121.7	5.3	**-0.0061**	0.001	20.4	ug/L	123	Standard
	Cd	111	25.6	32.6	**0.0026**	0.004	155.1	mg/L	11	Standard
	Cd	114	98.1	28.9	**0.0107**	0.005	47.2	ug/L	56	Standard
>	In	115	687341.4	2.8				ug/L	634401	Standard
	Sn	118	132.0	19.1	**0.0222**	0.016	72.3	ug/L	137	Standard
	Sb	123	490.8	23.4	**0.0169**	0.018	103.8	ug/L	907	Standard
	Ba	135	368267.2	1.3	**119.7806**	2.152	1.8	ug/L	166	Standard
	Ce	140	450.0	12.0				ug/L	57	Standard
>	Tb	159	1377769.7	1.0				ug/L	1347540	Standard
	Ho	165	51.7	40.3				ug/L	23	Standard
	Tl	203	275.3	7.7	**0.0199**	0.001	7.1	ug/L	45	Standard
	Tl	205	671.7	11.8	**0.0229**	0.003	11.4	ug/L	112	Standard
	Pb	206	544.0	1.8	**0.0092**	0.002	22.1	ug/L	825	Standard
	Pb	207	442.7	6.0	**0.0100**	0.003	30.0	ug/L	679	Standard
	Pb	208	2109.7	1.1	**0.0083**	0.001	13.6	ug/L	3166	Standard
	U	238	9748.5	2.3	**0.3191**	0.005	1.4	ug/L	119	Standard
>	Bi	209	641130.7	2.2				ug/L	668024	Standard

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⌈	**Na**	23	46.7	22.3	**13.2926**	3.162	23.8	mg/L	0	Standard
|	**Mg**	24	119897.6	1.2	**186.8201**	5.430	2.9	mg/L	48	Standard
|	**K**	39	50.0	26.5	**0.4225**	0.152	35.9	mg/L	8	Standard
|	**Ca**	43	71.7	26.4	**14.7695**	6.713	45.5	mg/L	27	Standard
|	**Fe**	54	202.3	7.0	**0.0971**	0.019	19.2	mg/L	121	Standard
|	**Fe**	57	361.7	8.4	**0.1794**	0.138	76.7	mg/L	305	Standard
⌊>	**Sc-1**	45	21380.1	1.7				mg/L	22700	Standard
	Cl	35	8.0	75.0				ug/L	3	Standard
	Kr	83	4.0	43.3				ug/L	5	Standard
	Br	81	66077.4	5.2				ug/L	1367	Standard
	P	31	175.0	31.8				ug/L	67	Standard
	S	34	73.3	20.8				ug/L	55	Standard
	Sr	88	276.7	7.3				ug/L	113	Standard
	C	12	1063.4	6.0				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	10.0	173.2				mg/L	10	Standard
	Dy	164	63.6	8.2				mg/L	18	Standard
	Ho-1	165	51.7	40.3				mg/L	23	Standard
	Er	166	63.3	24.1				mg/L	40	Standard
	I	127	803880.6	6.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		112.760	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.083	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	108.345
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	95.974
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
V 51 Lower	V	51	
Ba 135 Upper, S, EEE	Ba	135	

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 13:31:22
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	83097.3	1.2				ug/L	76335	Standard
	Be	9	58352.3	4.0	**48.6443**	2.531	5.2	ug/L	18	Standard
	Al	27	6168853.3	2.2	**45.6012**	0.489	1.1	ug/L	810	Standard
	Sc	45	21405.1	1.6				ug/L	22700	Standard
	Ti	47	19753.5	1.7	**97.6727**	0.703	0.7	ug/L	25	Standard
	V	51	348494.5	2.5	**49.3278**	0.375	0.8	ug/L	1541	Standard
	Cr	52	336555.8	2.8	**50.2836**	0.281	0.6	ug/L	7881	Standard
	Cr	53	43402.1	3.4	**51.1076**	1.187	2.3	ug/L	932	Standard
	Mn	55	551354.3	3.7	**49.7019**	0.886	1.8	ug/L	1508	Standard
	Co	59	455600.8	1.5	**49.4415**	0.520	1.1	ug/L	282	Standard
	Ni	60	99189.3	3.8	**49.8094**	0.740	1.5	ug/L	91	Standard
	Cu	65	96668.0	3.5	**49.4803**	0.595	1.2	ug/L	205	Standard
	Zn	66	50165.6	2.5	**49.9950**	0.654	1.3	ug/L	369	Standard
>	**Ge**	72	482196.8	2.4				ug/L	496734	Standard
	As	75	50523.7	2.9	**50.3621**	0.373	0.7	ug/L	-45	Standard
	Se	82	5035.6	3.3	**52.2017**	0.483	0.9	ug/L	18	Standard
	Se-1	77	3438.7	4.6	**52.1199**	2.279	4.4	ug/L	83	Standard
>	**Ga**	71	60.0	62.9				mg/L	30	Standard
	Rb	85	615.0	11.8				ug/L	23	Standard
	Y	89	403793.5	2.4				ug/L	405333	Standard
>	**Rh**	103	43.3	24.0				ug/L	17	Standard
	Mo	98	381599.7	2.6	**89.6066**	0.478	0.5	ug/L	135	Standard
	Ag	107	384774.9	1.2	**47.3916**	0.477	1.0	ug/L	123	Standard
	Cd	111	119048.5	1.7	**50.7438**	0.300	0.6	mg/L	11	Standard
	Cd	114	308393.9	2.3	**50.7692**	0.199	0.4	ug/L	56	Standard
>	**In**	115	736565.9	2.2				ug/L	634401	Standard
	Sn	118	70723.8	3.4	**49.8621**	0.594	1.2	ug/L	137	Standard
	Sb	123	309074.7	2.2	**50.4133**	0.593	1.2	ug/L	907	Standard
	Ba	135	153815.8	2.4	**46.6413**	0.301	0.6	ug/L	166	Standard
	Ce	140	206.7	14.6				ug/L	57	Standard
>	**Tb**	159	1398318.8	1.3				ug/L	1347540	Standard
	Ho	165	35.0	37.8				ug/L	23	Standard
	Tl	203	604358.9	2.9	**49.1745**	0.417	0.8	ug/L	45	Standard
	Tl	205	1444748.6	3.2	**48.6765**	1.442	3.0	ug/L	112	Standard
	Pb	206	465730.8	2.1	**50.4625**	0.156	0.3	ug/L	825	Standard
	Pb	207	408299.7	2.0	**50.2647**	0.301	0.6	ug/L	679	Standard
	Pb	208	1852161.3	1.6	**50.1777**	0.327	0.7	ug/L	3166	Standard
	U	238	1639202.3	2.1	**49.2836**	0.676	1.4	ug/L	119	Standard
>	**Bi**	209	701901.6	2.1				ug/L	668024	Standard

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	Na	23	23.3	61.9	**6.5821**	3.957	60.1	mg/L	0	Standard
	Mg	24	3650.4	7.7	**5.5859**	0.413	7.4	mg/L	48	Standard
	K	39	375.0	17.3	**4.0111**	0.651	16.2	mg/L	8	Standard
	Ca	43	58.3	43.1	**9.8418**	8.772	89.1	mg/L	27	Standard
	Fe	54	4518.6	4.2	**4.9238**	0.180	3.6	mg/L	121	Standard
	Fe	57	1566.7	8.2	**5.1072**	0.505	9.9	mg/L	305	Standard
>	**Sc-1**	45	21405.1	1.6				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	4.3	35.3				ug/L	5	Standard
	Br	81	2430.2	22.1				ug/L	1367	Standard
	P	31	115.0	15.7				ug/L	67	Standard
	S	34	98.3	19.3				ug/L	55	Standard
	Sr	88	136.7	20.1				ug/L	113	Standard
	C	12	353.3	3.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	25.5	82.2				mg/L	18	Standard
	Ho-1	165	35.0	37.8				mg/L	23	Standard
	Er	166	23.3	24.7				mg/L	40	Standard
	I	127	38424.2	25.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	97.289		
	Al	27	91.202		
	Sc	45			
	Ti	47	97.673		
	V	51	98.656		
	Cr	52	100.567		
	Cr	53			
	Mn	55	99.404		
	Co	59	98.883		
	Ni	60	99.619		
	Cu	65	98.961		
	Zn	66	99.990		
>	Ge	72		97.073	
	As	75	100.724		
	Se	82	104.403		
	Se-1	77			
>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	89.607		
Ag	107	94.783		
Cd	111	101.488		
Cd	114			
In	115			116.104
Sn	118	99.724		
Sb	123	100.827		
Ba	135	93.283		
Ce	140			
Tb	159			
Ho	165			
Tl	203	98.349		
Tl	205			
Pb	206			
Pb	207			
Pb	208	100.355		
U	238	98.567		
Bi	209			105.071
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 6	Mo	98	

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 13:34:21
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	67396.8	7.4				ug/L	76335	Standard
	Be	9	10.0	86.6	**0.0069**	0.009	124.3	ug/L	18	Standard
	Al	27	1180.0	6.2	**0.0064**	0.001	10.1	ug/L	810	Standard
	Sc	45	17381.6	3.3				ug/L	22700	Standard
	Ti	47	17.0	25.6	**-0.0408**	0.021	51.1	ug/L	25	Standard
	V	51	1064.3	0.6	**-0.0473**	0.007	15.6	ug/L	1541	Standard
	Cr	52	4785.8	5.3	**-0.3351**	0.008	2.4	ug/L	7881	Standard
	Cr	53	970.0	6.8	**0.2716**	0.080	29.5	ug/L	932	Standard
	Mn	55	555.0	7.3	**-0.0263**	0.003	10.6	ug/L	1508	Standard
	Co	59	231.7	4.0	**-0.0033**	0.001	20.9	ug/L	282	Standard
	Ni	60	98.3	3.3	**0.0151**	0.001	5.3	ug/L	91	Standard
	Cu	65	148.7	11.5	**0.0261**	0.009	35.8	ug/L	205	Standard
	Zn	66	210.0	9.6	**0.0600**	0.013	22.3	ug/L	369	Standard
>	Ge	72	415547.7	4.4				ug/L	496734	Standard
	As	75	-28.8	83.7	**0.0252**	0.029	114.1	ug/L	-45	Standard
	Se	82	18.7	4.9	**0.0273**	0.019	68.2	ug/L	18	Standard
	Se-1	77	82.3	11.0	**0.3301**	0.197	59.5	ug/L	83	Standard
>	Ga	71	10.0	50.0				mg/L	30	Standard
	Rb	85	21.7	48.0				ug/L	23	Standard
	Y	89	333609.1	2.4				ug/L	405333	Standard
>	Rh	103	16.7	45.8				ug/L	17	Standard
	Mo	98	152.9	34.4	**0.0224**	0.014	64.1	ug/L	135	Standard
	Ag	107	106.3	4.2	**-0.0062**	0.000	5.5	ug/L	123	Standard
	Cd	111	5.8	33.5	**-0.0062**	0.001	15.2	mg/L	11	Standard
	Cd	114	45.2	16.7	**0.0024**	0.001	52.8	ug/L	56	Standard
>	In	115	606391.5	3.1				ug/L	634401	Standard
	Sn	118	53.0	6.5	**-0.0320**	0.002	7.6	ug/L	137	Standard
	Sb	123	336.9	25.7	**-0.0015**	0.019	1222.6	ug/L	907	Standard
	Ba	135	38.0	32.3	**-0.0330**	0.004	12.7	ug/L	166	Standard
	Ce	140	15.0	120.2				ug/L	57	Standard
>	Tb	159	1173791.3	3.6				ug/L	1347540	Standard
	Ho	165	13.3	57.3				ug/L	23	Standard
	Tl	203	51.7	13.2	**0.0002**	0.001	379.1	ug/L	45	Standard
	Tl	205	113.3	22.2	**0.0025**	0.001	43.3	ug/L	112	Standard
	Pb	206	420.0	3.7	**-0.0033**	0.001	31.7	ug/L	825	Standard
	Pb	207	352.3	6.1	**-0.0001**	0.004	6031.9	ug/L	679	Standard
	Pb	208	1690.4	3.0	**-0.0020**	0.000	21.5	ug/L	3166	Standard
	U	238	47.7	15.9	**-0.0002**	0.000	181.5	ug/L	119	Standard
>	Bi	209	613991.9	2.9				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	51.7	5.6	**0.0038**	0.009	236.3	mg/L	48	Standard
|	**K**	39	13.3	94.4	**0.0487**	0.168	344.4	mg/L	8	Standard
|	**Ca**	43	26.7	10.8	**0.6756**	1.243	183.9	mg/L	27	Standard
|	**Fe**	54	40.9	39.5	**-0.0734**	0.022	29.4	mg/L	121	Standard
|	**Fe**	57	263.3	9.6	**0.0232**	0.106	459.2	mg/L	305	Standard
⌊>	**Sc-1**	45	17381.6	3.3				mg/L	22700	Standard
	Cl	35	5.3	21.7				ug/L	3	Standard
	Kr	83	3.0	120.2				ug/L	5	Standard
	Br	81	1536.7	11.1				ug/L	1367	Standard
	P	31	31.7	24.1				ug/L	67	Standard
	S	34	75.0	6.7				ug/L	55	Standard
	Sr	88	146.7	18.8				ug/L	113	Standard
	C	12	246.7	18.3				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	12.7	96.4				mg/L	18	Standard
	Ho-1	165	13.3	57.3				mg/L	23	Standard
	Er	166	13.3	114.6				mg/L	40	Standard
	I	127	27824.1	11.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		83.656	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	95.585
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	91.912
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610054401
Sample Date/Time: Thursday, October 20, 2016 13:37:22
Number of Replicates: 3
Autosampler Position: 302
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	98700.7	3.4				ug/L	76335	Standard
	Be	9	830.0	11.5	**0.5783**	0.050	8.6	ug/L	18	Standard
	Al	27	22836242.1	4.6	**142.1031**	1.726	1.2	ug/L	810	Standard
	Sc	45	20060.0	4.5				ug/L	22700	Standard
	Ti	47	105.0	12.9	**0.3982**	0.064	16.0	ug/L	25	Standard
	V	51	1278.5	10.8	**-0.0356**	0.019	52.6	ug/L	1541	Standard
	Cr	52	9600.7	3.6	**0.3313**	0.044	13.3	ug/L	7881	Standard
	Cr	53	1863.4	2.7	**1.2312**	0.078	6.4	ug/L	932	Standard
	Mn	55	162554413.7	2.6	**15151.9215**	145.276	1.0	ug/L	1508	Standard
	Co	59	2457678.5	2.0	**275.3920**	0.925	0.3	ug/L	282	Standard
	Ni	60	677625.5	1.2	**351.6026**	3.887	1.1	ug/L	91	Standard
	Cu	65	3554104.9	1.7	**1880.4290**	15.141	0.8	ug/L	205	Standard
	Zn	66	147530870.9	2.0	**152322.5262**	2521.191	1.7	ug/L	369	Standard
>	Ge	72	467196.1	2.3				ug/L	496734	Standard
	As	75	4837.9	3.6	**5.0303**	0.072	1.4	ug/L	-45	Standard
	Se	82	512.2	5.5	**5.3003**	0.178	3.4	ug/L	18	Standard
	Se-1	77	218.0	7.8	**2.3293**	0.197	8.5	ug/L	83	Standard
>	Ga	71	906.7	13.6				mg/L	30	Standard
	Rb	85	17541.8	1.5				ug/L	23	Standard
	Y	89	571343.2	3.5				ug/L	405333	Standard
>	Rh	103	415.0	8.3				ug/L	17	Standard
	Mo	98	367.0	1.3	**0.0707**	0.003	4.9	ug/L	135	Standard
	Ag	107	1365.7	1.2	**0.1572**	0.006	3.9	ug/L	123	Standard
	Cd	111	205058.4	3.7	**93.1050**	0.502	0.5	mg/L	11	Standard
	Cd	114	494890.0	3.5	**86.7998**	1.366	1.6	ug/L	56	Standard
>	In	115	691421.4	3.4				ug/L	634401	Standard
	Sn	118	206.0	40.9	**0.0772**	0.062	80.4	ug/L	137	Standard
	Sb	123	1959.6	45.6	**0.2701**	0.151	55.7	ug/L	907	Standard
	Ba	135	10295.2	2.8	**3.2826**	0.038	1.2	ug/L	166	Standard
	Ce	140	442619.6	2.5				ug/L	57	Standard
>	Tb	159	1182133.3	3.0				ug/L	1347540	Standard
	Ho	165	18140.9	2.2				ug/L	23	Standard
	Tl	203	418.3	4.7	**0.0312**	0.002	5.6	ug/L	45	Standard
	Tl	205	1063.4	15.3	**0.0358**	0.005	14.5	ug/L	112	Standard
	Pb	206	3908.5	0.9	**0.3905**	0.007	1.7	ug/L	825	Standard
	Pb	207	3401.7	3.7	**0.3910**	0.007	1.9	ug/L	679	Standard
	Pb	208	15803.3	2.1	**0.3963**	0.003	0.8	ug/L	3166	Standard
	U	238	2776.6	4.9	**0.0860**	0.002	2.7	ug/L	119	Standard
>	Bi	209	667492.3	2.2				ug/L	668024	Standard

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	Na	23	150.0	5.8	**45.3854**	0.832	1.8	mg/L	0	Standard
	Mg	24	9618.1	5.2	**15.8775**	0.190	1.2	mg/L	48	Standard
	K	39	211.7	15.7	**2.3664**	0.365	15.4	mg/L	8	Standard
	Ca	43	98.3	15.5	**26.9203**	6.126	22.8	mg/L	27	Standard
	Fe	54	11827.0	1.8	**13.9971**	0.398	2.8	mg/L	121	Standard
	Fe	57	3608.8	4.5	**14.4810**	1.141	7.9	mg/L	305	Standard
>	**Sc-1**	45	20060.0	4.5				mg/L	22700	Standard
	Cl	35	26.0	42.8				ug/L	3	Standard
	Kr	83	2.3	137.8				ug/L	5	Standard
	Br	81	4137.2	6.9				ug/L	1367	Standard
	P	31	80.0	6.3				ug/L	67	Standard
	S	34	96.7	10.8				ug/L	55	Standard
	Sr	88	211.7	20.1				ug/L	113	Standard
	C	12	623.3	18.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	28971.1	1.3				mg/L	18	Standard
	Ho-1	165	18140.9	2.2				mg/L	23	Standard
	Er	166	15197.6	4.8				mg/L	40	Standard
	I	127	49365.5	6.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		129.299	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		94.054	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	108.988
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	99.920
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Li 6 Int Std for sample	Li	6	Rerun sample
Al 27 Upper, S, EEE	Al	27	
Mn 55 Upper, S, EEE	Mn	55	

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Co 59 Upper, S, EEE	Co	59
Ni 60 Upper, S, EEE	Ni	60
Cu 65 Upper, S, EEE	Cu	65
Zn 66 Upper, S, EEE	Zn	66

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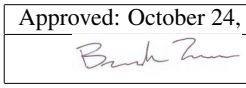

Method 6020 - Summary Report

Sample ID: L1610054402
Sample Date/Time: Thursday, October 20, 2016 13:40:21
Number of Replicates: 3
Autosampler Position: 303
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	85363.3	2.8				ug/L	76335	Standard
	Be	9	3607.1	2.8	**2.9258**	0.155	5.3	ug/L	18	Standard
	Al	27	22305626.9	4.7	**160.4895**	4.076	2.5	ug/L	810	Standard
	Sc	45	23206.1	2.2				ug/L	22700	Standard
	Ti	47	76.0	6.0	**0.2502**	0.028	11.1	ug/L	25	Standard
	V	51	13659.2	2.7	**1.7791**	0.046	2.6	ug/L	1541	Standard
	Cr	52	10605.7	2.0	**0.4881**	0.032	6.6	ug/L	7881	Standard
	Cr	53	1783.4	5.8	**1.1301**	0.158	14.0	ug/L	932	Standard
	Mn	55	127767018.8	1.8	**11899.5489**	373.077	3.1	ug/L	1508	Standard
	Co	59	4142268.1	0.8	**463.7173**	9.385	2.0	ug/L	282	Standard
	Ni	60	417806.1	2.4	**216.5557**	7.752	3.6	ug/L	91	Standard
	Cu	65	151938.4	0.6	**80.2440**	1.517	1.9	ug/L	205	Standard
	Zn	66	252806803.4	0.6	**260710.1802**	2431.186	0.9	ug/L	369	Standard
>	**Ge**	72	467718.9	1.3				ug/L	496734	Standard
	As	75	9066.4	2.0	**9.3659**	0.088	0.9	ug/L	-45	Standard
	Se	82	819.7	3.8	**8.5940**	0.229	2.7	ug/L	18	Standard
	Se-1	77	346.3	9.1	**4.3811**	0.549	12.5	ug/L	83	Standard
>	**Ga**	71	3182.0	3.1				mg/L	30	Standard
	Rb	85	61454.4	1.7				ug/L	23	Standard
	Y	89	1825283.5	3.5				ug/L	405333	Standard
>	**Rh**	103	125.0	24.3				ug/L	17	Standard
	Mo	98	549.4	2.8	**0.1201**	0.005	4.4	ug/L	135	Standard
	Ag	107	2265.8	0.4	**0.2835**	0.008	2.8	ug/L	123	Standard
	Cd	111	220954.1	1.9	**103.0995**	0.967	0.9	mg/L	11	Standard
	Cd	114	543414.1	2.9	**97.9221**	0.815	0.8	ug/L	56	Standard
>	**In**	115	672928.1	2.5				ug/L	634401	Standard
	Sn	118	159.0	12.1	**0.0453**	0.012	26.7	ug/L	137	Standard
	Sb	123	929.4	37.9	**0.0967**	0.060	62.1	ug/L	907	Standard
	Ba	135	13221.1	1.3	**4.3472**	0.107	2.5	ug/L	166	Standard
	Ce	140	4221197.6	1.6				ug/L	57	Standard
>	**Tb**	159	1153894.7	2.4				ug/L	1347540	Standard
	Ho	165	135385.6	1.5				ug/L	23	Standard
	Tl	203	853.0	2.2	**0.0705**	0.003	3.9	ug/L	45	Standard
	Tl	205	2310.2	9.4	**0.0823**	0.006	7.3	ug/L	112	Standard
	Pb	206	4539.0	3.5	**0.4771**	0.007	1.6	ug/L	825	Standard
	Pb	207	3946.2	4.1	**0.4761**	0.011	2.3	ug/L	679	Standard
	Pb	208	18470.5	2.2	**0.4875**	0.004	0.8	ug/L	3166	Standard
	U	238	16158.9	2.2	**0.5237**	0.002	0.4	ug/L	119	Standard
>	**Bi**	209	648856.8	2.2				ug/L	668024	Standard

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⌈	**Na**	23	345.0	8.7	**90.3961**	9.779	10.8	mg/L	0	Standard
|	**Mg**	24	12680.3	3.4	**18.1127**	0.545	3.0	mg/L	48	Standard
|	**K**	39	146.7	10.4	**1.3654**	0.160	11.7	mg/L	8	Standard
|	**Ca**	43	191.7	19.8	**52.9305**	12.273	23.2	mg/L	27	Standard
|	**Fe**	54	27831.3	2.1	**28.5933**	0.954	3.3	mg/L	121	Standard
|	**Fe**	57	7942.1	4.4	**28.6812**	1.425	5.0	mg/L	305	Standard
⌊>	**Sc-1**	45	23206.1	2.2				mg/L	22700	Standard
	Cl	35	32.0	25.0				ug/L	3	Standard
	Kr	83	2.3	24.7				ug/L	5	Standard
	Br	81	4017.2	6.0				ug/L	1367	Standard
	P	31	83.3	13.9				ug/L	67	Standard
	S	34	83.3	9.2				ug/L	55	Standard
	Sr	88	431.7	14.3				ug/L	113	Standard
	C	12	663.3	7.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	213189.1	3.0				mg/L	18	Standard
	Ho-1	165	135385.6	1.5				mg/L	23	Standard
	Er	166	111049.4	4.8				mg/L	40	Standard
	I	127	131213.7	9.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		111.827	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		94.159	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	106.073
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	97.131
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Mn 55 Upper, S, EEE	Mn	55	
Co 59 Upper, S, EEE	Co	59	

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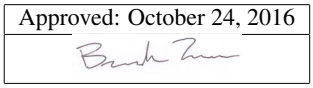

Ni 60 Upper, S, EEE	Ni	60
Zn 66 Upper, S, EEE	Zn	66
Cd 111 Upper, S, EEE	Cd	111

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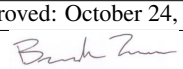

Method 6020 - Summary Report

Sample ID: L1610054403
Sample Date/Time: Thursday, October 20, 2016 13:43:20
Number of Replicates: 3
Autosampler Position: 304
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	86687.6	4.7				ug/L	76335	Standard
	Be	9	13.3	78.1	**0.0075**	0.008	106.1	ug/L	18	Standard
	Al	27	25701.9	8.1	**0.1776**	0.007	3.8	ug/L	810	Standard
	Sc	45	17972.3	4.0				ug/L	22700	Standard
	Ti	47	27.3	31.1	**0.0015**	0.044	2993.0	ug/L	25	Standard
	V	51	1191.5	14.4	**-0.0488**	0.026	52.3	ug/L	1541	Standard
	Cr	52	9447.3	3.8	**0.3027**	0.056	18.5	ug/L	7881	Standard
	Cr	53	1426.7	10.9	**0.6834**	0.195	28.5	ug/L	932	Standard
	Mn	55	89727.7	6.6	**8.2539**	0.526	6.4	ug/L	1508	Standard
	Co	59	2742.9	7.9	**0.2739**	0.023	8.5	ug/L	282	Standard
	Ni	60	609.3	2.2	**0.2730**	0.007	2.4	ug/L	91	Standard
	Cu	65	2412.9	2.3	**1.2105**	0.026	2.1	ug/L	205	Standard
	Zn	66	146586.6	5.2	**150.6858**	7.364	4.9	ug/L	369	Standard
>	Ge	72	468558.8	0.4				ug/L	496734	Standard
	As	75	-33.2	106.2	**0.0254**	0.036	142.1	ug/L	-45	Standard
	Se	82	20.5	50.9	**0.0206**	0.111	540.1	ug/L	18	Standard
	Se-1	77	89.7	7.2	**0.2762**	0.101	36.7	ug/L	83	Standard
>	Ga	71	41.7	18.3				mg/L	30	Standard
	Rb	85	131.7	11.0				ug/L	23	Standard
	Y	89	407971.5	0.8				ug/L	405333	Standard
>	Rh	103	8.3	34.6				ug/L	17	Standard
	Mo	98	66.0	10.1	**-0.0068**	0.002	28.2	ug/L	135	Standard
	Ag	107	128.3	6.6	**-0.0075**	0.001	7.0	ug/L	123	Standard
	Cd	111	178.6	16.0	**0.0610**	0.009	15.4	mg/L	11	Standard
	Cd	114	509.9	13.2	**0.0710**	0.009	13.1	ug/L	56	Standard
>	In	115	796871.3	3.2				ug/L	634401	Standard
	Sn	118	191.7	7.4	**0.0476**	0.006	13.5	ug/L	137	Standard
	Sb	123	533.5	38.6	**0.0123**	0.033	266.8	ug/L	907	Standard
	Ba	135	227.7	5.5	**0.0170**	0.006	32.7	ug/L	166	Standard
	Ce	140	2786.9	7.3				ug/L	57	Standard
>	Tb	159	1369799.9	3.0				ug/L	1347540	Standard
	Ho	165	120.0	21.7				ug/L	23	Standard
	Tl	203	28.7	4.0	**-0.0023**	0.000	4.7	ug/L	45	Standard
	Tl	205	81.7	47.6	**0.0009**	0.001	158.2	ug/L	112	Standard
	Pb	206	726.0	2.4	**0.0217**	0.004	19.7	ug/L	825	Standard
	Pb	207	596.3	3.4	**0.0221**	0.002	6.9	ug/L	679	Standard
	Pb	208	2803.4	1.9	**0.0199**	0.001	5.6	ug/L	3166	Standard
	U	238	55.3	32.4	**-0.0002**	0.001	309.3	ug/L	119	Standard
>	Bi	209	718344.5	3.2				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5926**	1.018	171.7	mg/L	0	Standard
|	**Mg**	24	63.3	16.4	**0.0226**	0.024	107.4	mg/L	48	Standard
|	**K**	39	13.3	94.4	**0.0456**	0.166	363.5	mg/L	8	Standard
|	**Ca**	43	28.3	27.0	**0.9499**	3.030	319.0	mg/L	27	Standard
|	**Fe**	54	130.8	5.7	**0.0447**	0.008	18.1	mg/L	121	Standard
|	**Fe**	57	266.7	12.5	**-0.0028**	0.160	5647.5	mg/L	305	Standard
⌊>	**Sc-1**	45	17972.3	4.0				mg/L	22700	Standard
	Cl	35	6.0	66.7				ug/L	3	Standard
	Kr	83	2.3	65.5				ug/L	5	Standard
	Br	81	1743.4	14.6				ug/L	1367	Standard
	P	31	96.7	16.6				ug/L	67	Standard
	S	34	55.0	9.1				ug/L	55	Standard
	Sr	88	120.0	22.0				ug/L	113	Standard
	C	12	513.3	13.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	136.8	23.0				mg/L	18	Standard
	Ho-1	165	120.0	21.7				mg/L	23	Standard
	Er	166	136.7	30.5				mg/L	40	Standard
	I	127	15347.9	14.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		113.562	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.328	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		125.610
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		107.533
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Zn 66 Upper, S, EEE	Zn	66	
In 115 Int Std for sample	In	115	Rerun sample

Sample ID: L1610054403
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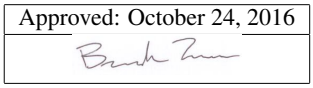

Method 6020 - Summary Report

Sample ID: L1610040801
Sample Date/Time: Thursday, October 20, 2016 13:47:28
Number of Replicates: 3
Autosampler Position: 255
Sample Description: 20
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75479.3	3.3				ug/L	76335	Standard
	Be	9	8.3	34.6	**0.0046**	0.003	56.0	ug/L	18	Standard
	Al	27	1448273.0	4.7	**11.7809**	0.211	1.8	ug/L	810	Standard
	Sc	45	16959.5	3.2				ug/L	22700	Standard
	Ti	47	30.0	21.9	**0.0239**	0.037	153.1	ug/L	25	Standard
	V	51	1103.5	1.6	**-0.0525**	0.002	3.0	ug/L	1541	Standard
	Cr	52	5143.9	2.0	**-0.3284**	0.011	3.4	ug/L	7881	Standard
	Cr	53	1145.0	3.7	**0.4160**	0.064	15.5	ug/L	932	Standard
	Mn	55	71599.4	0.7	**6.9514**	0.097	1.4	ug/L	1508	Standard
	Co	59	809.0	1.5	**0.0630**	0.001	2.3	ug/L	282	Standard
	Ni	60	430.3	1.8	**0.1931**	0.004	2.1	ug/L	91	Standard
	Cu	65	474.3	2.6	**0.2023**	0.008	4.1	ug/L	205	Standard
	Zn	66	6685.2	26.2	**7.0885**	1.886	26.6	ug/L	369	Standard
>	Ge	72	443198.8	0.7				ug/L	496734	Standard
	As	75	12.2	261.5	**0.0726**	0.034	47.4	ug/L	-45	Standard
	Se	82	30.3	21.3	**0.1450**	0.074	51.4	ug/L	18	Standard
	Se-1	77	95.0	13.1	**0.4476**	0.206	46.0	ug/L	83	Standard
>	Ga	71	36.7	20.8				mg/L	30	Standard
	Rb	85	505.0	6.9				ug/L	23	Standard
	Y	89	363589.9	1.6				ug/L	405333	Standard
>	Rh	103	20.0	100.0				ug/L	17	Standard
	Mo	98	53.6	24.3	**-0.0081**	0.003	39.7	ug/L	135	Standard
	Ag	107	106.0	11.3	**-0.0086**	0.001	16.0	ug/L	123	Standard
	Cd	111	21.6	26.7	**0.0004**	0.003	646.5	mg/L	11	Standard
	Cd	114	78.3	29.5	**0.0067**	0.004	56.6	ug/L	56	Standard
>	In	115	711193.3	2.1				ug/L	634401	Standard
	Sn	118	62.0	10.6	**-0.0320**	0.005	17.0	ug/L	137	Standard
	Sb	123	183.4	27.2	**-0.0376**	0.009	22.8	ug/L	907	Standard
	Ba	135	2176.5	1.4	**0.6374**	0.012	1.9	ug/L	166	Standard
	Ce	140	688.3	5.4				ug/L	57	Standard
>	Tb	159	1280398.1	0.8				ug/L	1347540	Standard
	Ho	165	35.0	14.3				ug/L	23	Standard
	Tl	203	153.0	24.1	**0.0085**	0.003	38.7	ug/L	45	Standard
	Tl	205	323.3	27.8	**0.0096**	0.003	35.3	ug/L	112	Standard
	Pb	206	485.0	2.0	**-0.0001**	0.001	1331.9	ug/L	825	Standard
	Pb	207	421.0	2.9	**0.0048**	0.002	39.3	ug/L	679	Standard
	Pb	208	1915.7	3.5	**0.0002**	0.002	765.7	ug/L	3166	Standard
	U	238	3251.7	1.9	**0.1009**	0.002	1.9	ug/L	119	Standard
>	Bi	209	667961.2	1.8				ug/L	668024	Standard

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⌈	**Na**	23	6.7	86.6	**2.4040**	2.081	86.5	mg/L	0	Standard
|	**Mg**	24	3498.7	3.5	**6.7794**	0.177	2.6	mg/L	48	Standard
|	**K**	39	11.7	49.5	**0.0318**	0.084	262.5	mg/L	8	Standard
|	**Ca**	43	33.3	43.3	**4.1737**	7.213	172.8	mg/L	27	Standard
|	**Fe**	54	51.2	11.4	**-0.0574**	0.006	10.8	mg/L	121	Standard
|	**Fe**	57	295.0	10.3	**0.2237**	0.191	85.3	mg/L	305	Standard
⌊>	**Sc-1**	45	16959.5	3.2				mg/L	22700	Standard
	Cl	35	2.7	43.3				ug/L	3	Standard
	Kr	83	4.0	43.3				ug/L	5	Standard
	Br	81	4557.4	6.7				ug/L	1367	Standard
	P	31	45.0	11.1				ug/L	67	Standard
	S	34	38.3	27.2				ug/L	55	Standard
	Sr	88	148.3	18.6				ug/L	113	Standard
	C	12	340.0	16.4				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	32.4	63.2				mg/L	18	Standard
	Ho-1	165	35.0	14.3				mg/L	23	Standard
	Er	166	20.0	50.0				mg/L	40	Standard
	I	127	319287.7	9.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		98.879	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		89.223	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	112.105
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	99.991
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610040802
Sample Date/Time: Thursday, October 20, 2016 13:50:28
Number of Replicates: 3
Autosampler Position: 256
Sample Description: 20
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	72973.8	3.4				ug/L	76335	Standard
	Be	9	16.7	45.8	**0.0130**	0.008	58.9	ug/L	18	Standard
	Al	27	1413848.1	3.1	**11.9115**	0.647	5.4	ug/L	810	Standard
	Sc	45	16724.2	3.0				ug/L	22700	Standard
	Ti	47	32.7	18.7	**0.0443**	0.036	81.0	ug/L	25	Standard
	V	51	1331.7	9.5	**-0.0101**	0.020	196.8	ug/L	1541	Standard
	Cr	52	5281.3	0.9	**-0.2752**	0.028	10.1	ug/L	7881	Standard
	Cr	53	1241.7	3.1	**0.5986**	0.083	13.9	ug/L	932	Standard
	Mn	55	70297.8	2.6	**7.0597**	0.223	3.2	ug/L	1508	Standard
	Co	59	820.0	1.6	**0.0676**	0.001	2.1	ug/L	282	Standard
	Ni	60	421.0	1.1	**0.1959**	0.004	2.0	ug/L	91	Standard
	Cu	65	212.3	14.1	**0.0599**	0.015	24.4	ug/L	205	Standard
	Zn	66	5784.8	2.7	**6.3299**	0.303	4.8	ug/L	369	Standard
>	Ge	72	428626.0	2.2				ug/L	496734	Standard
	As	75	30.0	58.4	**0.0931**	0.020	21.4	ug/L	-45	Standard
	Se	82	31.9	27.8	**0.1749**	0.104	59.3	ug/L	18	Standard
	Se-1	77	97.3	8.4	**0.5416**	0.110	20.4	ug/L	83	Standard
>	Ga	71	21.7	58.1				mg/L	30	Standard
	Rb	85	440.0	15.0				ug/L	23	Standard
	Y	89	355321.9	1.4				ug/L	405333	Standard
>	Rh	103	33.3	45.8				ug/L	17	Standard
	Mo	98	58.9	10.8	**-0.0064**	0.002	23.8	ug/L	135	Standard
	Ag	107	88.3	5.8	**-0.0105**	0.001	7.2	ug/L	123	Standard
	Cd	111	28.6	14.6	**0.0039**	0.002	52.1	mg/L	11	Standard
	Cd	114	61.8	46.4	**0.0042**	0.005	117.4	ug/L	56	Standard
>	In	115	690573.6	1.1				ug/L	634401	Standard
	Sn	118	58.3	19.1	**-0.0335**	0.008	23.5	ug/L	137	Standard
	Sb	123	147.8	23.0	**-0.0429**	0.006	14.2	ug/L	907	Standard
	Ba	135	2109.5	3.8	**0.6359**	0.021	3.3	ug/L	166	Standard
	Ce	140	848.4	20.6				ug/L	57	Standard
>	Tb	159	1242405.8	3.4				ug/L	1347540	Standard
	Ho	165	40.0	43.3				ug/L	23	Standard
	Tl	203	185.7	19.5	**0.0117**	0.003	29.4	ug/L	45	Standard
	Tl	205	363.3	8.4	**0.0114**	0.001	12.6	ug/L	112	Standard
	Pb	206	488.3	5.6	**0.0017**	0.002	112.6	ug/L	825	Standard
	Pb	207	384.3	7.2	**0.0013**	0.002	178.5	ug/L	679	Standard
	Pb	208	1831.4	3.7	**-0.0008**	0.001	97.8	ug/L	3166	Standard
	U	238	3343.7	2.5	**0.1067**	0.000	0.3	ug/L	119	Standard
>	Bi	209	650550.2	2.5				ug/L	668024	Standard

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⌈	**Na**	23	6.7	43.3	**2.4432**	1.122	45.9	mg/L	0	Standard
|	**Mg**	24	3275.4	7.0	**6.4411**	0.615	9.5	mg/L	48	Standard
|	**K**	39	8.3	91.7	**-0.0139**	0.110	793.0	mg/L	8	Standard
|	**Ca**	43	38.3	32.8	**6.5190**	5.706	87.5	mg/L	27	Standard
|	**Fe**	54	59.5	0.4	**-0.0443**	0.003	6.5	mg/L	121	Standard
|	**Fe**	57	273.3	8.6	**0.1269**	0.080	63.4	mg/L	305	Standard
⌊>	**Sc-1**	45	16724.2	3.0				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	3.3	17.3				ug/L	5	Standard
	Br	81	4480.7	6.3				ug/L	1367	Standard
	P	31	61.7	33.8				ug/L	67	Standard
	S	34	75.0	30.6				ug/L	55	Standard
	Sr	88	156.7	17.6				ug/L	113	Standard
	C	12	320.0	21.7				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	18.6	95.6				mg/L	18	Standard
	Ho-1	165	40.0	43.3				mg/L	23	Standard
	Er	166	30.0	33.3				mg/L	40	Standard
	I	127	289849.9	6.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		95.596	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		86.289	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	108.854
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	97.384
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610040803
Sample Date/Time: Thursday, October 20, 2016 13:53:27
Number of Replicates: 3
Autosampler Position: 257
Sample Description: 20
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	69556.2	5.2				ug/L	76335	Standard
	Be	9	15.0	33.3	**0.0119**	0.005	39.8	ug/L	18	Standard
	Al	27	1126663.9	4.2	**9.9588**	0.491	4.9	ug/L	810	Standard
	Sc	45	16227.0	3.0				ug/L	22700	Standard
	Ti	47	30.0	15.3	**0.0357**	0.024	68.3	ug/L	25	Standard
	V	51	1144.3	14.9	**-0.0329**	0.027	83.1	ug/L	1541	Standard
	Cr	52	5129.9	2.3	**-0.2666**	0.010	3.9	ug/L	7881	Standard
	Cr	53	1028.4	9.8	**0.3658**	0.163	44.5	ug/L	932	Standard
	Mn	55	66212.6	12.9	**6.9154**	0.951	13.8	ug/L	1508	Standard
	Co	59	1006.4	31.6	**0.0955**	0.041	43.2	ug/L	282	Standard
	Ni	60	414.3	21.3	**0.2015**	0.053	26.1	ug/L	91	Standard
	Cu	65	348.0	52.0	**0.1468**	0.109	74.5	ug/L	205	Standard
	Zn	66	22538.0	89.5	**26.2807**	23.696	90.2	ug/L	369	Standard
>	Ge	72	412233.5	1.6				ug/L	496734	Standard
	As	75	-9.4	209.1	**0.0484**	0.023	47.6	ug/L	-45	Standard
	Se	82	23.5	10.3	**0.0870**	0.032	37.0	ug/L	18	Standard
	Se-1	77	89.3	11.4	**0.4674**	0.208	44.5	ug/L	83	Standard
>	Ga	71	15.0	33.3				mg/L	30	Standard
	Rb	85	366.7	24.7				ug/L	23	Standard
	Y	89	340010.4	2.0				ug/L	405333	Standard
>	Rh	103	20.0	43.3				ug/L	17	Standard
	Mo	98	54.0	4.8	**-0.0068**	0.000	7.3	ug/L	135	Standard
	Ag	107	110.3	11.3	**-0.0068**	0.002	29.2	ug/L	123	Standard
	Cd	111	28.9	60.8	**0.0049**	0.009	176.4	mg/L	11	Standard
	Cd	114	93.4	37.3	**0.0109**	0.007	61.9	ug/L	56	Standard
>	In	115	651775.5	1.7				ug/L	634401	Standard
	Sn	118	58.7	10.3	**-0.0305**	0.006	18.0	ug/L	137	Standard
	Sb	123	144.7	7.9	**-0.0420**	0.002	4.1	ug/L	907	Standard
	Ba	135	1754.4	4.0	**0.5549**	0.022	4.0	ug/L	166	Standard
	Ce	140	610.0	8.2				ug/L	57	Standard
>	Tb	159	1178641.1	4.9				ug/L	1347540	Standard
	Ho	165	21.7	70.5				ug/L	23	Standard
	Tl	203	193.7	9.9	**0.0129**	0.002	12.9	ug/L	45	Standard
	Tl	205	461.7	28.3	**0.0155**	0.005	31.0	ug/L	112	Standard
	Pb	206	494.3	1.6	**0.0044**	0.002	38.0	ug/L	825	Standard
	Pb	207	371.3	3.6	**0.0013**	0.002	128.5	ug/L	679	Standard
	Pb	208	1854.4	1.8	**0.0017**	0.002	104.9	ug/L	3166	Standard
	U	238	2728.2	2.8	**0.0897**	0.003	3.8	ug/L	119	Standard
>	Bi	209	629576.4	1.9				ug/L	668024	Standard

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	Na	23	3.3	86.6	**1.2413**	1.072	86.3	mg/L	0	Standard
	Mg	24	2763.6	6.1	**5.5784**	0.287	5.2	mg/L	48	Standard
	K	39	5.0	100.0	**-0.0582**	0.074	127.4	mg/L	8	Standard
	Ca	43	30.0	44.1	**3.0921**	6.320	204.4	mg/L	27	Standard
	Fe	54	57.7	61.5	**-0.0442**	0.054	121.3	mg/L	121	Standard
	Fe	57	296.7	4.2	**0.2980**	0.029	9.7	mg/L	305	Standard
>	**Sc-1**	45	16227.0	3.0				mg/L	22700	Standard
	Cl	35	5.3	78.1				ug/L	3	Standard
	Kr	83	5.3	28.6				ug/L	5	Standard
	Br	81	4410.6	4.0				ug/L	1367	Standard
	P	31	45.0	19.2				ug/L	67	Standard
	S	34	61.7	12.4				ug/L	55	Standard
	Sr	88	140.0	12.9				ug/L	113	Standard
	C	12	340.0	15.6				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	38.4	50.9				mg/L	18	Standard
	Ho-1	165	21.7	70.5				mg/L	23	Standard
	Er	166	33.3	45.8				mg/L	40	Standard
	I	127	258359.3	6.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		91.119	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		82.989	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	102.739
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	94.245
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610040803
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Method 6020 - Summary Report

Sample ID: L1610040804
Sample Date/Time: Thursday, October 20, 2016 13:56:26
Number of Replicates: 3
Autosampler Position: 258
Sample Description: 20
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73151.5	5.7				ug/L	76335	Standard
	Be	9	8.3	173.2	**0.0047**	0.013	283.5	ug/L	18	Standard
	Al	27	1224910.9	5.6	**10.2935**	0.542	5.3	ug/L	810	Standard
	Sc	45	17605.2	3.7				ug/L	22700	Standard
	Ti	47	26.3	30.9	**0.0073**	0.041	562.4	ug/L	25	Standard
	V	51	1390.2	1.1	**-0.0015**	0.009	600.4	ug/L	1541	Standard
	Cr	52	5641.4	2.9	**-0.2172**	0.019	8.8	ug/L	7881	Standard
	Cr	53	1113.4	2.5	**0.4184**	0.025	5.9	ug/L	932	Standard
	Mn	55	61611.5	4.6	**6.1492**	0.087	1.4	ug/L	1508	Standard
	Co	59	716.7	4.8	**0.0547**	0.004	7.9	ug/L	282	Standard
	Ni	60	366.7	8.7	**0.1640**	0.011	6.5	ug/L	91	Standard
	Cu	65	184.0	11.4	**0.0436**	0.014	31.4	ug/L	205	Standard
	Zn	66	4776.1	11.1	**5.1799**	0.687	13.3	ug/L	369	Standard
>	Ge	72	430337.2	3.7				ug/L	496734	Standard
	As	75	-0.6	1653.9	**0.0590**	0.010	17.1	ug/L	-45	Standard
	Se	82	27.7	12.2	**0.1234**	0.029	23.8	ug/L	18	Standard
	Se-1	77	96.7	8.4	**0.5263**	0.155	29.4	ug/L	83	Standard
>	Ga	71	18.3	41.7				mg/L	30	Standard
	Rb	85	401.7	3.1				ug/L	23	Standard
	Y	89	349107.8	3.6				ug/L	405333	Standard
>	Rh	103	30.0	16.7				ug/L	17	Standard
	Mo	98	41.1	17.0	**-0.0106**	0.002	19.2	ug/L	135	Standard
	Ag	107	93.0	12.1	**-0.0097**	0.002	16.8	ug/L	123	Standard
	Cd	111	20.3	29.7	**0.0002**	0.003	1116.6	mg/L	11	Standard
	Cd	114	42.1	14.1	**0.0010**	0.001	117.0	ug/L	56	Standard
>	In	115	677174.9	2.9				ug/L	634401	Standard
	Sn	118	47.7	12.3	**-0.0408**	0.005	11.4	ug/L	137	Standard
	Sb	123	120.5	36.9	**-0.0474**	0.007	15.2	ug/L	907	Standard
	Ba	135	1769.8	4.9	**0.5372**	0.013	2.4	ug/L	166	Standard
	Ce	140	595.0	4.4				ug/L	57	Standard
>	Tb	159	1239602.8	3.1				ug/L	1347540	Standard
	Ho	165	18.3	41.7				ug/L	23	Standard
	Tl	203	183.3	18.8	**0.0112**	0.003	24.2	ug/L	45	Standard
	Tl	205	433.3	30.7	**0.0137**	0.005	34.9	ug/L	112	Standard
	Pb	206	477.0	4.8	**-0.0003**	0.001	215.3	ug/L	825	Standard
	Pb	207	390.0	2.9	**0.0014**	0.000	28.9	ug/L	679	Standard
	Pb	208	1881.4	5.3	**-0.0001**	0.001	1510.1	ug/L	3166	Standard
	U	238	2744.6	3.7	**0.0860**	0.002	2.3	ug/L	119	Standard
>	Bi	209	659628.5	3.5				ug/L	668024	Standard

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	Na	23	3.3	86.6	**1.1773**	1.016	86.3	mg/L	0	Standard
	Mg	24	2985.3	1.6	**5.5601**	0.242	4.4	mg/L	48	Standard
	K	39	8.3	91.7	**-0.0178**	0.106	597.6	mg/L	8	Standard
	Ca	43	26.7	47.2	**0.4465**	5.189	1162.0	mg/L	27	Standard
	Fe	54	44.1	40.1	**-0.0700**	0.022	31.4	mg/L	121	Standard
	Fe	57	308.3	11.5	**0.2337**	0.205	87.6	mg/L	305	Standard
>	**Sc-1**	45	17605.2	3.7				mg/L	22700	Standard
	Cl	35	6.0	57.7				ug/L	3	Standard
	Kr	83	2.7	21.7				ug/L	5	Standard
	Br	81	3730.5	10.0				ug/L	1367	Standard
	P	31	40.0	33.1				ug/L	67	Standard
	S	34	65.0	40.7				ug/L	55	Standard
	Sr	88	135.0	12.8				ug/L	113	Standard
	C	12	373.3	29.5				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	25.2	64.9				mg/L	18	Standard
	Ho-1	165	18.3	41.7				mg/L	23	Standard
	Er	166	30.0	88.2				mg/L	40	Standard
	I	127	266789.8	8.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		95.829	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		86.633	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	106.742
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	98.743
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610051201
Sample Date/Time: Thursday, October 20, 2016 13:59:26
Number of Replicates: 3
Autosampler Position: 259
Sample Description: 20
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71883.8	5.8				ug/L	76335	Standard
	Be	9	8.3	124.9	**0.0048**	0.010	203.2	ug/L	18	Standard
	Al	27	1071486.9	7.0	**9.1494**	0.160	1.7	ug/L	810	Standard
	Sc	45	17348.3	5.5				ug/L	22700	Standard
	Ti	47	23.7	6.5	**-0.0056**	0.004	67.3	ug/L	25	Standard
	V	51	1157.2	3.2	**-0.0372**	0.003	7.5	ug/L	1541	Standard
	Cr	52	5960.8	3.6	**-0.1542**	0.011	7.0	ug/L	7881	Standard
	Cr	53	1635.1	5.3	**1.1386**	0.061	5.3	ug/L	932	Standard
	Mn	55	10064.3	4.0	**0.9424**	0.016	1.7	ug/L	1508	Standard
	Co	59	427.7	2.0	**0.0200**	0.003	12.5	ug/L	282	Standard
	Ni	60	218.0	5.6	**0.0815**	0.003	4.2	ug/L	91	Standard
	Cu	65	172.0	7.6	**0.0373**	0.006	15.0	ug/L	205	Standard
	Zn	66	2710.6	13.9	**2.8795**	0.409	14.2	ug/L	369	Standard
>	Ge	72	426851.7	4.1				ug/L	496734	Standard
	As	75	2.3	309.1	**0.0620**	0.008	13.2	ug/L	-45	Standard
	Se	82	31.3	10.3	**0.1686**	0.023	13.4	ug/L	18	Standard
	Se-1	77	109.0	14.3	**0.7562**	0.286	37.8	ug/L	83	Standard
>	Ga	71	25.0	34.6				mg/L	30	Standard
	Rb	85	460.0	3.8				ug/L	23	Standard
	Y	89	350058.8	5.5				ug/L	405333	Standard
>	Rh	103	11.7	99.0				ug/L	17	Standard
	Mo	98	37.9	20.3	**-0.0112**	0.002	15.4	ug/L	135	Standard
	Ag	107	91.3	5.6	**-0.0095**	0.001	7.2	ug/L	123	Standard
	Cd	111	7.3	7.8	**-0.0056**	0.000	5.1	mg/L	11	Standard
	Cd	114	32.1	49.7	**-0.0007**	0.003	374.6	ug/L	56	Standard
>	In	115	654107.2	5.3				ug/L	634401	Standard
	Sn	118	46.3	20.1	**-0.0406**	0.007	17.1	ug/L	137	Standard
	Sb	123	121.3	20.0	**-0.0465**	0.004	7.8	ug/L	907	Standard
	Ba	135	18349.1	4.9	**6.2259**	0.038	0.6	ug/L	166	Standard
	Ce	140	103.3	29.2				ug/L	57	Standard
>	Tb	159	1226273.6	4.8				ug/L	1347540	Standard
	Ho	165	21.7	26.6				ug/L	23	Standard
	Tl	203	216.3	11.7	**0.0147**	0.002	13.7	ug/L	45	Standard
	Tl	205	516.7	22.9	**0.0172**	0.004	22.8	ug/L	112	Standard
	Pb	206	462.3	4.5	**-0.0002**	0.000	183.1	ug/L	825	Standard
	Pb	207	391.7	9.8	**0.0033**	0.003	85.6	ug/L	679	Standard
	Pb	208	1811.4	6.8	**-0.0004**	0.001	349.3	ug/L	3166	Standard
	U	238	499.3	6.1	**0.0147**	0.001	6.5	ug/L	119	Standard
>	Bi	209	638195.7	4.6				ug/L	668024	Standard

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	Na	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
	Mg	24	5369.3	5.6	**10.2193**	0.289	2.8	mg/L	48	Standard
	K	39	3.3	86.6	**-0.0876**	0.039	44.5	mg/L	8	Standard
	Ca	43	15.0	57.7	**-4.3794**	4.129	94.3	mg/L	27	Standard
	Fe	54	54.3	42.1	**-0.0555**	0.027	49.0	mg/L	121	Standard
	Fe	57	243.3	9.7	**-0.0762**	0.055	71.9	mg/L	305	Standard
>	**Sc-1**	45	17348.3	5.5				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	4.0	50.0				ug/L	5	Standard
	Br	81	4584.0	5.2				ug/L	1367	Standard
	P	31	53.3	14.3				ug/L	67	Standard
	S	34	43.3	48.0				ug/L	55	Standard
	Sr	88	133.3	20.7				ug/L	113	Standard
	C	12	396.7	16.8				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	25.4	59.8				mg/L	18	Standard
	Ho-1	165	21.7	26.6				mg/L	23	Standard
	Er	166	26.7	43.3				mg/L	40	Standard
	I	127	63139.8	4.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		94.169	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		85.932	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	103.106
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	95.535
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 14:02:27
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	90114.2	4.5				ug/L	76335	Standard
	Be	9	58302.0	3.5	**44.8520**	2.324	5.2	ug/L	18	Standard
	Al	27	6280446.5	3.6	**42.8302**	0.843	2.0	ug/L	810	Standard
	Sc	45	20338.7	3.3				ug/L	22700	Standard
	Ti	47	19304.0	3.0	**95.4683**	1.216	1.3	ug/L	25	Standard
	V	51	347363.2	2.8	**49.1848**	0.524	1.1	ug/L	1541	Standard
	Cr	52	333359.6	2.3	**49.8206**	0.481	1.0	ug/L	7881	Standard
	Cr	53	41892.9	2.5	**49.3170**	0.755	1.5	ug/L	932	Standard
	Mn	55	546388.2	1.7	**49.2872**	0.487	1.0	ug/L	1508	Standard
	Co	59	458539.8	2.6	**49.7742**	0.746	1.5	ug/L	282	Standard
	Ni	60	99672.9	2.4	**50.0865**	0.737	1.5	ug/L	91	Standard
	Cu	65	96875.5	2.4	**49.6197**	0.926	1.9	ug/L	205	Standard
	Zn	66	51405.8	4.2	**51.2488**	1.588	3.1	ug/L	369	Standard
>	Ge	72	481968.5	1.7				ug/L	496734	Standard
	As	75	51308.9	2.1	**51.1708**	0.235	0.5	ug/L	-45	Standard
	Se	82	5110.9	2.3	**53.0175**	0.613	1.2	ug/L	18	Standard
	Se-1	77	3346.0	3.7	**50.6929**	1.180	2.3	ug/L	83	Standard
>	Ga	71	65.0	27.7				mg/L	30	Standard
	Rb	85	615.0	2.4				ug/L	23	Standard
	Y	89	417436.0	1.2				ug/L	405333	Standard
>	Rh	103	38.3	19.9				ug/L	17	Standard
	Mo	98	393338.1	3.1	**87.0114**	0.878	1.0	ug/L	135	Standard
	Ag	107	404787.4	3.2	**46.9559**	0.213	0.5	ug/L	123	Standard
	Cd	111	128973.5	4.4	**51.7646**	0.519	1.0	mg/L	11	Standard
	Cd	114	322980.1	3.4	**50.0863**	0.770	1.5	ug/L	56	Standard
>	In	115	782023.2	3.6				ug/L	634401	Standard
	Sn	118	76614.5	4.5	**50.8781**	0.817	1.6	ug/L	137	Standard
	Sb	123	333217.5	3.2	**51.1946**	0.202	0.4	ug/L	907	Standard
	Ba	135	159929.0	2.6	**45.6883**	0.590	1.3	ug/L	166	Standard
	Ce	140	293.3	24.5				ug/L	57	Standard
>	Tb	159	1396322.0	3.4				ug/L	1347540	Standard
	Ho	165	55.0	15.7				ug/L	23	Standard
	Tl	203	630115.9	2.4	**50.0070**	0.536	1.1	ug/L	45	Standard
	Tl	205	1477043.5	2.6	**48.5390**	1.464	3.0	ug/L	112	Standard
	Pb	206	475897.4	2.7	**50.2899**	1.068	2.1	ug/L	825	Standard
	Pb	207	417381.5	3.1	**50.1069**	0.922	1.8	ug/L	679	Standard
	Pb	208	1892560.8	2.4	**50.0007**	0.733	1.5	ug/L	3166	Standard
	U	238	1681409.3	1.6	**49.3055**	0.798	1.6	ug/L	119	Standard
>	Bi	209	719821.6	3.0				ug/L	668024	Standard

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⌈	**Na**	23	15.0	120.2	**4.5520**	5.570	122.4	mg/L	0	Standard
|	**Mg**	24	3433.7	6.0	**5.5266**	0.160	2.9	mg/L	48	Standard
|	**K**	39	356.7	14.0	**4.0167**	0.520	13.0	mg/L	8	Standard
|	**Ca**	43	43.3	56.9	**5.1512**	9.106	176.8	mg/L	27	Standard
|	**Fe**	54	4651.6	3.9	**5.3452**	0.076	1.4	mg/L	121	Standard
|	**Fe**	57	1515.1	2.5	**5.2270**	0.301	5.8	mg/L	305	Standard
⌊>	**Sc-1**	45	20338.7	3.3				mg/L	22700	Standard
	Cl	35	5.3	78.1				ug/L	3	Standard
	Kr	83	3.0	66.7				ug/L	5	Standard
	Br	81	1693.4	2.9				ug/L	1367	Standard
	P	31	90.0	9.6				ug/L	67	Standard
	S	34	91.7	19.2				ug/L	55	Standard
	Sr	88	145.0	31.0				ug/L	113	Standard
	C	12	436.7	11.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	31.9	47.5				mg/L	18	Standard
	Ho-1	165	55.0	15.7				mg/L	23	Standard
	Er	166	30.0	57.7				mg/L	40	Standard
	I	127	10380.3	12.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	89.704		
⌊	Al	27	85.660		
⌈	Sc	45			
|	Ti	47	95.468		
|	V	51	98.370		
|	Cr	52	99.641		
|	Cr	53			
|	Mn	55	98.574		
|	Co	59	99.548		
|	Ni	60	100.173		
|	Cu	65	99.239		
|	Zn	66	102.498		
|>	Ge	72		97.027	
|	As	75	102.342		
|	Se	82	106.035		
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85		
⌈	Y	89		
⌊>	Rh	103		
⌈	Mo	98	87.011	
|	Ag	107	93.912	
|	Cd	111	103.529	
|	Cd	114		
|>	In	115		123.269
|	Sn	118	101.756	
|	Sb	123	102.389	
⌊	Ba	135	91.377	
⌈	Ce	140		
⌊>	Tb	159		
⌈	Ho	165		
|	Tl	203	100.014	
|	Tl	205		
|	Pb	206		
|	Pb	207		
|	Pb	208	100.001	
|	U	238	98.611	
⌊>	Bi	209		107.754
⌈	Na	23		
|	Mg	24		
|	K	39		
|	Ca	43		
|	Fe	54		
|	Fe	57		
⌊>	Sc-1	45		
	Cl	35		
	Kr	83		
	Br	81		
	P	31		
	S	34		
	Sr	88		
	C	12		
	N	14		
	Hg	202		
	Dy	164		
	Ho-1	165		
	Er	166		
	I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 6	Be	9	
QC Std 6	Al	27	
QC Std 6	Mo	98	

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In 115 Int Std for QC Std	In	115	Rerun sample

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 14:05:27
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75536.2	2.7				ug/L	76335	Standard
	Be	9	15.0	0.0	**0.0108**	0.000	3.5	ug/L	18	Standard
	Al	27	1361.7	6.5	**0.0067**	0.000	6.4	ug/L	810	Standard
	Sc	45	18499.6	4.6				ug/L	22700	Standard
	Ti	47	18.0	24.2	**-0.0415**	0.024	58.7	ug/L	25	Standard
	V	51	1170.1	5.7	**-0.0433**	0.013	29.0	ug/L	1541	Standard
	Cr	52	5790.1	1.6	**-0.2275**	0.018	8.0	ug/L	7881	Standard
	Cr	53	821.7	8.9	**-0.0140**	0.107	762.6	ug/L	932	Standard
	Mn	55	2313.5	13.9	**0.1411**	0.029	20.9	ug/L	1508	Standard
	Co	59	275.0	11.7	**-0.0003**	0.003	1148.7	ug/L	282	Standard
	Ni	60	81.0	15.0	**0.0017**	0.007	382.7	ug/L	91	Standard
	Cu	65	165.7	1.3	**0.0294**	0.001	2.0	ug/L	205	Standard
	Zn	66	2188.2	15.5	**2.1776**	0.327	15.0	ug/L	369	Standard
>	Ge	72	446368.1	1.8				ug/L	496734	Standard
	As	75	-21.9	214.0	**0.0358**	0.051	142.4	ug/L	-45	Standard
	Se	82	28.4	37.3	**0.1208**	0.121	100.3	ug/L	18	Standard
	Se-1	77	82.7	9.8	**0.2303**	0.137	59.6	ug/L	83	Standard
>	Ga	71	26.7	71.0				mg/L	30	Standard
	Rb	85	15.0	57.7				ug/L	23	Standard
	Y	89	373860.0	1.2				ug/L	405333	Standard
>	Rh	103	16.7	34.6				ug/L	17	Standard
	Mo	98	187.9	18.2	**0.0246**	0.008	33.1	ug/L	135	Standard
	Ag	107	117.7	6.9	**-0.0071**	0.001	12.2	ug/L	123	Standard
	Cd	111	16.4	21.2	**-0.0019**	0.002	84.0	mg/L	11	Standard
	Cd	114	63.2	20.4	**0.0042**	0.002	52.5	ug/L	56	Standard
>	In	115	710131.7	1.4				ug/L	634401	Standard
	Sn	118	129.7	27.3	**0.0178**	0.027	153.3	ug/L	137	Standard
	Sb	123	865.7	51.8	**0.0786**	0.078	99.6	ug/L	907	Standard
	Ba	135	33.7	26.6	**-0.0364**	0.003	7.4	ug/L	166	Standard
	Ce	140	100.0	30.4				ug/L	57	Standard
>	Tb	159	1315133.1	2.7				ug/L	1347540	Standard
	Ho	165	21.7	70.5				ug/L	23	Standard
	Tl	203	50.3	1.1	**-0.0004**	0.000	14.7	ug/L	45	Standard
	Tl	205	121.7	33.2	**0.0024**	0.001	59.7	ug/L	112	Standard
	Pb	206	499.3	10.5	**0.0006**	0.006	969.3	ug/L	825	Standard
	Pb	207	420.3	10.3	**0.0038**	0.006	153.6	ug/L	679	Standard
	Pb	208	1939.4	7.2	**0.0000**	0.004	32961.9	ug/L	3166	Standard
	U	238	96.7	22.5	**0.0012**	0.001	57.1	ug/L	119	Standard
>	Bi	209	678996.9	0.7				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	46.7	27.0	**-0.0107**	0.027	250.3	mg/L	48	Standard
|	**K**	39	6.7	43.3	**-0.0458**	0.042	91.7	mg/L	8	Standard
|	**Ca**	43	31.7	24.1	**2.0662**	3.146	152.3	mg/L	27	Standard
|	**Fe**	54	87.7	34.8	**-0.0170**	0.035	206.5	mg/L	121	Standard
|	**Fe**	57	255.0	30.4	**-0.1029**	0.330	321.0	mg/L	305	Standard
⌊>	**Sc-1**	45	18499.6	4.6				mg/L	22700	Standard
	Cl	35	1.3	173.2				ug/L	3	Standard
	Kr	83	2.3	99.0				ug/L	5	Standard
	Br	81	1566.7	11.9				ug/L	1367	Standard
	P	31	63.3	12.1				ug/L	67	Standard
	S	34	73.3	7.9				ug/L	55	Standard
	Sr	88	130.0	25.2				ug/L	113	Standard
	C	12	326.7	15.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	173.2				mg/L	10	Standard
	Dy	164	25.9	59.3				mg/L	18	Standard
	Ho-1	165	21.7	70.5				mg/L	23	Standard
	Er	166	16.7	34.6				mg/L	40	Standard
	I	127	17773.9	14.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		89.861	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	111.937
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	101.643
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 8
Sample Date/Time: Thursday, October 20, 2016 14:08:27
Number of Replicates: 3
Autosampler Position: 202
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79328.9	3.0				ug/L	76335	Standard
	Be	9	245.0	18.4	**0.2117**	0.045	21.5	ug/L	18	Standard
	Al	27	1740.1	13.3	**0.0092**	0.002	23.5	ug/L	810	Standard
	Sc	45	19123.7	1.4				ug/L	22700	Standard
	Ti	47	17.7	45.4	**-0.0453**	0.042	93.1	ug/L	25	Standard
	V	51	3703.0	4.2	**0.3349**	0.033	9.8	ug/L	1541	Standard
	Cr	52	11282.9	1.1	**0.6437**	0.028	4.3	ug/L	7881	Standard
	Cr	53	1531.7	13.3	**0.8656**	0.217	25.1	ug/L	932	Standard
	Mn	55	8073.5	6.0	**0.6874**	0.031	4.5	ug/L	1508	Standard
	Co	59	3577.8	1.4	**0.3789**	0.003	0.9	ug/L	282	Standard
	Ni	60	2947.3	0.3	**1.5273**	0.027	1.8	ug/L	91	Standard
	Cu	65	1564.4	6.5	**0.7865**	0.038	4.8	ug/L	205	Standard
	Zn	66	8289.6	2.5	**8.5978**	0.094	1.1	ug/L	369	Standard
>	Ge	72	455285.3	2.0				ug/L	496734	Standard
	As	75	329.4	4.9	**0.4066**	0.010	2.5	ug/L	-45	Standard
	Se	82	51.2	8.3	**0.3655**	0.054	14.8	ug/L	18	Standard
	Se-1	77	115.3	13.4	**0.7361**	0.214	29.0	ug/L	83	Standard
>	Ga	71	25.0	52.9				mg/L	30	Standard
	Rb	85	13.3	21.7				ug/L	23	Standard
	Y	89	384466.5	2.1				ug/L	405333	Standard
>	Rh	103	10.0	50.0				ug/L	17	Standard
	Mo	98	116.0	20.5	**0.0071**	0.006	81.1	ug/L	135	Standard
	Ag	107	2818.9	1.8	**0.3379**	0.004	1.2	ug/L	123	Standard
	Cd	111	569.2	3.9	**0.2423**	0.005	2.1	mg/L	11	Standard
	Cd	114	1552.8	0.2	**0.2585**	0.006	2.1	ug/L	56	Standard
>	In	115	710639.6	2.0				ug/L	634401	Standard
	Sn	118	147.3	12.7	**0.0304**	0.013	44.0	ug/L	137	Standard
	Sb	123	3360.3	12.9	**0.5002**	0.074	14.9	ug/L	907	Standard
	Ba	135	2161.2	1.9	**0.6330**	0.006	1.0	ug/L	166	Standard
	Ce	140	81.7	15.4				ug/L	57	Standard
>	Tb	159	1317152.3	1.6				ug/L	1347540	Standard
	Ho	165	10.0	86.6				ug/L	23	Standard
	Tl	203	932.4	3.2	**0.0735**	0.001	1.9	ug/L	45	Standard
	Tl	205	2258.5	3.7	**0.0766**	0.004	4.8	ug/L	112	Standard
	Pb	206	2336.2	1.0	**0.2057**	0.005	2.6	ug/L	825	Standard
	Pb	207	1948.8	2.5	**0.1977**	0.004	2.2	ug/L	679	Standard
	Pb	208	9081.1	2.7	**0.1993**	0.004	2.1	ug/L	3166	Standard
	U	238	12215.6	1.7	**0.3766**	0.006	1.7	ug/L	119	Standard
>	Bi	209	681334.3	1.5				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	66.7	24.1	**0.0208**	0.029	138.3	mg/L	48	Standard
|	**K**	39	0.0		**-0.1325**	0.000	0.0	mg/L	8	Standard
|	**Ca**	43	21.7	81.0	**-2.3987**	7.195	300.0	mg/L	27	Standard
|	**Fe**	54	84.1	17.9	**-0.0243**	0.019	77.4	mg/L	121	Standard
|	**Fe**	57	283.3	12.0	**-0.0059**	0.150	2550.3	mg/L	305	Standard
⌊>	**Sc-1**	45	19123.7	1.4				mg/L	22700	Standard
	Cl	35	7.3	56.8				ug/L	3	Standard
	Kr	83	4.0	25.0				ug/L	5	Standard
	Br	81	1663.4	1.5				ug/L	1367	Standard
	P	31	96.7	10.8				ug/L	67	Standard
	S	34	78.3	13.3				ug/L	55	Standard
	Sr	88	126.7	22.4				ug/L	113	Standard
	C	12	390.0	25.3				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	173.2				mg/L	10	Standard
	Dy	164	29.0	59.7				mg/L	18	Standard
	Ho-1	165	10.0	86.6				mg/L	23	Standard
	Er	166	20.0	100.0				mg/L	40	Standard
	I	127	5844.5	5.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	105.853		
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51	83.722		
|	Cr	52	80.458		
|	Cr	53			
|	Mn	55	137.477		
|	Co	59	94.731		
|	Ni	60	95.456		
|	Cu	65	98.313		
|	Zn	66	137.565		
|>	Ge	72		91.656	
|	As	75	101.657		
|	Se	82	91.370		
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85		
	Y	89		
>	Rh	103		
	Mo	98		
	Ag	107	84.466	
	Cd	111	100.955	
	Cd	114		
>	In	115		112.017
	Sn	118		
	Sb	123	125.057	
	Ba	135	84.400	
	Ce	140		
>	Tb	159		
	Ho	165		
	Tl	203	91.916	
	Tl	205		
	Pb	206		
	Pb	207		
	Pb	208	99.658	
	U	238	94.143	
>	Bi	209		101.992
	Na	23		
	Mg	24		
	K	39		
	Ca	43		
	Fe	54		
	Fe	57		
>	Sc-1	45		
	Cl	35		
	Kr	83		
	Br	81		
	P	31		
	S	34		
	Sr	88		
	C	12		
	N	14		
	Hg	202		
	Dy	164		
	Ho-1	165		
	Er	166		
	I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 8	Mn	55	
QC Std 8	Zn	66	

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Method 6020 - Summary Report

Sample ID: L1610042001
Sample Date/Time: Thursday, October 20, 2016 14:18:13
Number of Replicates: 3
Autosampler Position: 305
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	66623.1	5.0				ug/L	76335	Standard
	Be	9	26.7	28.6	**0.0248**	0.008	31.9	ug/L	18	Standard
	Al	27	182704.0	3.1	**1.6829**	0.088	5.2	ug/L	810	Standard
	Sc	45	17568.5	4.0				ug/L	22700	Standard
	Ti	47	68.7	22.7	**0.2567**	0.086	33.5	ug/L	25	Standard
	V	51	3762.0	1.5	**0.3987**	0.017	4.3	ug/L	1541	Standard
	Cr	52	6351.7	2.5	**-0.0552**	0.018	32.0	ug/L	7881	Standard
	Cr	53	831.7	8.8	**0.0806**	0.107	133.2	ug/L	932	Standard
	Mn	55	95259.6	2.5	**9.9147**	0.169	1.7	ug/L	1508	Standard
	Co	59	2257.5	2.4	**0.2523**	0.003	1.4	ug/L	282	Standard
	Ni	60	1348.1	3.0	**0.7453**	0.014	1.8	ug/L	91	Standard
	Cu	65	1682.1	0.3	**0.9400**	0.016	1.7	ug/L	205	Standard
	Zn	66	39549.9	1.6	**45.7955**	0.233	0.5	ug/L	369	Standard
>	Ge	72	414853.6	1.3				ug/L	496734	Standard
	As	75	434.0	4.3	**0.5618**	0.022	4.0	ug/L	-45	Standard
	Se	82	20.8	22.3	**0.0531**	0.057	106.7	ug/L	18	Standard
	Se-1	77	76.3	6.2	**0.2206**	0.068	31.0	ug/L	83	Standard
>	Ga	71	320.0	8.3				mg/L	30	Standard
	Rb	85	2498.5	1.9				ug/L	23	Standard
	Y	89	339150.4	4.5				ug/L	405333	Standard
>	Rh	103	10.0	50.0				ug/L	17	Standard
	Mo	98	428.3	10.1	**0.1007**	0.010	10.3	ug/L	135	Standard
	Ag	107	129.7	5.1	**-0.0028**	0.001	24.5	ug/L	123	Standard
	Cd	111	651.1	2.6	**0.3276**	0.012	3.6	mg/L	11	Standard
	Cd	114	1588.5	1.4	**0.3107**	0.009	3.0	ug/L	56	Standard
>	In	115	607266.7	1.7				ug/L	634401	Standard
	Sn	118	60.3	9.1	**-0.0257**	0.005	21.3	ug/L	137	Standard
	Sb	123	563.2	17.3	**0.0431**	0.021	48.4	ug/L	907	Standard
	Ba	135	8062.5	4.5	**2.9205**	0.085	2.9	ug/L	166	Standard
	Ce	140	22470.0	1.7				ug/L	57	Standard
>	Tb	159	1165479.3	1.0				ug/L	1347540	Standard
	Ho	165	561.7	8.6				ug/L	23	Standard
	Tl	203	158.3	9.1	**0.0097**	0.002	16.0	ug/L	45	Standard
	Tl	205	360.0	3.7	**0.0117**	0.001	5.1	ug/L	112	Standard
	Pb	206	16472.3	2.6	**1.9339**	0.015	0.8	ug/L	825	Standard
	Pb	207	13284.8	3.0	**1.7729**	0.037	2.1	ug/L	679	Standard
	Pb	208	62885.6	2.6	**1.8443**	0.013	0.7	ug/L	3166	Standard
	U	238	1994.1	3.7	**0.0650**	0.002	2.9	ug/L	119	Standard
>	Bi	209	630388.6	1.9				ug/L	668024	Standard

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⌈	**Na**	23	5.0	100.0	**1.7075**	1.659	97.2	mg/L	0	Standard
|	**Mg**	24	51.7	29.6	**0.0022**	0.028	1264.9	mg/L	48	Standard
|	**K**	39	6.7	43.3	**-0.0424**	0.040	93.3	mg/L	8	Standard
|	**Ca**	43	30.0	72.6	**2.2791**	9.984	438.1	mg/L	27	Standard
|	**Fe**	54	440.9	7.9	**0.4712**	0.040	8.6	mg/L	121	Standard
|	**Fe**	57	406.7	11.9	**0.7302**	0.302	41.3	mg/L	305	Standard
⌊>	**Sc-1**	45	17568.5	4.0				mg/L	22700	Standard
	Cl	35	3.3	124.9				ug/L	3	Standard
	Kr	83	2.7	21.7				ug/L	5	Standard
	Br	81	1176.7	5.1				ug/L	1367	Standard
	P	31	45.0	33.3				ug/L	67	Standard
	S	34	61.7	23.4				ug/L	55	Standard
	Sr	88	125.0	10.6				ug/L	113	Standard
	C	12	273.3	20.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	859.4	9.2				mg/L	18	Standard
	Ho-1	165	561.7	8.6				mg/L	23	Standard
	Er	166	430.0	2.3				mg/L	40	Standard
	I	127	6873.2	6.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		87.277	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		83.516	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
> Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
> In	115	95.723
Sn	118	
Sb	123	
Ba	135	
Ce	140	
> Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
> Bi	209	94.366
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
> Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610042001PS WG588224-01
Sample Date/Time: Thursday, October 20, 2016 14:21:12
Number of Replicates: 3
Autosampler Position: 306
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	66142.6	4.3				ug/L	76335	Standard
	Be	9	54697.0	4.4	**57.2610**	0.413	0.7	ug/L	18	Standard
	Al	27	206431.1	5.4	**1.9126**	0.033	1.7	ug/L	810	Standard
	Sc	45	16637.5	5.7				ug/L	22700	Standard
	Ti	47	70.0	9.9	**0.2713**	0.053	19.5	ug/L	25	Standard
	V	51	319334.9	4.9	**53.2163**	0.810	1.5	ug/L	1541	Standard
	Cr	52	305831.1	4.3	**53.8716**	0.504	0.9	ug/L	7881	Standard
	Cr	53	39207.3	2.3	**54.4397**	0.689	1.3	ug/L	932	Standard
	Mn	55	614602.5	3.4	**65.2664**	0.430	0.7	ug/L	1508	Standard
	Co	59	433575.2	3.8	**55.3886**	0.746	1.3	ug/L	282	Standard
	Ni	60	95406.4	4.2	**56.4149**	0.422	0.7	ug/L	91	Standard
	Cu	65	98046.9	4.0	**59.1016**	0.644	1.1	ug/L	205	Standard
	Zn	66	100943.6	1.9	**118.7428**	2.989	2.5	ug/L	369	Standard
>	Ge	72	409566.9	3.4				ug/L	496734	Standard
	As	75	55019.6	3.2	**64.5607**	0.238	0.4	ug/L	-45	Standard
	Se	82	5844.9	3.7	**71.4160**	0.247	0.3	ug/L	18	Standard
	Se-1	77	3916.8	1.9	**70.3038**	1.060	1.5	ug/L	83	Standard
>	Ga	71	361.7	10.7				mg/L	30	Standard
	Rb	85	3038.6	0.6				ug/L	23	Standard
	Y	89	343122.7	3.3				ug/L	405333	Standard
>	Rh	103	33.3	22.9				ug/L	17	Standard
	Mo	98	506.0	10.8	**0.1251**	0.022	17.4	ug/L	135	Standard
	Ag	107	384771.2	1.3	**58.1526**	2.198	3.8	ug/L	123	Standard
	Cd	111	124152.8	2.5	**64.9151**	1.868	2.9	mg/L	11	Standard
	Cd	114	317119.7	4.1	**64.0344**	2.337	3.6	ug/L	56	Standard
>	In	115	600779.7	3.9				ug/L	634401	Standard
	Sn	118	55.0	11.1	**-0.0298**	0.004	14.9	ug/L	137	Standard
	Sb	123	275531.4	3.2	**55.2040**	3.931	7.1	ug/L	907	Standard
	Ba	135	159976.6	2.9	**59.5338**	2.386	4.0	ug/L	166	Standard
	Ce	140	25528.2	2.7				ug/L	57	Standard
>	Tb	159	1143028.2	4.0				ug/L	1347540	Standard
	Ho	165	626.7	6.0				ug/L	23	Standard
	Tl	203	592842.3	2.1	**55.3285**	1.127	2.0	ug/L	45	Standard
	Tl	205	1382013.2	2.9	**53.3870**	0.928	1.7	ug/L	112	Standard
	Pb	206	472171.9	2.2	**58.6860**	1.470	2.5	ug/L	825	Standard
	Pb	207	415170.4	3.1	**58.6090**	0.775	1.3	ug/L	679	Standard
	Pb	208	1888378.8	2.8	**58.6658**	0.834	1.4	ug/L	3166	Standard
	U	238	1557796.9	1.7	**53.7188**	1.427	2.7	ug/L	119	Standard
>	Bi	209	612264.0	3.5				ug/L	668024	Standard

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⌈	**Na**	23	11.7	99.0	**4.2241**	4.111	97.3	mg/L	0	Standard
|	**Mg**	24	55.0	24.1	**0.0154**	0.030	197.0	mg/L	48	Standard
|	**K**	39	11.7	65.5	**0.0315**	0.105	332.4	mg/L	8	Standard
|	**Ca**	43	38.3	27.2	**6.5399**	3.976	60.8	mg/L	27	Standard
|	**Fe**	54	544.0	8.6	**0.6575**	0.115	17.5	mg/L	121	Standard
|	**Fe**	57	436.7	1.7	**1.0009**	0.140	14.0	mg/L	305	Standard
⌊>	**Sc-1**	45	16637.5	5.7				mg/L	22700	Standard
	Cl	35	0.7	173.2				ug/L	3	Standard
	Kr	83	2.0	50.0				ug/L	5	Standard
	Br	81	1240.1	14.0				ug/L	1367	Standard
	P	31	38.3	32.8				ug/L	67	Standard
	S	34	85.0	15.6				ug/L	55	Standard
	Sr	88	153.3	29.2				ug/L	113	Standard
	C	12	383.3	25.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	919.5	11.8				mg/L	18	Standard
	Ho-1	165	626.7	6.0				mg/L	23	Standard
	Er	166	636.7	9.2				mg/L	40	Standard
	I	127	7323.4	3.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		86.647	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		82.452	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	94.700
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	91.653
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Zn 66 Upper, S, EEE	Zn	66	

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Method 6020 - Summary Report

Sample ID: L1610042001SDL WG588224-02
Sample Date/Time: Thursday, October 20, 2016 14:24:11
Number of Replicates: 3
Autosampler Position: 307
Sample Description: 500
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	66979.5	3.6				ug/L	76335	Standard
	Be	9	8.3	34.6	**0.0056**	0.003	50.0	ug/L	18	Standard
	Al	27	36856.5	2.7	**0.3338**	0.008	2.3	ug/L	810	Standard
	Sc	45	17823.8	4.0				ug/L	22700	Standard
	Ti	47	28.0	14.3	**0.0223**	0.023	105.3	ug/L	25	Standard
	V	51	1563.6	1.4	**0.0337**	0.004	11.9	ug/L	1541	Standard
	Cr	52	4942.5	1.5	**-0.3108**	0.023	7.2	ug/L	7881	Standard
	Cr	53	711.7	3.2	**-0.0937**	0.022	23.1	ug/L	932	Standard
	Mn	55	20919.8	1.2	**2.0988**	0.056	2.7	ug/L	1508	Standard
	Co	59	701.3	4.2	**0.0554**	0.002	4.5	ug/L	282	Standard
	Ni	60	330.0	5.8	**0.1493**	0.009	6.1	ug/L	91	Standard
	Cu	65	410.3	3.9	**0.1808**	0.011	6.1	ug/L	205	Standard
	Zn	66	10022.0	0.2	**11.3988**	0.133	1.2	ug/L	369	Standard
>	Ge	72	417375.9	1.4				ug/L	496734	Standard
	As	75	60.5	68.9	**0.1289**	0.048	37.3	ug/L	-45	Standard
	Se	82	19.6	32.8	**0.0369**	0.076	204.9	ug/L	18	Standard
	Se-1	77	76.3	22.3	**0.2147**	0.318	148.1	ug/L	83	Standard
>	Ga	71	61.7	20.4				mg/L	30	Standard
	Rb	85	500.0	9.2				ug/L	23	Standard
	Y	89	343931.8	2.8				ug/L	405333	Standard
>	Rh	103	26.7	10.8				ug/L	17	Standard
	Mo	98	84.3	18.4	**0.0021**	0.004	192.8	ug/L	135	Standard
	Ag	107	143.3	5.8	**-0.0014**	0.001	64.0	ug/L	123	Standard
	Cd	111	140.2	6.2	**0.0612**	0.003	4.8	mg/L	11	Standard
	Cd	114	392.3	7.4	**0.0695**	0.007	10.0	ug/L	56	Standard
>	In	115	625845.3	2.3				ug/L	634401	Standard
	Sn	118	40.0	2.5	**-0.0441**	0.002	3.6	ug/L	137	Standard
	Sb	123	2371.0	37.8	**0.3884**	0.175	45.0	ug/L	907	Standard
	Ba	135	1749.1	1.0	**0.5782**	0.018	3.2	ug/L	166	Standard
	Ce	140	3473.7	11.0				ug/L	57	Standard
>	Tb	159	1198105.2	0.2				ug/L	1347540	Standard
	Ho	165	96.7	26.5				ug/L	23	Standard
	Tl	203	157.0	15.9	**0.0096**	0.002	24.9	ug/L	45	Standard
	Tl	205	398.3	8.5	**0.0131**	0.001	11.3	ug/L	112	Standard
	Pb	206	3159.7	5.6	**0.3259**	0.017	5.3	ug/L	825	Standard
	Pb	207	2490.9	7.1	**0.2916**	0.019	6.6	ug/L	679	Standard
	Pb	208	11908.2	6.6	**0.3048**	0.018	6.1	ug/L	3166	Standard
	U	238	446.0	6.4	**0.0131**	0.001	5.6	ug/L	119	Standard
>	Bi	209	630771.1	1.4				ug/L	668024	Standard

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⌈	**Na**	23	8.3	34.6	**2.8230**	0.905	32.1	mg/L	0	Standard
|	**Mg**	24	38.3	7.5	**-0.0236**	0.008	33.5	mg/L	48	Standard
|	**K**	39	10.0	86.6	**-0.0022**	0.113	5179.0	mg/L	8	Standard
|	**Ca**	43	26.7	21.7	**0.3930**	2.591	659.2	mg/L	27	Standard
|	**Fe**	54	74.4	41.9	**-0.0303**	0.038	126.2	mg/L	121	Standard
|	**Fe**	57	295.0	6.1	**0.1489**	0.122	82.2	mg/L	305	Standard
⌊>	**Sc-1**	45	17823.8	4.0				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	4.3	35.3				ug/L	5	Standard
	Br	81	1336.7	5.3				ug/L	1367	Standard
	P	31	40.0	45.1				ug/L	67	Standard
	S	34	86.7	26.0				ug/L	55	Standard
	Sr	88	120.0	11.0				ug/L	113	Standard
	C	12	256.7	11.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	108.2	20.5				mg/L	18	Standard
	Ho-1	165	96.7	26.5				mg/L	23	Standard
	Er	166	106.7	23.6				mg/L	40	Standard
	I	127	6046.2	5.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		87.744	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		84.024	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	98.651
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	94.423
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610042002
Sample Date/Time: Thursday, October 20, 2016 14:27:11
Number of Replicates: 3
Autosampler Position: 308
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	67843.5	5.2				ug/L	76335	Standard
	Be	9	28.3	83.4	**0.0253**	0.022	87.9	ug/L	18	Standard
	Al	27	138709.3	3.9	**1.2525**	0.031	2.5	ug/L	810	Standard
	Sc	45	17720.4	4.2				ug/L	22700	Standard
	Ti	47	58.0	9.1	**0.1898**	0.038	20.3	ug/L	25	Standard
	V	51	4022.5	4.2	**0.4280**	0.012	2.9	ug/L	1541	Standard
	Cr	52	6516.4	1.6	**-0.0491**	0.014	28.2	ug/L	7881	Standard
	Cr	53	910.0	6.3	**0.1631**	0.047	29.0	ug/L	932	Standard
	Mn	55	80161.2	2.3	**8.1605**	0.038	0.5	ug/L	1508	Standard
	Co	59	2107.5	4.6	**0.2280**	0.007	3.1	ug/L	282	Standard
	Ni	60	1213.7	4.5	**0.6523**	0.012	1.9	ug/L	91	Standard
	Cu	65	1442.7	3.8	**0.7797**	0.008	1.1	ug/L	205	Standard
	Zn	66	32072.3	3.8	**36.3410**	0.394	1.1	ug/L	369	Standard
>	Ge	72	423439.4	2.8				ug/L	496734	Standard
	As	75	307.9	6.4	**0.4085**	0.021	5.1	ug/L	-45	Standard
	Se	82	19.9	28.9	**0.0355**	0.061	171.4	ug/L	18	Standard
	Se-1	77	81.0	6.9	**0.2748**	0.065	23.7	ug/L	83	Standard
>	Ga	71	293.3	13.0				mg/L	30	Standard
	Rb	85	2790.3	3.4				ug/L	23	Standard
	Y	89	346712.4	3.8				ug/L	405333	Standard
>	Rh	103	13.3	21.7				ug/L	17	Standard
	Mo	98	391.4	17.3	**0.0875**	0.021	24.3	ug/L	135	Standard
	Ag	107	125.3	3.0	**-0.0039**	0.001	19.6	ug/L	123	Standard
	Cd	111	591.5	0.8	**0.2884**	0.015	5.1	mg/L	11	Standard
	Cd	114	1474.1	3.8	**0.2795**	0.008	2.7	ug/L	56	Standard
>	In	115	625285.4	4.9				ug/L	634401	Standard
	Sn	118	38.0	9.1	**-0.0458**	0.002	5.2	ug/L	137	Standard
	Sb	123	746.6	37.0	**0.0747**	0.053	71.0	ug/L	907	Standard
	Ba	135	8290.6	4.4	**2.9179**	0.018	0.6	ug/L	166	Standard
	Ce	140	22428.3	6.0				ug/L	57	Standard
>	Tb	159	1214384.6	1.9				ug/L	1347540	Standard
	Ho	165	526.7	16.0				ug/L	23	Standard
	Tl	203	193.7	6.1	**0.0127**	0.001	4.7	ug/L	45	Standard
	Tl	205	541.7	4.2	**0.0182**	0.001	5.4	ug/L	112	Standard
	Pb	206	13538.7	4.0	**1.5561**	0.024	1.6	ug/L	825	Standard
	Pb	207	10830.2	1.9	**1.4153**	0.014	1.0	ug/L	679	Standard
	Pb	208	51215.4	2.7	**1.4701**	0.001	0.1	ug/L	3166	Standard
	U	238	2131.1	1.3	**0.0686**	0.001	2.2	ug/L	119	Standard
>	Bi	209	639498.2	2.8				ug/L	668024	Standard

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	Na	23	1.7	173.2	**0.5701**	0.979	171.7	mg/L	0	Standard
	Mg	24	51.7	14.8	**0.0016**	0.013	807.8	mg/L	48	Standard
	K	39	3.3	86.6	**-0.0889**	0.038	42.4	mg/L	8	Standard
	Ca	43	31.7	32.9	**2.6553**	4.545	171.2	mg/L	27	Standard
	Fe	54	519.2	3.0	**0.5721**	0.010	1.8	mg/L	121	Standard
	Fe	57	403.3	6.8	**0.6920**	0.141	20.4	mg/L	305	Standard
>	**Sc-1**	45	17720.4	4.2				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	2.7	43.3				ug/L	5	Standard
	Br	81	1246.7	5.2				ug/L	1367	Standard
	P	31	55.0	24.1				ug/L	67	Standard
	S	34	88.3	8.6				ug/L	55	Standard
	Sr	88	138.3	15.0				ug/L	113	Standard
	C	12	326.7	23.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	958.1	11.1				mg/L	18	Standard
	Ho-1	165	526.7	16.0				mg/L	23	Standard
	Er	166	526.7	4.0				mg/L	40	Standard
	I	127	6271.3	2.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		88.876	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		85.245	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	98.563
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	95.730
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610042003
Sample Date/Time: Thursday, October 20, 2016 14:30:10
Number of Replicates: 3
Autosampler Position: 309
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	70058.6	5.9				ug/L	76335	Standard
	Be	9	13.3	78.1	**0.0098**	0.009	95.9	ug/L	18	Standard
	Al	27	171909.5	4.7	**1.5041**	0.032	2.1	ug/L	810	Standard
	Sc	45	18374.5	3.1				ug/L	22700	Standard
	Ti	47	71.7	8.4	**0.2608**	0.037	14.0	ug/L	25	Standard
	V	51	4152.0	3.6	**0.4396**	0.006	1.4	ug/L	1541	Standard
	Cr	52	6831.2	2.4	**-0.0111**	0.020	178.3	ug/L	7881	Standard
	Cr	53	850.0	3.7	**0.0664**	0.069	103.6	ug/L	932	Standard
	Mn	55	92260.0	4.3	**9.2674**	0.117	1.3	ug/L	1508	Standard
	Co	59	2239.8	6.3	**0.2403**	0.007	2.9	ug/L	282	Standard
	Ni	60	1362.1	3.0	**0.7265**	0.011	1.6	ug/L	91	Standard
	Cu	65	1759.1	5.5	**0.9494**	0.018	1.9	ug/L	205	Standard
	Zn	66	38309.1	3.8	**42.8304**	0.744	1.7	ug/L	369	Standard
>	Ge	72	429624.6	4.0				ug/L	496734	Standard
	As	75	571.1	6.2	**0.6974**	0.022	3.2	ug/L	-45	Standard
	Se	82	20.0	18.8	**0.0342**	0.035	103.6	ug/L	18	Standard
	Se-1	77	80.3	4.4	**0.2451**	0.083	34.0	ug/L	83	Standard
>	Ga	71	341.7	17.5				mg/L	30	Standard
	Rb	85	3012.0	9.3				ug/L	23	Standard
	Y	89	353679.5	4.0				ug/L	405333	Standard
>	Rh	103	13.3	21.7				ug/L	17	Standard
	Mo	98	424.2	5.4	**0.0959**	0.007	7.6	ug/L	135	Standard
	Ag	107	125.7	5.9	**-0.0039**	0.002	51.1	ug/L	123	Standard
	Cd	111	692.5	0.9	**0.3379**	0.015	4.5	mg/L	11	Standard
	Cd	114	1745.8	10.8	**0.3305**	0.025	7.4	ug/L	56	Standard
>	In	115	627352.7	4.9				ug/L	634401	Standard
	Sn	118	36.7	18.2	**-0.0471**	0.004	9.2	ug/L	137	Standard
	Sb	123	460.2	40.5	**0.0197**	0.035	177.7	ug/L	907	Standard
	Ba	135	9061.7	4.6	**3.1828**	0.018	0.6	ug/L	166	Standard
	Ce	140	23234.5	2.6				ug/L	57	Standard
>	Tb	159	1203389.7	5.0				ug/L	1347540	Standard
	Ho	165	600.0	7.3				ug/L	23	Standard
	Tl	203	194.3	10.4	**0.0128**	0.002	17.4	ug/L	45	Standard
	Tl	205	465.0	2.8	**0.0153**	0.001	4.1	ug/L	112	Standard
	Pb	206	16612.4	3.3	**1.9201**	0.019	1.0	ug/L	825	Standard
	Pb	207	13396.3	2.4	**1.7605**	0.033	1.9	ug/L	679	Standard
	Pb	208	62999.9	3.2	**1.8186**	0.010	0.6	ug/L	3166	Standard
	U	238	2242.5	4.2	**0.0721**	0.001	1.4	ug/L	119	Standard
>	Bi	209	640231.3	3.1				ug/L	668024	Standard

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⌈	**Na**	23	6.7	114.6	**2.1575**	2.438	113.0	mg/L	0	Standard
|	**Mg**	24	53.3	28.6	**0.0016**	0.030	1836.3	mg/L	48	Standard
|	**K**	39	15.0	33.3	**0.0603**	0.060	100.3	mg/L	8	Standard
|	**Ca**	43	36.7	20.8	**4.2230**	2.858	67.7	mg/L	27	Standard
|	**Fe**	54	517.7	13.8	**0.5436**	0.074	13.6	mg/L	121	Standard
|	**Fe**	57	473.3	6.8	**0.9521**	0.101	10.6	mg/L	305	Standard
⌊>	**Sc-1**	45	18374.5	3.1				mg/L	22700	Standard
	Cl	35	2.7	43.3				ug/L	3	Standard
	Kr	83	3.0	100.0				ug/L	5	Standard
	Br	81	1480.1	9.4				ug/L	1367	Standard
	P	31	28.3	53.9				ug/L	67	Standard
	S	34	80.0	28.6				ug/L	55	Standard
	Sr	88	161.7	6.4				ug/L	113	Standard
	C	12	270.0	28.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	1020.3	2.7				mg/L	18	Standard
	Ho-1	165	600.0	7.3				mg/L	23	Standard
	Er	166	620.0	4.8				mg/L	40	Standard
	I	127	6299.6	5.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		91.778	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		86.490	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	98.889
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	95.839
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610042006
Sample Date/Time: Thursday, October 20, 2016 14:33:10
Number of Replicates: 3
Autosampler Position: 310
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68477.9	3.6				ug/L	76335	Standard
	Be	9	25.0	34.6	**0.0223**	0.009	39.2	ug/L	18	Standard
	Al	27	202478.8	6.0	**1.8112**	0.046	2.5	ug/L	810	Standard
	Sc	45	17967.3	3.8				ug/L	22700	Standard
	Ti	47	68.0	17.3	**0.2326**	0.073	31.5	ug/L	25	Standard
	V	51	4131.2	4.3	**0.4208**	0.009	2.1	ug/L	1541	Standard
	Cr	52	6563.1	2.5	**-0.0835**	0.005	6.1	ug/L	7881	Standard
	Cr	53	910.0	5.8	**0.1173**	0.048	40.8	ug/L	932	Standard
	Mn	55	115474.6	4.4	**11.3485**	0.228	2.0	ug/L	1508	Standard
	Co	59	2358.5	3.0	**0.2483**	0.005	2.1	ug/L	282	Standard
	Ni	60	1345.4	5.9	**0.6989**	0.024	3.4	ug/L	91	Standard
	Cu	65	1622.4	5.7	**0.8492**	0.032	3.7	ug/L	205	Standard
	Zn	66	35069.9	2.5	**38.2824**	0.194	0.5	ug/L	369	Standard
>	Ge	72	439767.5	3.0				ug/L	496734	Standard
	As	75	385.8	7.2	**0.4813**	0.041	8.5	ug/L	-45	Standard
	Se	82	21.6	20.2	**0.0468**	0.045	97.0	ug/L	18	Standard
	Se-1	77	73.3	3.9	**0.0927**	0.048	51.9	ug/L	83	Standard
>	Ga	71	286.7	9.6				mg/L	30	Standard
	Rb	85	2780.3	5.6				ug/L	23	Standard
	Y	89	361497.5	3.9				ug/L	405333	Standard
>	Rh	103	5.0	173.2				ug/L	17	Standard
	Mo	98	403.7	12.2	**0.0857**	0.012	14.3	ug/L	135	Standard
	Ag	107	118.7	3.4	**-0.0057**	0.001	10.4	ug/L	123	Standard
	Cd	111	628.8	2.5	**0.2930**	0.004	1.3	mg/L	11	Standard
	Cd	114	1545.3	8.7	**0.2801**	0.022	7.9	ug/L	56	Standard
>	In	115	653450.9	1.9				ug/L	634401	Standard
	Sn	118	55.7	19.7	**-0.0331**	0.009	26.6	ug/L	137	Standard
	Sb	123	352.6	36.9	**-0.0036**	0.025	690.6	ug/L	907	Standard
	Ba	135	9008.3	4.4	**3.0343**	0.078	2.6	ug/L	166	Standard
	Ce	140	22561.8	4.9				ug/L	57	Standard
>	Tb	159	1238360.5	2.6				ug/L	1347540	Standard
	Ho	165	543.3	4.3				ug/L	23	Standard
	Tl	203	181.0	2.0	**0.0112**	0.000	2.5	ug/L	45	Standard
	Tl	205	430.0	8.1	**0.0137**	0.001	6.7	ug/L	112	Standard
	Pb	206	36243.7	3.4	**4.1736**	0.014	0.3	ug/L	825	Standard
	Pb	207	29942.3	4.0	**3.9188**	0.029	0.7	ug/L	679	Standard
	Pb	208	139922.4	3.8	**4.0270**	0.002	0.1	ug/L	3166	Standard
	U	238	1782.8	3.5	**0.0559**	0.002	3.2	ug/L	119	Standard
>	Bi	209	652551.7	3.8				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5478**	0.940	171.6	mg/L	0	Standard
|	**Mg**	24	48.3	15.8	**-0.0061**	0.011	179.8	mg/L	48	Standard
|	**K**	39	16.7	96.4	**0.0881**	0.212	240.1	mg/L	8	Standard
|	**Ca**	43	31.7	32.9	**2.4379**	4.391	180.1	mg/L	27	Standard
|	**Fe**	54	544.4	9.3	**0.5982**	0.094	15.8	mg/L	121	Standard
|	**Fe**	57	408.3	1.9	**0.6891**	0.074	10.7	mg/L	305	Standard
⌊>	**Sc-1**	45	17967.3	3.8				mg/L	22700	Standard
	Cl	35	2.7	43.3				ug/L	3	Standard
	Kr	83	4.7	53.9				ug/L	5	Standard
	Br	81	1456.7	9.5				ug/L	1367	Standard
	P	31	33.3	56.8				ug/L	67	Standard
	S	34	68.3	4.2				ug/L	55	Standard
	Sr	88	136.7	8.4				ug/L	113	Standard
	C	12	320.0	21.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	16.7	69.3				mg/L	10	Standard
	Dy	164	844.8	9.4				mg/L	18	Standard
	Ho-1	165	543.3	4.3				mg/L	23	Standard
	Er	166	456.7	8.3				mg/L	40	Standard
	I	127	6041.2	1.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		89.707	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		88.532	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	103.003
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	97.684
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610042010
Sample Date/Time: Thursday, October 20, 2016 14:36:09
Number of Replicates: 3
Autosampler Position: 311
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68155.2	7.6				ug/L	76335	Standard
	Be	9	33.3	37.7	**0.0304**	0.011	35.5	ug/L	18	Standard
	Al	27	103058.2	5.1	**0.9260**	0.031	3.3	ug/L	810	Standard
	Sc	45	18160.9	6.0				ug/L	22700	Standard
	Ti	47	603.7	2.7	**3.2576**	0.099	3.0	ug/L	25	Standard
	V	51	5970.4	6.8	**0.7409**	0.058	7.9	ug/L	1541	Standard
	Cr	52	9158.8	4.9	**0.4061**	0.041	10.2	ug/L	7881	Standard
	Cr	53	1166.7	0.9	**0.5121**	0.055	10.7	ug/L	932	Standard
	Mn	55	137958.1	4.6	**14.0608**	0.233	1.7	ug/L	1508	Standard
	Co	59	1409.7	6.3	**0.1412**	0.005	3.8	ug/L	282	Standard
	Ni	60	1014.7	6.5	**0.5366**	0.020	3.8	ug/L	91	Standard
	Cu	65	6900.2	5.2	**3.9528**	0.081	2.1	ug/L	205	Standard
	Zn	66	25395.6	4.1	**28.6576**	0.260	0.9	ug/L	369	Standard
>	Ge	72	424605.8	3.2				ug/L	496734	Standard
	As	75	599.3	3.1	**0.7373**	0.022	3.0	ug/L	-45	Standard
	Se	82	19.3	35.5	**0.0275**	0.075	271.7	ug/L	18	Standard
	Se-1	77	74.7	15.6	**0.1624**	0.224	137.9	ug/L	83	Standard
>	Ga	71	308.3	6.1				mg/L	30	Standard
	Rb	85	1908.5	1.3				ug/L	23	Standard
	Y	89	355428.4	2.1				ug/L	405333	Standard
>	Rh	103	13.3	78.1				ug/L	17	Standard
	Mo	98	417.2	8.3	**0.0945**	0.010	10.7	ug/L	135	Standard
	Ag	107	144.0	14.6	**-0.0012**	0.003	208.8	ug/L	123	Standard
	Cd	111	483.5	11.3	**0.2338**	0.024	10.4	mg/L	11	Standard
	Cd	114	1222.0	13.3	**0.2305**	0.028	12.1	ug/L	56	Standard
>	In	115	624263.9	2.6				ug/L	634401	Standard
	Sn	118	177.3	14.6	**0.0704**	0.022	30.7	ug/L	137	Standard
	Sb	123	432.5	23.3	**0.0149**	0.021	140.1	ug/L	907	Standard
	Ba	135	11083.4	4.0	**3.9216**	0.070	1.8	ug/L	166	Standard
	Ce	140	26027.4	4.4				ug/L	57	Standard
>	Tb	159	1200722.1	1.9				ug/L	1347540	Standard
	Ho	165	1115.0	7.8				ug/L	23	Standard
	Tl	203	116.7	12.9	**0.0059**	0.001	19.2	ug/L	45	Standard
	Tl	205	271.7	11.1	**0.0083**	0.002	18.4	ug/L	112	Standard
	Pb	206	36677.0	3.3	**4.3536**	0.064	1.5	ug/L	825	Standard
	Pb	207	29707.5	4.7	**4.0056**	0.025	0.6	ug/L	679	Standard
	Pb	208	140050.1	4.2	**4.1538**	0.060	1.4	ug/L	3166	Standard
	U	238	14134.9	4.8	**0.4690**	0.006	1.2	ug/L	119	Standard
>	Bi	209	633510.7	4.1				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**1.1436**	0.990	86.6	mg/L	0	Standard
|	**Mg**	24	66.7	18.9	**0.0264**	0.018	68.0	mg/L	48	Standard
|	**K**	39	15.0	33.3	**0.0613**	0.056	91.0	mg/L	8	Standard
|	**Ca**	43	41.7	13.9	**6.5253**	1.458	22.3	mg/L	27	Standard
|	**Fe**	54	524.3	13.2	**0.5595**	0.052	9.2	mg/L	121	Standard
|	**Fe**	57	426.7	9.4	**0.7667**	0.314	41.0	mg/L	305	Standard
⌊>	**Sc-1**	45	18160.9	6.0				mg/L	22700	Standard
	Cl	35	3.3	69.3				ug/L	3	Standard
	Kr	83	2.0	86.6				ug/L	5	Standard
	Br	81	1460.1	3.8				ug/L	1367	Standard
	P	31	43.3	63.5				ug/L	67	Standard
	S	34	61.7	40.8				ug/L	55	Standard
	Sr	88	126.7	30.1				ug/L	113	Standard
	C	12	240.0	15.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	30.0	57.7				mg/L	10	Standard
	Dy	164	1436.1	3.2				mg/L	18	Standard
	Ho-1	165	1115.0	7.8				mg/L	23	Standard
	Er	166	1056.7	9.9				mg/L	40	Standard
	I	127	5564.4	4.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		89.284	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		85.480	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	98.402
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	94.833
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610042010
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Method 6020 - Summary Report

Sample ID: L1610042010PS WG587692-03
Sample Date/Time: Thursday, October 20, 2016 14:39:08
Number of Replicates: 3
Autosampler Position: 312
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68392.8	6.6				ug/L	76335	Standard
	Be	9	50821.9	5.3	**51.5101**	2.199	4.3	ug/L	18	Standard
	Al	27	105164.3	5.0	**0.9414**	0.037	3.9	ug/L	810	Standard
	Sc	45	18354.5	5.3				ug/L	22700	Standard
	Ti	47	605.3	8.4	**3.2189**	0.172	5.3	ug/L	25	Standard
	V	51	301490.3	5.4	**47.8244**	1.150	2.4	ug/L	1541	Standard
	Cr	52	289931.4	4.5	**48.5239**	0.722	1.5	ug/L	7881	Standard
	Cr	53	36666.1	7.2	**48.3156**	1.934	4.0	ug/L	932	Standard
	Mn	55	621135.2	5.9	**62.7807**	1.686	2.7	ug/L	1508	Standard
	Co	59	404747.2	5.1	**49.2238**	0.898	1.8	ug/L	282	Standard
	Ni	60	89913.6	5.9	**50.6117**	1.320	2.6	ug/L	91	Standard
	Cu	65	97015.2	5.4	**55.6737**	1.171	2.1	ug/L	205	Standard
	Zn	66	77946.9	4.7	**87.2124**	1.246	1.4	ug/L	369	Standard
>	Ge	72	430031.9	3.3				ug/L	496734	Standard
	As	75	51277.3	4.4	**57.2962**	0.714	1.2	ug/L	-45	Standard
	Se	82	5469.0	5.1	**63.6006**	1.288	2.0	ug/L	18	Standard
	Se-1	77	3592.1	4.9	**61.2209**	1.202	2.0	ug/L	83	Standard
>	Ga	71	296.7	12.2				mg/L	30	Standard
	Rb	85	1768.4	6.8				ug/L	23	Standard
	Y	89	367969.1	3.9				ug/L	405333	Standard
>	Rh	103	40.0	25.0				ug/L	17	Standard
	Mo	98	477.7	2.7	**0.1084**	0.009	8.7	ug/L	135	Standard
	Ag	107	352505.6	4.7	**50.0259**	0.222	0.4	ug/L	123	Standard
	Cd	111	113895.5	4.7	**55.9403**	0.490	0.9	mg/L	11	Standard
	Cd	114	288418.1	4.6	**54.7213**	0.806	1.5	ug/L	56	Standard
>	In	115	639128.1	4.4				ug/L	634401	Standard
	Sn	118	187.7	9.3	**0.0758**	0.019	25.5	ug/L	137	Standard
	Sb	123	252580.3	3.8	**47.5302**	2.622	5.5	ug/L	907	Standard
	Ba	135	149989.8	4.6	**52.4224**	0.654	1.2	ug/L	166	Standard
	Ce	140	26002.3	5.1				ug/L	57	Standard
>	Tb	159	1234110.9	4.2				ug/L	1347540	Standard
	Ho	165	1115.0	14.7				ug/L	23	Standard
	Tl	203	551574.5	4.2	**48.7746**	0.882	1.8	ug/L	45	Standard
	Tl	205	1333886.4	7.7	**48.7864**	2.051	4.2	ug/L	112	Standard
	Pb	206	462153.7	5.1	**54.4016**	0.936	1.7	ug/L	825	Standard
	Pb	207	404535.0	5.1	**54.1031**	0.903	1.7	ug/L	679	Standard
	Pb	208	1830562.3	4.9	**53.8771**	0.824	1.5	ug/L	3166	Standard
	U	238	1457463.2	3.7	**47.6166**	0.490	1.0	ug/L	119	Standard
>	Bi	209	645950.2	4.0				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**1.1330**	0.979	86.4	mg/L	0	Standard
|	**Mg**	24	55.0	24.1	**0.0041**	0.021	511.0	mg/L	48	Standard
|	**K**	39	15.0	57.7	**0.0655**	0.126	192.2	mg/L	8	Standard
|	**Ca**	43	33.3	45.8	**2.8978**	6.363	219.6	mg/L	27	Standard
|	**Fe**	54	566.4	3.4	**0.6106**	0.047	7.7	mg/L	121	Standard
|	**Fe**	57	410.0	12.8	**0.6646**	0.350	52.7	mg/L	305	Standard
⌊>	**Sc-1**	45	18354.5	5.3				mg/L	22700	Standard
	Cl	35	2.7	86.6				ug/L	3	Standard
	Kr	83	3.7	83.3				ug/L	5	Standard
	Br	81	1336.7	11.5				ug/L	1367	Standard
	P	31	38.3	58.8				ug/L	67	Standard
	S	34	71.7	22.4				ug/L	55	Standard
	Sr	88	135.0	7.4				ug/L	113	Standard
	C	12	316.7	25.5				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	33.3	62.5				mg/L	10	Standard
	Dy	164	1595.5	5.7				mg/L	18	Standard
	Ho-1	165	1115.0	14.7				mg/L	23	Standard
	Er	166	1140.0	13.1				mg/L	40	Standard
	I	127	5857.8	4.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		89.595	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		86.572	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	100.745
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	96.696
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610042010SDL WG587692-04
Sample Date/Time: Thursday, October 20, 2016 14:42:07
Number of Replicates: 3
Autosampler Position: 313
Sample Description: 500
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	64979.1	3.2				ug/L	76335	Standard
	Be	9	21.7	13.3	**0.0201**	0.002	11.9	ug/L	18	Standard
	Al	27	20562.3	2.3	**0.1901**	0.002	0.9	ug/L	810	Standard
	Sc	45	17248.2	3.7				ug/L	22700	Standard
	Ti	47	122.0	23.1	**0.5617**	0.160	28.5	ug/L	25	Standard
	V	51	1900.9	6.8	**0.0900**	0.020	22.4	ug/L	1541	Standard
	Cr	52	5322.9	1.5	**-0.2410**	0.012	5.1	ug/L	7881	Standard
	Cr	53	761.7	2.5	**-0.0211**	0.024	114.9	ug/L	932	Standard
	Mn	55	27616.1	0.9	**2.8054**	0.025	0.9	ug/L	1508	Standard
	Co	59	499.7	9.7	**0.0303**	0.006	20.5	ug/L	282	Standard
	Ni	60	244.0	5.8	**0.0998**	0.008	7.7	ug/L	91	Standard
	Cu	65	1368.4	2.3	**0.7504**	0.016	2.1	ug/L	205	Standard
	Zn	66	6103.9	0.9	**6.8909**	0.095	1.4	ug/L	369	Standard
>	Ge	72	416161.6	0.4				ug/L	496734	Standard
	As	75	70.2	19.9	**0.1404**	0.016	11.5	ug/L	-45	Standard
	Se	82	22.6	10.1	**0.0740**	0.027	35.8	ug/L	18	Standard
	Se-1	77	88.0	10.1	**0.4267**	0.165	38.7	ug/L	83	Standard
>	Ga	71	50.0	43.6				mg/L	30	Standard
	Rb	85	361.7	6.8				ug/L	23	Standard
	Y	89	337491.2	3.0				ug/L	405333	Standard
>	Rh	103	15.0	66.7				ug/L	17	Standard
	Mo	98	83.6	8.2	**0.0025**	0.002	87.8	ug/L	135	Standard
	Ag	107	140.7	4.7	**-0.0013**	0.001	90.2	ug/L	123	Standard
	Cd	111	113.2	8.2	**0.0489**	0.005	10.6	mg/L	11	Standard
	Cd	114	275.2	15.2	**0.0479**	0.009	18.4	ug/L	56	Standard
>	In	115	613115.4	1.9				ug/L	634401	Standard
	Sn	118	56.3	12.5	**-0.0297**	0.005	17.4	ug/L	137	Standard
	Sb	123	2330.5	38.2	**0.3908**	0.182	46.6	ug/L	907	Standard
	Ba	135	2231.5	3.2	**0.7667**	0.012	1.6	ug/L	166	Standard
	Ce	140	3993.9	7.0				ug/L	57	Standard
>	Tb	159	1153463.6	1.7				ug/L	1347540	Standard
	Ho	165	200.0	7.5				ug/L	23	Standard
	Tl	203	158.3	16.5	**0.0101**	0.003	27.4	ug/L	45	Standard
	Tl	205	345.0	12.6	**0.0114**	0.002	16.5	ug/L	112	Standard
	Pb	206	6391.3	4.2	**0.7319**	0.016	2.1	ug/L	825	Standard
	Pb	207	5171.6	5.3	**0.6739**	0.023	3.5	ug/L	679	Standard
	Pb	208	24418.7	4.6	**0.6976**	0.018	2.6	ug/L	3166	Standard
	U	238	2204.5	10.7	**0.0734**	0.006	8.8	ug/L	119	Standard
>	Bi	209	617891.9	2.2				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	55.0	15.7	**0.0110**	0.019	168.7	mg/L	48	Standard
|	**K**	39	1.7	173.2	**-0.1090**	0.041	37.3	mg/L	8	Standard
|	**Ca**	43	23.3	32.7	**-0.6463**	3.767	582.9	mg/L	27	Standard
|	**Fe**	54	74.3	6.6	**-0.0264**	0.008	28.5	mg/L	121	Standard
|	**Fe**	57	290.0	3.0	**0.1715**	0.087	50.9	mg/L	305	Standard
⌊>	**Sc-1**	45	17248.2	3.7				mg/L	22700	Standard
	Cl	35	2.7	114.6				ug/L	3	Standard
	Kr	83	3.3	75.5				ug/L	5	Standard
	Br	81	1223.4	3.1				ug/L	1367	Standard
	P	31	36.7	31.5				ug/L	67	Standard
	S	34	80.0	16.5				ug/L	55	Standard
	Sr	88	136.7	4.2				ug/L	113	Standard
	C	12	323.3	15.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	199.3	26.6				mg/L	18	Standard
	Ho-1	165	200.0	7.5				mg/L	23	Standard
	Er	166	223.3	38.1				mg/L	40	Standard
	I	127	5009.2	6.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		85.123	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		83.780	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	96.645
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	92.495
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 14:45:08
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	85120.4	4.4				ug/L	76335	Standard
	Be	9	59456.6	4.6	**48.3641**	0.302	0.6	ug/L	18	Standard
	Al	27	6520297.8	4.0	**47.0769**	1.374	2.9	ug/L	810	Standard
	Sc	45	21822.4	3.7				ug/L	22700	Standard
	Ti	47	21148.1	4.1	**101.9378**	0.712	0.7	ug/L	25	Standard
	V	51	367409.7	5.1	**50.6896**	0.371	0.7	ug/L	1541	Standard
	Cr	52	350796.1	4.6	**51.1108**	0.397	0.8	ug/L	7881	Standard
	Cr	53	45000.2	5.7	**51.6525**	1.068	2.1	ug/L	932	Standard
	Mn	55	576538.1	3.6	**50.6871**	0.637	1.3	ug/L	1508	Standard
	Co	59	483028.8	4.6	**51.0877**	0.244	0.5	ug/L	282	Standard
	Ni	60	103977.7	4.6	**50.9096**	0.499	1.0	ug/L	91	Standard
	Cu	65	101846.1	3.4	**50.8436**	0.625	1.2	ug/L	205	Standard
	Zn	66	52953.8	4.3	**51.4503**	0.349	0.7	ug/L	369	Standard
>	Ge	72	494690.5	4.6				ug/L	496734	Standard
	As	75	52689.8	4.5	**51.1998**	0.316	0.6	ug/L	-45	Standard
	Se	82	5177.8	3.8	**52.3428**	0.585	1.1	ug/L	18	Standard
	Se-1	77	3503.7	6.2	**51.7231**	0.901	1.7	ug/L	83	Standard
>	Ga	71	60.0	25.0				mg/L	30	Standard
	Rb	85	670.0	7.9				ug/L	23	Standard
	Y	89	420234.8	5.2				ug/L	405333	Standard
>	Rh	103	18.3	68.6				ug/L	17	Standard
	Mo	98	401034.6	4.8	**91.9230**	2.962	3.2	ug/L	135	Standard
	Ag	107	408841.8	4.4	**49.1490**	1.487	3.0	ug/L	123	Standard
	Cd	111	124537.1	4.8	**51.8014**	1.201	2.3	mg/L	11	Standard
	Cd	114	321105.3	4.1	**51.6062**	1.514	2.9	ug/L	56	Standard
>	In	115	754684.7	4.0				ug/L	634401	Standard
	Sn	118	74128.8	4.5	**51.0124**	0.289	0.6	ug/L	137	Standard
	Sb	123	323912.5	4.4	**51.5655**	1.071	2.1	ug/L	907	Standard
	Ba	135	160858.7	4.1	**47.6108**	0.853	1.8	ug/L	166	Standard
	Ce	140	200.0	18.9				ug/L	57	Standard
>	Tb	159	1458013.0	4.2				ug/L	1347540	Standard
	Ho	165	46.7	6.2				ug/L	23	Standard
	Tl	203	631553.4	4.3	**49.6504**	0.960	1.9	ug/L	45	Standard
	Tl	205	1465943.8	3.4	**47.7185**	0.569	1.2	ug/L	112	Standard
	Pb	206	475779.2	3.3	**49.8094**	0.435	0.9	ug/L	825	Standard
	Pb	207	421216.3	3.2	**50.1031**	0.397	0.8	ug/L	679	Standard
	Pb	208	1905106.7	3.7	**49.8621**	0.625	1.3	ug/L	3166	Standard
	U	238	1683098.5	3.3	**48.8915**	0.414	0.8	ug/L	119	Standard
>	Bi	209	726323.4	2.5				ug/L	668024	Standard

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⌈	**Na**	23	16.7	34.6	**4.6515**	1.640	35.3	mg/L	0	Standard
|	**Mg**	24	3558.8	5.2	**5.3361**	0.086	1.6	mg/L	48	Standard
|	**K**	39	405.0	4.9	**4.2714**	0.348	8.2	mg/L	8	Standard
|	**Ca**	43	43.3	17.6	**4.1474**	2.372	57.2	mg/L	27	Standard
|	**Fe**	54	4798.5	3.7	**5.1380**	0.226	4.4	mg/L	121	Standard
|	**Fe**	57	1535.1	4.0	**4.8652**	0.374	7.7	mg/L	305	Standard
⌊>	**Sc-1**	45	21822.4	3.7				mg/L	22700	Standard
	Cl	35	3.3	91.7				ug/L	3	Standard
	Kr	83	2.3	107.9				ug/L	5	Standard
	Br	81	1560.1	3.8				ug/L	1367	Standard
	P	31	78.3	16.1				ug/L	67	Standard
	S	34	118.3	8.8				ug/L	55	Standard
	Sr	88	151.7	22.4				ug/L	113	Standard
	C	12	333.3	14.2				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	22.4	24.0				mg/L	18	Standard
	Ho-1	165	46.7	6.2				mg/L	23	Standard
	Er	166	20.0	50.0				mg/L	40	Standard
	I	127	4417.3	7.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	96.728		
⌊	Al	27	94.154		
⌈	Sc	45			
|	Ti	47	101.938		
|	V	51	101.379		
|	Cr	52	102.222		
|	Cr	53			
|	Mn	55	101.374		
|	Co	59	102.175		
|	Ni	60	101.819		
|	Cu	65	101.687		
|	Zn	66	102.901		
|>	Ge	72		99.589	
|	As	75	102.400		
|	Se	82	104.686		
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85		
	Y	89		
>	Rh	103		
	Mo	98	91.923	
	Ag	107	98.298	
	Cd	111	103.603	
	Cd	114		
>	In	115		118.960
	Sn	118	102.025	
	Sb	123	103.131	
	Ba	135	95.222	
	Ce	140		
>	Tb	159		
	Ho	165		
	Tl	203	99.301	
	Tl	205		
	Pb	206		
	Pb	207		
	Pb	208	99.724	
	U	238	97.783	
>	Bi	209		108.727
	Na	23		
	Mg	24		
	K	39		
	Ca	43		
	Fe	54		
	Fe	57		
>	Sc-1	45		
	Cl	35		
	Kr	83		
	Br	81		
	P	31		
	S	34		
	Sr	88		
	C	12		
	N	14		
	Hg	202		
	Dy	164		
	Ho-1	165		
	Er	166		
	I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 6
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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 14:48:08
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	85646.7	4.3				ug/L	76335	Standard
	Be	9	20.0	25.0	**0.0131**	0.004	27.1	ug/L	18	Standard
	Al	27	1175.0	31.0	**0.0040**	0.002	58.3	ug/L	810	Standard
	Sc	45	21238.2	5.3				ug/L	22700	Standard
	Ti	47	18.7	22.3	**-0.0467**	0.019	40.5	ug/L	25	Standard
	V	51	1366.5	5.8	**-0.0310**	0.009	30.1	ug/L	1541	Standard
	Cr	52	7430.2	3.0	**-0.0600**	0.023	38.3	ug/L	7881	Standard
	Cr	53	936.7	7.2	**0.0335**	0.102	304.2	ug/L	932	Standard
	Mn	55	1795.4	5.8	**0.0761**	0.013	16.7	ug/L	1508	Standard
	Co	59	304.0	16.6	**0.0001**	0.006	3966.8	ug/L	282	Standard
	Ni	60	97.3	13.4	**0.0062**	0.007	110.3	ug/L	91	Standard
	Cu	65	182.0	1.1	**0.0300**	0.001	4.7	ug/L	205	Standard
	Zn	66	706.0	21.1	**0.5175**	0.161	31.1	ug/L	369	Standard
>	Ge	72	487390.9	2.2				ug/L	496734	Standard
	As	75	-32.3	117.3	**0.0275**	0.038	137.4	ug/L	-45	Standard
	Se	82	17.9	27.0	**-0.0149**	0.049	332.4	ug/L	18	Standard
	Se-1	77	92.7	12.1	**0.2695**	0.199	73.8	ug/L	83	Standard
>	Ga	71	30.0	16.7				mg/L	30	Standard
	Rb	85	20.0	25.0				ug/L	23	Standard
	Y	89	408178.2	3.0				ug/L	405333	Standard
>	Rh	103	10.0	100.0				ug/L	17	Standard
	Mo	98	278.4	7.7	**0.0439**	0.006	12.8	ug/L	135	Standard
	Ag	107	136.0	12.0	**-0.0055**	0.002	38.8	ug/L	123	Standard
	Cd	111	14.6	7.0	**-0.0029**	0.000	12.7	mg/L	11	Standard
	Cd	114	51.6	16.6	**0.0019**	0.001	70.5	ug/L	56	Standard
>	In	115	740385.0	1.1				ug/L	634401	Standard
	Sn	118	190.3	19.3	**0.0565**	0.027	48.1	ug/L	137	Standard
	Sb	123	3998.8	45.6	**0.5832**	0.302	51.9	ug/L	907	Standard
	Ba	135	69.3	11.7	**-0.0260**	0.002	9.1	ug/L	166	Standard
	Ce	140	55.0	72.2				ug/L	57	Standard
>	Tb	159	1415079.5	1.3				ug/L	1347540	Standard
	Ho	165	16.7	96.4				ug/L	23	Standard
	Tl	203	81.0	18.7	**0.0018**	0.001	72.4	ug/L	45	Standard
	Tl	205	203.3	16.4	**0.0049**	0.001	25.4	ug/L	112	Standard
	Pb	206	578.3	5.5	**0.0060**	0.002	37.7	ug/L	825	Standard
	Pb	207	481.7	8.5	**0.0083**	0.004	49.2	ug/L	679	Standard
	Pb	208	2287.7	6.7	**0.0063**	0.003	45.5	ug/L	3166	Standard
	U	238	203.0	21.5	**0.0042**	0.001	33.1	ug/L	119	Standard
>	Bi	209	717048.4	2.4				ug/L	668024	Standard

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	Na	23	1.7	173.2	**0.5024**	0.861	171.5	mg/L	0	Standard
	Mg	24	51.7	34.0	**-0.0150**	0.024	159.3	mg/L	48	Standard
	K	39	10.0	50.0	**-0.0226**	0.050	220.8	mg/L	8	Standard
	Ca	43	26.7	28.6	**-1.4802**	2.874	194.1	mg/L	27	Standard
	Fe	54	142.5	14.3	**0.0321**	0.031	96.3	mg/L	121	Standard
	Fe	57	290.0	19.2	**-0.1128**	0.165	146.2	mg/L	305	Standard
>	**Sc-1**	45	21238.2	5.3				mg/L	22700	Standard
	Cl	35	4.7	24.7				ug/L	3	Standard
	Kr	83	2.7	57.3				ug/L	5	Standard
	Br	81	1436.7	11.3				ug/L	1367	Standard
	P	31	100.0	26.5				ug/L	67	Standard
	S	34	91.7	13.7				ug/L	55	Standard
	Sr	88	158.3	4.8				ug/L	113	Standard
	C	12	343.3	23.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0					mg/L	10	Standard
	Dy	164	12.9	122.5				mg/L	18	Standard
	Ho-1	165	16.7	96.4				mg/L	23	Standard
	Er	166	10.0	100.0				mg/L	40	Standard
	I	127	4452.3	1.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		98.119	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	116.706
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	107.339
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	

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Method 6020 - Summary Report

Sample ID: L1610042011
Sample Date/Time: Thursday, October 20, 2016 14:51:08
Number of Replicates: 3
Autosampler Position: 314
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71702.7	3.7				ug/L	76335	Standard
	Be	9	60.0	22.0	**0.0552**	0.014	26.0	ug/L	18	Standard
	Al	27	135962.8	7.4	**1.1628**	0.115	9.9	ug/L	810	Standard
	Sc	45	18938.5	0.6				ug/L	22700	Standard
	Ti	47	71.3	21.3	**0.2436**	0.092	37.7	ug/L	25	Standard
	V	51	4052.9	5.0	**0.3965**	0.023	5.8	ug/L	1541	Standard
	Cr	52	6847.9	3.5	**-0.0580**	0.023	39.0	ug/L	7881	Standard
	Cr	53	951.7	11.5	**0.1471**	0.120	81.4	ug/L	932	Standard
	Mn	55	87409.0	8.7	**8.4004**	0.617	7.3	ug/L	1508	Standard
	Co	59	2625.6	12.8	**0.2739**	0.036	13.3	ug/L	282	Standard
	Ni	60	1482.1	2.3	**0.7592**	0.024	3.1	ug/L	91	Standard
	Cu	65	1974.5	10.1	**1.0250**	0.089	8.7	ug/L	205	Standard
	Zn	66	30399.0	96.4	**32.2217**	30.797	95.6	ug/L	369	Standard
>	Ge	72	448463.4	3.3				ug/L	496734	Standard
	As	75	382.6	33.8	**0.4688**	0.135	28.7	ug/L	-45	Standard
	Se	82	19.5	87.2	**0.0186**	0.186	1001.5	ug/L	18	Standard
	Se-1	77	85.0	25.5	**0.2632**	0.355	134.9	ug/L	83	Standard
>	Ga	71	330.0	12.0				mg/L	30	Standard
	Rb	85	3395.4	2.6				ug/L	23	Standard
	Y	89	369004.5	3.5				ug/L	405333	Standard
>	Rh	103	13.3	57.3				ug/L	17	Standard
	Mo	98	467.2	38.9	**0.1041**	0.049	46.6	ug/L	135	Standard
	Ag	107	279.7	90.3	**0.0172**	0.036	206.5	ug/L	123	Standard
	Cd	111	189.4	57.5	**0.0831**	0.053	63.8	mg/L	11	Standard
	Cd	114	484.5	48.0	**0.0844**	0.043	51.5	ug/L	56	Standard
>	In	115	644866.2	2.7				ug/L	634401	Standard
	Sn	118	81.0	54.2	**-0.0120**	0.035	296.6	ug/L	137	Standard
	Sb	123	614.3	45.5	**0.0466**	0.053	114.8	ug/L	907	Standard
	Ba	135	10647.4	1.7	**3.6455**	0.072	2.0	ug/L	166	Standard
	Ce	140	26379.6	2.8				ug/L	57	Standard
>	Tb	159	1260557.0	2.9				ug/L	1347540	Standard
	Ho	165	645.0	4.7				ug/L	23	Standard
	Tl	203	362.7	79.4	**0.0268**	0.025	91.9	ug/L	45	Standard
	Tl	205	876.7	74.9	**0.0296**	0.023	78.6	ug/L	112	Standard
	Pb	206	25668.7	1.6	**2.9246**	0.030	1.0	ug/L	825	Standard
	Pb	207	20501.9	2.9	**2.6541**	0.064	2.4	ug/L	679	Standard
	Pb	208	97216.1	1.9	**2.7672**	0.027	1.0	ug/L	3166	Standard
	U	238	1840.8	36.1	**0.0573**	0.021	36.1	ug/L	119	Standard
>	Bi	209	655795.5	1.0				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**1.0704**	0.923	86.2	mg/L	0	Standard
|	**Mg**	24	60.0	43.3	**0.0102**	0.046	452.7	mg/L	48	Standard
|	**K**	39	11.7	65.5	**0.0138**	0.097	698.5	mg/L	8	Standard
|	**Ca**	43	36.7	15.7	**3.7907**	2.301	60.7	mg/L	27	Standard
|	**Fe**	54	579.6	10.0	**0.6032**	0.074	12.3	mg/L	121	Standard
|	**Fe**	57	465.0	9.9	**0.8478**	0.217	25.6	mg/L	305	Standard
⌊>	**Sc-1**	45	18938.5	0.6				mg/L	22700	Standard
	Cl	35	2.0	100.0				ug/L	3	Standard
	Kr	83	3.0	88.2				ug/L	5	Standard
	Br	81	1306.7	6.4				ug/L	1367	Standard
	P	31	43.3	54.5				ug/L	67	Standard
	S	34	78.3	7.4				ug/L	55	Standard
	Sr	88	113.3	42.4				ug/L	113	Standard
	C	12	280.0	25.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0					mg/L	10	Standard
	Dy	164	1083.9	8.1				mg/L	18	Standard
	Ho-1	165	645.0	4.7				mg/L	23	Standard
	Er	166	546.7	16.4				mg/L	40	Standard
	I	127	5574.4	3.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		93.931	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		90.282	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	101.650
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	98.169
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610071601
Sample Date/Time: Thursday, October 20, 2016 14:56:49
Number of Replicates: 3
Autosampler Position: 315
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	72078.0	4.9				ug/L	76335	Standard
	Be	9	25.0	52.9	**0.0206**	0.012	57.3	ug/L	18	Standard
	Al	27	63434.3	3.5	**0.5367**	0.015	2.9	ug/L	810	Standard
	Sc	45	19859.7	6.1				ug/L	22700	Standard
	Ti	47	35.3	17.1	**0.0509**	0.033	64.3	ug/L	25	Standard
	V	51	2473.5	5.6	**0.1563**	0.017	10.6	ug/L	1541	Standard
	Cr	52	6847.2	1.6	**-0.0540**	0.019	34.9	ug/L	7881	Standard
	Cr	53	860.0	2.5	**0.0337**	0.011	32.2	ug/L	932	Standard
	Mn	55	60100.3	2.0	**5.7730**	0.021	0.4	ug/L	1508	Standard
	Co	59	2586.6	1.0	**0.2706**	0.004	1.7	ug/L	282	Standard
	Ni	60	954.7	3.3	**0.4756**	0.012	2.5	ug/L	91	Standard
	Cu	65	1303.7	3.4	**0.6591**	0.028	4.3	ug/L	205	Standard
	Zn	66	2533.9	2.7	**2.5514**	0.038	1.5	ug/L	369	Standard
>	Ge	72	446821.2	1.7				ug/L	496734	Standard
	As	75	240.4	20.6	**0.3172**	0.049	15.3	ug/L	-45	Standard
	Se	82	20.5	40.4	**0.0309**	0.090	291.3	ug/L	18	Standard
	Se-1	77	79.3	21.6	**0.1710**	0.271	158.3	ug/L	83	Standard
>	Ga	71	278.3	2.7				mg/L	30	Standard
	Rb	85	2733.6	2.1				ug/L	23	Standard
	Y	89	369550.3	2.0				ug/L	405333	Standard
>	Rh	103	16.7	62.4				ug/L	17	Standard
	Mo	98	86.7	6.0	**0.0022**	0.001	38.1	ug/L	135	Standard
	Ag	107	96.7	12.9	**-0.0085**	0.001	17.2	ug/L	123	Standard
	Cd	111	13.9	14.4	**-0.0023**	0.001	36.7	mg/L	11	Standard
	Cd	114	39.8	29.3	**0.0010**	0.002	245.2	ug/L	56	Standard
>	In	115	640543.1	2.5				ug/L	634401	Standard
	Sn	118	70.3	8.7	**-0.0203**	0.004	18.7	ug/L	137	Standard
	Sb	123	666.8	23.4	**0.0561**	0.026	47.1	ug/L	907	Standard
	Ba	135	12772.4	1.7	**4.4119**	0.059	1.3	ug/L	166	Standard
	Ce	140	21425.1	2.5				ug/L	57	Standard
>	Tb	159	1264606.7	1.8				ug/L	1347540	Standard
	Ho	165	608.3	6.7				ug/L	23	Standard
	Tl	203	65.0	9.6	**0.0010**	0.001	54.0	ug/L	45	Standard
	Tl	205	145.0	18.2	**0.0033**	0.001	28.4	ug/L	112	Standard
	Pb	206	3027.0	3.0	**0.2911**	0.008	2.9	ug/L	825	Standard
	Pb	207	2487.5	1.0	**0.2738**	0.003	1.0	ug/L	679	Standard
	Pb	208	11714.4	1.9	**0.2809**	0.004	1.5	ug/L	3166	Standard
	U	238	575.0	3.8	**0.0164**	0.001	3.7	ug/L	119	Standard
>	Bi	209	665102.1	0.6				ug/L	668024	Standard

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	Na	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
	Mg	24	46.7	12.4	**-0.0166**	0.014	84.1	mg/L	48	Standard
	K	39	15.0	66.7	**0.0435**	0.110	251.9	mg/L	8	Standard
	Ca	43	16.7	45.8	**-4.7213**	3.072	65.1	mg/L	27	Standard
	Fe	54	435.9	9.9	**0.3960**	0.043	10.8	mg/L	121	Standard
	Fe	57	383.3	11.4	**0.3850**	0.119	31.0	mg/L	305	Standard
>	**Sc-1**	45	19859.7	6.1				mg/L	22700	Standard
	Cl	35	6.7	69.3				ug/L	3	Standard
	Kr	83	4.3	13.3				ug/L	5	Standard
	Br	81	1303.4	10.1				ug/L	1367	Standard
	P	31	51.7	40.3				ug/L	67	Standard
	S	34	81.7	25.5				ug/L	55	Standard
	Sr	88	145.0	11.9				ug/L	113	Standard
	C	12	263.3	30.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	937.8	1.1				mg/L	18	Standard
	Ho-1	165	608.3	6.7				mg/L	23	Standard
	Er	166	533.3	5.7				mg/L	40	Standard
	I	127	4775.8	2.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		94.423	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		89.952	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	100.968
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	99.563
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610071601PS WG588260-01
Sample Date/Time: Thursday, October 20, 2016 14:59:48
Number of Replicates: 3
Autosampler Position: 316
Sample Description: 100
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79995.7	2.0				ug/L	76335	Standard
	Be	9	55981.7	4.1	**48.4437**	0.994	2.1	ug/L	18	Standard
	Al	27	68213.3	2.4	**0.5195**	0.003	0.6	ug/L	810	Standard
	Sc	45	20231.8	1.8				ug/L	22700	Standard
	Ti	47	35.7	19.7	**0.0405**	0.030	73.0	ug/L	25	Standard
	V	51	343489.4	1.9	**49.3088**	0.917	1.9	ug/L	1541	Standard
	Cr	52	327844.2	2.0	**49.6660**	0.988	2.0	ug/L	7881	Standard
	Cr	53	41231.0	1.1	**49.2163**	1.552	3.2	ug/L	932	Standard
	Mn	55	598095.9	3.8	**54.6806**	1.201	2.2	ug/L	1508	Standard
	Co	59	455585.9	1.7	**50.1370**	1.028	2.1	ug/L	282	Standard
	Ni	60	100324.8	1.7	**51.1057**	0.720	1.4	ug/L	91	Standard
	Cu	65	102775.5	2.4	**53.3591**	0.593	1.1	ug/L	205	Standard
	Zn	66	59261.0	1.5	**59.9325**	0.985	1.6	ug/L	369	Standard
>	Ge	72	475604.6	3.1				ug/L	496734	Standard
	As	75	55920.6	1.8	**56.5297**	0.957	1.7	ug/L	-45	Standard
	Se	82	5906.8	1.6	**62.1599**	1.741	2.8	ug/L	18	Standard
	Se-1	77	4000.5	2.6	**61.7406**	3.329	5.4	ug/L	83	Standard
>	Ga	71	296.7	13.7				mg/L	30	Standard
	Rb	85	2795.3	4.3				ug/L	23	Standard
	Y	89	395215.7	1.7				ug/L	405333	Standard
>	Rh	103	33.3	22.9				ug/L	17	Standard
	Mo	98	102.9	8.3	**0.0046**	0.001	27.0	ug/L	135	Standard
	Ag	107	380673.4	1.0	**50.1069**	1.600	3.2	ug/L	123	Standard
	Cd	111	122698.4	0.9	**55.8915**	1.608	2.9	mg/L	11	Standard
	Cd	114	304449.0	1.4	**53.5732**	1.936	3.6	ug/L	56	Standard
>	In	115	689668.3	3.7				ug/L	634401	Standard
	Sn	118	53.0	5.7	**-0.0374**	0.004	9.7	ug/L	137	Standard
	Sb	123	265910.7	3.3	**46.3915**	3.215	6.9	ug/L	907	Standard
	Ba	135	163217.9	1.7	**52.8928**	1.176	2.2	ug/L	166	Standard
	Ce	140	22223.0	2.5				ug/L	57	Standard
>	Tb	159	1330713.1	3.8				ug/L	1347540	Standard
	Ho	165	636.7	8.7				ug/L	23	Standard
	Tl	203	601471.9	1.3	**48.8237**	1.422	2.9	ug/L	45	Standard
	Tl	205	1386700.8	1.6	**46.6080**	1.781	3.8	ug/L	112	Standard
	Pb	206	460721.7	0.7	**49.7905**	1.077	2.2	ug/L	825	Standard
	Pb	207	404841.0	0.4	**49.7087**	1.007	2.0	ug/L	679	Standard
	Pb	208	1834054.7	0.7	**49.5526**	0.893	1.8	ug/L	3166	Standard
	U	238	1556854.2	1.1	**46.6874**	1.263	2.7	ug/L	119	Standard
>	Bi	209	703934.0	2.4				ug/L	668024	Standard

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	Na	23	1.7	173.2	**0.5013**	0.860	171.5	mg/L	0	Standard
	Mg	24	45.0	29.4	**-0.0216**	0.021	96.1	mg/L	48	Standard
	K	39	5.0	100.0	**-0.0734**	0.060	81.5	mg/L	8	Standard
	Ca	43	20.0	50.0	**-3.5301**	3.980	112.7	mg/L	27	Standard
	Fe	54	437.8	11.3	**0.3881**	0.053	13.6	mg/L	121	Standard
	Fe	57	395.0	16.2	**0.4044**	0.251	62.2	mg/L	305	Standard
>	**Sc-1**	45	20231.8	1.8				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	5.0	52.9				ug/L	5	Standard
	Br	81	1320.1	14.4				ug/L	1367	Standard
	P	31	53.3	32.9				ug/L	67	Standard
	S	34	80.0	25.0				ug/L	55	Standard
	Sr	88	153.3	8.2				ug/L	113	Standard
	C	12	376.7	18.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	973.4	6.9				mg/L	18	Standard
	Ho-1	165	636.7	8.7				mg/L	23	Standard
	Er	166	556.7	5.2				mg/L	40	Standard
	I	127	5304.3	2.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		104.795	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		95.746	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	108.712
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	105.375
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610071601SDL WG588260-02
Sample Date/Time: Thursday, October 20, 2016 15:02:48
Number of Replicates: 3
Autosampler Position: 317
Sample Description: 500
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	72074.7	5.7				ug/L	76335	Standard
	Be	9	23.3	32.7	**0.0194**	0.007	36.3	ug/L	18	Standard
	Al	27	11734.5	4.2	**0.0957**	0.002	1.7	ug/L	810	Standard
	Sc	45	19277.3	1.3				ug/L	22700	Standard
	Ti	47	22.7	25.5	**-0.0168**	0.028	168.9	ug/L	25	Standard
	V	51	1542.7	3.4	**0.0146**	0.014	95.6	ug/L	1541	Standard
	Cr	52	5342.6	2.1	**-0.2993**	0.016	5.5	ug/L	7881	Standard
	Cr	53	681.7	15.0	**-0.1921**	0.158	82.1	ug/L	932	Standard
	Mn	55	11183.1	3.3	**1.0090**	0.007	0.7	ug/L	1508	Standard
	Co	59	692.7	4.3	**0.0489**	0.003	6.6	ug/L	282	Standard
	Ni	60	230.7	11.5	**0.0836**	0.017	20.8	ug/L	91	Standard
	Cu	65	332.0	8.6	**0.1218**	0.011	8.8	ug/L	205	Standard
	Zn	66	993.7	4.5	**0.8924**	0.020	2.3	ug/L	369	Standard
>	Ge	72	445351.8	2.9				ug/L	496734	Standard
	As	75	-15.0	247.5	**0.0424**	0.041	96.1	ug/L	-45	Standard
	Se	82	15.8	58.7	**-0.0211**	0.104	493.8	ug/L	18	Standard
	Se-1	77	70.0	8.0	**0.0197**	0.061	309.4	ug/L	83	Standard
>	Ga	71	58.3	24.7				mg/L	30	Standard
	Rb	85	540.0	9.8				ug/L	23	Standard
	Y	89	364537.2	3.8				ug/L	405333	Standard
>	Rh	103	13.3	78.1				ug/L	17	Standard
	Mo	98	33.9	36.5	**-0.0121**	0.003	28.1	ug/L	135	Standard
	Ag	107	121.0	8.4	**-0.0052**	0.001	21.3	ug/L	123	Standard
	Cd	111	15.0	41.9	**-0.0019**	0.003	157.7	mg/L	11	Standard
	Cd	114	35.8	34.3	**0.0001**	0.002	1849.7	ug/L	56	Standard
>	In	115	647455.6	2.3				ug/L	634401	Standard
	Sn	118	33.3	38.7	**-0.0506**	0.010	20.7	ug/L	137	Standard
	Sb	123	2379.3	38.1	**0.3733**	0.166	44.4	ug/L	907	Standard
	Ba	135	2297.2	2.0	**0.7463**	0.003	0.3	ug/L	166	Standard
	Ce	140	2706.9	6.3				ug/L	57	Standard
>	Tb	159	1259664.8	2.8				ug/L	1347540	Standard
	Ho	165	101.7	2.8				ug/L	23	Standard
	Tl	203	124.7	8.7	**0.0062**	0.001	12.3	ug/L	45	Standard
	Tl	205	350.0	12.5	**0.0107**	0.001	12.5	ug/L	112	Standard
	Pb	206	824.7	5.8	**0.0401**	0.004	10.8	ug/L	825	Standard
	Pb	207	686.3	6.7	**0.0406**	0.005	11.5	ug/L	679	Standard
	Pb	208	3174.5	4.6	**0.0376**	0.003	8.2	ug/L	3166	Standard
	U	238	261.7	14.0	**0.0066**	0.001	15.2	ug/L	119	Standard
>	Bi	209	657100.3	2.1				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5318**	0.912	171.6	mg/L	0	Standard
|	**Mg**	24	50.0	17.3	**-0.0089**	0.016	178.6	mg/L	48	Standard
|	**K**	39	13.3	57.3	**0.0322**	0.096	297.0	mg/L	8	Standard
|	**Ca**	43	13.3	43.3	**-5.8616**	2.391	40.8	mg/L	27	Standard
|	**Fe**	54	81.0	24.7	**-0.0288**	0.026	89.2	mg/L	121	Standard
|	**Fe**	57	311.7	13.6	**0.1148**	0.210	183.4	mg/L	305	Standard
⌊>	**Sc-1**	45	19277.3	1.3				mg/L	22700	Standard
	Cl	35	5.3	57.3				ug/L	3	Standard
	Kr	83	1.3	86.6				ug/L	5	Standard
	Br	81	1420.1	6.7				ug/L	1367	Standard
	P	31	33.3	85.3				ug/L	67	Standard
	S	34	73.3	10.4				ug/L	55	Standard
	Sr	88	146.7	20.8				ug/L	113	Standard
	C	12	236.7	24.8				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	114.9	48.3				mg/L	18	Standard
	Ho-1	165	101.7	2.8				mg/L	23	Standard
	Er	166	106.7	21.7				mg/L	40	Standard
	I	127	4745.7	5.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		94.419	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		89.656	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	102.058
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	98.365
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610071601SDL WG588260-02
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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 15:05:49
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	86734.3	2.1				ug/L	76335	Standard
	Be	9	59961.8	0.9	**47.8899**	1.434	3.0	ug/L	18	Standard
	Al	27	6652788.8	0.5	**47.1306**	0.751	1.6	ug/L	810	Standard
	Sc	45	22264.7	1.8				ug/L	22700	Standard
	Ti	47	21390.4	1.0	**102.5441**	0.809	0.8	ug/L	25	Standard
	V	51	377100.7	1.3	**51.7650**	0.740	1.4	ug/L	1541	Standard
	Cr	52	355021.2	0.2	**51.4613**	0.449	0.9	ug/L	7881	Standard
	Cr	53	45294.3	3.2	**51.7229**	1.426	2.8	ug/L	932	Standard
	Mn	55	581355.3	1.4	**50.8215**	0.527	1.0	ug/L	1508	Standard
	Co	59	487384.6	0.9	**51.2758**	0.470	0.9	ug/L	282	Standard
	Ni	60	105294.3	1.2	**51.2787**	0.431	0.8	ug/L	91	Standard
	Cu	65	101215.6	1.1	**50.2409**	0.394	0.8	ug/L	205	Standard
	Zn	66	52388.4	0.3	**50.6239**	0.454	0.9	ug/L	369	Standard
>	Ge	72	497333.4	0.8				ug/L	496734	Standard
	As	75	53253.7	1.9	**51.4696**	0.812	1.6	ug/L	-45	Standard
	Se	82	5290.8	2.3	**53.1908**	1.194	2.2	ug/L	18	Standard
	Se-1	77	3588.1	1.0	**52.7359**	0.250	0.5	ug/L	83	Standard
>	Ga	71	43.3	37.1				mg/L	30	Standard
	Rb	85	640.0	4.3				ug/L	23	Standard
	Y	89	422498.1	0.5				ug/L	405333	Standard
>	Rh	103	36.7	7.9				ug/L	17	Standard
	Mo	98	399341.9	2.8	**92.3028**	1.572	1.7	ug/L	135	Standard
	Ag	107	406296.7	2.5	**49.2537**	1.043	2.1	ug/L	123	Standard
	Cd	111	123700.2	2.5	**51.8932**	0.676	1.3	mg/L	11	Standard
	Cd	114	318201.8	3.6	**51.5539**	1.074	2.1	ug/L	56	Standard
>	In	115	748274.6	1.6				ug/L	634401	Standard
	Sn	118	73443.4	3.5	**50.9696**	0.988	1.9	ug/L	137	Standard
	Sb	123	320395.9	1.7	**51.4432**	0.694	1.3	ug/L	907	Standard
	Ba	135	160239.2	2.6	**47.8257**	0.491	1.0	ug/L	166	Standard
	Ce	140	160.0	21.9				ug/L	57	Standard
>	Tb	159	1445685.0	2.0				ug/L	1347540	Standard
	Ho	165	31.7	59.8				ug/L	23	Standard
	Tl	203	631857.7	1.3	**50.2512**	1.342	2.7	ug/L	45	Standard
	Tl	205	1507342.4	3.7	**49.6386**	2.502	5.0	ug/L	112	Standard
	Pb	206	485041.2	3.4	**51.3681**	2.295	4.5	ug/L	825	Standard
	Pb	207	421174.0	2.4	**50.6743**	1.786	3.5	ug/L	679	Standard
	Pb	208	1930112.9	2.4	**51.1024**	1.825	3.6	ug/L	3166	Standard
	U	238	1678572.3	1.1	**49.3193**	1.304	2.6	ug/L	119	Standard
>	Bi	209	718384.4	1.6				ug/L	668024	Standard

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	Na	23	23.3	44.6	**6.3947**	2.932	45.8	mg/L	0	Standard
	Mg	24	3758.8	4.2	**5.5315**	0.279	5.0	mg/L	48	Standard
	K	39	481.7	11.6	**4.9869**	0.503	10.1	mg/L	8	Standard
	Ca	43	53.3	19.5	**7.3339**	3.299	45.0	mg/L	27	Standard
	Fe	54	4854.4	4.2	**5.0898**	0.186	3.7	mg/L	121	Standard
	Fe	57	1628.4	4.5	**5.1010**	0.173	3.4	mg/L	305	Standard
>	**Sc-1**	45	22264.7	1.8				mg/L	22700	Standard
	Cl	35	2.0	100.0				ug/L	3	Standard
	Kr	83	5.7	44.4				ug/L	5	Standard
	Br	81	1406.7	6.0				ug/L	1367	Standard
	P	31	130.0	34.2				ug/L	67	Standard
	S	34	111.7	35.9				ug/L	55	Standard
	Sr	88	145.0	18.2				ug/L	113	Standard
	C	12	400.0	15.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	26.2	56.5				mg/L	18	Standard
	Ho-1	165	31.7	59.8				mg/L	23	Standard
	Er	166	10.0	100.0				mg/L	40	Standard
	I	127	3822.1	1.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	95.780		
	Al	27	94.261		
	Sc	45			
	Ti	47	102.544		
	V	51	103.530		
	Cr	52	102.923		
	Cr	53			
	Mn	55	101.643		
	Co	59	102.552		
	Ni	60	102.557		
	Cu	65	100.482		
	Zn	66	101.248		
>	Ge	72		100.121	
	As	75	102.939		
	Se	82	106.382		
	Se-1	77			
>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	92.303		
Ag	107	98.507		
Cd	111	103.786		
Cd	114			
In	115			117.950
Sn	118	101.939		
Sb	123	102.886		
Ba	135	95.651		
Ce	140			
Tb	159			
Ho	165			
Tl	203	100.502		
Tl	205			
Pb	206			
Pb	207			
Pb	208	102.205		
U	238	98.639		
Bi	209			107.539
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 6
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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 15:08:48
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	88030.2	3.9				ug/L	76335	Standard
	Be	9	6.7	114.6	**0.0023**	0.006	268.9	ug/L	18	Standard
	Al	27	685.0	30.5	**0.0004**	0.001	313.9	ug/L	810	Standard
	Sc	45	22278.0	2.9				ug/L	22700	Standard
	Ti	47	21.7	2.7	**-0.0346**	0.003	9.3	ug/L	25	Standard
	V	51	1482.7	5.0	**-0.0201**	0.012	62.2	ug/L	1541	Standard
	Cr	52	7607.6	2.1	**-0.0639**	0.036	55.9	ug/L	7881	Standard
	Cr	53	930.0	7.2	**-0.0062**	0.064	1046.0	ug/L	932	Standard
	Mn	55	1512.1	2.6	**0.0470**	0.004	8.3	ug/L	1508	Standard
	Co	59	276.0	17.0	**-0.0037**	0.005	131.5	ug/L	282	Standard
	Ni	60	94.3	14.2	**0.0033**	0.006	178.8	ug/L	91	Standard
	Cu	65	174.3	5.2	**0.0238**	0.006	23.7	ug/L	205	Standard
	Zn	66	326.7	13.5	**0.1309**	0.040	30.7	ug/L	369	Standard
>	Ge	72	500878.7	1.3				ug/L	496734	Standard
	As	75	-13.2	246.0	**0.0465**	0.031	67.6	ug/L	-45	Standard
	Se	82	25.1	13.1	**0.0525**	0.030	57.3	ug/L	18	Standard
	Se-1	77	87.3	12.4	**0.1506**	0.176	116.6	ug/L	83	Standard
>	Ga	71	10.0	86.6				mg/L	30	Standard
	Rb	85	25.0	40.0				ug/L	23	Standard
	Y	89	419140.7	1.4				ug/L	405333	Standard
>	Rh	103	10.0	86.6				ug/L	17	Standard
	Mo	98	315.7	6.0	**0.0534**	0.004	8.2	ug/L	135	Standard
	Ag	107	145.0	16.6	**-0.0042**	0.003	68.7	ug/L	123	Standard
	Cd	111	11.6	45.8	**-0.0042**	0.002	54.3	mg/L	11	Standard
	Cd	114	46.0	34.2	**0.0010**	0.003	255.0	ug/L	56	Standard
>	In	115	732794.3	0.5				ug/L	634401	Standard
	Sn	118	212.3	29.1	**0.0734**	0.044	60.3	ug/L	137	Standard
	Sb	123	4129.0	45.4	**0.6098**	0.309	50.7	ug/L	907	Standard
	Ba	135	73.0	12.2	**-0.0247**	0.003	10.6	ug/L	166	Standard
	Ce	140	31.7	39.7				ug/L	57	Standard
>	Tb	159	1434138.3	2.5				ug/L	1347540	Standard
	Ho	165	16.7	17.3				ug/L	23	Standard
	Tl	203	78.0	23.1	**0.0015**	0.001	94.8	ug/L	45	Standard
	Tl	205	231.7	15.3	**0.0057**	0.001	20.3	ug/L	112	Standard
	Pb	206	576.0	6.8	**0.0048**	0.004	80.7	ug/L	825	Standard
	Pb	207	490.7	8.1	**0.0085**	0.005	53.5	ug/L	679	Standard
	Pb	208	2275.1	5.9	**0.0051**	0.003	67.2	ug/L	3166	Standard
	U	238	186.0	8.4	**0.0036**	0.000	12.6	ug/L	119	Standard
>	Bi	209	728332.8	0.4				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**0.9270**	0.799	86.2	mg/L	0	Standard
|	**Mg**	24	58.3	30.1	**-0.0079**	0.027	346.4	mg/L	48	Standard
|	**K**	39	13.3	57.3	**0.0104**	0.083	795.6	mg/L	8	Standard
|	**Ca**	43	35.0	24.7	**0.9665**	3.033	313.9	mg/L	27	Standard
|	**Fe**	54	122.6	24.0	**0.0024**	0.033	1366.5	mg/L	121	Standard
|	**Fe**	57	346.7	4.4	**0.0611**	0.083	136.7	mg/L	305	Standard
⌊>	**Sc-1**	45	22278.0	2.9				mg/L	22700	Standard
	Cl	35	5.3	78.1				ug/L	3	Standard
	Kr	83	3.0	66.7				ug/L	5	Standard
	Br	81	1506.7	7.3				ug/L	1367	Standard
	P	31	105.0	45.4				ug/L	67	Standard
	S	34	101.7	54.8				ug/L	55	Standard
	Sr	88	143.3	14.5				ug/L	113	Standard
	C	12	293.3	7.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	15.4	66.1				mg/L	18	Standard
	Ho-1	165	16.7	17.3				mg/L	23	Standard
	Er	166	26.7	114.6				mg/L	40	Standard
	I	127	4253.9	3.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		100.834	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	115.510
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	109.028
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	

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Method 6020 - Summary Report

Sample ID: PBW 06 WG587431-02
Sample Date/Time: Thursday, October 20, 2016 15:11:49
Number of Replicates: 3
Autosampler Position: 318
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	86915.2	0.5				ug/L	76335	Standard
	Be	9	18.3	87.7	**0.0116**	0.013	110.1	ug/L	18	Standard
	Al	27	541.7	6.0	**-0.0005**	0.000	42.2	ug/L	810	Standard
	Sc	45	22229.6	1.5				ug/L	22700	Standard
	Ti	47	20.7	18.3	**-0.0386**	0.018	45.8	ug/L	25	Standard
	V	51	-918.7	49.1	**-0.3498**	0.062	17.6	ug/L	1541	Standard
	Cr	52	7899.4	1.6	**-0.0110**	0.023	207.9	ug/L	7881	Standard
	Cr	53	9241.2	9.3	**9.7050**	0.935	9.6	ug/L	932	Standard
	Mn	55	1481.4	3.0	**0.0455**	0.004	9.8	ug/L	1508	Standard
	Co	59	237.3	2.3	**-0.0075**	0.001	9.1	ug/L	282	Standard
	Ni	60	94.0	5.9	**0.0036**	0.003	81.6	ug/L	91	Standard
	Cu	65	147.7	12.0	**0.0112**	0.009	76.8	ug/L	205	Standard
	Zn	66	1399.7	3.7	**1.1759**	0.041	3.5	ug/L	369	Standard
>	Ge	72	496564.1	0.7				ug/L	496734	Standard
	As	75	-81.6	39.9	**-0.0194**	0.031	160.6	ug/L	-45	Standard
	Se	82	19.3	19.5	**-0.0034**	0.039	1153.5	ug/L	18	Standard
	Se-1	77	469.7	4.0	**5.9107**	0.238	4.0	ug/L	83	Standard
>	Ga	71	10.0	50.0				mg/L	30	Standard
	Rb	85	28.3	10.2				ug/L	23	Standard
	Y	89	419531.2	1.3				ug/L	405333	Standard
>	Rh	103	13.3	78.1				ug/L	17	Standard
	Mo	98	83.9	21.4	**-0.0012**	0.004	330.4	ug/L	135	Standard
	Ag	107	117.7	11.5	**-0.0074**	0.002	22.3	ug/L	123	Standard
	Cd	111	6.9	38.6	**-0.0061**	0.001	19.1	mg/L	11	Standard
	Cd	114	32.5	41.7	**-0.0011**	0.002	209.2	ug/L	56	Standard
>	In	115	724673.3	1.7				ug/L	634401	Standard
	Sn	118	93.7	13.9	**-0.0103**	0.008	81.6	ug/L	137	Standard
	Sb	123	1413.8	51.8	**0.1648**	0.117	71.3	ug/L	907	Standard
	Ba	135	35.0	7.6	**-0.0361**	0.001	2.4	ug/L	166	Standard
	Ce	140	33.3	48.2				ug/L	57	Standard
>	Tb	159	1431094.8	2.7				ug/L	1347540	Standard
	Ho	165	23.3	24.7				ug/L	23	Standard
	Tl	203	432.7	7.2	**0.0294**	0.002	7.0	ug/L	45	Standard
	Tl	205	1070.0	4.2	**0.0330**	0.002	4.6	ug/L	112	Standard
	Pb	206	611.0	0.5	**0.0086**	0.002	17.5	ug/L	825	Standard
	Pb	207	505.0	6.5	**0.0103**	0.003	28.3	ug/L	679	Standard
	Pb	208	2366.4	0.9	**0.0076**	0.001	9.7	ug/L	3166	Standard
	U	238	46.7	41.9	**-0.0004**	0.001	123.6	ug/L	119	Standard
>	Bi	209	726741.7	2.0				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	48.3	15.8	**-0.0231**	0.011	46.6	mg/L	48	Standard
|	**K**	39	15.0	88.2	**0.0285**	0.144	505.0	mg/L	8	Standard
|	**Ca**	43	35.0	28.6	**1.0101**	3.637	360.0	mg/L	27	Standard
|	**Fe**	54	124.2	38.8	**0.0039**	0.050	1297.3	mg/L	121	Standard
|	**Fe**	57	281.7	18.0	**-0.1912**	0.216	113.1	mg/L	305	Standard
⌊>	**Sc-1**	45	22229.6	1.5				mg/L	22700	Standard
	Cl	35	5.3	43.3				ug/L	3	Standard
	Kr	83	3.0	33.3				ug/L	5	Standard
	Br	81	1596.8	10.0				ug/L	1367	Standard
	P	31	118.3	14.8				ug/L	67	Standard
	S	34	81.7	17.7				ug/L	55	Standard
	Sr	88	165.0	12.1				ug/L	113	Standard
	C	12	336.7	17.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	12.1	53.7				mg/L	18	Standard
	Ho-1	165	23.3	24.7				mg/L	23	Standard
	Er	166	26.7	57.3				mg/L	40	Standard
	I	127	3268.7	6.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		113.860	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		99.966	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	114.229
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	108.790
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: LCSW 06 WG587431-03
Sample Date/Time: Thursday, October 20, 2016 15:21:47
Number of Replicates: 3
Autosampler Position: 319
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	81625.4	8.7				ug/L	76335	Standard
	Be	9	571.7	5.6	**0.4829**	0.016	3.3	ug/L	18	Standard
	Al	27	111887.5	5.7	**0.8396**	0.036	4.2	ug/L	810	Standard
	Sc	45	21333.4	5.8				ug/L	22700	Standard
	Ti	47	1910.1	5.3	**9.7159**	0.297	3.1	ug/L	25	Standard
	V	51	61539.5	3.9	**8.8964**	0.157	1.8	ug/L	1541	Standard
	Cr	52	38596.9	5.7	**4.9638**	0.066	1.3	ug/L	7881	Standard
	Cr	53	27750.4	2.7	**33.7148**	1.141	3.4	ug/L	932	Standard
	Mn	55	51980.5	5.8	**4.8052**	0.067	1.4	ug/L	1508	Standard
	Co	59	17604.9	5.1	**1.9588**	0.026	1.3	ug/L	282	Standard
	Ni	60	9552.7	5.7	**4.9593**	0.025	0.5	ug/L	91	Standard
	Cu	65	9436.6	5.8	**4.9755**	0.022	0.4	ug/L	205	Standard
	Zn	66	11032.7	10.6	**11.2969**	0.751	6.6	ug/L	369	Standard
>	Ge	72	462944.7	5.5				ug/L	496734	Standard
	As	75	3751.0	4.7	**3.9512**	0.081	2.1	ug/L	-45	Standard
	Se	82	362.3	7.6	**3.7352**	0.343	9.2	ug/L	18	Standard
	Se-1	77	1276.1	2.8	**19.4605**	0.762	3.9	ug/L	83	Standard
>	Ga	71	33.3	8.7				mg/L	30	Standard
	Rb	85	80.0	34.8				ug/L	23	Standard
	Y	89	375323.0	8.1				ug/L	405333	Standard
>	Rh	103	35.0	14.3				ug/L	17	Standard
	Mo	98	33142.3	5.8	**9.4534**	0.022	0.2	ug/L	135	Standard
	Ag	107	25506.5	4.9	**3.8041**	0.052	1.4	ug/L	123	Standard
	Cd	111	954.6	5.0	**0.4866**	0.020	4.1	mg/L	11	Standard
	Cd	114	3989.6	0.6	**0.7950**	0.053	6.7	ug/L	56	Standard
>	In	115	605237.9	6.0				ug/L	634401	Standard
	Sn	118	11470.7	4.9	**9.7859**	0.113	1.2	ug/L	137	Standard
	Sb	123	62587.5	3.3	**12.3853**	0.355	2.9	ug/L	907	Standard
	Ba	135	27258.2	3.1	**10.0340**	0.292	2.9	ug/L	166	Standard
	Ce	140	110.0	67.9				ug/L	57	Standard
>	Tb	159	1300334.4	5.7				ug/L	1347540	Standard
	Ho	165	10.0	50.0				ug/L	23	Standard
	Tl	203	54742.8	4.4	**4.8621**	0.125	2.6	ug/L	45	Standard
	Tl	205	128697.5	6.6	**4.7297**	0.035	0.7	ug/L	112	Standard
	Pb	206	41461.7	5.1	**4.8553**	0.037	0.8	ug/L	825	Standard
	Pb	207	36290.8	4.3	**4.8348**	0.078	1.6	ug/L	679	Standard
	Pb	208	165297.7	4.3	**4.8420**	0.086	1.8	ug/L	3166	Standard
	U	238	300.7	151.3	**0.0076**	0.014	184.7	ug/L	119	Standard
>	Bi	209	643002.1	5.8				ug/L	668024	Standard

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	Na	23	1.7	173.2	**0.4560**	0.781	171.3	mg/L	0	Standard
	Mg	24	315.0	13.0	**0.3956**	0.046	11.6	mg/L	48	Standard
	K	39	38.3	19.9	**0.2908**	0.061	21.1	mg/L	8	Standard
	Ca	43	41.7	6.9	**3.9576**	1.215	30.7	mg/L	27	Standard
	Fe	54	181.2	9.3	**0.0735**	0.007	9.8	mg/L	121	Standard
	Fe	57	350.0	9.9	**0.1384**	0.181	131.1	mg/L	305	Standard
>	**Sc-1**	45	21333.4	5.8				mg/L	22700	Standard
	Cl	35	6.7	96.4				ug/L	3	Standard
	Kr	83	3.7	41.7				ug/L	5	Standard
	Br	81	1320.1	26.1				ug/L	1367	Standard
	P	31	101.7	27.1				ug/L	67	Standard
	S	34	96.7	10.8				ug/L	55	Standard
	Sr	88	171.7	14.9				ug/L	113	Standard
	C	12	263.3	53.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	9.0	102.8				mg/L	18	Standard
	Ho-1	165	10.0	50.0				mg/L	23	Standard
	Er	166	20.0	86.6				mg/L	40	Standard
	I	127	2935.3	11.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		106.930	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		93.198	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	95.403
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	96.254
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: LCSW 06 WG587431-03
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Method 6020 - Summary Report

Sample ID: F BLANK WG587345-01
Sample Date/Time: Thursday, October 20, 2016 15:26:25
Number of Replicates: 3
Autosampler Position: 320
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	76023.6	1.3				ug/L	76335	Standard
	Be	9	5.0	0.0	**0.0016**	0.000	3.8	ug/L	18	Standard
	Al	27	571.7	6.4	**0.0003**	0.000	102.8	ug/L	810	Standard
	Sc	45	20869.4	3.1				ug/L	22700	Standard
	Ti	47	20.7	17.0	**-0.0311**	0.019	61.0	ug/L	25	Standard
	V	51	-845.1	38.3	**-0.3481**	0.046	13.3	ug/L	1541	Standard
	Cr	52	7347.1	1.2	**-0.0130**	0.005	36.2	ug/L	7881	Standard
	Cr	53	10165.1	5.0	**11.6588**	0.609	5.2	ug/L	932	Standard
	Mn	55	1373.7	3.3	**0.0448**	0.004	8.4	ug/L	1508	Standard
	Co	59	244.7	6.8	**-0.0048**	0.002	44.1	ug/L	282	Standard
	Ni	60	88.7	12.1	**0.0042**	0.005	125.4	ug/L	91	Standard
	Cu	65	198.0	3.6	**0.0435**	0.003	7.5	ug/L	205	Standard
	Zn	66	1902.1	2.1	**1.7996**	0.025	1.4	ug/L	369	Standard
>	Ge	72	462597.5	1.0				ug/L	496734	Standard
	As	75	-38.5	299.8	**0.0187**	0.120	640.1	ug/L	-45	Standard
	Se	82	20.0	24.4	**0.0174**	0.050	289.0	ug/L	18	Standard
	Se-1	77	448.0	6.5	**6.0783**	0.404	6.6	ug/L	83	Standard
>	Ga	71	20.0	86.6				mg/L	30	Standard
	Rb	85	18.3	56.8				ug/L	23	Standard
	Y	89	377266.5	1.5				ug/L	405333	Standard
>	Rh	103	13.3	78.1				ug/L	17	Standard
	Mo	98	36.9	33.1	**-0.0112**	0.003	29.4	ug/L	135	Standard
	Ag	107	96.3	7.8	**-0.0085**	0.001	11.2	ug/L	123	Standard
	Cd	111	5.6	57.0	**-0.0064**	0.002	24.8	mg/L	11	Standard
	Cd	114	23.2	59.0	**-0.0022**	0.003	122.9	ug/L	56	Standard
>	In	115	638299.9	0.9				ug/L	634401	Standard
	Sn	118	67.0	25.1	**-0.0229**	0.013	58.2	ug/L	137	Standard
	Sb	123	357.2	41.3	**-0.0015**	0.027	1849.0	ug/L	907	Standard
	Ba	135	33.3	18.1	**-0.0353**	0.002	6.0	ug/L	166	Standard
	Ce	140	48.3	23.9				ug/L	57	Standard
>	Tb	159	1319673.5	1.5				ug/L	1347540	Standard
	Ho	165	8.3	91.7				ug/L	23	Standard
	Tl	203	315.3	5.6	**0.0225**	0.002	6.7	ug/L	45	Standard
	Tl	205	781.7	6.4	**0.0260**	0.002	6.9	ug/L	112	Standard
	Pb	206	558.3	3.3	**0.0086**	0.002	24.0	ug/L	825	Standard
	Pb	207	480.7	3.4	**0.0128**	0.002	17.3	ug/L	679	Standard
	Pb	208	2197.4	2.9	**0.0086**	0.002	21.6	ug/L	3166	Standard
	U	238	35.0	29.0	**-0.0007**	0.000	47.0	ug/L	119	Standard
>	Bi	209	664366.5	0.1				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	55.0	18.2	**-0.0073**	0.019	253.6	mg/L	48	Standard
|	**K**	39	6.7	43.3	**-0.0571**	0.031	55.0	mg/L	8	Standard
|	**Ca**	43	28.3	27.0	**-0.7490**	2.569	343.0	mg/L	27	Standard
|	**Fe**	54	80.7	15.7	**-0.0369**	0.014	38.2	mg/L	121	Standard
|	**Fe**	57	326.7	5.8	**0.0672**	0.038	56.6	mg/L	305	Standard
⌊>	**Sc-1**	45	20869.4	3.1				mg/L	22700	Standard
	Cl	35	4.7	89.2				ug/L	3	Standard
	Kr	83	4.3	35.3				ug/L	5	Standard
	Br	81	1260.1	8.8				ug/L	1367	Standard
	P	31	91.7	20.7				ug/L	67	Standard
	S	34	71.7	20.1				ug/L	55	Standard
	Sr	88	128.3	24.7				ug/L	113	Standard
	C	12	360.0	11.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	33.0	47.5				mg/L	18	Standard
	Ho-1	165	8.3	91.7				mg/L	23	Standard
	Er	166	6.7	173.2				mg/L	40	Standard
	I	127	3232.0	10.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		99.592	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.128	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	100.615
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	99.452
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026702 WG587431-01
Sample Date/Time: Thursday, October 20, 2016 15:29:24
Number of Replicates: 3
Autosampler Position: 321
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78703.1	8.2				ug/L	76335	Standard
	Be	9	16.7	34.6	**0.0119**	0.006	48.3	ug/L	18	Standard
	Al	27	17233.2	5.9	**0.1306**	0.011	8.6	ug/L	810	Standard
	Sc	45	21750.6	4.8				ug/L	22700	Standard
	Ti	47	27.0	11.1	**-0.0040**	0.018	452.0	ug/L	25	Standard
	V	51	-1648.5	23.7	**-0.4579**	0.058	12.6	ug/L	1541	Standard
	Cr	52	8287.6	2.7	**0.0826**	0.013	16.0	ug/L	7881	Standard
	Cr	53	14146.6	7.4	**15.9187**	1.115	7.0	ug/L	932	Standard
	Mn	55	2670.2	7.5	**0.1564**	0.014	8.8	ug/L	1508	Standard
	Co	59	277.7	3.5	**-0.0024**	0.001	35.0	ug/L	282	Standard
	Ni	60	122.7	9.7	**0.0193**	0.004	22.6	ug/L	91	Standard
	Cu	65	246.3	2.5	**0.0640**	0.007	10.2	ug/L	205	Standard
	Zn	66	1455.1	4.9	**1.2708**	0.041	3.2	ug/L	369	Standard
>	Ge	72	482462.1	2.8				ug/L	496734	Standard
	As	75	-64.8	98.5	**-0.0044**	0.062	1418.8	ug/L	-45	Standard
	Se	82	22.1	12.8	**0.0319**	0.036	112.7	ug/L	18	Standard
	Se-1	77	593.0	3.4	**8.0335**	0.438	5.4	ug/L	83	Standard
>	Ga	71	30.0	28.9				mg/L	30	Standard
	Rb	85	216.7	7.4				ug/L	23	Standard
	Y	89	388753.5	5.4				ug/L	405333	Standard
>	Rh	103	11.7	24.7				ug/L	17	Standard
	Mo	98	29.6	14.8	**-0.0136**	0.001	9.5	ug/L	135	Standard
	Ag	107	107.0	9.0	**-0.0079**	0.001	11.5	ug/L	123	Standard
	Cd	111	8.3	18.4	**-0.0053**	0.001	15.4	mg/L	11	Standard
	Cd	114	22.9	57.7	**-0.0025**	0.002	96.3	ug/L	56	Standard
>	In	115	681980.3	2.9				ug/L	634401	Standard
	Sn	118	77.7	1.5	**-0.0182**	0.001	6.1	ug/L	137	Standard
	Sb	123	381.8	41.5	**-0.0010**	0.029	2816.6	ug/L	907	Standard
	Ba	135	561.7	5.1	**0.1371**	0.005	3.3	ug/L	166	Standard
	Ce	140	671.7	9.7				ug/L	57	Standard
>	Tb	159	1384685.1	3.0				ug/L	1347540	Standard
	Ho	165	31.7	32.9				ug/L	23	Standard
	Tl	203	303.0	1.7	**0.0202**	0.001	4.6	ug/L	45	Standard
	Tl	205	758.4	7.6	**0.0238**	0.002	7.1	ug/L	112	Standard
	Pb	206	652.3	5.3	**0.0158**	0.003	21.2	ug/L	825	Standard
	Pb	207	580.3	0.4	**0.0222**	0.002	8.4	ug/L	679	Standard
	Pb	208	2601.1	1.7	**0.0166**	0.002	9.1	ug/L	3166	Standard
	U	238	30.0	5.8	**-0.0009**	0.000	8.3	ug/L	119	Standard
>	Bi	209	697967.5	2.3				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4573**	0.783	171.3	mg/L	0	Standard
|	**Mg**	24	76.7	44.4	**0.0210**	0.048	230.1	mg/L	48	Standard
|	**K**	39	11.7	89.2	**-0.0026**	0.118	4547.8	mg/L	8	Standard
|	**Ca**	43	26.7	28.6	**-1.6229**	3.244	199.9	mg/L	27	Standard
|	**Fe**	54	104.4	12.4	**-0.0141**	0.018	130.6	mg/L	121	Standard
|	**Fe**	57	266.7	12.1	**-0.2259**	0.156	68.8	mg/L	305	Standard
⌊>	**Sc-1**	45	21750.6	4.8				mg/L	22700	Standard
	Cl	35	2.7	114.6				ug/L	3	Standard
	Kr	83	3.7	15.7				ug/L	5	Standard
	Br	81	1366.7	4.4				ug/L	1367	Standard
	P	31	93.3	11.2				ug/L	67	Standard
	S	34	83.3	22.7				ug/L	55	Standard
	Sr	88	135.0	16.1				ug/L	113	Standard
	C	12	300.0	29.1				mg/L	367	Standard
	N	14	6.7	173.2				mg/L	3	Standard
	Hg	202	13.3	43.3				mg/L	10	Standard
	Dy	164	35.5	42.4				mg/L	18	Standard
	Ho-1	165	31.7	32.9				mg/L	23	Standard
	Er	166	23.3	24.7				mg/L	40	Standard
	I	127	3838.8	5.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		103.102	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		97.127	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		107.500
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		104.482
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
V 51 Lower	V	51	

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Method 6020 - Summary Report

Sample ID: L1610026705S WG587431-04
Sample Date/Time: Thursday, October 20, 2016 15:32:24
Number of Replicates: 3
Autosampler Position: 322
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	76631.7	1.2				ug/L	76335	Standard
	Be	9	465.0	16.1	**0.4171**	0.066	15.8	ug/L	18	Standard
	Al	27	126530.8	6.3	**1.0098**	0.054	5.4	ug/L	810	Standard
	Sc	45	20752.5	3.3				ug/L	22700	Standard
	Ti	47	1859.8	6.3	**9.2835**	0.324	3.5	ug/L	25	Standard
	V	51	57928.7	1.0	**8.2131**	0.158	1.9	ug/L	1541	Standard
	Cr	52	38326.1	2.4	**4.8177**	0.042	0.9	ug/L	7881	Standard
	Cr	53	30494.0	5.4	**36.4466**	1.077	3.0	ug/L	932	Standard
	Mn	55	52442.1	5.1	**4.7629**	0.109	2.3	ug/L	1508	Standard
	Co	59	17510.8	5.1	**1.9133**	0.044	2.3	ug/L	282	Standard
	Ni	60	9388.9	4.9	**4.7883**	0.097	2.0	ug/L	91	Standard
	Cu	65	9600.0	3.7	**4.9753**	0.053	1.1	ug/L	205	Standard
	Zn	66	14482.3	46.8	**14.5248**	6.416	44.2	ug/L	369	Standard
>	Ge	72	470959.8	2.9				ug/L	496734	Standard
	As	75	3843.5	7.0	**3.9750**	0.166	4.2	ug/L	-45	Standard
	Se	82	376.4	4.7	**3.8134**	0.203	5.3	ug/L	18	Standard
	Se-1	77	1325.4	4.3	**19.8641**	0.483	2.4	ug/L	83	Standard
>	Ga	71	50.0	36.1				mg/L	30	Standard
	Rb	85	238.3	8.7				ug/L	23	Standard
	Y	89	366859.2	1.9				ug/L	405333	Standard
>	Rh	103	48.3	39.2				ug/L	17	Standard
	Mo	98	33759.3	1.2	**9.6253**	0.134	1.4	ug/L	135	Standard
	Ag	107	25560.2	3.5	**3.8082**	0.103	2.7	ug/L	123	Standard
	Cd	111	976.2	10.9	**0.4967**	0.050	10.1	mg/L	11	Standard
	Cd	114	3954.7	3.2	**0.7855**	0.022	2.8	ug/L	56	Standard
>	In	115	605508.5	1.2				ug/L	634401	Standard
	Sn	118	11961.4	3.3	**10.1974**	0.246	2.4	ug/L	137	Standard
	Sb	123	63267.8	3.8	**12.4991**	0.370	3.0	ug/L	907	Standard
	Ba	135	27566.4	2.7	**10.1316**	0.243	2.4	ug/L	166	Standard
	Ce	140	588.3	13.1				ug/L	57	Standard
>	Tb	159	1290275.6	1.1				ug/L	1347540	Standard
	Ho	165	15.0	57.7				ug/L	23	Standard
	Tl	203	54067.7	2.5	**4.8396**	0.107	2.2	ug/L	45	Standard
	Tl	205	128060.7	2.1	**4.7485**	0.128	2.7	ug/L	112	Standard
	Pb	206	41899.9	3.3	**4.9475**	0.122	2.5	ug/L	825	Standard
	Pb	207	36785.6	3.3	**4.9402**	0.134	2.7	ug/L	679	Standard
	Pb	208	165781.6	2.9	**4.8948**	0.118	2.4	ug/L	3166	Standard
	U	238	62.7	127.8	**0.0003**	0.003	980.8	ug/L	119	Standard
>	Bi	209	637598.0	1.6				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**0.9937**	0.857	86.2	mg/L	0	Standard
|	**Mg**	24	391.7	18.8	**0.5365**	0.141	26.4	mg/L	48	Standard
|	**K**	39	30.0	33.3	**0.2108**	0.115	54.6	mg/L	8	Standard
|	**Ca**	43	30.0	44.1	**-0.1174**	4.662	3971.1	mg/L	27	Standard
|	**Fe**	54	126.9	20.8	**0.0169**	0.030	176.8	mg/L	121	Standard
|	**Fe**	57	295.0	4.5	**-0.0576**	0.051	88.7	mg/L	305	Standard
⌊>	**Sc-1**	45	20752.5	3.3				mg/L	22700	Standard
	Cl	35	4.0	50.0				ug/L	3	Standard
	Kr	83	3.3	96.4				ug/L	5	Standard
	Br	81	1323.4	7.6				ug/L	1367	Standard
	P	31	58.3	13.1				ug/L	67	Standard
	S	34	68.3	41.6				ug/L	55	Standard
	Sr	88	135.0	9.8				ug/L	113	Standard
	C	12	240.0	16.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	5.4	211.7				mg/L	18	Standard
	Ho-1	165	15.0	57.7				mg/L	23	Standard
	Er	166	26.7	21.7				mg/L	40	Standard
	I	127	3538.7	2.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		100.388	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.811	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	95.446
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	95.445
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610026708SD WG587431-05
Sample Date/Time: Thursday, October 20, 2016 15:35:23
Number of Replicates: 3
Autosampler Position: 323
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78065.9	4.8				ug/L	76335	Standard
	Be	9	546.7	13.1	**0.4808**	0.045	9.3	ug/L	18	Standard
	Al	27	128467.3	6.9	**1.0061**	0.028	2.8	ug/L	810	Standard
	Sc	45	20226.9	7.8				ug/L	22700	Standard
	Ti	47	1932.1	5.9	**9.8402**	0.229	2.3	ug/L	25	Standard
	V	51	60777.4	4.0	**8.7960**	0.139	1.6	ug/L	1541	Standard
	Cr	52	38702.1	5.5	**4.9898**	0.012	0.2	ug/L	7881	Standard
	Cr	53	31389.3	8.8	**38.2501**	1.678	4.4	ug/L	932	Standard
	Mn	55	53206.2	7.3	**4.9248**	0.096	2.0	ug/L	1508	Standard
	Co	59	17390.0	5.4	**1.9371**	0.020	1.1	ug/L	282	Standard
	Ni	60	9484.3	5.7	**4.9308**	0.031	0.6	ug/L	91	Standard
	Cu	65	9445.3	5.5	**4.9880**	0.025	0.5	ug/L	205	Standard
	Zn	66	10797.9	4.8	**11.0859**	0.180	1.6	ug/L	369	Standard
>	Ge	72	462246.0	5.3				ug/L	496734	Standard
	As	75	3713.9	5.5	**3.9174**	0.081	2.1	ug/L	-45	Standard
	Se	82	373.9	4.5	**3.8618**	0.048	1.3	ug/L	18	Standard
	Se-1	77	1361.4	3.0	**20.8681**	0.744	3.6	ug/L	83	Standard
>	Ga	71	28.3	27.0				mg/L	30	Standard
	Rb	85	263.3	4.0				ug/L	23	Standard
	Y	89	367869.4	5.5				ug/L	405333	Standard
>	Rh	103	43.3	24.0				ug/L	17	Standard
	Mo	98	33759.7	3.5	**9.4025**	0.090	1.0	ug/L	135	Standard
	Ag	107	25699.1	5.0	**3.7390**	0.025	0.7	ug/L	123	Standard
	Cd	111	961.8	6.1	**0.4778**	0.013	2.6	mg/L	11	Standard
	Cd	114	3954.7	3.1	**0.7676**	0.030	3.9	ug/L	56	Standard
>	In	115	619953.2	4.4				ug/L	634401	Standard
	Sn	118	12335.4	1.9	**10.2805**	0.262	2.6	ug/L	137	Standard
	Sb	123	63881.1	3.3	**12.3310**	0.154	1.3	ug/L	907	Standard
	Ba	135	28447.7	4.7	**10.2121**	0.135	1.3	ug/L	166	Standard
	Ce	140	623.3	11.2				ug/L	57	Standard
>	Tb	159	1295382.9	3.3				ug/L	1347540	Standard
	Ho	165	10.0	86.6				ug/L	23	Standard
	Tl	203	54894.1	4.8	**4.8561**	0.128	2.6	ug/L	45	Standard
	Tl	205	129929.9	7.1	**4.7591**	0.231	4.9	ug/L	112	Standard
	Pb	206	41907.3	4.9	**4.8902**	0.130	2.7	ug/L	825	Standard
	Pb	207	36725.6	5.7	**4.8734**	0.169	3.5	ug/L	679	Standard
	Pb	208	167198.6	4.8	**4.8788**	0.124	2.5	ug/L	3166	Standard
	U	238	18.0	27.8	**-0.0012**	0.000	13.8	ug/L	119	Standard
>	Bi	209	644881.6	2.3				ug/L	668024	Standard

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⌈	**Na**	23	5.0	173.2	**1.5535**	2.682	172.6	mg/L	0	Standard
|	**Mg**	24	406.7	25.0	**0.5736**	0.157	27.4	mg/L	48	Standard
|	**K**	39	35.0	49.5	**0.2723**	0.191	70.3	mg/L	8	Standard
|	**Ca**	43	28.3	27.0	**-0.3765**	2.872	762.8	mg/L	27	Standard
|	**Fe**	54	150.5	15.9	**0.0478**	0.014	30.1	mg/L	121	Standard
|	**Fe**	57	283.3	14.3	**-0.0655**	0.250	381.6	mg/L	305	Standard
⌊>	**Sc-1**	45	20226.9	7.8				mg/L	22700	Standard
	Cl	35	2.7	43.3				ug/L	3	Standard
	Kr	83	4.7	53.9				ug/L	5	Standard
	Br	81	1363.4	5.2				ug/L	1367	Standard
	P	31	70.0	46.8				ug/L	67	Standard
	S	34	50.0	26.5				ug/L	55	Standard
	Sr	88	148.3	12.8				ug/L	113	Standard
	C	12	260.0	7.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	41.9	38.0				mg/L	18	Standard
	Ho-1	165	10.0	86.6				mg/L	23	Standard
	Er	166	30.0	57.7				mg/L	40	Standard
	I	127	3457.1	1.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		102.267	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.057	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	97.723
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	96.536
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610026708SD WG587431-05
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Method 6020 - Summary Report

Sample ID: L1610059801
Sample Date/Time: Thursday, October 20, 2016 15:38:23
Number of Replicates: 3
Autosampler Position: 324
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78089.2	3.7				ug/L	76335	Standard
	Be	9	16.7	96.4	**0.0122**	0.015	124.0	ug/L	18	Standard
	Al	27	2330.2	2.5	**0.0140**	0.001	8.0	ug/L	810	Standard
	Sc	45	21662.1	1.9				ug/L	22700	Standard
	Ti	47	27.0	20.6	**-0.0028**	0.030	1066.1	ug/L	25	Standard
	V	51	-232.4	308.1	**-0.2557**	0.102	39.8	ug/L	1541	Standard
	Cr	52	8034.5	4.3	**0.0545**	0.044	79.9	ug/L	7881	Standard
	Cr	53	8836.0	24.7	**9.6113**	2.508	26.1	ug/L	932	Standard
	Mn	55	5060.2	2.6	**0.3762**	0.005	1.2	ug/L	1508	Standard
	Co	59	330.0	9.0	**0.0036**	0.003	86.2	ug/L	282	Standard
	Ni	60	471.7	1.0	**0.1968**	0.001	0.6	ug/L	91	Standard
	Cu	65	849.4	0.9	**0.3767**	0.004	1.2	ug/L	205	Standard
	Zn	66	2703.9	3.6	**2.5433**	0.084	3.3	ug/L	369	Standard
>	Ge	72	478249.4	1.6				ug/L	496734	Standard
	As	75	-39.9	117.7	**0.0189**	0.048	254.8	ug/L	-45	Standard
	Se	82	41.7	5.3	**0.2387**	0.024	10.1	ug/L	18	Standard
	Se-1	77	560.7	6.5	**7.5992**	0.442	5.8	ug/L	83	Standard
>	Ga	71	136.7	5.6				mg/L	30	Standard
	Rb	85	13049.0	2.5				ug/L	23	Standard
	Y	89	395247.5	2.4				ug/L	405333	Standard
>	Rh	103	20.0	0.0				ug/L	17	Standard
	Mo	98	613.9	12.3	**0.1386**	0.018	12.6	ug/L	135	Standard
	Ag	107	108.0	18.2	**-0.0074**	0.003	34.5	ug/L	123	Standard
	Cd	111	9.9	42.7	**-0.0044**	0.002	46.9	mg/L	11	Standard
	Cd	114	45.2	41.2	**0.0017**	0.004	206.4	ug/L	56	Standard
>	In	115	664173.5	2.3				ug/L	634401	Standard
	Sn	118	179.3	15.9	**0.0629**	0.020	32.5	ug/L	137	Standard
	Sb	123	400.8	28.8	**0.0038**	0.020	526.3	ug/L	907	Standard
	Ba	135	10269.8	2.0	**3.4103**	0.012	0.4	ug/L	166	Standard
	Ce	140	168.3	12.4				ug/L	57	Standard
>	Tb	159	1352786.5	1.1				ug/L	1347540	Standard
	Ho	165	21.7	48.0				ug/L	23	Standard
	Tl	203	295.7	4.1	**0.0202**	0.001	3.2	ug/L	45	Standard
	Tl	205	738.4	8.5	**0.0238**	0.002	8.1	ug/L	112	Standard
	Pb	206	1367.7	2.9	**0.0979**	0.002	1.8	ug/L	825	Standard
	Pb	207	1165.4	5.2	**0.0986**	0.006	5.8	ug/L	679	Standard
	Pb	208	5465.7	0.6	**0.0988**	0.003	3.0	ug/L	3166	Standard
	U	238	20.0	10.0	**-0.0012**	0.000	5.3	ug/L	119	Standard
>	Bi	209	679391.3	2.4				ug/L	668024	Standard

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	Na	23	15.0	66.7	**4.1771**	2.743	65.7	mg/L	0	Standard
	Mg	24	2891.9	4.0	**4.3530**	0.163	3.7	mg/L	48	Standard
	K	39	345.0	22.6	**3.6303**	0.791	21.8	mg/L	8	Standard
	Ca	43	41.7	36.7	**3.6355**	5.248	144.4	mg/L	27	Standard
	Fe	54	139.2	6.2	**0.0242**	0.007	27.4	mg/L	121	Standard
	Fe	57	335.0	14.7	**0.0535**	0.217	406.5	mg/L	305	Standard
>	**Sc-1**	45	21662.1	1.9				mg/L	22700	Standard
	Cl	35	6.0	33.3				ug/L	3	Standard
	Kr	83	2.7	57.3				ug/L	5	Standard
	Br	81	1823.4	2.2				ug/L	1367	Standard
	P	31	115.0	19.0				ug/L	67	Standard
	S	34	71.7	14.5				ug/L	55	Standard
	Sr	88	148.3	30.2				ug/L	113	Standard
	C	12	403.3	20.6				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	26.3	43.3				mg/L	18	Standard
	Ho-1	165	21.7	48.0				mg/L	23	Standard
	Er	166	6.7	86.6				mg/L	40	Standard
	I	127	6094.6	4.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		102.298	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		96.279	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	104.693
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	101.702
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610059801PS WG588423-01
Sample Date/Time: Thursday, October 20, 2016 15:41:22
Number of Replicates: 3
Autosampler Position: 325
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	80367.9	4.8				ug/L	76335	Standard
	Be	9	55590.1	1.7	**47.9522**	1.849	3.9	ug/L	18	Standard
	Al	27	2145.3	103.4	**0.0117**	0.016	137.8	ug/L	810	Standard
	Sc	45	21441.8	2.3				ug/L	22700	Standard
	Ti	47	26.7	15.6	**-0.0040**	0.023	585.0	ug/L	25	Standard
	V	51	346921.9	1.3	**49.6883**	0.508	1.0	ug/L	1541	Standard
	Cr	52	334373.4	2.9	**50.5500**	0.856	1.7	ug/L	7881	Standard
	Cr	53	52803.6	2.7	**63.1532**	0.522	0.8	ug/L	932	Standard
	Mn	55	550803.0	2.9	**50.2375**	0.432	0.9	ug/L	1508	Standard
	Co	59	461293.8	3.1	**50.6345**	0.792	1.6	ug/L	282	Standard
	Ni	60	99483.7	2.6	**50.5515**	0.299	0.6	ug/L	91	Standard
	Cu	65	100413.4	2.1	**52.0165**	0.940	1.8	ug/L	205	Standard
	Zn	66	51708.4	0.8	**52.1518**	0.705	1.4	ug/L	369	Standard
>	Ge	72	476615.3	2.1				ug/L	496734	Standard
	As	75	50586.5	2.9	**51.0184**	1.018	2.0	ug/L	-45	Standard
	Se	82	4911.4	3.5	**51.5084**	0.948	1.8	ug/L	18	Standard
	Se-1	77	3822.5	3.3	**58.7443**	0.980	1.7	ug/L	83	Standard
>	Ga	71	153.3	26.6				mg/L	30	Standard
	Rb	85	13112.3	3.0				ug/L	23	Standard
	Y	89	395262.0	2.8				ug/L	405333	Standard
>	Rh	103	28.3	27.0				ug/L	17	Standard
	Mo	98	629.9	1.7	**0.1415**	0.004	2.5	ug/L	135	Standard
	Ag	107	349858.7	4.5	**47.3593**	1.900	4.0	ug/L	123	Standard
	Cd	111	110084.1	3.9	**51.5600**	0.902	1.7	mg/L	11	Standard
	Cd	114	274959.7	2.8	**49.7509**	0.332	0.7	ug/L	56	Standard
>	In	115	670163.0	2.8				ug/L	634401	Standard
	Sn	118	90.0	5.9	**-0.0075**	0.006	78.9	ug/L	137	Standard
	Sb	123	290106.0	3.1	**52.0040**	0.233	0.4	ug/L	907	Standard
	Ba	135	161376.8	4.7	**53.7736**	1.142	2.1	ug/L	166	Standard
	Ce	140	60.0	14.4				ug/L	57	Standard
>	Tb	159	1399200.0	3.9				ug/L	1347540	Standard
	Ho	165	51.7	27.9				ug/L	23	Standard
	Tl	203	589119.8	3.7	**49.3470**	0.501	1.0	ug/L	45	Standard
	Tl	205	1398358.1	4.4	**48.4860**	0.850	1.8	ug/L	112	Standard
	Pb	206	452839.5	3.8	**50.5032**	0.483	1.0	ug/L	825	Standard
	Pb	207	398142.5	3.7	**50.4526**	0.636	1.3	ug/L	679	Standard
	Pb	208	1799165.2	4.4	**50.1613**	0.765	1.5	ug/L	3166	Standard
	U	238	1571268.2	3.5	**48.6251**	0.356	0.7	ug/L	119	Standard
>	Bi	209	681789.7	2.9				ug/L	668024	Standard

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⌈	**Na**	23	13.3	108.3	**3.7201**	3.950	106.2	mg/L	0	Standard
|	**Mg**	24	2948.6	3.9	**4.4905**	0.273	6.1	mg/L	48	Standard
|	**K**	39	275.0	3.6	**2.9054**	0.066	2.3	mg/L	8	Standard
|	**Ca**	43	48.3	68.9	**6.4186**	12.380	192.9	mg/L	27	Standard
|	**Fe**	54	92.8	21.8	**-0.0260**	0.022	85.1	mg/L	121	Standard
|	**Fe**	57	366.7	23.2	**0.1901**	0.310	163.1	mg/L	305	Standard
⌊>	**Sc-1**	45	21441.8	2.3				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	2.7	114.6				ug/L	5	Standard
	Br	81	2030.1	3.8				ug/L	1367	Standard
	P	31	93.3	12.4				ug/L	67	Standard
	S	34	91.7	16.7				ug/L	55	Standard
	Sr	88	175.0	23.4				ug/L	113	Standard
	C	12	406.7	15.8				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0	100.0				mg/L	10	Standard
	Dy	164	15.9	37.5				mg/L	18	Standard
	Ho-1	165	51.7	27.9				mg/L	23	Standard
	Er	166	16.7	91.7				mg/L	40	Standard
	I	127	6177.9	2.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		105.283	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		95.950	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	105.637
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	102.061
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1610059801PS WG588423-01
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Method 6020 - Summary Report

Sample ID: L1610059801SDL WG588423-02
Sample Date/Time: Thursday, October 20, 2016 15:44:22
Number of Replicates: 3
Autosampler Position: 326
Sample Description: 250
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78593.5	3.7				ug/L	76335	Standard
	Be	9	13.3	78.1	**0.0090**	0.010	108.6	ug/L	18	Standard
	Al	27	705.0	13.1	**0.0011**	0.001	48.8	ug/L	810	Standard
	Sc	45	21663.8	2.6				ug/L	22700	Standard
	Ti	47	17.7	29.0	**-0.0517**	0.025	48.0	ug/L	25	Standard
	V	51	956.5	18.9	**-0.0889**	0.026	29.3	ug/L	1541	Standard
	Cr	52	8455.4	2.2	**0.0909**	0.013	14.1	ug/L	7881	Standard
	Cr	53	4315.6	1.4	**4.0358**	0.083	2.0	ug/L	932	Standard
	Mn	55	1685.8	4.9	**0.0656**	0.007	10.2	ug/L	1508	Standard
	Co	59	267.7	5.5	**-0.0039**	0.001	36.9	ug/L	282	Standard
	Ni	60	201.0	0.5	**0.0574**	0.002	3.3	ug/L	91	Standard
	Cu	65	374.7	2.4	**0.1272**	0.008	6.0	ug/L	205	Standard
	Zn	66	1649.4	2.2	**1.4434**	0.021	1.5	ug/L	369	Standard
>	Ge	72	488987.7	1.7				ug/L	496734	Standard
	As	75	-53.8	27.0	**0.0065**	0.014	220.2	ug/L	-45	Standard
	Se	82	22.6	7.4	**0.0326**	0.013	40.8	ug/L	18	Standard
	Se-1	77	204.0	6.3	**1.9639**	0.207	10.5	ug/L	83	Standard
>	Ga	71	33.3	69.3				mg/L	30	Standard
	Rb	85	2761.9	6.7				ug/L	23	Standard
	Y	89	404228.7	1.5				ug/L	405333	Standard
>	Rh	103	13.3	43.3				ug/L	17	Standard
	Mo	98	158.0	7.9	**0.0180**	0.003	14.1	ug/L	135	Standard
	Ag	107	143.0	7.9	**-0.0036**	0.001	38.3	ug/L	123	Standard
	Cd	111	12.8	20.7	**-0.0034**	0.001	33.2	mg/L	11	Standard
	Cd	114	52.9	5.4	**0.0026**	0.001	22.0	ug/L	56	Standard
>	In	115	698272.4	2.4				ug/L	634401	Standard
	Sn	118	140.3	15.5	**0.0274**	0.018	67.4	ug/L	137	Standard
	Sb	123	3138.2	43.6	**0.4713**	0.237	50.2	ug/L	907	Standard
	Ba	135	2111.1	1.3	**0.6291**	0.009	1.4	ug/L	166	Standard
	Ce	140	86.7	43.3				ug/L	57	Standard
>	Tb	159	1405842.6	1.6				ug/L	1347540	Standard
	Ho	165	16.7	75.5				ug/L	23	Standard
	Tl	203	488.7	7.3	**0.0357**	0.003	7.1	ug/L	45	Standard
	Tl	205	1160.0	5.6	**0.0378**	0.003	7.5	ug/L	112	Standard
	Pb	206	771.0	8.2	**0.0293**	0.007	22.2	ug/L	825	Standard
	Pb	207	629.7	0.8	**0.0289**	0.002	7.2	ug/L	679	Standard
	Pb	208	2945.1	2.3	**0.0266**	0.001	3.6	ug/L	3166	Standard
	U	238	127.3	14.3	**0.0021**	0.001	28.9	ug/L	119	Standard
>	Bi	209	692820.2	2.0				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**0.9274**	0.799	86.2	mg/L	0	Standard
|	**Mg**	24	650.0	9.4	**0.9049**	0.099	10.9	mg/L	48	Standard
|	**K**	39	68.3	40.3	**0.6179**	0.308	49.9	mg/L	8	Standard
|	**Ca**	43	38.3	86.8	**2.6817**	12.086	450.7	mg/L	27	Standard
|	**Fe**	54	132.4	14.6	**0.0171**	0.025	146.7	mg/L	121	Standard
|	**Fe**	57	273.3	10.7	**-0.1955**	0.145	74.1	mg/L	305	Standard
⌊>	**Sc-1**	45	21663.8	2.6				mg/L	22700	Standard
	Cl	35	4.7	49.5				ug/L	3	Standard
	Kr	83	2.0	0.0				ug/L	5	Standard
	Br	81	1546.7	5.6				ug/L	1367	Standard
	P	31	101.7	33.5				ug/L	67	Standard
	S	34	90.0	9.6				ug/L	55	Standard
	Sr	88	105.0	21.8				ug/L	113	Standard
	C	12	290.0	6.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	10.0					mg/L	10	Standard
	Dy	164	11.9	124.5				mg/L	18	Standard
	Ho-1	165	16.7	75.5				mg/L	23	Standard
	Er	166	30.0	33.3				mg/L	40	Standard
	I	127	3605.4	4.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		102.958	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		98.441	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	110.068
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	103.712
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: PBW 10 WG588019-02
Sample Date/Time: Thursday, October 20, 2016 15:47:21
Number of Replicates: 3
Autosampler Position: 327
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	80552.3	5.2				ug/L	76335	Standard
	Be	9	11.7	49.5	**0.0071**	0.005	72.4	ug/L	18	Standard
	Al	27	348.3	15.7	**-0.0017**	0.001	33.8	ug/L	810	Standard
	Sc	45	21825.7	3.4				ug/L	22700	Standard
	Ti	47	23.3	12.4	**-0.0204**	0.017	82.9	ug/L	25	Standard
	V	51	-2682.7	6.8	**-0.6106**	0.033	5.3	ug/L	1541	Standard
	Cr	52	8690.8	2.9	**0.1644**	0.010	6.3	ug/L	7881	Standard
	Cr	53	17692.0	3.2	**20.5102**	0.706	3.4	ug/L	932	Standard
	Mn	55	1155.4	3.2	**0.0215**	0.006	27.4	ug/L	1508	Standard
	Co	59	235.3	2.4	**-0.0066**	0.000	4.1	ug/L	282	Standard
	Ni	60	79.7	5.2	**-0.0016**	0.003	207.9	ug/L	91	Standard
	Cu	65	139.0	9.4	**0.0100**	0.006	59.6	ug/L	205	Standard
	Zn	66	1178.0	4.6	**1.0122**	0.046	4.5	ug/L	369	Standard
>	**Ge**	72	475288.4	3.3				ug/L	496734	Standard
	As	75	-43.9	70.7	**0.0157**	0.031	195.0	ug/L	-45	Standard
	Se	82	20.3	4.6	**0.0152**	0.004	25.8	ug/L	18	Standard
	Se-1	77	657.7	6.5	**9.1845**	0.612	6.7	ug/L	83	Standard
>	**Ga**	71	31.7	24.1				mg/L	30	Standard
	Rb	85	21.7	35.3				ug/L	23	Standard
	Y	89	385987.2	1.6				ug/L	405333	Standard
>	**Rh**	103	11.7	89.2				ug/L	17	Standard
	Mo	98	16.0	15.9	**-0.0170**	0.001	4.6	ug/L	135	Standard
	Ag	107	103.3	12.9	**-0.0081**	0.002	19.6	ug/L	123	Standard
	Cd	111	5.6	36.8	**-0.0065**	0.001	16.7	mg/L	11	Standard
	Cd	114	19.9	80.0	**-0.0030**	0.003	92.3	ug/L	56	Standard
>	**In**	115	667440.2	3.3				ug/L	634401	Standard
	Sn	118	65.7	9.3	**-0.0262**	0.005	18.3	ug/L	137	Standard
	Sb	123	855.9	47.6	**0.0851**	0.070	82.7	ug/L	907	Standard
	Ba	135	29.7	12.8	**-0.0370**	0.002	4.3	ug/L	166	Standard
	Ce	140	38.3	27.2				ug/L	57	Standard
>	**Tb**	159	1380197.1	2.4				ug/L	1347540	Standard
	Ho	165	23.3	32.7				ug/L	23	Standard
	Tl	203	243.3	2.9	**0.0158**	0.001	6.5	ug/L	45	Standard
	Tl	205	601.7	10.8	**0.0191**	0.003	14.0	ug/L	112	Standard
	Pb	206	538.7	12.6	**0.0048**	0.007	139.0	ug/L	825	Standard
	Pb	207	452.3	4.9	**0.0078**	0.003	32.3	ug/L	679	Standard
	Pb	208	2113.1	4.6	**0.0048**	0.002	46.0	ug/L	3166	Standard
	U	238	39.7	40.8	**-0.0006**	0.001	92.2	ug/L	119	Standard
>	**Bi**	209	680290.2	2.1				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	43.3	33.3	**-0.0288**	0.025	86.0	mg/L	48	Standard
|	**K**	39	15.0	57.7	**0.0296**	0.091	308.2	mg/L	8	Standard
|	**Ca**	43	41.7	60.4	**3.7474**	9.425	251.5	mg/L	27	Standard
|	**Fe**	54	122.1	22.3	**0.0044**	0.029	663.4	mg/L	121	Standard
|	**Fe**	57	305.0	16.6	**-0.0821**	0.170	206.6	mg/L	305	Standard
⌊>	**Sc-1**	45	21825.7	3.4				mg/L	22700	Standard
	Cl	35	5.3	78.1				ug/L	3	Standard
	Kr	83	3.0	57.7				ug/L	5	Standard
	Br	81	1393.4	6.1				ug/L	1367	Standard
	P	31	110.0	9.1				ug/L	67	Standard
	S	34	98.3	33.1				ug/L	55	Standard
	Sr	88	128.3	17.6				ug/L	113	Standard
	C	12	273.3	23.5				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	18.7	138.9				mg/L	18	Standard
	Ho-1	165	23.3	32.7				mg/L	23	Standard
	Er	166	26.7	57.3				mg/L	40	Standard
	I	127	3173.7	3.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		105.524	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		95.683	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		105.208
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		101.836
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
V 51 Lower	V	51	

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 15:50:21
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	82539.3	2.3				ug/L	76335	Standard
	Be	9	56552.3	6.0	**47.4254**	2.130	4.5	ug/L	18	Standard
	Al	27	6172908.5	3.4	**45.9518**	1.555	3.4	ug/L	810	Standard
	Sc	45	22424.9	3.0				ug/L	22700	Standard
	Ti	47	20633.7	4.3	**99.6542**	1.880	1.9	ug/L	25	Standard
	V	51	363110.4	4.0	**50.2100**	0.334	0.7	ug/L	1541	Standard
	Cr	52	346477.7	3.8	**50.5825**	0.575	1.1	ug/L	7881	Standard
	Cr	53	44933.2	2.6	**51.7266**	1.392	2.7	ug/L	932	Standard
	Mn	55	578252.0	4.9	**50.9205**	0.822	1.6	ug/L	1508	Standard
	Co	59	476560.3	4.4	**50.5068**	0.544	1.1	ug/L	282	Standard
	Ni	60	102820.2	3.0	**50.4602**	0.301	0.6	ug/L	91	Standard
	Cu	65	99088.9	3.4	**49.5616**	0.459	0.9	ug/L	205	Standard
	Zn	66	51764.7	3.5	**50.3988**	0.138	0.3	ug/L	369	Standard
>	Ge	72	493561.2	3.4				ug/L	496734	Standard
	As	75	52573.6	3.2	**51.2085**	0.840	1.6	ug/L	-45	Standard
	Se	82	5143.2	2.6	**52.1064**	0.531	1.0	ug/L	18	Standard
	Se-1	77	3461.7	4.5	**51.2274**	1.074	2.1	ug/L	83	Standard
>	Ga	71	58.3	32.5				mg/L	30	Standard
	Rb	85	686.7	6.6				ug/L	23	Standard
	Y	89	406141.9	4.5				ug/L	405333	Standard
>	Rh	103	55.0	41.7				ug/L	17	Standard
	Mo	98	387245.0	5.2	**96.1233**	2.310	2.4	ug/L	135	Standard
	Ag	107	386108.4	4.5	**50.2669**	0.672	1.3	ug/L	123	Standard
	Cd	111	115040.3	3.4	**51.8442**	0.102	0.2	mg/L	11	Standard
	Cd	114	296514.4	5.1	**51.6003**	1.211	2.3	ug/L	56	Standard
>	In	115	696571.2	3.2				ug/L	634401	Standard
	Sn	118	68883.3	2.0	**51.3893**	1.528	3.0	ug/L	137	Standard
	Sb	123	299535.4	3.9	**51.6553**	0.631	1.2	ug/L	907	Standard
	Ba	135	154268.5	3.9	**49.4717**	1.299	2.6	ug/L	166	Standard
	Ce	140	158.3	24.1				ug/L	57	Standard
>	Tb	159	1415938.6	4.3				ug/L	1347540	Standard
	Ho	165	61.7	32.8				ug/L	23	Standard
	Tl	203	601169.6	3.0	**49.6427**	0.292	0.6	ug/L	45	Standard
	Tl	205	1392731.4	4.1	**47.6031**	0.841	1.8	ug/L	112	Standard
	Pb	206	456378.4	3.5	**50.1723**	0.273	0.5	ug/L	825	Standard
	Pb	207	404543.3	4.6	**50.5199**	0.778	1.5	ug/L	679	Standard
	Pb	208	1826778.3	3.9	**50.2062**	0.202	0.4	ug/L	3166	Standard
	U	238	1611461.4	4.0	**49.1501**	0.452	0.9	ug/L	119	Standard
>	Bi	209	691781.4	3.5				ug/L	668024	Standard

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	Na	23	31.7	36.5	**8.6330**	3.380	39.1	mg/L	0	Standard
	Mg	24	3593.8	5.2	**5.2494**	0.372	7.1	mg/L	48	Standard
	K	39	466.7	7.9	**4.7979**	0.373	7.8	mg/L	8	Standard
	Ca	43	33.3	67.6	**0.1566**	7.488	4783.0	mg/L	27	Standard
	Fe	54	4783.2	5.4	**4.9760**	0.200	4.0	mg/L	121	Standard
	Fe	57	1498.4	8.7	**4.5428**	0.330	7.3	mg/L	305	Standard
>	**Sc-1**	45	22424.9	3.0				mg/L	22700	Standard
	Cl	35	2.7	114.6				ug/L	3	Standard
	Kr	83	3.0	33.3				ug/L	5	Standard
	Br	81	1373.4	14.9				ug/L	1367	Standard
	P	31	106.7	24.1				ug/L	67	Standard
	S	34	115.0	38.6				ug/L	55	Standard
	Sr	88	143.3	38.4				ug/L	113	Standard
	C	12	333.3	18.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	25.7	24.1				mg/L	18	Standard
	Ho-1	165	61.7	32.8				mg/L	23	Standard
	Er	166	20.0	50.0				mg/L	40	Standard
	I	127	3270.4	2.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	94.851		
	Al	27	91.904		
	Sc	45			
	Ti	47	99.654		
	V	51	100.420		
	Cr	52	101.165		
	Cr	53			
	Mn	55	101.841		
	Co	59	101.014		
	Ni	60	100.920		
	Cu	65	99.123		
	Zn	66	100.798		
>	Ge	72		99.361	
	As	75	102.417		
	Se	82	104.213		
	Se-1	77			
>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	96.123		
Ag	107	100.534		
Cd	111	103.688		
Cd	114			
In	115			109.800
Sn	118	102.779		
Sb	123	103.311		
Ba	135	98.943		
Ce	140			
Tb	159			
Ho	165			
Tl	203	99.285		
Tl	205			
Pb	206			
Pb	207			
Pb	208	100.412		
U	238	98.300		
Bi	209			103.556
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 6
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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 15:53:21
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75355.8	6.5				ug/L	76335	Standard
	Be	9	11.7	65.5	**0.0078**	0.008	95.7	ug/L	18	Standard
	Al	27	365.0	12.2	**-0.0014**	0.000	32.4	ug/L	810	Standard
	Sc	45	20759.2	4.7				ug/L	22700	Standard
	Ti	47	19.7	28.0	**-0.0374**	0.026	70.7	ug/L	25	Standard
	V	51	1279.3	4.7	**-0.0350**	0.007	20.9	ug/L	1541	Standard
	Cr	52	6995.6	2.3	**-0.0777**	0.006	8.3	ug/L	7881	Standard
	Cr	53	980.0	4.5	**0.1376**	0.080	57.9	ug/L	932	Standard
	Mn	55	1251.4	2.3	**0.0324**	0.002	6.4	ug/L	1508	Standard
	Co	59	248.7	7.3	**-0.0046**	0.003	60.1	ug/L	282	Standard
	Ni	60	84.3	2.5	**0.0016**	0.001	63.2	ug/L	91	Standard
	Cu	65	160.0	4.1	**0.0225**	0.002	6.8	ug/L	205	Standard
	Zn	66	243.7	10.7	**0.0684**	0.022	31.5	ug/L	369	Standard
>	Ge	72	466257.2	2.6				ug/L	496734	Standard
	As	75	-33.2	2.0	**0.0252**	0.001	4.1	ug/L	-45	Standard
	Se	82	21.6	34.0	**0.0324**	0.074	230.1	ug/L	18	Standard
	Se-1	77	88.7	5.3	**0.2668**	0.048	18.1	ug/L	83	Standard
>	Ga	71	20.0	25.0				mg/L	30	Standard
	Rb	85	13.3	78.1				ug/L	23	Standard
	Y	89	386403.3	2.2				ug/L	405333	Standard
>	Rh	103	13.3	43.3				ug/L	17	Standard
	Mo	98	256.0	2.5	**0.0462**	0.001	1.5	ug/L	135	Standard
	Ag	107	112.0	7.6	**-0.0067**	0.002	24.4	ug/L	123	Standard
	Cd	111	6.3	45.4	**-0.0061**	0.001	20.4	mg/L	11	Standard
	Cd	114	40.2	40.9	**0.0008**	0.003	370.3	ug/L	56	Standard
>	In	115	658052.0	3.2				ug/L	634401	Standard
	Sn	118	178.7	33.6	**0.0639**	0.049	76.2	ug/L	137	Standard
	Sb	123	2972.8	41.5	**0.4749**	0.229	48.2	ug/L	907	Standard
	Ba	135	68.7	2.2	**-0.0236**	0.001	5.2	ug/L	166	Standard
	Ce	140	31.7	39.7				ug/L	57	Standard
>	Tb	159	1328250.1	2.8				ug/L	1347540	Standard
	Ho	165	13.3	78.1				ug/L	23	Standard
	Tl	203	50.0	19.1	**-0.0003**	0.001	298.4	ug/L	45	Standard
	Tl	205	131.7	22.9	**0.0028**	0.001	35.1	ug/L	112	Standard
	Pb	206	516.7	10.8	**0.0036**	0.005	133.7	ug/L	825	Standard
	Pb	207	413.7	4.5	**0.0040**	0.001	16.8	ug/L	679	Standard
	Pb	208	1992.7	5.3	**0.0025**	0.001	48.6	ug/L	3166	Standard
	U	238	94.3	35.2	**0.0012**	0.001	88.3	ug/L	119	Standard
>	Bi	209	666303.8	3.3				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**0.9656**	0.834	86.3	mg/L	0	Standard
|	**Mg**	24	46.7	16.4	**-0.0208**	0.009	41.9	mg/L	48	Standard
|	**K**	39	21.7	113.8	**0.1196**	0.293	245.4	mg/L	8	Standard
|	**Ca**	43	21.7	74.2	**-3.0301**	6.242	206.0	mg/L	27	Standard
|	**Fe**	54	99.3	15.1	**-0.0149**	0.018	120.5	mg/L	121	Standard
|	**Fe**	57	306.7	3.8	**-0.0064**	0.097	1522.6	mg/L	305	Standard
⌊>	**Sc-1**	45	20759.2	4.7				mg/L	22700	Standard
	Cl	35	4.7	49.5				ug/L	3	Standard
	Kr	83	3.0	66.7				ug/L	5	Standard
	Br	81	1323.4	5.1				ug/L	1367	Standard
	P	31	103.3	5.6				ug/L	67	Standard
	S	34	98.3	19.3				ug/L	55	Standard
	Sr	88	133.3	25.0				ug/L	113	Standard
	C	12	203.3	7.5				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	5.2	205.1				mg/L	18	Standard
	Ho-1	165	13.3	78.1				mg/L	23	Standard
	Er	166	30.0	66.7				mg/L	40	Standard
	I	127	3165.3	2.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.865	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	103.728
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	99.742
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	

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Method 6020 - Summary Report

Sample ID: LCSW 10 WG588019-03
Sample Date/Time: Thursday, October 20, 2016 15:56:21
Number of Replicates: 3
Autosampler Position: 328
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	77479.3	1.2				ug/L	76335	Standard
	Be	9	606.7	2.5	**0.5392**	0.008	1.5	ug/L	18	Standard
	Al	27	117978.2	4.5	**0.9309**	0.032	3.5	ug/L	810	Standard
	Sc	45	21775.6	3.6				ug/L	22700	Standard
	Ti	47	2029.8	7.2	**10.0695**	0.594	5.9	ug/L	25	Standard
	V	51	66621.7	5.3	**9.3995**	0.353	3.8	ug/L	1541	Standard
	Cr	52	39892.5	2.8	**5.0153**	0.095	1.9	ug/L	7881	Standard
	Cr	53	24256.3	14.1	**28.5217**	3.753	13.2	ug/L	932	Standard
	Mn	55	59523.5	4.7	**5.3768**	0.176	3.3	ug/L	1508	Standard
	Co	59	18669.8	3.7	**2.0270**	0.044	2.2	ug/L	282	Standard
	Ni	60	10022.7	4.1	**5.0770**	0.146	2.9	ug/L	91	Standard
	Cu	65	10168.1	3.3	**5.2334**	0.090	1.7	ug/L	205	Standard
	Zn	66	11364.6	3.6	**11.3663**	0.268	2.4	ug/L	369	Standard
>	Ge	72	474495.5	1.6				ug/L	496734	Standard
	As	75	3967.2	2.3	**4.0734**	0.026	0.6	ug/L	-45	Standard
	Se	82	406.7	8.8	**4.1009**	0.343	8.4	ug/L	18	Standard
	Se-1	77	1189.0	8.9	**17.5521**	1.423	8.1	ug/L	83	Standard
>	Ga	71	41.7	6.9				mg/L	30	Standard
	Rb	85	113.3	15.5				ug/L	23	Standard
	Y	89	380353.8	4.2				ug/L	405333	Standard
>	Rh	103	48.3	41.8				ug/L	17	Standard
	Mo	98	35875.1	3.0	**9.8002**	0.140	1.4	ug/L	135	Standard
	Ag	107	27299.3	3.6	**3.8977**	0.073	1.9	ug/L	123	Standard
	Cd	111	985.1	3.1	**0.4803**	0.009	1.8	mg/L	11	Standard
	Cd	114	4332.3	5.5	**0.8244**	0.024	2.9	ug/L	56	Standard
>	In	115	631977.4	2.8				ug/L	634401	Standard
	Sn	118	12739.7	5.6	**10.4034**	0.294	2.8	ug/L	137	Standard
	Sb	123	68136.7	3.6	**12.9003**	0.218	1.7	ug/L	907	Standard
	Ba	135	29832.0	1.9	**10.5092**	0.166	1.6	ug/L	166	Standard
	Ce	140	58.3	64.3				ug/L	57	Standard
>	Tb	159	1339945.7	2.8				ug/L	1347540	Standard
	Ho	165	13.3	21.7				ug/L	23	Standard
	Tl	203	57948.0	3.6	**4.9995**	0.079	1.6	ug/L	45	Standard
	Tl	205	138594.7	3.0	**4.9531**	0.056	1.1	ug/L	112	Standard
	Pb	206	44575.9	3.5	**5.0752**	0.077	1.5	ug/L	825	Standard
	Pb	207	39335.7	2.3	**5.0945**	0.036	0.7	ug/L	679	Standard
	Pb	208	177926.8	2.8	**5.0661**	0.037	0.7	ug/L	3166	Standard
	U	238	39.0	18.5	**-0.0006**	0.000	38.2	ug/L	119	Standard
>	Bi	209	661346.8	2.1				ug/L	668024	Standard

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	Na	23	3.3	173.2	**0.9173**	1.580	172.3	mg/L	0	Standard
	Mg	24	428.3	13.5	**0.5595**	0.079	14.1	mg/L	48	Standard
	K	39	63.3	46.3	**0.5624**	0.335	59.7	mg/L	8	Standard
	Ca	43	21.7	13.3	**-3.4865**	1.335	38.3	mg/L	27	Standard
	Fe	54	166.8	10.3	**0.0536**	0.013	24.0	mg/L	121	Standard
	Fe	57	293.3	13.7	**-0.1253**	0.131	104.2	mg/L	305	Standard
>	**Sc-1**	45	21775.6	3.6				mg/L	22700	Standard
	Cl	35	4.7	99.0				ug/L	3	Standard
	Kr	83	3.3	34.6				ug/L	5	Standard
	Br	81	1206.7	15.9				ug/L	1367	Standard
	P	31	90.0	11.1				ug/L	67	Standard
	S	34	101.7	14.2				ug/L	55	Standard
	Sr	88	161.7	32.5				ug/L	113	Standard
	C	12	223.3	33.6				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	173.2				mg/L	10	Standard
	Dy	164	15.5	96.0				mg/L	18	Standard
	Ho-1	165	13.3	21.7				mg/L	23	Standard
	Er	166	23.3	65.5				mg/L	40	Standard
	I	127	2793.6	7.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		101.499	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		95.523	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	99.618
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	99.000
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: F BLANK WG587809-01
Sample Date/Time: Thursday, October 20, 2016 15:59:21
Number of Replicates: 3
Autosampler Position: 329
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75461.8	9.0				ug/L	76335	Standard
	Be	9	13.3	78.1	**0.0088**	0.008	93.1	ug/L	18	Standard
	Al	27	363.3	4.8	**-0.0014**	0.000	21.2	ug/L	810	Standard
	Sc	45	20318.6	5.0				ug/L	22700	Standard
	Ti	47	19.3	34.4	**-0.0389**	0.030	76.3	ug/L	25	Standard
	V	51	-1621.7	25.8	**-0.4655**	0.070	15.0	ug/L	1541	Standard
	Cr	52	7856.0	4.7	**0.0687**	0.006	8.4	ug/L	7881	Standard
	Cr	53	12139.9	2.5	**14.1510**	0.346	2.4	ug/L	932	Standard
	Mn	55	1058.0	8.8	**0.0151**	0.006	36.7	ug/L	1508	Standard
	Co	59	229.7	5.2	**-0.0065**	0.001	11.4	ug/L	282	Standard
	Ni	60	127.0	13.8	**0.0243**	0.009	35.8	ug/L	91	Standard
	Cu	65	117.3	14.6	**0.0003**	0.007	2416.0	ug/L	205	Standard
	Zn	66	1336.1	6.3	**1.2095**	0.028	2.3	ug/L	369	Standard
>	Ge	72	462355.6	4.2				ug/L	496734	Standard
	As	75	-95.2	31.8	**-0.0393**	0.031	78.0	ug/L	-45	Standard
	Se	82	15.8	20.4	**-0.0269**	0.040	147.9	ug/L	18	Standard
	Se-1	77	569.3	1.1	**8.0570**	0.441	5.5	ug/L	83	Standard
>	Ga	71	23.3	32.7				mg/L	30	Standard
	Rb	85	26.7	28.6				ug/L	23	Standard
	Y	89	386601.9	3.3				ug/L	405333	Standard
>	Rh	103	16.7	17.3				ug/L	17	Standard
	Mo	98	72.6	11.4	**-0.0016**	0.002	157.4	ug/L	135	Standard
	Ag	107	99.3	9.1	**-0.0081**	0.002	22.5	ug/L	123	Standard
	Cd	111	8.6	6.9	**-0.0049**	0.000	5.7	mg/L	11	Standard
	Cd	114	30.6	9.1	**-0.0008**	0.001	96.7	ug/L	56	Standard
>	In	115	641916.9	4.2				ug/L	634401	Standard
	Sn	118	101.0	5.5	**0.0046**	0.008	164.3	ug/L	137	Standard
	Sb	123	559.3	38.2	**0.0371**	0.043	115.6	ug/L	907	Standard
	Ba	135	30.0	20.3	**-0.0365**	0.002	5.2	ug/L	166	Standard
	Ce	140	35.0	49.5				ug/L	57	Standard
>	Tb	159	1317047.1	4.1				ug/L	1347540	Standard
	Ho	165	8.3	69.3				ug/L	23	Standard
	Tl	203	238.7	9.3	**0.0160**	0.002	10.6	ug/L	45	Standard
	Tl	205	586.7	8.4	**0.0192**	0.002	10.5	ug/L	112	Standard
	Pb	206	524.0	4.0	**0.0053**	0.005	103.6	ug/L	825	Standard
	Pb	207	452.0	3.1	**0.0096**	0.004	40.2	ug/L	679	Standard
	Pb	208	2037.1	1.5	**0.0045**	0.003	74.7	ug/L	3166	Standard
	U	238	13.3	18.9	**-0.0014**	0.000	6.9	ug/L	119	Standard
>	Bi	209	659917.8	5.4				ug/L	668024	Standard

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⌈	**Na**	23	3.3	86.6	**0.9898**	0.855	86.4	mg/L	0	Standard
|	**Mg**	24	1873.4	2.7	**2.9801**	0.124	4.2	mg/L	48	Standard
|	**K**	39	10.0	86.6	**-0.0142**	0.105	739.2	mg/L	8	Standard
|	**Ca**	43	41.7	18.3	**4.7840**	3.504	73.2	mg/L	27	Standard
|	**Fe**	54	107.3	33.6	**-0.0023**	0.047	2065.2	mg/L	121	Standard
|	**Fe**	57	276.7	10.3	**-0.1112**	0.095	85.8	mg/L	305	Standard
⌊>	**Sc-1**	45	20318.6	5.0				mg/L	22700	Standard
	Cl	35	3.3	69.3				ug/L	3	Standard
	Kr	83	4.7	12.4				ug/L	5	Standard
	Br	81	1266.7	10.2				ug/L	1367	Standard
	P	31	93.3	45.6				ug/L	67	Standard
	S	34	75.0	48.1				ug/L	55	Standard
	Sr	88	166.7	15.1				ug/L	113	Standard
	C	12	366.7	16.4				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	22.2	69.7				mg/L	18	Standard
	Ho-1	165	8.3	69.3				mg/L	23	Standard
	Er	166	23.3	24.7				mg/L	40	Standard
	I	127	2851.9	3.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		98.856	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.079	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	101.185
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	98.786
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
V 51 Lower	V	51	

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Method 6020 - Summary Report

Sample ID: F BLANK WG587809-02
Sample Date/Time: Thursday, October 20, 2016 16:02:20
Number of Replicates: 3
Autosampler Position: 330
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	72285.6	5.0				ug/L	76335	Standard
	Be	9	10.0		**0.0066**	0.000	7.4	ug/L	18	Standard
	Al	27	385.0	17.0	**-0.0011**	0.001	52.9	ug/L	810	Standard
	Sc	45	20320.3	2.4				ug/L	22700	Standard
	Ti	47	20.3	37.2	**-0.0315**	0.038	119.5	ug/L	25	Standard
	V	51	-1850.7	20.4	**-0.5026**	0.058	11.5	ug/L	1541	Standard
	Cr	52	7516.2	2.2	**0.0361**	0.011	30.9	ug/L	7881	Standard
	Cr	53	13310.8	2.6	**15.9154**	0.605	3.8	ug/L	932	Standard
	Mn	55	1043.4	4.4	**0.0156**	0.004	28.8	ug/L	1508	Standard
	Co	59	231.7	9.3	**-0.0058**	0.003	50.0	ug/L	282	Standard
	Ni	60	77.7	18.8	**-0.0007**	0.008	1146.9	ug/L	91	Standard
	Cu	65	147.3	13.4	**0.0178**	0.009	52.1	ug/L	205	Standard
	Zn	66	1239.1	4.0	**1.1332**	0.075	6.6	ug/L	369	Standard
>	Ge	72	454208.5	1.7				ug/L	496734	Standard
	As	75	-31.1	91.3	**0.0262**	0.030	115.4	ug/L	-45	Standard
	Se	82	12.4	46.7	**-0.0631**	0.061	96.7	ug/L	18	Standard
	Se-1	77	539.7	2.8	**7.7261**	0.388	5.0	ug/L	83	Standard
>	Ga	71	25.0	52.9				mg/L	30	Standard
	Rb	85	16.7	96.4				ug/L	23	Standard
	Y	89	369471.3	1.6				ug/L	405333	Standard
>	Rh	103	18.3	15.7				ug/L	17	Standard
	Mo	98	38.2	26.8	**-0.0105**	0.003	24.8	ug/L	135	Standard
	Ag	107	95.7	6.7	**-0.0081**	0.001	17.1	ug/L	123	Standard
	Cd	111	6.3	18.2	**-0.0060**	0.000	8.2	mg/L	11	Standard
	Cd	114	32.7	0.8	**-0.0002**	0.000	97.0	ug/L	56	Standard
>	In	115	620416.8	3.0				ug/L	634401	Standard
	Sn	118	87.3	11.8	**-0.0041**	0.009	228.9	ug/L	137	Standard
	Sb	123	406.3	47.1	**0.0101**	0.036	359.8	ug/L	907	Standard
	Ba	135	25.7	13.7	**-0.0377**	0.001	3.5	ug/L	166	Standard
	Ce	140	31.7	9.1				ug/L	57	Standard
>	Tb	159	1299950.0	3.8				ug/L	1347540	Standard
	Ho	165	15.0	0.0				ug/L	23	Standard
	Tl	203	245.0	7.0	**0.0171**	0.002	10.0	ug/L	45	Standard
	Tl	205	550.0	12.7	**0.0183**	0.003	14.4	ug/L	112	Standard
	Pb	206	560.7	4.9	**0.0109**	0.005	45.7	ug/L	825	Standard
	Pb	207	454.0	4.7	**0.0111**	0.002	17.6	ug/L	679	Standard
	Pb	208	2089.4	1.2	**0.0073**	0.002	32.0	ug/L	3166	Standard
	U	238	23.3	35.9	**-0.0010**	0.000	26.1	ug/L	119	Standard
>	Bi	209	645280.1	3.1				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	53.3	5.4	**-0.0079**	0.006	80.9	mg/L	48	Standard
|	**K**	39	6.7	43.3	**-0.0542**	0.036	66.1	mg/L	8	Standard
|	**Ca**	43	33.3	34.6	**1.5176**	4.480	295.2	mg/L	27	Standard
|	**Fe**	54	110.8	48.1	**0.0005**	0.060	11085.7	mg/L	121	Standard
|	**Fe**	57	296.7	12.8	**-0.0255**	0.143	558.6	mg/L	305	Standard
⌊>	**Sc-1**	45	20320.3	2.4				mg/L	22700	Standard
	Cl	35	6.0	100.0				ug/L	3	Standard
	Kr	83	4.7	65.5				ug/L	5	Standard
	Br	81	1160.0	10.5				ug/L	1367	Standard
	P	31	63.3	18.2				ug/L	67	Standard
	S	34	93.3	24.2				ug/L	55	Standard
	Sr	88	123.3	6.2				ug/L	113	Standard
	C	12	423.3	16.8				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	173.2				mg/L	10	Standard
	Dy	164	9.2	108.7				mg/L	18	Standard
	Ho-1	165	15.0	0.0				mg/L	23	Standard
	Er	166	16.7	34.6				mg/L	40	Standard
	I	127	2890.3	6.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		94.695	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		91.439	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	97.796
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	96.595
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
V 51 Lower	V	51	

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Method 6020 - Summary Report

Sample ID: L1610068501 WG588019-01
Sample Date/Time: Thursday, October 20, 2016 16:05:19
Number of Replicates: 3
Autosampler Position: 331
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78868.6	6.1				ug/L	76335	Standard
	Be	9	13.3	21.7	**0.0087**	0.003	29.4	ug/L	18	Standard
	Al	27	1025.0	5.5	**0.0036**	0.000	7.4	ug/L	810	Standard
	Sc	45	21685.5	2.4				ug/L	22700	Standard
	Ti	47	16.0	16.5	**-0.0574**	0.013	21.9	ug/L	25	Standard
	V	51	-1987.7	6.2	**-0.5108**	0.018	3.5	ug/L	1541	Standard
	Cr	52	7807.0	4.5	**0.0307**	0.034	111.4	ug/L	7881	Standard
	Cr	53	13370.9	4.9	**15.2776**	0.553	3.6	ug/L	932	Standard
	Mn	55	110597.7	2.4	**10.0815**	0.112	1.1	ug/L	1508	Standard
	Co	59	462.0	8.1	**0.0185**	0.003	17.5	ug/L	282	Standard
	Ni	60	4747.1	2.1	**2.3866**	0.014	0.6	ug/L	91	Standard
	Cu	65	184.7	10.1	**0.0340**	0.008	23.6	ug/L	205	Standard
	Zn	66	1677.1	0.9	**1.5241**	0.016	1.0	ug/L	369	Standard
>	Ge	72	473756.8	1.8				ug/L	496734	Standard
	As	75	-90.4	33.1	**-0.0319**	0.029	91.2	ug/L	-45	Standard
	Se	82	16.2	41.4	**-0.0277**	0.068	246.3	ug/L	18	Standard
	Se-1	77	559.7	8.5	**7.6641**	0.597	7.8	ug/L	83	Standard
>	Ga	71	28.3	44.4				mg/L	30	Standard
	Rb	85	35.0	28.6				ug/L	23	Standard
	Y	89	382776.2	2.1				ug/L	405333	Standard
>	Rh	103	11.7	49.5				ug/L	17	Standard
	Mo	98	206.3	9.0	**0.0330**	0.004	12.0	ug/L	135	Standard
	Ag	107	108.0	6.5	**-0.0073**	0.001	11.5	ug/L	123	Standard
	Cd	111	8.4	48.1	**-0.0052**	0.002	35.8	mg/L	11	Standard
	Cd	114	28.1	17.0	**-0.0014**	0.001	66.3	ug/L	56	Standard
>	In	115	658618.5	2.4				ug/L	634401	Standard
	Sn	118	71.3	16.7	**-0.0209**	0.011	51.1	ug/L	137	Standard
	Sb	123	373.9	32.3	**-0.0000**	0.02<220	320.2	ug/L	907	Standard
	Ba	135	72.7	9.4	**-0.0223**	0.003	11.5	ug/L	166	Standard
	Ce	140	53.3	28.6				ug/L	57	Standard
>	Tb	159	1356977.0	2.1				ug/L	1347540	Standard
	Ho	165	21.7	35.3				ug/L	23	Standard
	Tl	203	219.0	5.5	**0.0139**	0.001	9.5	ug/L	45	Standard
	Tl	205	553.3	4.5	**0.0176**	0.001	6.9	ug/L	112	Standard
	Pb	206	546.3	1.2	**0.0063**	0.002	31.7	ug/L	825	Standard
	Pb	207	486.3	6.2	**0.0126**	0.004	35.0	ug/L	679	Standard
	Pb	208	2182.4	2.8	**0.0072**	0.000	2.5	ug/L	3166	Standard
	U	238	24.0	21.7	**-0.0010**	0.000	15.9	ug/L	119	Standard
>	Bi	209	675233.7	2.6				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4820**	0.826	171.4	mg/L	0	Standard
|	**Mg**	24	1980.1	3.6	**2.9465**	0.052	1.8	mg/L	48	Standard
|	**K**	39	6.7	43.3	**-0.0601**	0.029	49.1	mg/L	8	Standard
|	**Ca**	43	41.7	18.3	**3.7321**	3.092	82.9	mg/L	27	Standard
|	**Fe**	54	566.0	11.5	**0.4967**	0.087	17.4	mg/L	121	Standard
|	**Fe**	57	416.7	8.5	**0.3788**	0.115	30.3	mg/L	305	Standard
⌊>	**Sc-1**	45	21685.5	2.4				mg/L	22700	Standard
	Cl	35	4.7	49.5				ug/L	3	Standard
	Kr	83	3.3	62.4				ug/L	5	Standard
	Br	81	1290.1	13.2				ug/L	1367	Standard
	P	31	78.3	25.8				ug/L	67	Standard
	S	34	90.0	27.8				ug/L	55	Standard
	Sr	88	138.3	16.3				ug/L	113	Standard
	C	12	430.0	45.4				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	8.6	105.6				mg/L	18	Standard
	Ho-1	165	21.7	35.3				mg/L	23	Standard
	Er	166	30.0	66.7				mg/L	40	Standard
	I	127	2845.3	9.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		103.319	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		95.374	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		103.817
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		101.079
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
V 51 Lower	V	51	

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Method 6020 - Summary Report

Sample ID: L1610068501S WG588019-04
Sample Date/Time: Thursday, October 20, 2016 16:08:17
Number of Replicates: 3
Autosampler Position: 332
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78225.0	4.2				ug/L	76335	Standard
	Be	9	480.0	1.0	**0.4225**	0.022	5.3	ug/L	18	Standard
	Al	27	106003.0	8.5	**0.8275**	0.045	5.5	ug/L	810	Standard
	Sc	45	21027.9	1.9				ug/L	22700	Standard
	Ti	47	1838.1	6.0	**9.0475**	0.291	3.2	ug/L	25	Standard
	V	51	59694.0	6.9	**8.3419**	0.339	4.1	ug/L	1541	Standard
	Cr	52	37626.8	5.4	**4.6245**	0.147	3.2	ug/L	7881	Standard
	Cr	53	26616.7	5.9	**31.2230**	0.996	3.2	ug/L	932	Standard
	Mn	55	155895.3	4.6	**14.1300**	0.227	1.6	ug/L	1508	Standard
	Co	59	17352.6	4.6	**1.8696**	0.032	1.7	ug/L	282	Standard
	Ni	60	13667.5	3.2	**6.8962**	0.018	0.3	ug/L	91	Standard
	Cu	65	9363.2	4.0	**4.7844**	0.114	2.4	ug/L	205	Standard
	Zn	66	10677.8	3.7	**10.6010**	0.080	0.8	ug/L	369	Standard
>	Ge	72	477467.8	3.0				ug/L	496734	Standard
	As	75	3717.9	4.3	**3.7970**	0.050	1.3	ug/L	-45	Standard
	Se	82	371.2	5.1	**3.7018**	0.134	3.6	ug/L	18	Standard
	Se-1	77	1186.0	3.7	**17.4082**	0.730	4.2	ug/L	83	Standard
>	Ga	71	41.7	30.2				mg/L	30	Standard
	Rb	85	106.7	7.2				ug/L	23	Standard
	Y	89	370342.2	3.8				ug/L	405333	Standard
>	Rh	103	33.3	31.2				ug/L	17	Standard
	Mo	98	33005.2	2.3	**9.1040**	0.098	1.1	ug/L	135	Standard
	Ag	107	25216.7	4.1	**3.6334**	0.036	1.0	ug/L	123	Standard
	Cd	111	970.5	5.1	**0.4777**	0.019	3.9	mg/L	11	Standard
	Cd	114	3845.9	5.6	**0.7383**	0.024	3.2	ug/L	56	Standard
>	In	115	625916.5	3.4				ug/L	634401	Standard
	Sn	118	11854.0	6.3	**9.7677**	0.301	3.1	ug/L	137	Standard
	Sb	123	62772.3	5.1	**11.9912**	0.218	1.8	ug/L	907	Standard
	Ba	135	27082.6	5.9	**9.6224**	0.311	3.2	ug/L	166	Standard
	Ce	140	53.3	19.5				ug/L	57	Standard
>	Tb	159	1338162.3	4.6				ug/L	1347540	Standard
	Ho	165	21.7	70.5				ug/L	23	Standard
	Tl	203	53524.2	5.2	**4.6875**	0.101	2.1	ug/L	45	Standard
	Tl	205	129998.1	5.5	**4.7154**	0.117	2.5	ug/L	112	Standard
	Pb	206	40793.6	4.5	**4.7116**	0.068	1.4	ug/L	825	Standard
	Pb	207	35627.9	5.5	**4.6790**	0.116	2.5	ug/L	679	Standard
	Pb	208	162306.9	4.6	**4.6874**	0.076	1.6	ug/L	3166	Standard
	U	238	29.3	66.9	**-0.0008**	0.001	81.5	ug/L	119	Standard
>	Bi	209	651334.4	3.1				ug/L	668024	Standard

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	Na	23	5.0	173.2	**1.4211**	2.453	172.6	mg/L	0	Standard
	Mg	24	2125.2	10.9	**3.2683**	0.310	9.5	mg/L	48	Standard
	K	39	28.3	10.2	**0.1864**	0.028	15.1	mg/L	8	Standard
	Ca	43	43.3	17.6	**4.7501**	2.685	56.5	mg/L	27	Standard
	Fe	54	610.8	14.7	**0.5650**	0.094	16.6	mg/L	121	Standard
	Fe	57	383.3	17.0	**0.2917**	0.255	87.6	mg/L	305	Standard
>	**Sc-1**	45	21027.9	1.9				mg/L	22700	Standard
	Cl	35	4.0	50.0				ug/L	3	Standard
	Kr	83	4.0	66.1				ug/L	5	Standard
	Br	81	1230.1	5.7				ug/L	1367	Standard
	P	31	98.3	28.0				ug/L	67	Standard
	S	34	100.0	30.4				ug/L	55	Standard
	Sr	88	133.3	5.7				ug/L	113	Standard
	C	12	370.0	35.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	25.5	86.6				mg/L	18	Standard
	Ho-1	165	21.7	70.5				mg/L	23	Standard
	Er	166	23.3	89.2				mg/L	40	Standard
	I	127	2793.6	3.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		102.475	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		96.121	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	98.663
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	97.502
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610068501SD WG588019-05
Sample Date/Time: Thursday, October 20, 2016 16:11:17
Number of Replicates: 3
Autosampler Position: 333
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78310.7	5.9				ug/L	76335	Standard
	Be	9	550.0	10.1	**0.4846**	0.061	12.5	ug/L	18	Standard
	Al	27	116466.9	5.7	**0.9095**	0.012	1.4	ug/L	810	Standard
	Sc	45	21361.7	2.8				ug/L	22700	Standard
	Ti	47	1981.5	2.7	**9.7598**	0.143	1.5	ug/L	25	Standard
	V	51	62942.7	2.7	**8.8058**	0.073	0.8	ug/L	1541	Standard
	Cr	52	39627.5	3.6	**4.9287**	0.020	0.4	ug/L	7881	Standard
	Cr	53	30170.2	8.5	**35.4703**	1.844	5.2	ug/L	932	Standard
	Mn	55	162233.7	3.6	**14.6948**	0.160	1.1	ug/L	1508	Standard
	Co	59	18644.1	2.5	**2.0098**	0.020	1.0	ug/L	282	Standard
	Ni	60	14644.4	4.2	**7.3825**	0.091	1.2	ug/L	91	Standard
	Cu	65	9834.9	0.9	**5.0259**	0.136	2.7	ug/L	205	Standard
	Zn	66	11228.5	2.4	**11.1484**	0.181	1.6	ug/L	369	Standard
>	Ge	72	478044.4	3.5				ug/L	496734	Standard
	As	75	3889.9	4.5	**3.9657**	0.076	1.9	ug/L	-45	Standard
	Se	82	401.7	1.6	**4.0199**	0.081	2.0	ug/L	18	Standard
	Se-1	77	1280.4	1.6	**18.8647**	0.578	3.1	ug/L	83	Standard
>	Ga	71	45.0	29.4				mg/L	30	Standard
	Rb	85	106.7	2.7				ug/L	23	Standard
	Y	89	384752.0	3.9				ug/L	405333	Standard
>	Rh	103	43.3	63.5				ug/L	17	Standard
	Mo	98	35284.9	3.4	**9.8507**	0.128	1.3	ug/L	135	Standard
	Ag	107	26822.7	2.8	**3.9147**	0.064	1.6	ug/L	123	Standard
	Cd	111	973.2	3.0	**0.4851**	0.010	2.1	mg/L	11	Standard
	Cd	114	4085.8	7.0	**0.7939**	0.025	3.1	ug/L	56	Standard
>	In	115	618585.1	4.4				ug/L	634401	Standard
	Sn	118	12419.8	4.3	**10.3680**	0.190	1.8	ug/L	137	Standard
	Sb	123	65810.2	3.9	**12.7320**	0.137	1.1	ug/L	907	Standard
	Ba	135	28340.8	2.7	**10.2014**	0.171	1.7	ug/L	166	Standard
	Ce	140	68.3	11.2				ug/L	57	Standard
>	Tb	159	1305389.2	3.2				ug/L	1347540	Standard
	Ho	165	10.0	132.3				ug/L	23	Standard
	Tl	203	56550.1	3.1	**4.9705**	0.047	0.9	ug/L	45	Standard
	Tl	205	134141.6	3.4	**4.8831**	0.036	0.7	ug/L	112	Standard
	Pb	206	43279.4	2.4	**5.0201**	0.048	0.9	ug/L	825	Standard
	Pb	207	38122.9	2.9	**5.0287**	0.036	0.7	ug/L	679	Standard
	Pb	208	172156.5	3.0	**4.9925**	0.033	0.7	ug/L	3166	Standard
	U	238	14.0	86.9	**-0.0013**	0.000	29.1	ug/L	119	Standard
>	Bi	209	649344.2	3.3				ug/L	668024	Standard

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⌈	**Na**	23	3.3	173.2	**0.9488**	1.635	172.3	mg/L	0	Standard
|	**Mg**	24	2245.2	5.2	**3.4059**	0.132	3.9	mg/L	48	Standard
|	**K**	39	46.7	40.6	**0.3815**	0.199	52.1	mg/L	8	Standard
|	**Ca**	43	28.3	20.4	**-0.8998**	2.406	267.4	mg/L	27	Standard
|	**Fe**	54	638.8	11.8	**0.5883**	0.105	17.8	mg/L	121	Standard
|	**Fe**	57	423.3	4.8	**0.4321**	0.037	8.6	mg/L	305	Standard
⌊>	**Sc-1**	45	21361.7	2.8				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	5.0	40.0				ug/L	5	Standard
	Br	81	1280.1	19.0				ug/L	1367	Standard
	P	31	96.7	13.0				ug/L	67	Standard
	S	34	93.3	35.7				ug/L	55	Standard
	Sr	88	143.3	12.3				ug/L	113	Standard
	C	12	323.3	9.9				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	22.4	48.1				mg/L	18	Standard
	Ho-1	165	10.0	132.3				mg/L	23	Standard
	Er	166	20.0	132.3				mg/L	40	Standard
	I	127	2656.9	3.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		102.588	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		96.237	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	97.507
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	97.204
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610069801
Sample Date/Time: Thursday, October 20, 2016 16:14:17
Number of Replicates: 3
Autosampler Position: 334
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73739.1	2.7				ug/L	76335	Standard
	Be	9	23.3	81.1	**0.0187**	0.017	92.1	ug/L	18	Standard
	Al	27	1326.7	35.3	**0.0067**	0.004	54.9	ug/L	810	Standard
	Sc	45	20420.4	2.4				ug/L	22700	Standard
	Ti	47	28.7	10.7	**0.0092**	0.018	191.7	ug/L	25	Standard
	V	51	867.3	37.5	**-0.0949**	0.049	52.1	ug/L	1541	Standard
	Cr	52	7427.5	1.2	**-0.0075**	0.033	444.0	ug/L	7881	Standard
	Cr	53	5077.5	13.0	**5.2330**	0.717	13.7	ug/L	932	Standard
	Mn	55	1716.4	7.5	**0.0761**	0.013	16.9	ug/L	1508	Standard
	Co	59	333.7	19.0	**0.0050**	0.007	146.9	ug/L	282	Standard
	Ni	60	246.7	19.1	**0.0862**	0.025	29.0	ug/L	91	Standard
	Cu	65	332.0	4.7	**0.1139**	0.008	7.0	ug/L	205	Standard
	Zn	66	8765.9	0.3	**8.8983**	0.181	2.0	ug/L	369	Standard
>	Ge	72	465637.0	1.7				ug/L	496734	Standard
	As	75	-98.5	132.6	**-0.0407**	0.132	323.6	ug/L	-45	Standard
	Se	82	43.1	8.8	**0.2653**	0.038	14.3	ug/L	18	Standard
	Se-1	77	496.7	7.6	**6.8130**	0.573	8.4	ug/L	83	Standard
>	Ga	71	41.7	38.6				mg/L	30	Standard
	Rb	85	15007.4	1.0				ug/L	23	Standard
	Y	89	383930.7	3.6				ug/L	405333	Standard
>	Rh	103	20.0	50.0				ug/L	17	Standard
	Mo	98	334.1	5.2	**0.0684**	0.003	4.3	ug/L	135	Standard
	Ag	107	121.3	16.3	**-0.0051**	0.002	45.0	ug/L	123	Standard
	Cd	111	13.9	97.6	**-0.0025**	0.006	258.8	mg/L	11	Standard
	Cd	114	80.1	62.5	**0.0084**	0.009	107.7	ug/L	56	Standard
>	In	115	645225.3	2.9				ug/L	634401	Standard
	Sn	118	119.0	38.8	**0.0182**	0.035	193.8	ug/L	137	Standard
	Sb	123	424.3	70.2	**0.0097**	0.053	546.7	ug/L	907	Standard
	Ba	135	14102.2	2.6	**4.8400**	0.045	0.9	ug/L	166	Standard
	Ce	140	63.3	31.9				ug/L	57	Standard
>	Tb	159	1351103.9	0.5				ug/L	1347540	Standard
	Ho	165	31.7	36.5				ug/L	23	Standard
	Tl	203	489.3	69.7	**0.0377**	0.030	79.4	ug/L	45	Standard
	Tl	205	1021.7	75.7	**0.0347**	0.028	80.8	ug/L	112	Standard
	Pb	206	12093.8	3.1	**1.3313**	0.056	4.2	ug/L	825	Standard
	Pb	207	10149.4	2.1	**1.2723**	0.040	3.1	ug/L	679	Standard
	Pb	208	47236.2	2.5	**1.2997**	0.046	3.5	ug/L	3166	Standard
	U	238	224.7	159.7	**0.0054**	0.012	212.9	ug/L	119	Standard
>	Bi	209	664139.7	1.0				ug/L	668024	Standard

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⌈	**Na**	23	8.3	34.6	**2.4897**	0.883	35.5	mg/L	0	Standard
|	**Mg**	24	4242.3	3.3	**6.8328**	0.397	5.8	mg/L	48	Standard
|	**K**	39	385.0	6.7	**4.3307**	0.197	4.5	mg/L	8	Standard
|	**Ca**	43	46.7	37.6	**6.4273**	6.346	98.7	mg/L	27	Standard
|	**Fe**	54	107.4	12.0	**-0.0034**	0.018	516.2	mg/L	121	Standard
|	**Fe**	57	346.7	18.6	**0.1802**	0.246	136.5	mg/L	305	Standard
⌊>	**Sc-1**	45	20420.4	2.4				mg/L	22700	Standard
	Cl	35	3.3	69.3				ug/L	3	Standard
	Kr	83	2.7	43.3				ug/L	5	Standard
	Br	81	1726.8	7.3				ug/L	1367	Standard
	P	31	101.7	7.5				ug/L	67	Standard
	S	34	95.0	13.9				ug/L	55	Standard
	Sr	88	133.3	7.8				ug/L	113	Standard
	C	12	343.3	6.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	8.9	123.5				mg/L	18	Standard
	Ho-1	165	31.7	36.5				mg/L	23	Standard
	Er	166	23.3	99.0				mg/L	40	Standard
	I	127	4087.2	2.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		96.599	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.740	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	101.706
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	99.418
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610069801PS WG588103-01
Sample Date/Time: Thursday, October 20, 2016 16:17:16
Number of Replicates: 3
Autosampler Position: 335
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75680.9	7.5				ug/L	76335	Standard
	Be	9	52383.8	3.3	**48.0700**	3.166	6.6	ug/L	18	Standard
	Al	27	826.7	13.8	**0.0023**	0.000	18.7	ug/L	810	Standard
	Sc	45	21241.6	3.4				ug/L	22700	Standard
	Ti	47	21.3	25.8	**-0.0289**	0.031	107.5	ug/L	25	Standard
	V	51	336718.7	3.1	**48.9751**	0.590	1.2	ug/L	1541	Standard
	Cr	52	321044.5	3.2	**49.2686**	0.488	1.0	ug/L	7881	Standard
	Cr	53	47363.9	0.2	**57.4908**	2.284	4.0	ug/L	932	Standard
	Mn	55	528590.1	3.6	**48.9657**	0.494	1.0	ug/L	1508	Standard
	Co	59	441309.5	3.7	**49.2010**	0.810	1.6	ug/L	282	Standard
	Ni	60	95138.9	2.6	**49.1124**	0.920	1.9	ug/L	91	Standard
	Cu	65	95266.7	2.8	**50.1227**	0.786	1.6	ug/L	205	Standard
	Zn	66	55134.5	3.2	**56.4837**	0.576	1.0	ug/L	369	Standard
>	Ge	72	469387.4	4.1				ug/L	496734	Standard
	As	75	48976.0	2.5	**50.1786**	0.835	1.7	ug/L	-45	Standard
	Se	82	4707.3	2.4	**50.1567**	1.096	2.2	ug/L	18	Standard
	Se-1	77	3674.1	2.1	**57.3472**	1.221	2.1	ug/L	83	Standard
>	Ga	71	56.7	10.2				mg/L	30	Standard
	Rb	85	14663.8	2.8				ug/L	23	Standard
	Y	89	385154.0	4.6				ug/L	405333	Standard
>	Rh	103	48.3	15.8				ug/L	17	Standard
	Mo	98	320.1	1.7	**0.0652**	0.004	6.5	ug/L	135	Standard
	Ag	107	331769.1	2.1	**46.8780**	0.642	1.4	ug/L	123	Standard
	Cd	111	104634.4	2.0	**51.1757**	1.207	2.4	mg/L	11	Standard
	Cd	114	263674.6	2.3	**49.8105**	1.224	2.5	ug/L	56	Standard
>	In	115	642123.5	3.3				ug/L	634401	Standard
	Sn	118	89.7	16.9	**-0.0045**	0.014	312.2	ug/L	137	Standard
	Sb	123	275465.7	3.5	**51.5364**	0.303	0.6	ug/L	907	Standard
	Ba	135	158734.3	1.5	**55.2424**	0.970	1.8	ug/L	166	Standard
	Ce	140	48.3	15.8				ug/L	57	Standard
>	Tb	159	1338734.3	5.2				ug/L	1347540	Standard
	Ho	165	43.3	35.3				ug/L	23	Standard
	Tl	203	559570.6	2.6	**47.7384**	0.826	1.7	ug/L	45	Standard
	Tl	205	1334734.8	1.4	**47.1488**	0.856	1.8	ug/L	112	Standard
	Pb	206	440606.8	2.7	**50.0453**	0.474	0.9	ug/L	825	Standard
	Pb	207	388280.5	2.0	**50.1132**	0.586	1.2	ug/L	679	Standard
	Pb	208	1757044.2	2.6	**49.8962**	0.388	0.8	ug/L	3166	Standard
	U	238	1506100.9	2.3	**47.4692**	0.503	1.1	ug/L	119	Standard
>	Bi	209	669649.5	3.2				ug/L	668024	Standard

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⌈	**Na**	23	35.0	24.7	**9.9721**	2.182	21.9	mg/L	0	Standard
|	**Mg**	24	4334.0	6.3	**6.6988**	0.225	3.4	mg/L	48	Standard
|	**K**	39	375.0	17.9	**4.0687**	0.881	21.6	mg/L	8	Standard
|	**Ca**	43	31.7	39.7	**0.2867**	4.450	1552.0	mg/L	27	Standard
|	**Fe**	54	127.4	17.1	**0.0146**	0.029	199.7	mg/L	121	Standard
|	**Fe**	57	310.0	4.3	**-0.0249**	0.029	115.4	mg/L	305	Standard
⌊>	**Sc-1**	45	21241.6	3.4				mg/L	22700	Standard
	Cl	35	2.0	100.0				ug/L	3	Standard
	Kr	83	5.3	21.7				ug/L	5	Standard
	Br	81	1660.1	5.7				ug/L	1367	Standard
	P	31	83.3	33.0				ug/L	67	Standard
	S	34	80.0	16.5				ug/L	55	Standard
	Sr	88	140.0	6.2				ug/L	113	Standard
	C	12	466.7	8.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	6.7	173.2				mg/L	10	Standard
	Dy	164	22.5	112.0				mg/L	18	Standard
	Ho-1	165	43.3	35.3				mg/L	23	Standard
	Er	166	16.7	69.3				mg/L	40	Standard
	I	127	4040.5	3.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		99.143	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.495	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	101.217
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	100.243
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610069801SDL WG588103-02
Sample Date/Time: Thursday, October 20, 2016 16:20:16
Number of Replicates: 3
Autosampler Position: 336
Sample Description: 250
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78663.9	4.2				ug/L	76335	Standard
	Be	9	16.7	62.4	**0.0115**	0.009	76.1	ug/L	18	Standard
	Al	27	535.0	12.1	**-0.0002**	0.001	398.9	ug/L	810	Standard
	Sc	45	21655.5	6.0				ug/L	22700	Standard
	Ti	47	30.3	31.2	**0.0147**	0.046	314.2	ug/L	25	Standard
	V	51	712.4	9.3	**-0.1201**	0.009	7.6	ug/L	1541	Standard
	Cr	52	7831.4	1.8	**0.0354**	0.041	115.2	ug/L	7881	Standard
	Cr	53	3947.2	1.3	**3.7508**	0.136	3.6	ug/L	932	Standard
	Mn	55	1131.4	5.0	**0.0195**	0.004	19.3	ug/L	1508	Standard
	Co	59	258.7	5.3	**-0.0039**	0.002	49.4	ug/L	282	Standard
	Ni	60	107.7	9.0	**0.0129**	0.006	43.8	ug/L	91	Standard
	Cu	65	167.7	2.7	**0.0252**	0.004	14.1	ug/L	205	Standard
	Zn	66	2740.6	3.7	**2.6080**	0.129	5.0	ug/L	369	Standard
>	Ge	72	473689.7	1.5				ug/L	496734	Standard
	As	75	-40.5	108.8	**0.0180**	0.046	253.6	ug/L	-45	Standard
	Se	82	24.5	31.0	**0.0601**	0.077	128.9	ug/L	18	Standard
	Se-1	77	210.0	7.5	**2.1579**	0.233	10.8	ug/L	83	Standard
>	Ga	71	20.0	50.0				mg/L	30	Standard
	Rb	85	2943.6	5.9				ug/L	23	Standard
	Y	89	388523.9	3.5				ug/L	405333	Standard
>	Rh	103	6.7	114.6				ug/L	17	Standard
	Mo	98	84.2	16.9	**0.0007**	0.004	638.6	ug/L	135	Standard
	Ag	107	127.3	15.3	**-0.0049**	0.003	56.8	ug/L	123	Standard
	Cd	111	11.2	13.5	**-0.0039**	0.001	20.8	mg/L	11	Standard
	Cd	114	36.3	55.5	**0.0000**	0.004	10308.7	ug/L	56	Standard
>	In	115	669396.1	2.2				ug/L	634401	Standard
	Sn	118	75.3	10.8	**-0.0188**	0.007	39.5	ug/L	137	Standard
	Sb	123	2918.4	40.7	**0.4540**	0.209	46.0	ug/L	907	Standard
	Ba	135	2806.9	2.0	**0.8908**	0.028	3.1	ug/L	166	Standard
	Ce	140	35.0	28.6				ug/L	57	Standard
>	Tb	159	1349720.7	2.4				ug/L	1347540	Standard
	Ho	165	8.3	69.3				ug/L	23	Standard
	Tl	203	441.3	4.7	**0.0326**	0.002	5.9	ug/L	45	Standard
	Tl	205	1136.7	6.9	**0.0379**	0.003	7.9	ug/L	112	Standard
	Pb	206	2808.3	2.5	**0.2606**	0.009	3.6	ug/L	825	Standard
	Pb	207	2427.5	1.4	**0.2606**	0.005	1.9	ug/L	679	Standard
	Pb	208	11025.2	0.6	**0.2558**	0.002	0.8	ug/L	3166	Standard
	U	238	155.0	7.4	**0.0030**	0.000	9.8	ug/L	119	Standard
>	Bi	209	676638.9	1.3				ug/L	668024	Standard

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⌈	**Na**	23	6.7	86.6	**1.8912**	1.642	86.8	mg/L	0	Standard
|	**Mg**	24	881.7	9.0	**1.2652**	0.160	12.6	mg/L	48	Standard
|	**K**	39	86.7	14.5	**0.8220**	0.190	23.1	mg/L	8	Standard
|	**Ca**	43	28.3	10.2	**-1.0970**	0.530	48.3	mg/L	27	Standard
|	**Fe**	54	115.9	19.6	**-0.0004**	0.032	8234.3	mg/L	121	Standard
|	**Fe**	57	243.3	16.6	**-0.3134**	0.193	61.6	mg/L	305	Standard
⌊>	**Sc-1**	45	21655.5	6.0				mg/L	22700	Standard
	Cl	35	4.0	50.0				ug/L	3	Standard
	Kr	83	5.0	0.0				ug/L	5	Standard
	Br	81	1433.4	2.2				ug/L	1367	Standard
	P	31	95.0					ug/L	67	Standard
	S	34	81.7	9.4				ug/L	55	Standard
	Sr	88	128.3	42.0				ug/L	113	Standard
	C	12	266.7	26.6				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	0.0					mg/L	10	Standard
	Dy	164	15.5	75.2				mg/L	18	Standard
	Ho-1	165	8.3	69.3				mg/L	23	Standard
	Er	166	23.3	24.7				mg/L	40	Standard
	I	127	3015.3	9.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		103.050	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		95.361	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	105.516
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	101.290
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1610069901
Sample Date/Time: Thursday, October 20, 2016 16:23:14
Number of Replicates: 3
Autosampler Position: 337
Sample Description: 50
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	78198.1	3.7				ug/L	76335	Standard
	Be	9	15.0	33.3	**0.0103**	0.004	41.4	ug/L	18	Standard
	Al	27	861.7	11.0	**0.0024**	0.001	23.2	ug/L	810	Standard
	Sc	45	21495.2	2.6				ug/L	22700	Standard
	Ti	47	20.0	25.0	**-0.0385**	0.025	64.1	ug/L	25	Standard
	V	51	-888.6	95.1	**-0.3495**	0.120	34.3	ug/L	1541	Standard
	Cr	52	8570.8	1.3	**0.1320**	0.009	7.1	ug/L	7881	Standard
	Cr	53	11249.2	7.3	**12.4926**	0.763	6.1	ug/L	932	Standard
	Mn	55	1342.4	3.7	**0.0372**	0.003	7.0	ug/L	1508	Standard
	Co	59	300.0	3.9	**0.0002**	0.001	431.6	ug/L	282	Standard
	Ni	60	298.3	2.1	**0.1083**	0.002	2.1	ug/L	91	Standard
	Cu	65	432.3	6.6	**0.1602**	0.013	8.0	ug/L	205	Standard
	Zn	66	7549.5	1.1	**7.4009**	0.189	2.6	ug/L	369	Standard
>	Ge	72	480221.2	1.7				ug/L	496734	Standard
	As	75	-46.2	183.3	**0.0139**	0.083	600.5	ug/L	-45	Standard
	Se	82	39.4	20.9	**0.2122**	0.079	37.0	ug/L	18	Standard
	Se-1	77	603.7	4.3	**8.2427**	0.551	6.7	ug/L	83	Standard
>	Ga	71	38.3	19.9				mg/L	30	Standard
	Rb	85	12765.4	3.0				ug/L	23	Standard
	Y	89	389290.8	2.1				ug/L	405333	Standard
>	Rh	103	11.7	65.5				ug/L	17	Standard
	Mo	98	288.1	12.0	**0.0548**	0.009	16.9	ug/L	135	Standard
	Ag	107	110.0	24.1	**-0.0069**	0.004	52.7	ug/L	123	Standard
	Cd	111	9.0	33.6	**-0.0049**	0.001	29.8	mg/L	11	Standard
	Cd	114	34.6	22.5	**-0.0002**	0.001	809.2	ug/L	56	Standard
>	In	115	655844.3	0.2				ug/L	634401	Standard
	Sn	118	76.0	10.5	**-0.0171**	0.006	37.6	ug/L	137	Standard
	Sb	123	818.8	44.2	**0.0816**	0.067	81.8	ug/L	907	Standard
	Ba	135	31608.9	1.2	**10.7284**	0.119	1.1	ug/L	166	Standard
	Ce	140	40.0	25.0				ug/L	57	Standard
>	Tb	159	1363960.5	0.3				ug/L	1347540	Standard
	Ho	165	8.3	34.6				ug/L	23	Standard
	Tl	203	280.3	6.1	**0.0189**	0.001	6.2	ug/L	45	Standard
	Tl	205	645.0	3.4	**0.0205**	0.001	3.6	ug/L	112	Standard
	Pb	206	7411.5	1.4	**0.7721**	0.004	0.5	ug/L	825	Standard
	Pb	207	6155.9	0.7	**0.7312**	0.014	1.9	ug/L	679	Standard
	Pb	208	28697.9	0.6	**0.7468**	0.005	0.7	ug/L	3166	Standard
	U	238	32.0	13.6	**-0.0008**	0.000	16.2	ug/L	119	Standard
>	Bi	209	681882.4	1.2				ug/L	668024	Standard

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	Na	23	20.0	66.1	**5.6083**	3.686	65.7	mg/L	0	Standard
	Mg	24	3702.1	2.5	**5.6475**	0.273	4.8	mg/L	48	Standard
	K	39	343.3	16.9	**3.6572**	0.676	18.5	mg/L	8	Standard
	Ca	43	43.3	6.7	**4.4259**	1.121	25.3	mg/L	27	Standard
	Fe	54	122.7	31.0	**0.0068**	0.041	606.3	mg/L	121	Standard
	Fe	57	303.3	1.0	**-0.0663**	0.042	63.4	mg/L	305	Standard
>	**Sc-1**	45	21495.2	2.6				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	4.0	25.0				ug/L	5	Standard
	Br	81	1780.1	5.6				ug/L	1367	Standard
	P	31	106.7	34.6				ug/L	67	Standard
	S	34	68.3	27.7				ug/L	55	Standard
	Sr	88	146.7	10.4				ug/L	113	Standard
	C	12	390.0	17.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3.3	173.2				mg/L	10	Standard
	Dy	164	17.8	89.2				mg/L	18	Standard
	Ho-1	165	8.3	34.6				mg/L	23	Standard
	Er	166	46.7	86.6				mg/L	40	Standard
	I	127	5792.8	3.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		102.440	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		96.676	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	103.380
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	102.074
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 16:26:15
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	77112.4	0.9				ug/L	76335	Standard
	Be	9	53991.1	3.8	**48.4916**	2.154	4.4	ug/L	18	Standard
	Al	27	6058636.5	2.8	**48.2609**	0.914	1.9	ug/L	810	Standard
	Sc	45	21578.7	1.0				ug/L	22700	Standard
	Ti	47	20382.4	1.6	**103.1550**	1.714	1.7	ug/L	25	Standard
	V	51	353411.8	2.4	**51.2121**	1.273	2.5	ug/L	1541	Standard
	Cr	52	334110.9	1.1	**51.1183**	0.604	1.2	ug/L	7881	Standard
	Cr	53	42524.7	5.0	**51.2602**	2.646	5.2	ug/L	932	Standard
	Mn	55	547542.2	0.7	**50.5321**	0.392	0.8	ug/L	1508	Standard
	Co	59	459193.4	1.7	**51.0000**	0.895	1.8	ug/L	282	Standard
	Ni	60	98630.7	0.6	**50.7090**	0.308	0.6	ug/L	91	Standard
	Cu	65	96660.1	1.6	**50.6530**	0.843	1.7	ug/L	205	Standard
	Zn	66	50567.6	1.7	**51.5879**	0.920	1.8	ug/L	369	Standard
>	Ge	72	471092.2	0.1				ug/L	496734	Standard
	As	75	51124.1	1.3	**52.1643**	0.675	1.3	ug/L	-45	Standard
	Se	82	4993.6	2.3	**52.9975**	1.250	2.4	ug/L	18	Standard
	Se-1	77	3370.7	0.2	**52.2915**	0.125	0.2	ug/L	83	Standard
>	Ga	71	53.3	19.5				mg/L	30	Standard
	Rb	85	693.3	3.3				ug/L	23	Standard
	Y	89	387324.6	2.1				ug/L	405333	Standard
>	Rh	103	33.3	17.3				ug/L	17	Standard
	Mo	98	376158.4	1.9	**98.1195**	2.013	2.1	ug/L	135	Standard
	Ag	107	371111.0	2.4	**50.7602**	0.953	1.9	ug/L	123	Standard
	Cd	111	109775.2	1.8	**51.9630**	0.228	0.4	mg/L	11	Standard
	Cd	114	280504.8	2.3	**51.2891**	0.931	1.8	ug/L	56	Standard
>	In	115	663229.7	2.1				ug/L	634401	Standard
	Sn	118	65267.6	0.8	**51.1255**	0.877	1.7	ug/L	137	Standard
	Sb	123	287695.8	1.9	**52.1166**	0.341	0.7	ug/L	907	Standard
	Ba	135	150237.8	2.4	**50.5984**	0.552	1.1	ug/L	166	Standard
	Ce	140	143.3	10.7				ug/L	57	Standard
>	Tb	159	1377932.0	3.8				ug/L	1347540	Standard
	Ho	165	40.0	66.1				ug/L	23	Standard
	Tl	203	583791.5	1.5	**50.4684**	0.764	1.5	ug/L	45	Standard
	Tl	205	1386025.4	1.3	**49.6075**	0.954	1.9	ug/L	112	Standard
	Pb	206	444108.5	2.1	**51.1161**	0.716	1.4	ug/L	825	Standard
	Pb	207	389090.2	2.5	**50.8758**	0.284	0.6	ug/L	679	Standard
	Pb	208	1762217.5	2.0	**50.7098**	0.603	1.2	ug/L	3166	Standard
	U	238	1557025.3	3.5	**49.7202**	1.345	2.7	ug/L	119	Standard
>	Bi	209	660821.9	2.3				ug/L	668024	Standard

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	Na	23	18.3	103.3	**5.1288**	5.253	102.4	mg/L	0	Standard
	Mg	24	3312.0	4.0	**5.0178**	0.163	3.2	mg/L	48	Standard
	K	39	458.3	2.7	**4.8986**	0.086	1.8	mg/L	8	Standard
	Ca	43	45.0	29.4	**4.9291**	4.625	93.8	mg/L	27	Standard
	Fe	54	4633.7	7.2	**5.0131**	0.400	8.0	mg/L	121	Standard
	Fe	57	1468.4	7.0	**4.6604**	0.478	10.3	mg/L	305	Standard
>	**Sc-1**	45	21578.7	1.0				mg/L	22700	Standard
	Cl	35	2.0	173.2				ug/L	3	Standard
	Kr	83	2.3	24.7				ug/L	5	Standard
	Br	81	1200.0	10.0				ug/L	1367	Standard
	P	31	100.0	18.0				ug/L	67	Standard
	S	34	86.7	26.6				ug/L	55	Standard
	Sr	88	131.7	9.6				ug/L	113	Standard
	C	12	330.0	9.1				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	6.7	86.6				mg/L	10	Standard
	Dy	164	21.6	72.8				mg/L	18	Standard
	Ho-1	165	40.0	66.1				mg/L	23	Standard
	Er	166	36.7	31.5				mg/L	40	Standard
	I	127	2928.6	0.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	96.983		
	Al	27	96.522		
	Sc	45			
	Ti	47	103.155		
	V	51	102.424		
	Cr	52	102.237		
	Cr	53			
	Mn	55	101.064		
	Co	59	102.000		
	Ni	60	101.418		
	Cu	65	101.306		
	Zn	66	103.176		
>	Ge	72		94.838	
	As	75	104.329		
	Se	82	105.995		
	Se-1	77			
>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	98.119		
Ag	107	101.520		
Cd	111	103.926		
Cd	114			
In	115		104.544	
Sn	118	102.251		
Sb	123	104.233		
Ba	135	101.197		
Ce	140			
Tb	159			
Ho	165			
Tl	203	100.937		
Tl	205			
Pb	206			
Pb	207			
Pb	208	101.420		
U	238	99.440		
Bi	209		98.922	
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 6
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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 16:29:14
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	74328.8	4.4				ug/L	76335	Standard
	Be	9	15.0	66.7	**0.0108**	0.009	84.2	ug/L	18	Standard
	Al	27	778.4	31.6	**0.0021**	0.002	88.9	ug/L	810	Standard
	Sc	45	20774.2	2.6				ug/L	22700	Standard
	Ti	47	20.3	5.7	**-0.0334**	0.008	25.3	ug/L	25	Standard
	V	51	1245.8	1.8	**-0.0392**	0.011	28.4	ug/L	1541	Standard
	Cr	52	6945.9	1.8	**-0.0824**	0.029	35.4	ug/L	7881	Standard
	Cr	53	910.0	4.8	**0.0521**	0.036	68.3	ug/L	932	Standard
	Mn	55	1264.7	3.2	**0.0339**	0.001	3.7	ug/L	1508	Standard
	Co	59	280.7	9.6	**-0.0010**	0.002	179.6	ug/L	282	Standard
	Ni	60	85.7	13.5	**0.0023**	0.005	207.5	ug/L	91	Standard
	Cu	65	159.3	3.6	**0.0224**	0.003	12.0	ug/L	205	Standard
	Zn	66	257.7	2.9	**0.0839**	0.010	11.7	ug/L	369	Standard
>	Ge	72	465224.3	4.1				ug/L	496734	Standard
	As	75	-37.8	66.4	**0.0197**	0.028	141.6	ug/L	-45	Standard
	Se	82	20.7	25.8	**0.0232**	0.052	222.3	ug/L	18	Standard
	Se-1	77	85.3	6.7	**0.2162**	0.049	22.8	ug/L	83	Standard
>	Ga	71	20.0	43.3				mg/L	30	Standard
	Rb	85	21.7	58.1				ug/L	23	Standard
	Y	89	385782.9	3.2				ug/L	405333	Standard
>	Rh	103	13.3	43.3				ug/L	17	Standard
	Mo	98	270.2	16.9	**0.0513**	0.010	20.1	ug/L	135	Standard
	Ag	107	149.3	27.9	**-0.0011**	0.005	463.0	ug/L	123	Standard
	Cd	111	12.0	42.9	**-0.0033**	0.002	71.4	mg/L	11	Standard
	Cd	114	60.2	38.7	**0.0047**	0.004	86.2	ug/L	56	Standard
>	In	115	643420.2	3.9				ug/L	634401	Standard
	Sn	118	178.3	33.6	**0.0672**	0.049	73.0	ug/L	137	Standard
	Sb	123	2901.2	45.4	**0.4757**	0.246	51.8	ug/L	907	Standard
	Ba	135	85.3	12.9	**-0.0174**	0.003	15.7	ug/L	166	Standard
	Ce	140	81.7	114.9				ug/L	57	Standard
>	Tb	159	1314550.4	3.8				ug/L	1347540	Standard
	Ho	165	20.0	66.1				ug/L	23	Standard
	Tl	203	68.3	24.9	**0.0013**	0.001	95.2	ug/L	45	Standard
	Tl	205	148.3	9.7	**0.0035**	0.001	15.3	ug/L	112	Standard
	Pb	206	542.7	6.2	**0.0079**	0.003	38.6	ug/L	825	Standard
	Pb	207	470.0	7.0	**0.0125**	0.003	21.2	ug/L	679	Standard
	Pb	208	2087.1	7.3	**0.0065**	0.003	40.7	ug/L	3166	Standard
	U	238	173.0	24.5	**0.0038**	0.001	30.8	ug/L	119	Standard
>	Bi	209	652690.9	3.9				ug/L	668024	Standard

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⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	53.3	30.1	**-0.0095**	0.027	288.3	mg/L	48	Standard
|	**K**	39	5.0	0.0	**-0.0754**	0.001	2.0	mg/L	8	Standard
|	**Ca**	43	30.0	66.7	**0.0643**	7.600	11816.3	mg/L	27	Standard
|	**Fe**	54	134.3	17.3	**0.0256**	0.029	113.1	mg/L	121	Standard
|	**Fe**	57	286.7	16.9	**-0.0974**	0.172	176.5	mg/L	305	Standard
⌊>	**Sc-1**	45	20774.2	2.6				mg/L	22700	Standard
	Cl	35	4.7	65.5				ug/L	3	Standard
	Kr	83	1.3	86.6				ug/L	5	Standard
	Br	81	1180.0	10.3				ug/L	1367	Standard
	P	31	85.0	15.6				ug/L	67	Standard
	S	34	81.7	7.1				ug/L	55	Standard
	Sr	88	111.7	25.5				ug/L	113	Standard
	C	12	233.3	29.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	13.3	43.3				mg/L	10	Standard
	Dy	164	6.2	86.7				mg/L	18	Standard
	Ho-1	165	20.0	66.1				mg/L	23	Standard
	Er	166	10.0	100.0				mg/L	40	Standard
	I	127	3017.0	5.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.657	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	101.422
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	97.705
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	

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Method 6020 - Summary Report

Sample ID: L1610085501
Sample Date/Time: Thursday, October 20, 2016 16:32:15
Number of Replicates: 3
Autosampler Position: 338
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73121.3	4.9				ug/L	76335	Standard
	Be	9	926.7	11.7	**0.8741**	0.089	10.2	ug/L	18	Standard
	Al	27	3103015.6	1.7	**26.1105**	1.409	5.4	ug/L	810	Standard
	Sc	45	22458.3	2.1				ug/L	22700	Standard
	Ti	47	22277.0	1.8	**114.2462**	2.906	2.5	ug/L	25	Standard
	V	51	96459.4	0.3	**13.9994**	0.127	0.9	ug/L	1541	Standard
	Cr	52	155091.7	0.4	**23.4126**	0.257	1.1	ug/L	7881	Standard
	Cr	53	19245.6	2.1	**22.9155**	0.440	1.9	ug/L	932	Standard
	Mn	55	3506136.2	1.0	**328.2811**	3.916	1.2	ug/L	1508	Standard
	Co	59	85241.1	0.9	**9.5644**	0.015	0.2	ug/L	282	Standard
	Ni	60	29069.5	1.0	**15.1111**	0.075	0.5	ug/L	91	Standard
	Cu	65	110784.6	1.2	**58.8228**	0.536	0.9	ug/L	205	Standard
	Zn	66	90890.1	0.4	**94.0878**	0.409	0.4	ug/L	369	Standard
>	Ge	72	465015.7	0.8				ug/L	496734	Standard
	As	75	5354.3	1.8	**5.5875**	0.054	1.0	ug/L	-45	Standard
	Se	82	114.2	2.4	**1.0332**	0.021	2.0	ug/L	18	Standard
	Se-1	77	172.0	5.7	**1.6089**	0.137	8.5	ug/L	83	Standard
>	Ga	71	7735.3	2.5				mg/L	30	Standard
	Rb	85	47833.7	1.4				ug/L	23	Standard
	Y	89	493481.6	1.2				ug/L	405333	Standard
>	Rh	103	45.0	11.1				ug/L	17	Standard
	Mo	98	4779.1	1.6	**1.2706**	0.030	2.4	ug/L	135	Standard
	Ag	107	5026.8	1.5	**0.6904**	0.007	1.0	ug/L	123	Standard
	Cd	111	894.9	0.5	**0.4298**	0.010	2.3	mg/L	11	Standard
	Cd	114	2466.3	2.2	**0.4609**	0.021	4.6	ug/L	56	Standard
>	In	115	640300.9	2.5				ug/L	634401	Standard
	Sn	118	954.4	4.1	**0.6983**	0.039	5.5	ug/L	137	Standard
	Sb	123	1303.3	29.0	**0.1768**	0.075	42.3	ug/L	907	Standard
	Ba	135	25880983.4	0.3	**9040.5293**	219.471	2.4	ug/L	166	Standard
	Ce	140	630504.8	0.4				ug/L	57	Standard
>	Tb	159	1294538.9	3.1				ug/L	1347540	Standard
	Ho	165	14727.2	3.5				ug/L	23	Standard
	Tl	203	1639.8	1.8	**0.1568**	0.001	0.9	ug/L	45	Standard
	Tl	205	3727.1	7.9	**0.1501**	0.012	7.7	ug/L	112	Standard
	Pb	206	499744.2	1.6	**65.5255**	0.630	1.0	ug/L	825	Standard
	Pb	207	394424.2	2.0	**58.7482**	0.469	0.8	ug/L	679	Standard
	Pb	208	1853914.1	1.0	**60.7744**	0.733	1.2	ug/L	3166	Standard
	U	238	17516.1	2.4	**0.6352**	0.003	0.4	ug/L	119	Standard
>	Bi	209	580211.0	2.0				ug/L	668024	Standard

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⌈	**Na**	23	33.3	60.6	**8.9483**	5.353	59.8	mg/L	0	Standard
|	**Mg**	24	61.7	9.4	**-0.0039**	0.010	260.6	mg/L	48	Standard
|	**K**	39	35.0	14.3	**0.2372**	0.058	24.6	mg/L	8	Standard
|	**Ca**	43	56.7	50.9	**8.2588**	9.579	116.0	mg/L	27	Standard
|	**Fe**	54	9831.0	2.1	**10.3535**	0.323	3.1	mg/L	121	Standard
|	**Fe**	57	2875.3	2.7	**9.9125**	0.332	3.4	mg/L	305	Standard
⌊>	**Sc-1**	45	22458.3	2.1				mg/L	22700	Standard
	Cl	35	4.0	50.0				ug/L	3	Standard
	Kr	83	5.0	20.0				ug/L	5	Standard
	Br	81	1640.1	1.8				ug/L	1367	Standard
	P	31	86.7	39.3				ug/L	67	Standard
	S	34	80.0	6.3				ug/L	55	Standard
	Sr	88	141.7	7.3				ug/L	113	Standard
	C	12	453.3	8.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3673.8	13.1				mg/L	10	Standard
	Dy	164	23326.4	1.2				mg/L	18	Standard
	Ho-1	165	14727.2	3.5				mg/L	23	Standard
	Er	166	12508.5	2.1				mg/L	40	Standard
	I	127	4519.0	3.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		95.790	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		93.615	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	100.930
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	86.855
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Ti 47 Upper, S, EEE	Ti	47	
Mn 55 Upper, S, EEE	Mn	55	
Ba 135 Upper, S, EEE	Ba	135	

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Method 6020 - Summary Report

Sample ID: L1610085502
Sample Date/Time: Thursday, October 20, 2016 17:24:55
Number of Replicates: 3
Autosampler Position: 339
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	79960.7	4.3				ug/L	76335	Standard
	Be	9	615.0	17.4	**0.5303**	0.094	17.7	ug/L	18	Standard
	Al	27	14392604.8	3.1	**110.6423**	3.063	2.8	ug/L	810	Standard
	Sc	45	25406.3	4.1				ug/L	22700	Standard
	Ti	47	10005.6	3.8	**47.0784**	0.846	1.8	ug/L	25	Standard
	V	51	74301.8	4.4	**9.8450**	0.194	2.0	ug/L	1541	Standard
	Cr	52	73356.6	2.9	**9.5121**	0.267	2.8	ug/L	7881	Standard
	Cr	53	9119.4	7.5	**9.3751**	0.798	8.5	ug/L	932	Standard
	Mn	55	2716690.8	4.6	**233.7555**	6.299	2.7	ug/L	1508	Standard
	Co	59	77416.5	4.0	**7.9787**	0.151	1.9	ug/L	282	Standard
	Ni	60	23949.3	4.3	**11.4324**	0.280	2.5	ug/L	91	Standard
	Cu	65	48482.9	5.5	**23.6168**	0.718	3.0	ug/L	205	Standard
	Zn	66	111416.0	4.4	**106.0278**	2.638	2.5	ug/L	369	Standard
>	Ge	72	505864.3	2.9				ug/L	496734	Standard
	As	75	5728.6	4.4	**5.4952**	0.100	1.8	ug/L	-45	Standard
	Se	82	103.5	10.3	**0.8283**	0.100	12.0	ug/L	18	Standard
	Se-1	77	165.0	6.4	**1.2829**	0.128	10.0	ug/L	83	Standard
>	Ga	71	5456.0	6.9				mg/L	30	Standard
	Rb	85	36640.9	1.7				ug/L	23	Standard
	Y	89	492525.7	1.9				ug/L	405333	Standard
>	Rh	103	41.7	18.3				ug/L	17	Standard
	Mo	98	3308.5	3.9	**0.8527**	0.004	0.4	ug/L	135	Standard
	Ag	107	11493.0	4.5	**1.5701**	0.022	1.4	ug/L	123	Standard
	Cd	111	1458.5	3.2	**0.6902**	0.017	2.5	mg/L	11	Standard
	Cd	114	3765.0	4.6	**0.6904**	0.012	1.7	ug/L	56	Standard
>	In	115	655024.1	4.0				ug/L	634401	Standard
	Sn	118	1011.0	10.0	**0.7242**	0.047	6.5	ug/L	137	Standard
	Sb	123	1590.8	24.8	**0.2221**	0.062	28.1	ug/L	907	Standard
	Ba	135	7204899.3	5.7	**2458.1090**	41.617	1.7	ug/L	166	Standard
	Ce	140	648556.5	4.8				ug/L	57	Standard
>	Tb	159	1417240.3	3.0				ug/L	1347540	Standard
	Ho	165	12191.6	5.2				ug/L	23	Standard
	Tl	203	1824.1	4.3	**0.1517**	0.003	2.1	ug/L	45	Standard
	Tl	205	4308.9	5.5	**0.1510**	0.005	3.4	ug/L	112	Standard
	Pb	206	448325.6	4.0	**51.1674**	0.943	1.8	ug/L	825	Standard
	Pb	207	354200.6	4.2	**45.9232**	0.882	1.9	ug/L	679	Standard
	Pb	208	1681564.9	4.3	**47.9769**	1.011	2.1	ug/L	3166	Standard
	U	238	21644.1	3.5	**0.6837**	0.011	1.6	ug/L	119	Standard
>	Bi	209	666191.9	2.2				ug/L	668024	Standard

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⌈	**Na**	23	115.0	31.4	**27.5404**	8.966	32.6	mg/L	0	Standard
|	**Mg**	24	81.7	38.9	**0.0111**	0.040	360.3	mg/L	48	Standard
|	**K**	39	45.0	22.2	**0.2872**	0.095	33.0	mg/L	8	Standard
|	**Ca**	43	111.7	12.9	**22.8830**	3.834	16.8	mg/L	27	Standard
|	**Fe**	54	8809.2	4.3	**8.1712**	0.086	1.1	mg/L	121	Standard
|	**Fe**	57	2636.9	7.4	**7.7806**	0.356	4.6	mg/L	305	Standard
⌊>	**Sc-1**	45	25406.3	4.1				mg/L	22700	Standard
	Cl	35	4.0	86.6				ug/L	3	Standard
	Kr	83	4.0	66.1				ug/L	5	Standard
	Br	81	1490.1	13.1				ug/L	1367	Standard
	P	31	120.0	15.0				ug/L	67	Standard
	S	34	101.7	5.7				ug/L	55	Standard
	Sr	88	156.7	29.7				ug/L	113	Standard
	C	12	643.3	16.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	3133.7	2.1				mg/L	10	Standard
	Dy	164	19907.6	4.5				mg/L	18	Standard
	Ho-1	165	12191.6	5.2				mg/L	23	Standard
	Er	166	10984.0	6.5				mg/L	40	Standard
	I	127	4102.2	1.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		104.749	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		101.838	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115	103.251	
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209	99.726	
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Al 27 Upper, S, EEE	Al	27	
Mn 55 Upper, S, EEE	Mn	55	
Zn 66 Upper, S, EEE	Zn	66	

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Ba 135 Upper, S, EEE	Ba	135

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Method 6020 - Summary Report

Sample ID: L1610085503
Sample Date/Time: Thursday, October 20, 2016 17:27:54
Number of Replicates: 3
Autosampler Position: 340
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	77667.1	3.8				ug/L	76335	Standard
	Be	9	420.0	11.7	**0.3730**	0.059	15.8	ug/L	18	Standard
	Al	27	6709680.6	0.4	**53.1256**	2.141	4.0	ug/L	810	Standard
	Sc	45	24696.8	3.5				ug/L	22700	Standard
	Ti	47	8699.8	2.4	**41.7032**	0.264	0.6	ug/L	25	Standard
	V	51	52176.8	2.7	**6.9837**	0.121	1.7	ug/L	1541	Standard
	Cr	52	51059.6	3.4	**6.4005**	0.127	2.0	ug/L	7881	Standard
	Cr	53	5947.8	4.7	**5.8639**	0.218	3.7	ug/L	932	Standard
	Mn	55	2758176.6	2.9	**241.8900**	4.090	1.7	ug/L	1508	Standard
	Co	59	46611.0	2.6	**4.8838**	0.083	1.7	ug/L	282	Standard
	Ni	60	13832.6	2.0	**6.7135**	0.100	1.5	ug/L	91	Standard
	Cu	65	25551.2	3.3	**12.6597**	0.252	2.0	ug/L	205	Standard
	Zn	66	63196.3	3.6	**61.2168**	1.572	2.6	ug/L	369	Standard
>	Ge	72	496366.8	2.0				ug/L	496734	Standard
	As	75	2333.6	3.0	**2.3165**	0.037	1.6	ug/L	-45	Standard
	Se	82	54.9	16.3	**0.3563**	0.087	24.4	ug/L	18	Standard
	Se-1	77	123.0	14.9	**0.6966**	0.259	37.1	ug/L	83	Standard
>	Ga	71	3507.1	9.8				mg/L	30	Standard
	Rb	85	31776.6	3.2				ug/L	23	Standard
	Y	89	468738.6	2.7				ug/L	405333	Standard
>	Rh	103	41.7	30.2				ug/L	17	Standard
	Mo	98	1372.6	3.4	**0.3482**	0.008	2.3	ug/L	135	Standard
	Ag	107	2602.9	2.6	**0.3453**	0.004	1.1	ug/L	123	Standard
	Cd	111	1634.7	2.0	**0.7894**	0.017	2.1	mg/L	11	Standard
	Cd	114	4382.6	4.2	**0.8201**	0.025	3.0	ug/L	56	Standard
>	In	115	642858.1	2.6				ug/L	634401	Standard
	Sn	118	549.7	5.6	**0.3672**	0.018	4.9	ug/L	137	Standard
	Sb	123	804.2	14.4	**0.0821**	0.025	30.1	ug/L	907	Standard
	Ba	135	2611467.3	3.3	**908.1420**	15.684	1.7	ug/L	166	Standard
	Ce	140	408599.8	2.4				ug/L	57	Standard
>	Tb	159	1377058.0	3.2				ug/L	1347540	Standard
	Ho	165	9237.8	1.9				ug/L	23	Standard
	Tl	203	726.0	6.5	**0.0575**	0.003	5.5	ug/L	45	Standard
	Tl	205	1700.1	2.3	**0.0584**	0.001	1.3	ug/L	112	Standard
	Pb	206	328665.1	3.2	**37.4380**	0.607	1.6	ug/L	825	Standard
	Pb	207	267849.6	3.7	**34.6612**	0.743	2.1	ug/L	679	Standard
	Pb	208	1254834.0	3.0	**35.7353**	0.521	1.5	ug/L	3166	Standard
	U	238	17802.5	2.4	**0.5612**	0.004	0.7	ug/L	119	Standard
>	Bi	209	667282.9	1.7				ug/L	668024	Standard

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⌈	**Na**	23	101.7	37.2	**24.9948**	9.307	37.2	mg/L	0	Standard
|	**Mg**	24	91.7	3.1	**0.0282**	0.002	7.2	mg/L	48	Standard
|	**K**	39	40.0	12.5	**0.2520**	0.057	22.5	mg/L	8	Standard
|	**Ca**	43	95.0	24.1	**18.5624**	6.412	34.5	mg/L	27	Standard
|	**Fe**	54	5549.4	1.2	**5.2528**	0.124	2.4	mg/L	121	Standard
|	**Fe**	57	1911.8	7.4	**5.4729**	0.326	6.0	mg/L	305	Standard
⌊>	**Sc-1**	45	24696.8	3.5				mg/L	22700	Standard
	Cl	35	2.0	0.0				ug/L	3	Standard
	Kr	83	2.3	65.5				ug/L	5	Standard
	Br	81	1480.1	2.4				ug/L	1367	Standard
	P	31	125.0	27.7				ug/L	67	Standard
	S	34	106.7	29.8				ug/L	55	Standard
	Sr	88	141.7	30.4				ug/L	113	Standard
	C	12	560.0	15.5				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	1510.1	3.7				mg/L	10	Standard
	Dy	164	14184.9	6.4				mg/L	18	Standard
	Ho-1	165	9237.8	1.9				mg/L	23	Standard
	Er	166	7838.7	4.2				mg/L	40	Standard
	I	127	2903.6	2.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		101.745	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		99.926	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	101.333
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	99.889
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	
Ba 135 Upper, S, EEE	Ba	135	

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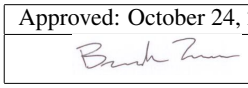

Method 6020 - Summary Report

Sample ID: L1610085504
Sample Date/Time: Thursday, October 20, 2016 17:30:53
Number of Replicates: 3
Autosampler Position: 341
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	69691.9	5.5				ug/L	76335	Standard
	Be	9	725.0	3.4	**0.7179**	0.015	2.1	ug/L	18	Standard
	Al	27	3477400.4	2.0	**30.6902**	1.073	3.5	ug/L	810	Standard
	Sc	45	23521.6	4.0				ug/L	22700	Standard
	Ti	47	20507.2	2.5	**105.1288**	2.337	2.2	ug/L	25	Standard
	V	51	94563.8	1.5	**13.7175**	0.170	1.2	ug/L	1541	Standard
	Cr	52	85420.8	1.5	**12.3607**	0.161	1.3	ug/L	7881	Standard
	Cr	53	10572.0	0.6	**12.0992**	0.127	1.0	ug/L	932	Standard
	Mn	55	2843633.2	2.5	**266.1874**	6.038	2.3	ug/L	1508	Standard
	Co	59	56800.3	2.4	**6.3615**	0.138	2.2	ug/L	282	Standard
	Ni	60	21733.9	3.4	**11.2855**	0.365	3.2	ug/L	91	Standard
	Cu	65	101742.6	2.9	**54.0089**	1.427	2.6	ug/L	205	Standard
	Zn	66	101631.5	1.8	**105.2133**	1.758	1.7	ug/L	369	Standard
>	Ge	72	465066.3	0.3				ug/L	496734	Standard
	As	75	5438.4	0.6	**5.6740**	0.044	0.8	ug/L	-45	Standard
	Se	82	112.1	12.6	**1.0104**	0.154	15.3	ug/L	18	Standard
	Se-1	77	178.3	10.1	**1.7107**	0.284	16.6	ug/L	83	Standard
>	Ga	71	6653.1	2.7				mg/L	30	Standard
	Rb	85	38600.8	1.8				ug/L	23	Standard
	Y	89	481163.2	1.3				ug/L	405333	Standard
>	Rh	103	36.7	20.8				ug/L	17	Standard
	Mo	98	4047.8	2.4	**1.1305**	0.035	3.1	ug/L	135	Standard
	Ag	107	12332.0	1.1	**1.8180**	0.016	0.9	ug/L	123	Standard
	Cd	111	1605.2	4.0	**0.8193**	0.020	2.4	mg/L	11	Standard
	Cd	114	4181.5	2.3	**0.8271**	0.008	1.0	ug/L	56	Standard
>	In	115	608208.2	1.7				ug/L	634401	Standard
	Sn	118	1147.0	4.1	**0.9034**	0.028	3.1	ug/L	137	Standard
	Sb	123	985.3	6.0	**0.1261**	0.008	6.7	ug/L	907	Standard
	Ba	135	23152348.2	2.1	**8512.2527**	223.033	2.6	ug/L	166	Standard
	Ce	140	593186.6	2.5				ug/L	57	Standard
>	Tb	159	1300802.9	1.1				ug/L	1347540	Standard
	Ho	165	13267.5	1.1				ug/L	23	Standard
	Tl	203	1700.1	1.6	**0.1632**	0.005	3.2	ug/L	45	Standard
	Tl	205	4143.9	4.4	**0.1674**	0.007	3.9	ug/L	112	Standard
	Pb	206	639271.0	1.0	**84.0410**	1.191	1.4	ug/L	825	Standard
	Pb	207	502919.6	1.3	**75.1065**	0.800	1.1	ug/L	679	Standard
	Pb	208	2374026.8	1.4	**78.0210**	0.813	1.0	ug/L	3166	Standard
	U	238	21517.6	2.3	**0.7827**	0.010	1.3	ug/L	119	Standard
>	Bi	209	578870.5	2.3				ug/L	668024	Standard

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⌈	**Na**	23	43.3	26.6	**11.1449**	2.740	24.6	mg/L	0	Standard
|	**Mg**	24	83.3	19.3	**0.0223**	0.021	93.3	mg/L	48	Standard
|	**K**	39	36.7	56.8	**0.2419**	0.224	92.5	mg/L	8	Standard
|	**Ca**	43	83.3	29.6	**16.1517**	7.462	46.2	mg/L	27	Standard
|	**Fe**	54	8085.0	1.7	**8.1078**	0.349	4.3	mg/L	121	Standard
|	**Fe**	57	2400.2	4.1	**7.6452**	0.551	7.2	mg/L	305	Standard
⌊>	**Sc-1**	45	23521.6	4.0				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	3.3	34.6				ug/L	5	Standard
	Br	81	1303.4	11.4				ug/L	1367	Standard
	P	31	85.0	36.7				ug/L	67	Standard
	S	34	96.7	20.9				ug/L	55	Standard
	Sr	88	188.3	13.6				ug/L	113	Standard
	C	12	513.3	11.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	13696.2	4.6				mg/L	10	Standard
	Dy	164	20974.3	0.7				mg/L	18	Standard
	Ho-1	165	13267.5	1.1				mg/L	23	Standard
	Er	166	11851.3	0.3				mg/L	40	Standard
	I	127	3417.1	0.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		91.297	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		93.625	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115		95.871
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209		86.654
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Ti 47 Upper, S, EEE	Ti	47	
Mn 55 Upper, S, EEE	Mn	55	
Zn 66 Upper, S, EEE	Zn	66	

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Ba 135 Upper, S, EEE	Ba	135

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Method 6020 - Summary Report

Sample ID: L1610085505
Sample Date/Time: Thursday, October 20, 2016 17:33:53
Number of Replicates: 3
Autosampler Position: 342
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73553.1	1.8				ug/L	76335	Standard
	Be	9	366.7	18.6	**0.3423**	0.064	18.8	ug/L	18	Standard
	Al	27	838621.4	1.4	**7.0026**	0.194	2.8	ug/L	810	Standard
	Sc	45	23908.9	6.2				ug/L	22700	Standard
	Ti	47	4504.3	0.9	**21.6151**	0.523	2.4	ug/L	25	Standard
	V	51	41021.4	1.3	**5.4652**	0.069	1.3	ug/L	1541	Standard
	Cr	52	39724.3	0.7	**4.7412**	0.093	2.0	ug/L	7881	Standard
	Cr	53	4927.5	2.9	**4.6969**	0.186	3.9	ug/L	932	Standard
	Mn	55	1170171.1	2.7	**102.9616**	0.906	0.9	ug/L	1508	Standard
	Co	59	43157.7	2.1	**4.5369**	0.052	1.2	ug/L	282	Standard
	Ni	60	12089.5	2.5	**5.8838**	0.055	0.9	ug/L	91	Standard
	Cu	65	20700.5	2.5	**10.2851**	0.183	1.8	ug/L	205	Standard
	Zn	66	36928.0	2.3	**35.8331**	0.164	0.5	ug/L	369	Standard
>	Ge	72	494513.7	2.3				ug/L	496734	Standard
	As	75	1836.4	4.2	**1.8420**	0.043	2.3	ug/L	-45	Standard
	Se	82	43.6	14.0	**0.2425**	0.055	22.6	ug/L	18	Standard
	Se-1	77	106.0	8.2	**0.4481**	0.129	28.8	ug/L	83	Standard
>	Ga	71	2631.9	9.3				mg/L	30	Standard
	Rb	85	24852.0	2.9				ug/L	23	Standard
	Y	89	446529.6	3.0				ug/L	405333	Standard
>	Rh	103	20.0	75.0				ug/L	17	Standard
	Mo	98	1007.3	5.7	**0.2474**	0.014	5.5	ug/L	135	Standard
	Ag	107	4906.1	3.0	**0.6638**	0.006	1.0	ug/L	123	Standard
	Cd	111	538.0	1.7	**0.2512**	0.003	1.1	mg/L	11	Standard
	Cd	114	1394.8	3.4	**0.2540**	0.006	2.4	ug/L	56	Standard
>	In	115	649015.4	2.1				ug/L	634401	Standard
	Sn	118	320.3	4.3	**0.1794**	0.012	6.5	ug/L	137	Standard
	Sb	123	457.0	15.9	**0.0159**	0.012	73.7	ug/L	907	Standard
	Ba	135	1311196.5	2.0	**451.6698**	5.201	1.2	ug/L	166	Standard
	Ce	140	292082.4	3.6				ug/L	57	Standard
>	Tb	159	1365050.2	2.1				ug/L	1347540	Standard
	Ho	165	6691.5	4.0				ug/L	23	Standard
	Tl	203	552.7	4.4	**0.0430**	0.001	2.8	ug/L	45	Standard
	Tl	205	1258.4	2.0	**0.0431**	0.001	2.0	ug/L	112	Standard
	Pb	206	149425.7	1.7	**17.1275**	0.271	1.6	ug/L	825	Standard
	Pb	207	119990.6	0.8	**15.6281**	0.358	2.3	ug/L	679	Standard
	Pb	208	567101.6	1.3	**16.2504**	0.276	1.7	ug/L	3166	Standard
	U	238	10538.0	1.5	**0.3341**	0.007	2.2	ug/L	119	Standard
>	Bi	209	662268.7	3.0				ug/L	668024	Standard

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⌈	**Na**	23	10.0		**2.5507**	0.161	6.3	mg/L	0	Standard
|	**Mg**	24	76.7	18.8	**0.0123**	0.025	204.5	mg/L	48	Standard
|	**K**	39	23.3	32.7	**0.0967**	0.067	69.3	mg/L	8	Standard
|	**Ca**	43	43.3	37.1	**2.6750**	4.643	173.6	mg/L	27	Standard
|	**Fe**	54	3953.1	3.8	**3.8327**	0.098	2.6	mg/L	121	Standard
|	**Fe**	57	1316.7	6.5	**3.5384**	0.524	14.8	mg/L	305	Standard
⌊>	**Sc-1**	45	23908.9	6.2				mg/L	22700	Standard
	Cl	35	2.7	114.6				ug/L	3	Standard
	Kr	83	3.3	96.4				ug/L	5	Standard
	Br	81	1420.1	8.0				ug/L	1367	Standard
	P	31	101.7	5.7				ug/L	67	Standard
	S	34	80.0	6.3				ug/L	55	Standard
	Sr	88	145.0	24.1				ug/L	113	Standard
	C	12	516.7	5.9				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	17276.5	2.4				mg/L	10	Standard
	Dy	164	10866.7	0.6				mg/L	18	Standard
	Ho-1	165	6691.5	4.0				mg/L	23	Standard
	Er	166	5861.1	4.7				mg/L	40	Standard
	I	127	3058.6	8.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		96.355	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		99.553	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	102.304
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	99.138
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	
Ba 135 Upper, S, EEE	Ba	135	

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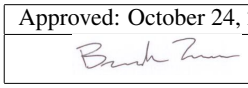

Method 6020 - Summary Report

Sample ID: L1610085506
Sample Date/Time: Thursday, October 20, 2016 17:36:52
Number of Replicates: 3
Autosampler Position: 343
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	70565.9	5.5				ug/L	76335	Standard
	Be	9	620.0	11.4	**0.6062**	0.072	11.9	ug/L	18	Standard
	Al	27	3163681.5	5.0	**27.5515**	0.788	2.9	ug/L	810	Standard
	Sc	45	22413.2	3.3				ug/L	22700	Standard
	Ti	47	21273.3	4.2	**107.6972**	2.210	2.1	ug/L	25	Standard
	V	51	84217.6	5.7	**12.0340**	0.425	3.5	ug/L	1541	Standard
	Cr	52	163829.4	5.1	**24.4646**	0.707	2.9	ug/L	7881	Standard
	Cr	53	20879.4	3.0	**24.6285**	0.179	0.7	ug/L	932	Standard
	Mn	55	1892660.4	4.4	**174.9159**	3.638	2.1	ug/L	1508	Standard
	Co	59	50498.4	3.5	**5.5816**	0.066	1.2	ug/L	282	Standard
	Ni	60	19422.1	4.8	**9.9530**	0.247	2.5	ug/L	91	Standard
	Cu	65	193914.4	2.1	**101.7370**	0.243	0.2	ug/L	205	Standard
	Zn	66	119180.7	3.8	**121.8704**	1.803	1.5	ug/L	369	Standard
>	Ge	72	470841.1	2.4				ug/L	496734	Standard
	As	75	5377.5	3.7	**5.5418**	0.077	1.4	ug/L	-45	Standard
	Se	82	94.9	5.7	**0.8122**	0.036	4.4	ug/L	18	Standard
	Se-1	77	145.3	7.4	**1.1543**	0.197	17.1	ug/L	83	Standard
>	Ga	71	6989.9	1.3				mg/L	30	Standard
	Rb	85	45882.8	4.2				ug/L	23	Standard
	Y	89	479364.5	4.4				ug/L	405333	Standard
>	Rh	103	81.7	14.1				ug/L	17	Standard
	Mo	98	3692.4	3.9	**1.0139**	0.007	0.7	ug/L	135	Standard
	Ag	107	12031.4	4.0	**1.7469**	0.018	1.0	ug/L	123	Standard
	Cd	111	3966.4	7.5	**2.0070**	0.084	4.2	mg/L	11	Standard
	Cd	114	10018.3	8.1	**1.9612**	0.120	6.1	ug/L	56	Standard
>	In	115	617125.6	3.4				ug/L	634401	Standard
	Sn	118	1059.4	7.0	**0.8149**	0.038	4.6	ug/L	137	Standard
	Sb	123	1133.5	5.3	**0.1522**	0.004	2.8	ug/L	907	Standard
	Ba	135	14613159.8	3.0	**5294.7555**	56.238	1.1	ug/L	166	Standard
	Ce	140	549427.5	3.2				ug/L	57	Standard
>	Tb	159	1298474.7	3.5				ug/L	1347540	Standard
	Ho	165	12777.1	5.3				ug/L	23	Standard
	Tl	203	1894.8	4.7	**0.1759**	0.007	4.2	ug/L	45	Standard
	Tl	205	4372.3	3.4	**0.1706**	0.001	0.4	ug/L	112	Standard
	Pb	206	1275686.3	3.8	**161.8896**	1.182	0.7	ug/L	825	Standard
	Pb	207	1021348.8	3.7	**147.2524**	1.530	1.0	ug/L	679	Standard
	Pb	208	4943309.4	3.7	**156.8397**	0.243	0.2	ug/L	3166	Standard
	U	238	22756.8	4.3	**0.7989**	0.015	1.9	ug/L	119	Standard
>	Bi	209	599731.1	3.7				ug/L	668024	Standard

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⌈	**Na**	23	73.3	14.2	**19.8263**	2.217	11.2	mg/L	0	Standard
|	**Mg**	24	96.7	43.4	**0.0480**	0.061	127.5	mg/L	48	Standard
|	**K**	39	56.7	35.7	**0.4714**	0.237	50.2	mg/L	8	Standard
|	**Ca**	43	86.7	12.0	**18.7503**	2.653	14.1	mg/L	27	Standard
|	**Fe**	54	8682.1	2.7	**9.1535**	0.477	5.2	mg/L	121	Standard
|	**Fe**	57	2651.9	6.6	**9.0717**	0.832	9.2	mg/L	305	Standard
⌊>	**Sc-1**	45	22413.2	3.3				mg/L	22700	Standard
	Cl	35	6.0	66.7				ug/L	3	Standard
	Kr	83	3.7	41.7				ug/L	5	Standard
	Br	81	1463.4	9.5				ug/L	1367	Standard
	P	31	96.7	13.0				ug/L	67	Standard
	S	34	95.0	27.9				ug/L	55	Standard
	Sr	88	143.3	10.1				ug/L	113	Standard
	C	12	343.3	9.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	57709.7	1.1				mg/L	10	Standard
	Dy	164	19262.1	4.1				mg/L	18	Standard
	Ho-1	165	12777.1	5.3				mg/L	23	Standard
	Er	166	11080.7	4.8				mg/L	40	Standard
	I	127	3702.1	1.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		92.442	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.787	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	97.277
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	89.777
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Ti 47 Upper, S, EEE	Ti	47	
Mn 55 Upper, S, EEE	Mn	55	
Cu 65 Upper, S, EEE	Cu	65	

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Zn 66 Upper, S, EEE	Zn	66
Ba 135 Upper, S, EEE	Ba	135
Pb 206 Upper, S, EEE	Pb	206
Pb 207 Upper, S, EEE	Pb	207
Pb 208 Upper, S, EEE	Pb	208

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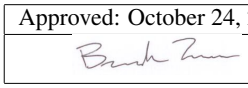

Method 6020 - Summary Report

Sample ID: L1610085507
Sample Date/Time: Thursday, October 20, 2016 17:39:52
Number of Replicates: 3
Autosampler Position: 344
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	75075.6	1.9				ug/L	76335	Standard
	Be	9	486.7	4.6	**0.4463**	0.029	6.6	ug/L	18	Standard
	Al	27	1668535.9	2.6	**13.6534**	0.442	3.2	ug/L	810	Standard
	Sc	45	24115.8	2.1				ug/L	22700	Standard
	Ti	47	14278.1	0.5	**68.9474**	0.488	0.7	ug/L	25	Standard
	V	51	60580.7	1.9	**8.1947**	0.144	1.8	ug/L	1541	Standard
	Cr	52	81447.7	1.4	**10.9890**	0.164	1.5	ug/L	7881	Standard
	Cr	53	9941.6	5.0	**10.5994**	0.534	5.0	ug/L	932	Standard
	Mn	55	1093218.9	1.2	**96.4015**	0.513	0.5	ug/L	1508	Standard
	Co	59	33126.8	1.0	**3.4825**	0.037	1.1	ug/L	282	Standard
	Ni	60	11623.5	2.0	**5.6679**	0.083	1.5	ug/L	91	Standard
	Cu	65	129549.7	2.2	**64.8305**	1.096	1.7	ug/L	205	Standard
	Zn	66	88505.1	1.4	**86.3296**	1.133	1.3	ug/L	369	Standard
>	Ge	72	493416.1	0.8				ug/L	496734	Standard
	As	75	2869.5	0.7	**2.8518**	0.037	1.3	ug/L	-45	Standard
	Se	82	75.3	6.8	**0.5670**	0.049	8.7	ug/L	18	Standard
	Se-1	77	110.7	12.8	**0.5213**	0.205	39.3	ug/L	83	Standard
>	Ga	71	4609.0	2.7				mg/L	30	Standard
	Rb	85	33522.1	2.4				ug/L	23	Standard
	Y	89	456033.8	1.5				ug/L	405333	Standard
>	Rh	103	66.7	30.3				ug/L	17	Standard
	Mo	98	2066.2	2.3	**0.5338**	0.013	2.4	ug/L	135	Standard
	Ag	107	5241.2	1.2	**0.7163**	0.007	1.0	ug/L	123	Standard
	Cd	111	1414.1	0.6	**0.6802**	0.005	0.8	mg/L	11	Standard
	Cd	114	3683.2	4.8	**0.6869**	0.031	4.6	ug/L	56	Standard
>	In	115	644099.3	0.3				ug/L	634401	Standard
	Sn	118	890.7	7.2	**0.6419**	0.050	7.8	ug/L	137	Standard
	Sb	123	777.6	7.1	**0.0765**	0.010	13.2	ug/L	907	Standard
	Ba	135	11443706.6	1.1	**3972.1959**	33.979	0.9	ug/L	166	Standard
	Ce	140	399746.9	1.3				ug/L	57	Standard
>	Tb	159	1328100.6	2.7				ug/L	1347540	Standard
	Ho	165	9072.7	8.2				ug/L	23	Standard
	Tl	203	1106.4	1.4	**0.0945**	0.001	1.1	ug/L	45	Standard
	Tl	205	2750.2	4.4	**0.1001**	0.005	4.8	ug/L	112	Standard
	Pb	206	1250095.7	0.5	**149.1883**	0.545	0.4	ug/L	825	Standard
	Pb	207	983005.3	1.3	**133.2764**	2.043	1.5	ug/L	679	Standard
	Pb	208	4805043.5	1.2	**143.3662**	1.605	1.1	ug/L	3166	Standard
	U	238	16898.4	0.9	**0.5574**	0.007	1.3	ug/L	119	Standard
>	Bi	209	637717.4	0.4				ug/L	668024	Standard

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⌈	**Na**	23	30.0	50.0	**7.5234**	3.706	49.3	mg/L	0	Standard
|	**Mg**	24	55.0	18.2	**-0.0195**	0.013	67.8	mg/L	48	Standard
|	**K**	39	33.3	31.2	**0.1944**	0.100	51.3	mg/L	8	Standard
|	**Ca**	43	58.3	30.1	**7.4990**	5.435	72.5	mg/L	27	Standard
|	**Fe**	54	4986.1	3.7	**4.8192**	0.086	1.8	mg/L	121	Standard
|	**Fe**	57	1745.1	7.0	**5.0335**	0.379	7.5	mg/L	305	Standard
⌊>	**Sc-1**	45	24115.8	2.1				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	2.7	43.3				ug/L	5	Standard
	Br	81	1513.4	7.7				ug/L	1367	Standard
	P	31	106.7	43.6				ug/L	67	Standard
	S	34	78.3	9.8				ug/L	55	Standard
	Sr	88	131.7	11.6				ug/L	113	Standard
	C	12	413.3	6.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	48748.3	1.2				mg/L	10	Standard
	Dy	164	14455.1	1.8				mg/L	18	Standard
	Ho-1	165	9072.7	8.2				mg/L	23	Standard
	Er	166	7978.8	3.5				mg/L	40	Standard
	I	127	3413.7	6.5				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		98.350	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		99.332	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	101.529
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	95.463
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Ba 135 Upper, S, EEE	Ba	135	
Pb 206 Upper, S, EEE	Pb	206	
Pb 207 Upper, S, EEE	Pb	207	

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Pb 208 Upper, S, EEE	Pb	208

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Method 6020 - Summary Report

Sample ID: L1610085508
Sample Date/Time: Thursday, October 20, 2016 17:43:06
Number of Replicates: 3
Autosampler Position: 345
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	74537.9	2.1				ug/L	76335	Standard
	Be	9	626.7	7.4	**0.5794**	0.045	7.8	ug/L	18	Standard
	Al	27	2643855.6	2.1	**21.7875**	0.053	0.2	ug/L	810	Standard
	Sc	45	23918.9	3.0				ug/L	22700	Standard
	Ti	47	21488.9	4.4	**104.7512**	3.010	2.9	ug/L	25	Standard
	V	51	77359.0	5.8	**10.6200**	0.491	4.6	ug/L	1541	Standard
	Cr	52	100644.6	4.3	**13.9901**	0.388	2.8	ug/L	7881	Standard
	Cr	53	12598.6	6.4	**13.8496**	0.702	5.1	ug/L	932	Standard
	Mn	55	3222044.0	3.4	**286.8209**	4.860	1.7	ug/L	1508	Standard
	Co	59	51109.8	3.2	**5.4388**	0.084	1.5	ug/L	282	Standard
	Ni	60	19064.0	2.5	**9.4078**	0.097	1.0	ug/L	91	Standard
	Cu	65	116138.6	2.6	**58.6381**	0.557	0.9	ug/L	205	Standard
	Zn	66	96504.5	2.7	**94.9928**	0.996	1.0	ug/L	369	Standard
>	Ge	72	488979.8	1.7				ug/L	496734	Standard
	As	75	4512.9	1.7	**4.4906**	0.017	0.4	ug/L	-45	Standard
	Se	82	77.8	6.1	**0.5994**	0.035	5.9	ug/L	18	Standard
	Se-1	77	126.7	5.1	**0.7827**	0.119	15.2	ug/L	83	Standard
>	Ga	71	6569.8	3.9				mg/L	30	Standard
	Rb	85	38453.8	4.4				ug/L	23	Standard
	Y	89	515579.3	4.7				ug/L	405333	Standard
>	Rh	103	71.7	10.7				ug/L	17	Standard
	Mo	98	2702.2	4.4	**0.7008**	0.016	2.2	ug/L	135	Standard
	Ag	107	6716.5	1.9	**0.9196**	0.012	1.3	ug/L	123	Standard
	Cd	111	1462.9	3.8	**0.7004**	0.015	2.2	mg/L	11	Standard
	Cd	114	3881.5	6.1	**0.7202**	0.028	3.9	ug/L	56	Standard
>	In	115	647308.0	2.3				ug/L	634401	Standard
	Sn	118	833.0	7.8	**0.5928**	0.064	10.8	ug/L	137	Standard
	Sb	123	967.7	1.6	**0.1112**	0.004	3.8	ug/L	907	Standard
	Ba	135	13399501.5	2.0	**4628.4741**	59.705	1.3	ug/L	166	Standard
	Ce	140	620705.5	3.5				ug/L	57	Standard
>	Tb	159	1343867.5	2.5				ug/L	1347540	Standard
	Ho	165	14984.1	4.6				ug/L	23	Standard
	Tl	203	1149.0	3.7	**0.1014**	0.002	1.8	ug/L	45	Standard
	Tl	205	2600.2	11.7	**0.0974**	0.011	11.0	ug/L	112	Standard
	Pb	206	740315.6	2.7	**90.9649**	0.615	0.7	ug/L	825	Standard
	Pb	207	579476.4	3.2	**80.8853**	1.264	1.6	ug/L	679	Standard
	Pb	208	2754065.1	2.3	**84.6052**	0.297	0.4	ug/L	3166	Standard
	U	238	23521.9	2.8	**0.7998**	0.007	0.9	ug/L	119	Standard
>	Bi	209	619186.5	2.0				ug/L	668024	Standard

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⌈	**Na**	23	133.3	25.0	**33.9655**	9.038	26.6	mg/L	0	Standard
|	**Mg**	24	81.7	24.7	**0.0184**	0.029	157.5	mg/L	48	Standard
|	**K**	39	55.0	9.1	**0.4135**	0.065	15.6	mg/L	8	Standard
|	**Ca**	43	118.3	17.1	**27.3584**	7.578	27.7	mg/L	27	Standard
|	**Fe**	54	9559.5	4.9	**9.4405**	0.446	4.7	mg/L	121	Standard
|	**Fe**	57	2973.6	4.1	**9.5972**	0.691	7.2	mg/L	305	Standard
⌊>	**Sc-1**	45	23918.9	3.0				mg/L	22700	Standard
	Cl	35	4.0	0.0				ug/L	3	Standard
	Kr	83	3.7	15.7				ug/L	5	Standard
	Br	81	1503.4	7.4				ug/L	1367	Standard
	P	31	120.0	19.1				ug/L	67	Standard
	S	34	113.3	19.9				ug/L	55	Standard
	Sr	88	173.3	10.9				ug/L	113	Standard
	C	12	356.7	35.5				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	140371.2	3.8				mg/L	10	Standard
	Dy	164	23293.4	1.4				mg/L	18	Standard
	Ho-1	165	14984.1	4.6				mg/L	23	Standard
	Er	166	13195.7	3.7				mg/L	40	Standard
	I	127	2977.0	6.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		97.645	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		98.439	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85		
Y	89		
Rh	103		
Mo	98		
Ag	107		
Cd	111		
Cd	114		
In	115	102.034	
Sn	118		
Sb	123		
Ba	135		
Ce	140		
Tb	159		
Ho	165		
Tl	203		
Tl	205		
Pb	206		
Pb	207		
Pb	208		
U	238		
Bi	209	92.689	
Na	23		
Mg	24		
K	39		
Ca	43		
Fe	54		
Fe	57		
Sc-1	45		
Cl	35		
Kr	83		
Br	81		
P	31		
S	34		
Sr	88		
C	12		
N	14		
Hg	202		
Dy	164		
Ho-1	165		
Er	166		
I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Ti 47 Upper, S, EEE	Ti	47	
Mn 55 Upper, S, EEE	Mn	55	
Ba 135 Upper, S, EEE	Ba	135	

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Method 6020 - Summary Report

Sample ID: L1610085509
Sample Date/Time: Thursday, October 20, 2016 17:46:05
Number of Replicates: 3
Autosampler Position: 346
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71955.6	3.2				ug/L	76335	Standard
	Be	9	598.3	10.8	**0.5746**	0.081	14.2	ug/L	18	Standard
	Al	27	1007074.8	1.5	**8.6030**	0.404	4.7	ug/L	810	Standard
	Sc	45	24589.9	2.6				ug/L	22700	Standard
	Ti	47	10695.4	3.5	**51.8549**	1.877	3.6	ug/L	25	Standard
	V	51	75989.6	0.5	**10.3854**	0.078	0.8	ug/L	1541	Standard
	Cr	52	59457.8	1.0	**7.7438**	0.073	0.9	ug/L	7881	Standard
	Cr	53	7535.2	2.8	**7.8148**	0.276	3.5	ug/L	932	Standard
	Mn	55	2361540.4	1.0	**209.3194**	1.585	0.8	ug/L	1508	Standard
	Co	59	56920.7	1.3	**6.0354**	0.082	1.4	ug/L	282	Standard
	Ni	60	14079.9	1.0	**6.9072**	0.064	0.9	ug/L	91	Standard
	Cu	65	28171.2	1.2	**14.1161**	0.213	1.5	ug/L	205	Standard
	Zn	66	39162.2	1.1	**38.2770**	0.548	1.4	ug/L	369	Standard
>	Ge	72	491117.2	0.3				ug/L	496734	Standard
	As	75	1894.2	2.4	**1.9111**	0.041	2.1	ug/L	-45	Standard
	Se	82	45.4	11.5	**0.2649**	0.052	19.7	ug/L	18	Standard
	Se-1	77	124.3	7.5	**0.7380**	0.144	19.6	ug/L	83	Standard
>	Ga	71	5117.5	5.6				mg/L	30	Standard
	Rb	85	50619.5	2.6				ug/L	23	Standard
	Y	89	487008.6	2.1				ug/L	405333	Standard
>	Rh	103	31.7	9.1				ug/L	17	Standard
	Mo	98	1235.6	3.0	**0.3107**	0.018	5.8	ug/L	135	Standard
	Ag	107	757.7	1.9	**0.0845**	0.004	4.6	ug/L	123	Standard
	Cd	111	292.4	1.8	**0.1334**	0.006	4.7	mg/L	11	Standard
	Cd	114	759.0	8.5	**0.1362**	0.012	9.2	ug/L	56	Standard
>	In	115	644919.8	3.4				ug/L	634401	Standard
	Sn	118	287.3	6.9	**0.1545**	0.016	10.5	ug/L	137	Standard
	Sb	123	458.9	9.5	**0.0168**	0.006	36.9	ug/L	907	Standard
	Ba	135	4892679.4	1.5	**1697.3890**	61.738	3.6	ug/L	166	Standard
	Ce	140	510972.7	3.8				ug/L	57	Standard
>	Tb	159	1369958.6	3.4				ug/L	1347540	Standard
	Ho	165	12051.5	1.1				ug/L	23	Standard
	Tl	203	914.0	1.7	**0.0755**	0.002	2.3	ug/L	45	Standard
	Tl	205	2108.5	6.7	**0.0746**	0.004	5.3	ug/L	112	Standard
	Pb	206	170262.4	1.5	**19.8356**	0.164	0.8	ug/L	825	Standard
	Pb	207	135061.7	1.4	**17.8765**	0.254	1.4	ug/L	679	Standard
	Pb	208	642462.4	1.6	**18.7105**	0.169	0.9	ug/L	3166	Standard
	U	238	16810.7	1.0	**0.5426**	0.007	1.3	ug/L	119	Standard
>	Bi	209	651742.9	1.9				ug/L	668024	Standard

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	Na	23	8.3	91.7	**2.0811**	1.929	92.7	mg/L	0	Standard
	Mg	24	66.7	22.9	**-0.0049**	0.022	453.7	mg/L	48	Standard
	K	39	41.7	59.2	**0.2677**	0.234	87.5	mg/L	8	Standard
	Ca	43	41.7	6.9	**1.9414**	1.265	65.1	mg/L	27	Standard
	Fe	54	6605.2	1.9	**6.3059**	0.285	4.5	mg/L	121	Standard
	Fe	57	1998.5	7.2	**5.8230**	0.620	10.6	mg/L	305	Standard
>	**Sc-1**	45	24589.9	2.6				mg/L	22700	Standard
	Cl	35	6.0	57.7				ug/L	3	Standard
	Kr	83	2.7	21.7				ug/L	5	Standard
	Br	81	1306.7	12.4				ug/L	1367	Standard
	P	31	63.3	50.8				ug/L	67	Standard
	S	34	95.0	27.9				ug/L	55	Standard
	Sr	88	155.0	21.2				ug/L	113	Standard
	C	12	310.0	25.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	4684.1	3.2				mg/L	10	Standard
	Dy	164	19581.4	2.0				mg/L	18	Standard
	Ho-1	165	12051.5	1.1				mg/L	23	Standard
	Er	166	10757.2	0.5				mg/L	40	Standard
	I	127	2511.9	9.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6		94.263	
	Be	9			
	Al	27			
	Sc	45			
	Ti	47			
	V	51			
	Cr	52			
	Cr	53			
	Mn	55			
	Co	59			
	Ni	60			
	Cu	65			
	Zn	66			
>	Ge	72		98.869	
	As	75			
	Se	82			
	Se-1	77			
>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	101.658
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	97.563
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	
Ba 135 Upper, S, EEE	Ba	135	

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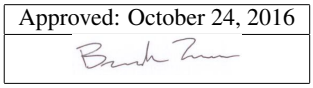

Method 6020 - Summary Report

Sample ID: L1610085510
Sample Date/Time: Thursday, October 20, 2016 17:49:38
Number of Replicates: 3
Autosampler Position: 347
Sample Description: 1
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	77054.2	5.4				ug/L	76335	Standard
	Be	9	676.7	10.9	**0.6040**	0.033	5.5	ug/L	18	Standard
	Al	27	1076119.0	2.7	**8.5843**	0.236	2.7	ug/L	810	Standard
	Sc	45	25050.7	1.0				ug/L	22700	Standard
	Ti	47	8328.3	1.5	**39.2001**	1.391	3.5	ug/L	25	Standard
	V	51	74601.1	3.0	**9.8955**	0.413	4.2	ug/L	1541	Standard
	Cr	52	60085.9	2.0	**7.5804**	0.222	2.9	ug/L	7881	Standard
	Cr	53	7333.4	2.4	**7.3297**	0.291	4.0	ug/L	932	Standard
	Mn	55	3704902.2	1.9	**319.0429**	6.854	2.1	ug/L	1508	Standard
	Co	59	75283.7	2.8	**7.7627**	0.202	2.6	ug/L	282	Standard
	Ni	60	15945.1	1.9	**7.6032**	0.204	2.7	ug/L	91	Standard
	Cu	65	34559.0	1.9	**16.8327**	0.354	2.1	ug/L	205	Standard
	Zn	66	52915.9	1.9	**50.2940**	0.950	1.9	ug/L	369	Standard
>	Ge	72	505838.1	3.8				ug/L	496734	Standard
	As	75	1745.9	3.3	**1.7170**	0.036	2.1	ug/L	-45	Standard
	Se	82	38.8	16.8	**0.1856**	0.061	32.9	ug/L	18	Standard
	Se-1	77	111.3	10.4	**0.4910**	0.166	33.9	ug/L	83	Standard
>	Ga	71	5152.5	4.6				mg/L	30	Standard
	Rb	85	40250.1	2.4				ug/L	23	Standard
	Y	89	497075.2	1.6				ug/L	405333	Standard
>	Rh	103	40.0	50.0				ug/L	17	Standard
	Mo	98	1194.1	1.4	**0.2882**	0.003	1.0	ug/L	135	Standard
	Ag	107	1049.0	4.1	**0.1204**	0.003	2.5	ug/L	123	Standard
	Cd	111	481.8	3.0	**0.2174**	0.006	2.6	mg/L	11	Standard
	Cd	114	1210.8	5.4	**0.2132**	0.009	4.0	ug/L	56	Standard
>	In	115	667925.7	2.4				ug/L	634401	Standard
	Sn	118	283.0	2.9	**0.1432**	0.011	8.0	ug/L	137	Standard
	Sb	123	538.8	5.5	**0.0284**	0.006	21.3	ug/L	907	Standard
	Ba	135	13971697.5	2.4	**4676.9916**	57.481	1.2	ug/L	166	Standard
	Ce	140	561352.4	3.0				ug/L	57	Standard
>	Tb	159	1378163.7	2.6				ug/L	1347540	Standard
	Ho	165	11749.6	4.2				ug/L	23	Standard
	Tl	203	740.7	2.3	**0.0612**	0.002	2.7	ug/L	45	Standard
	Tl	205	1646.8	9.9	**0.0588**	0.008	13.1	ug/L	112	Standard
	Pb	206	241098.8	1.6	**28.4809**	0.501	1.8	ug/L	825	Standard
	Pb	207	190150.8	1.1	**25.5201**	0.491	1.9	ug/L	679	Standard
	Pb	208	901457.0	1.1	**26.6238**	0.586	2.2	ug/L	3166	Standard
	U	238	19496.2	0.9	**0.6380**	0.023	3.6	ug/L	119	Standard
>	Bi	209	643447.8	3.0				ug/L	668024	Standard

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⌈	**Na**	23	35.0	51.5	**8.4578**	4.303	50.9	mg/L	0	Standard
|	**Mg**	24	56.7	22.2	**-0.0201**	0.017	82.9	mg/L	48	Standard
|	**K**	39	45.0	11.1	**0.2930**	0.047	15.9	mg/L	8	Standard
|	**Ca**	43	63.3	12.1	**8.4143**	2.516	29.9	mg/L	27	Standard
|	**Fe**	54	10147.2	1.9	**9.5673**	0.104	1.1	mg/L	121	Standard
|	**Fe**	57	2843.6	8.3	**8.6393**	0.818	9.5	mg/L	305	Standard
⌊>	**Sc-1**	45	25050.7	1.0				mg/L	22700	Standard
	Cl	35	4.7	65.5				ug/L	3	Standard
	Kr	83	1.3	43.3				ug/L	5	Standard
	Br	81	1360.1	3.2				ug/L	1367	Standard
	P	31	113.3	6.7				ug/L	67	Standard
	S	34	85.0	42.4				ug/L	55	Standard
	Sr	88	148.3	22.4				ug/L	113	Standard
	C	12	370.0	4.7				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	1996.8	10.2				mg/L	10	Standard
	Dy	164	18152.4	2.5				mg/L	18	Standard
	Ho-1	165	11749.6	4.2				mg/L	23	Standard
	Er	166	10280.2	2.6				mg/L	40	Standard
	I	127	3180.3	1.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		100.942	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		101.833	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	105.284
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	96.321
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	
Ba 135 Upper, S, EEE	Ba	135	

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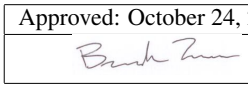

Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 17:52:39
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	70446.9	3.7				ug/L	76335	Standard
	Be	9	51432.2	2.7	**50.5922**	2.057	4.1	ug/L	18	Standard
	Al	27	5768316.7	4.0	**50.3251**	1.986	3.9	ug/L	810	Standard
	Sc	45	21480.2	2.3				ug/L	22700	Standard
	Ti	47	19859.7	1.0	**100.0271**	2.553	2.6	ug/L	25	Standard
	V	51	347369.2	0.9	**50.0833**	0.535	1.1	ug/L	1541	Standard
	Cr	52	328154.6	1.2	**49.9310**	0.427	0.9	ug/L	7881	Standard
	Cr	53	41369.8	4.2	**49.5789**	1.796	3.6	ug/L	932	Standard
	Mn	55	530874.3	1.4	**48.7516**	0.902	1.9	ug/L	1508	Standard
	Co	59	446816.0	1.9	**49.3789**	0.898	1.8	ug/L	282	Standard
	Ni	60	97268.7	2.3	**49.7614**	1.162	2.3	ug/L	91	Standard
	Cu	65	96171.6	1.4	**50.1486**	0.820	1.6	ug/L	205	Standard
	Zn	66	50245.2	0.9	**51.0050**	0.625	1.2	ug/L	369	Standard
>	Ge	72	473478.7	1.8				ug/L	496734	Standard
	As	75	50052.9	1.5	**50.8173**	0.180	0.4	ug/L	-45	Standard
	Se	82	4855.5	1.5	**51.2680**	0.179	0.3	ug/L	18	Standard
	Se-1	77	3311.4	0.9	**51.0928**	0.660	1.3	ug/L	83	Standard
>	Ga	71	33.3	8.7				mg/L	30	Standard
	Rb	85	646.7	11.3				ug/L	23	Standard
	Y	89	382525.4	0.9				ug/L	405333	Standard
>	Rh	103	40.0	54.5				ug/L	17	Standard
	Mo	98	358702.1	1.6	**99.1100**	1.281	1.3	ug/L	135	Standard
	Ag	107	356855.7	1.8	**51.7051**	0.465	0.9	ug/L	123	Standard
	Cd	111	103407.2	2.5	**51.8496**	0.840	1.6	mg/L	11	Standard
	Cd	114	267700.6	1.8	**51.8484**	0.341	0.7	ug/L	56	Standard
>	In	115	626046.0	1.3				ug/L	634401	Standard
	Sn	118	62063.6	3.8	**51.4870**	1.646	3.2	ug/L	137	Standard
	Sb	123	269684.7	0.9	**51.7556**	0.459	0.9	ug/L	907	Standard
	Ba	135	144527.7	2.8	**51.5687**	1.360	2.6	ug/L	166	Standard
	Ce	140	233.3	46.7				ug/L	57	Standard
>	Tb	159	1292411.0	0.7				ug/L	1347540	Standard
	Ho	165	28.3	83.4				ug/L	23	Standard
	Tl	203	550209.3	2.4	**50.0202**	0.728	1.5	ug/L	45	Standard
	Tl	205	1292595.4	1.4	**48.6511**	0.148	0.3	ug/L	112	Standard
	Pb	206	415865.7	2.2	**50.3400**	0.661	1.3	ug/L	825	Standard
	Pb	207	367913.1	2.0	**50.6008**	0.527	1.0	ug/L	679	Standard
	Pb	208	1662691.6	2.2	**50.3202**	0.621	1.2	ug/L	3166	Standard
	U	238	1437293.8	2.9	**48.2737**	1.085	2.2	ug/L	119	Standard
>	Bi	209	628229.5	1.2				ug/L	668024	Standard

Sample ID: QC Std 6
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	Na	23	13.3	94.4	**3.8155**	3.644	95.5	mg/L	0	Standard
	Mg	24	3190.3	0.7	**4.8556**	0.151	3.1	mg/L	48	Standard
	K	39	476.7	11.1	**5.1343**	0.696	13.6	mg/L	8	Standard
	Ca	43	31.7	39.7	**0.2740**	4.842	1767.1	mg/L	27	Standard
	Fe	54	4701.1	2.5	**5.1139**	0.256	5.0	mg/L	121	Standard
	Fe	57	1490.1	6.3	**4.7749**	0.400	8.4	mg/L	305	Standard
>	**Sc-1**	45	21480.2	2.3				mg/L	22700	Standard
	Cl	35	1.3	86.6				ug/L	3	Standard
	Kr	83	3.3	62.4				ug/L	5	Standard
	Br	81	1183.4	18.6				ug/L	1367	Standard
	P	31	96.7	20.9				ug/L	67	Standard
	S	34	73.3	17.2				ug/L	55	Standard
	Sr	88	143.3	22.4				ug/L	113	Standard
	C	12	316.7	44.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	136.7	16.9				mg/L	10	Standard
	Dy	164	28.2	34.6				mg/L	18	Standard
	Ho-1	165	28.3	83.4				mg/L	23	Standard
	Er	166	36.7	15.7				mg/L	40	Standard
	I	127	2503.5	7.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	101.184		
	Al	27	100.650		
	Sc	45			
	Ti	47	100.027		
	V	51	100.167		
	Cr	52	99.862		
	Cr	53			
	Mn	55	97.503		
	Co	59	98.758		
	Ni	60	99.523		
	Cu	65	100.297		
	Zn	66	102.010		
>	Ge	72		95.318	
	As	75	101.635		
	Se	82	102.536		
	Se-1	77			
>	Ga	71			

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	Rb	85		
	Y	89		
>	Rh	103		
	Mo	98	99.110	
	Ag	107	103.410	
	Cd	111	103.699	
	Cd	114		
>	In	115		98.683
	Sn	118	102.974	
	Sb	123	103.511	
	Ba	135	103.137	
	Ce	140		
>	Tb	159		
	Ho	165		
	Tl	203	100.040	
	Tl	205		
	Pb	206		
	Pb	207		
	Pb	208	100.640	
	U	238	96.547	
>	Bi	209		94.043
	Na	23		
	Mg	24		
	K	39		
	Ca	43		
	Fe	54		
	Fe	57		
>	Sc-1	45		
	Cl	35		
	Kr	83		
	Br	81		
	P	31		
	S	34		
	Sr	88		
	C	12		
	N	14		
	Hg	202		
	Dy	164		
	Ho-1	165		
	Er	166		
	I	127		

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 17:55:38
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73073.0	7.0				ug/L	76335	Standard
	Be	9	10.0	50.0	**0.0065**	0.005	75.9	ug/L	18	Standard
	Al	27	890.0	12.8	**0.0031**	0.001	23.7	ug/L	810	Standard
	Sc	45	22059.5	9.6				ug/L	22700	Standard
	Ti	47	23.7	6.5	**-0.0216**	0.007	33.6	ug/L	25	Standard
	V	51	1460.9	7.9	**-0.0173**	0.005	30.0	ug/L	1541	Standard
	Cr	52	7365.5	5.9	**-0.0668**	0.025	37.1	ug/L	7881	Standard
	Cr	53	845.0	1.2	**-0.0725**	0.050	69.6	ug/L	932	Standard
	Mn	55	1524.7	2.1	**0.0523**	0.005	9.4	ug/L	1508	Standard
	Co	59	256.3	5.2	**-0.0049**	0.002	41.4	ug/L	282	Standard
	Ni	60	83.3	8.4	**-0.0007**	0.003	502.2	ug/L	91	Standard
	Cu	65	165.0	6.7	**0.0217**	0.005	22.8	ug/L	205	Standard
	Zn	66	318.3	5.6	**0.1331**	0.026	19.7	ug/L	369	Standard
>	Ge	72	486079.0	5.3				ug/L	496734	Standard
	As	75	-52.2	48.4	**0.0070**	0.027	384.0	ug/L	-45	Standard
	Se	82	20.9	18.8	**0.0164**	0.033	200.9	ug/L	18	Standard
	Se-1	77	85.7	5.5	**0.1679**	0.137	81.7	ug/L	83	Standard
>	Ga	71	15.0	120.2				mg/L	30	Standard
	Rb	85	25.0	60.0				ug/L	23	Standard
	Y	89	398473.2	6.6				ug/L	405333	Standard
>	Rh	103	16.7	62.4				ug/L	17	Standard
	Mo	98	286.3	19.7	**0.0550**	0.011	19.5	ug/L	135	Standard
	Ag	107	119.0	9.7	**-0.0055**	0.001	17.4	ug/L	123	Standard
	Cd	111	13.3	15.2	**-0.0027**	0.001	25.7	mg/L	11	Standard
	Cd	114	61.9	2.5	**0.0050**	0.000	9.7	ug/L	56	Standard
>	In	115	647009.0	5.5				ug/L	634401	Standard
	Sn	118	176.3	35.8	**0.0628**	0.043	68.2	ug/L	137	Standard
	Sb	123	2827.9	45.8	**0.4497**	0.212	47.2	ug/L	907	Standard
	Ba	135	1083.4	16.3	**0.3302**	0.081	24.4	ug/L	166	Standard
	Ce	140	83.3	12.5				ug/L	57	Standard
>	Tb	159	1313028.8	4.6				ug/L	1347540	Standard
	Ho	165	13.3	94.4				ug/L	23	Standard
	Tl	203	42.0	4.1	**-0.0010**	0.000	23.9	ug/L	45	Standard
	Tl	205	108.3	41.4	**0.0021**	0.002	86.0	ug/L	112	Standard
	Pb	206	570.3	6.1	**0.0109**	0.003	30.5	ug/L	825	Standard
	Pb	207	462.3	5.0	**0.0113**	0.002	21.1	ug/L	679	Standard
	Pb	208	2172.1	5.2	**0.0088**	0.002	19.0	ug/L	3166	Standard
	U	238	100.7	1.5	**0.0015**	0.000	11.9	ug/L	119	Standard
>	Bi	209	655404.5	5.9				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4184**	0.716	171.1	mg/L	0	Standard
|	**Mg**	24	55.0	31.5	**-0.0124**	0.026	206.7	mg/L	48	Standard
|	**K**	39	15.0	0.0	**0.0295**	0.015	50.3	mg/L	8	Standard
|	**Ca**	43	28.3	44.4	**-0.9836**	5.046	513.0	mg/L	27	Standard
|	**Fe**	54	104.2	22.0	**-0.0171**	0.017	100.5	mg/L	121	Standard
|	**Fe**	57	308.3	7.3	**-0.0755**	0.083	110.2	mg/L	305	Standard
⌊>	**Sc-1**	45	22059.5	9.6				mg/L	22700	Standard
	Cl	35	3.3	124.9				ug/L	3	Standard
	Kr	83	2.0	86.6				ug/L	5	Standard
	Br	81	1376.7	14.6				ug/L	1367	Standard
	P	31	108.3	34.0				ug/L	67	Standard
	S	34	83.3	33.0				ug/L	55	Standard
	Sr	88	108.3	7.1				ug/L	113	Standard
	C	12	206.7	24.8				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	140.0	24.7				mg/L	10	Standard
	Dy	164	18.9	55.6				mg/L	18	Standard
	Ho-1	165	13.3	94.4				mg/L	23	Standard
	Er	166	23.3	65.5				mg/L	40	Standard
	I	127	2618.6	3.6				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		97.855	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	101.987
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	98.111
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	

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Method 6020 - Summary Report

Sample ID: L1610085510
Sample Date/Time: Thursday, October 20, 2016 17:58:39
Number of Replicates: 3
Autosampler Position: 348
Sample Description: 10
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	58322.1	3.0				ug/L	76335	Standard
	Be	9	60.0	38.2	**0.0688**	0.029	42.2	ug/L	18	Standard
	Al	27	86684.0	2.2	**0.9091**	0.025	2.8	ug/L	810	Standard
	Sc	45	19679.5	5.5				ug/L	22700	Standard
	Ti	47	705.0	1.4	**3.7069**	0.133	3.6	ug/L	25	Standard
	V	51	7024.6	1.2	**0.8767**	0.019	2.2	ug/L	1541	Standard
	Cr	52	9128.4	2.0	**0.3532**	0.042	11.9	ug/L	7881	Standard
	Cr	53	1083.4	6.8	**0.3539**	0.129	36.4	ug/L	932	Standard
	Mn	55	298370.0	3.1	**29.5803**	0.484	1.6	ug/L	1508	Standard
	Co	59	6541.1	5.0	**0.7490**	0.021	2.8	ug/L	282	Standard
	Ni	60	1396.4	1.6	**0.7307**	0.015	2.0	ug/L	91	Standard
	Cu	65	3086.0	4.9	**1.6785**	0.047	2.8	ug/L	205	Standard
	Zn	66	5802.8	2.4	**6.2069**	0.104	1.7	ug/L	369	Standard
>	Ge	72	437988.4	2.3				ug/L	496734	Standard
	As	75	140.5	32.9	**0.2141**	0.053	24.8	ug/L	-45	Standard
	Se	82	15.6	39.2	**-0.0206**	0.070	340.5	ug/L	18	Standard
	Se-1	77	70.7	15.6	**0.0539**	0.202	374.1	ug/L	83	Standard
>	Ga	71	435.0	10.5				mg/L	30	Standard
	Rb	85	3343.7	1.7				ug/L	23	Standard
	Y	89	354277.2	2.3				ug/L	405333	Standard
>	Rh	103	20.0	75.0				ug/L	17	Standard
	Mo	98	162.2	11.5	**0.0300**	0.005	15.7	ug/L	135	Standard
	Ag	107	156.7	5.4	**0.0038**	0.001	19.1	ug/L	123	Standard
	Cd	111	49.1	8.2	**0.0191**	0.003	15.6	mg/L	11	Standard
	Cd	114	141.3	17.1	**0.0247**	0.005	19.1	ug/L	56	Standard
>	In	115	547334.8	3.3				ug/L	634401	Standard
	Sn	118	76.0	28.9	**-0.0056**	0.019	330.7	ug/L	137	Standard
	Sb	123	293.5	41.7	**-0.0047**	0.025	528.7	ug/L	907	Standard
	Ba	135	1136872.4	2.8	**464.4216**	6.361	1.4	ug/L	166	Standard
	Ce	140	46992.8	2.7				ug/L	57	Standard
>	Tb	159	1166391.6	1.9				ug/L	1347540	Standard
	Ho	165	1043.4	1.8				ug/L	23	Standard
	Tl	203	74.3	14.4	**0.0026**	0.001	34.0	ug/L	45	Standard
	Tl	205	161.7	15.3	**0.0046**	0.001	18.5	ug/L	112	Standard
	Pb	206	21462.5	2.4	**2.7181**	0.018	0.6	ug/L	825	Standard
	Pb	207	17161.0	1.1	**2.4701**	0.035	1.4	ug/L	679	Standard
	Pb	208	81964.2	2.1	**2.5938**	0.008	0.3	ug/L	3166	Standard
	U	238	1747.4	4.5	**0.0608**	0.001	2.2	ug/L	119	Standard
>	Bi	209	589179.2	2.4				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5516**	0.947	171.6	mg/L	0	Standard
|	**Mg**	24	41.7	38.6	**-0.0248**	0.027	108.5	mg/L	48	Standard
|	**K**	39	11.7	65.5	**0.0050**	0.084	1669.9	mg/L	8	Standard
|	**Ca**	43	36.7	68.6	**3.1799**	9.562	300.7	mg/L	27	Standard
|	**Fe**	54	915.8	6.0	**0.9852**	0.054	5.5	mg/L	121	Standard
|	**Fe**	57	543.3	9.9	**1.1126**	0.139	12.5	mg/L	305	Standard
⌊>	**Sc-1**	45	19679.5	5.5				mg/L	22700	Standard
	Cl	35	3.3	34.6				ug/L	3	Standard
	Kr	83	3.7	41.7				ug/L	5	Standard
	Br	81	1183.4	8.5				ug/L	1367	Standard
	P	31	55.0	31.5				ug/L	67	Standard
	S	34	78.3	7.4				ug/L	55	Standard
	Sr	88	128.3	14.8				ug/L	113	Standard
	C	12	223.3	22.1				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	250.0	6.9				mg/L	10	Standard
	Dy	164	1636.7	12.7				mg/L	18	Standard
	Ho-1	165	1043.4	1.8				mg/L	23	Standard
	Er	166	836.7	8.4				mg/L	40	Standard
	I	127	3267.0	7.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		76.403	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		88.174	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	86.276
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	88.197
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Ba 135 Upper, S, EEE	Ba	135	

Sample ID: L1610085510
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Method 6020 - Summary Report

Sample ID: QC Std 4
Sample Date/Time: Thursday, October 20, 2016 18:01:40
Number of Replicates: 3
Autosampler Position: 203
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	60348.4	3.3				ug/L	76335	Standard
	Be	9	6.7	114.6	**0.0049**	0.009	187.3	ug/L	18	Standard
	Al	27	4578369.3	3.6	**46.6082**	0.859	1.8	ug/L	810	Standard
	Sc	45	19248.9	3.4				ug/L	22700	Standard
	Ti	47	2231.8	2.8	**11.9741**	0.384	3.2	ug/L	25	Standard
	V	51	1191.8	6.3	**-0.0376**	0.004	10.3	ug/L	1541	Standard
	Cr	52	5186.6	2.9	**-0.3150**	0.013	4.1	ug/L	7881	Standard
	Cr	53	1078.4	7.1	**0.3387**	0.095	28.1	ug/L	932	Standard
	Mn	55	1559.1	5.1	**0.0697**	0.004	5.3	ug/L	1508	Standard
	Co	59	351.7	5.3	**0.0093**	0.000	4.0	ug/L	282	Standard
	Ni	60	427.7	2.5	**0.1934**	0.005	2.5	ug/L	91	Standard
	Cu	65	262.7	16.3	**0.0848**	0.019	22.1	ug/L	205	Standard
	Zn	66	911.0	10.8	**0.8131**	0.065	8.1	ug/L	369	Standard
>	Ge	72	440220.6	4.4				ug/L	496734	Standard
	As	75	-87.1	25.3	**-0.0359**	0.026	72.7	ug/L	-45	Standard
	Se	82	18.2	19.9	**0.0092**	0.045	483.3	ug/L	18	Standard
	Se-1	77	177.7	5.9	**1.8660**	0.241	12.9	ug/L	83	Standard
>	Ga	71	60.0	28.9				mg/L	30	Standard
	Rb	85	2238.5	3.0				ug/L	23	Standard
	Y	89	343308.3	3.2				ug/L	405333	Standard
>	Rh	103	16.7	62.4				ug/L	17	Standard
	Mo	98	247243.4	3.8	**78.3133**	4.153	5.3	ug/L	135	Standard
	Ag	107	148.0	7.3	**0.0024**	0.002	71.2	ug/L	123	Standard
	Cd	111	-9.9	187.7	**-0.0148**	0.011	72.4	mg/L	11	Standard
	Cd	114	583.8	3.7	**0.1230**	0.006	4.5	ug/L	56	Standard
>	In	115	546441.7	2.8				ug/L	634401	Standard
	Sn	118	44.0	19.8	**-0.0355**	0.008	23.2	ug/L	137	Standard
	Sb	123	399.6	27.5	**0.0190**	0.023	121.2	ug/L	907	Standard
	Ba	135	1015.7	12.8	**0.3682**	0.046	12.4	ug/L	166	Standard
	Ce	140	1448.4	10.8				ug/L	57	Standard
>	Tb	159	1155727.7	2.1				ug/L	1347540	Standard
	Ho	165	20.0	43.3				ug/L	23	Standard
	Tl	203	133.0	17.8	**0.0085**	0.002	23.7	ug/L	45	Standard
	Tl	205	313.3	8.8	**0.0109**	0.001	9.9	ug/L	112	Standard
	Pb	206	852.4	3.4	**0.0566**	0.003	4.9	ug/L	825	Standard
	Pb	207	714.7	8.3	**0.0568**	0.007	12.4	ug/L	679	Standard
	Pb	208	3357.8	3.7	**0.0559**	0.003	5.4	ug/L	3166	Standard
	U	238	86.7	8.2	**0.0014**	0.000	14.2	ug/L	119	Standard
>	Bi	209	579641.1	2.4				ug/L	668024	Standard

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⌈	**Na**	23	41.7	30.2	**13.2130**	4.343	32.9	mg/L	0	Standard
|	**Mg**	24	6359.7	2.2	**10.9160**	0.136	1.2	mg/L	48	Standard
|	**K**	39	398.3	14.1	**4.7583**	0.526	11.1	mg/L	8	Standard
|	**Ca**	43	66.7	21.7	**15.8050**	6.534	41.3	mg/L	27	Standard
|	**Fe**	54	4041.7	1.6	**4.9010**	0.184	3.7	mg/L	121	Standard
|	**Fe**	57	1391.7	3.2	**5.0367**	0.366	7.3	mg/L	305	Standard
⌊>	**Sc-1**	45	19248.9	3.4				mg/L	22700	Standard
	Cl	35	4.0	50.0				ug/L	3	Standard
	Kr	83	3.7	15.7				ug/L	5	Standard
	Br	81	1106.7	19.0				ug/L	1367	Standard
	P	31	40.0	50.0				ug/L	67	Standard
	S	34	91.7	31.0				ug/L	55	Standard
	Sr	88	136.7	12.8				ug/L	113	Standard
	C	12	263.3	18.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	100.0	17.3				mg/L	10	Standard
	Dy	164	18.2	48.3				mg/L	18	Standard
	Ho-1	165	20.0	43.3				mg/L	23	Standard
	Er	166	36.7	68.6				mg/L	40	Standard
	I	127	1710.1	3.1				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27	0.932		
⌈	Sc	45			
|	Ti	47	11.974		
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		88.623	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	78.313		
Ag	107			
Cd	111			
Cd	114			
In	115			86.135
Sn	118			
Sb	123			
Ba	135			
Ce	140			
Tb	159			
Ho	165			
Tl	203			
Tl	205			
Pb	206			
Pb	207			
Pb	208			
U	238			
Bi	209			86.769
Na	23	105.704		
Mg	24	218.320		
K	39	95.166		
Ca	43	105.367		
Fe	54	39.208		
Fe	57	40.294		
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 4	Al	27	
QC Std 4	Ti	47	
QC Std 4	Mo	98	

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QC Std 4	Mg	24
QC Std 4	Fe	54
QC Std 4	Fe	57

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Method 6020 - Summary Report

Sample ID: QC Std 5
Sample Date/Time: Thursday, October 20, 2016 18:04:40
Number of Replicates: 3
Autosampler Position: 204
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	69196.2	4.8				ug/L	76335	Standard
	Be	9	102643.2	0.3	**102.8757**	4.940	4.8	ug/L	18	Standard
	Al	27	5251569.2	1.6	**46.7189**	2.997	6.4	ug/L	810	Standard
	Sc	45	21401.8	1.3				ug/L	22700	Standard
	Ti	47	19410.8	2.7	**97.9310**	2.969	3.0	ug/L	25	Standard
	V	51	669227.8	1.4	**96.8844**	2.295	2.4	ug/L	1541	Standard
	Cr	52	627922.0	1.3	**96.8069**	1.337	1.4	ug/L	7881	Standard
	Cr	53	85158.7	0.6	**103.4127**	1.064	1.0	ug/L	932	Standard
	Mn	55	1074566.7	1.4	**98.9417**	1.264	1.3	ug/L	1508	Standard
	Co	59	880751.1	0.9	**97.5434**	0.554	0.6	ug/L	282	Standard
	Ni	60	191064.9	1.0	**97.9637**	0.488	0.5	ug/L	91	Standard
	Cu	65	190556.4	1.9	**99.6015**	1.448	1.5	ug/L	205	Standard
	Zn	66	108740.9	1.8	**110.7880**	0.506	0.5	ug/L	369	Standard
>	Ge	72	472592.8	1.4				ug/L	496734	Standard
	As	75	102520.8	0.9	**104.2228**	1.016	1.0	ug/L	-45	Standard
	Se	82	10053.3	1.1	**106.5644**	1.015	1.0	ug/L	18	Standard
	Se-1	77	7151.0	1.2	**111.8755**	0.924	0.8	ug/L	83	Standard
>	Ga	71	146.7	18.8				mg/L	30	Standard
	Rb	85	941.7	3.5				ug/L	23	Standard
	Y	89	380154.7	2.2				ug/L	405333	Standard
>	Rh	103	58.3	30.1				ug/L	17	Standard
	Mo	98	324842.1	1.1	**92.7694**	2.107	2.3	ug/L	135	Standard
	Ag	107	350681.7	15.1	**52.5156**	7.941	15.1	ug/L	123	Standard
	Cd	111	200165.8	1.4	**103.7384**	0.118	0.1	mg/L	11	Standard
	Cd	114	503482.3	1.6	**100.7839**	0.430	0.4	ug/L	56	Standard
>	In	115	605784.9	1.3				ug/L	634401	Standard
	Sn	118	234.0	5.6	**0.1234**	0.009	7.0	ug/L	137	Standard
	Sb	123	474334.5	2.4	**94.1320**	2.274	2.4	ug/L	907	Standard
	Ba	135	279264.5	0.7	**103.0367**	1.902	1.8	ug/L	166	Standard
	Ce	140	620.0	14.1				ug/L	57	Standard
>	Tb	159	1308583.2	3.1				ug/L	1347540	Standard
	Ho	165	71.7	14.5				ug/L	23	Standard
	Tl	203	1081910.0	1.4	**98.5960**	1.202	1.2	ug/L	45	Standard
	Tl	205	2713348.7	1.2	**102.3675**	1.429	1.4	ug/L	112	Standard
	Pb	206	825864.9	2.0	**100.2573**	1.645	1.6	ug/L	825	Standard
	Pb	207	719982.7	1.0	**99.3026**	0.701	0.7	ug/L	679	Standard
	Pb	208	3259734.2	1.4	**98.9367**	0.907	0.9	ug/L	3166	Standard
	U	238	3046255.5	0.3	**102.5645**	1.320	1.3	ug/L	119	Standard
>	Bi	209	626799.0	1.0				ug/L	668024	Standard

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	Na	23	51.7	31.1	**14.6361**	4.403	30.1	mg/L	0	Standard
	Mg	24	7343.4	5.0	**11.3371**	0.538	4.7	mg/L	48	Standard
	K	39	461.7	6.5	**4.9762**	0.293	5.9	mg/L	8	Standard
	Ca	43	76.7	19.9	**16.6225**	5.751	34.6	mg/L	27	Standard
	Fe	54	10269.6	1.0	**11.3597**	0.215	1.9	mg/L	121	Standard
	Fe	57	3030.3	6.2	**11.0959**	0.686	6.2	mg/L	305	Standard
>	**Sc-1**	45	21401.8	1.3				mg/L	22700	Standard
	Cl	35	3.3	69.3				ug/L	3	Standard
	Kr	83	3.3	45.8				ug/L	5	Standard
	Br	81	1336.7	7.3				ug/L	1367	Standard
	P	31	91.7	15.7				ug/L	67	Standard
	S	34	75.0	30.6				ug/L	55	Standard
	Sr	88	153.3	35.2				ug/L	113	Standard
	C	12	486.7	7.2				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	260.0	13.9				mg/L	10	Standard
	Dy	164	45.4	52.1				mg/L	18	Standard
	Ho-1	165	71.7	14.5				mg/L	23	Standard
	Er	166	26.7	57.3				mg/L	40	Standard
	I	127	1625.1	11.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	102.876		
	Al	27	0.934		
	Sc	45			
	Ti	47	97.931		
	V	51	96.884		
	Cr	52	96.807		
	Cr	53			
	Mn	55	98.942		
	Co	59	97.543		
	Ni	60	97.964		
	Cu	65	99.601		
	Zn	66	110.788		
>	Ge	72		95.140	
	As	75	104.223		
	Se	82	106.564		
	Se-1	77			
>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	92.769		
Ag	107	52.516		
Cd	111	103.738		
Cd	114			
In	115		95.489	
Sn	118			
Sb	123	94.132		
Ba	135	103.037		
Ce	140			
Tb	159			
Ho	165			
Tl	203	98.596		
Tl	205			
Pb	206			
Pb	207			
Pb	208	98.937		
U	238	102.565		
Bi	209		93.829	
Na	23	117.089		
Mg	24	226.741		
K	39	99.524		
Ca	43	110.817		
Fe	54	90.878		
Fe	57	88.768		
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 5	Al	27	
QC Std 5	Ag	107	
QC Std 5	Na	23	

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QC Std 5	Mg	24
QC Std 5	Ca	43

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 18:07:41
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	73412.7	5.3				ug/L	76335	Standard
	Be	9	52663.0	1.6	**49.7352**	1.799	3.6	ug/L	18	Standard
	Al	27	5973402.4	1.5	**50.0519**	1.893	3.8	ug/L	810	Standard
	Sc	45	21920.8	1.7				ug/L	22700	Standard
	Ti	47	20288.6	2.1	**101.1918**	2.182	2.2	ug/L	25	Standard
	V	51	352240.1	3.1	**50.3038**	1.792	3.6	ug/L	1541	Standard
	Cr	52	334768.2	3.1	**50.4659**	1.765	3.5	ug/L	7881	Standard
	Cr	53	41899.6	4.3	**49.7404**	2.064	4.1	ug/L	932	Standard
	Mn	55	552479.9	2.1	**50.2498**	1.126	2.2	ug/L	1508	Standard
	Co	59	459206.9	2.9	**50.2633**	1.506	3.0	ug/L	282	Standard
	Ni	60	98215.7	1.6	**49.7628**	0.699	1.4	ug/L	91	Standard
	Cu	65	96762.0	0.4	**49.9712**	0.250	0.5	ug/L	205	Standard
	Zn	66	50575.9	1.0	**50.8452**	0.223	0.4	ug/L	369	Standard
>	Ge	72	478024.7	0.8				ug/L	496734	Standard
	As	75	51454.8	0.1	**51.7432**	0.457	0.9	ug/L	-45	Standard
	Se	82	4945.0	2.2	**51.7197**	1.292	2.5	ug/L	18	Standard
	Se-1	77	3427.4	1.4	**52.4037**	0.809	1.5	ug/L	83	Standard
>	Ga	71	70.0	21.4				mg/L	30	Standard
	Rb	85	626.7	5.8				ug/L	23	Standard
	Y	89	383999.8	2.1				ug/L	405333	Standard
>	Rh	103	33.3	45.8				ug/L	17	Standard
	Mo	98	370258.9	1.8	**99.1910**	1.073	1.1	ug/L	135	Standard
	Ag	107	372457.4	1.6	**52.3279**	0.500	1.0	ug/L	123	Standard
	Cd	111	106942.2	1.2	**51.9980**	0.262	0.5	mg/L	11	Standard
	Cd	114	275425.2	0.8	**51.7280**	0.133	0.3	ug/L	56	Standard
>	In	115	645642.0	0.9				ug/L	634401	Standard
	Sn	118	63420.2	3.4	**51.0133**	1.311	2.6	ug/L	137	Standard
	Sb	123	283087.0	2.2	**52.6738**	0.751	1.4	ug/L	907	Standard
	Ba	135	148632.4	2.3	**51.4205**	0.945	1.8	ug/L	166	Standard
	Ce	140	251.7	39.0				ug/L	57	Standard
>	Tb	159	1318580.2	1.6				ug/L	1347540	Standard
	Ho	165	38.3	19.9				ug/L	23	Standard
	Tl	203	565122.3	2.0	**50.0633**	0.170	0.3	ug/L	45	Standard
	Tl	205	1331963.1	2.5	**48.8493**	0.831	1.7	ug/L	112	Standard
	Pb	206	428898.1	1.9	**50.5914**	0.266	0.5	ug/L	825	Standard
	Pb	207	376815.4	2.6	**50.4974**	0.640	1.3	ug/L	679	Standard
	Pb	208	1709741.7	1.9	**50.4218**	0.134	0.3	ug/L	3166	Standard
	U	238	1500082.9	1.4	**49.0999**	0.544	1.1	ug/L	119	Standard
>	Bi	209	644734.7	1.7				ug/L	668024	Standard

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	Na	23	25.0	87.2	**6.8809**	6.008	87.3	mg/L	0	Standard
	Mg	24	3415.4	3.6	**5.0972**	0.217	4.3	mg/L	48	Standard
	K	39	425.0	7.3	**4.4589**	0.299	6.7	mg/L	8	Standard
	Ca	43	33.3	31.2	**0.5289**	3.468	655.7	mg/L	27	Standard
	Fe	54	4547.6	6.8	**4.8343**	0.258	5.3	mg/L	121	Standard
	Fe	57	1426.7	0.9	**4.3990**	0.130	3.0	mg/L	305	Standard
>	**Sc-1**	45	21920.8	1.7				mg/L	22700	Standard
	Cl	35	6.0	115.5				ug/L	3	Standard
	Kr	83	3.7	56.8				ug/L	5	Standard
	Br	81	1260.1	16.7				ug/L	1367	Standard
	P	31	96.7	20.9				ug/L	67	Standard
	S	34	78.3	9.8				ug/L	55	Standard
	Sr	88	116.7	33.3				ug/L	113	Standard
	C	12	310.0	11.2				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	86.7	40.5				mg/L	10	Standard
	Dy	164	32.5	71.8				mg/L	18	Standard
	Ho-1	165	38.3	19.9				mg/L	23	Standard
	Er	166	16.7	34.6				mg/L	40	Standard
	I	127	2481.9	6.2				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
>	Li	6			
	Be	9	99.470		
	Al	27	100.104		
	Sc	45			
	Ti	47	101.192		
	V	51	100.608		
	Cr	52	100.932		
	Cr	53			
	Mn	55	100.500		
	Co	59	100.527		
	Ni	60	99.526		
	Cu	65	99.942		
	Zn	66	101.690		
>	Ge	72		96.234	
	As	75	103.486		
	Se	82	103.439		
	Se-1	77			
>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	99.191		
Ag	107	104.656		
Cd	111	103.996		
Cd	114			
In	115			101.772
Sn	118	102.027		
Sb	123	105.348		
Ba	135	102.841		
Ce	140			
Tb	159			
Ho	165			
Tl	203	100.127		
Tl	205			
Pb	206			
Pb	207			
Pb	208	100.844		
U	238	98.200		
Bi	209			96.514
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 6
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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 18:10:41
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	72719.6	6.6				ug/L	76335	Standard
	Be	9	8.3	69.3	**0.0050**	0.005	110.7	ug/L	18	Standard
	Al	27	693.3	20.3	**0.0015**	0.001	93.8	ug/L	810	Standard
	Sc	45	21723.9	0.8				ug/L	22700	Standard
	Ti	47	19.7	28.9	**-0.0403**	0.026	64.6	ug/L	25	Standard
	V	51	1441.5	4.1	**-0.0168**	0.011	67.9	ug/L	1541	Standard
	Cr	52	7407.8	1.1	**-0.0439**	0.036	82.8	ug/L	7881	Standard
	Cr	53	891.7	3.6	**-0.0027**	0.061	2285.5	ug/L	932	Standard
	Mn	55	1367.4	1.3	**0.0398**	0.004	10.6	ug/L	1508	Standard
	Co	59	253.3	1.3	**-0.0049**	0.000	5.9	ug/L	282	Standard
	Ni	60	74.0	2.3	**-0.0048**	0.001	29.4	ug/L	91	Standard
	Cu	65	172.3	3.2	**0.0266**	0.003	9.5	ug/L	205	Standard
	Zn	66	270.0	5.2	**0.0882**	0.008	9.1	ug/L	369	Standard
>	Ge	72	479316.2	2.2				ug/L	496734	Standard
	As	75	-40.6	57.9	**0.0186**	0.024	130.0	ug/L	-45	Standard
	Se	82	20.0	24.0	**0.0098**	0.047	480.3	ug/L	18	Standard
	Se-1	77	84.0	7.8	**0.1559**	0.101	64.6	ug/L	83	Standard
>	Ga	71	20.0	0.0				mg/L	30	Standard
	Rb	85	23.3	75.3				ug/L	23	Standard
	Y	89	387169.7	2.6				ug/L	405333	Standard
>	Rh	103	21.7	58.1				ug/L	17	Standard
	Mo	98	523.4	18.9	**0.1192**	0.024	20.5	ug/L	135	Standard
	Ag	107	212.0	14.8	**0.0077**	0.004	48.8	ug/L	123	Standard
	Cd	111	8.0	20.7	**-0.0052**	0.001	16.8	mg/L	11	Standard
	Cd	114	52.0	25.0	**0.0032**	0.002	72.4	ug/L	56	Standard
>	In	115	643969.0	3.0				ug/L	634401	Standard
	Sn	118	173.7	26.4	**0.0624**	0.035	55.6	ug/L	137	Standard
	Sb	123	3662.5	43.7	**0.6117**	0.289	47.3	ug/L	907	Standard
	Ba	135	249.3	16.7	**0.0399**	0.017	42.4	ug/L	166	Standard
	Ce	140	46.7	44.6				ug/L	57	Standard
>	Tb	159	1317842.7	1.7				ug/L	1347540	Standard
	Ho	165	15.0	57.7				ug/L	23	Standard
	Tl	203	62.7	21.8	**0.0009**	0.001	139.1	ug/L	45	Standard
	Tl	205	150.0	16.7	**0.0036**	0.001	25.5	ug/L	112	Standard
	Pb	206	535.0	7.4	**0.0070**	0.005	69.8	ug/L	825	Standard
	Pb	207	436.0	5.0	**0.0080**	0.003	39.3	ug/L	679	Standard
	Pb	208	2072.4	2.6	**0.0060**	0.002	29.1	ug/L	3166	Standard
	U	238	103.0	6.1	**0.0015**	0.000	13.7	ug/L	119	Standard
>	Bi	209	653533.1	0.4				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.4667**	0.800	171.3	mg/L	0	Standard
|	**Mg**	24	53.3	19.5	**-0.0136**	0.016	120.8	mg/L	48	Standard
|	**K**	39	16.7	45.8	**0.0489**	0.082	167.2	mg/L	8	Standard
|	**Ca**	43	25.0	20.0	**-2.3003**	1.830	79.5	mg/L	27	Standard
|	**Fe**	54	123.0	12.4	**0.0060**	0.017	279.2	mg/L	121	Standard
|	**Fe**	57	263.3	35.3	**-0.2432**	0.365	150.0	mg/L	305	Standard
⌊>	**Sc-1**	45	21723.9	0.8				mg/L	22700	Standard
	Cl	35	2.0	100.0				ug/L	3	Standard
	Kr	83	4.0	90.1				ug/L	5	Standard
	Br	81	1390.1	9.7				ug/L	1367	Standard
	P	31	103.3	2.8				ug/L	67	Standard
	S	34	70.0	37.1				ug/L	55	Standard
	Sr	88	128.3	12.5				ug/L	113	Standard
	C	12	246.7	26.4				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	26.7	43.3				mg/L	10	Standard
	Dy	164	18.6	97.9				mg/L	18	Standard
	Ho-1	165	15.0	57.7				mg/L	23	Standard
	Er	166	30.0	88.2				mg/L	40	Standard
	I	127	2625.2	4.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		96.494	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	101.508
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	97.831
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	

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Method 6020 - Summary Report

Sample ID: L1609106003
Sample Date/Time: Thursday, October 20, 2016 18:13:41
Number of Replicates: 3
Autosampler Position: 349
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	64661.1	2.4				ug/L	76335	Standard
	Be	9	45.0	29.4	**0.0453**	0.015	32.9	ug/L	18	Standard
	Al	27	1558089.4	0.8	**14.8060**	0.402	2.7	ug/L	810	Standard
	Sc	45	20515.5	1.1				ug/L	22700	Standard
	Ti	47	500.7	0.8	**2.4755**	0.011	0.5	ug/L	25	Standard
	V	51	7502.5	4.2	**0.9013**	0.039	4.3	ug/L	1541	Standard
	Cr	52	15702.8	3.3	**1.3474**	0.065	4.8	ug/L	7881	Standard
	Cr	53	1810.1	5.0	**1.2125**	0.112	9.3	ug/L	932	Standard
	Mn	55	2491262.9	0.9	**237.1386**	3.081	1.3	ug/L	1508	Standard
	Co	59	3694.8	1.6	**0.3905**	0.009	2.4	ug/L	282	Standard
	Ni	60	2715.2	1.6	**1.3969**	0.028	2.0	ug/L	91	Standard
	Cu	65	6666.1	1.2	**3.5406**	0.073	2.1	ug/L	205	Standard
	Zn	66	36475.2	0.7	**38.2808**	0.128	0.3	ug/L	369	Standard
>	Ge	72	457365.7	0.8				ug/L	496734	Standard
	As	75	136.7	15.6	**0.2028**	0.021	10.5	ug/L	-45	Standard
	Se	82	30.6	26.3	**0.1369**	0.090	66.1	ug/L	18	Standard
	Se-1	77	88.7	12.8	**0.2941**	0.177	60.0	ug/L	83	Standard
>	Ga	71	361.7	18.4				mg/L	30	Standard
	Rb	85	59680.7	2.9				ug/L	23	Standard
	Y	89	372433.3	2.3				ug/L	405333	Standard
>	Rh	103	13.3	57.3				ug/L	17	Standard
	Mo	98	3433.8	2.5	**0.9856**	0.021	2.2	ug/L	135	Standard
	Ag	107	279.0	7.6	**0.0207**	0.002	11.7	ug/L	123	Standard
	Cd	111	1654.7	2.8	**0.8712**	0.006	0.7	mg/L	11	Standard
	Cd	114	4115.7	4.6	**0.8400**	0.056	6.7	ug/L	56	Standard
>	In	115	590141.9	2.2				ug/L	634401	Standard
	Sn	118	118.7	38.1	**0.0268**	0.038	143.3	ug/L	137	Standard
	Sb	123	834.9	38.9	**0.1007**	0.064	63.2	ug/L	907	Standard
	Ba	135	44065.3	1.9	**16.6481**	0.090	0.5	ug/L	166	Standard
	Ce	140	39471.4	1.7				ug/L	57	Standard
>	Tb	159	1222161.5	1.2				ug/L	1347540	Standard
	Ho	165	1220.0	9.9				ug/L	23	Standard
	Tl	203	880.0	1.3	**0.0784**	0.001	1.5	ug/L	45	Standard
	Tl	205	2006.8	10.9	**0.0765**	0.008	10.1	ug/L	112	Standard
	Pb	206	3427.1	2.3	**0.3754**	0.007	1.9	ug/L	825	Standard
	Pb	207	2642.2	0.8	**0.3276**	0.003	0.8	ug/L	679	Standard
	Pb	208	12537.0	1.4	**0.3397**	0.003	0.7	ug/L	3166	Standard
	U	238	4130.2	0.7	**0.1421**	0.003	1.8	ug/L	119	Standard
>	Bi	209	605622.2	1.2				ug/L	668024	Standard

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⌈	**Na**	23	13.3	21.7	**3.9451**	0.820	20.8	mg/L	0	Standard
|	**Mg**	24	58.3	27.6	**-0.0009**	0.025	2870.1	mg/L	48	Standard
|	**K**	39	1265.1	3.9	**14.4720**	0.412	2.8	mg/L	8	Standard
|	**Ca**	43	38.3	7.5	**3.2748**	1.119	34.2	mg/L	27	Standard
|	**Fe**	54	230.1	9.2	**0.1391**	0.027	19.6	mg/L	121	Standard
|	**Fe**	57	326.7	3.9	**0.0915**	0.049	53.1	mg/L	305	Standard
⌊>	**Sc-1**	45	20515.5	1.1				mg/L	22700	Standard
	Cl	35	2.7	86.6				ug/L	3	Standard
	Kr	83	3.0	0.0				ug/L	5	Standard
	Br	81	3247.0	7.4				ug/L	1367	Standard
	P	31	40.0	43.3				ug/L	67	Standard
	S	34	81.7	17.7				ug/L	55	Standard
	Sr	88	133.3	28.4				ug/L	113	Standard
	C	12	1990.1	9.2				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	76.7	52.7				mg/L	10	Standard
	Dy	164	1758.2	2.1				mg/L	18	Standard
	Ho-1	165	1220.0	9.9				mg/L	23	Standard
	Er	166	1153.4	5.9				mg/L	40	Standard
	I	127	7250.1	7.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		84.707	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		92.075	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	93.023
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	90.659
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
Mn 55 Upper, S, EEE	Mn	55	

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Method 6020 - Summary Report

Sample ID: L1609106004
Sample Date/Time: Thursday, October 20, 2016 18:16:40
Number of Replicates: 3
Autosampler Position: 350
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	65434.6	5.4				ug/L	76335	Standard
	Be	9	55.0	18.2	**0.0549**	0.007	13.6	ug/L	18	Standard
	Al	27	1189206.6	2.7	**11.1722**	0.314	2.8	ug/L	810	Standard
	Sc	45	20080.0	4.9				ug/L	22700	Standard
	Ti	47	2280.2	6.5	**11.9933**	0.341	2.8	ug/L	25	Standard
	V	51	16990.9	4.6	**2.3742**	0.024	1.0	ug/L	1541	Standard
	Cr	52	21691.2	4.2	**2.3829**	0.044	1.9	ug/L	7881	Standard
	Cr	53	2386.9	4.9	**2.0109**	0.272	13.5	ug/L	932	Standard
	Mn	55	1026124.0	2.9	**99.6041**	2.040	2.0	ug/L	1508	Standard
	Co	59	6273.0	5.3	**0.6996**	0.007	1.0	ug/L	282	Standard
	Ni	60	4196.6	3.3	**2.2268**	0.037	1.6	ug/L	91	Standard
	Cu	65	7510.2	4.5	**4.0765**	0.016	0.4	ug/L	205	Standard
	Zn	66	26567.0	3.1	**28.3988**	0.496	1.7	ug/L	369	Standard
>	Ge	72	448542.0	4.8				ug/L	496734	Standard
	As	75	642.9	2.1	**0.7490**	0.046	6.2	ug/L	-45	Standard
	Se	82	163.1	2.8	**1.6307**	0.141	8.6	ug/L	18	Standard
	Se-1	77	121.0	12.5	**0.8718**	0.338	38.8	ug/L	83	Standard
>	Ga	71	946.7	1.6				mg/L	30	Standard
	Rb	85	51032.5	3.0				ug/L	23	Standard
	Y	89	398025.9	5.2				ug/L	405333	Standard
>	Rh	103	28.3	10.2				ug/L	17	Standard
	Mo	98	9037.0	4.2	**2.6539**	0.041	1.6	ug/L	135	Standard
	Ag	107	342.3	5.2	**0.0312**	0.005	16.4	ug/L	123	Standard
	Cd	111	3359.7	5.1	**1.7952**	0.012	0.6	mg/L	11	Standard
	Cd	114	8467.5	2.7	**1.7514**	0.054	3.1	ug/L	56	Standard
>	In	115	584789.4	5.7				ug/L	634401	Standard
	Sn	118	118.0	11.5	**0.0280**	0.017	59.7	ug/L	137	Standard
	Sb	123	767.8	25.0	**0.0903**	0.046	50.6	ug/L	907	Standard
	Ba	135	81873.1	3.4	**31.2830**	0.795	2.5	ug/L	166	Standard
	Ce	140	130918.5	2.9				ug/L	57	Standard
>	Tb	159	1242351.1	5.6				ug/L	1347540	Standard
	Ho	165	3823.8	8.7				ug/L	23	Standard
	Tl	203	307.0	2.7	**0.0242**	0.001	2.2	ug/L	45	Standard
	Tl	205	705.0	12.3	**0.0255**	0.003	10.3	ug/L	112	Standard
	Pb	206	8699.8	3.4	**1.0318**	0.014	1.4	ug/L	825	Standard
	Pb	207	6460.0	3.9	**0.8673**	0.011	1.3	ug/L	679	Standard
	Pb	208	31420.9	3.2	**0.9273**	0.007	0.7	ug/L	3166	Standard
	U	238	13155.0	2.7	**0.4539**	0.004	0.9	ug/L	119	Standard
>	Bi	209	609284.1	3.4				ug/L	668024	Standard

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⌈	**Na**	23	31.7	9.1	**9.6197**	1.333	13.9	mg/L	0	Standard
|	**Mg**	24	66.7	4.3	**0.0153**	0.007	44.6	mg/L	48	Standard
|	**K**	39	1613.4	4.6	**18.9099**	0.642	3.4	mg/L	8	Standard
|	**Ca**	43	41.7	38.6	**4.8568**	6.118	126.0	mg/L	27	Standard
|	**Fe**	54	751.5	4.8	**0.7687**	0.076	9.9	mg/L	121	Standard
|	**Fe**	57	476.7	9.9	**0.7732**	0.114	14.8	mg/L	305	Standard
⌊>	**Sc-1**	45	20080.0	4.9				mg/L	22700	Standard
	Cl	35	4.0	86.6				ug/L	3	Standard
	Kr	83	4.3	74.2				ug/L	5	Standard
	Br	81	32291.1	3.8				ug/L	1367	Standard
	P	31	55.0	18.2				ug/L	67	Standard
	S	34	73.3	31.5				ug/L	55	Standard
	Sr	88	123.3	8.4				ug/L	113	Standard
	C	12	2156.8	2.4				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	70.0	42.9				mg/L	10	Standard
	Dy	164	5229.4	6.9				mg/L	18	Standard
	Ho-1	165	3823.8	8.7				mg/L	23	Standard
	Er	166	3790.5	11.2				mg/L	40	Standard
	I	127	12003.1	4.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		85.720	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
| >	Ge	72		90.298	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	92.180
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	91.207
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1609106004
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Method 6020 - Summary Report

Sample ID: L1609106005
Sample Date/Time: Thursday, October 20, 2016 18:20:13
Number of Replicates: 3
Autosampler Position: 351
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	51304.4	13.6				ug/L	76335	Standard
	Be	9	6.7	43.3	**0.0059**	0.003	51.2	ug/L	18	Standard
	Al	27	34761.8	71.7	**0.3894**	0.269	69.2	ug/L	810	Standard
	Sc	45	16619.2	13.3				ug/L	22700	Standard
	Ti	47	75.3	62.2	**0.3483**	0.306	87.8	ug/L	25	Standard
	V	51	1137.2	34.4	**-0.0144**	0.073	508.8	ug/L	1541	Standard
	Cr	52	4467.4	28.8	**-0.2985**	0.287	96.1	ug/L	7881	Standard
	Cr	53	548.3	13.0	**-0.2310**	0.150	64.8	ug/L	932	Standard
	Mn	55	51143.3	76.0	**5.9135**	4.445	75.2	ug/L	1508	Standard
	Co	59	311.7	29.1	**0.0114**	0.015	130.4	ug/L	282	Standard
	Ni	60	388.3	62.7	**0.2119**	0.160	75.5	ug/L	91	Standard
	Cu	65	317.7	66.2	**0.1502**	0.142	94.4	ug/L	205	Standard
	Zn	66	2903.7	68.0	**3.6065**	2.588	71.8	ug/L	369	Standard
>	Ge	72	376809.7	10.6				ug/L	496734	Standard
	As	75	58.8	73.7	**0.1368**	0.060	43.7	ug/L	-45	Standard
	Se	82	46.0	54.3	**0.4231**	0.340	80.4	ug/L	18	Standard
	Se-1	77	61.7	13.8	**0.0860**	0.276	321.2	ug/L	83	Standard
>	Ga	71	21.7	81.0				mg/L	30	Standard
	Rb	85	893.4	39.2				ug/L	23	Standard
	Y	89	326519.2	9.0				ug/L	405333	Standard
>	Rh	103	10.0	86.6				ug/L	17	Standard
	Mo	98	1487.8	41.7	**0.5383**	0.253	47.0	ug/L	135	Standard
	Ag	107	124.0	7.3	**0.0020**	0.003	149.4	ug/L	123	Standard
	Cd	111	92.7	45.9	**0.0542**	0.031	57.4	mg/L	11	Standard
	Cd	114	223.8	31.2	**0.0522**	0.021	39.8	ug/L	56	Standard
>	In	115	468226.1	5.8				ug/L	634401	Standard
	Sn	118	44.7	10.3	**-0.0276**	0.007	24.7	ug/L	137	Standard
	Sb	123	249.7	29.8	**-0.0038**	0.022	584.1	ug/L	907	Standard
	Ba	135	4412.8	55.3	**2.1071**	1.253	59.5	ug/L	166	Standard
	Ce	140	698.4	51.7				ug/L	57	Standard
>	Tb	159	877407.3	11.8				ug/L	1347540	Standard
	Ho	165	35.0	37.8				ug/L	23	Standard
	Tl	203	40.7	27.2	**0.0007**	0.002	231.3	ug/L	45	Standard
	Tl	205	96.7	46.4	**0.0031**	0.002	56.7	ug/L	112	Standard
	Pb	206	395.3	14.3	**0.0126**	0.004	32.4	ug/L	825	Standard
	Pb	207	324.3	21.4	**0.0130**	0.003	25.0	ug/L	679	Standard
	Pb	208	1536.7	19.8	**0.0112**	0.002	20.4	ug/L	3166	Standard
	U	238	100.7	62.5	**0.0027**	0.002	90.3	ug/L	119	Standard
>	Bi	209	444494.7	16.7				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5680**	0.975	171.7	mg/L	0	Standard
|	**Mg**	24	36.7	15.7	**-0.0205**	0.019	94.2	mg/L	48	Standard
|	**K**	39	28.3	62.0	**0.2549**	0.215	84.4	mg/L	8	Standard
|	**Ca**	43	26.7	43.3	**1.1326**	4.554	402.1	mg/L	27	Standard
|	**Fe**	54	171.4	49.2	**0.1089**	0.098	89.6	mg/L	121	Standard
|	**Fe**	57	266.7	26.6	**0.1253**	0.433	345.6	mg/L	305	Standard
⌊>	**Sc-1**	45	16619.2	13.3				mg/L	22700	Standard
	Cl	35	2.7	86.6				ug/L	3	Standard
	Kr	83	3.3	62.4				ug/L	5	Standard
	Br	81	1316.7	24.1				ug/L	1367	Standard
	P	31	41.7	48.5				ug/L	67	Standard
	S	34	18.3	56.8				ug/L	55	Standard
	Sr	88	130.0	23.4				ug/L	113	Standard
	C	12	423.3	29.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	46.7	12.4				mg/L	10	Standard
	Dy	164	34.4	60.9				mg/L	18	Standard
	Ho-1	165	35.0	37.8				mg/L	23	Standard
	Er	166	46.7	24.7				mg/L	40	Standard
	I	127	1515.1	19.3				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		67.209	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		75.857	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85	
Y	89	
Rh	103	
Mo	98	
Ag	107	
Cd	111	
Cd	114	
In	115	73.806
Sn	118	
Sb	123	
Ba	135	
Ce	140	
Tb	159	
Ho	165	
Tl	203	
Tl	205	
Pb	206	
Pb	207	
Pb	208	
U	238	
Bi	209	66.539
Na	23	
Mg	24	
K	39	
Ca	43	
Fe	54	
Fe	57	
Sc-1	45	
Cl	35	
Kr	83	
Br	81	
P	31	
S	34	
Sr	88	
C	12	
N	14	
Hg	202	
Dy	164	
Ho-1	165	
Er	166	
I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1609106009
Sample Date/Time: Thursday, October 20, 2016 18:24:33
Number of Replicates: 3
Autosampler Position: 352
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	**Li**	6	49328.5	1.0				ug/L	76335	Standard
	Be	9	5.0	0.0	**0.0040**	0.000	1.7	ug/L	18	Standard
	Al	27	61469.6	72.5	**0.7638**	0.558	73.1	ug/L	810	Standard
	Sc	45	16258.8	8.0				ug/L	22700	Standard
	Ti	47	41.3	47.8	**0.1423**	0.149	104.8	ug/L	25	Standard
	V	51	969.6	25.3	**-0.0362**	0.069	190.5	ug/L	1541	Standard
	Cr	52	3836.8	16.8	**-0.3965**	0.221	55.8	ug/L	7881	Standard
	Cr	53	473.3	7.2	**-0.3224**	0.165	51.1	ug/L	932	Standard
	Mn	55	14251.7	66.9	**1.7150**	1.263	73.6	ug/L	1508	Standard
	Co	59	292.7	21.5	**0.0105**	0.015	142.1	ug/L	282	Standard
	Ni	60	130.0	45.2	**0.0476**	0.047	99.1	ug/L	91	Standard
	Cu	65	820.7	64.0	**0.5289**	0.413	78.1	ug/L	205	Standard
	Zn	66	2725.0	66.0	**3.6557**	2.756	75.4	ug/L	369	Standard
>	**Ge**	72	369497.2	15.5				ug/L	496734	Standard
	As	75	34.1	86.2	**0.1029**	0.039	38.2	ug/L	-45	Standard
	Se	82	45.6	45.2	**0.4466**	0.323	72.4	ug/L	18	Standard
	Se-1	77	64.3	20.9	**0.1943**	0.455	234.1	ug/L	83	Standard
>	**Ga**	71	15.0	0.0				mg/L	30	Standard
	Rb	85	3222.2	84.1				ug/L	23	Standard
	Y	89	313607.5	5.7				ug/L	405333	Standard
>	**Rh**	103	13.3	21.7				ug/L	17	Standard
	Mo	98	476.3	73.0	**0.1582**	0.125	78.9	ug/L	135	Standard
	Ag	107	99.3	27.9	**-0.0026**	0.005	183.8	ug/L	123	Standard
	Cd	111	139.7	75.6	**0.0856**	0.067	77.9	mg/L	11	Standard
	Cd	114	415.6	70.2	**0.1032**	0.074	71.4	ug/L	56	Standard
>	**In**	115	460220.0	10.8				ug/L	634401	Standard
	Sn	118	40.7	15.8	**-0.0314**	0.005	17.3	ug/L	137	Standard
	Sb	123	184.7	55.3	**-0.0203**	0.026	126.7	ug/L	907	Standard
	Ba	135	7063.0	77.9	**3.3829**	2.537	75.0	ug/L	166	Standard
	Ce	140	338.3	79.5				ug/L	57	Standard
>	**Tb**	159	933212.6	29.3				ug/L	1347540	Standard
	Ho	165	28.3	27.0				ug/L	23	Standard
	Tl	203	20.0	50.0	**-0.0021**	0.001	54.1	ug/L	45	Standard
	Tl	205	45.0	58.8	**0.0005**	0.001	262.7	ug/L	112	Standard
	Pb	206	387.3	21.2	**0.0093**	0.010	105.2	ug/L	825	Standard
	Pb	207	305.0	22.4	**0.0081**	0.009	116.0	ug/L	679	Standard
	Pb	208	1435.4	17.1	**0.0056**	0.006	114.1	ug/L	3166	Standard
	U	238	27.3	68.7	**-0.0005**	0.001	156.3	ug/L	119	Standard
>	**Bi**	209	453856.6	7.1				ug/L	668024	Standard

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⌈	**Na**	23	1.7	173.2	**0.5774**	0.991	171.7	mg/L	0	Standard
|	**Mg**	24	23.3	75.3	**-0.0462**	0.037	80.7	mg/L	48	Standard
|	**K**	39	123.3	72.7	**1.7371**	1.395	80.3	mg/L	8	Standard
|	**Ca**	43	35.0	42.9	**5.9278**	8.472	142.9	mg/L	27	Standard
|	**Fe**	54	162.9	66.0	**0.1196**	0.174	145.7	mg/L	121	Standard
|	**Fe**	57	270.0	5.6	**0.1592**	0.168	105.2	mg/L	305	Standard
⌊>	**Sc-1**	45	16258.8	8.0				mg/L	22700	Standard
	Cl	35	2.0	100.0				ug/L	3	Standard
	Kr	83	4.3	70.5				ug/L	5	Standard
	Br	81	860.0	21.2				ug/L	1367	Standard
	P	31	46.7	52.9				ug/L	67	Standard
	S	34	38.3	45.8				ug/L	55	Standard
	Sr	88	141.7	7.3				ug/L	113	Standard
	C	12	483.3	64.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	23.3	137.8				mg/L	10	Standard
	Dy	164	31.6	112.0				mg/L	18	Standard
	Ho-1	165	28.3	27.0				mg/L	23	Standard
	Er	166	36.7	15.7				mg/L	40	Standard
	I	127	1093.4	26.9				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		64.621	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		74.385	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	72.544
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	67.940
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1609106010
Sample Date/Time: Thursday, October 20, 2016 18:27:57
Number of Replicates: 3
Autosampler Position: 353
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	68894.8	4.7				ug/L	76335	Standard
	Be	9	18.3	95.8	**0.0149**	0.017	112.8	ug/L	18	Standard
	Al	27	365064.0	0.3	**3.2557**	0.145	4.4	ug/L	810	Standard
	Sc	45	20647.4	2.2				ug/L	22700	Standard
	Ti	47	359.3	3.0	**1.7347**	0.045	2.6	ug/L	25	Standard
	V	51	2608.0	4.9	**0.1672**	0.018	10.7	ug/L	1541	Standard
	Cr	52	10559.0	1.1	**0.5157**	0.019	3.8	ug/L	7881	Standard
	Cr	53	1336.7	2.4	**0.6099**	0.045	7.4	ug/L	932	Standard
	Mn	55	186682.0	0.1	**17.6643**	0.183	1.0	ug/L	1508	Standard
	Co	59	593.3	0.7	**0.0353**	0.001	2.7	ug/L	282	Standard
	Ni	60	1310.4	3.0	**0.6513**	0.027	4.2	ug/L	91	Standard
	Cu	65	3401.7	0.7	**1.7733**	0.018	1.0	ug/L	205	Standard
	Zn	66	28021.6	1.9	**29.3239**	0.791	2.7	ug/L	369	Standard
>	Ge	72	458086.9	1.1				ug/L	496734	Standard
	As	75	-45.7	18.6	**0.0116**	0.009	75.7	ug/L	-45	Standard
	Se	82	14.3	7.1	**-0.0423**	0.010	24.7	ug/L	18	Standard
	Se-1	77	98.7	13.8	**0.4568**	0.235	51.4	ug/L	83	Standard
>	Ga	71	61.7	33.8				mg/L	30	Standard
	Rb	85	9177.8	5.0				ug/L	23	Standard
	Y	89	369071.0	0.3				ug/L	405333	Standard
>	Rh	103	15.0	66.7				ug/L	17	Standard
	Mo	98	5819.2	1.2	**1.6436**	0.006	0.4	ug/L	135	Standard
	Ag	107	110.0	4.5	**-0.0056**	0.001	14.1	ug/L	123	Standard
	Cd	111	154.5	11.7	**0.0711**	0.010	13.5	mg/L	11	Standard
	Cd	114	413.2	11.5	**0.0763**	0.009	11.9	ug/L	56	Standard
>	In	115	604742.0	1.3				ug/L	634401	Standard
	Sn	118	67.7	8.9	**-0.0192**	0.006	30.9	ug/L	137	Standard
	Sb	123	289.9	28.7	**-0.0109**	0.017	159.0	ug/L	907	Standard
	Ba	135	41290.9	0.3	**15.2199**	0.165	1.1	ug/L	166	Standard
	Ce	140	2011.8	6.4				ug/L	57	Standard
>	Tb	159	1258941.1	1.8				ug/L	1347540	Standard
	Ho	165	71.7	46.5				ug/L	23	Standard
	Tl	203	36.0	13.9	**-0.0014**	0.000	31.6	ug/L	45	Standard
	Tl	205	103.3	46.0	**0.0020**	0.002	85.0	ug/L	112	Standard
	Pb	206	757.4	3.1	**0.0365**	0.004	12.3	ug/L	825	Standard
	Pb	207	638.3	6.5	**0.0382**	0.005	13.3	ug/L	679	Standard
	Pb	208	2927.1	2.4	**0.0344**	0.003	8.6	ug/L	3166	Standard
	U	238	190.3	1.8	**0.0046**	0.000	2.6	ug/L	119	Standard
>	Bi	209	628051.5	1.8				ug/L	668024	Standard

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⌈	**Na**	23	11.7	24.7	**3.4388**	0.868	25.2	mg/L	0	Standard
|	**Mg**	24	60.0	57.7	**0.0015**	0.056	3664.2	mg/L	48	Standard
|	**K**	39	743.4	3.3	**8.4025**	0.454	5.4	mg/L	8	Standard
|	**Ca**	43	43.3	63.5	**5.1880**	10.736	206.9	mg/L	27	Standard
|	**Fe**	54	252.3	15.8	**0.1634**	0.049	30.3	mg/L	121	Standard
|	**Fe**	57	390.0	15.5	**0.3539**	0.276	78.1	mg/L	305	Standard
⌊>	**Sc-1**	45	20647.4	2.2				mg/L	22700	Standard
	Cl	35	2.7	114.6				ug/L	3	Standard
	Kr	83	3.3	45.8				ug/L	5	Standard
	Br	81	1593.4	3.5				ug/L	1367	Standard
	P	31	55.0	9.1				ug/L	67	Standard
	S	34	65.0	23.1				ug/L	55	Standard
	Sr	88	136.7	27.7				ug/L	113	Standard
	C	12	1540.1	5.2				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	70.0	37.8				mg/L	10	Standard
	Dy	164	94.6	6.8				mg/L	18	Standard
	Ho-1	165	71.7	46.5				mg/L	23	Standard
	Er	166	43.3	35.3				mg/L	40	Standard
	I	127	4682.4	7.4				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		90.253	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		92.220	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	95.325
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	94.016
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: L1609106010
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Method 6020 - Summary Report

Sample ID: L1609106011
Sample Date/Time: Thursday, October 20, 2016 18:30:57
Number of Replicates: 3
Autosampler Position: 354
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	70422.0	6.2				ug/L	76335	Standard
	Be	9	5.0	173.2	**0.0023**	0.009	402.9	ug/L	18	Standard
	Al	27	665724.5	6.4	**5.8049**	0.180	3.1	ug/L	810	Standard
	Sc	45	20927.8	6.5				ug/L	22700	Standard
	Ti	47	392.7	13.2	**1.8826**	0.215	11.4	ug/L	25	Standard
	V	51	3282.2	1.9	**0.2631**	0.018	6.9	ug/L	1541	Standard
	Cr	52	11250.5	2.0	**0.6085**	0.062	10.2	ug/L	7881	Standard
	Cr	53	1586.7	6.5	**0.9073**	0.167	18.4	ug/L	932	Standard
	Mn	55	271549.9	4.9	**25.4495**	0.814	3.2	ug/L	1508	Standard
	Co	59	789.4	6.2	**0.0567**	0.003	4.5	ug/L	282	Standard
	Ni	60	1847.4	7.7	**0.9238**	0.043	4.6	ug/L	91	Standard
	Cu	65	5421.6	5.7	**2.8310**	0.124	4.4	ug/L	205	Standard
	Zn	66	48530.1	4.9	**50.3501**	1.386	2.8	ug/L	369	Standard
>	Ge	72	463143.5	3.8				ug/L	496734	Standard
	As	75	0.7	8409.3	**0.0603**	0.061	100.4	ug/L	-45	Standard
	Se	82	26.6	38.3	**0.0912**	0.120	131.1	ug/L	18	Standard
	Se-1	77	110.3	16.5	**0.6206**	0.231	37.2	ug/L	83	Standard
>	Ga	71	71.7	24.5				mg/L	30	Standard
	Rb	85	15416.2	3.0				ug/L	23	Standard
	Y	89	377022.0	2.7				ug/L	405333	Standard
>	Rh	103	15.0	33.3				ug/L	17	Standard
	Mo	98	1252.2	6.0	**0.3347**	0.011	3.3	ug/L	135	Standard
	Ag	107	134.3	3.5	**-0.0021**	0.001	62.9	ug/L	123	Standard
	Cd	111	6701.9	3.9	**3.4492**	0.060	1.7	mg/L	11	Standard
	Cd	114	17061.0	3.9	**3.3938**	0.056	1.6	ug/L	56	Standard
>	In	115	608451.2	3.4				ug/L	634401	Standard
	Sn	118	136.0	3.9	**0.0390**	0.008	20.4	ug/L	137	Standard
	Sb	123	284.5	28.8	**-0.0121**	0.018	150.4	ug/L	907	Standard
	Ba	135	88377.0	4.3	**32.4203**	0.310	1.0	ug/L	166	Standard
	Ce	140	4497.3	2.8				ug/L	57	Standard
>	Tb	159	1278940.6	4.1				ug/L	1347540	Standard
	Ho	165	141.7	33.5				ug/L	23	Standard
	Tl	203	76.3	18.4	**0.0023**	0.001	42.5	ug/L	45	Standard
	Tl	205	143.3	19.8	**0.0036**	0.001	36.4	ug/L	112	Standard
	Pb	206	1052.7	4.6	**0.0719**	0.007	9.7	ug/L	825	Standard
	Pb	207	900.4	10.2	**0.0738**	0.011	14.7	ug/L	679	Standard
	Pb	208	4099.5	5.9	**0.0695**	0.005	6.6	ug/L	3166	Standard
	U	238	284.0	10.5	**0.0077**	0.001	12.7	ug/L	119	Standard
>	Bi	209	630208.1	4.6				ug/L	668024	Standard

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⌈	**Na**	23	15.0	33.3	**4.3065**	1.189	27.6	mg/L	0	Standard
|	**Mg**	24	65.0	20.4	**0.0078**	0.017	223.6	mg/L	48	Standard
|	**K**	39	956.7	2.9	**10.7309**	0.835	7.8	mg/L	8	Standard
|	**Ca**	43	50.0	26.5	**7.5550**	5.944	78.7	mg/L	27	Standard
|	**Fe**	54	115.8	36.6	**0.0015**	0.041	2654.1	mg/L	121	Standard
|	**Fe**	57	300.0	7.3	**-0.0479**	0.017	36.0	mg/L	305	Standard
⌊>	**Sc-1**	45	20927.8	6.5				mg/L	22700	Standard
	Cl	35	5.3	43.3				ug/L	3	Standard
	Kr	83	4.7	12.4				ug/L	5	Standard
	Br	81	2206.8	6.4				ug/L	1367	Standard
	P	31	68.3	18.4				ug/L	67	Standard
	S	34	90.0	14.7				ug/L	55	Standard
	Sr	88	166.7	13.5				ug/L	113	Standard
	C	12	2126.8	7.7				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	50.0	52.9				mg/L	10	Standard
	Dy	164	204.4	29.1				mg/L	18	Standard
	Ho-1	165	141.7	33.5				mg/L	23	Standard
	Er	166	116.7	26.2				mg/L	40	Standard
	I	127	5532.7	6.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		92.254	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		93.238	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	95.910
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	94.339
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: L1609106012
Sample Date/Time: Thursday, October 20, 2016 18:33:56
Number of Replicates: 3
Autosampler Position: 355
Sample Description: 5
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	71095.0	4.6				ug/L	76335	Standard
	Be	9	8.3	91.7	**0.0051**	0.008	148.7	ug/L	18	Standard
	Al	27	400065.7	5.3	**3.4522**	0.023	0.7	ug/L	810	Standard
	Sc	45	21259.9	3.9				ug/L	22700	Standard
	Ti	47	326.3	11.8	**1.5285**	0.214	14.0	ug/L	25	Standard
	V	51	3483.0	2.7	**0.2871**	0.004	1.4	ug/L	1541	Standard
	Cr	52	11063.7	0.7	**0.5594**	0.022	3.9	ug/L	7881	Standard
	Cr	53	1220.0	5.7	**0.4296**	0.089	20.7	ug/L	932	Standard
	Mn	55	157821.1	1.3	**14.6028**	0.173	1.2	ug/L	1508	Standard
	Co	59	671.0	3.8	**0.0425**	0.001	3.5	ug/L	282	Standard
	Ni	60	1463.7	2.0	**0.7161**	0.022	3.1	ug/L	91	Standard
	Cu	65	2434.5	3.0	**1.2233**	0.015	1.2	ug/L	205	Standard
	Zn	66	23541.9	2.0	**24.0775**	0.021	0.1	ug/L	369	Standard
>	Ge	72	468008.9	1.9				ug/L	496734	Standard
	As	75	39.6	53.9	**0.0999**	0.021	21.5	ug/L	-45	Standard
	Se	82	26.9	12.7	**0.0900**	0.036	40.0	ug/L	18	Standard
	Se-1	77	80.7	9.3	**0.1348**	0.124	91.8	ug/L	83	Standard
>	Ga	71	71.7	21.3				mg/L	30	Standard
	Rb	85	9471.3	5.7				ug/L	23	Standard
	Y	89	370750.7	3.1				ug/L	405333	Standard
>	Rh	103	20.0	25.0				ug/L	17	Standard
	Mo	98	2864.3	3.3	**0.7849**	0.012	1.5	ug/L	135	Standard
	Ag	107	329.7	2.5	**0.0265**	0.000	1.2	ug/L	123	Standard
	Cd	111	852.7	3.1	**0.4265**	0.016	3.7	mg/L	11	Standard
	Cd	114	2163.5	6.8	**0.4200**	0.022	5.2	ug/L	56	Standard
>	In	115	614694.9	1.8				ug/L	634401	Standard
	Sn	118	61.7	12.6	**-0.0252**	0.007	28.3	ug/L	137	Standard
	Sb	123	268.6	31.9	**-0.0159**	0.018	112.2	ug/L	907	Standard
	Ba	135	62793.2	1.0	**22.7946**	0.210	0.9	ug/L	166	Standard
	Ce	140	3195.3	9.1				ug/L	57	Standard
>	Tb	159	1285745.2	2.6				ug/L	1347540	Standard
	Ho	165	78.3	32.1				ug/L	23	Standard
	Tl	203	49.0	8.2	**-0.0002**	0.000	243.8	ug/L	45	Standard
	Tl	205	93.3	3.1	**0.0017**	0.000	9.4	ug/L	112	Standard
	Pb	206	893.7	0.4	**0.0524**	0.003	5.2	ug/L	825	Standard
	Pb	207	730.0	1.8	**0.0503**	0.000	0.9	ug/L	679	Standard
	Pb	208	3439.8	1.6	**0.0493**	0.001	1.7	ug/L	3166	Standard
	U	238	213.3	1.2	**0.0053**	0.000	2.9	ug/L	119	Standard
>	Bi	209	631415.3	2.1				ug/L	668024	Standard

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⌈	**Na**	23	13.3	21.7	**3.8235**	0.884	23.1	mg/L	0	Standard
|	**Mg**	24	40.0	33.1	**-0.0332**	0.019	56.2	mg/L	48	Standard
|	**K**	39	911.7	5.5	**10.0233**	0.253	2.5	mg/L	8	Standard
|	**Ca**	43	45.0	58.8	**4.9794**	9.296	186.7	mg/L	27	Standard
|	**Fe**	54	306.0	7.5	**0.2147**	0.014	6.5	mg/L	121	Standard
|	**Fe**	57	335.0	27.6	**0.0735**	0.357	485.8	mg/L	305	Standard
⌊>	**Sc-1**	45	21259.9	3.9				mg/L	22700	Standard
	Cl	35	7.3	78.7				ug/L	3	Standard
	Kr	83	2.3	49.5				ug/L	5	Standard
	Br	81	1490.1	7.1				ug/L	1367	Standard
	P	31	71.7	4.0				ug/L	67	Standard
	S	34	76.7	10.0				ug/L	55	Standard
	Sr	88	126.7	9.9				ug/L	113	Standard
	C	12	2026.8	14.0				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	50.0	40.0				mg/L	10	Standard
	Dy	164	126.2	42.4				mg/L	18	Standard
	Ho-1	165	78.3	32.1				mg/L	23	Standard
	Er	166	80.0	21.7				mg/L	40	Standard
	I	127	3960.5	1.8				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6		93.135	
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		94.217	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

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	Rb	85	
	Y	89	
>	Rh	103	
	Mo	98	
	Ag	107	
	Cd	111	
	Cd	114	
>	In	115	96.894
	Sn	118	
	Sb	123	
	Ba	135	
	Ce	140	
>	Tb	159	
	Ho	165	
	Tl	203	
	Tl	205	
	Pb	206	
	Pb	207	
	Pb	208	
	U	238	
>	Bi	209	94.520
	Na	23	
	Mg	24	
	K	39	
	Ca	43	
	Fe	54	
	Fe	57	
>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

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Method 6020 - Summary Report

Sample ID: QC Std 6
Sample Date/Time: Thursday, October 20, 2016 18:36:57
Number of Replicates: 3
Autosampler Position: 101
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	80436.3	1.4				ug/L	76335	Standard
	Be	9	55372.7	2.7	**47.6659**	0.990	2.1	ug/L	18	Standard
	Al	27	6287817.0	2.7	**48.0199**	0.911	1.9	ug/L	810	Standard
	Sc	45	22832.2	1.6				ug/L	22700	Standard
	Ti	47	20894.4	3.1	**101.2653**	1.286	1.3	ug/L	25	Standard
	V	51	366727.8	1.0	**50.9032**	0.535	1.1	ug/L	1541	Standard
	Cr	52	348453.5	1.4	**51.0642**	0.292	0.6	ug/L	7881	Standard
	Cr	53	44475.2	3.0	**51.3432**	0.653	1.3	ug/L	932	Standard
	Mn	55	571195.8	2.2	**50.4893**	0.467	0.9	ug/L	1508	Standard
	Co	59	475288.4	1.0	**50.5649**	0.501	1.0	ug/L	282	Standard
	Ni	60	101765.6	1.2	**50.1166**	0.411	0.8	ug/L	91	Standard
	Cu	65	100120.1	2.2	**50.2487**	0.189	0.4	ug/L	205	Standard
	Zn	66	51673.0	1.6	**50.4881**	0.210	0.4	ug/L	369	Standard
>	Ge	72	491855.5	1.9				ug/L	496734	Standard
	As	75	51990.6	1.1	**50.8175**	0.655	1.3	ug/L	-45	Standard
	Se	82	5092.5	0.1	**51.7748**	1.048	2.0	ug/L	18	Standard
	Se-1	77	3442.7	2.9	**51.1520**	2.237	4.4	ug/L	83	Standard
>	Ga	71	61.7	24.8				mg/L	30	Standard
	Rb	85	656.7	12.5				ug/L	23	Standard
	Y	89	395774.1	0.3				ug/L	405333	Standard
>	Rh	103	30.0	57.7				ug/L	17	Standard
	Mo	98	377010.3	0.9	**97.7850**	1.536	1.6	ug/L	135	Standard
	Ag	107	374293.4	0.3	**50.9151**	1.055	2.1	ug/L	123	Standard
	Cd	111	110050.2	2.0	**51.7950**	0.142	0.3	mg/L	11	Standard
	Cd	114	285829.6	0.9	**51.9779**	1.316	2.5	ug/L	56	Standard
>	In	115	667043.9	2.3				ug/L	634401	Standard
	Sn	118	65833.4	0.4	**51.2771**	0.995	1.9	ug/L	137	Standard
	Sb	123	282725.9	1.4	**50.9315**	1.017	2.0	ug/L	907	Standard
	Ba	135	149025.7	0.8	**49.9150**	0.872	1.7	ug/L	166	Standard
	Ce	140	198.3	25.5				ug/L	57	Standard
>	Tb	159	1374073.1	2.0				ug/L	1347540	Standard
	Ho	165	41.7	38.6				ug/L	23	Standard
	Tl	203	583245.6	1.4	**49.3912**	0.634	1.3	ug/L	45	Standard
	Tl	205	1388048.3	0.9	**48.6620**	0.281	0.6	ug/L	112	Standard
	Pb	206	448615.6	1.5	**50.5828**	0.608	1.2	ug/L	825	Standard
	Pb	207	391308.5	0.8	**50.1297**	0.232	0.5	ug/L	679	Standard
	Pb	208	1772611.5	0.7	**49.9713**	0.381	0.8	ug/L	3166	Standard
	U	238	1534336.8	0.2	**48.0034**	0.169	0.4	ug/L	119	Standard
>	Bi	209	674475.6	0.4				ug/L	668024	Standard

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⌈	**Na**	23	15.0	88.2	**4.0260**	3.586	89.1	mg/L	0	Standard
|	**Mg**	24	3448.7	3.8	**4.9366**	0.137	2.8	mg/L	48	Standard
|	**K**	39	493.3	18.8	**4.9949**	1.030	20.6	mg/L	8	Standard
|	**Ca**	43	36.7	7.9	**1.2236**	0.786	64.2	mg/L	27	Standard
|	**Fe**	54	4714.8	2.0	**4.8145**	0.099	2.1	mg/L	121	Standard
|	**Fe**	57	1591.8	15.7	**4.8095**	1.024	21.3	mg/L	305	Standard
⌊>	**Sc-1**	45	22832.2	1.6				mg/L	22700	Standard
	Cl	35	4.0	100.0				ug/L	3	Standard
	Kr	83	2.0	86.6				ug/L	5	Standard
	Br	81	1490.1	10.5				ug/L	1367	Standard
	P	31	101.7	23.2				ug/L	67	Standard
	S	34	110.0	13.6				ug/L	55	Standard
	Sr	88	155.0	3.2				ug/L	113	Standard
	C	12	430.0	8.4				mg/L	367	Standard
	N	14	3.3	173.2				mg/L	3	Standard
	Hg	202	46.7	44.6				mg/L	10	Standard
	Dy	164	35.2	61.4				mg/L	18	Standard
	Ho-1	165	41.7	38.6				mg/L	23	Standard
	Er	166	30.0	57.7				mg/L	40	Standard
	I	127	2451.9	14.7				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9	95.332		
⌊	Al	27	96.040		
⌈	Sc	45			
|	Ti	47	101.265		
|	V	51	101.806		
|	Cr	52	102.128		
|	Cr	53			
|	Mn	55	100.979		
|	Co	59	101.130		
|	Ni	60	100.233		
|	Cu	65	100.497		
|	Zn	66	100.976		
|>	Ge	72		99.018	
|	As	75	101.635		
|	Se	82	103.550		
⌊	Se-1	77			
⌈>	Ga	71			

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Rb	85			
Y	89			
Rh	103			
Mo	98	97.785		
Ag	107	101.830		
Cd	111	103.590		
Cd	114			
In	115			105.145
Sn	118	102.554		
Sb	123	101.863		
Ba	135	99.830		
Ce	140			
Tb	159			
Ho	165			
Tl	203	98.782		
Tl	205			
Pb	206			
Pb	207			
Pb	208	99.943		
U	238	96.007		
Bi	209			100.966
Na	23			
Mg	24			
K	39			
Ca	43			
Fe	54			
Fe	57			
Sc-1	45			
Cl	35			
Kr	83			
Br	81			
P	31			
S	34			
Sr	88			
C	12			
N	14			
Hg	202			
Dy	164			
Ho-1	165			
Er	166			
I	127			

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message

Sample ID: QC Std 6
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Method 6020 - Summary Report

Sample ID: QC Std 7
Sample Date/Time: Thursday, October 20, 2016 18:39:57
Number of Replicates: 3
Autosampler Position: 102
Sample Description:
Method File: C:\NexIONData\Method\6020a.mth
Aliquot Volume (mL):
Diluted to Volume (mL):
User Name: JYH Nexion300X
Cumulative Autodilution Factor: 1
Nexion-ICP 200.8\6020

Concentration Results

IS	Analyte	Mass	Intensity	RSD	Conc.	SD	RSD	Units	Blank Intens.	Mode
>	Li	6	83965.8	5.2				ug/L	76335	Standard
	Be	9	18.3	15.7	**0.0122**	0.003	22.6	ug/L	18	Standard
	Al	27	703.4	38.9	**0.0009**	0.002	264.1	ug/L	810	Standard
	Sc	45	24281.1	1.8				ug/L	22700	Standard
	Ti	47	24.3	12.6	**-0.0263**	0.013	50.8	ug/L	25	Standard
	V	51	1636.7	2.7	**-0.0074**	0.008	108.4	ug/L	1541	Standard
	Cr	52	8122.2	2.4	**-0.0327**	0.019	58.4	ug/L	7881	Standard
	Cr	53	778.4	16.2	**-0.2148**	0.138	64.5	ug/L	932	Standard
	Mn	55	1629.8	2.1	**0.0520**	0.004	7.8	ug/L	1508	Standard
	Co	59	263.3	6.7	**-0.0060**	0.002	33.1	ug/L	282	Standard
	Ni	60	92.0	8.6	**0.0006**	0.004	606.6	ug/L	91	Standard
	Cu	65	176.0	7.9	**0.0214**	0.007	31.2	ug/L	205	Standard
	Zn	66	266.3	3.6	**0.0636**	0.011	17.9	ug/L	369	Standard
>	Ge	72	520121.3	1.0				ug/L	496734	Standard
	As	75	-32.6	62.2	**0.0293**	0.019	63.9	ug/L	-45	Standard
	Se	82	25.1	18.0	**0.0428**	0.041	96.1	ug/L	18	Standard
	Se-1	77	96.3	6.7	**0.2308**	0.103	44.6	ug/L	83	Standard
>	Ga	71	28.3	10.2				mg/L	30	Standard
	Rb	85	25.0	60.0				ug/L	23	Standard
	Y	89	424269.9	2.2				ug/L	405333	Standard
>	Rh	103	13.3	21.7				ug/L	17	Standard
	Mo	98	327.3	4.6	**0.0577**	0.003	5.5	ug/L	135	Standard
	Ag	107	142.0	14.6	**-0.0042**	0.002	58.5	ug/L	123	Standard
	Cd	111	14.6	13.8	**-0.0028**	0.001	34.1	mg/L	11	Standard
	Cd	114	40.7	28.6	**0.0003**	0.002	676.9	ug/L	56	Standard
>	In	115	718032.6	0.9				ug/L	634401	Standard
	Sn	118	224.0	22.4	**0.0849**	0.036	42.6	ug/L	137	Standard
	Sb	123	3209.1	42.1	**0.4687**	0.224	47.8	ug/L	907	Standard
	Ba	135	118.7	12.9	**-0.0100**	0.004	44.4	ug/L	166	Standard
	Ce	140	36.7	7.9				ug/L	57	Standard
>	Tb	159	1432960.7	1.8				ug/L	1347540	Standard
	Ho	165	15.0	100.0				ug/L	23	Standard
	Tl	203	42.0	14.5	**-0.0013**	0.000	31.7	ug/L	45	Standard
	Tl	205	115.0	27.2	**0.0019**	0.001	50.2	ug/L	112	Standard
	Pb	206	576.3	3.8	**0.0054**	0.002	29.4	ug/L	825	Standard
	Pb	207	467.3	4.0	**0.0063**	0.003	54.9	ug/L	679	Standard
	Pb	208	2207.7	2.7	**0.0039**	0.002	41.5	ug/L	3166	Standard
	U	238	153.0	14.3	**0.0027**	0.001	20.5	ug/L	119	Standard
>	Bi	209	721696.1	2.2				ug/L	668024	Standard

Sample ID: QC Std 7
Report Date/Time: Monday, October 24, 2016 12:07:53
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Approved: October 24, 2016

⌈	**Na**	23	0.0		**0.0050**	0.000	0.0	mg/L	0	Standard
|	**Mg**	24	66.7	34.6	**-0.0036**	0.033	914.3	mg/L	48	Standard
|	**K**	39	20.0	66.1	**0.0633**	0.130	205.9	mg/L	8	Standard
|	**Ca**	43	43.3	6.7	**2.6347**	1.157	43.9	mg/L	27	Standard
|	**Fe**	54	122.4	19.5	**-0.0087**	0.025	280.9	mg/L	121	Standard
|	**Fe**	57	291.7	22.3	**-0.2526**	0.221	87.5	mg/L	305	Standard
⌊>	**Sc-1**	45	24281.1	1.8				mg/L	22700	Standard
	Cl	35	1.3	173.2				ug/L	3	Standard
	Kr	83	6.0	44.1				ug/L	5	Standard
	Br	81	1406.7	0.4				ug/L	1367	Standard
	P	31	120.0	12.5				ug/L	67	Standard
	S	34	98.3	17.9				ug/L	55	Standard
	Sr	88	140.0	31.7				ug/L	113	Standard
	C	12	276.7	9.1				mg/L	367	Standard
	N	14	0.0					mg/L	3	Standard
	Hg	202	43.3	74.2				mg/L	10	Standard
	Dy	164	29.0	62.5				mg/L	18	Standard
	Ho-1	165	15.0	100.0				mg/L	23	Standard
	Er	166	20.0	86.6				mg/L	40	Standard
	I	127	2716.9	8.0				mg/L	3235	Standard

QC Calculated Values

	Analyte	Mass	QC Std % Recovery	Int Std % Recovery	Spike % Recovery
⌈>	Li	6			
|	Be	9			
⌊	Al	27			
⌈	Sc	45			
|	Ti	47			
|	V	51			
|	Cr	52			
|	Cr	53			
|	Mn	55			
|	Co	59			
|	Ni	60			
|	Cu	65			
|	Zn	66			
|>	Ge	72		104.708	
|	As	75			
|	Se	82			
⌊	Se-1	77			
⌈>	Ga	71			

Sample ID: QC Std 7
Report Date/Time: Monday, October 24, 2016 12:07:53
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Approved: October 24, 2016

⌊	Rb	85	
⌈	Y	89	
⌊>	Rh	103	
⌈	Mo	98	
|	Ag	107	
|	Cd	111	
|	Cd	114	
|>	In	115	113.183
|	Sn	118	
|	Sb	123	
⌊	Ba	135	
⌈	Ce	140	
⌊>	Tb	159	
⌈	Ho	165	
|	Tl	203	
|	Tl	205	
|	Pb	206	
|	Pb	207	
|	Pb	208	
|	U	238	
⌊>	Bi	209	108.034
⌈	Na	23	
|	Mg	24	
|	K	39	
|	Ca	43	
|	Fe	54	
|	Fe	57	
⌊>	Sc-1	45	
	Cl	35	
	Kr	83	
	Br	81	
	P	31	
	S	34	
	Sr	88	
	C	12	
	N	14	
	Hg	202	
	Dy	164	
	Ho-1	165	
	Er	166	
	I	127	

QC Out of Limits

Measurement Type	Analyte	Mass	Out of Limits Message
QC Std 7	Sb	123	

Sample ID: QC Std 7
Report Date/Time: Monday, October 24, 2016 12:07:53
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Approved: October 24, 2016

2.1.3 Metals CVAA Data (Mercury)

2.1.3.1 Summary Data

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-01	**PrePrep Method:**	N/A	**Instrument:**	CVAA1
Client ID:	35AWW13F-100616	**Prep Method:**	7470A	**Prep Date:**	10/12/2016 10:38
Matrix:	Water	**Analytical Method:**	7470A	**Cal Date:**	10/12/2016 14:36
Workgroup #:	WG587342	**Analyst:**	KDD	**Run Date:**	10/12/2016 14:54
Collect Date:	10/06/2016 08:30	**Dilution:**	1	**File ID:**	M7.101216.145428
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Mercury	7439-97-6	0.000200	U	0.000400	0.000200	0.000100

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-02	**PrePrep Method:**	N/A	**Instrument:**	CVAA1
Client ID:	35AWW13FDF-100616	**Prep Method:**	7470A	**Prep Date:**	10/12/2016 10:38
Matrix:	Water	**Analytical Method:**	7470A	**Cal Date:**	10/12/2016 14:36
Workgroup #:	WG587342	**Analyst:**	KDD	**Run Date:**	10/12/2016 15:02
Collect Date:	10/06/2016 08:30	**Dilution:**	1	**File ID:**	M7.101216.150204
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Mercury	7439-97-6	0.000200	U	0.000400	0.000200	0.000100

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-03	**PrePrep Method:**	N/A	**Instrument:**	CVAA1
Client ID:	35AWW13MSF-100616	**Prep Method:**	7470A	**Prep Date:**	10/12/2016 10:38
Matrix:	Water	**Analytical Method:**	7470A	**Cal Date:**	10/12/2016 14:36
Workgroup #:	WG587342	**Analyst:**	KDD	**Run Date:**	10/12/2016 15:07
Collect Date:	10/06/2016 08:30	**Dilution:**	1	**File ID:**	M7.101216.150709
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Mercury	7439-97-6	0.000200	U	0.000400	0.000200	0.000100

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L16100408-04	**PrePrep Method:**	N/A	**Instrument:**	CVAA1
Client ID:	35AWW13MSDF-100616	**Prep Method:**	7470A	**Prep Date:**	10/12/2016 10:38
Matrix:	Water	**Analytical Method:**	7470A	**Cal Date:**	10/12/2016 14:36
Workgroup #:	WG587342	**Analyst:**	KDD	**Run Date:**	10/12/2016 15:12
Collect Date:	10/06/2016 08:30	**Dilution:**	1	**File ID:**	M7.101216.151215
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Mercury	7439-97-6	0.000200	U	0.000400	0.000200	0.000100

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L16100408
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

2.1.3.2 QC Summary

Example Cold Vapor Mercury Calculations
Hydra AA Mercury Analyzer / CETAC M-7600 Quick Trace Mercury Analyzer

1.0 Initial Calibration (ICAL) Parameters
The system performs linear regression from data consisting of a blank and five standards.

2.0 Calculating the concentration (C) of an element in water using data from run log and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (ug/L)	0.1
Vf = Diluted to Volume (mL)	40
Vi = Aliquot Volume (mL)	40
D = Manual dilution factor, if required (10X = 10)	1
Cx = Concentration of element in ppb (ug/L)	0.1

3.0 Calculating the concentration (C) of an element in soil using data from prep log and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Ws} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (ug/L)	0.1
Vf = Diluted to volume (mL)	40
Ws = Aliquot weight (g)	0.6
D = Manual dilution factor	1
Cx = Concentration of element in ug/kg	6.67

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

1 Cx = Concentration calculated as received (wet basis)	6.67
Px = Percent solids of sample (%wt)	80
$Cdry$ = Concentration calculated as dry weight (ug/kg)	8.33

8.33 ug/kg = 0.00833 mg/kg

Microbac Laboratories Inc.
Metals Digest Log

Workgroup: WG587300
Analyst: REK
Spike Analyst: REK
Method: 7470A
Run Date: 10/12/2016 10:38
Hotblock Start Temp: 95.2 @ 10:30
Hotblock End Temp: 95.3 @ 12:30
Instrument: HB6

SOP: ME404 Revison 17
Spike Solution: STD78455
Spike Witness: ERP
40 & 50 ML. DIGESTION TU COA18987
H2SO4 Lot #: COA18359
HNO3 Lot #: COA19196
K2S2O8 1:1 Lot #: RGT38134
KMnO4 1:1 Lot #: RGT38046
Mercury Water ICV Lot #: STD78457
HG H2O STDS 10PPM Lot #: STD78463

	SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Spike Amount	Due Date
1	WG587300-03	BLANK	1	40 mL	40 mL		
2	WG587300-04	LCS	1	40 mL	40 mL	4 mL	
3	WG587300-01	REF	1	40 mL	40 mL		
4	L16100408-01	SAMP	1	40 mL	40 mL		10/18/16
5	L16100408-02	SAMP	1	40 mL	40 mL		10/18/16
6	WG587300-02	REF	1	40 mL	40 mL		
7	L16100408-03	SAMP	1	40 mL	40 mL		10/18/16
8	L16100408-04	SAMP	1	40 mL	40 mL		10/18/16
9	L16100448-03	SAMP	2	40 mL	40 mL		10/14/16
10	WG587300-05	MS	1	36 mL	40 mL	4 mL	
11	WG587300-06	MSD	1	36 mL	40 mL	4 mL	
12	WG587300-07	DUP	1	40 mL	40 mL		

Analyst: 

Reviewer: 

* All calibration and check standards are prepared and digested with sample batch following the procedures in section 7.0 of SOP ME404/ME405.

HB_DIG - Modified 07/26/2012
PDF ID: 4972188
Report generated: 10/12/2016 12:51

Microbac Laboratories Inc.

Instrument Run Log

Instrument: CVAA1 Dataset: 101216D.CSV
Analyst1: KDD Analyst2: N/A
Method: 7470A/245.1 SOP: 404 Rev: 17
Maintenance Log ID:

Calibration Std: STD78463 ICV Std: STD78457 Post Spike: STD78463
ICSA: N/A ICSAB: N/A Int. Std:
CCV: LLCCV: Tuning Sol :
Stannous : RGT78056 Hydroxylamine : RGT38054

Workgroups: 587300

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
1	M7.101216.142403	WG587426-01	Calibration Point		1		10/12/16 14:24
2	M7.101216.142635	WG587426-02	Calibration Point		1		10/12/16 14:26
3	M7.101216.142907	WG587426-03	Calibration Point		1		10/12/16 14:29
4	M7.101216.143139	WG587426-04	Calibration Point		1		10/12/16 14:31
5	M7.101216.143412	WG587426-05	Calibration Point		1		10/12/16 14:34
6	M7.101216.143646	WG587426-06	Calibration Point		1		10/12/16 14:36
7	M7.101216.143920	WG587426-07	Initial Calibration Verification		1		10/12/16 14:39
8	M7.101216.144151	WG587426-08	Initial Calib Blank		1		10/12/16 14:41
9	M7.101216.144423	WG587426-09	CCV		1		10/12/16 14:44
10	M7.101216.144654	WG587426-10	CCB		1		10/12/16 14:46
11	M7.101216.144925	WG587300-03	Method/Prep Blank	40/40	1		10/12/16 14:49
12	M7.101216.145156	WG587300-04	Laboratory Control S	40/40	1		10/12/16 14:51
13	M7.101216.145428	WG587300-01	Reference Sample	40/40	1	L16100408-01	10/12/16 14:54
14	M7.101216.145659	WG587300-05	Matrix Spike	36/40	1	L16100408-01	10/12/16 14:56
15	M7.101216.145931	WG587300-06	Matrix Spike Duplica	36/40	1	L16100408-01	10/12/16 14:59
16	M7.101216.150204	L16100408-02	35AWW13FDF-100616	40/40	1		10/12/16 15:02
17	M7.101216.150436	WG587342-01	Post Digestion Spike		1	L16100408-02	10/12/16 15:04
18	M7.101216.150709	WG587300-02	Reference Sample	40/40	1	L16100408-03	10/12/16 15:07
19	M7.101216.150942	WG587300-07	Duplicate	40/40	1	L16100408-03	10/12/16 15:09
20	M7.101216.151215	L16100408-04	35AWW13MSDF-100616	40/40	1		10/12/16 15:12
21	M7.101216.151448	WG587426-11	CCV		1		10/12/16 15:14
22	M7.101216.151719	WG587426-12	CCB		1		10/12/16 15:17
23	M7.101216.151952	L16100448-03	16J0432-03	40/40	1		10/12/16 15:19
24	M7.101216.152225	WG587426-13	CCV		1		10/12/16 15:22
25	M7.101216.152456	WG587426-14	CCB		1		10/12/16 15:24

Page: 1 Approved: October 13, 2016

Microbac Laboratories Inc.

Data Checklist

Date: 12-OCT-2016
Analyst: KDD
Analyst: NA
Method: 7470A/245.1
Instrument: CVAA1
Curve Workgroup: 587426
Runlog ID: 78032
Analytical Workgroups: 587342

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	
ICB/CCB	X
ICSA/ICSAB	
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	0448
Client Forms	X
Level X	
Level 3	
Level 4	
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	KDD
Secondary Reviewer	KHR
Comments	

Primary Reviewer:
13-OCT-2016

Secondary Reviewer:
13-OCT-2016

CHECKLIST1 - Modified 03/05/2008
Generated: OCT-13-2016 10:44:42

HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 7470A AAB#: WG587342

Login Number: L16100408

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
35AWW13F-100616	01	10/06/16					10/12/2016	6.1	28		10/12/16	6.3	28	
35AWW13FDF-100616	02	10/06/16					10/12/2016	6.1	28		10/12/16	6.3	28	
35AWW13MSF-100616	03	10/06/16					10/12/2016	6.1	28		10/12/16	6.3	28	
35AWW13MSDF-100616	04	10/06/16					10/12/2016	6.1	28		10/12/16	6.3	28	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 4973068
Report generated 10/13/2016 09:03

METHOD BLANK SUMMARY

Login Number: L16100408
Work Group: WG587342
Blank File ID: M7.101216.144925
Blank Sample ID: WG587300-03
Prep Date: 10/12/16 10:38
Instrument ID: CVAA1
Analyzed Date: 10/12/16 14:49
Method: 7470A
Analyst: KDD

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG587300-04	M7.101216.145156	10/12/16 14:51	01
35AWW13F-100616	L16100408-01	M7.101216.145428	10/12/16 14:54	01
35AWW13FDF-100616	L16100408-02	M7.101216.150204	10/12/16 15:02	01
35AWW13MSF-100616	L16100408-03	M7.101216.150709	10/12/16 15:07	01
DUP	WG587300-07	M7.101216.150942	10/12/16 15:09	01
35AWW13MSDF-100616	L16100408-04	M7.101216.151215	10/12/16 15:12	01

Report Name: BLANK_SUMMARY
PDF File ID: 4973069
Report generated 10/13/2016 09:03

Microbac Laboratories Inc.
METHOD BLANK REPORT

Login Number: L16100408 Prep Date: 10/12/16 10:38 Sample ID: WG587300-03
Instrument ID: CVAA1 Run Date: 10/12/16 14:49 Prep Method: 7470A
File ID: M7.101216.144925 Analyst: KDD Method: 7470A
Workgroup (AAB#): WG587342 Matrix: Water Units: mg/L
Contract #: Cal ID: CVAA1-12-OCT-16

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Mercury	0.000100	0.000400	0.000100	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name:BLANK
PDF ID: 4973070
13-OCT-2016 09:03

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L16100408 **Run Date:** 10/12/2016 **Sample ID:** WG587300-04
Instrument ID: CVAA1 **Run Time:** 14:51 **Prep Method:** 7470A
File ID: M7.101216.145156 **Analyst:** KDD **Method:** 7470A
Workgroup (AAB#): WG587342 **Matrix:** Water **Units:** mg/L
QC Key: DOD4 **Lot#:** STD78455 **Cal ID:** CVAA1-12-OCT-16

Analytes	Expected	Found	% Rec	LCS Limits	Q
Mercury	0.00400	0.00420	105	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 4973071
Report generated: 10/13/2016 09:03

Loginnum:L16100408 Cal ID:CVAA1- Worknum:WG587342
Instrument ID:CVAA1 Contract #: Method:7470A
Parent ID:WG587300-01 File ID:M7.101216.145428 Dil:1 Matrix:WATER
Sample ID:WG587300-05 MS File ID:M7.101216.145659 Dil:1 Units:mg/L
Sample ID:WG587300-06 MSD File ID:M7.101216.145931 Dil:1

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Mercury	ND	0.00444	0.00411	92.6	0.00444	0.00412	92.7	0.135	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

NOTE: This is an internal quality control sample.

WG_MS_MSD_DRYWT - Modified 05/26/2011
PDF File ID: 4973072
Report generated 10/13/2016 09:03

Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L16100408 **Worknum:** WG587342
Instrument ID: CVAA1 **Method:** 7470A
Post Spike ID: WG587342-01 **File ID:** M7.101216.150436 **Dil:** 1 **Units:** ug/L
Sample ID: L16100408-02 **File ID:** M7.101216.150204 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
MERCURY	0.925		0	U	1	92.5	85 - 115	

N = % Recovery exceeds control limits
F = Result is between MDL and RL
U = Sample result is below MDL. A value of zero is used in the calculation

POST_SPIKE - Modified 03/06/2008
PDF File ID: 4973067
Report generated: 10/13/2016 09:03

Microbac Laboratories Inc.
INITIAL CALIBRATION SUMMARY

Login Number: L16100408
Analytical Method: 7470A
ICAL Worknum: WG587426

Workgroup (AAB#): WG587342
Instrument ID: CVAA1
Initial Calibration Date: 10/12/2016 14:36

Analyte	WG587426-01		WG587426-02		WG587426-03		WG587426-04		WG587426-05		WG587426-06	
	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT	STD	INT
Mercury	0	39.45	0.200	2090	1.00	10150	2.00	20100	5.00	48710	10.0	92690

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

INT_CAL_HG_FU - Modified 03/06/2008
PDF File ID: 4973073
Report generated 10/13/2016 09:03

Login Number: L16100408
Analytical Method: 7470A
ICAL Worknum: WG587426

Workgroup (AAB#): WG587342
Instrument ID: CVAA1
Initial Calibration Date: 10/12/2016 14:36

Analyte	R	Q
Mercury	0.9995	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
* = Out of Compliance; R < 0.995

INT_CAL_HG_FU - Modified 03/06/2008
PDF File ID: 4973073
Report generated 10/13/2016 09:03

Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L16100408 Run Date: 10/12/2016 Sample ID: WG587426-08
Instrument ID: CVAA1 Run Time: 14:41 Method: 7470A
File ID: M7.101216.144151 Analyst: KDD Units: ug/L
Workgroup (AAB#): WG587342 Cal ID: CVAA1 - 12-OCT-16
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
MERCURY	.1	.4	.1	U

U = Result is less than 2 x MDL

F = Result is between MDL and 2 x MDL

* = Result is above 2 x MDL

ICB - Modified 07/14/2009
PDF File ID: 4973075
Report generated 10/13/2016 09:03

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number: L16100408 | Run Date: 10/12/2016 | Sample ID: WG587426-10
Instrument ID: CVAA1 | Run Time: 14:46 | Method: 7470A
File ID: M7.101216.144654 | Analyst: KDD | Units: ug/L
Workgroup (AAB#): WG587342 | Cal ID: CVAA1 - 12-OCT-16
Matrix: WATER | QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Mercury	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 4973077
Report generated 10/13/2016 09:03

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number:	L16100408	Run Date:	10/12/2016	Sample ID:	WG587426-12
Instrument ID:	CVAA1	Run Time:	15:17	Method:	7470A
File ID:	M7.101216.151719	Analyst:	KDD	Units:	ug/L
Workgroup (AAB#):	WG587342	Cal ID:	CVAA1 - 12-OCT-16		
Matrix:	WATER	QAPP:	DOD4		

Analytes	MDL	RDL	Concentration	Qualifier
Mercury	0.100	0.400	0.100	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 4973077
Report generated 10/13/2016 09:03

Microbac Laboratories Inc.

INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L16100408 Run Date: 10/12/2016 Sample ID: WG587426-07
Instrument ID: CVAA1 Run Time: 14:39 Method: 7470A
File ID: M7.101216.143920 Analyst: KDD Units: ug/L
Workgroup (AAB#): WG587342 Cal ID: CVAA1 - 12-OCT-16
QC Key: DOD4

Analyte		Expected	Found	%REC	LIMITS	Q
Mercury		2	2.08	104	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 4973074
Report generated 10/13/2016 09:03

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16100408 Run Date: 10/12/2016 Sample ID: WG587426-09
Instrument ID: CVAA1 Run Time: 14:44 Method: 7470A
File ID: M7.101216.144423 Analyst: KDD QC Key: DOD4
Workgroup (AAB#): WG587342 Cal ID: CVAA1 - 12-OCT-16
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00204	mg/L	102	80 - 120		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 4973076
Report generated 10/13/2016 09:03

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L16100408 Run Date: 10/12/2016 Sample ID: WG587426-11
Instrument ID: CVAA1 Run Time: 15:14 Method: 7470A
File ID: M7.101216.151448 Analyst: KDD QC Key: DOD4
Workgroup (AAB#): WG587342 Cal ID: CVAA1 - 12-OCT-16
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Mercury, Total		0.00200	0.00212	mg/L	106	80 - 120		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 4973076
Report generated 10/13/2016 09:03

2.1.3.3 Raw Data

PDM CVAA1 245.1/7470/7471

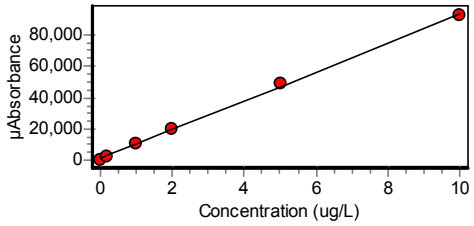
Report Generated By CETAC QuickTrace
Analyst: VOA
Worksheet file: C:\Program Files (x86)\QuickTrace\Worksheets\101216D.wsz
Date Started: 10/12/2016 2:19:25 PM
Comment:

Results

Sample Name					Type	Date/Time	Conc (ug/L)	µAbs	%RSD	Flags	DF
Standard #0					STD	10/12/16 02:24:03 pm	0.0000	39	47.73		1.00
Replicates	65.4	31.5	39.6	21.3							
Standard #1 (0.2 ug/L)					STD	10/12/16 02:26:35 pm	0.2000	2090	0.57		1.00
Replicates	2088.0	2105.6	2090.4	2076.7							
Standard #2 (1.0 ug/L)					STD	10/12/16 02:29:07 pm	1.0000	10146	0.13		1.00
Replicates	10142.2	10149.1	10130.7	10161.9							
Standard #3 (2.0 ug/L)					STD	10/12/16 02:31:39 pm	2.0000	20096	0.26		1.00
Replicates	20150.0	20122.8	20081.8	20028.3							
Standard #4 (5.0 ug/L)					STD	10/12/16 02:34:12 pm	5.0000	48709	0.21		1.00
Replicates	48819.9	48769.8	48653.8	48594.5							
Standard #5 (10.0 ug/L)					STD	10/12/16 02:36:46 pm	10.0000	92694	0.23		1.00
Replicates	92926.3	92809.5	92596.2	92445.7							

Calibration

Equation: A = 826.365 + 9275.665C
R2: 0.99930
SEE: 1065.4190
Flags:



ICV					ICV	10/12/16 02:39:20 pm	2.0840	20154	0.49		1.00
Replicates	20253.2	20209.2	20121.0	20032.5							
% Recovery	104.18										

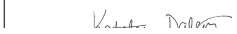
Approved: October 13, 2016

Sample Name					Type	Date/Time	Conc (ug/L)	µAbs	%RSD	Flags	DF
ICB					ICB	10/12/16 02:41:51 pm	-0.0865	24	105.65		1.00
Replicates	12.9	30.5	-3.3	55.7							
CCV					CCV	10/12/16 02:44:23 pm	2.0410	19755	3.19		1.00
Replicates	20577.7	19896.4	19393.5	19152.0							
% Recovery	102.03										
CCB					CCB	10/12/16 02:46:54 pm	-0.0848	40	28.52		1.00
Replicates	25.4	36.9	49.6	48.9							
WG587300-03					MB	10/12/16 02:49:25 pm	-0.0846	42	45.58		1.00
Replicates	13.8	55.2	46.6	52.7							
WG587300-04					LCS	10/12/16 02:51:56 pm	4.2010	39793	0.12		1.00
Replicates	39842.1	39821.8	39762.2	39744.3							
% Recovery	105.02										
L1610040801					UNK	10/12/16 02:54:28 pm	-0.0838	49	14.32		1.00
Replicates	49.6	46.9	57.9	41.0							
WG587300-05					UNK	10/12/16 02:56:59 pm	3.7030	35173	0.02		1.00
Replicates	35173.4	35183.4	35166.8	35168.8							
WG587300-06					UNK	10/12/16 02:59:31 pm	3.7080	35217	0.08		1.00
Replicates	35249.7	35229.2	35190.4	35200.4							
L1610040802					UNK	10/12/16 03:02:04 pm	-0.0869	21	7.44		1.00
Replicates	20.5	22.9	19.5	19.7							
WG587342-01					SPK	10/12/16 03:04:36 pm	0.9248	9404	0.47		1.00
Replicates	9459.5	9420.3	9366.4	9370.9							
% Recovery	101.16										
L1610040803					UNK	10/12/16 03:07:09 pm	-0.0802	83	16.88		1.00
Replicates	88.4	98.5	78.3	65.8							
WG587300-07					UNK	10/12/16 03:09:42 pm	-0.0804	80	15.27		1.00
Replicates	69.1	85.7	94.9	71.2							

Approved: October 13, 2016

Sample Name					Type	Date/Time	Conc (ug/L)	µAbs	%RSD	Flags	DF
L1610040804					UNK	10/12/16 03:12:15 pm	-0.0829	58	33.65		1.00
	Replicates	81.7	42.8	41.1	65.6						
CCV					CCV	10/12/16 03:14:48 pm	2.1190	20478	0.18		1.00
	Replicates	20493.2	20523.5	20455.9	20440.2						
	% Recovery	105.93									
CCB					CCB	10/12/16 03:17:19 pm	-0.0881	9	115.53		1.00
	Replicates	-3.5	21.2	5.2	14.3						
L1610044803					UNK	10/12/16 03:19:52 pm	0.1175	1917	1.14		1.00
	Replicates	1935.6	1919.4	1925.9	1885.2						
CCV					CCV	10/12/16 03:22:25 pm	2.1140	20434	0.10		1.00
	Replicates	20459.4	20437.4	20412.7	20425.4						
	% Recovery	105.69									
CCB					CCB	10/12/16 03:24:56 pm	-0.0823	63	44.70		1.00
	Replicates	63.0	55.0	100.5	33.0						

Approved: October 13, 2016



3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
October 25, 2016

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001 - BIO-CHEM TESTING WVDEP 220	002 - REIC Consultants, Inc. WVDEP 060
003 - Sturm Environmental	004 - MICROBAC PITTSBURGH
005 - ES LABORATORIES	006 - ALCOSAN LABORATORIES
007 - ALS LABORATORIES	008 - BENCHMARK LABORATORIES
010 - MICROBAC CHICAGOLAND	AC - AMBER R. CARMICHAEL
ADC - ANTHONY D. CANTER	ADG - APRIL D. GREENE
AED - ALLEN E. DAVIS	ALS - ADRIANE L. STEED
AMA - ALEXANDRA M. ALFRED	AWE - ANDREW W. ESSIG
AZH - AFTER HOURS	BJO - BRIAN J. OGDEN
BKT - BRENDAN TORRENCE	BLG - BRENDA L. GREENWALT
BNB - Brandi N. Bentley	BRG - BRENDA R. GREGORY
CAA - CASSIE A. AUGENSTEIN	CAF - CHERYL A. FLOWERS
CAS - Craig A. Smith	CEB - CHAD E. BARNES
CJQ - Cameron J. Quick	CLC - CHRYS L. CRAWFORD
CLS - CARA L. STRICKLER	CLW - CHARISSA L. WINTERS
CPD - CHAD P. DAVIS	CSH - CHRIS S. HILL
CV - Carl Volkman	DAK - DEAN A. KETELSEN
DCM - DAVID C. MERCKLE	DEV - DAVID E. VANDENBERG
DIH - DEANNA I. HESSON	DLB - DAVID L. BUMGARNER
DLP - DOROTHY L. PAYNE	DSM - DAVID S. MOSSOR
ECL - ERIC C. LAWSON	EMW - ERIC M. WILKEN
ENY - EMILY N. YOAK	ERP - ERIN R. PORTER
FJB - FRANCES J. BOLDEN	HDD - HANAH D. DAWKINS
JDH - JUSTIN D. HESSON	JDS - JARED D. SMITH
JKP - JACQUELINE K. PARSONS	JLD - JESSICA L. DELONG
JLL - JOHN L. LENT	JMW - JEANA M. WHITE
JTP - JOSHUA T. PEMBERTON	JWR - JOHN W. RICHARDS
JWS - JACK W. SHEAVES	JYH - JI Y. HU
KAK - KATHY A. KIRBY	KAT - KATHY A. TUCKER
KDD - Katelyn D. Daley	KDW - KATHRYN D. WELCH
KEB - KATIE E. BARNES	KHR - KIM H. RHODES
KKB - KERRI K. BUCK	KRA - KATHY R. ALBERTSON
KRB - KAELY R. BECKER	KRP - KATHY R. PARSONS
LJH - Lacey J. Hendershot	LKN - LINDA K. NEDEFF
LLS - LARRY L. STEPHENS	LSB - LESLIE S. BUCINA
MAP - MARLA A. PORTER	MBK - MORGAN B. KNOWLTON
MDA - MIKE D. ALBERTSON	MDC - MIKE D. COCHRAN
MES - MARY E. SCHILLING	MMB - MAREN M. BEERY
MRT - MICHELLE R. TAYLOR	MSW - MATT S. WILSON
NPH - Natalie P. Hart	PDM - PIERCE D. MORRIS
PIT - MICROBAC WARRENDALE	QX - QIN XU
RAH - ROY A. HALSTEAD	REK - BOB E. KYER
RLB - BOB BUCHANAN	RNP - RICK N. PETTY
SAV - SARAH A. VANDENBERG	SCB - SARAH C. BOGOLIN
SDC - SHALYN D. CONLEY	SLM - STEPHANIE L. MOSSBURG
SLP - SHERI L. PFALZGRAF	TB - TODD BOYLE
TGF - TIM G. FELTON	TMB - TIFFANY M. BAILEY
TMM - TAMMY M. MORRIS	VC - VICKI COLLIER
WJB - WILL J. BEASLEY	WTD - WADE T. DELONG
XXX - UNAVAILABLE OR SUBCONTRACT	

Microbac Laboratories Inc.
List of Valid Qualifiers
October 25, 2016

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample reciept exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample reciept exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentativlely identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound

Microbac Laboratories Inc.
List of Valid Qualifiers
October 25, 2016

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample reciept exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below

AECOM

Chain of Custody Record

COC Number:

Laboratory:	Microbac POC: Stephanie Mossburg	Project Manager:	Mark Heaston
Address:	158 Starlite Drive	Phone/Fax Number:	210-296-2000
	Marietta, OH 45750	Sampler (print):	Scott Beesinger
Phone:	1-800-373-4071		
Client:	AECOM	Signature:	Scott Beesinger
Address:	112 East Pecan Ste. 400		
	San Antonio, TX 78205		
Turn Around Time:	STANDARD	pH:	
Project Name/Location:	Longhorn		
Project Number:	60274185.0012SOW12		

Mail to: Linda Raabe, 112 East Pecan STE. 400, San Antonio, TX 78205, 210-296-2000

Fed Ex Airbill No:

Program:

ERPIMS REQUIRED FIELDS

Site Name	Sample ID/Location ID	SBD	SED	Date	Time	Comp	Grab	Matrix	Number of Containers	Total Metals	SA CODE	Cooler ID	LOT CONTROL NUMBERS ABLOT	EBLOT	TBLOT
SITE 02	35AWW13F-100616			10/6/16	0830		X	W	1	X					
	35AWW13FDF-100616			10/6/16	0830		X	W	1	X					
	35AWW13MSF-100616			10/6/16	0830		X	W	1	X					
	35AWW13MSDF-100616			10/6/16	0830		X	W	1	X					

Comments: STANDARD TAT

Relinquished by: (Signature) Scott Beesinger	Date 10/6/16	Time 1500	Received by: (Signature)	Received by: (Signature)	Date	Time	Relinquished by: (Signature)
Relinquished by: (Signature)	Date	Time			Time		Remarks:

Microbac OVD
Received: 10/07/2016 12:45
By: BRENDA GREGORY
221000091877
Brenda Gregory

•Homogenize all composite samples prior to analysis

...Manager, Pink QA/QC Manager

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L16100408
Account: 2551
Project: 2551.096
Samples: 4
Due Date: 18-OCT-2016

Samplenum **Container ID** **Products**
L16100408-01 812134 CO-MS CR-MS CU-MS FE HG AG-MS AL AS-MS BA-MS K

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-OCT-2016 16:06	CLS		
2	STORE	W1	DIG	07-OCT-2016 16:07	ERP	BRG	
3	STORE	DIG	A1	13-OCT-2016 13:03	CLS	ERP	

Samplenum **Container ID** **Products**
L16100408-02 812135 NA NI-MS PB-MS SB-MS SE-AX TL-MS V-MS ZN-MS AG

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-OCT-2016 16:06	CLS		
2	STORE	W1	DIG	07-OCT-2016 16:07	ERP	BRG	
3	STORE	DIG	A1	13-OCT-2016 13:03	CLS	ERP	

Samplenum **Container ID** **Products**
L16100408-03 812136 AG-MS AL AS-MS BA-MS BE-AX CA CD-MS CO-MS CR-M

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-OCT-2016 16:06	CLS		
2	STORE	W1	DIG	07-OCT-2016 16:07	ERP	BRG	
3	STORE	DIG	A1	13-OCT-2016 13:03	CLS	ERP	

Samplenum **Container ID** **Products**
L16100408-04 812137 AG-MS AL AS-MS BA-MS BE-AX CA CD-MS CO-MS CR-M

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	07-OCT-2016 16:06	CLS		
2	STORE	W1	DIG	07-OCT-2016 16:07	ERP	BRG	
3	STORE	DIG	A1	13-OCT-2016 13:03	CLS	ERP	

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
Total Halide by Bomb Combustion (TX)
Particle Sizing - 200 Mesh (PS200)
Specific Gravity/Density (SPGRAV)
Total Residual Chlorine (CL-TRL)
Total Volatile Solids (all forms) (TVS)
Total Coliform Bacteria (all methods)
Fecal Coliform Bacteria (all methods)
Sulfite (SO3)
Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS
Nitrogen, Ammonia by Method 350.1
Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
Phenolics, Total by Method 420.1
ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
Acetic acid
Butyric acid
Lactic acid
Propionic acid
Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
1-Methylnaphthalene
1,4-Dioxane
Atrazine
Benzaldehyde
Biphenyl
Caprolactam
Hexamethylphosphoramide (HMPA)
Pentachlorobenzene
Pentachloroethane

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALS

OVD MSS0I/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP

SOLID AND HAZARDOUS CHEMICALS

OVD MSV0I/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)

Microbac

Laboratory Report Number: L17040974

Linda Raabe
AECOM Technical Services, Inc.
1950 N Stemmons FWY
Dallas, TX 75207

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac's Ohio Valley Division (OVD). If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed below.

Laboratory Contact:
Adriane Steed – Client Services Specialist
(740) 373-4071
Adriane.Steed@microbac.com

I certify that all test results meet all of the requirements of the DoD QSM and other applicable contract terms and conditions. Any exceptions are attached to this cover page or addressed in the method narratives presented in the report. All results for soil samples are reported on a 'dry-weight' basis unless specified otherwise. Analytical results for water and wastes are reported on a 'as received' basis unless specified otherwise. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories, DoD ELAP certification number 2936.01. The reported results are related only to the samples analyzed as received.

This report was certified on May 02 2017

Leslie Bucina – Managing Director

State of Origin: TX
Accrediting Authority: Texas Commission on Environmental Quality ID:T104704252-07-TX
QAPP: DOD Ver 4.1

Microbac

Lab Report #: L17040974
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Record of Sample Receipt and Inspection

Comments/Discrepancies

This is the record of the shipment conditions and the inspection records for the samples received and reported as a sample delivery group (SDG). All of the samples were inspected and observed to conform to our receipt policies, except as noted below.

There were no discrepancies.

Discrepancy	Resolution

Coolers

Cooler #	Temperature Gun	Temperature	COC #	Airbill #	Temp Required?
00112413	H	3.0		J4616882265	X
00113657	H	2.0		J4616882201	X

Inspection Checklist

#	Question	Result
1	Were shipping coolers sealed?	Yes
2	Were custody seals intact?	Yes
3	Were cooler temperatures in range of 0-6?	Yes
4	Was ice present?	Yes
5	Were COC's received/information complete/signed and dated?	Yes
6	Were sample containers intact and match COC?	Yes
7	Were sample labels intact and match COC?	Yes
8	Were the correct containers and volumes received?	Yes
9	Were samples received within EPA hold times?	Yes
10	Were correct preservatives used? (water only)	Yes
11	Were pH ranges acceptable? (voa's excluded)	Yes
12	Were VOA samples free of headspace (less than 6mm)?	NA

Microbac

Lab Report #: L17040974
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Samples Received

Client ID	Laboratory ID	Date Collected	Date Received
35AWW13F-041917	L17040974-01	04/19/2017 13:40	04/20/2017 09:43
35AWW13FDF-041917	L17040974-02	04/19/2017 13:40	04/20/2017 09:43
35AWW13MSF-041917	L17040974-03	04/19/2017 13:40	04/20/2017 09:43
35AWW13MSDF-041917	L17040974-04	04/19/2017 13:40	04/20/2017 09:43

Microbac

Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	**Laboratory Log Number:**	L17040974
Project Name:		**Method:**	6020
Prep Batch Number(s):	611411	**Reviewer Name:**	Kerri Buck
LRC Date:	2017-05-02 00:00:00		

Laboratory Data Package Cover Page

	R1	Field chain-of-custody documentation;
	R2	Sample identification cross-reference;
	R3	Test reports (analytical data sheets) for each environmental sample that includes: (a) Items consistent with NELAC Chapter 5, (b) dilution factors, (c) preparation methods, (d) cleanup methods, and (e) a.if required for the project, tentatively identified compounds (TICs).
	R4	Surrogate recovery data including: (a) Calculated recovery (%R), and (b) the laboratory's surrogate QC limits.
	R5	Test reports/summary forms for blank samples;
	R6	Test reports/summary forms for laboratory control samples (LCSs) including: (a) LCS spiking amounts, (b) calculated %R for each analyte, and (c) the laboratory's LCS QC limits.
	R7	Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including: (a) samples associated with the MS/MSD clearly identified, (b) MS/MSD spiking compounds, (c) concentration of each MS/MSD analyte measured in the parent and spiked samples, (d) calculated %Rs and relative percent differences (RPDs), and (e) the laboratory's MS/MSD QC limits.
	R8	Laboratory analytical duplicate (if applicable) recovery and precision: (a) the amount of analyte measured in the duplicate, (b) the calculated RPD, and (c) the laboratory's QC limits for analytical duplicates.
	R9	List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
	R10	Other problems or anomalies.

Name (Printed)	Signature	Official Title (Printed)	Date
Kerri Buck	Kerri K Buck		2017-05-02 18:52:51

Microbac

Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	**Laboratory Log Number:**	L17040974
Project Name:		**Method:**	6020
Prep Batch Number(s):	611411	**Reviewer Name:**	Kerri Buck
LRC Date:	2017-05-02 00:00:00		

Description	Yes	No	NA	NR	ER#
Chain-of-custody (C-O-C)					
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
Were all departures from standard conditions described in an exception report?	X				
Sample and quality control (QC) identification	X				
Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
Test reports	X				
Were all samples prepared and analyzed within holding times?	X				
Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
Were calculations checked by a peer or supervisor?	X				
Were all analyte identifications checked by a peer or supervisor?	X				
Were sample detection limits reported for all analytes not detected?	X				
Were all results for soil and sediment samples reported on a dry weight basis?	X				
Were % moisture (or solids) reported for all soil and sediment samples?	X				
Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
If required for the project, are TICs reported?			X		
Surrogate recovery data					
Were surrogates added prior to extraction?			X		
Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
Test reports/summary forms for blank samples					
Were appropriate type(s) of blanks analyzed?	X				
Were blanks analyzed at the appropriate frequency?	X				
Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
Were blank concentrations < MQL?	X				
Laboratory control samples (LCS):					
Were all COCs included in the LCS?	X				

Microbac

Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	**Laboratory Log Number:**	L17040974
Project Name:		**Method:**	6020
Prep Batch Number(s):	611411	**Reviewer Name:**	Kerri Buck
LRC Date:	2017-05-02 00:00:00		

Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
Were LCSs analyzed at the required frequency?	X				
Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
Was the LCSD RPD within QC limits?			X		
Matrix spike (MS) and matrix spike duplicate (MSD) data					
Were the project/method specified analytes included in the MS and MSD?	X				
Were MS/MSD analyzed at the appropriate frequency?	X				
Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?	X				
Were MS/MSD RPDs within laboratory QC limits?	X				
Analytical duplicate data					
Were appropriate analytical duplicates analyzed for each matrix?			X		
Were analytical duplicates analyzed at the appropriate frequency?			X		
Were RPDs or relative standard deviations within the laboratory QC limits?			X		
Method quantitation limits (MQLs):					
Are the MQLs for each method analyte included in the laboratory data package?	X				
Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
Other problems/anomalies					
Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				
Initial calibration (ICAL)					
Were response factors and/or relative response factors for each analyte within QC limits?	X				
Were percent RSDs or correlation coefficient criteria met?	X				

Microbac

Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	**Laboratory Log Number:**	L17040974
Project Name:		**Method:**	6020
Prep Batch Number(s):	611411	**Reviewer Name:**	Kerri Buck
LRC Date:	2017-05-02 00:00:00		

Was the number of standards recommended in the method used for all analytes?	X				
Were all points generated between the lowest and highest standard used to calculate the curve?					
Are ICAL data available for all instruments used?	X				
Has the initial calibration curve been verified using an appropriate second source standard?	X				
Initial and continuing calibration verification (ICCV and CCV) and continuing calibration blank (CCB):					
Was the CCV analyzed at the method-required frequency?	X				
Were percent differences for each analyte within the method-required QC limits?	X				
Was the ICAL curve verified for each analyte?	X				
Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
Mass spectral tuning					
Was the appropriate compound for the method used for tuning?	X				
Were ion abundance data within the method-required QC limits?	X				
Internal standards (IS)					
Were IS area counts and retention times within the method-required QC limits?	X				
Raw data (NELAC Section 5.5.10)					
Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
Were data associated with manual integrations flagged on the raw data?			X		
Dual column confirmation					
Did dual column confirmation results meet the method-required QC?			X		
Tentatively identified compounds (TICs)					
If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
Interference Check Sample (ICS) results					
Were percent recoveries within method QC limits?	X				
Serial dilutions, post digestion spikes, and method of standard additions					
Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
Method detection limit (MDL) studies					

Microbac

Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	**Laboratory Log Number:**	L17040974
Project Name:		**Method:**	6020
Prep Batch Number(s):	611411	**Reviewer Name:**	Kerri Buck
LRC Date:	2017-05-02 00:00:00		

Was a MDL study performed for each reported analyte?	X				
Is the MDL either adjusted or supported by the analysis of DCSs?	X				
Proficiency test reports					
Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
Standards documentation					
Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
Compound/analyte identification procedures					
Are the procedures for compound/analyte identification documented?	X				
Demonstration of analyst competency (DOC)					
Was DOC conducted consistent with NELAC Chapter 5?	X				
Is documentation of the analyst's competency up-to-date and on file?	X				
Verification/validation documentation for methods (NELAC Chapter 5)					
Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
Laboratory standard operating procedures (SOPs)					
Are laboratory SOPs current and on file for each method performed	X				

1. Items identified by the letter “R” must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter “S” should be retained and made available upon request for the appropriate retention period;

2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);

3. NA = Not applicable;

4. NR = Not reviewed;

5. ER# = Exception Report identification number (an Exception Report should be completed for an item if “NR” or “No” is checked).

The Exception Report for each “No” or “Not Reviewed (NR)” item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature

Texas Risk Reduction Program (TRRP) Checklist

Laboratory Name:	Microbac OVD	**Laboratory Log Number:**	L17040974
Project Name:		**Method:**	6020
Prep Batch Number(s):	611411	**Reviewer Name:**	Kerri Buck
LRC Date:	2017-05-02 00:00:00		

below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: [ ] This laboratory meets an exception under 30 TAC §25.6 and was last inspection by [ ] TCEQ or [ ] _____ on **(enter date of last inspection**). Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Exceptions Report

Microbac

Lab Report #: L17040974
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L17040974-01	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13F-041917	**Prep Method:**	3015	**Prep Date:**	04/25/2017 09:14
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	04/26/2017 09:39
Workgroup #:	WG611585	**Analyst:**	JYH	**Run Date:**	04/26/2017 10:16
Collect Date:	04/19/2017 13:40	**Dilution:**	1	**File ID:**	NI.042617.101659
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Arsenic, Total	7440-38-2	0.00218		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L17040974
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L17040974-02	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13FDF-041917	**Prep Method:**	3015	**Prep Date:**	04/25/2017 09:14
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	04/26/2017 09:39
Workgroup #:	WG611585	**Analyst:**	JYH	**Run Date:**	04/26/2017 10:26
Collect Date:	04/19/2017 13:40	**Dilution:**	1	**File ID:**	NI.042617.102615
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Arsenic, Total	7440-38-2	0.00214		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L17040974
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L17040974-03	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13MSF-041917	**Prep Method:**	3015	**Prep Date:**	04/25/2017 09:14
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	04/26/2017 09:39
Workgroup #:	WG611585	**Analyst:**	JYH	**Run Date:**	04/26/2017 10:20
Collect Date:	04/19/2017 13:40	**Dilution:**	1	**File ID:**	NI.042617.102005
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Arsenic, Total	7440-38-2	0.130		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.125		0.00200	0.00100	0.000500

Certificate of Analysis

Sample #:	L17040974-04	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13MSDF-041917	**Prep Method:**	3015	**Prep Date:**	04/25/2017 09:14
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	04/26/2017 09:39
Workgroup #:	WG611585	**Analyst:**	JYH	**Run Date:**	04/26/2017 10:23
Collect Date:	04/19/2017 13:40	**Dilution:**	1	**File ID:**	NI.042617.102310
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Arsenic, Total	7440-38-2	0.131		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.126		0.00200	0.00100	0.000500

2.1 Metals Data

2.1.1 Metals ICP-MS Data

2.1.1.1 Summary Data

Microbac

Lab Report #: L17040974
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L17040974-01	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13F-041917	**Prep Method:**	3015	**Prep Date:**	04/25/2017 09:14
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	04/26/2017 09:39
Workgroup #:	WG611585	**Analyst:**	JYH	**Run Date:**	04/26/2017 10:16
Collect Date:	04/19/2017 13:40	**Dilution:**	1	**File ID:**	NI.042617.101659
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Arsenic, Total	7440-38-2	0.00218		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L17040974
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L17040974-02	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13FDF-041917	**Prep Method:**	3015	**Prep Date:**	04/25/2017 09:14
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	04/26/2017 09:39
Workgroup #:	WG611585	**Analyst:**	JYH	**Run Date:**	04/26/2017 10:26
Collect Date:	04/19/2017 13:40	**Dilution:**	1	**File ID:**	NI.042617.102615
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Arsenic, Total	7440-38-2	0.00214		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.00100	U	0.00200	0.00100	0.000500

U	Analyte was not detected. The concentration is below the reported LOD.

Microbac

Lab Report #: L17040974
Lab Project #: 2551.096
Project Name: Longhorn Army Ammunition
Lab Contact: Adriane Steed

Certificate of Analysis

Sample #:	L17040974-03	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13MSF-041917	**Prep Method:**	3015	**Prep Date:**	04/25/2017 09:14
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	04/26/2017 09:39
Workgroup #:	WG611585	**Analyst:**	JYH	**Run Date:**	04/26/2017 10:20
Collect Date:	04/19/2017 13:40	**Dilution:**	1	**File ID:**	NI.042617.102005
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Arsenic, Total	7440-38-2	0.130		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.125		0.00200	0.00100	0.000500

Certificate of Analysis

Sample #:	L17040974-04	**PrePrep Method:**	N/A	**Instrument:**	ICP-MS2
Client ID:	35AWW13MSDF-041917	**Prep Method:**	3015	**Prep Date:**	04/25/2017 09:14
Matrix:	Water	**Analytical Method:**	6020A	**Cal Date:**	04/26/2017 09:39
Workgroup #:	WG611585	**Analyst:**	JYH	**Run Date:**	04/26/2017 10:23
Collect Date:	04/19/2017 13:40	**Dilution:**	1	**File ID:**	NI.042617.102310
Sample Tag:	01	**Units:**	mg/L		

Analyte	CAS #	Result	Qual	LOQ	LOD	DL
Arsenic, Total	7440-38-2	0.131		0.00200	0.00100	0.000500
Lead, Total	7439-92-1	0.126		0.00200	0.00100	0.000500

2.1.1.2 QC Summary Data

Example 6020 Calculations
Perkin Elmer ELAN 6100

1.0 Initial Calibration (ICAL) Parameters
The system performs linear regression from data consisting of a blank and three standards.

2.0 Calculating the concentration (C) of an element in water using data from prep log, run log, and quantitation report (note:the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (ug/L)	0.1
Vf = Final volume	100
Vi = Initial volume	40
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in (ug/L)	0.25

3.0 Calculating the concentration (C) of an element in soil using data from prep log, run log, and quantitation report (note: the data system performs this calculation automatically when correction factors have been entered):

$$Cx = Cs \times \frac{Vf}{Vi} \times D$$

Where:	**Example:**
Cs = Concentration computed by the data system (ug/L)	0.1
Vf = Final volume	200
Vi = Initial volume	0.5
D = Dilution factor as a multiplier (10X = 10)	1
Cx = Concentration of element in (ug/kg)	40

4.0 Adjusting the concentration to dry weight:

$$Cdry = \frac{Cx \times 100}{Px}$$

Where:	**Example:**
Cx = Concentration calculated as received (wet basis)	40
Px = Percent solids of sample (%wt)	80
$Cdry$ = Concentration calculated as dry weight (ug/kg)	50

50 ug/kg = 0.050 mg/kg

Perkin Elmer ELAN ICP/MS

STANDARDS KEY

QC Std 1 - ICV
QC Std 2 - ICB
QC Std 3 - LLICV
QC Std 4 - ICSA
QC Std 5 - ICSAB
QC Std 6 - CCV
QC Std 7 - CCB
QC Std 8 - LLCCV

Calibration Solutions

Analyte	Stock Conc. (mg/L)	S1 (mg/L)	S2 (mg/L)	S3 (mg/L)	S4 (mg/L)
Al	10	0	0.0004	0.05	0.1
Sb	10	0	0.0004	0.05	0.1
As	10	0	0.0004	0.05	0.1
Ba	10	0	0.0004	0.05	0.1
Be	10	0	0.0004	0.05	0.1
Ca	1000	0	0.04	5	10
Cd	10	0	0.0004	0.05	0.1
Cr	10	0	0.0004	0.05	0.1
Co	10	0	0.0004	0.05	0.1
Cu	10	0	0.0004	0.05	0.1
Fe	1000	0	0.04	5	10
Pb	10	0	0.0004	0.05	0.1
Mg	1000	0	0.04	5	10
Mn	10	0	0.0004	0.05	0.1
Ni	10	0	0.0004	0.05	0.1
K	1000	0	0.04	5	10
Se	10	0	0.0004	0.05	0.1
Ag	10	0	0.0004	0.05	0.1
Na	1000	0	0.04	5	10
Tl	10	0	0.0004	0.05	0.1
V	10	0	0.0004	0.05	0.1
U	1000	0	0.0004	0.05	0.1
Zn	10	0	0.0004	0.05	0.1

Microbac Laboratories Inc.
Microwave Digestion Log

Workgroup: WG611411
Analyst: VC
Spike Analyst: VC
Run Date: 04/25/2017 09:14
Method: 3015
Balance: BAL016
Instrument: MW-3
Instrument Start: 04/25/2017 09:19

SOP: ME407 Revison 19
Spike Solution: STD80296
Spike Witness: ERP
40 & 50 ML. DIGESTION TU: COA19487
HNO3 Lot #: COA19650
MS Filters- fisher-Lot#R: RGT38288

	SAMPLE #	Type	Matrix	Initial Amount	Final Volume	Initial Vessel Wt	Final Vessel Wt	Spike Amount	Due Date
1	WG611411-04	BLANK	1	20 mL	50 mL	185.225 g	185.217 g		
2	WG611411-06	FLT_BLK	1	20 mL	50 mL	181.638 g	181.631 g		
3	WG611411-13	FLT_BLK	1	20 mL	50 mL	181.569 g	181.561 g		
4	WG611411-05	LCS	1	20 mL	50 mL	185.874 g	185.865 g	.25 mL	
5	WG611411-01	REF	1	20 mL	50 mL	183.328 g	183.313 g		
6	L17040974-01	RS01	1	20 mL	50 mL	183.328 g	183.313 g		05/01/17
7	L17040974-02	SAMP	1	20 mL	50 mL	182.607 g	182.593 g		05/01/17
8	WG611411-07	MS	1	20 mL	50 mL	183.202 g	183.183 g	.25 mL	
9	L17040974-03	MS01	1	20 mL	50 mL	183.202 g	183.183 g	.25 mL	05/01/17
10	WG611411-08	MSD	1	20 mL	50 mL	183.455 g	183.444 g	.25 mL	
11	L17040974-04	SD01	1	20 mL	50 mL	183.455 g	183.444 g	.25 mL	05/01/17
12	L17041081-05	SAMP	1	20 mL	50 mL	184.165 g	184.156 g		05/02/17
13	L17041081-06	SAMP	1	20 mL	50 mL	184.192 g	184.144 g		05/02/17
14	WG611411-02	REF	1	20 mL	50 mL	184.585 g	184.565 g		
15	L17041081-07	RS01	1	20 mL	50 mL	184.585 g	184.565 g		05/02/17
16	WG611411-03	REF	1	20 mL	50 mL	183.46 g	183.441 g		
17	L17041081-08	RS02	1	20 mL	50 mL	183.46 g	183.441 g		05/02/17
18	L17041081-09	SAMP	1	20 mL	50 mL	184.576 g	184.569 g		05/02/17
19	L17041081-10	SAMP	1	20 mL	50 mL	182.383 g	182.375 g		05/02/17
20	L17041081-11	SAMP	1	20 mL	50 mL	181.719 g	181.696 g		05/02/17
21	L17041081-12	SAMP	1	20 mL	50 mL	184.15 g	184.143 g		05/02/17
22	L17041081-13	SAMP	1	20 mL	50 mL	185.378 g	185.36 g		05/02/17
23	L17041081-14	SAMP	1	20 mL	50 mL	184.512 g	184.492 g		05/02/17
24	L17041081-15	SAMP	1	20 mL	50 mL	182.367 g	182.322 g		05/02/17
25	L17041081-16	SAMP	1	20 mL	50 mL	182.813 g	182.712 g		05/02/17
26	WG611411-09	MS	1	20 mL	50 mL	183.314 g	183.305 g	.25 mL	
27	L17041081-18	MS01	1	20 mL	50 mL	183.314 g	183.305 g	.25 mL	05/02/17
28	WG611411-11	MS	1	20 mL	50 mL	184.354 g	184.234 g	.25 mL	
29	L17041081-19	MS02	1	20 mL	50 mL	184.354 g	184.234 g	.25 mL	05/02/17
30	WG611411-10	MSD	1	20 mL	50 mL	183.474 g	183.467 g	.25 mL	
31	L17041081-20	SD01	1	20 mL	50 mL	183.474 g	183.467 g	.25 mL	05/02/17
32	WG611411-12	MSD	1	20 mL	50 mL	184.809 g	184.789 g	.25 mL	
33	L17041081-21	SD02	1	20 mL	50 mL	184.809 g	184.789 g	.25 mL	05/02/17

WG611411-13	FILTER TEST R6SA42561

Analyst: Vicki Collins

Reviewer: Erin Potter

MW_DIG - Modified 09/30/2009
PDF ID: 5261535
Report generated: 04/25/2017 11:00

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 042617A.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD81368 ICV Std: STD81367 Post Spike: STD79415
ICSA: STD81369 ICSAB: STD81611 Int. Std: RGT39300
CCV: STD81610 LLCCV: STD81372 Tuning Sol : STD81373
Stannous : Hydroxylamine :

Workgroups: 611585,611588,611590,611442611637,611724

Comments:

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2	NI.042617.093028	WG611700-01	Calibration Point		1		04/26/17 09:30
3	NI.042617.093334	WG611700-02	Calibration Point		1		04/26/17 09:33
4	NI.042617.093640	WG611700-03	Calibration Point		1		04/26/17 09:36
5	NI.042617.093946	WG611700-04	Calibration Point		1		04/26/17 09:39
6	NI.042617.094252	WG611700-05	Initial Calibration Verification		1		04/26/17 09:42
7	NI.042617.094600	WG611700-06	Initial Calib Blank		1		04/26/17 09:46
8	NI.042617.094906	WG611700-07	Low Level Initial Calibration V		1		04/26/17 09:49
9	NI.042617.095212	WG611700-08	Interference Check		1		04/26/17 09:52
10	NI.042617.095517	WG611700-09	Interference Check		1		04/26/17 09:55
11	NI.042617.095824	WG611700-10	CCV		1		04/26/17 09:58
12	NI.042617.100130	WG611700-11	CCB		1		04/26/17 10:01
13	NI.042617.100437	WG611411-04	Method/Prep Blank	20/50	1		04/26/17 10:04
14	NI.042617.100742	WG611411-05	Laboratory Control S	20/50	1		04/26/17 10:07
15	NI.042617.101048	WG611411-06	Filter Blank		1		04/26/17 10:10
16	NI.042617.101354	WG611411-13	Filter Blank		1		04/26/17 10:13
17	NI.042617.101659	WG611411-01	Reference Sample		1	L17040974-01	04/26/17 10:16
18	NI.042617.102005	WG611411-07	Matrix Spike	20/50	1	L17040974-01	04/26/17 10:20
19	NI.042617.102310	WG611411-08	Matrix Spike Duplica	20/50	1	L17040974-01	04/26/17 10:23
20	NI.042617.102615	L17040974-02	35AWW13FDF-041917	20/50	1		04/26/17 10:26
21	NI.042617.102921	WG611585-01	Post Digestion Spike		1	L17040974-02	04/26/17 10:29
22	NI.042617.103226	WG611585-02	Serial Dilution		5	L17040974-02	04/26/17 10:32
23	NI.042617.103533	WG611700-12	CCV		1		04/26/17 10:35
24	NI.042617.103840	WG611700-13	CCB		1		04/26/17 10:38
25	NI.042617.104147	WG611700-14	Low Level Continuing Calibra		1		04/26/17 10:41
26	NI.042617.104508	L17041081-05	42MW101	20/50	1		04/26/17 10:45
27	NI.042617.104814	L17041081-06	42MW101	20/50	1		04/26/17 10:48
28	NI.042617.105119	WG611411-02	Reference Sample		1	L17041081-07	04/26/17 10:51
29	NI.042617.105424	WG611411-03	Reference Sample		1	L17041081-08	04/26/17 10:54
30	NI.042617.105730	L17041081-09	42MW103	20/50	1		04/26/17 10:57
31	NI.042617.110035	L17041081-10	42MW103	20/50	1		04/26/17 11:00
32	NI.042617.110341	L17041081-11	42MW104	20/50	1		04/26/17 11:03
33	NI.042617.110646	L17041081-12	42MW104	20/50	1		04/26/17 11:06
34	NI.042617.110952	L17041081-13	42MW304	20/50	1		04/26/17 11:09

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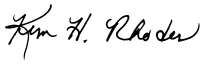

Microbac

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 042617A.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD81368 ICV Std: STD81367 Post Spike: STD79415
ICSA: STD81369 ICSAB: STD81611 Int. Std: RGT39300
CCV: STD81610 LLCCV: STD81372 Tuning Sol : STD81373
Stannous : Hydroxylamine :

Workgroups: 611585,611588,611590,611442611637,611724

Comments:

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37	NI.042617.111910	WG611700-16	CCB		1		04/26/17 11:19
38	NI.042617.112216	L17041081-15	42MW107	20/50	1		04/26/17 11:22
39	NI.042617.112521	L17041081-16	42MW107	20/50	1		04/26/17 11:25
40	NI.042617.112827	WG611411-09	Matrix Spike	20/50	1	L17041081-07	04/26/17 11:28
41	NI.042617.113133	WG611411-11	Matrix Spike	20/50	1	L17041081-08	04/26/17 11:31
42	NI.042617.113438	WG611411-10	Matrix Spike Duplica	20/50	1	L17041081-07	04/26/17 11:34
43	NI.042617.113744	WG611411-12	Matrix Spike Duplica	20/50	1	L17041081-08	04/26/17 11:37
44	NI.042617.114049	L17041136-06	TEST TUBES 200.8		1		04/26/17 11:40
45	NI.042617.114558	L17041136-06	TEST TUBES 200.8		1		04/26/17 11:45
46	NI.042617.114905	WG611700-17	CCV		1		04/26/17 11:49
47	NI.042617.115210	WG611700-18	CCB		1		04/26/17 11:52
48	NI.042617.115709	WG611369-02	Method/Prep Blank	.25/100	1		04/26/17 11:57
49	NI.042617.120014	WG611369-03	Laboratory Control S	.25/100	1		04/26/17 12:00
50	NI.042617.120320	WG611369-01	Reference Sample		1	L17040992-02	04/26/17 12:03
51	NI.042617.120625	WG611369-04	Matrix Spike	.255/100	1	L17040992-02	04/26/17 12:06
52	NI.042617.120931	WG611369-05	Matrix Spike Duplica	.252/100	1	L17040992-02	04/26/17 12:09
53	NI.042617.121236	L17040992-01	GS200SS041717S-ES	.258/100	1		04/26/17 12:12
54	NI.042617.121541	WG611588-01	Post Digestion Spike		1	L17040992-01	04/26/17 12:15
55	NI.042617.121847	WG611588-02	Serial Dilution		5	L17040992-01	04/26/17 12:18
56	NI.042617.122152	WG611588-02	Serial Dilution		25	L17040992-01	04/26/17 12:21
57	NI.042617.122459	WG611700-19	CCV		1		04/26/17 12:24
58	NI.042617.122805	WG611700-20	CCB		1		04/26/17 12:28
59	NI.042617.123322	WG611369-01	Reference Sample		10	L17040992-02	04/26/17 12:33
60	NI.042617.123627	WG611369-04	Matrix Spike	.255/100	10	L17040992-02	04/26/17 12:36
61	NI.042617.123932	WG611369-05	Matrix Spike Duplica	.252/100	10	L17040992-02	04/26/17 12:39
62	NI.042617.124238	L17040992-01	GS200SS041717S-ES	.258/100	5		04/26/17 12:42
63	NI.042617.124542	WG611588-01	Post Digestion Spike		5	L17040992-01	04/26/17 12:45
64	NI.042617.124847	WG611588-02	Serial Dilution		25	L17040992-01	04/26/17 12:48
65	NI.042617.125155	WG611700-21	CCV		1		04/26/17 12:51
66	NI.042617.125500	WG611700-22	CCB		1		04/26/17 12:55
67	NI.042617.125807	L17041136-06	TEST TUBES 200.8	20/50	1		04/26/17 12:58
68	NI.042617.130112	WG611370-02	Method/Prep Blank	.25/100	1		04/26/17 13:01

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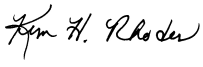

Microbac

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 042617A.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD81368 ICV Std: STD81367 Post Spike: STD79415
ICSA: STD81369 ICSAB: STD81611 Int. Std: RGT39300
CCV: STD81610 LLCCV: STD81372 Tuning Sol : STD81373
Stannous : Hydroxylamine :

Workgroups: 611585,611588,611590,611442611637,611724

Comments:

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70	NI.042617.130723	WG611370-01	Reference Sample		1	L17040992-02	04/26/17 13:07
71	NI.042617.131028	WG611370-04	Matrix Spike	.253/100	1	L17040992-02	04/26/17 13:10
72	NI.042617.131334	WG611370-05	Matrix Spike Duplica	.256/100	1	L17040992-02	04/26/17 13:13
73	NI.042617.131639	L17040992-01	GS200SS041717S-ES	.256/100	1		04/26/17 13:16
74	NI.042617.131944	WG611590-01	Post Digestion Spike		1	L17040992-01	04/26/17 13:19
75	NI.042617.132249	WG611590-02	Serial Dilution		5	L17040992-01	04/26/17 13:22
76	NI.042617.132554	WG611590-02	Serial Dilution		25	L17040992-01	04/26/17 13:25
77	NI.042617.132901	WG611700-23	CCV		1		04/26/17 13:29
78	NI.042617.133206	WG611700-24	CCB		1		04/26/17 13:32
79	NI.042617.134016	WG611583-02	Method/Prep Blank	40/50	50		04/26/17 13:40
80	NI.042617.134321	WG611583-03	Laboratory Control S	40/50	50		04/26/17 13:43
81	NI.042617.134627	WG611436-01	Fluid Blank 2		50		04/26/17 13:46
82	NI.042617.134932	WG611583-01	Reference Sample		50	L17041124-01	04/26/17 13:49
83	NI.042617.135238	WG611583-04	Matrix Spike	5/50	50	L17041124-01	04/26/17 13:52
84	NI.042617.135544	WG611583-05	Matrix Spike Duplica	5/50	50	L17041124-01	04/26/17 13:55
85	NI.042617.135849	WG611637-01	Post Digestion Spike		50	L17041124-01	04/26/17 13:58
86	NI.042617.140154	WG611637-02	Serial Dilution		250	L17041124-01	04/26/17 14:01
87	NI.042617.140500	WG611700-25	CCV		1		04/26/17 14:05
88	NI.042617.140806	WG611700-26	CCB		1		04/26/17 14:08
89	NI.042617.142552	WG611691-02	Method/Prep Blank	20/50	1		04/26/17 14:25
90	NI.042617.142857	WG611691-03	Laboratory Control S	20/50	1		04/26/17 14:28
91	NI.042617.143203	WG611691-01	Reference Sample		1	L17041244-02	04/26/17 14:32
92	NI.042617.143509	WG611691-04	Matrix Spike	20/50	1	L17041244-02	04/26/17 14:35
93	NI.042617.143814	WG611691-05	Matrix Spike Duplica	20/50	1	L17041244-02	04/26/17 14:38
94	NI.042617.144120	L17041105-01	WELL MW-CSU	20/50	1		04/26/17 14:41
95	NI.042617.144425	L17041105-02	WELL MW-CSU	20/50	1		04/26/17 14:44
96	NI.042617.144730	WG611724-01	Post Digestion Spike		1	L17041105-02	04/26/17 14:47
97	NI.042617.145036	WG611724-02	Serial Dilution		5	L17041105-02	04/26/17 14:50
98	NI.042617.145342	WG611724-02	Serial Dilution		25	L17041105-02	04/26/17 14:53
99	NI.042617.145648	WG611700-27	CCV		1		04/26/17 14:56
100	NI.042617.145953	WG611700-28	CCB		1		04/26/17 14:59
101	NI.042617.150300	L17041105-03	WELL MW-CSD-B	20/50	1		04/26/17 15:03
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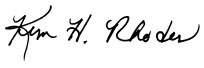

Microbac Laboratories Inc.

Instrument Run Log

Instrument: ICP-MS2 Dataset: 042617A.REP
Analyst1: JYH Analyst2: N/A
Method: 6020/6020A/200.8 SOP: ME700A Rev: 3
Maintenance Log ID:

Calibration Std: STD81368 ICV Std: STD81367 Post Spike: STD79415
ICSA: STD81369 ICSAB: STD81611 Int. Std: RGT39300
CCV: STD81610 LLCCV: STD81372 Tuning Sol : STD81373
Stannous : Hydroxylamine :

Workgroups: 611585,611588,611590,611442611637,611724

Comments:

Seq.	File ID	Sample	ID	Prep	Dil	Reference	Date/Time
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104	NI.042617.151217	L17041244-06	01MW217D	20/50	1		04/26/17 15:12
105	NI.042617.151620	L17041105-01	WELL MW-CSU	20/50	10		04/26/17 15:16
106	NI.042617.151925	L17041105-02	WELL MW-CSU	20/50	5		04/26/17 15:19
107	NI.042617.152230	WG611724-01	Post Digestion Spike		5	L17041105-02	04/26/17 15:22
108	NI.042617.152535	L17041105-03	WELL MW-CSD-B	20/50	10		04/26/17 15:25
109	NI.042617.152841	L17041105-04	WELL MW-CSD-B	20/50	10		04/26/17 15:28
110	NI.042617.153148	WG611700-29	CCV		1		04/26/17 15:31
111	NI.042617.153454	WG611700-30	CCB		1		04/26/17 15:34
112	NI.042617.154107	L17041244-07	01MW210S	20/50	1		04/26/17 15:41
113	NI.042617.154412	L17041244-08	01MW215D	20/50	1		04/26/17 15:44
114	NI.042617.154718	L17041244-10	01MW218	20/50	1		04/26/17 15:47
115	NI.042617.155024	L17041244-12	01MW204D	20/50	1		04/26/17 15:50
116	NI.042617.155329	L17041244-19	01MW216S	20/50	1		04/26/17 15:53
117	NI.042617.155634	L17041244-23	01MW213S	20/50	1		04/26/17 15:56
118	NI.042617.155940	L17041244-24	01MW413S	20/50	1		04/26/17 15:59
119	NI.042617.160246	L17041244-25	01MW217S	20/50	1		04/26/17 16:02
120	NI.042617.160551	L17041244-27	01MW213D	20/50	1		04/26/17 16:05
121	NI.042617.160857	L17041244-28	01MW203D	20/50	1		04/26/17 16:08
122	NI.042617.161204	WG611700-31	CCV		1		04/26/17 16:12
123	NI.042617.161510	WG611700-32	CCB		1		04/26/17 16:15
124	NI.042617.161817	WG611583-01	Reference Sample	5/50	50	L17041124-01	04/26/17 16:18
125	NI.042617.162122	+10 PPB SE	+10 PPB SE		50		04/26/17 16:21
126	NI.042617.162428	+15 PPB SE	+15 PPB SE		50		04/26/17 16:24
127	NI.042617.162733	+20 PPB SE	+20 PPB SE		50		04/26/17 16:27
128	NI.042617.163039	WG611700-33	CCV		1		04/26/17 16:30
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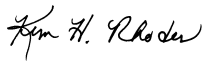

Microbac

Microbac Laboratories Inc.

Data Checklist

Date: 26-APR-2017
Analyst: JYH
Analyst: NA
Method: 6020/6020A/200.8
Instrument: ICP-MS2
Curve Workgroup: 611700
Runlog ID: 81748
Analytical Workgroups: 611585,611588,611590,611442611637,611724

STD ID#s on Runlog	X
Calibration/Linearity	X
ICV/CCV	X
ICV RSD < 3% (EPA 200.7 only)	X
ICB/CCB	X
ICSA/ICSAB	X
CRI	
Blank/LCS	X
MS/MSD	X
Post Spike/Serial Dilution	X
Upload Results	X
Data Qualifiers	
Generate PDF Instrument Data	X
Sign/Annotate PDF Data	X
Upload Curve Data	X
Workgroup Forms	X
Case Narrative	974,1081,992,1124,1105,1244
Client Forms	X
Level X	
Level 3	
Level 4	974,1081,992,1244
Check for compliance with method and project specific requirements	X
Check the completeness of reported information	X
Check the information for the report narrative	X
Primary Reviewer	JYH
Secondary Reviewer	KHR
Comments	

Primary Reviewer:

Secondary Reviewer:
27-APR-2017

CHECKLIST1 - Modified 03/05/2008
Generated: APR-27-2017 09:29:50

Microbac Laboratories Inc.

HOLDING TIMES
EQUIVALENT TO AFCEE FORM 9

Analytical Method: 6020A AAB#: WG611585

Login Number: L17040974

Client ID	ID	Date Collected	TCLP Date	Time Held	Max Hold	Q	Extract Date	Time Held	Max Hold	Q	Run Date	Time Held	Max Hold	Q
35AWW13F-041917	01	04/19/17					04/25/2017	5.8	180		04/26/17	6.9	180	
35AWW13FDF-041917	02	04/19/17					04/25/2017	5.8	180		04/26/17	6.9	180	
35AWW13MSF-041917	03	04/19/17					04/25/2017	5.8	180		04/26/17	6.9	180	
35AWW13MSDF-041917	04	04/19/17					04/25/2017	5.8	180		04/26/17	6.9	180	

* = SEE PROJECT QAPP REQUIREMENTS

HOLD_TIMES - Modified 03/06/2008
PDF File ID: 5264505
Report generated 04/26/2017 13:55

METHOD BLANK SUMMARY

Login Number: L17040974
Work Group: WG611585
Blank File ID: NI.042617.100437
Blank Sample ID: WG611411-04
Prep Date: 04/25/17 09:14
Instrument ID: ICP-MS2
Analyzed Date: 04/26/17 10:04
Method: 6020A
Analyst: JYH

This Method Blank Applies To The Following Samples:

Client ID	Lab Sample ID	Lab File ID	Time Analyzed	TAG
LCS	WG611411-05	NI.042617.100742	04/26/17 10:07	01
FLT_BLK	WG611411-06	NI.042617.101048	04/26/17 10:10	01
FLT_BLK	WG611411-13	NI.042617.101354	04/26/17 10:13	01
35AWW13F-041917	L17040974-01	NI.042617.101659	04/26/17 10:16	01
35AWW13MSF-041917	L17040974-03	NI.042617.102005	04/26/17 10:20	01
35AWW13MSDF-041917	L17040974-04	NI.042617.102310	04/26/17 10:23	01
35AWW13FDF-041917	L17040974-02	NI.042617.102615	04/26/17 10:26	01

Report Name: BLANK_SUMMARY
PDF File ID: 5264506
Report generated 04/26/2017 14:00

Microbac Laboratories Inc.

METHOD BLANK REPORT

Login Number: L17040974 Prep Date: 04/25/17 09:14 Sample ID: WG611411-04
Instrument ID: ICP-MS2 Run Date: 04/26/17 10:04 Prep Method: 3015
File ID: NI.042617.100437 Analyst: JYH Method: 6020A
Workgroup (AAB#): WG611585 Matrix: Water Units: mg/L
Contract #: Cal ID: ICP-MS-26-APR-17

Analytes	DL	LOQ	Concentration	Dilution	Qualifier
Arsenic, Total	0.000500	0.00200	0.000500	1	U
Lead, Total	0.000500	0.00200	0.000500	1	U

DL Method Detection Limit
LOQ Reporting/Practical Quantitation Limit
ND Analyte Not detected at or above reporting limit
* |Analyte concentration| > 1/2 RL

Report Name:BLANK
PDF ID: 5264507
26-APR-2017 14:00

Microbac Laboratories Inc.
LABORATORY CONTROL SAMPLE (LCS)

Login Number: L17040974 **Run Date:** 04/26/2017 **Sample ID:** WG611411-05
Instrument ID: ICP-MS2 **Run Time:** 10:07 **Prep Method:** 3015
File ID: NI.042617.100742 **Analyst:** JYH **Method:** 6020A
Workgroup (AAB#): WG611585 **Matrix:** Water **Units:** mg/L
QC Key: DOD4 **Lot#:** STD80296 **Cal ID:** ICP-MS-26-APR-17

Analytes	Expected	Found	% Rec	LCS Limits	Q
Arsenic, Total	0.125	0.127	101	80 - 120	
Lead, Total	0.125	0.125	99.9	80 - 120	

LCS - Modified 03/06/2008
PDF File ID: 5264508
Report generated: 04/26/2017 14:00

Microbac Laboratories Inc.

MS/MSD REPORT

Loginnum:L17040974 Cal ID:ICP-MS2- 26-APR-17 Worknum:WG611585

Instrument ID:ICP-MS2 Contract #: Prep Method:3015

Parent ID:L17040974-01 File ID:NI.042617.101659 Dil:1 Method:6020

Sample ID:L17040974-03 MS File ID:NI.042617.102005 Dil:1 Matrix:Water

Sample ID:L17040974-04 MSD File ID:NI.042617.102310 Dil:1 Units:mg/L

Analyte	Parent	MS Spiked	MS Found	MS %Rec	MSD Spiked	MSD Found	MSD %Rec	%RPD	%Rec Limits	RPD Limit	Q
Arsenic, Total	0.00218	0.125	0.130	102	0.125	0.131	103	0.208	80 - 120	20	
Lead, Total	U	0.125	0.125	100	0.125	0.126	101	1.11	80 - 120	20	

* FAILS %REC LIMIT

FAILS RPD LIMIT

MS_MSD - Modified 03/06/2008

PDF File ID: 5265371

Report generated 04/27/2017 11:11

Microbac Laboratories Inc.
Serial Dilution Report

Login: L17040974 **Worknum:** WG611585
Instrument: ICP-MS2 **Method:** 6020A
Serial Dil: WG611585-02 **File ID:** NI.042617.103226 **Dil:** 5 **Units:** ug/L
Sample: L17040974-02 **File ID:** NI.042617.102615 **Dil:** 1

Analyte	Sample	Qual	Serial Dil	Qual	% Diff	Q
Arsenic	0.858	X	ND	U		
Lead	ND	U	ND	U		

U = Result is below MDL.
F = Result is greater than or equal to MDL and less than the RL.
X = Result is greater than or equal to RL and less than 100 times the MDL.
E = %D exceeds control limit of 10% and initial sample result is greater than or equal to 100 times the MDL.

SERIAL_DIL - Modified 09/22/2008
PDF File ID: 5264503
04/26/2017 14:00

Microbac Laboratories Inc.
POST SPIKE REPORT

Sample Login ID: L17040974 **Worknum:** WG611585
Instrument ID: ICP-MS2 **Method:** 6020A
Post Spike ID: WG611585-01 **File ID:** NI.042617.102921 **Dil:** 1 **Units:** ug/L
Sample ID: L17040974-02 **File ID:** NI.042617.102615 **Dil:** 1 **Matrix:** Water

Analyte	Post Spike Result	C	Sample Result	C	Spike Added(SA)	% R	Control Limit %R	Q
ARSENIC	52.7		0.858		50	103.8	75 - 125	
LEAD	51.3		0	U	50	102.6	75 - 125	

N = % Recovery exceeds control limits
F = Result is between MDL and RL
U = Sample result is below MDL. A value of zero is used in the calculation

POST_SPIKE - Modified 03/06/2008
PDF File ID: 5264504
Report generated: 04/26/2017 14:00

Microbac Laboratories Inc.
Initial Calibration Summary

Login:	**L17040974**	Workgroup (AAB#):	**WG611585**
Analytical Method:	**6020A**	Instrument ID:	**ICP-MS2**
ICAL Worknum:	**WG611700**	Initial Calibration Date:	**26-APR-2017 09:39**

	WG611700-01		WG611700-02		WG611700-03		WG611700-04			
	Conc	INT	Conc	INT	Conc	INT	Conc	INT	R	Q
ARSENIC	0	-41.3	.4	49.9	50	42500	100	84600	.999905	
LEAD	0	472	.4	737	50	256000	100	507000	.999992	

INT = Instrument intensity
R = Coefficient of correlation
Q = Data Qualifier
*** = Out of Compliance; R < 0.995**

INT_CAL_ICP - Modified 03/06/2008
PDF File ID: 5264512
Report generated: 26-APR-2017 13:55

Microbac Laboratories Inc.
INITIAL CALIBRATION BLANK (ICB)

Login Number: L17040974 Run Date: 04/26/2017 Sample ID: WG611700-06
Instrument ID: ICP-MS2 Run Time: 09:46 Method: 6020A
File ID: NI.042617.094600 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG611585 Cal ID: ICP-MS2 - 26-APR-17
Matrix: WATER

Analytes	MDL	RDL	Concentration	Qualifier
ARSENIC	.2	.8	.2	U
LEAD	.2	.8	.2	U

U = Result is less than 2 x MDL

F = Result is between MDL and 2 x MDL

* = Result is above 2 x MDL

ICB - Modified 07/14/2009
PDF File ID: 5264514
Report generated 04/26/2017 13:55

Login Number: L17040974 | Run Date: 04/26/2017 | Sample ID: WG611700-11
Instrument ID: ICP-MS2 | Run Time: 10:01 | Method: 6020A
File ID: NI.042617.100130 | Analyst: JYH | Units: ug/L
Workgroup (AAB#): WG611585 | Cal ID: ICP-MS - 26-APR-17
Matrix: WATER | QAPP: DOD4

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5264517
Report generated 04/26/2017 13:55

Microbac Laboratories Inc.
CONTINUING CALIBRATION BLANK (CCB)

Login Number:	L17040974	Run Date:	04/26/2017	Sample ID:	WG611700-13
Instrument ID:	ICP-MS2	Run Time:	10:38	Method:	6020A
File ID:	NI.042617.103840	Analyst:	JYH	Units:	ug/L
Workgroup (AAB#):	WG611585	Cal ID:	ICP-MS - 26-APR-17		
Matrix:	WATER	QAPP:	DOD4		

Analytes	MDL	RDL	Concentration	Qualifier
Arsenic	0.200	0.800	0.200	U
Lead	0.200	0.800	0.200	U

U = Result is less than MDL.
F = Result is between MDL and RL.
* = Result is above RL.

CCB - Modified 03/05/2008
PDF File ID: 5264517
Report generated 04/26/2017 13:55

Microbac Laboratories Inc.

INITIAL CALIBRATION VERIFICATION (ICV)
(Alternate Source)

Login Number: L17040974 Run Date: 04/26/2017 Sample ID: WG611700-05
Instrument ID: ICP-MS2 Run Time: 09:42 Method: 6020A
File ID: NI.042617.094252 Analyst: JYH Units: ug/L
Workgroup (AAB#): WG611585 Cal ID: ICP-MS - 26-APR-17
QC Key: DOD4

Analyte		Expected	Found	%REC	LIMITS	Q
Arsenic		50	50.6	101	90 - 110	
Lead		50	50.9	102	90 - 110	

* Exceeds LIMITS Limit

ICV - Modified 03/06/2008
PDF File ID: 5264513
Report generated 04/26/2017 13:55

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L17040974 Run Date: 04/26/2017 Sample ID: WG611700-10
Instrument ID: ICP-MS2 Run Time: 09:58 Method: 6020A
File ID: NI.042617.095824 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG611585 Cal ID: ICP-MS - 26-APR-17
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.0500	0.0500	mg/L	100	90 - 110		
Lead		0.0500	0.0500	mg/L	100	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5264516
Report generated 04/26/2017 13:55

Microbac Laboratories Inc.
CONTINUING CALIBRATION VERIFICATION (CCV)

Login Number: L17040974 Run Date: 04/26/2017 Sample ID: WG611700-12
Instrument ID: ICP-MS2 Run Time: 10:35 Method: 6020A
File ID: NI.042617.103533 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG611585 Cal ID: ICP-MS - 26-APR-17
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.0500	0.0494	mg/L	98.7	90 - 110		
Lead		0.0500	0.0500	mg/L	100	90 - 110		

* Exceeds LIMITS Criteria

CCV - Modified 03/05/2008
PDF File ID: 5264516
Report generated 04/26/2017 13:55

Microbac Laboratories Inc.
LOW LEVEL CALIBRATION VERIFICATION

Login Number:	L17040974	**Run Date:**	04/26/2017	**Sample ID:**	WG611700-07
Instrument ID:	ICP-MS2	**Run Time:**	09:49	**Method:**	6020A
File ID:	NI.042617.094906	**Analyst:**	JYH	**QC Key:**	DOD4
Workgroup (AAB#):	WG611585	**Cal ID:**	ICP-MS - 26-APR-17		
Matrix:	WATER				

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.400	0.331	ug/L	82.8	70 - 130		
Lead		0.200	0.213	ug/L	107	70 - 130		

*** Exceeds LIMITS Criteria**

LLCCV - Modified 1/7/2010
PDF File ID: 5264518
Report generated 04/26/2017 14:00

Login Number: L17040974 Run Date: 04/26/2017 Sample ID: WG611700-14
Instrument ID: ICP-MS2 Run Time: 10:41 Method: 6020A
File ID: NI.042617.104147 Analyst: JYH QC Key: DOD4
Workgroup (AAB#): WG611585 Cal ID: ICP-MS - 26-APR-17
Matrix: WATER

Analyte		Expected	Found	UNITS	%REC	LIMITS		Q
Arsenic		0.400	0.378	ug/L	94.4	70 - 130		
Lead		0.200	0.215	ug/L	107	70 - 130		

* Exceeds LIMITS Criteria

LLCCV - Modified 1/7/2010
PDF File ID: 5264518
Report generated 04/26/2017 14:00

Microbac Laboratories Inc.
INTERFERENCE CHECK SAMPLES

Login number: L17040974 **Workgroup (AAB#):** WG611585
Instrument ID: ICP-MS2 **Method:** 6020A
Sol. A : WG611700-08 **File ID:** NI.042617.095212 **Units:** ug/L
Sol. AB : WG611700-09 **File ID:** NI.042617.095517 **Matrix:** Water

	Sol. A			Sol. AB			
ANALYTE	True	Found	%Recovery	True	Found	%Recovery	Q
Arsenic	NS	-0.0149	NS	100	102	102	
Lead	NS	0.0269	NS	100	102	102	

NS = Not spiked
*** = Recovery of spiked element is outside acceptance limit of 80% - 120% of true value.**
 # = Result for unspiked element is outside the acceptance limits of (+/-) the project reporting limit (RL).
+ = Result for unspiked element is outside the acceptance limits of (+/-) 2 times the project method detection limit (MDL). This criteria is only applicable to specific QAPPs.

ICS - Modified 03/06/2008
PDF File ID: 5264515
Report generated 04/26/2017 13:55

Microbac Laboratories Inc.

INTERNAL STANDARD REPORT

Login: L17040974 **Analytical Method:** 6020
Analytical Workgroup: WG611585 **Matrix:** 1
Instrument: ICP-MS2 **Analyst:** JYH
ICAL Date: 26-APR-2017 09:30

			BISMUTH	GERMANIUM	INDIUM
Sample	Type	Run Date	% Rec	% Rec	% Rec
L17040974-01	SAMP	26-APR-2017 10:16	92.573	94.243	89.48
L17040974-02	SAMP	26-APR-2017 10:26	96.858	93.169	90.158
L17040974-03	SAMP	26-APR-2017 10:20	96.034	95.32	91.633
L17040974-04	SAMP	26-APR-2017 10:23	96.512	94.494	91.313
WG611411-04	BLANK	26-APR-2017 10:04	100.595	97.029	94.579
WG611411-05	LCS	26-APR-2017 10:07	100.663	96.163	94.293
WG611411-06	FLT_BLK	26-APR-2017 10:10	99.483	95.43	94.568
WG611411-13	FLT_BLK	26-APR-2017 10:13	95.243	90.596	88.561
WG611585-01	PSPK	26-APR-2017 10:29	96.107	92.39	88.424
WG611585-02	SERIAL	26-APR-2017 10:32	95.194	89.537	86.1
WG611700-05	ICV	26-APR-2017 09:42	95.791	91.861	91.319
WG611700-06	ICB	26-APR-2017 09:46	96.696	93.556	91.966
WG611700-07	LLICV	26-APR-2017 09:49	97.457	92.916	92.08
WG611700-08	ICS	26-APR-2017 09:52	95.692	94.216	90.557
WG611700-09	ICS	26-APR-2017 09:55	95.341	94.245	91.481
WG611700-10	CCV	26-APR-2017 09:58	98.661	94.714	93.363
WG611700-11	CCB	26-APR-2017 10:01	98.844	94.744	92.649
WG611700-12	CCV	26-APR-2017 10:35	99.776	95.633	92.905
WG611700-13	CCB	26-APR-2017 10:38	100.219	94.172	92.697
WG611700-14	LLCCV	26-APR-2017 10:41	98.532	92.13	90.644

Acceptance criteria: 30% - 120% Underlined recoveries are out of range
Acceptance criteria for CCVs and CCBs for method SW846-6020: 80% - 120%

INT_STD_ICPMS - Modified 07/28/2010
PDF File ID: 5264511
Report generated: 04/26/2017 14:00

Microbac Laboratories Inc.
LINEAR RANGE (QUARTERLY)

Login Number: L17040974 **Date:** 04/12/2017
Insturment ID: ICP-MS2 **Method:** 6020A

Analyte	Integration Time (Sec.)	Concentration (ug/L)
Antimony	1.00	100.0
Arsenic	1.00	100.0
Barium	1.00	100.0
Cadmium	1.00	100.0
Chromium	1.00	100.0
Cobalt	1.00	100.0
Copper	1.00	100.0
Lead	1.00	100.0
Manganese	1.00	100.0
Nickel	1.00	100.0
Selenium	1.00	100.0
Silver	1.00	100.0
Thallium	1.00	100.0
Uranium	1.00	100.0
Vanadium	1.00	100.0
Zinc	1.00	100.0

Comments:
All analytes passed acceptance criteria at the specified concentration.

LINEAR_RANGE - Modified 03/06/2008
PDF File ID: 5264510
Report generated: 04/26/2017 13:55

3.0 Attachments

Microbac Laboratories Inc.
Ohio Valley Division Analyst List
May 2, 2017

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001 – BIO-CHEM TESTING WVDEP 220	002 – REIC Consultants, Inc. WVDEP 060
003 – Sturm Environmental	004 – MICROBAC PITTSBURGH
005 – ES LABORATORIES	006 – ALCOSAN LABORATORIES
007 – ALS LABORATORIES	008 – BENCHMARK LABORATORIES
010 – MICROBAC CHICAGOLAND	AC – AMBER R. CARMICHAEL
ADC – ANTHONY D. CANTER	ADG – APRIL D. GREENE
ALS – ADRIANE L. STEED	AWE – ANDREW W. ESSIG
AZH – AFTER HOURS	BJO – BRIAN J. OGDEN
BLG – BRENDA L. GREENWALT	BNB – Brandi N. Bentley
BRG – BRENDA R. GREGORY	CAS – Craig A. Smith
CEB – CHAD E. BARNES	CLC – CHRYS L. CRAWFORD
CLS – CARA L. STRICKLER	CPD – CHAD P. DAVIS
CSH – CHRIS S. HILL	CV – Carl Volkman
DAK – DEAN A. KETELSEN	DCM – DAVID C. MERCKLE
DEV – DAVID E. VANDENBERG	DIH – DEANNA I. HESSON
DLB – DAVID L. BUMGARNER	DLP – DOROTHY L. PAYNE
DSM – DAVID S. MOSSOR	DTG – DOMINIC T. GEHRET
ECL – ERIC C. LAWSON	EPT – ETHAN P. TIDD
ERP – ERIN R. PORTER	FJB – FRANCES J. BOLDEN
HRF – HEATHER R. FAIRCHILD	JDH – JUSTIN D. HESSON
JDS – JARED D. SMITH	JKP – JACQUELINE K. PARSONS
JLD – JESSICA L. DELONG	JST – JOSHUA S. TAYLOR
JTP – JOSHUA T. PEMBERTON	JWR – JOHN W. RICHARDS
JWS – JACK W. SHEAVES	JYH – JI Y. HU
KAK – KATHY A. KIRBY	KDD – Katelyn D. Daley
KEB – KATIE E. BARNES	KHR – KIM H. RHODES
KKB – KERRI K. BUCK	KRA – KATHY R. ALBERTSON
KRP – KATHY R. PARSONS	LJH – Lacey J. Hendershot
LLS – LARRY L. STEPHENS	LSB – LESLIE S. BUCINA
LSJ – LAURA S. JONES	MAP – MARLA A. PORTER
MBK – MORGAN B. KNOWLTON	MES – MARY E. SCHILLING
MMB – MAREN M. BEERY	MRT – MICHELLE R. TAYLOR
OJE – OMOYEMWEN J. ENGLISH	PDM – PIERCE D. MORRIS
PIT – MICROBAC WARRENDALE	REK – BOB E. KYER
RLB – BOB BUCHANAN	RNP – RICK N. PETTY
SAV – SARAH A. VANDENBERG	SCA – SUEELLEN C. ADAMS
SCB – SARAH C. BOGOLIN	SCJ – SUE ELLEN C. JOHNSON
SDC – SHALYN D. CONLEY	TB – TODD BOYLE
TMB – TIFFANY M. BAILEY	TMM – TAMMY M. MORRIS
VC – VICKI COLLIER	WTD – WADE T. DELONG
XXX – UNAVAILABLE OR SUBCONTRACT	

Microbac Laboratories Inc.
List of Valid Qualifiers
May 02, 2017

Qualkey: DOD

Qualifier	Description
*	Surrogate or spike compound out of range
+	Correlation coefficient for the MSA is less than 0.995
<	Result is less than the associated numerical value.
>	Greater than
>,H1	Result is greater than the associated numerical value. Sample analysis performed past holding time.
A	See the report narrative
B	The reported result is associated with a contaminated method blank.
B,H1	Analyte present in method blank. Sample analysis performed past holding time.
B1	Target analyte detected in method blank at or above the method reporting limit
B3	Target analyte detected in calibration blank at or above the method reporting limit
B4	The BOD unseeded dilution water blank exceeded 0.2 mg/L
C	Confirmed by GC/MS
CG	Confluent growth
CT1	Cooler temperature at sample reciept exceeded regulatory limit.
DL	Surrogate or spike compound was diluted out
E	Estimated concentration due to sample matrix interference
E,CT1	Estimated results. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
EDL	Elevated sample reporting limits, presence of non-target analytes
EMPC	Estimated Maximum Possible Concentration
F, S	Estimated result below quantitation limit; method of standard additions(MSA)
F,CT1	Estimated value; the analyte concentration was less than the RL/LOQ. The cooler temperature at receipt exceeded regula
FL	Free Liquid
FP1	Did not ignite.
H1	Sample analysis performed past holding time.
H1,CT1	Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guidelines for reque
I	Semiquantitative result (out of instrument calibration range)
J	Estimated concentration; sample matrix interference.
J	Estimated value ; the analyte concentration was greater than the highest standard
J	Estimated value ; the analyte concentration was less than the LOQ.
J	The reported result is an estimated value.
J,B	Analyte detected in both the method blank and sample above the MDL.
J,CT1	Estimated value ; the analyte concentration was less than the LOQ. Cooler temperature at sample reciept exceeded regu
J,H1	Estimated value ; the analyte concentration was less than the LOQ. Sample analysis performed past holding time.
J,H1	The reported result is an estimated value. Sample was analyzed past holding time.
J,P	Estimate; columns don't agree to within 40%
J,S	Estimated concentration; analyzed by method of standard addition (MSA)
JB	The reported result is an estimated value. The reported result is also associated with a contaminated method blank.
JQ	The reported result is an estimated value and one or more quality control criteria failed. See narrative.
L	Sample reporting limits elevated due to matrix interference
L1	The associated blank spike (LCS) recovery was above the laboratory acceptance limits.
L2	The associated blank spike (LCS) recovery was below the laboratory acceptance limits.
M	Matrix effect; the concentration is an estimate due to matrix effect.
N	Nontarget analyte; the analyte is a tentativlely identified compound (TIC) by GC/MS
NA	Not applicable
ND	Not detected at or above the reporting limit (RL)
ND, B	Not detected at or above the reporting limit (RL). Analyte present in method blank.
ND, CT1	Analyte was not detected. The concentration is below the reported LOD. The cooler temperature at receipt exceeded reg
ND, L	Not detected; sample reporting limit (RL) elevated due to interference
ND, S	Not detected; analyzed by method of standard addition (MSA)
ND,H1	Not detected; Sample analysis performed past holding time.
ND,H1,CT1	Not detected; Sample analysis performed past holding time. The cooler temperature at receipt exceeded regulatory guide
NF	Not found by library search
NFL	No free liquid
NI	Non-ignitable
NR	Analyte is not required to be analyzed
NS	Not spiked
P	Concentrations >40% difference between the two GC columns
Q	One or more quality control criteria failed. See narrative.
Q,H1	One or more quality control criteria failed. Sample analyzed past holding time. See narrative.
QNS	Quantity of sample not sufficient to perform analysis
RA	Reanalysis confirms reported results
RE	Reanalysis confirms sample matrix interference
S	Analyzed by method of standard addition (MSA)
SMI	Sample matrix interference on surrogate
SP	Reported results are for spike compounds only
T5	Laboratory not licensed for this parameter
TIC	Library Search Compound

Microbac Laboratories Inc.
List of Valid Qualifiers
May 02, 2017

Qualkey: DOD

TNTC	Too numerous to count
TNTC, B	Too numerous to count. Analyte present in method blank.
TNTC,CT1	Too numerous to count. The cooler temperature at receipt exceeded regulatory guidelines for requested testing.
TNTC,H1	Too numerous to count. Sample analysis performed past holding time.
U	Analyte was not detected. The concentration is below the reported LOD.
U,CT1	Analyte was not detected. The concentration is below the reported LOD. Cooler temperature at sample reciept exceeded
U,H1	Not detected; Sample analysis performed past holding time.
UJ	Undetected; the MDL and RL are estimated due to quality control discrepancies.
UQ	Undetected; the analyte was analyzed for, but not detected.
W	Post-digestion spike for furnace AA out of control limits
X	Exceeds regulatory limit
X, S	Exceeds regulatory limit; method of standard additions (MSA)
Z	Cannot be resolved from isomer - see below

AECOM

Chain of Custody Record

COC Number:

Laboratory: Microbac POC: Stephanie Mossburg	Project Manager: Elspeth Sharp	Mail to: Linda Raabe	
Address: 158 Starlite Drive	Phone/Fax Number: 210-296-2000	112 East Pecan STE. 400	
Marietta, OH 45750	Sampler (print): Scott Beesinger	San Antonio, TX 78205	
Phone: 1-800-373-4071		210-296-2000	
Client: AECOM	Signature: Scott Beesinger	Fed Ex Airbill No:	
Address: 112 East Pecan Ste. 400			
San Antonio, TX 78205	pH:	Program:	
Turn Around Time: STANDARD			
Project Name/Location: Longhorn			
Project Number: 60274185.0012SOW12			

Site Name	Sample ID/Location ID	SBD	SED	Date	Time	Comp-	Grab	Matrix	Number of Containers	Arsenic & Lead	SA CODE	Cooler ID	LOT CONTROL NUMBERS ABLOT	EBLOT	TBLOT
SITE 02	35AWW13F-041917			4/19/17	1340		X	W	1	X					
	35AWW13FDF-041917			4/19/17	1340		X	W	1	X					
	35AWW13MSF-041917			4/19/17	1340		X	W	1	X					
	35AWW13MSDF-041917			4/19/17	1340		X	W	1	X					

Microbac OVD
Received: 04/20/2017 09:43
By: BRENDA GREENWALT 221000099745
Brenda Greenwalt

Comments: **STANDARD TAT**

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Received by: (Signature)	Date	Time	Relinquished by: (Signature)
Scott Beesinger	4/19/17	1500					
Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:	

•Homogenize all composite samples prior to analysis

Distribution: White to Laboratory, Canary to Project Manager, Pink QA/QC Manager

MICROBAC

COOLER TEMP >6° C LOG

Cooler ID 9745

SAMPLE ID	Bottle 1 °C	Bottle 2 °C	Bottle 3 °C	Bottle 4 °C	Bottle 5 °C	Bottle 6 °C

4/20/17 BG

pH Exceptions

pH Lot # HC693124

SAMPLE ID	Bottle 1	Bottle 2	Bottle 3	Bottle 4	Bottle 5	Bottle 6

4/20/17 BG

PRESERVATIVE EXCEPTIONS

☑ NONE

☐ AS NOTED

BG 4/20/17

Document Control # 1957
Last 10-07-2016

Issued to: Document Master File

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17040974
Account: 2551
Project: 2551.096
Samples: 4
Due Date: 01-MAY-2017

Samplenum	Container ID	Products
L17040974-01	896674	AS-MS PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	20-APR-2017 13:26	BRG		
2	PREP	W1	DIG	20-APR-2017 13:27	ERP	BRG	
3	STORE	DIG	A1	25-APR-2017 13:19	CLS	ERP	
4	ANALYZ*	DIG	METALS	26-APR-2017 08:23	JYH	ERP	

***Sample extract/digestate/leachate**

Samplenum	Container ID	Products
L17040974-02	896675	AS-MS PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	20-APR-2017 13:26	BRG		
2	PREP	W1	DIG	20-APR-2017 13:27	ERP	BRG	
3	STORE	DIG	A1	25-APR-2017 13:19	CLS	ERP	
4	ANALYZ*	DIG	METALS	26-APR-2017 08:23	JYH	ERP	

***Sample extract/digestate/leachate**

Samplenum	Container ID	Products
L17040974-03	896676	AS-MS PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	20-APR-2017 13:26	BRG		
2	PREP	W1	DIG	20-APR-2017 13:27	ERP	BRG	
3	STORE	DIG	A1	25-APR-2017 13:19	CLS	ERP	
4	ANALYZ*	DIG	METALS	26-APR-2017 08:23	JYH	ERP	

***Sample extract/digestate/leachate**

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

Microbac Laboratories Inc.

Internal Chain of Custody Report

Login: L17040974
Account: 2551
Project: 2551.096
Samples: 4
Due Date: 01-MAY-2017

Samplenum	Container ID	Products
L17040974-04	896677	AS-MS PB-MS

Bottle: 1

Seq.	Purpose	From	To	Date/Time	Accept	Relinquish	pH
1	LOGIN	COOLER	W1	20-APR-2017 13:26	BRG		
2	PREP	W1	DIG	20-APR-2017 13:27	ERP	BRG	
3	STORE	DIG	A1	25-APR-2017 13:19	CLS	ERP	
4	ANALYZ*	DIG	METALS	26-APR-2017 08:23	JYH	ERP	

Sample extract/digestate/leachate

A1 - Sample Archive (COLD)
A2 - Sample Archive (AMBIENT)
F1 - Volatiles Freezer in Login
V1 - Volatiles Refrigerator in Login
W1 - Walkin Cooler in Login

NELAP Addendum - January 4, 2016

Non-NELAP LIMS Product and Description

The following is a list of those tests that are not included in the Microbac – OVD NELAP Scope of Accreditation:

Heat of Combustion (BTU)
Total Halide by Bomb Combustion (TX)
Particle Sizing - 200 Mesh (PS200)
Specific Gravity/Density (SPGRAV)
Total Residual Chlorine (CL-TRL)
Total Volatile Solids (all forms) (TVS)
Total Coliform Bacteria (all methods)
Fecal Coliform Bacteria (all methods)
Sulfite (SO3)
Propionaldehyde (HPLC-UV)

SOLID AND HAZARDOUS CHEMICALS
Nitrogen, Ammonia by Method 350.1
Chromium, Hexavalent, Leachable by SM3500 Cr-B 2009
Phenolics, Total by Method 420.1
ASTM D3987-06

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD HPLC02/HPLC-UV

Nitroglycerin
Acetic acid
Butyric acid
Lactic acid
Propionic acid
Pyruvic acid

OVD MSS01/GC-MS

1,4-Phenylenediamine
1-Methylnaphthalene
1,4-Dioxane
Atrazine
Benzaldehyde
Biphenyl
Caprolactam
Hexamethylphosphoramide (HMPA)
Pentachlorobenzene
Pentachloroethane

NELAP Accreditation by Laboratory SOP

NONPOTABLE WATER

OVD MSV01/GC-MS

1, 1, 2-Trichloro-1,2,2-trifluoroethane
1,3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
T-amylmethylether (TAME)
Tetrahydrofuran (THF)

OVD HPLC07/HPLC-MS-MS

Hexamethylphosphoramide (XMPA-LCMS)

OVD HPLC12/HPLC/UV

Acetate
Formate

OVD RSK01/GC-FID

Acetylene
Propane

OVD K9305/ISE

Fluoroborate

SOLID AND HAZARDOUS CHEMICALS

OVD MSS0I/GC-MS

1-Methylnaphthalene
Benzaldehyde
Biphenyl
Caprolactam
Pentachloroethane

NELAP Accreditation by Laboratory SOP

SOLID AND HAZARDOUS CHEMICALS

OVD MSV0I/GC-MS

1.3-Butadiene
Cyclohexane
Cyclohexanone
Dimethyl disulfide
Dimethylsulfide
Ethyl-t-butylether (ETBE)
Isoprene
Methylacetate
Methylcyclohexane
n-Hexane
T-amylmethylether (TAME)

ATTACHMENT B – MONITORING WELL SAMPLE COLLECTION FORMS (YEAR 3)

00897381

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW13	Date: 11/16/17
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump/SamplePro	Water Quality Meter/ID#: U-52 Horiba/21354	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC / 2"	Unit Casing Volume (gal/lin ft) (A):	Initial Depth to Water (ft) (B): 25.06
	Total Well Depth (ft) (C): 40.26	Water Column Thickness (ft) (C-B):	Well Volume (gal) (A*(C-B)):
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Overcast	Well Condition: Good	Comments:

CASING INFO										
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
11/16/17	0935	25.12	.13	100	21.83	6.18	1.08	1.93	128	160	
	0940	25.17	.26	100	22.70	5.89	1.19	0.82	183	188	
	0945	25.21	.39	100	23.00	5.80	1.30	0.36	148	205	
	0950	25.24	.52	100	23.25	5.79	1.63	0.13	128	205	
	0955	25.26	.65	100	23.28	5.78	1.64	0.12	127	205	
	1000	25.28	.78	100	23.30	5.78	1.65	0.12	126	205	
	1005	25.29	.91	100	23.31	5.77	1.65	0.12	126	205	

Colorimeter Results

Time	Analyte	Dilution	Result	Units
				FORSTR02

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
3	40mL Glass		HCL	N	8260	VOC
1	1 Liter Amber		NA	N	8270	1,4-Dioxane
4	60mL Plastic		HNO3	N		TOTAL METALS

Sample ID: 35AWW13_111617

Sample Time: 1005

00897382

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

Page 1 of 1

LOCATION	Site: ~~LHAAP-58~~ LHAAP-02	Location ID: 35A WW13	Date: 4/4/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Kennie Moore
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 24.54
	Total Well Depth (ft) (C): 40.28	Water Column Thickness (ft) (C-B): 15.74	Well Volume (gal) (A*(C-B)): 2.51
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Clear / cool	Well Condition: Good	Comments:

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
4/4/18	1155	24.60	.13	100	19.35	5.84	1.61	1.20	111	93	
	1200	24.66	.26	100	20.89	5.79	1.61	.95	157	95	
	1205	24.71	.39	100	21.26	5.79	2.00	.55	110	96	
	1210	24.73	.52	100	21.69	5.79	2.37	.38	97.9	96	
	1215	24.75	.65	100	21.58	5.78	2.38	.01	96.0	97	
	1220	24.78	.78	100	21.56	5.79	2.39	0.00	96.5	99	
	1225	24.80	.91	100	21.44	5.78	2.39	0.00	88.7	103	

Colorimeter Results					**No. Containers/Volume/Type**			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Time	**Analyte**	**Dilution**	**Result**	**Units**							
					4	60ml	plastic	HNO3	N		Arsenic/lead

Conversions	**Stabilization Criteria**									
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%						
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%						
	Cond	+/- 10%	ORP	+/- 10	Sample ID: 35AWW13-040418				Sample Time: 1225	

ATTACHMENT C – QUALITY CONTROL SUMMARY REPORT (YEAR 3)

QUALITY CONTROL SUMMARY REPORT
LHAAP-02 (NOVEMBER 2017 AND APRIL 2018)
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

May 2018

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

Prepared By:

1608 13th Avenue South, Suite 300
Birmingham, Alabama 35205
1-800-806-4001 • www.bhate.com

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List of Tables

1.0 INTRODUCTION

Bhate Environmental Associates, Inc. (Bhate) reviewed two data packages from ALS Environmental (ALS), Houston, TX. Groundwater samples were collected on November 16, 2017, and April 4, 2018, from Site LHAAP-02 at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: United States Environmental Protection Agency (EPA) Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (EPA, January 2017); EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA, January 2017); and quality control (QC) specified in the Basewide Uniform Federal Policy - Quality Assurance Project Plan (QAPP) (November, 2017). Laboratory QC samples followed method specific requirements of the Department of Defense (DoD) Quality System Manual, Version 5.1 (Appendix F of the Quality Systems Manual) (DoD, January 2017).

1.1 Intended Use of Data

The semi-annual groundwater sampling and analysis included:

• SW6020A – Arsenic and Lead by Inductively Coupled Plasma (ICP)/Mass Spectrometry (MS)

Table 1 lists the sample identification (ID) numbers and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to QC discrepancies.

1.2 Preservation and Holding Times

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and with the required signatures.

1.3 Initial Calibration Verification (ICV) and Continuing Calibration Verifications (CCV)

All analytes reported must be present in the initial and continuing calibration. All results reported must be within the calibration range. Samples will be diluted, if necessary, to bring analyte responses within the calibration range. A CCV will be performed daily before sample analysis, unless an initial calibration (ICAL) and second-source standard verification is performed immediately before sample analysis, and as required by the method.

All initial and continuing calibration verifications were within control limits.

1.4 Blanks

If the sample result for an associated sample was less than 5X the analyte concentration in the blank, the corresponding sample result for the analyte was qualified "UB" and considered an artifact of blank contamination. Where the sample result for the affected analyte was greater than 5X the amount in the blank, no qualifier was applied.

No blank contamination was found.

1.5 Surrogates

Surrogates are added to all environmental samples, controls, and blanks in accordance with method requirements. Per method 6020, no surrogates are added. Therefore accuracy and precision are measured by the recovery of the laboratory control sample and matrix spike samples.

1.6 Laboratory Control Sample (LCS)

All LCS recoveries were within control limits.

1.7 Matrix Spike/ Matrix Spike Duplicate (MS/MSD)

The April 2018 lab package HS18040243 reported MS/MSD recoveries for lead below control limits (76.5%/78.7%). Lead was qualified as estimated, "J", in the spike sample 35AWW13_040418 and its duplicate. No spike issues were encountered in the November 2017 data package.

1.8 Field Duplicate Precision

Precision is the measure of variability of individual sample measurements. Evaluation of field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater matrices and both sets of field duplicate data were within control limits.

2.0 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (see Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Identification

Client Sample ID	Lab Sample ID	Collected	SW6020A
35AWW13_111617	HS17111047-01	11/16/17	X
35AWW13_111617_a	HS17111047-02	11/16/17	X
35AWW13_040418	HS18040243-01	4/4/18	X
35AWW13_040418_a	HS18040243-02	4/4/18	X

ID – Identification
SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.
HS - Houston

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Data Validation Qualifier	Reason for Qualification
35AWW13_040418	HS18040243-01	Lead	0.00122 J	MS/MSD <
35AWW13_040418_a	HS18040243-02	Lead	0.00109 J	MS/MSD <

ID – identification
J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
MS/MSD <– Matrix spike/duplicate recoveries below control limits
HS - Houston

Table 3: Completeness by Method

Method	Total Analytes	No. of Rejected Results	% Completeness
SW6020A	1 (+ 1 field duplicate)	0	100

SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

ATTACHMENT D – LABORATORY DATA PACKAGES (YEAR 3)

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

WorkOrder: HS17111047

LHAAP-Site 02

Bhate Environmental Associates, Inc.

Marcia Olive
445 Union Blvd Ste 129
Lakewood CO 80228

12-Dec-2017

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

November 29, 2017

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS17111047**

Laboratory Results for: **LHAAP-Site 02**

Dear Marcia,

ALS Environmental received 2 sample(s) on Nov 17, 2017 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Sonia West

Generated By: Jumoke.Lawal
Sonia West
Project Manager

ALS Group USA, Corp Date: 29-Nov-17

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
Work Order: HS17111047

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS17111047-01	35AWW13_111617	Groundwater		16-Nov-2017 10:05	17-Nov-2017 08:30	☐
HS17111047-02	35AWW13_111617_a	Groundwater		16-Nov-2017 10:05	17-Nov-2017 08:30	☐

ALS Group USA, Corp Date: 29-Nov-17

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
Work Order: HS17111047

CASE NARRATIVE

Metals by Method SW6020

Batch ID: 122596

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Group USA, Corp Date: 29-Nov-17

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
Sample ID: 35AWW13_111617
Collection Date: 16-Nov-2017 10:05

ANALYTICAL REPORT
WorkOrder:HS17111047
Lab ID:HS17111047-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**					Prep:SW3010A / 27-Nov-2017		Analyst: RPM
Arsenic	**0.00117**	J	**0.000400**	**0.00100**	**0.00200**	**mg/L**	1	28-Nov-2017 15:06
Lead	**0.00306**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	28-Nov-2017 15:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp Date: 29-Nov-17

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
Sample ID: 35AWW13_111617_a
Collection Date: 16-Nov-2017 10:05

ANALYTICAL REPORT
WorkOrder:HS17111047
Lab ID:HS17111047-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**					Prep:SW3010A / 27-Nov-2017		Analyst: RPM
Arsenic	**0.00120**	J	**0.000400**	**0.00100**	**0.00200**	**mg/L**	1	28-Nov-2017 15:24
Lead	**0.00353**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	28-Nov-2017 15:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 29-Nov-17

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Batch ID: 122596 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS17111047-01	1	10	10 (mL)	1
HS17111047-02	1	10	10 (mL)	1

ALS Group USA, Corp Date: 29-Nov-17

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 122596	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS17111047-01	35AWW13_111617	16 Nov 2017 10:05		27 Nov 2017 15:30	28 Nov 2017 15:06	1
HS17111047-02	35AWW13_111617_a	16 Nov 2017 10:05		27 Nov 2017 15:30	28 Nov 2017 15:24	1

ALS Group USA, Corp Date: 29-Nov-17

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

QC BATCH REPORT

Batch ID: 122596 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-122596** Units: **mg/L** Analysis Date: **28-Nov-2017 14:52**
Client ID: Run ID: **ICPMS05_306132** SeqNo: **4326336** PrepDate: **27-Nov-2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00200								U
Lead	0.00100	0.00200								U

LCS Sample ID: **LCS-122596** Units: **mg/L** Analysis Date: **28-Nov-2017 14:54**
Client ID: Run ID: **ICPMS05_306132** SeqNo: **4326337** PrepDate: **27-Nov-2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04981	0.00200	0.05	0	99.6	80 - 120				
Lead	0.04832	0.00200	0.05	0	96.6	80 - 120				

MS Sample ID: **HS17111047-01MS** Units: **mg/L** Analysis Date: **28-Nov-2017 15:10**
Client ID: **35AWW13_111617** Run ID: **ICPMS05_306132** SeqNo: **4326345** PrepDate: **27-Nov-2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04783	0.00200	0.05	0.001171	93.3	80 - 120				
Lead	0.05058	0.00200	0.05	0.003056	95.0	80 - 120				

MSD Sample ID: **HS17111047-01MSD** Units: **mg/L** Analysis Date: **28-Nov-2017 15:18**
Client ID: **35AWW13_111617** Run ID: **ICPMS05_306132** SeqNo: **4326469** PrepDate: **27-Nov-2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.0495	0.00200	0.05	0.001171	96.7	80 - 120	0.04783	3.44	20	
Lead	0.05187	0.00200	0.05	0.003056	97.6	80 - 120	0.05058	2.52	20	

PDS Sample ID: **HS17111047-01PDS** Units: **mg/L** Analysis Date: **28-Nov-2017 15:20**
Client ID: **35AWW13_111617** Run ID: **ICPMS05_306132** SeqNo: **4326470** PrepDate: **27-Nov-2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09284	0.00200	0.1	0.001171	91.7	75 - 125				
Lead	0.09357	0.00200	0.1	0.003056	90.5	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp Date: 29-Nov-17

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

QC BATCH REPORT

Batch ID: 122596 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS17111047-01SD** Units: **mg/L** Analysis Date: **28-Nov-2017 15:08**
Client ID: **35AWW13_111617** Run ID: **ICPMS05_306132** SeqNo: **4326344** PrepDate: **27-Nov-2017** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.00500	0.0100					0.001171	0	10	U
Lead	0.003017	0.0100					0.003056	0	10	J

The following samples were analyzed in this batch: HS17111047-01 HS17111047-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp Date: 29-Nov-17

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: **HS17111047**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Group USA, Corp Date: 29-Nov-17

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Carolina	624-2017	31-Dec-2017
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018

ALS Group USA, Corp Date: 29-Nov-17

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS17111047
Date/Time Received: **17-Nov-2017 08:30**
Received by: **RPG**

Checklist completed by: *Raegen Giga* eSignature 20-Nov-2017 Date
Reviewed by: *Corey Grandits* eSignature 21-Nov-2017 Date

Matrices: **GW**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.0c/1.3c uc/c	IR 11	
Cooler(s)/Kit(s):	35474		
Date/Time sample(s) sent to storage:	11/17/2017 18:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00897403

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: 1 of 1

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / ~~Site 58~~ Site 02

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	TOTAL METALS (ARSEN.C & LEAD)									Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW13_111617		16 NOV 2017	1005	-			WG	1	X												
35AWW13_111617_e		16 NOV 2017	1005	-			WG	1	X												
35AWW13_111617_MS		16 NOV 2017	1005	-			WG	1	X												
35AWW13_111617_SD		16 NOV 2017	1005				WG	1	X												
				-																	
				-																	
				-																	
				-																	
				-																	
				-																	

HS17111047
Bhate Environmental Associates, Inc.
LHAAP-Site 02

COMMENTS: Cooler # 25474

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Scott Beesinger	11/16/17	1435	R Cigg	11/17/17	0830
2.						Temp 1.0
3.						IR # 11
						CF +0.3

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped _____ No.:

Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

25474

CUSTODY SEAL
Date: 11/16/17 Time: 1:45
Name: Scott Bell
Company: Battle

Seal Broken By:
Date: 11/17/17

25474 NOV 17 2017

FedEx
TRK# 0221 7376 9750 0710

FRI - 17 NOV 10:30A
PRIORITY OVERNIGHT

77090
TX-US

AB 9GRA 25474

Metals Raw Data

Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
ALS WO# HS17111047

ALS Group USA, Corp

Date: 04-Dec-17

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Run ID: ICPMS05_306132
Instrument: ICPMS05
Method: SW6020

ICV	Date: 28-Nov-2017 10:25		Seq: 4325746	ICV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	95.391	95	90-110	
Lead	100	103.491	103	90-110	

CCV1	Date: 28-Nov-2017 10:47		Seq: 4325757	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.05	99	90-110	
Lead	100	104.036	104	90-110	

CCV2	Date: 28-Nov-2017 11:11		Seq: 4325929	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	97.324	97	90-110	
Lead	100	101.971	102	90-110	

CCV3	Date: 28-Nov-2017 11:36		Seq: 4325941	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	97.595	98	90-110	
Lead	100	102.97	103	90-110	

CCV4	Date: 28-Nov-2017 12:00		Seq: 4325958	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	97.855	98	90-110	
Lead	100	101.315	101	90-110	

CCV5	Date: 28-Nov-2017 12:23		Seq: 4325970	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	100.524	101	90-110	
Lead	100	101.528	102	90-110	

CCV6	Date: 28-Nov-2017 12:47		Seq: 4325982	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	98.071	98	90-110	
Lead	100	98.609	99	90-110	

CCV7	Date: 28-Nov-2017 13:11		Seq: 4325994	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	97.245	97	90-110	
Lead	100	100.163	100	90-110	

CCV8	Date: 28-Nov-2017 13:35		Seq: 4326006	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	95.84	96	90-110	
Lead	100	100.624	101	90-110	

CCV9	Date: 28-Nov-2017 14:00		Seq: 4326018	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.265	99	90-110	
Lead	100	101.848	102	90-110	

CCV10	Date: 28-Nov-2017 14:24		Seq: 4326113	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	97.511	98	90-110	
Lead	100	99.978	100	90-110	

CCV11	Date: 28-Nov-2017 14:48		Seq: 4326238	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	99.484	100	90-110	
Lead	100	102.03	102	90-110	

ALS Group USA, Corp

Date: 04-Dec-17

Form 2 - Initial and Continuing Calibration Verification

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Run ID: ICPMS05_306132
Instrument: ICPMS05
Method: SW6020

CCV12	Date: 28-Nov-2017 15:12		Seq: 4326346	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	100.263	100	90-110	
Lead	100	98.563	99	90-110	

CCV13	Date: 28-Nov-2017 15:36		Seq: 4326478	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	98.748	99	90-110	
Lead	100	101.306	101	90-110	

CCV14	Date: 28-Nov-2017 16:02		Seq: 4326490	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	100.797	101	90-110	
Lead	100	100.265	100	90-110	

CCV15	Date: 28-Nov-2017 16:26		Seq: 4326779	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	97.366	97	90-110	
Lead	100	101.061	101	90-110	

CCV16	Date: 28-Nov-2017 16:47		Seq: 4326863	CCV	Units: ug/L
Analyte	**True**	**Found**	**%R**	**Control Limits**	**Flag**
Arsenic	100	98.719	99	90-110	
Lead	100	97.637	98	90-110	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Run ID: ICPMS05_306132
Instrument: ICPMS05
Method: SW6020

ICB	Date: 28-Nov-2017 10:31		Seq: 4325749	ICB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB1	Date: 28-Nov-2017 10:49		Seq: 4325758	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB2	Date: 28-Nov-2017 11:13		Seq: 4325930	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB3	Date: 28-Nov-2017 11:38		Seq: 4325942	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB4	Date: 28-Nov-2017 12:02		Seq: 4325959	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB5	Date: 28-Nov-2017 12:25		Seq: 4325971	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB6	Date: 28-Nov-2017 12:49		Seq: 4325983	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB7	Date: 28-Nov-2017 13:13		Seq: 4325995	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB8	Date: 28-Nov-2017 13:37		Seq: 4326007	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB9	Date: 28-Nov-2017 14:02		Seq: 4326019	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB10	Date: 28-Nov-2017 14:26		Seq: 4326114	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB11	Date: 28-Nov-2017 14:50		Seq: 4326239	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

Form 3 - BLANKS

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Run ID: ICPMS05_306132
Instrument: ICPMS05
Method: SW6020

MBLK-122596	Date: 28-Nov-2017 14:52		Seq: 4326336	MBLK	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB12	Date: 28-Nov-2017 15:14		Seq: 4326347	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB13	Date: 28-Nov-2017 15:38		Seq: 4326479	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB14	Date: 28-Nov-2017 16:04		Seq: 4326491	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB15	Date: 28-Nov-2017 16:28		Seq: 4326780	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

CCB16	Date: 28-Nov-2017 16:49		Seq: 4326864	CCB	Units: ug/L
Analyte	**Result**	**MDL**	**Report Limit**	**Qual**	
Arsenic	2	0.4	2	U	
Lead	2	0.6	2	U	

ALS Group USA, Corp

Date: 04-Dec-17

Form 4 - ICP Interference Check Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Run ID: ICPMS05_306132
Instrument: ICPMS05
Method: SW6020

ICSA	Date: 28-Nov-2017 10:33	Seq: 4325750	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic		-0.071	0	
Lead		0.091	0	
ICSAB	Date: 28-Nov-2017 10:35	Seq: 4325751	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic	100	92.07	92.1	
Lead	100	97.4	97.4	
ICSA	Date: 28-Nov-2017 16:55	Seq: 4326867	ICSA	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic		-0.191	0	
Lead		0.08	0	
ICSAB	Date: 28-Nov-2017 16:57	Seq: 4326868	ICSAB	Units: ug/L
Analyte	**True**	**Found**	**%R**	
Arsenic	100	96.62	96.6	
Lead	100	101.1	101	

ALS Group USA, Corp Date: 04-Dec-17

Form 5A - Matrix Spike/Matrix Spike Duplicate Recovery

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Date Analyzed: 28-Nov-2017 15:18
Date Extracted: 27-Nov-2017 15:30
Units: ug/L

Matrix Spike: HS17111047-01MS
Client Sample ID: 35AWW13_111617

Analysis Method: SW6020

Analyte	Sample Result	MS Result	Spike Amount	% Rec	MSD Result	Spike Amount	% Rec	% Rec Limits	RPD	RPD Limit
Arsenic	1.171	47.83	50.00	93.3	49.50	50.00	96.7	80-120	3.44	20
Lead	3.056	50.58	50.00	95.0	51.87	50.00	97.6	80-120	2.52	20

ALS Group USA, Corp

Date: 04-Dec-17

Form 5B - Post Digest Sample Recovery

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Date Analyzed: 28-Nov-2017 15:20
Date Extracted: 27-Nov-2017 15:30
Units: ug/L

Lab Sample ID: HS17111047-01PDS
Client Sample ID: 35AWW13_111617

Analysis Method: SW6020

Analyte	Sample Result	PDS Result	Spike Amount	% Rec	% Rec Limits
Arsenic	1.171	92.84	100	92	75-125
Lead	3.056	93.57	100	91	75-125

ALS Group USA, Corp

Date: 04-Dec-17

Form 7 - Laboratory Control Sample

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Date Analyzed: 28-Nov-2017 14:54
Date Extracted: 27-Nov-2017 15:30
Units: ug/L

Lab Sample ID: LCS-122596

Analysis Method: SW6020

Analyte	Spike Amount	LCS Result	% Rec	% Rec Limits
Arsenic	50	49.81	100	80-120
Lead	50	48.32	97	80-120

ALS Group USA, Corp

Date: 04-Dec-17

Form 8 - ICP Serial Dilutions

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047

Date Analyzed: 28-Nov-2017 15:08
Date Extracted: 27-Nov-2017 15:30
Units: ug/L

Lab Sample ID: HS17111047-01SD
Client Sample ID:35AWW13_111617

Analysis Method: SW6020

Analyte	Sample Result	C	SD Result	C	RPD	Q
Arsenic	1.171	J	0	U	0	
Lead	3.056		3.017	J	1	

ALS Group USA, Corp

Date: 04-Dec-17

Form 11 - INTERNAL STANDARD ASSOCIATION

Client: Bhate Environmental Associates, Inc.

Project: LHAAP-Site 02

WorkOrder: HS17111047

Instrument:ICPMS05

Mass	Analyte	Assoc Int Standard 1	Assoc Int Standard 2	Mode
9	Beryllium	Lithium		Ar
11	Boron	Lithium		Ar
23	Sodium	Germanium		Ar
24	Magnesium	Germanium		Ar
27	Aluminum	Germanium		Ar
39	Potassium	Germanium		Ar
44	Calcium	Germanium		Ar
47	Titanium	Germanium		Ar
51	Vanadium	Germanium		ArHe
52	Chromium	Germanium		ArHe
55	Manganese	Germanium		ArHe
56	Iron	Germanium		ArHe
59	Cobalt	Germanium		ArHe
60	Nickel	Germanium		ArHe
63	Copper	Germanium		ArHe
66	Zinc	Germanium		ArHe
75	Arsenic	Germanium		ArHe
78	Selenium	Germanium		ArHe
88	Strontium	Germanium		Ar
95	Molybdenum	Germanium		Ar
105	Palladium	Germanium		Ar
107	Silver	Germanium		Ar
114	Cadmium	Indium		Ar
118	Tin	Germanium		Ar
121	Antimony	Germanium		ArHe
137	Barium	Indium		Ar
205	Thallium	Bismuth		Ar
208	Lead	Bismuth		Ar

ALS Group USA, Corp

Date: 04-Dec-17

FORM 12 - PREPARATION LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047
Start Date: 27-Nov-2017 15:30 End Date: 27-Nov-2017 17:45

Batch ID: 122596
Prep Code: 3010A
Method: SW3010A
Technician:

SampID	ClientID	Matrix	Init Wt	Init Vol	FinalVol (mL)	PrepFac
HS17111047-01	35AWW13_111617	Groundwater		10	10	1
HS17111047-01MS				10	10	1
HS17111047-01MSD				10	10	1
HS17111047-01PDS				10	10	1
HS17111047-01SD				10	10	1
HS17111047-02	35AWW13_111617_a	Groundwater		10	10	1
LCS-122596				10	10	1
MBLK-122596				10	10	1

ALS Group USA, Corp Date: 04-Dec-17

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047
Start Date: 28-Nov-2017 End Date: 28-Nov-2017

Run ID:ICPMS05_306132
Instrument:ICPMS05
Method:

Sample No.	D/F	Time	FileID	Analytes
ICPMS05_306132_Tune	1	28-Nov-2017 00:00	ICPMS05_306132_Tune_1	
CAL BLK	1	28-Nov-2017 10:12	004CALB.d_4325734	AS PB
2/10/200	1	28-Nov-2017 10:14	005CALS.d_4325735	AS PB
5/25/500	1	28-Nov-2017 10:16	006CALS.d_4325736	AS PB
10/50/1000	1	28-Nov-2017 10:18	007CALS.d_4325737	AS PB
100/500/10K	1	28-Nov-2017 10:20	008CALS.d_4325738	AS PB
200/1000/20K	1	28-Nov-2017 10:21	009CALS.d_4325744	AS PB
ICV	1	28-Nov-2017 10:25	011_ICV.d_4325746	AS PB
LLICV2	1	28-Nov-2017 10:27	012SMPL.d_4325747	AS PB
LLICV5	1	28-Nov-2017 10:29	013LICV.d_4325748	AS PB
ICB	1	28-Nov-2017 10:31	014_ICB.d_4325749	AS PB
ICSA	1	28-Nov-2017 10:33	015ICSA.d_4325750	AS PB
ICSAB	1	28-Nov-2017 10:35	016ICSB.d_4325751	AS PB
CCV 1	1	28-Nov-2017 10:47	022_CCV.d_4325757	AS PB
CCB 1	1	28-Nov-2017 10:49	023_CCB.d_4325758	AS PB
CCV 2	1	28-Nov-2017 11:11	034_CCV.d_4325929	AS PB
CCB 2	1	28-Nov-2017 11:13	035_CCB.d_4325930	AS PB
CCV 3	1	28-Nov-2017 11:36	046_CCV.d_4325941	AS PB
CCB 3	1	28-Nov-2017 11:38	047_CCB.d_4325942	AS PB
CCV 4	1	28-Nov-2017 12:00	058_CCV.d_4325958	AS PB
CCB 4	1	28-Nov-2017 12:02	059_CCB.d_4325959	AS PB
CCV 5	1	28-Nov-2017 12:23	070_CCV.d_4325970	AS PB
CCB 5	1	28-Nov-2017 12:25	071_CCB.d_4325971	AS PB
CCV 6	1	28-Nov-2017 12:47	082_CCV.d_4325982	AS PB
CCB 6	1	28-Nov-2017 12:49	083_CCB.d_4325983	AS PB
CCV 7	1	28-Nov-2017 13:11	094_CCV.d_4325994	AS PB
CCB 7	1	28-Nov-2017 13:13	095_CCB.d_4325995	AS PB
CCV 8	1	28-Nov-2017 13:35	106_CCV.d_4326006	AS PB
CCB 8	1	28-Nov-2017 13:37	107_CCB.d_4326007	AS PB
CCV 9	1	28-Nov-2017 14:00	118_CCV.d_4326018	AS PB
CCB 9	1	28-Nov-2017 14:02	119_CCB.d_4326019	AS PB
CCV 10	1	28-Nov-2017 14:24	130_CCV.d_4326113	AS PB
CCB 10	1	28-Nov-2017 14:26	131_CCB.d_4326114	AS PB
CCV 11	1	28-Nov-2017 14:48	142_CCV.d_4326238	AS PB
CCB 11	1	28-Nov-2017 14:50	143_CCB.d_4326239	AS PB
MBLK-122596	1	28-Nov-2017 14:52	144SMPL.d_4326336	AS PB
LCS-122596	1	28-Nov-2017 14:54	145SMPL.d_4326337	AS PB
35AWW13_111617	1	28-Nov-2017 15:06	151SMPL.d_4326343	AS PB
35AWW13_111617SD	5	28-Nov-2017 15:08	152SMPL.d_4326344	AS PB
35AWW13_111617MS	1	28-Nov-2017 15:10	153SMPL.d_4326345	AS PB
CCV 12	1	28-Nov-2017 15:12	154_CCV.d_4326346	AS PB
CCB 12	1	28-Nov-2017 15:14	155_CCB.d_4326347	AS PB
35AWW13_111617MSD	1	28-Nov-2017 15:18	157SMPL.d_4326469	AS PB
35AWW13_111617PDS	1	28-Nov-2017 15:20	158SMPL.d_4326470	AS PB
35AWW13_111617_a	1	28-Nov-2017 15:24	160SMPL.d_4326472	AS PB
CCV 13	1	28-Nov-2017 15:36	166_CCV.d_4326478	AS PB
CCB 13	1	28-Nov-2017 15:38	167_CCB.d_4326479	AS PB
CCV 14	1	28-Nov-2017 16:02	178_CCV.d_4326490	AS PB
CCB 14	1	28-Nov-2017 16:04	179_CCB.d_4326491	AS PB
CCV 15	1	28-Nov-2017 16:26	190_CCV.d_4326779	AS PB
CCB 15	1	28-Nov-2017 16:28	191_CCB.d_4326780	AS PB
CCV 16	1	28-Nov-2017 16:47	200_CCV.d_4326863	AS PB
CCB 16	1	28-Nov-2017 16:49	201_CCB.d_4326864	AS PB
:V5	1	28-Nov-2017 16:51	202LICV.d_4326865	AS PB

ALS Group USA, Corp

Date: 04-Dec-17

FORM 13 - ANALYSIS RUN LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-Site 02
WorkOrder: HS17111047
Start Date: 28-Nov-2017 End Date: 28-Nov-2017

Run ID:ICPMS05_306132
Instrument:ICPMS05
Method:

Sample No.	D/F	Time	FileID	Analytes
LLCCV2	1	28-Nov-2017 16:53	203SMPL.d_4326866	AS PB
ICSA	1	28-Nov-2017 16:55	204ICSA.d_4326867	AS PB
ICSAB	1	28-Nov-2017 16:57	205ICSB.d_4326868	AS PB

Tune Report

Batch Folder C:\Agilent\ICPMH\1\DATA\112817A.b
Report Comment
Instrument Name G3281A JP11080910

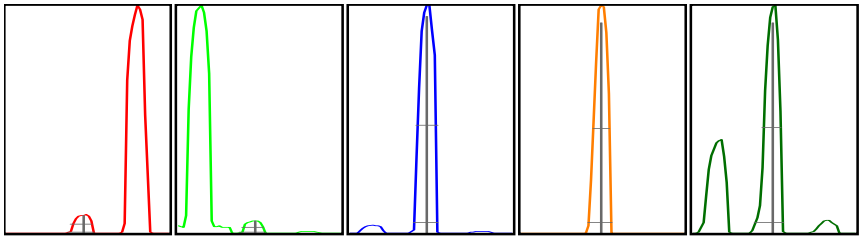
[nogas]

Mass	Range	Count (Actual)	Response (Actual) [cps/ug/l]	Response (Required) [cps/ug/l]	Response (Flag)	Resp Ratio (Actual)	Resp Ratio (Required)	Resp Ratio (Flag)
9		7349				NaN	-	
24		25123				NaN	-	
59		38453				NaN	-	
115		44273				NaN	-	
208		32068				NaN	-	

Mass	RSD% (Actual)	RSD% (Required)	RSD% (Flag)	Background (Actual)	Background (Required)	Background (Flag)
9	2.01	5.00				
24	1.30	5.00				
59	0.68	5.00				
115	1.57	5.00				
208	0.56	5.00				

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	7503	7115	7357	7440	7329
24	24561	25178	25275	25406	25196
59	38750	38376	38396	38086	38659
115	43180	44641	44724	43989	44830
208	32023	32180	31885	31933	32319

Integration Time [sec] 0.1



Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	W-50%	W-X% (Actual)	W-X% (Required)	W-X% (Flag)
9	2025.00	8.95	8.9 - 9.1		0.37	0.475	0.750	
24	6928.61	23.95	23.9 - 24.1		0.37	0.457	0.750	
59	11195.29	58.95	58.9 - 59.1		0.35	0.442	0.750	
115	13655.40	115.00	114.9 - 115.1		0.32	0.443	0.750	
208	9436.24	208.00	207.9 - 208.1		0.33	0.516	0.750	

X = 5 **Integration Time [sec]** 0.1 **Acquisition Time [sec]** 168.5 **Y Axis** Linear

Tune Parameters

Plasma Paramters

RF Power	1600 W	Carrier Gas	0.35 L/min	S/C Temp	2 ℃
RF Matching	1.70 V	Option Gas	0.0 %	Makeup/Dilution Gas	0.50 L/min
Smpl Depth	8.0 mm	Nebulizer Pump	0.10 rps	Gas Switch	Dilution Gas

Lenses Parameters

Extract 1	0.0 V	Omega Lens	8.0 V	Deflect	15.6 V
Extract 2	-200.0 V	Cell Entrance	-38 V	Plate Bias	-50 V
Omega Bias	-100 V	Cell Exit	-58 V		

Cell Parameters

OctP Bias	-8.0 V	He Flow	0.0 mL/min	Energy Discrimination	5.0 V
OctP RF	190 V	H2 Flow	0.0 mL/min		
Use Gas	true	3rd Gas Flow	0 %		

[He]

Mass	Range	Count (Actual)	Response (Actual) [cps/ug/l]	Response (Required) [cps/ug/l]	Response (Flag)	Resp Ratio (Actual)	Resp Ratio (Required)	Resp Ratio (Flag)
9		74				NaN	-	
24		542				NaN	-	
59		10423				NaN	-	

Tune Report

Mass	RSD% (Actual)	RSD% (Required)	RSD% (Flag)	Background (Actual)	Background (Required)	Background (Flag)
9	14.24	5.00	[F]			
24	2.90	5.00				
59	2.86	5.00				

Mass	Replicate 1 Count	Replicate 2 Count	Replicate 3 Count	Replicate 4 Count	Replicate 5 Count
9	68	64	69	89	81
24	528	525	543	554	560
59	10237	10371	10056	10723	10728

Integration Time [sec] 0.1

Mass	Peak Height	Axis (Actual)	Axis (Required)	Axis (Flag)	W-50%	W-X% (Actual)	W-X% (Required)	W-X% (Flag)
9	19.52	8.90	8.9 - 9.1		0.38	0.518	0.750	
24	148.69	23.90	23.9 - 24.1		0.38	0.445	0.750	
59	3156.41	58.95	58.9 - 59.1		0.33	0.438	0.750	

X = 5 **Integration Time [sec]** 0.1 **Acquisition Time [sec]** 100.6 **Y Axis** Linear

Tune Parameters

Plasma Paramters

RF Power	1600 W	Carrier Gas	0.35 L/min	S/C Temp	2 ℃
RF Matching	1.70 V	Option Gas	0.0 %	Makeup/Dilution Gas	0.50 L/min
Smpl Depth	8.0 mm	Nebulizer Pump	0.10 rps	Gas Switch	Dilution Gas

Lenses Parameters

Extract 1	0.0 V	Omega Lens	8.0 V	Deflect	2.0 V
Extract 2	-200.0 V	Cell Entrance	-32 V	Plate Bias	-60 V
Omega Bias	-100 V	Cell Exit	-70 V		

Cell Parameters

OctP Bias	-18.0 V	He Flow	5.5 mL/min	Energy Discrimination	5.0 V
OctP RF	190 V	H2 Flow	0.0 mL/min		
Use Gas	true	3rd Gas Flow	0 %		

Calibration Blank Report

Sample Table

Sample Name	CAL BLK
Data File Name	004CALB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:12:02-06:00
Sample Type	CalBlk
Level	1
Dilution	1
Comment	

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	23	212.09
Na	23	1	nogas	1643381	0.00
Mg	24	1	nogas	4402	0.27
Al	27	1	nogas	9473	0.03
K	39	1	nogas	5342223	0.00
Ti	47	1	nogas	280	10.12
V	51	1	nogas	2135941	0.00
Cr	52	1	nogas	55149	0.01
Mn	55	1	nogas	9256	0.03
Co	59	1	nogas	283	3.60
Ni	60	1	nogas	1123	1.44
Cu	63	1	nogas	5664	0.19
Zn	66	1	nogas	467	4.46
As	75	1	nogas	310922	0.00
Sr	88	1	nogas	513	1.53
Ag	107	1	nogas	427	1.68
Sb	121	1	nogas	2807	0.12
Tl	205	1	nogas	263	3.00
Pb	208	1	nogas	563	3.40
[Pb]	206	1	nogas	147	14.94
[Pb]	207	1	nogas	117	29.69
Na	23	2	He	51353	0.00
Mg	24	2	He	217	23.94
Al	27	2	He	87	27.71
K	39	2	He	15710	0.01
Ca	43	2	He	7	1299.04
Ca	44	2	He	167	5.50
V	51	2	He	1295	0.16
Cr	52	2	He	1240	0.49
Mn	55	2	He	200	2.50
Fe	56	2	He	5017	0.09
Co	59	2	He	23	280.57
Ni	60	2	He	187	6.63
Cu	63	2	He	1253	0.22
Zn	66	2	He	20	866.03
As	75	2	He	123	29.48
Se	78	2	He	6	1111.11
B	11	1	nogas	1225558	0.00
Si	28	1	nogas	1342847	0.00
Ca	43	1	nogas	1140	0.68
Ca	44	1	nogas	257630	0.00
Fe	56	1	nogas	1051764	0.00

Calibration Blank Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Se	77	1	nogas	103500	0.00
Se	82	1	nogas	610	2.42
Mo	95	1	nogas	1300	1.08
Sn	118	1	nogas	933	2.44
Ba	137	1	nogas	157	6.22
Sb	121	2	He	320	0.98
Li	7	1	nogas	29530	0.01
P	31	1	nogas	50358	0.00
La	139	1	nogas	77	59.75

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Li	6	1	nogas	318818	1.95
Ge	72	1	nogas	1556628	3.66
In	115	1	nogas	1631900	5.47
Bi	209	1	nogas	1453823	2.26
Ge	72	2	He	131050	1.04

Calibration Standard Report

Sample Table

Sample Name	2/10/200
Data File Name	005CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:14:04-06:00
Sample Type	CalStd
Level	2
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	5354	0.07
Na	23	1	nogas	4064483	0.00
Mg	24	1	nogas	1683986	0.00
Al	27	1	nogas	30081	0.01
K	39	1	nogas	7400025	0.00
Ti	47	1	nogas	2227	0.58
V	51	1	nogas	2353104	0.00
Cr	52	1	nogas	84570	0.00
Mn	55	1	nogas	43305	0.00
Co	59	1	nogas	29671	0.01
Ni	60	1	nogas	8075	0.04
Cu	63	1	nogas	21446	0.01
Zn	66	1	nogas	5741	0.02
As	75	1	nogas	343087	0.00
Sr	88	1	nogas	36973	0.01
Ag	107	1	nogas	20886	0.02
Cd	111	1	nogas	4181	0.18
Sb	121	1	nogas	22161	0.01
Tl	205	1	nogas	34323	0.01
Pb	208	1	nogas	51010	0.00
[Pb]	206	1	nogas	12365	0.02
[Pb]	207	1	nogas	11121	0.04
Na	23	2	He	102555	0.00
Mg	24	2	He	24156	0.01
Al	27	2	He	127	21.89
K	39	2	He	28826	0.01
Ca	43	2	He	60	96.23
Ca	44	2	He	980	1.20
V	51	2	He	3984	0.03
Cr	52	2	He	4734	0.08
Mn	55	2	He	1590	0.21
Fe	56	2	He	293527	0.00
Co	59	2	He	6285	0.08
Ni	60	2	He	1753	0.20
Cu	63	2	He	6161	0.03
Zn	66	2	He	827	2.93
As	75	2	He	652	0.70
Se	78	2	He	37	111.65
B	11	1	nogas	1352964	0.00
Si	28	1	nogas	1798540	0.00

Calibration Standard Report

Ca	43	1	nogas	5458	0.13
Ca	44	1	nogas	318486	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	4003593	0.00
Se	77	1	nogas	112761	0.00
Se	82	1	nogas	723	1.41
Mo	95	1	nogas	8779	0.03
Sn	118	1	nogas	12878	0.06
Ba	137	1	nogas	6145	0.07
Sb	121	2	He	2540	0.30
P	31	1	nogas	59023	0.00
La	139	1	nogas	67	90.93

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	324538	2.25	318818	101.79	70	125	
Ge	72	1	nogas	1583538	1.70	1556628	101.73	70	125	
In	115	1	nogas	1695072	3.10	1631900	103.87	70	125	
Bi	209	1	nogas	1515032	3.84	1453823	104.21	70	125	
Ge	72	2	He	137664	3.34	131050	105.05	70	125	

Calibration Standard Report

Sample Table

Sample Name	5/25/500
Data File Name	006CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:16:03-06:00
Sample Type	CalStd
Level	3
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	12871	0.02
Na	23	1	nogas	7813692	0.00
Mg	24	1	nogas	4270068	0.00
Al	27	1	nogas	65285	0.00
K	39	1	nogas	10325634	0.00
Ti	47	1	nogas	5781	0.06
V	51	1	nogas	2451673	0.00
Cr	52	1	nogas	127389	0.00
Mn	55	1	nogas	92890	0.00
Co	59	1	nogas	74667	0.00
Ni	60	1	nogas	18116	0.02
Cu	63	1	nogas	46721	0.01
Zn	66	1	nogas	14032	0.03
As	75	1	nogas	362578	0.00
Sr	88	1	nogas	90946	0.00
Ag	107	1	nogas	53769	0.00
Cd	111	1	nogas	10730	0.04
Sb	121	1	nogas	51176	0.01
Tl	205	1	nogas	86182	0.01
Pb	208	1	nogas	129587	0.00
[Pb]	206	1	nogas	31478	0.00
[Pb]	207	1	nogas	29514	0.01
Na	23	2	He	177965	0.00
Mg	24	2	He	61006	0.00
Al	27	2	He	197	13.01
K	39	2	He	49599	0.00
Ca	43	2	He	107	41.54
Ca	44	2	He	2247	0.29
V	51	2	He	8103	0.02
Cr	52	2	He	10126	0.07
Mn	55	2	He	3929	0.13
Fe	56	2	He	725194	0.00
Co	59	2	He	15767	0.03
Ni	60	2	He	4347	0.15
Cu	63	2	He	13292	0.01
Zn	66	2	He	1827	0.44
As	75	2	He	1557	0.36
Se	78	2	He	61	29.93
B	11	1	nogas	1434488	0.00
Si	28	1	nogas	2552097	0.00

Calibration Standard Report

Ca	43	1	nogas	11224	0.03
Ca	44	1	nogas	413814	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	8231548	0.00
Se	77	1	nogas	116407	0.00
Se	82	1	nogas	1240	0.72
Mo	95	1	nogas	20282	0.01
Sn	118	1	nogas	30798	0.01
Ba	137	1	nogas	14800	0.02
Sb	121	2	He	6295	0.03
P	31	1	nogas	73192	0.00
La	139	1	nogas	100	36.06

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	329596	3.94	318818	103.38	70	125	
Ge	72	1	nogas	1605796	3.75	1556628	103.16	70	125	
In	115	1	nogas	1664098	1.88	1631900	101.97	70	125	
Bi	209	1	nogas	1503749	3.84	1453823	103.43	70	125	
Ge	72	2	He	137532	1.70	131050	104.95	70	125	

Calibration Standard Report

Sample Table

Sample Name	10/50/1000
Data File Name	007CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:18:01-06:00
Sample Type	CalStd
Level	4
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	26489	0.02
Na	23	1	nogas	14294787	0.00
Mg	24	1	nogas	8602353	0.00
Al	27	1	nogas	116707	0.00
K	39	1	nogas	15678664	0.00
Ti	47	1	nogas	10530	0.03
V	51	1	nogas	2693625	0.00
Cr	52	1	nogas	201173	0.00
Mn	55	1	nogas	185120	0.00
Co	59	1	nogas	153003	0.00
Ni	60	1	nogas	36714	0.00
Cu	63	1	nogas	90562	0.00
Zn	66	1	nogas	27568	0.00
As	75	1	nogas	404632	0.00
Sr	88	1	nogas	187991	0.00
Ag	107	1	nogas	109924	0.00
Cd	111	1	nogas	22838	0.02
Sb	121	1	nogas	102601	0.00
Tl	205	1	nogas	178024	0.00
Pb	208	1	nogas	259179	0.00
[Pb]	206	1	nogas	62892	0.00
[Pb]	207	1	nogas	56482	0.00
Na	23	2	He	305242	0.00
Mg	24	2	He	122945	0.00
Al	27	2	He	443	2.89
K	39	2	He	84249	0.00
Ca	43	2	He	227	12.96
Ca	44	2	He	4222	0.29
V	51	2	He	15218	0.02
Cr	52	2	He	19925	0.01
Mn	55	2	He	7542	0.08
Fe	56	2	He	1386425	0.00
Co	59	2	He	31007	0.00
Ni	60	2	He	8932	0.03
Cu	63	2	He	26132	0.01
Zn	66	2	He	3800	0.21
As	75	2	He	2588	0.13
Se	78	2	He	103	18.85
B	11	1	nogas	1467926	0.00
Si	28	1	nogas	3813322	0.00

Calibration Standard Report

Ca	43	1	nogas	21626	0.02
Ca	44	1	nogas	590128	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	16155709	0.00
Se	77	1	nogas	125742	0.00
Se	82	1	nogas	2107	0.34
Mo	95	1	nogas	39949	0.00
Sn	118	1	nogas	62242	0.00
Ba	137	1	nogas	31112	0.01
Sb	121	2	He	11164	0.03
P	31	1	nogas	95199	0.00
La	139	1	nogas	103	14.31

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	335902	3.40	318818	105.36	70	125	
Ge	72	1	nogas	1621498	3.50	1556628	104.17	70	125	
In	115	1	nogas	1684124	5.26	1631900	103.20	70	125	
Bi	209	1	nogas	1501684	2.65	1453823	103.29	70	125	
Ge	72	2	He	137083	3.19	131050	104.60	70	125	

Calibration Standard Report

Sample Table

Sample Name	100/500/10K
Data File Name	008CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:20:00-06:00
Sample Type	CalStd
Level	5
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	251763	0.00
Na	23	1	nogas	123887849	0.00
Mg	24	1	nogas	80951910	0.00
Al	27	1	nogas	987313	0.00
K	39	1	nogas	98705413	0.00
Ti	47	1	nogas	96051	0.00
V	51	1	nogas	3716706	0.00
Cr	52	1	nogas	1254008	0.00
Mn	55	1	nogas	1542143	0.00
Co	59	1	nogas	1334754	0.00
Ni	60	1	nogas	315518	0.00
Cu	63	1	nogas	787528	0.00
Zn	66	1	nogas	252701	0.00
As	75	1	nogas	642976	0.00
Sr	88	1	nogas	1607772	0.00
Ag	107	1	nogas	1003983	0.00
Cd	111	1	nogas	211768	0.00
Sb	121	1	nogas	917596	0.00
Tl	205	1	nogas	1604718	0.00
Pb	208	1	nogas	2449671	0.00
[Pb]	206	1	nogas	605414	0.00
[Pb]	207	1	nogas	533617	0.00
Na	23	2	He	2347335	0.00
Mg	24	2	He	1070032	0.00
Al	27	2	He	3004	0.23
K	39	2	He	626303	0.00
Ca	43	2	He	2043	0.14
Ca	44	2	He	35374	0.00
V	51	2	He	128499	0.00
Cr	52	2	He	165765	0.00
Mn	55	2	He	66920	0.00
Fe	56	2	He	12014361	0.00
Co	59	2	He	289980	0.00
Ni	60	2	He	84225	0.00
Cu	63	2	He	233646	0.00
Zn	66	2	He	36156	0.01
As	75	2	He	25706	0.00
Se	78	2	He	977	1.14
B	11	1	nogas	2210183	0.00
Si	28	1	nogas	23624266	0.00

Calibration Standard Report

Ca	43	1	nogas	191475	0.00
Ca	44	1	nogas	3131885	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	135911361	0.00
Se	77	1	nogas	132163	0.00
Se	82	1	nogas	14890	0.01
Mo	95	1	nogas	357518	0.00
Sn	118	1	nogas	559712	0.00
Ba	137	1	nogas	284607	0.00
Sb	121	2	He	105800	0.00
P	31	1	nogas	391508	0.00
La	139	1	nogas	630	1.51

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	296364	3.79	318818	92.96	70	125	
Ge	72	1	nogas	1592215	2.34	1556628	102.29	70	125	
In	115	1	nogas	1658738	1.16	1631900	101.64	70	125	
Bi	209	1	nogas	1502150	2.51	1453823	103.32	70	125	
Ge	72	2	He	132045	4.01	131050	100.76	70	125	

Calibration Standard Report

Sample Table

Sample Name	200/1000/20K
Data File Name	009CALS.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:21:56-06:00
Sample Type	CalStd
Level	6
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Be	9	1	nogas	507130	0.00
Na	23	1	nogas	239036464	0.00
Mg	24	1	nogas	167936329	0.00
Al	27	1	nogas	1853347	0.00
K	39	1	nogas	195268492	0.00
Ti	47	1	nogas	193249	0.00
V	51	1	nogas	5211662	0.00
Cr	52	1	nogas	2445832	0.00
Mn	55	1	nogas	3139002	0.00
Co	59	1	nogas	2585197	0.00
Ni	60	1	nogas	611602	0.00
Cu	63	1	nogas	1432624	0.00
Zn	66	1	nogas	493156	0.00
As	75	1	nogas	975032	0.00
Sr	88	1	nogas	3244111	0.00
Ag	107	1	nogas	1937250	0.00
Cd	111	1	nogas	420152	0.00
Sb	121	1	nogas	1769970	0.00
Tl	205	1	nogas	3168933	0.00
Pb	208	1	nogas	4772832	0.00
[Pb]	206	1	nogas	1194314	0.00
[Pb]	207	1	nogas	1111988	0.00
Na	23	2	He	4697306	0.00
Mg	24	2	He	2168395	0.00
Al	27	2	He	5901	0.16
K	39	2	He	1219396	0.00
Ca	43	2	He	3957	0.12
Ca	44	2	He	71699	0.00
V	51	2	He	257761	0.00
Cr	52	2	He	339926	0.00
Mn	55	2	He	134096	0.00
Fe	56	2	He	24830366	0.00
Co	59	2	He	587874	0.00
Ni	60	2	He	165782	0.00
Cu	63	2	He	461004	0.00
Zn	66	2	He	70952	0.00
As	75	2	He	50383	0.00
Se	78	2	He	1916	0.15
B	11	1	nogas	2991824	0.00
Si	28	1	nogas	43104448	0.00

Calibration Standard Report

Ca	43	1	nogas	383085	0.00
Ca	44	1	nogas	5966578	0.00
Name	Mass	Tune Step	Tune Mode	CPS	%RSD
Fe	56	1	nogas	281952648	0.00
Se	77	1	nogas	162956	0.00
Se	82	1	nogas	29067	0.01
Mo	95	1	nogas	731875	0.00
Sn	118	1	nogas	1154201	0.00
Ba	137	1	nogas	569468	0.00
Sb	121	2	He	215835	0.00
P	31	1	nogas	746919	0.00
La	139	1	nogas	890	2.34

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	274309	5.17	318818	86.04	70	125	
Ge	72	1	nogas	1577363	1.44	1556628	101.33	70	125	
In	115	1	nogas	1580497	2.11	1631900	96.85	70	125	
Bi	209	1	nogas	1464885	2.87	1453823	100.76	70	125	
Ge	72	2	He	127474	0.58	131050	97.27	70	125	

Initial Calibration Verification (ICV) Report

Sample Table

Sample Name	ICV
Data File Name	011_ICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:25:57-06:00
Sample Type	ICV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	95.447	8.247	246869	0.35	100	95.4	90	110	
Na	23	1	nogas	9897.446	5.232	115608253	1.93	10000	99.0	90	110	
Mg	24	1	nogas	9476.474	5.681	76227808	2.48	10000	94.8	90	110	
Al	27	1	nogas	105.946	3.605	936477	1.79	100	105.9	90	110	
K	39	1	nogas	10066.505	7.473	94331052	3.53	10000	100.7	90	110	
Ti	47	1	nogas	99.843	1.361	90603	3.12	100	99.8	90	110	
V	51	1	nogas	76.333	15.633	3131120	1.51	100	76.3	90	110	ICV Main CR1 Failed
Cr	52	1	nogas	100.072	4.042	1175167	1.36	100	100.1	90	110	
Mn	55	1	nogas	100.588	7.035	1478214	3.03	100	100.6	90	110	
Co	59	1	nogas	104.959	8.998	1279604	5.10	100	105.0	90	110	
Ni	60	1	nogas	106.532	9.295	308193	5.28	100	106.5	90	110	
Cu	63	1	nogas	109.759	5.996	753786	1.96	100	109.8	90	110	
Zn	66	1	nogas	104.540	0.766	243735	3.48	100	104.5	90	110	
As	75	1	nogas	88.608	10.490	579022	0.85	100	88.6	90	110	ICV Main CR1 Failed
Sr	88	1	nogas	105.367	9.999	1598270	6.11	100	105.4	90	110	
Ag	107	1	nogas	103.558	1.425	948503	2.71	100	103.6	90	110	
Cd	111	1	nogas	100.243	4.209	203121	3.52	100	100.2	90	110	
Sb	121	1	nogas	108.308	5.746	906466	2.12	100	108.3	90	110	
Tl	205	1	nogas	107.084	1.604	1616072	1.61	100	107.1	90	110	
Pb	208	1	nogas	103.491	3.266	2357234	2.33	100	103.5	90	110	
U	238	1	nogas	103.490	2.478	2252894	0.41	100	103.5	90	110	
[Pb]	206	1	nogas	105.580	2.957	600092	0.78	100	105.6	90	110	
[Pb]	207	1	nogas	99.964	3.299	523448	1.58	100	100.0	90	110	
Na	23	2	He	9705.216	0.688	2264542	0.25	10000	97.1	90	110	
Mg	24	2	He	9592.905	0.784	1021709	0.51	10000	95.9	90	110	
Al	27	2	He	100.483	6.849	2957	6.65	100	100.5	90	110	
K	39	2	He	9601.831	1.649	595466	1.61	10000	96.0	90	110	
Ca	43	2	He	9697.032	14.818	1903	14.53	10000	97.0	90	110	
Ca	44	2	He	9264.215	3.905	32686	3.17	10000	92.6	90	110	
V	51	2	He	94.990	0.233	120815	1.00	100	95.0	90	110	
Cr	52	2	He	98.801	1.385	165065	2.20	100	98.8	90	110	
Mn	55	2	He	98.992	1.756	65404	0.92	100	99.0	90	110	
Fe	56	2	He	9495.330	3.871	11536792	3.46	10000	95.0	90	110	
Co	59	2	He	96.832	2.766	279507	2.28	100	96.8	90	110	
Ni	60	2	He	97.374	1.225	79684	1.27	100	97.4	90	110	
Cu	63	2	He	97.566	0.934	222340	1.76	100	97.6	90	110	
Zn	66	2	He	95.181	1.941	33358	2.79	100	95.2	90	110	
As	75	2	He	95.391	3.070	23798	2.26	100	95.4	90	110	
Se	78	2	He	95.479	6.233	907	6.13	100	95.5	90	110	
B	11	1	nogas	343.764	28.130	1786451	2.50	500	68.8	90	110	ICV Main CR1 Failed
Si	28	1	nogas	5345.579	3.397	22495876	1.63	5000	106.9	90	110	
Ca	43	1	nogas	10433.574	5.440	187811	3.08	10000	104.3	90	110	
Ca	44	1	nogas	10494.210	2.840	3058568	2.71	10000	104.9	90	110	
Fe	56	1	nogas	9905.497	7.205	130348745	3.49	10000	99.1	90	110	
Se	77	1	nogas	64.983	55.404	116065	4.43	100	65.0	90	110	ICV Main CR1 Failed
Se	82	1	nogas	102.038	6.297	14193	2.20	100	102.0	90	110	
Mo	95	1	nogas	103.148	8.592	352539	4.95	100	103.1	90	110	
Sn	118	1	nogas	99.939	1.071	552752	3.02	100	99.9	90	110	
Ba	137	1	nogas	100.187	3.396	274720	1.56	100	100.2	90	110	
Sb	121	2	He	97.105	3.532	102890	2.79	100	97.1	90	110	
Li	7	1	nogas	92.381	5.093	621675	3.50	100	92.4	90	110	
P	31	1	nogas	504.239	5.993	375641	1.25	500	100.8	90	110	
La	139	1	nogas	124.518	4.174	593	4.24	100	124.5	90	110	ICV Main CR1 Failed
Au	197	1	nogas	275.454	104.632	10	100.00	100	275.5	90	110	ICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	285407	8.30	318818	89.52	70	125	
Ge	72	1	nogas	1483486	4.11	1556628	95.30	70	125	
In	115	1	nogas	1536670	2.15	1631900	94.16	70	125	
Bi	209	1	nogas	1397399	2.87	1453823	96.12	70	125	

Initial Calibration Verification (ICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	126363	0.84	131050	96.42	70	125	

Sample Report

Sample Table

Sample Name	LLICV2
Data File Name	012SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:27:52-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.920	1.920	0.56	5461	0.04	2000	
Na	23	1	nogas	193.622	193.622	6.24	3933930	0.00	200000	
Mg	24	1	nogas	206.683	206.683	1.20	1734568	0.01	200000	
Al	27	1	nogas	2.479	2.479	5.46	31400	0.01	2000	
K	39	1	nogas	163.141	163.141	16.38	6676300	0.00	200000	
Ti	47	1	nogas	2.151	2.151	4.33	2260	0.10	2000	
V	51	1	nogas	-11.042	-11.042	-14.54	1917404	0.00	2000	
Cr	52	1	nogas	2.015	2.015	11.23	76756	0.00	2000	
Mn	55	1	nogas	2.247	2.247	5.14	42543	0.01	2000	
Co	59	1	nogas	2.379	2.379	9.81	29908	0.01	2000	
Ni	60	1	nogas	1.493	1.493	13.35	7445	0.02	2000	
Cu	63	1	nogas	2.145	2.145	8.90	20455	0.01	2000	
Zn	66	1	nogas	1.925	1.925	5.27	6028	0.03	2000	
As	75	1	nogas	-3.559	-3.559	-42.28	311981	0.00	2000	
Sr	88	1	nogas	2.304	2.304	4.48	36231	0.01	2000	
Ag	107	1	nogas	2.336	2.336	1.07	22254	0.01	2000	
Cd	111	1	nogas	2.013	2.013	5.28	4304	0.05	2000	
Sb	121	1	nogas	2.148	2.148	8.47	21036	0.01	2000	
Tl	205	1	nogas	3.289	3.289	13.90	52289	0.01	2000	
Pb	208	1	nogas	2.188	2.188	3.78	52794	0.00	2000	
U	238	1	nogas	2.314	2.314	2.36	53701	0.00	2000	
[Pb]	206	1	nogas	2.178	2.178	6.76	13126	0.02	2000	
[Pb]	207	1	nogas	2.167	2.167	6.36	12005	0.02	2000	
Na	23	2	He	203.751	203.751	2.57	95703	0.21	200000	
Mg	24	2	He	207.040	207.040	2.63	22177	0.93	200000	
Al	27	2	He	2.556	2.556	34.56	140	1.83	2000	
K	39	2	He	163.647	163.647	6.38	25591	0.64	200000	
Ca	43	2	He	153.787	153.787	124.47	37	419.42	200000	
Ca	44	2	He	184.836	184.836	23.91	807	22.91	200000	
V	51	2	He	2.142	2.142	4.60	3411	0.06	2000	
Cr	52	2	He	2.042	2.042	11.19	4564	0.04	2000	
Mn	55	2	He	2.131	2.131	7.82	1590	0.13	2000	
Fe	56	2	He	219.824	219.824	3.02	270873	0.08	200000	
Co	59	2	He	1.962	1.962	3.07	5664	0.03	2000	
Ni	60	2	He	2.281	2.281	4.89	1743	0.13	2000	
Cu	63	2	He	2.139	2.139	3.91	5471	0.04	2000	
Zn	66	2	He	2.285	2.285	2.75	750	0.30	2000	
As	75	2	He	1.900	1.900	13.62	588	0.32	2000	
Se	78	2	He	1.774	1.774	39.97	23	7.83	2000	
B	11	1	nogas	-138.179	-138.179	-13.53	888802	-0.02	2000	
Si	28	1	nogas	129.487	129.487	15.29	1831019	0.01	2000	
Ca	43	1	nogas	228.843	228.843	10.51	5298	4.32	200000	

Sample Report

Ca	44	1	nogas	168.966	168.966	18.11	296927	0.06	200000	
Fe	56	1	nogas	204.174	204.174	9.45	3746419	0.01	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	5.830	5.830	113.15	102413	0.01	2000	
Se	82	1	nogas	1.522	1.522	60.13	803	0.19	2000	
Mo	95	1	nogas	2.098	2.098	7.71	8572	0.02	2000	
Sn	118	1	nogas	2.087	2.087	7.35	13079	0.02	2000	
Ba	137	1	nogas	2.091	2.091	3.45	6191	0.03	2000	
Sb	121	2	He	2.038	2.038	2.01	2454	0.08	2000	
La	139	1	nogas	-3.214	-3.214	-282.12	63	-5.07	2000	
Au	197	1	nogas	379.667	379.667	85.65	7	5695.01	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	311129	3.48	318818	97.59	70	125	
Ge	72	1	nogas	1514105	1.99	1556628	97.27	70	125	
In	115	1	nogas	1619161	3.96	1631900	99.22	70	125	
Bi	209	1	nogas	1464195	1.26	1453823	100.71	70	125	
Ge	72	2	He	125952	2.01	131050	96.11	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLICV5
Data File Name	013LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:29:51-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	4.401	6.717	12061	3.44	5	88.0	70	130	
Na	23	1	nogas	512.129	2.069	7411361	1.52	500	102.4	70	130	
Mg	24	1	nogas	500.845	3.792	4010700	2.85	500	100.2	70	130	
Al	27	1	nogas	5.926	3.479	61091	1.61	5	118.5	70	130	
K	39	1	nogas	489.714	4.181	9466380	0.82	500	97.9	70	130	
Ti	47	1	nogas	5.023	12.016	4831	12.69	5	100.5	70	130	
V	51	1	nogas	-1.138	-262.530	2026569	4.18	5	-22.8	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	5.349	1.518	112939	2.40	5	107.0	70	130	
Mn	55	1	nogas	5.366	1.846	87584	2.58	5	107.3	70	130	
Co	59	1	nogas	5.678	2.069	69818	2.79	5	113.6	70	130	
Ni	60	1	nogas	4.807	4.621	16855	3.28	5	96.1	70	130	
Cu	63	1	nogas	5.397	2.465	42367	2.27	5	107.9	70	130	
Zn	66	1	nogas	4.917	1.934	12868	1.75	5	98.3	70	130	
As	75	1	nogas	3.469	90.596	327463	4.91	5	69.4	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	5.415	2.932	82998	1.24	5	108.3	70	130	
Ag	107	1	nogas	5.540	1.933	51273	3.11	5	110.8	70	130	
Cd	111	1	nogas	5.019	6.057	10453	4.12	5	100.4	70	130	
Sb	121	1	nogas	5.259	2.917	46734	0.88	5	105.2	70	130	
Tl	205	1	nogas	5.413	2.120	85636	2.02	5	108.3	70	130	
Pb	208	1	nogas	5.154	1.381	123269	0.34	5	103.1	70	130	
U	238	1	nogas	5.382	1.386	123370	0.19	5	107.6	70	130	
[Pb]	206	1	nogas	5.094	0.994	30416	1.15	5	101.9	70	130	
[Pb]	207	1	nogas	4.945	0.499	27187	1.30	5	98.9	70	130	
Na	23	2	He	520.953	3.772	165072	0.73	500	104.2	70	130	
Mg	24	2	He	533.587	3.648	55890	2.03	500	106.7	70	130	
Al	27	2	He	5.868	45.732	230	30.44	5	117.4	70	130	
K	39	2	He	476.978	1.382	44510	0.89	500	95.4	70	130	
Ca	43	2	He	625.920	19.014	127	19.87	500	125.2	70	130	
Ca	44	2	He	543.634	10.670	2030	10.74	500	108.7	70	130	
V	51	2	He	5.276	2.569	7242	3.74	5	105.5	70	130	
Cr	52	2	He	5.134	1.143	9523	3.10	5	102.7	70	130	
Mn	55	2	He	4.376	6.064	3014	3.67	5	87.5	70	130	
Fe	56	2	He	552.769	3.950	662704	2.18	500	110.6	70	130	
Co	59	2	He	4.993	4.966	14142	2.94	5	99.9	70	130	
Ni	60	2	He	5.632	1.503	4407	1.07	5	112.6	70	130	
Cu	63	2	He	5.222	2.573	12248	1.54	5	104.4	70	130	
Zn	66	2	He	5.240	3.808	1753	2.16	5	104.8	70	130	
As	75	2	He	4.936	2.600	1318	1.97	5	98.7	70	130	
Se	78	2	He	5.403	29.276	56	27.89	5	108.1	70	130	
B	11	1	nogas	-141.044	-12.002	853548	0.75	25	-564.2	70	130	LLICV Main CR1 Failed
Si	28	1	nogas	272.663	7.153	2368572	1.27	25	1090.7	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	565.870	5.078	11260	6.32	500	113.2	70	130	
Ca	44	1	nogas	506.484	3.540	382437	0.82	500	101.3	70	130	
Fe	56	1	nogas	506.641	1.294	7649347	1.37	500	101.3	70	130	
Se	77	1	nogas	21.030	18.299	104709	3.06	5	420.6	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	4.159	19.690	1143	11.14	5	83.2	70	130	
Mo	95	1	nogas	5.188	5.640	18987	3.58	5	103.8	70	130	
Sn	118	1	nogas	4.924	0.923	28858	1.16	5	98.5	70	130	
Ba	137	1	nogas	5.147	2.620	14660	1.64	5	102.9	70	130	
Sb	121	2	He	4.845	1.728	5321	1.17	5	96.9	70	130	
Li	7	1	nogas	4.218	2.232	56616	4.23	5	84.4	70	130	
P	31	1	nogas	27.605	11.951	66139	1.17	25	110.4	70	130	
La	139	1	nogas	1.915	366.303	83	34.64	5	38.3	70	130	LLICV Main CR1 Failed
Au	197	1	nogas	379.048	43.037	7	86.60	5	7581.0	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	300943	3.61	318818	94.39	70	125	
Ge	72	1	nogas	1487198	2.07	1556628	95.54	70	125	
In	115	1	nogas	1580160	2.05	1631900	96.83	70	125	
Bi	209	1	nogas	1460316	1.19	1453823	100.45	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Ge	72	2	He	123893	2.11	131050	94.54	70	125	

Initial Calibration Blank (ICB) Report

Sample Table

Sample Name	ICB
Data File Name	014_ICB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:31:50-06:00
Sample Type	ICB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.027	38.6	100	30.0	1	
Na	23	1	nogas	-10.532	-59.1	1478096	1.7	100	
Mg	24	1	nogas	0.900	53.6	11907	37.5	100	
Al	27	1	nogas	0.138	27.3	10236	3.1	5	
K	39	1	nogas	-31.045	-65.2	4813859	0.8	100	
Ti	47	1	nogas	-0.058	-227.0	213	52.3	2.5	
V	51	1	nogas	-5.341	-130.6	1957768	2.8	2.5	
Cr	52	1	nogas	-0.121	-188.1	51154	2.0	2.5	
Mn	55	1	nogas	0.039	122.7	9379	5.9	2.5	
Co	59	1	nogas	0.004	72.7	323	12.5	2.5	
Ni	60	1	nogas	-0.778	-1.6	777	7.5	2.5	
Cu	63	1	nogas	-0.253	-7.0	3677	4.4	2.5	
Zn	66	1	nogas	-0.335	-15.2	660	14.6	2.5	
As	75	1	nogas	-1.446	-361.2	311543	3.7	2.5	
Sr	88	1	nogas	0.013	45.6	687	12.6	2.5	
Ag	107	1	nogas	0.030	75.4	680	31.6	2.5	
Cd	111	1	nogas	0.014	56.5	30	57.7	1	
Sb	121	1	nogas	-0.144	-22.8	1470	15.6	2.5	
Tl	205	1	nogas	0.136	34.4	2384	32.2	1	
Pb	208	1	nogas	-0.005	-77.8	437	23.5	2.5	
U	238	1	nogas	-0.023	-23.9	400	32.5	2.5	
[Pb]	206	1	nogas	-0.007	-25.7	103	11.2	2.5	
[Pb]	207	1	nogas	-0.007	-75.3	77	39.8	2.5	
Na	23	2	He	-3.495	-303.3	49254	2.6	100	
Mg	24	2	He	0.172	194.6	230	15.1	100	
Al	27	2	He	-1.416	-35.8	27	57.3	5	
K	39	2	He	-33.426	-13.5	13692	2.0	100	
Ca	43	2	He	0.536	5374.4	7	86.6	100	
Ca	44	2	He	2.983	130.7	173	8.8	100	
V	51	2	He	0.291	13.0	1095	3.8	2.5	
Cr	52	2	He	0.020	120.4	1243	3.3	2.5	
Mn	55	2	He	-0.027	-186.2	177	18.2	2.5	
Fe	56	2	He	0.624	44.2	5658	3.9	100	
Co	59	2	He	0.015	134.6	67	87.9	2.5	
Ni	60	2	He	0.467	19.1	267	30.1	2.5	
Cu	63	2	He	0.155	40.5	993	15.7	2.5	
Zn	66	2	He	0.358	3.3	77	7.5	2.5	
As	75	2	He	-0.200	-20.8	70	12.6	2.5	
Se	78	2	He	0.902	101.7	15	61.5	2.5	
B	11	1	nogas	-192.188	-5.6	774803	2.5	10	
Si	28	1	nogas	-0.497	-1576.1	1277628	2.0	5	
Ca	43	1	nogas	23.342	41.1	1503	10.6	100	
Ca	44	1	nogas	-69.577	-35.4	226816	0.5	100	
Fe	56	1	nogas	-10.688	-6.2	862392	2.2	100	
Se	77	1	nogas	12.595	149.0	102014	2.7	2.5	ICB Main CR1 Failed
Se	82	1	nogas	-0.262	-333.8	550	22.8	2.5	

Initial Calibration Blank (ICB) Report

Mo	95	1	nogas	-0.154	-19.1	717	13.4	2.5	
Sn	118	1	nogas	0.133	104.5	1688	47.7	5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Ba	137	1	nogas	0.028	75.3	237	27.2	2.5	
Sb	121	2	He	-0.121	-77.7	183	55.2	2.5	
P	31	1	nogas	1.048	396.8	48646	2.6	10	
La	139	1	nogas	28.312	80.2	200	48.2	2.5	ICB Main CR1 Failed
Au	197	1	nogas	-104.752	-148.7	23	24.7	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	313182	0.99	318818	98.23	70	125	
Ge	72	1	nogas	1482812	3.05	1556628	95.26	70	125	
In	115	1	nogas	1609395	1.33	1631900	98.62	70	125	
Bi	209	1	nogas	1438924	1.43	1453823	98.98	70	125	
Ge	72	2	He	127833	2.39	131050	97.55	70	125	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	015ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:33:49-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.025	71.5	87	53.3	0	ICSA Main CR1 Failed
Na	23	1	nogas	101906.413	2.7	1119877458	0.7	0	
Mg	24	1	nogas	94910.069	5.0	726941366	3.4	0	
Al	27	1	nogas	104826.108	5.0	839160841	1.3	0	
K	39	1	nogas	102707.699	3.7	838472735	1.2	0	
Ti	47	1	nogas	2214.972	5.6	1831473	1.8	0	
V	51	1	nogas	-15.132	-33.2	1662874	0.2	0	ICSA Main CR1 Failed
Cr	52	1	nogas	1.637	18.4	64857	2.5	0	ICSA Main CR1 Failed
Mn	55	1	nogas	0.322	11.9	12374	2.5	0	ICSA Main CR1 Failed
Co	59	1	nogas	0.158	2.2	2013	2.0	0	ICSA Main CR1 Failed
Ni	60	1	nogas	-0.166	-71.6	2324	15.8	0	ICSA Main CR1 Failed
Cu	63	1	nogas	0.857	13.8	10283	4.9	0	ICSA Main CR1 Failed
Zn	66	1	nogas	1.135	9.3	3720	4.3	0	ICSA Main CR1 Failed
As	75	1	nogas	1.235	332.9	292345	0.2	0	ICSA Main CR1 Failed
Sr	88	1	nogas	1.074	7.5	15364	4.0	0	ICSA Main CR1 Failed
Ag	107	1	nogas	0.028	48.0	607	15.7	0	ICSA Main CR1 Failed
Cd	111	1	nogas	1.151	9.2	2194	10.7	0	ICSA Main CR1 Failed
Sb	121	1	nogas	-0.106	-10.5	1640	7.6	0	ICSA Main CR1 Failed
Tl	205	1	nogas	0.049	15.3	933	8.7	0	ICSA Main CR1 Failed
Pb	208	1	nogas	0.091	12.1	2440	7.4	0	ICSA Main CR1 Failed
[Pb]	206	1	nogas	0.081	13.1	563	12.8	0	ICSA Main CR1 Failed
[Pb]	207	1	nogas	0.088	18.0	533	11.0	0	ICSA Main CR1 Failed
Na	23	2	He	99455.370	2.2	21228196	0.7	0	
Mg	24	2	He	96166.338	2.0	9556387	0.7	0	
Al	27	2	He	93684.028	1.8	2514657	0.5	0	
K	39	2	He	88908.518	0.5	5383983	0.5	0	
Ca	43	2	He	95410.701	4.3	17439	5.6	0	
Ca	44	2	He	92685.487	0.7	303905	0.9	0	
V	51	2	He	0.242	26.1	954	8.9	0	ICSA Main CR1 Failed
Cr	52	2	He	1.455	7.4	3367	4.1	0	ICSA Main CR1 Failed
Mn	55	2	He	0.201	47.5	303	18.2	0	ICSA Main CR1 Failed
Fe	56	2	He	96573.588	0.7	109485515	1.4	0	
Co	59	2	He	0.013	90.8	57	56.7	0	ICSA Main CR1 Failed
Ni	60	2	He	0.522	4.7	287	5.3	0	ICSA Main CR1 Failed
Cu	63	2	He	0.484	7.9	1613	5.8	0	ICSA Main CR1 Failed
Zn	66	2	He	0.793	3.4	213	2.7	0	ICSA Main CR1 Failed
As	75	2	He	-0.071	-137.1	94	23.5	0	ICSA Main CR1 Failed
Se	78	2	He	-0.023	-594.6	5	21.7	0	ICSA Main CR1 Failed
B	11	1	nogas	-161.175	-16.3	779183	4.5	0	ICSA Main CR1 Failed
Si	28	1	nogas	109.574	5.3	1569261	2.6	0	
Ca	43	1	nogas	100365.466	5.6	1643884	1.8	0	
Ca	44	1	nogas	106745.948	5.0	26381970	1.3	0	
Fe	56	1	nogas	100916.057	1.7	1208444827	3.1	0	
Se	77	1	nogas	33.433	44.2	98518	0.4	0	
Se	82	1	nogas	0.033	2008.7	540	18.5	0	ICSA Main CR1 Failed
Mo	95	1	nogas	2098.242	4.1	6547167	1.6	0	
Sn	118	1	nogas	0.077	27.7	1227	12.3	0	ICSA Main CR1 Failed
Ba	137	1	nogas	0.046	69.0	260	35.3	0	ICSA Main CR1 Failed
Sb	121	2	He	-0.126	-17.5	163	12.7	0	ICSA Main CR1 Failed

Interference Check Solution A (ICS-A) Report

P	31	1	nogas	98551.152	2.7	58675776	1.2	0	
La	139	1	nogas	46.332	23.4	250	14.4	0	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	289398	2.54	318818	90.77	70	125	
Ge	72	1	nogas	1357181	3.93	1556628	87.19	70	125	
In	115	1	nogas	1443578	3.32	1631900	88.46	70	125	
Bi	209	1	nogas	1307824	3.47	1453823	89.96	70	125	
Ge	72	2	He	117939	1.40	131050	90.00	70	125	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	016ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:35:54-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	87.899	7.151	218976	3.39	100	87.9	80	120	
Na	23	1	nogas	107490.439	2.170	1199001393	2.39	100	107490.4	80	120	ICSB Main CR1 Failed
Mg	24	1	nogas	100156.905	5.998	778875917	6.05	100	100156.9	80	120	ICSB Main CR1 Failed
Al	27	1	nogas	101973.358	3.618	820628094	0.78	100	101973.4	80	120	ICSB Main CR1 Failed
K	39	1	nogas	112381.954	7.855	920683921	4.91	100	112382.0	80	120	
Ti	47	1	nogas	2225.142	5.567	1849345	3.18	100	2225.1	80	120	ICSB Main CR1 Failed
V	51	1	nogas	79.512	6.100	2923286	1.83	100	79.5	80	120	
Cr	52	1	nogas	100.085	3.386	1080688	1.06	100	100.1	80	120	
Mn	55	1	nogas	93.083	5.398	1259222	3.28	100	93.1	80	120	
Co	59	1	nogas	99.979	2.217	1122630	1.09	100	100.0	80	120	
Ni	60	1	nogas	101.848	4.120	271396	0.80	100	101.8	80	120	
Cu	63	1	nogas	103.937	4.435	656914	2.37	100	103.9	80	120	
Zn	66	1	nogas	100.722	2.668	215852	2.25	100	100.7	80	120	
As	75	1	nogas	95.622	2.510	552027	2.80	100	95.6	80	120	
Sr	88	1	nogas	102.430	2.266	1431592	2.48	100	102.4	80	120	
Ag	107	1	nogas	98.023	1.113	825408	2.29	100	98.0	80	120	
Cd	111	1	nogas	92.582	2.801	177357	4.31	100	92.6	80	120	
Sb	121	1	nogas	106.166	5.284	817118	2.36	100	106.2	80	120	
Tl	205	1	nogas	94.164	3.013	1327735	3.42	100	94.2	80	120	
Pb	208	1	nogas	97.398	4.805	2071236	0.08	100	97.4	80	120	
U	238	1	nogas	98.659	4.873	2005253	0.46	100	98.7	80	120	
[Pb]	206	1	nogas	96.420	3.846	511897	1.32	100	96.4	80	120	
[Pb]	207	1	nogas	94.399	5.485	461455	0.74	100	94.4	80	120	
Na	23	2	He	106046.354	3.705	22458448	1.89	100	106046.4	80	120	ICSB Main CR1 Failed
Mg	24	2	He	103171.820	3.677	10174000	2.03	100	103171.8	80	120	ICSB Main CR1 Failed
Al	27	2	He	94470.643	5.333	2515755	3.49	100	94470.6	80	120	ICSB Main CR1 Failed
K	39	2	He	96324.738	2.152	5831772	2.15	100	96324.7	80	120	ICSB Main CR1 Failed
Ca	43	2	He	101190.933	1.246	18349	1.75	100	101190.9	80	120	ICSB Main CR1 Failed
Ca	44	2	He	99399.022	2.362	323412	0.55	100	99399.0	80	120	ICSB Main CR1 Failed
V	51	2	He	92.103	2.130	108523	1.68	100	92.1	80	120	
Cr	52	2	He	93.508	0.308	144769	1.58	100	93.5	80	120	
Mn	55	2	He	91.724	3.999	56134	2.23	100	91.7	80	120	
Fe	56	2	He	105258.888	4.114	118389995	2.37	100	105258.9	80	120	
Co	59	2	He	91.686	6.566	245030	4.97	100	91.7	80	120	
Ni	60	2	He	88.631	6.891	67134	5.33	100	88.6	80	120	
Cu	63	2	He	89.431	2.312	188808	1.86	100	89.4	80	120	
Zn	66	2	He	92.074	1.311	29885	0.85	100	92.1	80	120	
As	75	2	He	92.067	1.507	21284	1.72	100	92.1	80	120	
Se	78	2	He	92.221	8.194	812	9.44	100	92.2	80	120	
B	11	1	nogas	197.990	22.977	1438974	1.96	100	198.0	80	120	ICSB Main CR1 Failed
Si	28	1	nogas	5294.018	2.205	20498336	1.76	100	5294.0	80	120	ICSB Main CR1 Failed
Ca	43	1	nogas	110653.206	2.377	1822878	2.37	100	110653.2	80	120	
Ca	44	1	nogas	115790.673	2.167	28757468	1.15	100	115790.7	80	120	
Fe	56	1	nogas	107096.311	2.407	1288170029	0.89	100	107096.3	80	120	ICSB Main CR1 Failed
Se	77	1	nogas	102.391	6.125	116245	3.73	100	102.4	80	120	ICSB Main CR1 Failed
Se	82	1	nogas	100.208	0.244	12842	3.10	100	100.2	80	120	
Mo	95	1	nogas	2162.693	4.945	6781529	3.43	100	2162.7	80	120	ICSB Main CR1 Failed
Sn	118	1	nogas	94.346	1.351	492992	1.55	100	94.3	80	120	
Ba	137	1	nogas	95.455	1.899	247411	2.10	100	95.5	80	120	
Sb	121	2	He	93.301	2.021	91590	0.46	100	93.3	80	120	
La	139	1	nogas	172.203	19.003	750	18.67	100	172.2	80	120	ICSB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	274178	4.38	318818	86.00	70	125	
Ge	72	1	nogas	1363622	3.33	1556628	87.60	70	125	
In	115	1	nogas	1451896	1.53	1631900	88.97	70	125	
Bi	209	1	nogas	1306134	4.91	1453823	89.84	70	125	
Ge	72	2	He	117064	1.82	131050	89.33	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	022_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:47:57-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	98.219	1.569	261483	1.74	100	98.2	90	110	
Na	23	1	nogas	9645.322	5.558	120915240	2.62	10000	96.5	90	110	
Mg	24	1	nogas	9244.723	4.249	79809537	1.46	10000	92.4	90	110	
Al	27	1	nogas	101.422	4.670	965135	1.96	100	101.4	90	110	
K	39	1	nogas	9525.196	5.426	96428602	2.18	10000	95.3	90	110	
Ti	47	1	nogas	100.035	2.007	97676	1.10	100	100.0	90	110	
V	51	1	nogas	77.807	14.200	3394177	2.49	100	77.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	98.734	2.599	1249172	1.57	100	98.7	90	110	
Mn	55	1	nogas	97.013	3.013	1537472	4.30	100	97.0	90	110	
Co	59	1	nogas	100.641	2.473	1322974	0.65	100	100.6	90	110	
Ni	60	1	nogas	100.833	2.829	314733	1.85	100	100.8	90	110	
Cu	63	1	nogas	104.611	6.675	773612	3.49	100	104.6	90	110	
Zn	66	1	nogas	100.749	3.650	252694	0.61	100	100.7	90	110	
As	75	1	nogas	77.446	9.517	587846	2.86	100	77.4	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	101.842	4.780	1665297	1.68	100	101.8	90	110	
Ag	107	1	nogas	99.754	3.077	983261	2.90	100	99.8	90	110	
Cd	111	1	nogas	96.169	2.117	210940	1.68	100	96.2	90	110	
Sb	121	1	nogas	105.615	4.213	951942	1.28	100	105.6	90	110	
Tl	205	1	nogas	106.023	2.934	1688147	1.31	100	106.0	90	110	
Pb	208	1	nogas	104.036	4.327	2500476	3.38	100	104.0	90	110	
U	238	1	nogas	100.729	2.836	2315564	4.58	100	100.7	90	110	
[Pb]	206	1	nogas	106.720	4.346	639971	1.93	100	106.7	90	110	
[Pb]	207	1	nogas	100.911	2.417	557702	1.20	100	100.9	90	110	
Na	23	2	He	10170.166	1.727	2375003	1.48	10000	101.7	90	110	
Mg	24	2	He	9866.150	2.757	1052709	2.52	10000	98.7	90	110	
Al	27	2	He	99.126	6.160	2924	6.24	100	99.1	90	110	
K	39	2	He	9855.384	1.623	610776	1.58	10000	98.6	90	110	
Ca	43	2	He	9897.906	1.272	1947	1.07	10000	99.0	90	110	
Ca	44	2	He	9544.717	1.755	33738	1.51	10000	95.4	90	110	
V	51	2	He	98.730	0.604	125771	0.68	100	98.7	90	110	
Cr	52	2	He	99.181	0.516	165983	0.38	100	99.2	90	110	
Mn	55	2	He	101.393	4.096	67110	3.85	100	101.4	90	110	
Fe	56	2	He	9924.839	1.913	12081535	1.68	10000	99.2	90	110	
Co	59	2	He	103.126	0.925	298241	0.71	100	103.1	90	110	
Ni	60	2	He	101.272	2.289	83029	2.07	100	101.3	90	110	
Cu	63	2	He	100.231	0.629	228798	0.52	100	100.2	90	110	
Zn	66	2	He	99.445	0.823	34914	0.81	100	99.4	90	110	
As	75	2	He	99.050	1.690	24756	1.89	100	99.1	90	110	
Se	78	2	He	98.692	7.453	939	7.29	100	98.7	90	110	
B	11	1	nogas	379.070	2.929	1915134	0.47	500	75.8	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5008.303	7.123	22755389	3.58	5000	100.2	90	110	
Ca	43	1	nogas	9883.074	4.970	191548	1.82	10000	98.8	90	110	
Ca	44	1	nogas	9944.147	5.777	3131260	2.58	10000	99.4	90	110	
Fe	56	1	nogas	9373.131	2.303	133027374	3.34	10000	93.7	90	110	
Se	77	1	nogas	30.835	71.403	115125	3.13	100	30.8	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	97.357	1.895	14619	1.33	100	97.4	90	110	
Mo	95	1	nogas	100.335	7.253	369354	4.10	100	100.3	90	110	
Sn	118	1	nogas	96.971	3.942	580083	0.18	100	97.0	90	110	
Ba	137	1	nogas	98.155	4.003	291255	0.61	100	98.2	90	110	
Sb	121	2	He	102.537	2.876	108841	2.66	100	102.5	90	110	
Li	7	1	nogas	94.105	4.824	650084	4.44	100	94.1	90	110	
P	31	1	nogas	481.337	5.696	388404	2.12	500	96.3	90	110	
La	139	1	nogas	115.790	21.711	603	19.77	100	115.8	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-101.527	-723.334	23	107.85	100	-101.5	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	292439	0.95	318818	91.73	70	125	
Ge	72	1	nogas	1596425	3.08	1556628	102.56	70	125	
In	115	1	nogas	1663773	3.78	1631900	101.95	70	125	
Bi	209	1	nogas	1474658	2.79	1453823	101.43	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	126593	0.24	131050	96.60	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	023_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T10:49:53-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.159	50.1	487	47.3	1	
Na	23	1	nogas	7.994	139.4	1728767	6.5	100	
Mg	24	1	nogas	14.127	59.6	123489	56.4	100	
Al	27	1	nogas	1.537	19.1	23672	12.5	5	
K	39	1	nogas	-47.876	-27.6	4906748	1.4	100	
Ti	47	1	nogas	0.148	5.5	423	1.4	2.5	
V	51	1	nogas	-14.401	-32.3	1922585	2.5	2.5	
Cr	52	1	nogas	-0.490	-17.8	49476	0.5	2.5	
Mn	55	1	nogas	0.233	33.7	12861	10.6	2.5	
Co	59	1	nogas	0.132	75.1	1984	64.8	2.5	
Ni	60	1	nogas	-0.622	-23.0	1290	34.1	2.5	
Cu	63	1	nogas	-0.124	-35.5	4791	7.6	2.5	
Zn	66	1	nogas	-0.296	-20.7	793	19.7	2.5	
As	75	1	nogas	-14.554	-32.2	286664	3.8	2.5	
Sr	88	1	nogas	0.138	60.3	2727	49.4	2.5	
Ag	107	1	nogas	0.318	51.0	3494	45.4	2.5	
Cd	111	1	nogas	0.107	77.5	230	75.4	1	
Sb	121	1	nogas	-0.003	-3130.2	2790	31.7	2.5	
Tl	205	1	nogas	1.258	47.8	20763	49.7	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.123	75.7	3620	65.7	2.5	
U	238	1	nogas	0.144	79.8	4361	64.5	2.5	
[Pb]	206	1	nogas	0.117	64.1	873	55.4	2.5	
[Pb]	207	1	nogas	0.122	94.0	817	82.2	2.5	
Na	23	2	He	8.307	64.0	51637	2.0	100	
Mg	24	2	He	5.425	5.0	790	1.3	100	
Al	27	2	He	1.941	16.8	123	9.4	5	
K	39	2	He	-31.824	-44.7	13789	6.2	100	
Ca	43	2	He	68.105	145.7	20	100.0	100	
Ca	44	2	He	18.314	57.1	227	18.4	100	
V	51	2	He	0.325	37.5	1129	11.5	2.5	
Cr	52	2	He	-0.004	-2704.6	1193	12.6	2.5	
Mn	55	2	He	0.025	31.2	210	0.0	2.5	
Fe	56	2	He	5.644	9.1	11737	2.9	100	
Co	59	2	He	0.042	24.0	143	22.4	2.5	
Ni	60	2	He	0.458	24.5	257	36.8	2.5	
Cu	63	2	He	0.224	49.3	1140	20.4	2.5	
Zn	66	2	He	0.380	30.9	83	48.5	2.5	
As	75	2	He	-0.199	-26.6	70	20.8	2.5	
Se	78	2	He	0.286	44.0	9	13.3	2.5	
B	11	1	nogas	-159.161	-13.5	870383	2.5	10	
Si	28	1	nogas	-7.659	-67.6	1313737	1.4	5	
Ca	43	1	nogas	47.699	31.3	2040	13.6	100	
Ca	44	1	nogas	-205.288	-5.1	200342	1.4	100	
Fe	56	1	nogas	9.915	137.1	1190701	16.2	100	
Se	77	1	nogas	-34.325	-44.4	93971	3.7	2.5	
Se	82	1	nogas	-0.510	-179.3	543	25.1	2.5	
Mo	95	1	nogas	0.085	145.4	1613	28.2	2.5	
Sn	118	1	nogas	0.208	50.3	2167	26.3	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.115	54.8	493	34.7	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.081	-84.1	223	29.8	2.5	
P	31	1	nogas	-1.921	-97.8	49164	2.3	10	
La	139	1	nogas	3.150	132.5	93	22.3	2.5	CCB Main CR1 Failed
Au	197	1	nogas	102.339	563.0	17	124.9	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	321581	3.31	318818	100.87	70	125	
Ge	72	1	nogas	1559006	1.64	1556628	100.15	70	125	
In	115	1	nogas	1651416	2.49	1631900	101.20	70	125	
Bi	209	1	nogas	1495794	2.71	1453823	102.89	70	125	
Ge	72	2	He	126930	2.44	131050	96.86	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	034_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T11:11:53-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	89.026	3.505	253255	3.36	100	89.0	90	110	CCV Main CR1-2 Failed
Na	23	1	nogas	9494.039	1.839	121449349	1.39	10000	94.9	90	110	
Mg	24	1	nogas	9066.850	1.001	79851500	2.34	10000	90.7	90	110	
Al	27	1	nogas	103.580	5.679	989845	0.15	100	103.6	90	110	
K	39	1	nogas	9606.864	4.058	97724848	2.16	10000	96.1	90	110	
Ti	47	1	nogas	101.449	7.086	99413	2.86	100	101.4	90	110	
V	51	1	nogas	64.760	25.754	3203843	2.83	100	64.8	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	98.607	7.275	1252098	2.14	100	98.6	90	110	
Mn	55	1	nogas	97.632	8.175	1551965	4.43	100	97.6	90	110	
Co	59	1	nogas	100.311	9.935	1322045	5.08	100	100.3	90	110	
Ni	60	1	nogas	98.437	5.853	308548	0.49	100	98.4	90	110	
Cu	63	1	nogas	102.684	4.201	763720	2.35	100	102.7	90	110	
Zn	66	1	nogas	101.072	4.439	254766	2.86	100	101.1	90	110	
As	75	1	nogas	72.369	20.990	573319	2.91	100	72.4	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	97.935	5.645	1608714	0.83	100	97.9	90	110	
Ag	107	1	nogas	101.560	7.314	1004301	1.70	100	101.6	90	110	
Cd	111	1	nogas	96.579	2.042	209407	0.53	100	96.6	90	110	
Sb	121	1	nogas	103.236	3.610	935444	2.45	100	103.2	90	110	
Tl	205	1	nogas	101.458	2.328	1632958	0.90	100	101.5	90	110	
Pb	208	1	nogas	101.971	2.716	2477388	1.58	100	102.0	90	110	
U	238	1	nogas	99.973	3.570	2321275	2.30	100	100.0	90	110	
[Pb]	206	1	nogas	100.903	1.786	611855	1.00	100	100.9	90	110	
[Pb]	207	1	nogas	96.205	3.413	537297	1.02	100	96.2	90	110	
Na	23	2	He	9832.135	2.417	2306489	0.73	10000	98.3	90	110	
Mg	24	2	He	9813.601	2.230	1051158	0.93	10000	98.1	90	110	
Al	27	2	He	100.102	11.678	2960	10.09	100	100.1	90	110	
K	39	2	He	9755.091	1.453	604720	1.41	10000	97.6	90	110	
Ca	43	2	He	10330.922	3.571	2040	4.27	10000	103.3	90	110	
Ca	44	2	He	9600.482	0.700	34072	1.52	10000	96.0	90	110	
V	51	2	He	96.361	1.968	123242	0.38	100	96.4	90	110	
Cr	52	2	He	96.525	3.649	162185	2.91	100	96.5	90	110	
Mn	55	2	He	97.693	3.231	64912	1.59	100	97.7	90	110	
Fe	56	2	He	9470.674	2.563	11574818	2.51	10000	94.7	90	110	
Co	59	2	He	97.545	3.818	283209	3.62	100	97.5	90	110	
Ni	60	2	He	99.769	0.914	82121	0.87	100	99.8	90	110	
Cu	63	2	He	99.760	2.939	228593	1.97	100	99.8	90	110	
Zn	66	2	He	97.351	2.467	34319	3.39	100	97.4	90	110	
As	75	2	He	97.324	1.167	24423	1.51	100	97.3	90	110	
Se	78	2	He	95.151	4.235	909	3.52	100	95.2	90	110	
B	11	1	nogas	233.529	5.261	1722285	2.14	500	46.7	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5166.353	5.556	23552058	2.02	5000	103.3	90	110	
Ca	43	1	nogas	9648.975	3.400	188060	2.43	10000	96.5	90	110	
Ca	44	1	nogas	9749.037	5.993	3089436	1.34	10000	97.5	90	110	
Fe	56	1	nogas	9541.028	7.531	135823395	3.21	10000	95.4	90	110	
Se	77	1	nogas	13.795	262.652	110500	4.07	100	13.8	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	98.477	9.251	14820	3.34	100	98.5	90	110	
Mo	95	1	nogas	96.786	6.602	358006	1.11	100	96.8	90	110	
Sn	118	1	nogas	96.315	1.040	569929	1.73	100	96.3	90	110	
Ba	137	1	nogas	97.112	4.204	284927	2.77	100	97.1	90	110	
Sb	121	2	He	97.040	0.675	103447	1.96	100	97.0	90	110	
Li	7	1	nogas	87.176	3.673	645602	2.87	100	87.2	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	483.224	6.039	391557	1.07	500	96.6	90	110	
La	139	1	nogas	123.752	23.836	630	19.50	100	123.8	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-267.013	-99.760	30	33.33	100	-267.0	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	312508	1.29	318818	98.02	70	125	
Ge	72	1	nogas	1605648	5.91	1556628	103.15	70	125	
In	115	1	nogas	1644172	1.68	1631900	100.75	70	125	
Bi	209	1	nogas	1490442	2.58	1453823	102.52	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	127107	1.68	131050	96.99	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	035_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T11:13:50-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.188	52.3	620	49.1	1	
Na	23	1	nogas	72.214	3.1	2530148	1.4	100	
Mg	24	1	nogas	17.954	43.2	158000	42.3	100	
Al	27	1	nogas	0.920	14.0	17392	5.3	5	
K	39	1	nogas	-2.876	-514.6	5158933	1.5	100	
Ti	47	1	nogas	0.249	40.0	503	19.1	2.5	
V	51	1	nogas	-23.515	-27.5	1728936	5.4	2.5	
Cr	52	1	nogas	-0.389	-4.3	49075	1.4	2.5	
Mn	55	1	nogas	0.357	27.0	14292	9.2	2.5	
Co	59	1	nogas	0.210	49.4	2877	43.7	2.5	
Ni	60	1	nogas	-0.405	-11.0	1883	8.0	2.5	
Cu	63	1	nogas	0.199	63.1	6881	11.8	2.5	
Zn	66	1	nogas	-0.112	-90.9	1200	19.6	2.5	
As	75	1	nogas	-12.186	-33.3	284942	4.6	2.5	
Sr	88	1	nogas	0.255	35.1	4444	30.2	2.5	
Ag	107	1	nogas	0.190	37.7	2180	29.6	2.5	
Cd	111	1	nogas	0.205	49.0	447	51.1	1	
Sb	121	1	nogas	0.089	117.7	3477	24.7	2.5	
Tl	205	1	nogas	1.249	52.5	20443	52.3	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.183	45.0	5050	40.3	2.5	
U	238	1	nogas	0.198	51.1	5561	42.8	2.5	
[Pb]	206	1	nogas	0.185	45.4	1277	40.5	2.5	
[Pb]	207	1	nogas	0.182	48.8	1140	44.2	2.5	
Na	23	2	He	76.993	10.7	66232	2.3	100	
Mg	24	2	He	11.896	8.3	1457	6.5	100	
Al	27	2	He	0.377	376.6	77	52.7	5	
K	39	2	He	-23.924	-25.2	14266	2.6	100	
Ca	43	2	He	36.252	81.8	13	43.3	100	
Ca	44	2	He	16.000	235.2	213	59.7	100	
V	51	2	He	0.266	9.8	1038	2.2	2.5	
Cr	52	2	He	-0.060	-53.6	1083	5.9	2.5	
Mn	55	2	He	0.056	138.8	227	21.8	2.5	
Fe	56	2	He	10.259	9.0	17078	6.3	100	
Co	59	2	He	0.090	47.3	280	43.9	2.5	
Ni	60	2	He	0.501	19.6	287	27.1	2.5	
Cu	63	2	He	0.364	13.4	1437	7.1	2.5	
Zn	66	2	He	0.411	17.3	93	27.0	2.5	
As	75	2	He	-0.130	-110.4	86	40.9	2.5	
Se	78	2	He	0.158	391.4	7	78.7	2.5	
B	11	1	nogas	-234.769	-3.5	755568	1.4	10	
Si	28	1	nogas	-10.215	-38.4	1262018	0.7	5	
Ca	43	1	nogas	42.090	11.9	1873	3.7	100	
Ca	44	1	nogas	-276.230	-7.5	174639	2.3	100	
Fe	56	1	nogas	19.594	70.5	1280637	13.6	100	
Se	77	1	nogas	-22.531	-85.7	94277	5.4	2.5	
Se	82	1	nogas	-0.173	-380.2	570	14.4	2.5	
Mo	95	1	nogas	0.103	125.3	1623	27.1	2.5	
Sn	118	1	nogas	0.254	31.7	2434	21.5	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.185	40.8	700	33.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.059	-49.5	243	12.6	2.5	
P	31	1	nogas	4.627	37.0	51948	0.9	10	
La	139	1	nogas	-2.655	-289.4	67	52.7	2.5	
Au	197	1	nogas	-84.702	-832.5	23	107.9	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	348202	1.96	318818	109.22	70	125	
Ge	72	1	nogas	1509872	1.38	1556628	97.00	70	125	
In	115	1	nogas	1638465	1.99	1631900	100.40	70	125	
Bi	209	1	nogas	1493166	0.62	1453823	102.71	70	125	
Ge	72	2	He	124751	1.10	131050	95.19	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	046_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T11:36:07-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	91.226	8.157	229598	2.44	100	91.2	90	110	
Na	23	1	nogas	9897.549	1.688	111857594	0.15	10000	99.0	90	110	
Mg	24	1	nogas	9093.463	0.909	70788987	1.31	10000	90.9	90	110	
Al	27	1	nogas	102.268	2.963	860717	0.50	100	102.3	90	110	
K	39	1	nogas	9757.793	5.096	87237223	2.12	10000	97.6	90	110	
Ti	47	1	nogas	99.423	1.787	85844	1.10	100	99.4	90	110	
V	51	1	nogas	70.909	16.893	2906477	2.91	100	70.9	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	99.223	4.030	1109425	1.05	100	99.2	90	110	
Mn	55	1	nogas	94.175	7.584	1318116	4.78	100	94.2	90	110	
Co	59	1	nogas	102.489	3.569	1191207	2.20	100	102.5	90	110	
Ni	60	1	nogas	101.822	5.808	280856	3.61	100	101.8	90	110	
Cu	63	1	nogas	106.296	4.762	695434	3.24	100	106.3	90	110	
Zn	66	1	nogas	101.619	2.350	225422	1.16	100	101.6	90	110	
As	75	1	nogas	69.147	14.891	496049	3.16	100	69.1	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	99.201	4.292	1434527	1.48	100	99.2	90	110	
Ag	107	1	nogas	100.068	2.944	871975	0.82	100	100.1	90	110	
Cd	111	1	nogas	95.995	0.967	187020	1.19	100	96.0	90	110	
Sb	121	1	nogas	105.325	4.360	839468	2.00	100	105.3	90	110	
Tl	205	1	nogas	101.350	3.596	1463445	3.67	100	101.4	90	110	
Pb	208	1	nogas	102.970	1.439	2244351	1.46	100	103.0	90	110	
U	238	1	nogas	98.457	0.952	2051075	0.53	100	98.5	90	110	
[Pb]	206	1	nogas	104.161	2.019	566626	2.46	100	104.2	90	110	
[Pb]	207	1	nogas	97.523	1.866	488732	1.92	100	97.5	90	110	
Na	23	2	He	9855.050	4.835	2089175	1.30	10000	98.6	90	110	
Mg	24	2	He	9668.937	4.652	935992	1.74	10000	96.7	90	110	
Al	27	2	He	96.668	5.384	2594	8.75	100	96.7	90	110	
K	39	2	He	8622.884	1.113	536358	1.08	10000	86.2	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	10618.052	7.214	1893	4.49	10000	106.2	90	110	
Ca	44	2	He	9124.452	2.691	29283	2.23	10000	91.2	90	110	
V	51	2	He	94.501	2.570	109305	2.25	100	94.5	90	110	
Cr	52	2	He	96.410	2.711	146482	1.91	100	96.4	90	110	
Mn	55	2	He	93.659	2.424	56287	1.83	100	93.7	90	110	
Fe	56	2	He	9336.678	2.446	10317563	2.08	10000	93.4	90	110	
Co	59	2	He	95.983	3.312	251903	0.56	100	96.0	90	110	
Ni	60	2	He	95.659	1.803	71192	1.96	100	95.7	90	110	
Cu	63	2	He	97.258	2.310	201568	2.57	100	97.3	90	110	
Zn	66	2	He	96.424	1.839	30730	1.77	100	96.4	90	110	
As	75	2	He	97.595	3.497	22137	1.56	100	97.6	90	110	
Se	78	2	He	94.578	8.072	816	4.68	100	94.6	90	110	
B	11	1	nogas	143.398	32.005	1346715	2.10	500	28.7	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5200.376	4.532	20856957	1.49	5000	104.0	90	110	
Ca	43	1	nogas	9866.057	3.090	169155	1.03	10000	98.7	90	110	
Ca	44	1	nogas	9862.844	3.567	2749470	2.35	10000	98.6	90	110	
Fe	56	1	nogas	9384.724	6.252	117647294	3.44	10000	93.8	90	110	
Se	77	1	nogas	1.054	2359.934	94116	4.42	100	1.1	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.922	6.633	13242	3.56	100	99.9	90	110	
Mo	95	1	nogas	98.622	1.665	321409	1.51	100	98.6	90	110	
Sn	118	1	nogas	94.773	1.021	503884	2.51	100	94.8	90	110	
Ba	137	1	nogas	96.905	1.596	255505	1.09	100	96.9	90	110	
Sb	121	2	He	97.190	5.544	93588	2.15	100	97.2	90	110	
Li	7	1	nogas	89.310	5.672	585353	3.12	100	89.3	90	110	CCV Main CR1-2 Failed
P	31	1	nogas	490.096	6.596	348834	3.29	500	98.0	90	110	
La	139	1	nogas	82.669	20.016	403	18.77	100	82.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	48.018	1873.520	17	173.21	100	48.0	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	277306	5.65	318818	86.98	70	125	
Ge	72	1	nogas	1411527	2.74	1556628	90.68	70	125	
In	115	1	nogas	1477185	2.13	1631900	90.52	70	125	
Bi	209	1	nogas	1336693	1.32	1453823	91.94	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	114967	3.53	131050	87.73	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	047_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T11:38:05-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.136	43.8	427	39.4	1	
Na	23	1	nogas	207.188	2.7	3895266	0.7	100	CCB Main CR1 Failed
Mg	24	1	nogas	19.154	46.0	156539	44.8	100	
Al	27	1	nogas	0.398	18.3	12238	6.5	5	
K	39	1	nogas	10.204	60.2	5063342	1.7	100	
Ti	47	1	nogas	0.155	41.7	400	15.2	2.5	
V	51	1	nogas	-12.939	-52.2	1806174	3.4	2.5	
Cr	52	1	nogas	-0.523	-46.7	45580	4.3	2.5	
Mn	55	1	nogas	0.297	17.0	12868	7.4	2.5	
Co	59	1	nogas	0.163	58.1	2217	53.2	2.5	
Ni	60	1	nogas	-0.266	-53.9	2200	20.5	2.5	
Cu	63	1	nogas	0.171	36.9	6425	8.5	2.5	
Zn	66	1	nogas	-0.087	-75.0	1210	13.3	2.5	
As	75	1	nogas	-13.443	-43.7	269476	4.5	2.5	
Sr	88	1	nogas	0.364	5.4	5891	6.1	2.5	
Ag	107	1	nogas	0.118	62.8	1463	47.9	2.5	
Cd	111	1	nogas	0.155	74.2	313	73.1	1	
Sb	121	1	nogas	0.085	120.6	3317	27.0	2.5	
Tl	205	1	nogas	1.209	44.1	18856	47.6	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.146	58.1	3950	54.3	2.5	
U	238	1	nogas	0.159	79.9	4454	67.6	2.5	
[Pb]	206	1	nogas	0.157	81.3	1060	74.4	2.5	
[Pb]	207	1	nogas	0.146	49.7	893	47.3	2.5	
Na	23	2	He	246.743	10.3	97659	2.8	100	CCB Main CR1 Failed
Mg	24	2	He	10.652	22.0	1237	16.2	100	
Al	27	2	He	0.554	92.8	77	19.9	5	
K	39	2	He	-18.233	-50.4	14609	3.8	100	
Ca	43	2	He	40.502	72.6	13	43.3	100	
Ca	44	2	He	34.769	72.1	260	29.0	100	
V	51	2	He	0.369	5.1	1091	3.6	2.5	
Cr	52	2	He	0.034	338.6	1160	18.1	2.5	
Mn	55	2	He	0.026	213.2	193	14.9	2.5	
Fe	56	2	He	6.242	8.0	11467	3.8	100	
Co	59	2	He	0.046	20.9	143	16.1	2.5	
Ni	60	2	He	0.349	3.2	153	3.8	2.5	
Cu	63	2	He	0.265	20.4	1137	8.8	2.5	
Zn	66	2	He	0.316	40.8	57	73.5	2.5	
As	75	2	He	-0.187	-61.9	67	37.8	2.5	
Se	78	2	He	-0.092	-637.5	5	107.9	2.5	
B	11	1	nogas	-293.912	-2.1	573212	0.2	10	
Si	28	1	nogas	13.577	61.3	1302974	2.6	5	CCB Main CR1 Failed
Ca	43	1	nogas	47.349	10.4	1890	5.1	100	
Ca	44	1	nogas	-305.287	-3.4	159939	1.0	100	
Fe	56	1	nogas	23.696	41.7	1283456	11.9	100	
Se	77	1	nogas	-33.877	-60.9	87389	4.5	2.5	
Se	82	1	nogas	-1.083	-68.9	430	24.5	2.5	
Mo	95	1	nogas	0.011	1189.6	1257	37.8	2.5	
Sn	118	1	nogas	0.221	64.3	2094	35.8	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.149	46.5	557	32.7	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	0.008	1363.0	293	36.5	2.5	
P	31	1	nogas	3.826	18.3	49338	2.2	10	
La	139	1	nogas	-6.442	-169.2	47	96.6	2.5	
Au	197	1	nogas	-512.950	-29.3	37	15.7	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	327945	2.73	318818	102.86	70	125	
Ge	72	1	nogas	1448504	2.07	1556628	93.05	70	125	
In	115	1	nogas	1541457	2.28	1631900	94.46	70	125	
Bi	209	1	nogas	1407757	4.17	1453823	96.83	70	125	
Ge	72	2	He	116715	2.82	131050	89.06	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	058_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T12:00:05-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	93.796	2.562	241451	1.87	100	93.8	90	110	
Na	23	1	nogas	9871.440	4.879	114764553	2.49	10000	98.7	90	110	
Mg	24	1	nogas	9411.548	5.746	75339856	3.05	10000	94.1	90	110	
Al	27	1	nogas	104.677	3.853	906950	1.90	100	104.7	90	110	
K	39	1	nogas	9668.939	5.031	89056846	1.50	10000	96.7	90	110	
Ti	47	1	nogas	99.386	2.136	88380	2.46	100	99.4	90	110	
V	51	1	nogas	86.159	13.071	3207837	1.17	100	86.2	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	101.303	7.530	1164284	3.45	100	101.3	90	110	
Mn	55	1	nogas	99.321	5.237	1431470	1.56	100	99.3	90	110	
Co	59	1	nogas	99.799	3.725	1194321	1.20	100	99.8	90	110	
Ni	60	1	nogas	100.037	7.829	283983	4.30	100	100.0	90	110	
Cu	63	1	nogas	104.635	2.876	705164	1.01	100	104.6	90	110	
Zn	66	1	nogas	102.560	1.919	234314	2.14	100	102.6	90	110	
As	75	1	nogas	84.071	14.945	554061	2.86	100	84.1	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	99.971	6.069	1488079	2.93	100	100.0	90	110	
Ag	107	1	nogas	102.901	5.244	922899	2.06	100	102.9	90	110	
Cd	111	1	nogas	96.352	1.738	194680	2.68	100	96.4	90	110	
Sb	121	1	nogas	104.602	4.534	858454	1.50	100	104.6	90	110	
Tl	205	1	nogas	101.163	6.158	1536048	3.56	100	101.2	90	110	
Pb	208	1	nogas	101.315	3.221	2323278	0.47	100	101.3	90	110	
U	238	1	nogas	95.873	3.179	2102807	4.65	100	95.9	90	110	
[Pb]	206	1	nogas	101.576	6.253	580914	2.99	100	101.6	90	110	
[Pb]	207	1	nogas	95.867	3.927	505370	0.96	100	95.9	90	110	
Na	23	2	He	9768.104	5.699	2099307	4.87	10000	97.7	90	110	
Mg	24	2	He	9785.491	2.921	960256	2.48	10000	97.9	90	110	
Al	27	2	He	103.192	6.499	2797	6.71	100	103.2	90	110	
K	39	2	He	8874.952	1.359	551577	1.32	10000	88.7	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	10382.404	8.268	1880	10.11	10000	103.8	90	110	
Ca	44	2	He	9393.104	3.446	30542	3.76	10000	93.9	90	110	
V	51	2	He	96.702	2.580	113289	0.56	100	96.7	90	110	
Cr	52	2	He	98.820	2.396	152082	0.55	100	98.8	90	110	
Mn	55	2	He	99.868	0.707	60805	1.57	100	99.9	90	110	
Fe	56	2	He	9492.879	2.355	10628900	2.52	10000	94.9	90	110	
Co	59	2	He	98.834	2.641	262841	1.19	100	98.8	90	110	
Ni	60	2	He	99.682	0.477	75171	1.59	100	99.7	90	110	
Cu	63	2	He	100.032	2.207	209986	0.78	100	100.0	90	110	
Zn	66	2	He	99.403	2.817	32092	1.59	100	99.4	90	110	
As	75	2	He	97.855	1.088	22496	1.79	100	97.9	90	110	
Se	78	2	He	99.412	5.665	869	4.69	100	99.4	90	110	
B	11	1	nogas	94.634	35.122	1277685	3.53	500	18.9	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5314.643	3.911	21924312	0.26	5000	106.3	90	110	
Ca	43	1	nogas	9956.214	4.604	175708	1.09	10000	99.6	90	110	
Ca	44	1	nogas	9896.822	6.002	2838294	2.04	10000	99.0	90	110	
Fe	56	1	nogas	9506.071	5.288	122710828	1.66	10000	95.1	90	110	
Se	77	1	nogas	51.879	64.628	110316	4.45	100	51.9	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	98.423	12.331	13419	8.29	100	98.4	90	110	
Mo	95	1	nogas	98.430	5.597	330039	1.81	100	98.4	90	110	
Sn	118	1	nogas	93.688	1.815	516584	3.23	100	93.7	90	110	
Ba	137	1	nogas	97.522	1.684	266629	0.36	100	97.5	90	110	
Sb	121	2	He	98.408	2.656	96067	0.68	100	98.4	90	110	
Li	7	1	nogas	90.487	1.275	605570	1.86	100	90.5	90	110	
P	31	1	nogas	503.519	4.335	367872	0.54	500	100.7	90	110	
La	139	1	nogas	109.209	26.872	527	21.84	100	109.2	90	110	
Au	197	1	nogas	-229.645	-324.340	27	94.37	100	-229.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	282824	1.74	318818	88.71	70	125	
Ge	72	1	nogas	1453934	3.87	1556628	93.40	70	125	
In	115	1	nogas	1531688	1.44	1631900	93.86	70	125	
Bi	209	1	nogas	1407195	3.27	1453823	96.79	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	116447	2.01	131050	88.86	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	059_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T12:02:03-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.142	44.7	447	41.4	1	
Na	23	1	nogas	66.532	4.7	2381714	3.5	100	
Mg	24	1	nogas	15.314	55.8	131633	55.8	100	
Al	27	1	nogas	0.442	14.8	12805	6.4	5	
K	39	1	nogas	6.268	127.5	5103704	0.9	100	
Ti	47	1	nogas	0.181	87.2	430	34.9	2.5	
V	51	1	nogas	-0.982	-751.1	2003507	3.3	2.5	
Cr	52	1	nogas	-0.046	-475.8	51566	2.7	2.5	
Mn	55	1	nogas	0.346	32.7	13779	13.9	2.5	
Co	59	1	nogas	0.163	72.7	2257	65.9	2.5	
Ni	60	1	nogas	-0.524	-11.4	1497	13.4	2.5	
Cu	63	1	nogas	0.029	484.4	5568	19.3	2.5	
Zn	66	1	nogas	-0.212	-59.8	943	33.1	2.5	
As	75	1	nogas	-3.874	-173.8	301655	4.6	2.5	
Sr	88	1	nogas	0.224	41.8	3887	38.7	2.5	
Ag	107	1	nogas	0.132	48.1	1610	37.9	2.5	
Cd	111	1	nogas	0.154	85.0	313	83.2	1	
Sb	121	1	nogas	-0.015	-544.9	2537	29.2	2.5	
Tl	205	1	nogas	1.263	51.0	20559	51.9	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.138	71.4	3937	62.6	2.5	
U	238	1	nogas	0.158	80.7	4614	65.9	2.5	
[Pb]	206	1	nogas	0.129	72.6	930	62.5	2.5	
[Pb]	207	1	nogas	0.134	74.2	870	65.7	2.5	
Na	23	2	He	90.249	7.4	67112	1.8	100	
Mg	24	2	He	6.506	17.5	863	13.3	100	
Al	27	2	He	0.451	154.0	77	27.2	5	
K	39	2	He	-21.935	-56.6	14386	5.2	100	
Ca	43	2	He	-14.673	-213.0	3	173.2	100	
Ca	44	2	He	-1.927	-926.3	147	39.4	100	
V	51	2	He	0.377	12.2	1141	4.4	2.5	
Cr	52	2	He	0.058	274.3	1233	18.6	2.5	
Mn	55	2	He	0.003	3841.7	187	36.5	2.5	
Fe	56	2	He	5.420	10.2	10927	4.1	100	
Co	59	2	He	0.043	48.6	140	39.8	2.5	
Ni	60	2	He	0.392	17.5	193	29.4	2.5	
Cu	63	2	He	0.264	48.8	1177	23.4	2.5	
Zn	66	2	He	0.349	29.8	70	51.5	2.5	
As	75	2	He	-0.219	-59.8	62	52.6	2.5	
Se	78	2	He	0.178	248.1	7	56.8	2.5	
B	11	1	nogas	-318.082	-2.6	514626	2.7	10	
Si	28	1	nogas	-2.929	-89.7	1257428	1.2	5	
Ca	43	1	nogas	26.694	39.5	1553	13.6	100	
Ca	44	1	nogas	-369.407	-2.0	145288	0.7	100	
Fe	56	1	nogas	17.908	61.4	1227816	13.7	100	
Se	77	1	nogas	7.456	396.6	99742	5.9	2.5	CCB Main CR1 Failed
Se	82	1	nogas	-1.026	-47.4	443	16.0	2.5	
Mo	95	1	nogas	0.011	816.0	1273	26.1	2.5	
Sn	118	1	nogas	0.256	53.3	2317	31.0	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.149	97.4	560	69.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.107	-20.9	187	11.2	2.5	
P	31	1	nogas	7.176	8.9	52229	1.5	10	
La	139	1	nogas	4.413	53.4	93	12.4	2.5	CCB Main CR1 Failed
Au	197	1	nogas	379.505	85.8	7	173.2	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	326644	2.95	318818	102.45	70	125	
Ge	72	1	nogas	1470092	2.04	1556628	94.44	70	125	
In	115	1	nogas	1559718	1.90	1631900	95.58	70	125	
Bi	209	1	nogas	1480545	1.74	1453823	101.84	70	125	
Ge	72	2	He	120961	2.01	131050	92.30	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	070_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T12:23:58-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	98.998	5.493	230204	2.50	100	99.0	90	110	
Na	23	1	nogas	9787.316	4.595	113216398	5.91	10000	97.9	90	110	
Mg	24	1	nogas	9406.544	3.424	74897437	3.67	10000	94.1	90	110	
Al	27	1	nogas	104.678	1.188	912335	3.26	100	104.7	90	110	
K	39	1	nogas	9314.442	5.381	86448827	3.63	10000	93.1	90	110	
Ti	47	1	nogas	99.042	3.313	88551	4.14	100	99.0	90	110	
V	51	1	nogas	75.676	3.168	3079183	2.50	100	75.7	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	97.237	4.892	1127103	4.85	100	97.2	90	110	
Mn	55	1	nogas	94.680	1.077	1373371	1.61	100	94.7	90	110	
Co	59	1	nogas	99.606	5.808	1198565	5.36	100	99.6	90	110	
Ni	60	1	nogas	99.479	4.164	284244	3.20	100	99.5	90	110	
Cu	63	1	nogas	102.556	3.256	694857	1.46	100	102.6	90	110	
Zn	66	1	nogas	99.302	2.034	228072	0.51	100	99.3	90	110	
As	75	1	nogas	78.609	5.316	541787	3.60	100	78.6	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	98.347	4.527	1472319	2.40	100	98.3	90	110	
Ag	107	1	nogas	99.612	0.336	898931	2.12	100	99.6	90	110	
Cd	111	1	nogas	96.454	2.656	188530	1.83	100	96.5	90	110	
Sb	121	1	nogas	104.040	3.376	858598	1.26	100	104.0	90	110	
Tl	205	1	nogas	96.680	3.002	1431486	2.40	100	96.7	90	110	
Pb	208	1	nogas	101.528	2.512	2269040	1.27	100	101.5	90	110	
U	238	1	nogas	97.801	4.555	2088316	1.97	100	97.8	90	110	
[Pb]	206	1	nogas	100.333	2.094	559631	0.64	100	100.3	90	110	
[Pb]	207	1	nogas	96.386	2.733	495276	1.52	100	96.4	90	110	
Na	23	2	He	10121.271	0.592	2101461	0.64	10000	101.2	90	110	
Mg	24	2	He	10054.804	2.555	953771	2.53	10000	100.5	90	110	
Al	27	2	He	92.450	8.776	2427	7.84	100	92.5	90	110	
K	39	2	He	8388.096	2.636	522181	2.56	10000	83.9	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	10294.595	4.326	1800	4.81	10000	102.9	90	110	
Ca	44	2	He	9610.684	2.728	30199	2.51	10000	96.1	90	110	
V	51	2	He	97.792	1.680	110753	1.69	100	97.8	90	110	
Cr	52	2	He	99.637	2.679	148227	2.47	100	99.6	90	110	
Mn	55	2	He	99.053	0.756	58293	1.42	100	99.1	90	110	
Fe	56	2	He	9601.838	1.681	10390776	1.23	10000	96.0	90	110	
Co	59	2	He	99.392	2.339	255523	1.96	100	99.4	90	110	
Ni	60	2	He	99.714	2.364	72671	1.83	100	99.7	90	110	
Cu	63	2	He	98.544	2.560	199969	2.00	100	98.5	90	110	
Zn	66	2	He	96.494	0.917	30115	0.72	100	96.5	90	110	
As	75	2	He	100.524	0.503	22334	1.20	100	100.5	90	110	
Se	78	2	He	96.466	7.331	816	7.75	100	96.5	90	110	
B	11	1	nogas	104.796	27.148	1257010	1.30	500	21.0	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5125.388	0.599	21311044	1.67	5000	102.5	90	110	
Ca	43	1	nogas	9562.737	2.485	169782	1.33	10000	95.6	90	110	
Ca	44	1	nogas	9378.672	0.864	2719197	1.97	10000	93.8	90	110	
Fe	56	1	nogas	9247.973	3.367	120104153	2.01	10000	92.5	90	110	
Se	77	1	nogas	39.776	19.052	107858	3.00	100	39.8	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	93.907	5.254	12925	4.01	100	93.9	90	110	
Mo	95	1	nogas	94.881	4.476	320004	2.36	100	94.9	90	110	
Sn	118	1	nogas	95.287	0.785	508391	2.91	100	95.3	90	110	
Ba	137	1	nogas	99.944	4.976	264265	2.44	100	99.9	90	110	
Sb	121	2	He	100.198	1.333	94559	0.99	100	100.2	90	110	
Li	7	1	nogas	101.023	3.138	580986	3.46	100	101.0	90	110	
P	31	1	nogas	478.291	4.866	353721	3.21	500	95.7	90	110	
La	139	1	nogas	106.337	14.170	500	14.42	100	106.3	90	110	
Au	197	1	nogas	263.866	199.253	10	173.21	100	263.9	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	274086	5.01	318818	85.97	70	125	
Ge	72	1	nogas	1461075	2.13	1556628	93.86	70	125	
In	115	1	nogas	1482327	2.49	1631900	90.83	70	125	
Bi	209	1	nogas	1371083	2.74	1453823	94.31	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	112542	0.75	131050	85.88	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	071_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T12:25:55-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.166	59.6	473	58.2	1	
Na	23	1	nogas	52.335	12.5	2166431	3.7	100	
Mg	24	1	nogas	16.197	60.9	135590	59.2	100	
Al	27	1	nogas	0.998	101.4	17508	49.1	5	
K	39	1	nogas	-14.134	-48.3	4903560	1.0	100	
Ti	47	1	nogas	0.147	67.5	397	23.4	2.5	
V	51	1	nogas	-14.506	-50.6	1803467	4.7	2.5	
Cr	52	1	nogas	-0.469	-7.2	46699	1.7	2.5	
Mn	55	1	nogas	0.413	12.5	14669	6.1	2.5	
Co	59	1	nogas	0.178	70.7	2424	64.1	2.5	
Ni	60	1	nogas	-0.573	-11.8	1350	15.4	2.5	
Cu	63	1	nogas	-0.049	-378.1	5011	26.2	2.5	
Zn	66	1	nogas	-0.213	-27.0	933	14.3	2.5	
As	75	1	nogas	-10.611	-46.1	280759	4.2	2.5	
Sr	88	1	nogas	0.184	49.8	3257	43.5	2.5	
Ag	107	1	nogas	0.138	57.4	1650	44.6	2.5	
Cd	111	1	nogas	0.192	69.0	393	69.0	1	
Sb	121	1	nogas	0.050	177.3	3064	25.2	2.5	
Tl	205	1	nogas	1.282	57.3	19758	54.6	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.154	72.9	4074	61.2	2.5	
U	238	1	nogas	0.188	79.9	5021	63.8	2.5	
[Pb]	206	1	nogas	0.157	76.9	1043	64.5	2.5	
[Pb]	207	1	nogas	0.137	71.0	837	59.8	2.5	
Na	23	2	He	74.840	2.7	62202	0.9	100	
Mg	24	2	He	5.877	20.5	780	15.5	100	
Al	27	2	He	0.649	247.5	80	54.5	5	
K	39	2	He	-36.411	-33.3	13512	5.4	100	
Ca	43	2	He	3.957	1605.2	7	173.2	100	
Ca	44	2	He	-4.107	-118.5	137	11.2	100	
V	51	2	He	0.283	16.0	1003	4.8	2.5	
Cr	52	2	He	0.103	77.9	1277	9.8	2.5	
Mn	55	2	He	-0.006	-336.7	177	6.5	2.5	
Fe	56	2	He	6.479	9.9	11871	6.3	100	
Co	59	2	He	0.048	41.6	150	35.3	2.5	
Ni	60	2	He	0.417	19.3	207	29.6	2.5	
Cu	63	2	He	0.220	25.0	1053	11.5	2.5	
Zn	66	2	He	0.325	24.9	60	44.1	2.5	
As	75	2	He	-0.206	-61.9	63	46.8	2.5	
Se	78	2	He	-0.099	-264.8	5	49.5	2.5	
B	11	1	nogas	-327.654	-3.3	479701	2.4	10	
Si	28	1	nogas	15.544	14.8	1324536	1.0	5	CCB Main CR1 Failed
Ca	43	1	nogas	20.338	55.0	1433	14.7	100	
Ca	44	1	nogas	-387.127	-0.1	140002	1.2	100	
Fe	56	1	nogas	9.271	123.8	1110158	14.5	100	
Se	77	1	nogas	-15.826	-97.4	93171	3.3	2.5	
Se	82	1	nogas	-0.377	-71.3	527	7.7	2.5	
Mo	95	1	nogas	0.006	1447.0	1250	26.0	2.5	
Sn	118	1	nogas	0.286	32.4	2480	21.2	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.127	52.2	500	36.7	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.073	-129.6	217	42.9	2.5	
P	31	1	nogas	2.094	106.9	48736	2.1	10	
La	139	1	nogas	5.276	243.3	97	57.0	2.5	CCB Main CR1 Failed
Au	197	1	nogas	172.733	265.3	13	114.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	318507	4.22	318818	99.90	70	125	
Ge	72	1	nogas	1463774	1.12	1556628	94.03	70	125	
In	115	1	nogas	1550053	1.09	1631900	94.98	70	125	
Bi	209	1	nogas	1419469	2.13	1453823	97.64	70	125	
Ge	72	2	He	118010	0.52	131050	90.05	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	082_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T12:47:42-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	92.139	3.849	239540	2.81	100	92.1	90	110	
Na	23	1	nogas	9356.788	1.219	111513482	1.11	10000	93.6	90	110	
Mg	24	1	nogas	8922.168	1.837	73172056	0.83	10000	89.2	90	110	CCV Main CR1-2 Failed
Al	27	1	nogas	114.657	4.870	988358	5.88	100	114.7	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10140.831	4.933	92725296	3.23	10000	101.4	90	110	
Ti	47	1	nogas	99.631	1.336	88164	2.46	100	99.6	90	110	
V	51	1	nogas	76.347	6.334	3056562	1.72	100	76.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.319	3.807	1149130	2.95	100	100.3	90	110	
Mn	55	1	nogas	95.741	4.769	1373778	2.68	100	95.7	90	110	
Co	59	1	nogas	100.587	8.654	1197037	6.51	100	100.6	90	110	
Ni	60	1	nogas	101.753	6.998	287551	4.82	100	101.8	90	110	
Cu	63	1	nogas	106.601	5.116	714518	2.95	100	106.6	90	110	
Zn	66	1	nogas	103.341	1.303	234926	2.01	100	103.3	90	110	
As	75	1	nogas	78.866	8.025	536785	2.57	100	78.9	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	98.746	3.950	1463493	2.35	100	98.7	90	110	
Ag	107	1	nogas	102.017	0.581	911286	2.37	100	102.0	90	110	
Cd	111	1	nogas	97.964	4.016	191487	2.78	100	98.0	90	110	
Sb	121	1	nogas	105.188	3.758	859245	2.32	100	105.2	90	110	
Tl	205	1	nogas	97.734	3.484	1452691	0.83	100	97.7	90	110	
Pb	208	1	nogas	98.609	5.201	2211704	2.26	100	98.6	90	110	
U	238	1	nogas	99.469	5.020	2132450	2.22	100	99.5	90	110	
[Pb]	206	1	nogas	99.767	1.440	558904	2.11	100	99.8	90	110	
[Pb]	207	1	nogas	95.227	2.073	491466	2.45	100	95.2	90	110	
Na	23	2	He	10122.027	4.561	2139152	2.85	10000	101.2	90	110	
Mg	24	2	He	9889.360	2.568	955063	1.32	10000	98.9	90	110	
Al	27	2	He	101.145	6.640	2700	7.44	100	101.1	90	110	
K	39	2	He	8718.538	2.197	542133	2.13	10000	87.2	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	9825.650	16.861	1747	15.51	10000	98.3	90	110	
Ca	44	2	He	9466.718	1.944	30305	4.04	10000	94.7	90	110	
V	51	2	He	97.267	2.913	112145	1.07	100	97.3	90	110	
Cr	52	2	He	99.737	1.075	151110	2.34	100	99.7	90	110	
Mn	55	2	He	98.255	1.260	58881	1.88	100	98.3	90	110	
Fe	56	2	He	9424.948	2.360	10384690	1.17	10000	94.2	90	110	
Co	59	2	He	98.062	3.546	256637	1.61	100	98.1	90	110	
Ni	60	2	He	99.035	5.336	73468	3.96	100	99.0	90	110	
Cu	63	2	He	100.360	3.076	207347	2.16	100	100.4	90	110	
Zn	66	2	He	98.746	1.977	31388	3.00	100	98.7	90	110	
As	75	2	He	98.071	1.651	22188	1.44	100	98.1	90	110	
Se	78	2	He	98.678	4.168	849	2.54	100	98.7	90	110	
B	11	1	nogas	13.810	209.287	1205732	1.46	500	2.8	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5231.541	1.174	21505905	2.11	5000	104.6	90	110	
Ca	43	1	nogas	10254.903	4.090	180102	2.31	10000	102.5	90	110	
Ca	44	1	nogas	10027.300	4.398	2859908	2.63	10000	100.3	90	110	
Fe	56	1	nogas	9478.500	4.071	121800415	1.89	10000	94.8	90	110	
Se	77	1	nogas	31.640	59.154	104572	4.06	100	31.6	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	97.175	3.007	13228	4.55	100	97.2	90	110	
Mo	95	1	nogas	97.693	4.266	326110	2.14	100	97.7	90	110	
Sn	118	1	nogas	98.413	4.996	524592	1.27	100	98.4	90	110	
Ba	137	1	nogas	101.068	5.466	267210	1.77	100	101.1	90	110	
Sb	121	2	He	98.727	1.470	94882	1.76	100	98.7	90	110	
Li	7	1	nogas	98.295	2.777	632313	2.37	100	98.3	90	110	
P	31	1	nogas	503.239	3.490	365950	1.45	500	100.6	90	110	
La	139	1	nogas	115.223	12.915	537	15.18	100	115.2	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	70.629	466.194	17	69.28	100	70.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	306141	3.85	318818	96.02	70	125	
Ge	72	1	nogas	1446214	2.12	1556628	92.91	70	125	
In	115	1	nogas	1483038	3.91	1631900	90.88	70	125	
Bi	209	1	nogas	1376841	2.98	1453823	94.70	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	114611	2.10	131050	87.46	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	083_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T12:49:41-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.148	23.3	450	27.0	1	
Na	23	1	nogas	33.872	32.5	1939020	4.7	100	
Mg	24	1	nogas	16.071	54.6	132719	51.1	100	
Al	27	1	nogas	1.703	50.5	23326	28.8	5	
K	39	1	nogas	-8.642	-363.3	4905924	3.0	100	
Ti	47	1	nogas	0.086	242.2	337	52.2	2.5	
V	51	1	nogas	-4.849	-27.5	1925416	3.4	2.5	
Cr	52	1	nogas	-0.518	-18.5	45750	1.7	2.5	
Mn	55	1	nogas	0.400	26.4	14332	7.9	2.5	
Co	59	1	nogas	0.160	71.8	2150	60.7	2.5	
Ni	60	1	nogas	-0.587	-12.0	1293	12.8	2.5	
Cu	63	1	nogas	-0.082	-178.4	4724	18.0	2.5	
Zn	66	1	nogas	-0.216	-41.2	917	19.3	2.5	
As	75	1	nogas	-8.041	-14.9	286038	3.7	2.5	
Sr	88	1	nogas	0.195	60.8	3357	49.6	2.5	
Ag	107	1	nogas	0.127	43.6	1527	29.7	2.5	
Cd	111	1	nogas	0.149	53.6	303	54.9	1	
Sb	121	1	nogas	0.037	190.4	2914	17.0	2.5	
Tl	205	1	nogas	1.119	52.6	16848	52.8	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.152	66.8	3940	58.9	2.5	
U	238	1	nogas	0.148	63.7	4037	50.8	2.5	
[Pb]	206	1	nogas	0.145	62.3	950	54.4	2.5	
[Pb]	207	1	nogas	0.139	73.4	823	64.5	2.5	
Na	23	2	He	55.071	5.3	56096	2.0	100	
Mg	24	2	He	6.316	2.9	797	2.6	100	
Al	27	2	He	0.753	268.7	80	66.1	5	
K	39	2	He	-42.211	-22.5	13161	4.4	100	
Ca	43	2	He	117.249	146.9	27	114.6	100	CCB Main CR1 Failed
Ca	44	2	He	22.498	52.4	217	17.5	100	
V	51	2	He	0.411	20.1	1115	7.6	2.5	
Cr	52	2	He	0.101	152.4	1230	17.4	2.5	
Mn	55	2	He	-0.017	-675.4	163	40.8	2.5	
Fe	56	2	He	7.197	8.2	12268	5.0	100	
Co	59	2	He	0.051	25.7	153	22.9	2.5	
Ni	60	2	He	0.421	26.2	203	41.2	2.5	
Cu	63	2	He	0.207	19.3	993	9.6	2.5	
Zn	66	2	He	0.341	27.8	63	48.2	2.5	
As	75	2	He	-0.227	-42.2	57	38.6	2.5	
Se	78	2	He	0.151	231.3	7	45.8	2.5	
B	11	1	nogas	-347.791	-2.1	458207	2.3	10	
Si	28	1	nogas	25.041	66.5	1349271	2.1	5	CCB Main CR1 Failed
Ca	43	1	nogas	27.666	45.1	1547	12.7	100	
Ca	44	1	nogas	-415.541	-6.2	131266	2.9	100	
Fe	56	1	nogas	9.693	140.9	1102256	13.2	100	
Se	77	1	nogas	-9.455	-23.8	94115	2.9	2.5	
Se	82	1	nogas	-0.223	-241.9	543	15.7	2.5	
Mo	95	1	nogas	-0.001	-9964.3	1203	37.7	2.5	
Sn	118	1	nogas	0.244	29.6	2227	17.4	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.171	37.5	620	29.6	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.069	-21.6	213	7.2	2.5	
P	31	1	nogas	4.169	88.5	49618	2.1	10	
La	139	1	nogas	-0.893	-233.6	70	14.3	2.5	
Au	197	1	nogas	-138.200	-120.2	23	24.7	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	336207	4.83	318818	105.45	70	125	
Ge	72	1	nogas	1451564	2.69	1556628	93.25	70	125	
In	115	1	nogas	1541323	1.93	1631900	94.45	70	125	
Bi	209	1	nogas	1371636	2.28	1453823	94.35	70	125	
Ge	72	2	He	114156	1.37	131050	87.11	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	094_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T13:11:40-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	94.002	4.745	232312	1.91	100	94.0	90	110	
Na	23	1	nogas	9919.178	3.708	113123973	2.35	10000	99.2	90	110	
Mg	24	1	nogas	9513.690	3.631	74731541	2.59	10000	95.1	90	110	
Al	27	1	nogas	113.812	6.160	968366	6.17	100	113.8	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10411.276	6.535	93844190	4.79	10000	104.1	90	110	
Ti	47	1	nogas	98.606	4.470	86094	2.08	100	98.6	90	110	
V	51	1	nogas	78.966	13.808	3052083	2.09	100	79.0	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	99.183	2.190	1122291	0.89	100	99.2	90	110	
Mn	55	1	nogas	102.213	5.548	1447246	3.35	100	102.2	90	110	
Co	59	1	nogas	101.407	5.686	1191815	3.34	100	101.4	90	110	
Ni	60	1	nogas	100.158	5.266	279512	2.38	100	100.2	90	110	
Cu	63	1	nogas	104.758	5.974	693171	3.53	100	104.8	90	110	
Zn	66	1	nogas	102.379	4.090	229663	1.41	100	102.4	90	110	
As	75	1	nogas	78.935	13.404	529816	2.95	100	78.9	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	105.766	2.104	1548126	2.28	100	105.8	90	110	
Ag	107	1	nogas	102.312	3.266	901991	2.34	100	102.3	90	110	
Cd	111	1	nogas	96.855	3.249	192948	0.60	100	96.9	90	110	
Sb	121	1	nogas	108.142	6.204	871693	4.17	100	108.1	90	110	
Tl	205	1	nogas	94.846	6.888	1414646	2.77	100	94.8	90	110	
Pb	208	1	nogas	100.163	5.531	2256172	2.01	100	100.2	90	110	
U	238	1	nogas	97.337	5.066	2096438	3.22	100	97.3	90	110	
[Pb]	206	1	nogas	98.332	6.524	552605	2.71	100	98.3	90	110	
[Pb]	207	1	nogas	94.466	5.937	489188	2.38	100	94.5	90	110	
Na	23	2	He	10140.171	5.263	2107285	3.19	10000	101.4	90	110	
Mg	24	2	He	10026.194	4.035	952100	2.08	10000	100.3	90	110	
Al	27	2	He	104.738	9.792	2744	7.60	100	104.7	90	110	
K	39	2	He	8576.100	0.524	533533	0.51	10000	85.8	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	10089.291	5.000	1767	5.14	10000	100.9	90	110	
Ca	44	2	He	9556.196	2.595	30068	1.00	10000	95.6	90	110	
V	51	2	He	97.178	0.805	110229	1.31	100	97.2	90	110	
Cr	52	2	He	100.204	2.809	149257	0.94	100	100.2	90	110	
Mn	55	2	He	96.802	3.718	57035	1.88	100	96.8	90	110	
Fe	56	2	He	9581.370	1.824	10384090	1.45	10000	95.8	90	110	
Co	59	2	He	99.415	1.636	255971	1.44	100	99.4	90	110	
Ni	60	2	He	100.287	3.685	73183	2.34	100	100.3	90	110	
Cu	63	2	He	99.693	3.038	202558	1.10	100	99.7	90	110	
Zn	66	2	He	97.418	3.405	30453	3.84	100	97.4	90	110	
As	75	2	He	97.245	1.386	21640	1.01	100	97.2	90	110	
Se	78	2	He	97.459	4.875	826	6.78	100	97.5	90	110	
B	11	1	nogas	14.027	156.876	1147477	0.58	500	2.8	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5402.114	7.241	21863160	4.48	5000	108.0	90	110	
Ca	43	1	nogas	10219.429	5.487	177164	3.57	10000	102.2	90	110	
Ca	44	1	nogas	9723.205	6.031	2744535	3.90	10000	97.2	90	110	
Fe	56	1	nogas	9704.219	1.731	123138303	1.26	10000	97.0	90	110	
Se	77	1	nogas	36.301	82.332	104354	4.59	100	36.3	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	100.665	1.187	13505	2.27	100	100.7	90	110	
Mo	95	1	nogas	99.912	3.655	329296	2.04	100	99.9	90	110	
Sn	118	1	nogas	96.159	2.375	523149	4.73	100	96.2	90	110	
Ba	137	1	nogas	96.945	4.946	261346	3.01	100	96.9	90	110	
Sb	121	2	He	100.526	1.313	95012	1.37	100	100.5	90	110	
Li	7	1	nogas	99.042	4.500	605417	2.04	100	99.0	90	110	
P	31	1	nogas	510.215	4.754	365568	1.52	500	102.0	90	110	
La	139	1	nogas	133.497	6.603	620	4.84	100	133.5	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-150.905	-424.243	23	89.21	100	-150.9	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	291151	4.00	318818	91.32	70	125	
Ge	72	1	nogas	1428036	3.00	1556628	91.74	70	125	
In	115	1	nogas	1511171	2.71	1631900	92.60	70	125	
Bi	209	1	nogas	1383398	4.32	1453823	95.16	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	112722	1.95	131050	86.01	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	095_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T13:13:38-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.152	72.5	453	70.0	1	
Na	23	1	nogas	23.451	23.7	1895208	4.8	100	
Mg	24	1	nogas	16.424	58.4	142594	57.9	100	
Al	27	1	nogas	0.843	16.6	16401	6.9	5	
K	39	1	nogas	-24.771	-82.7	4868539	1.8	100	
Ti	47	1	nogas	0.021	258.6	287	14.1	2.5	
V	51	1	nogas	-9.911	-60.9	1891932	3.2	2.5	
Cr	52	1	nogas	-0.631	-20.1	45449	2.7	2.5	
Mn	55	1	nogas	0.349	31.0	13936	13.0	2.5	
Co	59	1	nogas	0.180	63.0	2477	58.5	2.5	
Ni	60	1	nogas	-0.621	-18.2	1230	28.2	2.5	
Cu	63	1	nogas	-0.095	-99.9	4757	14.8	2.5	
Zn	66	1	nogas	-0.172	-66.0	1040	25.5	2.5	
As	75	1	nogas	-10.965	-50.5	283079	3.6	2.5	
Sr	88	1	nogas	0.193	46.1	3427	41.5	2.5	
Ag	107	1	nogas	0.133	50.5	1627	40.2	2.5	
Cd	111	1	nogas	0.155	67.2	320	65.0	1	
Sb	121	1	nogas	-0.056	-178.9	2220	40.4	2.5	
Tl	205	1	nogas	1.238	54.4	19328	55.4	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.144	70.7	3897	62.4	2.5	
U	238	1	nogas	0.174	72.4	4778	60.6	2.5	
[Pb]	206	1	nogas	0.130	82.8	900	71.4	2.5	
[Pb]	207	1	nogas	0.167	51.5	1007	47.3	2.5	
Na	23	2	He	49.165	22.6	55114	1.6	100	
Mg	24	2	He	5.548	37.5	723	24.9	100	
Al	27	2	He	0.856	129.7	83	36.7	5	
K	39	2	He	-44.585	-12.7	13018	2.6	100	
Ca	43	2	He	6.335	1067.7	7	173.2	100	
Ca	44	2	He	-3.241	-356.9	137	30.5	100	
V	51	2	He	0.359	40.7	1057	11.8	2.5	
Cr	52	2	He	0.095	163.0	1223	15.1	2.5	
Mn	55	2	He	-0.015	-291.9	167	19.3	2.5	
Fe	56	2	He	6.913	8.2	12027	7.6	100	
Co	59	2	He	0.064	40.6	190	36.8	2.5	
Ni	60	2	He	0.406	12.3	193	20.9	2.5	
Cu	63	2	He	0.196	18.8	977	11.9	2.5	
Zn	66	2	He	0.343	32.0	63	50.8	2.5	
As	75	2	He	-0.320	-15.8	36	28.6	2.5	
Se	78	2	He	0.552	195.1	10	91.7	2.5	
B	11	1	nogas	-356.975	-3.0	430137	3.4	10	
Si	28	1	nogas	0.257	3428.1	1280032	0.8	5	
Ca	43	1	nogas	23.234	37.1	1500	8.2	100	
Ca	44	1	nogas	-462.052	-2.5	121665	2.7	100	
Fe	56	1	nogas	9.520	126.2	1127217	15.2	100	
Se	77	1	nogas	-22.923	-91.2	92370	4.0	2.5	
Se	82	1	nogas	-0.464	-134.9	523	18.9	2.5	
Mo	95	1	nogas	-0.019	-690.3	1180	40.3	2.5	
Sn	118	1	nogas	0.256	29.3	2347	16.0	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.133	42.1	523	27.8	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.128	-9.7	157	3.7	2.5	
P	31	1	nogas	0.274	1728.5	48118	3.3	10	
La	139	1	nogas	1.061	200.8	80	12.5	2.5	
Au	197	1	nogas	372.891	45.2	7	86.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	331564	3.46	318818	104.00	70	125	
Ge	72	1	nogas	1482510	3.45	1556628	95.24	70	125	
In	115	1	nogas	1578349	2.27	1631900	96.72	70	125	
Bi	209	1	nogas	1417212	1.84	1453823	97.48	70	125	
Ge	72	2	He	114776	4.24	131050	87.58	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	106_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T13:35:50-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	96.692	6.735	233506	4.25	100	96.7	90	110	
Na	23	1	nogas	10557.303	3.986	120297061	2.33	10000	105.6	90	110	
Mg	24	1	nogas	9155.469	2.105	71928766	1.31	10000	91.6	90	110	
Al	27	1	nogas	113.190	4.844	933355	3.17	100	113.2	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10946.309	2.850	95445790	0.51	10000	109.5	90	110	
Ti	47	1	nogas	103.820	3.746	87897	2.59	100	103.8	90	110	
V	51	1	nogas	43.698	9.597	2487443	1.74	100	43.7	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	104.530	6.505	1143478	4.31	100	104.5	90	110	
Mn	55	1	nogas	105.483	4.400	1448384	3.48	100	105.5	90	110	
Co	59	1	nogas	107.725	2.355	1228203	0.86	100	107.7	90	110	
Ni	60	1	nogas	111.289	1.863	300994	0.37	100	111.3	90	110	CCV Main CR1-2 Failed
Cu	63	1	nogas	112.687	0.836	723213	2.21	100	112.7	90	110	CCV Main CR1-2 Failed
Zn	66	1	nogas	106.388	2.578	231400	0.39	100	106.4	90	110	
As	75	1	nogas	58.788	5.724	458142	1.04	100	58.8	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	105.995	0.432	1504331	1.77	100	106.0	90	110	
Ag	107	1	nogas	105.614	3.845	902535	1.68	100	105.6	90	110	
Cd	111	1	nogas	101.079	5.620	196165	1.79	100	101.1	90	110	
Sb	121	1	nogas	109.284	2.352	854860	3.48	100	109.3	90	110	
Tl	205	1	nogas	96.544	3.665	1382929	1.82	100	96.5	90	110	
Pb	208	1	nogas	100.624	0.575	2176673	1.76	100	100.6	90	110	
U	238	1	nogas	99.422	2.093	2056195	3.97	100	99.4	90	110	
[Pb]	206	1	nogas	100.220	2.461	540890	0.35	100	100.2	90	110	
[Pb]	207	1	nogas	94.529	0.484	470166	1.97	100	94.5	90	110	
Na	23	2	He	11243.114	2.846	2465314	1.55	10000	112.4	90	110	CCV Main CR1-2 Failed
Mg	24	2	He	9779.311	1.357	981855	0.17	10000	97.8	90	110	
Al	27	2	He	94.416	2.682	2624	3.42	100	94.4	90	110	
K	39	2	He	9316.254	4.323	578223	4.21	10000	93.2	90	110	
Ca	43	2	He	10627.401	19.393	1963	18.26	10000	106.3	90	110	
Ca	44	2	He	9584.211	1.601	31885	2.88	10000	95.8	90	110	
V	51	2	He	94.886	2.980	113750	2.06	100	94.9	90	110	
Cr	52	2	He	96.769	0.122	152426	1.27	100	96.8	90	110	
Mn	55	2	He	96.545	3.597	60129	2.49	100	96.5	90	110	
Fe	56	2	He	9343.130	1.815	10701888	0.76	10000	93.4	90	110	
Co	59	2	He	95.018	1.718	258561	0.63	100	95.0	90	110	
Ni	60	2	He	98.230	1.413	75777	0.61	100	98.2	90	110	
Cu	63	2	He	98.543	0.695	211683	0.81	100	98.5	90	110	
Zn	66	2	He	97.215	4.560	32112	4.13	100	97.2	90	110	
As	75	2	He	95.840	2.096	22541	1.02	100	95.8	90	110	
Se	78	2	He	102.060	0.361	913	1.39	100	102.1	90	110	
B	11	1	nogas	-21.818	-166.226	1048352	4.21	500	-4.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5792.055	6.135	22647972	3.99	5000	115.8	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10958.453	2.164	184199	0.56	10000	109.6	90	110	
Ca	44	1	nogas	10458.759	2.489	2845913	0.19	10000	104.6	90	110	
Fe	56	1	nogas	10198.437	5.505	125349578	3.41	10000	102.0	90	110	
Se	77	1	nogas	-50.886	-18.183	79272	2.70	100	-50.9	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	103.577	4.755	13449	2.38	100	103.6	90	110	
Mo	95	1	nogas	107.822	0.626	344590	1.70	100	107.8	90	110	
Sn	118	1	nogas	99.167	2.346	525556	1.87	100	99.2	90	110	
Ba	137	1	nogas	99.414	3.479	261279	1.16	100	99.4	90	110	
Sb	121	2	He	97.726	1.118	97630	1.10	100	97.7	90	110	
Li	7	1	nogas	99.377	4.405	593703	2.18	100	99.4	90	110	
P	31	1	nogas	540.267	3.853	372756	1.65	500	108.1	90	110	
La	139	1	nogas	142.829	11.908	643	13.58	100	142.8	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-367.662	-79.271	30	33.33	100	-367.7	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	284499	2.78	318818	89.24	70	125	
Ge	72	1	nogas	1384364	2.20	1556628	88.93	70	125	
In	115	1	nogas	1473437	3.91	1631900	90.29	70	125	
Bi	209	1	nogas	1326649	2.31	1453823	91.25	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	119130	1.30	131050	90.90	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	107_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T13:37:46-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.160	60.2	473	53.7	1	
Na	23	1	nogas	1322.196	5.0	16912798	1.3	100	CCB Main CR1 Failed
Mg	24	1	nogas	18.579	70.0	155810	68.5	100	
Al	27	1	nogas	0.962	6.8	16905	1.6	5	
K	39	1	nogas	58.571	22.0	5435505	1.4	100	
Ti	47	1	nogas	0.449	36.2	653	21.2	2.5	
V	51	1	nogas	-38.168	-19.5	1438621	4.0	2.5	
Cr	52	1	nogas	-1.112	-11.6	38804	2.2	2.5	
Mn	55	1	nogas	0.437	23.2	14763	13.1	2.5	
Co	59	1	nogas	0.206	53.7	2730	51.6	2.5	
Ni	60	1	nogas	0.895	10.1	5408	6.1	2.5	
Cu	63	1	nogas	1.605	13.6	15881	12.5	2.5	
Zn	66	1	nogas	-0.115	-77.2	1140	21.0	2.5	
As	75	1	nogas	-30.390	-18.7	218295	4.3	2.5	
Sr	88	1	nogas	0.220	55.4	3751	51.6	2.5	
Ag	107	1	nogas	0.241	49.7	2554	45.5	2.5	
Cd	111	1	nogas	0.191	38.4	387	35.3	1	
Sb	121	1	nogas	0.008	1060.1	2677	30.2	2.5	
Tl	205	1	nogas	1.422	40.0	21487	44.1	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.173	65.6	4454	61.8	2.5	
U	238	1	nogas	0.162	74.8	4404	64.1	2.5	
[Pb]	206	1	nogas	0.167	66.4	1087	61.9	2.5	
[Pb]	207	1	nogas	0.177	56.5	1033	54.8	2.5	
Na	23	2	He	1349.581	5.1	339219	3.6	100	CCB Main CR1 Failed
Mg	24	2	He	5.744	20.8	780	16.8	100	
Al	27	2	He	-0.238	-340.7	57	36.7	5	
K	39	2	He	0.884	143.2	15764	0.5	100	
Ca	43	2	He	-14.989	-204.8	3	173.2	100	
Ca	44	2	He	-6.970	-364.5	130	66.6	100	
V	51	2	He	0.277	2.7	1011	2.7	2.5	
Cr	52	2	He	0.232	37.7	1500	9.4	2.5	
Mn	55	2	He	0.113	109.0	253	30.1	2.5	
Fe	56	2	He	6.875	12.1	12521	8.3	100	
Co	59	2	He	0.051	13.7	160	10.8	2.5	
Ni	60	2	He	0.459	10.7	243	16.6	2.5	
Cu	63	2	He	0.222	13.4	1077	7.9	2.5	
Zn	66	2	He	0.421	28.0	93	43.3	2.5	
As	75	2	He	-0.182	-3.3	70	0.0	2.5	
Se	78	2	He	0.121	537.6	7	86.6	2.5	
B	11	1	nogas	-387.285	-2.2	361535	2.2	10	
Si	28	1	nogas	35.715	5.3	1377360	2.9	5	CCB Main CR1 Failed
Ca	43	1	nogas	13.512	67.4	1290	15.0	100	
Ca	44	1	nogas	-421.263	-0.4	128528	3.3	100	
Fe	56	1	nogas	19.710	42.4	1223043	12.1	100	
Se	77	1	nogas	-88.104	-26.2	72387	5.2	2.5	
Se	82	1	nogas	-0.816	-59.8	460	14.3	2.5	
Mo	95	1	nogas	2.476	7.2	9399	9.4	2.5	
Sn	118	1	nogas	0.249	55.9	2257	31.3	5	
Ba	137	1	nogas	0.389	14.3	1223	8.0	2.5	

Continuing Calibration Blank (CCB) Report

Sb	121	2	He	-0.088	-141.2	203	58.3	2.5	
P	31	1	nogas	8.148	43.8	51604	1.2	10	
La	139	1	nogas	13.910	107.6	133	47.6	2.5	CCB Main CR1 Failed
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Au	197	1	nogas	-244.688	-143.2	27	43.3	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	334411	3.70	318818	104.89	70	125	
Ge	72	1	nogas	1436520	3.30	1556628	92.28	70	125	
In	115	1	nogas	1556301	4.99	1631900	95.37	70	125	
Bi	209	1	nogas	1365235	4.98	1453823	93.91	70	125	
Ge	72	2	He	119929	2.01	131050	91.51	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	118_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T14:00:03-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	90.872	2.938	231420	1.33	100	90.9	90	110	
Na	23	1	nogas	9993.136	1.298	115570240	1.86	10000	99.9	90	110	
Mg	24	1	nogas	9029.664	2.372	71919329	1.58	10000	90.3	90	110	
Al	27	1	nogas	104.167	2.354	894324	0.39	100	104.2	90	110	
K	39	1	nogas	10081.052	2.565	91848252	2.99	10000	100.8	90	110	
Ti	47	1	nogas	100.191	0.927	88263	1.68	100	100.2	90	110	
V	51	1	nogas	61.718	4.745	2839200	1.88	100	61.7	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.056	3.234	1141071	0.81	100	100.1	90	110	
Mn	55	1	nogas	98.562	3.380	1408313	2.65	100	98.6	90	110	
Co	59	1	nogas	102.751	2.211	1218521	0.89	100	102.8	90	110	
Ni	60	1	nogas	101.888	3.942	286781	1.64	100	101.9	90	110	
Cu	63	1	nogas	105.339	2.363	703322	1.30	100	105.3	90	110	
Zn	66	1	nogas	101.402	1.897	229497	0.95	100	101.4	90	110	
As	75	1	nogas	69.545	8.998	507514	2.51	100	69.5	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	99.299	2.951	1465642	2.66	100	99.3	90	110	
Ag	107	1	nogas	100.885	3.058	896867	1.55	100	100.9	90	110	
Cd	111	1	nogas	95.856	1.655	191466	1.44	100	95.9	90	110	
Sb	121	1	nogas	102.529	2.831	834529	4.64	100	102.5	90	110	
Tl	205	1	nogas	98.772	7.373	1397947	4.40	100	98.8	90	110	
Pb	208	1	nogas	101.848	4.860	2176703	0.90	100	101.8	90	110	
U	238	1	nogas	98.689	4.896	2016020	1.52	100	98.7	90	110	
[Pb]	206	1	nogas	102.204	6.584	544974	3.33	100	102.2	90	110	
[Pb]	207	1	nogas	96.501	6.068	474097	2.64	100	96.5	90	110	
Na	23	2	He	10545.955	0.349	2217791	0.42	10000	105.5	90	110	
Mg	24	2	He	9903.481	0.471	952312	0.57	10000	99.0	90	110	
Al	27	2	He	104.106	5.961	2764	5.66	100	104.1	90	110	
K	39	2	He	8624.064	1.117	536429	1.08	10000	86.2	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	9194.845	7.717	1630	7.54	10000	91.9	90	110	
Ca	44	2	He	9336.695	5.658	29744	5.56	10000	93.4	90	110	
V	51	2	He	96.327	0.415	110599	0.55	100	96.3	90	110	
Cr	52	2	He	98.199	3.985	148105	3.78	100	98.2	90	110	
Mn	55	2	He	99.675	3.331	59461	3.41	100	99.7	90	110	
Fe	56	2	He	9680.535	2.551	10620119	2.59	10000	96.8	90	110	
Co	59	2	He	97.849	2.014	255027	2.17	100	97.8	90	110	
Ni	60	2	He	98.956	2.348	73113	2.42	100	99.0	90	110	
Cu	63	2	He	97.095	1.551	199758	1.66	100	97.1	90	110	
Zn	66	2	He	94.494	0.722	29895	0.77	100	94.5	90	110	
As	75	2	He	99.265	0.548	22357	0.68	100	99.3	90	110	
Se	78	2	He	98.772	2.553	847	2.69	100	98.8	90	110	
B	11	1	nogas	-11.969	-261.214	1125950	2.64	500	-2.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5342.738	1.195	21838061	1.19	5000	106.9	90	110	
Ca	43	1	nogas	9979.297	3.659	174551	2.60	10000	99.8	90	110	
Ca	44	1	nogas	9869.052	4.433	2806409	3.00	10000	98.7	90	110	
Fe	56	1	nogas	9920.194	2.715	126896553	0.65	10000	99.2	90	110	
Se	77	1	nogas	2.955	611.902	96585	4.41	100	3.0	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	100.253	5.887	13555	3.54	100	100.3	90	110	
Mo	95	1	nogas	97.414	2.140	323873	1.31	100	97.4	90	110	
Sn	118	1	nogas	94.613	4.713	515409	2.56	100	94.6	90	110	
Ba	137	1	nogas	93.735	4.807	253247	1.77	100	93.7	90	110	
Sb	121	2	He	96.416	1.339	92252	1.48	100	96.4	90	110	
Li	7	1	nogas	95.402	2.955	602242	4.39	100	95.4	90	110	
P	31	1	nogas	502.584	2.230	363980	0.65	500	100.5	90	110	
La	139	1	nogas	109.696	19.276	523	16.03	100	109.7	90	110	
Au	197	1	nogas	-74.835	-455.341	20	50.00	100	-74.8	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	299847	3.24	318818	94.05	70	125	
Ge	72	1	nogas	1439909	2.28	1556628	92.50	70	125	
In	115	1	nogas	1514810	3.10	1631900	92.82	70	125	
Bi	209	1	nogas	1312363	4.13	1453823	90.27	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	114083	0.18	131050	87.05	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	119_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T14:02:00-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.147	59.0	417	56.4	1	
Na	23	1	nogas	303.009	1.7	5055601	1.5	100	CCB Main CR1 Failed
Mg	24	1	nogas	17.147	59.3	142727	58.0	100	
Al	27	1	nogas	0.859	36.3	15676	16.3	5	
K	39	1	nogas	24.742	87.1	5032523	1.8	100	
Ti	47	1	nogas	0.294	57.5	507	29.3	2.5	
V	51	1	nogas	-19.297	-35.2	1665828	4.2	2.5	
Cr	52	1	nogas	-0.623	-28.4	43170	2.7	2.5	
Mn	55	1	nogas	0.379	21.0	13609	8.2	2.5	
Co	59	1	nogas	0.169	44.4	2210	40.2	2.5	
Ni	60	1	nogas	0.038	177.4	2960	8.9	2.5	
Cu	63	1	nogas	0.447	18.5	8012	6.8	2.5	
Zn	66	1	nogas	-0.130	-106.7	1077	28.3	2.5	
As	75	1	nogas	-14.438	-39.8	258667	4.8	2.5	
Sr	88	1	nogas	0.195	59.8	3280	52.6	2.5	
Ag	107	1	nogas	0.144	33.2	1630	25.5	2.5	
Cd	111	1	nogas	0.144	69.3	280	67.9	1	
Sb	121	1	nogas	-0.015	-709.5	2417	33.9	2.5	
Tl	205	1	nogas	1.172	47.6	17274	44.9	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.159	64.4	4007	54.0	2.5	
U	238	1	nogas	0.155	77.5	4094	59.4	2.5	
[Pb]	206	1	nogas	0.178	58.1	1110	48.9	2.5	
[Pb]	207	1	nogas	0.153	75.9	877	64.6	2.5	
Na	23	2	He	388.444	4.4	124272	1.0	100	CCB Main CR1 Failed
Mg	24	2	He	6.203	6.6	783	7.8	100	
Al	27	2	He	-0.787	-42.8	40	25.0	5	
K	39	2	He	-35.471	-14.9	13568	2.4	100	
Ca	43	2	He	-12.967	-263.8	3	173.2	100	
Ca	44	2	He	20.000	141.0	210	45.4	100	
V	51	2	He	0.267	20.4	946	3.1	2.5	
Cr	52	2	He	0.232	42.2	1420	8.0	2.5	
Mn	55	2	He	0.045	170.1	200	22.9	2.5	
Fe	56	2	He	6.619	7.0	11591	5.7	100	
Co	59	2	He	0.056	18.3	167	19.3	2.5	
Ni	60	2	He	0.397	21.2	183	30.0	2.5	
Cu	63	2	He	0.275	6.9	1127	3.4	2.5	
Zn	66	2	He	0.450	17.4	97	21.5	2.5	
As	75	2	He	-0.217	-35.5	59	32.2	2.5	
Se	78	2	He	0.083	312.8	6	33.3	2.5	
B	11	1	nogas	-362.496	-1.1	396584	1.7	10	
Si	28	1	nogas	34.055	67.6	1340905	6.3	5	CCB Main CR1 Failed
Ca	43	1	nogas	19.426	55.6	1360	14.2	100	
Ca	44	1	nogas	-447.569	-3.6	119026	3.2	100	
Fe	56	1	nogas	12.188	68.7	1100236	8.8	100	
Se	77	1	nogas	-32.411	-61.1	85206	5.9	2.5	
Se	82	1	nogas	-0.707	-22.8	463	1.2	2.5	
Mo	95	1	nogas	1.474	12.4	5938	9.1	2.5	
Sn	118	1	nogas	0.203	40.6	1930	21.1	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.210	37.3	700	28.1	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.085	-41.9	197	19.3	2.5	
P	31	1	nogas	6.255	76.2	49311	2.9	10	
La	139	1	nogas	2.227	203.3	80	21.7	2.5	
Au	197	1	nogas	-43.300	-1208.9	20	86.6	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	314984	2.64	318818	98.80	70	125	
Ge	72	1	nogas	1405512	3.09	1556628	90.29	70	125	
In	115	1	nogas	1489587	1.64	1631900	91.28	70	125	
Bi	209	1	nogas	1353795	1.94	1453823	93.12	70	125	
Ge	72	2	He	113720	3.64	131050	86.78	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	130_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T14:24:20-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	96.590	4.419	248062	3.32	100	96.6	90	110	
Na	23	1	nogas	10078.587	2.956	123844244	3.18	10000	100.8	90	110	
Mg	24	1	nogas	9287.180	0.544	78611652	0.57	10000	92.9	90	110	
Al	27	1	nogas	103.606	6.287	949079	0.84	100	103.6	90	110	
K	39	1	nogas	9958.552	9.382	96752800	3.50	10000	99.6	90	110	
Ti	47	1	nogas	98.393	6.872	92439	1.09	100	98.4	90	110	
V	51	1	nogas	107.612	10.394	3714721	1.65	100	107.6	90	110	
Cr	52	1	nogas	94.157	7.797	1148744	3.33	100	94.2	90	110	
Mn	55	1	nogas	96.725	7.784	1474056	3.04	100	96.7	90	110	
Co	59	1	nogas	99.139	10.250	1252332	4.11	100	99.1	90	110	
Ni	60	1	nogas	100.856	9.554	302591	3.37	100	100.9	90	110	
Cu	63	1	nogas	103.376	5.958	736682	2.42	100	103.4	90	110	
Zn	66	1	nogas	102.184	3.134	247033	3.42	100	102.2	90	110	
As	75	1	nogas	78.027	12.324	567873	1.90	100	78.0	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	101.621	8.303	1599210	3.84	100	101.6	90	110	
Ag	107	1	nogas	99.761	6.145	946318	0.94	100	99.8	90	110	
Cd	111	1	nogas	96.910	5.092	201677	3.69	100	96.9	90	110	
Sb	121	1	nogas	103.155	8.401	894597	3.24	100	103.2	90	110	
Tl	205	1	nogas	99.092	8.496	1477458	4.43	100	99.1	90	110	
Pb	208	1	nogas	99.978	7.053	2250852	2.66	100	100.0	90	110	
U	238	1	nogas	99.648	2.775	2147808	4.02	100	99.6	90	110	
[Pb]	206	1	nogas	103.108	6.502	579391	1.94	100	103.1	90	110	
[Pb]	207	1	nogas	97.559	4.541	505357	0.33	100	97.6	90	110	
Na	23	2	He	10147.926	5.291	2280478	2.71	10000	101.5	90	110	
Mg	24	2	He	9465.798	6.211	971707	3.65	10000	94.7	90	110	
Al	27	2	He	96.031	1.273	2730	3.96	100	96.0	90	110	
K	39	2	He	9364.736	0.280	581150	0.27	10000	93.6	90	110	
Ca	43	2	He	9715.702	3.490	1840	3.31	10000	97.2	90	110	
Ca	44	2	He	9076.263	1.921	30896	0.81	10000	90.8	90	110	
V	51	2	He	95.993	1.915	117769	2.20	100	96.0	90	110	
Cr	52	2	He	99.486	3.915	160241	1.50	100	99.5	90	110	
Mn	55	2	He	99.546	2.696	63441	1.80	100	99.5	90	110	
Fe	56	2	He	9632.683	5.155	11284257	2.88	10000	96.3	90	110	
Co	59	2	He	97.705	5.397	271890	2.88	100	97.7	90	110	
Ni	60	2	He	96.866	5.849	76404	3.21	100	96.9	90	110	
Cu	63	2	He	96.983	2.709	213142	1.09	100	97.0	90	110	
Zn	66	2	He	94.892	3.490	32069	2.26	100	94.9	90	110	
As	75	2	He	97.511	3.047	23464	2.16	100	97.5	90	110	
Se	78	2	He	96.672	2.393	885	0.57	100	96.7	90	110	
B	11	1	nogas	17.126	94.262	1199239	2.54	500	3.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5227.973	6.190	22826878	0.92	5000	104.6	90	110	
Ca	43	1	nogas	10065.036	8.160	187697	2.45	10000	100.7	90	110	
Ca	44	1	nogas	10047.813	5.694	3046400	3.70	10000	100.5	90	110	
Fe	56	1	nogas	9433.175	9.058	128667957	3.30	10000	94.3	90	110	
Se	77	1	nogas	33.999	81.505	111752	3.56	100	34.0	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	92.789	9.612	13422	3.33	100	92.8	90	110	
Mo	95	1	nogas	97.761	7.873	346543	2.39	100	97.8	90	110	
Sn	118	1	nogas	95.942	3.052	545004	2.93	100	95.9	90	110	
Ba	137	1	nogas	96.202	3.334	271021	2.08	100	96.2	90	110	
Sb	121	2	He	92.571	3.286	94617	1.04	100	92.6	90	110	
Li	7	1	nogas	100.780	6.763	639504	5.39	100	100.8	90	110	
P	31	1	nogas	490.943	8.622	380276	1.52	500	98.2	90	110	
La	139	1	nogas	132.472	5.410	643	3.59	100	132.5	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	59.800	766.500	17	91.65	100	59.8	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	302303	1.11	318818	94.82	70	125	
Ge	72	1	nogas	1539405	5.81	1556628	98.89	70	125	
In	115	1	nogas	1578475	1.44	1631900	96.73	70	125	
Bi	209	1	nogas	1383447	4.47	1453823	95.16	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	121924	2.72	131050	93.04	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	131_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T14:26:18-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.132	76.1	417	73.0	1	
Na	23	1	nogas	421.013	4.0	6921916	2.7	100	CCB Main CR1 Failed
Mg	24	1	nogas	19.086	58.0	170523	56.7	100	
Al	27	1	nogas	0.436	30.2	13000	6.8	5	
K	39	1	nogas	17.586	72.9	5315990	0.7	100	
Ti	47	1	nogas	0.254	55.0	507	27.7	2.5	
V	51	1	nogas	11.938	86.0	2234391	4.1	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	-0.607	-12.7	46342	1.0	2.5	
Mn	55	1	nogas	0.406	27.8	14980	14.0	2.5	
Co	59	1	nogas	0.165	62.3	2344	57.8	2.5	
Ni	60	1	nogas	0.331	19.3	4017	7.3	2.5	
Cu	63	1	nogas	0.528	9.2	9129	6.6	2.5	
Zn	66	1	nogas	-0.144	-65.4	1123	22.3	2.5	
As	75	1	nogas	-12.005	-52.4	283694	4.0	2.5	
Sr	88	1	nogas	0.205	52.8	3687	48.5	2.5	
Ag	107	1	nogas	0.098	63.4	1330	45.9	2.5	
Cd	111	1	nogas	0.153	61.9	330	65.6	1	
Sb	121	1	nogas	-0.078	-129.5	2067	44.8	2.5	
Tl	205	1	nogas	1.081	44.8	17378	45.9	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.148	67.2	4117	59.4	2.5	
U	238	1	nogas	0.167	88.7	4768	72.6	2.5	
[Pb]	206	1	nogas	0.145	75.6	1013	65.8	2.5	
[Pb]	207	1	nogas	0.154	66.3	963	59.7	2.5	
Na	23	2	He	537.411	3.6	164976	0.7	100	CCB Main CR1 Failed
Mg	24	2	He	10.446	5.6	1267	5.1	100	
Al	27	2	He	0.937	212.4	90	61.9	5	
K	39	2	He	6.355	63.2	16094	1.5	100	
Ca	43	2	He	20.627	255.8	10	100.0	100	
Ca	44	2	He	-9.122	-26.8	123	4.7	100	
V	51	2	He	0.695	3.8	1527	0.9	2.5	
Cr	52	2	He	0.247	29.6	1540	8.4	2.5	
Mn	55	2	He	-0.049	-210.0	153	39.8	2.5	
Fe	56	2	He	4.672	24.1	10063	11.3	100	
Co	59	2	He	0.028	2.5	100	0.0	2.5	
Ni	60	2	He	0.479	17.7	260	23.4	2.5	
Cu	63	2	He	0.311	2.0	1280	2.8	2.5	
Zn	66	2	He	0.381	28.5	80	43.3	2.5	
As	75	2	He	-0.185	-17.2	70	12.6	2.5	
Se	78	2	He	0.332	79.5	9	26.6	2.5	
B	11	1	nogas	-389.166	-3.0	371443	2.8	10	
Si	28	1	nogas	2.052	324.5	1305593	4.8	5	
Ca	43	1	nogas	10.790	79.4	1297	12.1	100	
Ca	44	1	nogas	-493.898	-0.9	114665	1.9	100	
Fe	56	1	nogas	29.059	38.0	1403122	13.3	100	
Se	77	1	nogas	-22.265	-92.4	93787	3.5	2.5	
Se	82	1	nogas	-0.957	-60.3	463	19.9	2.5	
Mo	95	1	nogas	0.814	9.1	4077	9.0	2.5	
Sn	118	1	nogas	0.242	52.9	2340	35.4	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.145	75.9	580	59.0	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.167	-21.6	127	29.9	2.5	
P	31	1	nogas	8.004	24.2	53911	2.6	10	
La	139	1	nogas	-2.432	-85.3	67	17.3	2.5	
Au	197	1	nogas	-96.295	-438.3	23	65.5	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	348347	5.28	318818	109.26	70	125	
Ge	72	1	nogas	1502285	2.84	1556628	96.51	70	125	
In	115	1	nogas	1614471	3.42	1631900	98.93	70	125	
Bi	209	1	nogas	1455351	3.33	1453823	100.11	70	125	
Ge	72	2	He	121115	1.92	131050	92.42	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	142_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T14:48:31-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	94.644	2.519	258853	1.17	100	94.6	90	110	
Na	23	1	nogas	10261.471	1.644	125754557	1.44	10000	102.6	90	110	
Mg	24	1	nogas	9645.256	2.531	81449504	2.55	10000	96.5	90	110	
Al	27	1	nogas	110.402	2.457	991526	2.64	100	110.4	90	110	CCV Main CR1-2 Failed
K	39	1	nogas	10403.749	1.949	99017527	2.10	10000	104.0	90	110	
Ti	47	1	nogas	104.146	2.846	95966	0.55	100	104.1	90	110	
V	51	1	nogas	90.496	10.795	3390453	2.94	100	90.5	90	110	
Cr	52	1	nogas	103.781	5.505	1236239	3.43	100	103.8	90	110	
Mn	55	1	nogas	102.514	3.699	1532206	2.20	100	102.5	90	110	
Co	59	1	nogas	103.663	4.135	1286014	1.97	100	103.7	90	110	
Ni	60	1	nogas	103.759	0.923	305696	1.64	100	103.8	90	110	
Cu	63	1	nogas	107.182	0.449	749008	2.52	100	107.2	90	110	
Zn	66	1	nogas	104.986	1.058	248633	1.93	100	105.0	90	110	
As	75	1	nogas	76.597	7.960	552381	2.24	100	76.6	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	104.433	4.053	1612551	2.76	100	104.4	90	110	
Ag	107	1	nogas	104.551	1.363	972861	1.73	100	104.6	90	110	
Cd	111	1	nogas	96.483	1.522	209109	2.09	100	96.5	90	110	
Sb	121	1	nogas	108.078	3.349	919807	2.35	100	108.1	90	110	
Tl	205	1	nogas	101.055	3.142	1559320	1.70	100	101.1	90	110	
Pb	208	1	nogas	102.030	2.523	2376592	0.72	100	102.0	90	110	
U	238	1	nogas	99.583	4.998	2216596	3.56	100	99.6	90	110	
[Pb]	206	1	nogas	102.122	3.131	593632	1.68	100	102.1	90	110	
[Pb]	207	1	nogas	97.657	3.974	522919	2.17	100	97.7	90	110	
Na	23	2	He	10639.008	3.218	2290247	1.40	10000	106.4	90	110	
Mg	24	2	He	10247.738	1.459	1009151	1.49	10000	102.5	90	110	
Al	27	2	He	97.424	1.303	2654	3.42	100	97.4	90	110	
K	39	2	He	8976.850	2.793	557730	2.71	10000	89.8	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	9596.950	8.145	1740	5.48	10000	96.0	90	110	
Ca	44	2	He	9521.845	3.045	31060	2.48	10000	95.2	90	110	
V	51	2	He	99.284	4.473	116657	1.90	100	99.3	90	110	
Cr	52	2	He	101.302	2.037	156447	2.40	100	101.3	90	110	
Mn	55	2	He	99.053	0.979	60528	2.84	100	99.1	90	110	
Fe	56	2	He	10054.815	0.892	11300251	3.40	10000	100.5	90	110	
Co	59	2	He	103.128	3.134	275182	1.40	100	103.1	90	110	
Ni	60	2	He	104.991	4.634	79400	1.99	100	105.0	90	110	
Cu	63	2	He	103.247	4.943	217353	2.33	100	103.2	90	110	
Zn	66	2	He	98.594	6.093	31918	3.50	100	98.6	90	110	
As	75	2	He	99.484	2.320	22945	1.87	100	99.5	90	110	
Se	78	2	He	93.757	5.538	823	2.82	100	93.8	90	110	
B	11	1	nogas	31.757	69.238	1310313	2.60	500	6.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5602.938	1.248	23901819	1.33	5000	112.1	90	110	CCV Main CR1-2 Failed
Ca	43	1	nogas	10277.680	3.826	188054	1.83	10000	102.8	90	110	
Ca	44	1	nogas	9988.684	2.660	2969552	1.18	10000	99.9	90	110	
Fe	56	1	nogas	9982.407	4.682	133573645	2.37	10000	99.8	90	110	
Se	77	1	nogas	13.546	178.756	103946	5.05	100	13.5	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	103.694	1.437	14666	3.64	100	103.7	90	110	
Mo	95	1	nogas	100.534	3.123	349657	1.07	100	100.5	90	110	
Sn	118	1	nogas	95.624	0.395	565510	1.87	100	95.6	90	110	
Ba	137	1	nogas	94.015	4.590	275663	3.10	100	94.0	90	110	
Sb	121	2	He	97.302	2.417	95327	1.46	100	97.3	90	110	
Li	7	1	nogas	99.375	3.923	672071	3.03	100	99.4	90	110	
P	31	1	nogas	526.642	2.153	396794	1.22	500	105.3	90	110	
La	139	1	nogas	125.658	8.188	640	8.70	100	125.7	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	177.917	98.651	13	43.30	100	177.9	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	321910	1.36	318818	100.97	70	125	
Ge	72	1	nogas	1506766	2.29	1556628	96.80	70	125	
In	115	1	nogas	1643116	1.60	1631900	100.69	70	125	
Bi	209	1	nogas	1428850	1.80	1453823	98.28	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	116864	2.91	131050	89.18	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	143_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T14:50:28-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.157	54.9	533	55.6	1	
Na	23	1	nogas	188.759	1.6	4097350	2.0	100	CCB Main CR1 Failed
Mg	24	1	nogas	18.431	60.2	169512	61.4	100	
Al	27	1	nogas	0.331	24.0	12675	12.1	5	
K	39	1	nogas	1.658	1837.7	5402337	1.9	100	
Ti	47	1	nogas	0.259	34.3	537	22.5	2.5	
V	51	1	nogas	-5.243	-280.5	2068767	3.8	2.5	
Cr	52	1	nogas	-0.535	-54.2	49212	1.7	2.5	
Mn	55	1	nogas	0.370	9.2	15116	10.0	2.5	
Co	59	1	nogas	0.178	53.2	2650	53.4	2.5	
Ni	60	1	nogas	-0.111	-44.0	2857	10.5	2.5	
Cu	63	1	nogas	0.266	29.4	7665	12.7	2.5	
Zn	66	1	nogas	-0.185	-70.0	1080	35.0	2.5	
As	75	1	nogas	-19.182	-53.3	273145	5.1	2.5	
Sr	88	1	nogas	0.235	50.4	4387	50.6	2.5	
Ag	107	1	nogas	0.103	60.8	1453	48.4	2.5	
Cd	111	1	nogas	0.147	80.6	327	81.1	1	
Sb	121	1	nogas	0.031	296.1	3147	32.6	2.5	
Tl	205	1	nogas	1.115	52.3	18360	51.8	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.166	73.4	4657	64.3	2.5	
U	238	1	nogas	0.161	94.0	4718	75.0	2.5	
[Pb]	206	1	nogas	0.160	76.2	1130	66.1	2.5	
[Pb]	207	1	nogas	0.160	58.9	1023	52.2	2.5	
Na	23	2	He	287.131	3.4	111890	1.9	100	CCB Main CR1 Failed
Mg	24	2	He	6.930	29.5	917	19.4	100	
Al	27	2	He	-0.165	-600.4	60	44.1	5	
K	39	2	He	-7.238	-49.8	15273	1.4	100	
Ca	43	2	He	1.719	3469.4	7	173.2	100	
Ca	44	2	He	-0.233	-5645.8	157	31.5	100	
V	51	2	He	0.474	4.7	1279	4.8	2.5	
Cr	52	2	He	0.129	43.6	1373	8.8	2.5	
Mn	55	2	He	-0.010	-959.4	180	29.4	2.5	
Fe	56	2	He	5.091	18.2	10700	6.6	100	
Co	59	2	He	0.026	18.5	93	12.4	2.5	
Ni	60	2	He	0.478	11.0	263	12.2	2.5	
Cu	63	2	He	0.132	65.1	900	17.5	2.5	
Zn	66	2	He	0.298	14.3	53	28.6	2.5	
As	75	2	He	-0.276	-8.5	49	7.9	2.5	
Se	78	2	He	0.082	1077.5	7	124.9	2.5	
B	11	1	nogas	-376.596	-1.9	433619	1.0	10	
Si	28	1	nogas	-16.185	-76.4	1286617	2.9	5	
Ca	43	1	nogas	20.276	64.4	1547	22.5	100	
Ca	44	1	nogas	-511.365	-4.1	114796	2.8	100	
Fe	56	1	nogas	21.305	33.5	1361862	13.7	100	
Se	77	1	nogas	-50.775	-62.3	89657	3.2	2.5	
Se	82	1	nogas	-0.434	-73.8	557	9.0	2.5	
Mo	95	1	nogas	0.556	32.8	3347	25.5	2.5	
Sn	118	1	nogas	0.256	46.2	2504	29.8	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.132	76.5	557	55.1	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.072	-60.3	227	22.6	2.5	
P	31	1	nogas	6.003	71.2	54914	1.7	10	
La	139	1	nogas	0.617	1304.9	83	45.4	2.5	
Au	197	1	nogas	200.761	158.2	13	86.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	374538	3.41	318818	117.48	70	125	
Ge	72	1	nogas	1572056	6.85	1556628	100.99	70	125	
In	115	1	nogas	1675397	2.12	1631900	102.67	70	125	
Bi	209	1	nogas	1499427	1.45	1453823	103.14	70	125	
Ge	72	2	He	122934	3.46	131050	93.81	70	125	

Sample Report

Sample Table

Sample Name	MBLK-122596
Data File Name	144SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T14:52:28-06:00
Sample Type	Sample
Dilution	1
Comment	B122596 TW
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.018	0.018	36.79	87	0.02	2000	
Na	23	1	nogas	143.113	143.113	5.25	3693809	0.00	200000	
Mg	24	1	nogas	14.402	14.402	1.94	138605	0.01	200000	
Al	27	1	nogas	5.866	5.866	0.56	68158	0.01	2000	
K	39	1	nogas	-45.410	-45.410	-31.37	5290371	0.00	200000	
Ti	47	1	nogas	-0.005	-0.005	-1067.60	297	0.00	2000	
V	51	1	nogas	-17.090	-17.090	-51.54	2018808	0.00	2000	
Cr	52	1	nogas	-1.124	-1.124	-13.42	45065	0.00	2000	
Mn	55	1	nogas	0.016	0.016	197.49	10210	0.00	2000	
Co	59	1	nogas	0.002	0.002	260.18	330	0.00	2000	
Ni	60	1	nogas	-0.389	-0.389	-21.07	2133	-0.02	2000	
Cu	63	1	nogas	-0.061	-0.061	-100.89	5621	0.00	2000	
Zn	66	1	nogas	-0.111	-0.111	-47.59	1333	-0.01	2000	
As	75	1	nogas	-28.939	-28.939	-17.11	259341	-0.01	2000	
Sr	88	1	nogas	0.037	0.037	20.47	1193	0.00	2000	
Ag	107	1	nogas	0.005	0.005	67.48	513	0.00	2000	
Cd	111	1	nogas	0.020	0.020	48.45	47	0.04	2000	
Sb	121	1	nogas	-0.157	-0.157	-0.68	1543	-0.01	2000	
Tl	205	1	nogas	0.044	0.044	18.62	1043	0.00	2000	
Pb	208	1	nogas	-0.003	-0.003	-174.26	553	0.00	2000	
U	238	1	nogas	-0.032	-0.032	-4.62	227	-0.01	2000	
[Pb]	206	1	nogas	-0.004	-0.004	-57.51	133	0.00	2000	
[Pb]	207	1	nogas	-0.004	-0.004	-269.60	107	0.00	2000	
Na	23	2	He	225.897	225.897	9.11	103014	0.22	200000	
Mg	24	2	He	15.077	15.077	12.57	1847	0.82	200000	
Al	27	2	He	6.011	6.011	40.29	247	2.44	2000	
K	39	2	He	-6.852	-6.852	-42.80	15296	-0.04	200000	
Ca	43	2	He	50.083	50.083	52.57	17	300.50	200000	
Ca	44	2	He	-13.098	-13.098	-58.36	117	-11.23	200000	
V	51	2	He	0.328	0.328	12.18	1151	0.03	2000	
Cr	52	2	He	0.100	0.100	6.57	1390	0.01	2000	
Mn	55	2	He	-0.053	-0.053	-90.73	160	-0.03	2000	
Fe	56	2	He	0.986	0.986	9.03	6158	0.02	200000	
Co	59	2	He	0.007	0.007	214.78	43	0.02	2000	
Ni	60	2	He	0.370	0.370	9.29	187	0.20	2000	
Cu	63	2	He	0.133	0.133	53.56	947	0.01	2000	
Zn	66	2	He	0.436	0.436	29.30	107	0.41	2000	
As	75	2	He	-0.255	-0.255	-76.21	56	-0.46	2000	
Se	78	2	He	0.220	0.220	361.90	8	2.75	2000	
B	11	1	nogas	-377.381	-377.381	-0.76	447497	-0.08	2000	
Si	28	1	nogas	-5.824	-5.824	-88.80	1418047	0.00	2000	
Ca	43	1	nogas	-5.553	-5.553	-195.62	1117	-0.50	200000	

Sample Report

Ca	44	1	nogas	-556.750	-556.750	-1.36	108693	-0.51	200000	
Fe	56	1	nogas	-2.686	-2.686	-41.20	1091555	0.00	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	-85.647	-85.647	-20.51	85152	-0.10	2000	
Se	82	1	nogas	-1.169	-1.169	-88.29	483	-0.24	2000	
Mo	95	1	nogas	0.159	0.159	47.52	2017	0.01	2000	
Sn	118	1	nogas	-0.049	-0.049	-58.40	690	-0.01	2000	
Ba	137	1	nogas	0.028	0.028	21.26	257	0.01	2000	
Sb	121	2	He	-0.171	-0.171	-24.22	130	-0.13	2000	
La	139	1	nogas	-5.776	-5.776	-52.22	57	-10.19	2000	
Au	197	1	nogas	-48.347	-48.347	-1143.66	23	-207.20	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	388066	1.52	318818	121.72	70	125	
Ge	72	1	nogas	1673188	1.85	1556628	107.49	70	125	
In	115	1	nogas	1761360	1.86	1631900	107.93	70	125	
Bi	209	1	nogas	1598913	2.73	1453823	109.98	70	125	
Ge	72	2	He	128943	4.30	131050	98.39	70	125	

Sample Report

Sample Table

Sample Name	LCS-122596
Data File Name	145SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T14:54:27-06:00
Sample Type	Sample
Dilution	1
Comment	B122596 TW
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	50.348	50.348	3.26	144813	0.03	2000	
Na	23	1	nogas	5127.791	5127.791	1.63	67962252	0.01	200000	
Mg	24	1	nogas	4826.731	4826.731	4.34	43510343	0.01	200000	
Al	27	1	nogas	106.466	106.466	1.72	1059631	0.01	2000	
K	39	1	nogas	4750.208	4750.208	3.41	53202237	0.01	200000	
Ti	47	1	nogas	147.628	147.628	1.80	150657	0.10	2000	
V	51	1	nogas	25.688	25.688	18.26	2707544	0.00	2000	
Cr	52	1	nogas	50.361	50.361	0.95	695433	0.01	2000	
Mn	55	1	nogas	50.732	50.732	3.25	845169	0.01	2000	
Co	59	1	nogas	51.632	51.632	2.67	709988	0.01	2000	
Ni	60	1	nogas	50.288	50.288	2.58	165864	0.03	2000	
Cu	63	1	nogas	52.818	52.818	0.83	411945	0.01	2000	
Zn	66	1	nogas	52.426	52.426	2.45	138347	0.04	2000	
As	75	1	nogas	16.287	16.287	34.28	410110	0.00	2000	
Sr	88	1	nogas	101.551	101.551	3.80	1737731	0.01	2000	
Ag	107	1	nogas	50.150	50.150	4.20	517051	0.01	2000	
Cd	111	1	nogas	48.074	48.074	1.10	110269	0.04	2000	
Sb	121	1	nogas	53.873	53.873	4.85	509379	0.01	2000	
Tl	205	1	nogas	49.982	49.982	6.50	874853	0.01	2000	
Pb	208	1	nogas	48.322	48.322	6.97	1276537	0.00	2000	
U	238	1	nogas	92.125	92.125	6.13	2326193	0.00	2000	
[Pb]	206	1	nogas	47.345	47.345	8.26	312025	0.02	2000	
[Pb]	207	1	nogas	46.810	46.810	7.51	284269	0.02	2000	
Na	23	2	He	5355.472	5355.472	3.54	1282577	0.42	200000	
Mg	24	2	He	4996.548	4996.548	2.13	536853	0.93	200000	
Al	27	2	He	107.881	107.881	3.19	3197	3.37	2000	
K	39	2	He	4757.152	4757.152	2.10	302946	1.57	200000	
Ca	43	2	He	5405.304	5405.304	1.46	1073	503.57	200000	
Ca	44	2	He	4605.859	4605.859	2.62	16478	27.95	200000	
V	51	2	He	48.938	48.938	1.52	63143	0.08	2000	
Cr	52	2	He	50.954	50.954	3.17	86434	0.06	2000	
Mn	55	2	He	50.013	50.013	0.28	33434	0.15	2000	
Fe	56	2	He	4905.057	4905.057	3.13	6012918	0.08	200000	
Co	59	2	He	49.993	49.993	1.69	145580	0.03	2000	
Ni	60	2	He	51.132	51.132	0.46	42156	0.12	2000	
Cu	63	2	He	50.948	50.948	5.30	117349	0.04	2000	
Zn	66	2	He	50.652	50.652	5.17	17876	0.28	2000	
As	75	2	He	49.806	49.806	1.46	12593	0.40	2000	
Se	78	2	He	46.315	46.315	2.04	447	10.37	2000	
B	11	1	nogas	22.798	22.798	144.56	1355728	0.00	2000	
Si	28	1	nogas	5059.002	5059.002	0.98	24049341	0.02	2000	>LDR
Ca	43	1	nogas	4971.359	4971.359	2.43	101442	4.90	200000	
Ca	44	1	nogas	4640.624	4640.624	2.92	1676477	0.28	200000	
Fe	56	1	nogas	4597.222	4597.222	2.61	68785481	0.01	200000	

Sample Report

Se	77	1	nogas	-56.737	-56.737	-25.29	93777	-0.06	2000	
Se	82	1	nogas	48.375	48.375	3.31	7929	0.61	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Mo	95	1	nogas	48.493	48.493	1.96	187628	0.03	2000	
Sn	118	1	nogas	94.987	94.987	1.66	594611	0.02	2000	
Ba	137	1	nogas	46.606	46.606	1.97	144762	0.03	2000	
Sb	121	2	He	48.994	48.994	3.84	52513	0.09	2000	
La	139	1	nogas	32.568	32.568	21.06	237	13.76	2000	
Au	197	1	nogas	398.439	398.439	36.82	7	5976.59	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	338647	3.00	318818	106.22	70	125	
Ge	72	1	nogas	1669168	1.43	1556628	107.23	70	125	
In	115	1	nogas	1739054	1.68	1631900	106.57	70	125	
Bi	209	1	nogas	1623059	4.61	1453823	111.64	70	125	
Ge	72	2	He	127472	1.74	131050	97.27	70	125	

Sample Report

Sample Table

Sample Name	HS17111047-01
Data File Name	151SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:06:25-06:00
Sample Type	Sample
Dilution	1
Comment	B122596 TW
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.539	0.539	22.94	1540	0.04	2000	
Na	23	1	nogas	220024.867	220024.867	7.40	2843802530	0.01	200000	>LDR
Mg	24	1	nogas	49779.427	49779.427	2.58	449392643	0.01	200000	
Al	27	1	nogas	2271.086	2271.086	1.87	21590441	0.01	2000	>LDR
K	39	1	nogas	508.357	508.357	2.80	10422686	0.00	200000	
Ti	47	1	nogas	64.664	64.664	2.06	63755	0.10	2000	
V	51	1	nogas	-32.621	-32.621	-10.22	1700904	0.00	2000	
Cr	52	1	nogas	3.382	3.382	5.05	98216	0.00	2000	
Mn	55	1	nogas	314.325	314.325	1.00	4999332	0.01	2000	
Co	59	1	nogas	5.241	5.241	2.56	69764	0.01	2000	
Ni	60	1	nogas	18.908	18.908	3.40	62180	0.03	2000	
Cu	63	1	nogas	10.000	10.000	1.84	79933	0.01	2000	
Zn	66	1	nogas	24.208	24.208	1.84	62422	0.04	2000	
As	75	1	nogas	-43.637	-43.637	-5.00	202220	-0.02	2000	
Sr	88	1	nogas	1869.993	1869.993	0.86	30837897	0.01	2000	>LDR
Ag	107	1	nogas	0.026	0.026	52.56	700	0.00	2000	
Cd	111	1	nogas	0.590	0.590	13.74	1330	0.04	2000	
Sb	121	1	nogas	-0.013	-0.013	-134.94	2784	0.00	2000	
Tl	205	1	nogas	0.073	0.073	20.41	1370	0.01	2000	
Pb	208	1	nogas	3.056	3.056	3.59	71199	0.00	2000	
U	238	1	nogas	9.853	9.853	4.45	218561	0.00	2000	
[Pb]	206	1	nogas	3.315	3.315	5.21	19262	0.02	2000	
[Pb]	207	1	nogas	2.689	2.689	4.91	14403	0.02	2000	
Na	23	2	He	231297.661	231297.661	2.39	51777139	0.45	200000	>LDR
Mg	24	2	He	52688.531	52688.531	1.42	5498385	0.96	200000	
Al	27	2	He	2154.608	2154.608	0.95	60792	3.54	2000	>LDR
K	39	2	He	504.595	504.595	4.76	46177	1.09	200000	
Ca	43	2	He	80348.685	80348.685	3.63	15410	521.40	200000	
Ca	44	2	He	72757.168	72757.168	4.29	250439	29.05	200000	
V	51	2	He	21.312	21.312	2.90	27099	0.08	2000	
Cr	52	2	He	5.062	5.062	3.94	9399	0.05	2000	
Mn	55	2	He	308.484	308.484	4.11	199269	0.15	2000	
Fe	56	2	He	3622.771	3622.771	1.51	4316649	0.08	200000	
Co	59	2	He	5.138	5.138	4.81	14549	0.04	2000	
Ni	60	2	He	18.815	18.815	2.88	14990	0.13	2000	
Cu	63	2	He	10.262	10.262	3.14	23462	0.04	2000	
Zn	66	2	He	23.475	23.475	1.16	8025	0.29	2000	
As	75	2	He	1.171	1.171	15.09	401	0.29	2000	
Se	78	2	He	1.245	1.245	7.96	17	7.18	2000	
B	11	1	nogas	-319.432	-319.432	-1.72	518440	-0.06	2000	
Si	28	1	nogas	33252.467	33252.467	0.47	144644698	0.02	2000	>LDR
Ca	43	1	nogas	73274.761	73274.761	2.50	1424959	5.14	200000	
Ca	44	1	nogas	76216.785	76216.785	3.56	22437692	0.34	200000	
Fe	56	1	nogas	3614.871	3614.871	1.02	52386000	0.01	200000	
Se	77	1	nogas	-139.036	-139.036	-3.69	66284	-0.21	2000	
Se	82	1	nogas	-0.097	-0.097	-824.95	620	-0.02	2000	

Sample Report

Mo	95	1	nogas	0.320	0.320	7.94	2534	0.01	2000	
Sn	118	1	nogas	0.049	0.049	80.77	1280	0.00	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	54.890	54.890	2.72	167647	0.03	2000	
Sb	121	2	He	-0.041	-0.041	-41.94	260	-0.02	2000	
La	139	1	nogas	29216.433	29216.433	3.01	135843	21.51	2000	>LDR
Au	197	1	nogas	-673.788	-673.788	-165.35	43	-1554.90	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	330996	1.62	318818	103.82	70	125	
Ge	72	1	nogas	1608985	1.26	1556628	103.36	70	125	
In	115	1	nogas	1710665	1.97	1631900	104.83	70	125	
Bi	209	1	nogas	1419460	3.77	1453823	97.64	70	125	
Ge	72	2	He	123833	1.55	131050	94.49	70	125	

Sample Report

Sample Table

Sample Name	HS17111047-01SD
Data File Name	152SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:08:26-06:00
Sample Type	Sample
Dilution	5
Comment	B122596 TW
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.109	0.544	19.38	350	0.03	2000	
Na	23	1	nogas	46554.597	232772.984	4.27	586639546	0.01	200000	
Mg	24	1	nogas	10568.198	52840.989	1.55	92738821	0.01	200000	
Al	27	1	nogas	473.567	2367.834	0.99	4407125	0.01	2000	
K	39	1	nogas	78.626	393.129	31.90	6134780	0.00	200000	
Ti	47	1	nogas	13.611	68.055	6.96	13325	0.10	2000	
V	51	1	nogas	-24.818	-124.088	-44.27	1776323	0.00	2000	
Cr	52	1	nogas	-0.449	-2.244	-55.71	50322	0.00	2000	
Mn	55	1	nogas	68.236	341.179	3.95	1067227	0.01	2000	
Co	59	1	nogas	1.098	5.488	4.95	14483	0.01	2000	
Ni	60	1	nogas	4.049	20.243	10.55	15484	0.03	2000	
Cu	63	1	nogas	2.140	10.701	7.00	21196	0.01	2000	
Zn	66	1	nogas	5.156	25.780	6.19	14192	0.04	2000	
As	75	1	nogas	-33.696	-168.481	-18.16	228388	-0.01	2000	
Sr	88	1	nogas	368.955	1844.777	3.77	5940866	0.01	2000	
Ag	107	1	nogas	-0.008	-0.041	-60.20	350	0.00	2000	
Cd	111	1	nogas	0.122	0.612	19.50	267	0.05	2000	
Sb	121	1	nogas	-0.189	-0.947	-11.26	1160	-0.02	2000	
Tl	205	1	nogas	0.015	0.075	30.18	517	0.00	2000	
Pb	208	1	nogas	0.603	3.017	1.98	15386	0.00	2000	
U	238	1	nogas	1.828	9.141	3.02	43805	0.00	2000	
[Pb]	206	1	nogas	0.636	3.181	3.77	4047	0.02	2000	
[Pb]	207	1	nogas	0.558	2.791	8.34	3267	0.02	2000	
Na	23	2	He	46605.274	233026.371	2.65	10137543	0.46	200000	
Mg	24	2	He	10713.217	53566.087	1.94	1082481	0.99	200000	
Al	27	2	He	447.869	2239.343	0.45	12288	3.64	2000	
K	39	2	He	92.619	463.096	4.99	21302	0.43	200000	
Ca	43	2	He	17217.167	86085.835	7.73	3204	537.42	200000	
Ca	44	2	He	14833.342	74166.710	3.14	49560	29.93	200000	
V	51	2	He	4.530	22.652	0.67	6114	0.07	2000	
Cr	52	2	He	1.136	5.678	7.81	2920	0.04	2000	
Mn	55	2	He	63.438	317.189	7.51	39851	0.16	2000	
Fe	56	2	He	792.506	3962.530	2.92	918113	0.09	200000	
Co	59	2	He	1.020	5.099	11.36	2810	0.04	2000	
Ni	60	2	He	4.480	22.398	5.43	3367	0.13	2000	
Cu	63	2	He	2.000	9.998	10.98	4901	0.04	2000	
Zn	66	2	He	5.441	27.204	15.54	1767	0.31	2000	
As	75	2	He	-0.057	-0.286	-324.08	100	-0.06	2000	
Se	78	2	He	-0.261	-1.303	-130.15	3	-7.82	2000	
B	11	1	nogas	-353.992	-1769.958	-2.22	464277	-0.08	2000	
Si	28	1	nogas	6621.694	33108.472	2.82	29218535	0.02	2000	>LDR
Ca	43	1	nogas	15762.941	78814.707	6.32	300044	5.25	200000	
Ca	44	1	nogas	15549.486	77747.432	9.47	4672323	0.33	200000	
Fe	56	1	nogas	743.554	3717.771	4.91	11362275	0.01	200000	

Sample Report

Se	77	1	nogas	-107.154	-535.771	-22.98	73723	-0.15	2000	
Se	82	1	nogas	0.213	1.063	165.56	650	0.03	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Mo	95	1	nogas	0.225	1.124	19.15	2134	0.01	2000	
Sn	118	1	nogas	0.027	0.136	60.84	1100	0.00	2000	
Ba	137	1	nogas	11.610	58.051	5.33	34308	0.03	2000	
Sb	121	2	He	-0.165	-0.827	-30.33	127	-0.13	2000	
La	139	1	nogas	6300.815	31504.077	7.01	28287	22.27	2000	>LDR
Au	197	1	nogas	-263.772	-1318.861	-110.53	30	-879.24	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	352044	3.62	318818	110.42	70	125	
Ge	72	1	nogas	1572460	4.12	1556628	101.02	70	125	
In	115	1	nogas	1651427	5.08	1631900	101.20	70	125	
Bi	209	1	nogas	1504934	2.14	1453823	103.52	70	125	
Ge	72	2	He	119917	2.55	131050	91.50	70	125	

Sample Report

Sample Table

Sample Name	HS17111047-01MS
Data File Name	153SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:10:24-06:00
Sample Type	Sample
Dilution	1
Comment	B122596 TW
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	51.297	51.297	3.44	124349	0.04	2000	
Na	23	1	nogas	228902.187	228902.187	4.41	2974088133	0.01	200000	>LDR
Mg	24	1	nogas	55560.821	55560.821	7.75	503092511	0.01	200000	
Al	27	1	nogas	4956.437	4956.437	5.41	46728351	0.01	2000	>LDR
K	39	1	nogas	4915.619	4915.619	5.44	52441763	0.01	200000	
Ti	47	1	nogas	224.734	224.734	6.37	219003	0.10	2000	
V	51	1	nogas	26.114	26.114	33.05	2595612	0.00	2000	
Cr	52	1	nogas	53.338	53.338	6.22	700771	0.01	2000	
Mn	55	1	nogas	364.405	364.405	3.45	5747699	0.01	2000	
Co	59	1	nogas	52.707	52.707	1.42	693277	0.01	2000	
Ni	60	1	nogas	66.318	66.318	0.90	208204	0.03	2000	
Cu	63	1	nogas	58.278	58.278	2.92	434009	0.01	2000	
Zn	66	1	nogas	77.773	77.773	3.21	195504	0.04	2000	
As	75	1	nogas	3.855	3.855	105.51	352522	0.00	2000	
Sr	88	1	nogas	1974.934	1974.934	0.89	32319507	0.01	2000	>LDR
Ag	107	1	nogas	47.058	47.058	2.96	464110	0.01	2000	
Cd	111	1	nogas	46.863	46.863	2.29	100763	0.05	2000	
Sb	121	1	nogas	46.136	46.136	2.73	417713	0.01	2000	
Tl	205	1	nogas	46.290	46.290	0.59	750196	0.01	2000	
Pb	208	1	nogas	50.579	50.579	0.25	1237390	0.00	2000	
U	238	1	nogas	102.683	102.683	1.35	2400345	0.00	2000	
[Pb]	206	1	nogas	49.771	49.771	0.56	303889	0.02	2000	
[Pb]	207	1	nogas	48.311	48.311	1.22	271753	0.02	2000	
Na	23	2	He	244968.635	244968.635	1.52	53320284	0.46	200000	>LDR
Mg	24	2	He	60026.023	60026.023	1.78	6090389	0.99	200000	
Al	27	2	He	4714.365	4714.365	3.42	129240	3.65	2000	>LDR
K	39	2	He	4732.399	4732.399	3.02	301451	1.57	200000	
Ca	43	2	He	89745.048	89745.048	4.12	16748	535.86	200000	
Ca	44	2	He	79844.508	79844.508	0.31	267349	29.87	200000	
V	51	2	He	71.962	71.962	2.98	87356	0.08	2000	
Cr	52	2	He	53.614	53.614	1.95	85881	0.06	2000	
Mn	55	2	He	369.575	369.575	2.71	232201	0.16	2000	
Fe	56	2	He	9054.636	9054.636	3.35	10483069	0.09	200000	
Co	59	2	He	51.019	51.019	2.92	140318	0.04	2000	
Ni	60	2	He	66.149	66.149	1.70	51547	0.13	2000	
Cu	63	2	He	57.606	57.606	0.44	125334	0.05	2000	
Zn	66	2	He	75.194	75.194	2.40	25108	0.30	2000	
As	75	2	He	47.829	47.829	3.30	11426	0.42	2000	
Se	78	2	He	45.038	45.038	4.86	411	10.97	2000	
B	11	1	nogas	104.998	104.998	33.15	1309272	0.01	2000	
Si	28	1	nogas	44714.395	44714.395	6.73	192430084	0.02	2000	>LDR
Ca	43	1	nogas	79037.080	79037.080	3.45	1524720	5.18	200000	
Ca	44	1	nogas	82123.745	82123.745	5.57	23951804	0.34	200000	
Fe	56	1	nogas	8949.316	8949.316	2.79	127043053	0.01	200000	

Sample Report

Se	77	1	nogas	-96.752	-96.752	-10.34	78057	-0.12	2000	
Se	82	1	nogas	45.064	45.064	5.83	7105	0.63	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Mo	95	1	nogas	43.988	43.988	2.27	162927	0.03	2000	
Sn	118	1	nogas	78.711	78.711	1.68	461995	0.02	2000	
Ba	137	1	nogas	111.324	111.324	0.99	324018	0.03	2000	
Sb	121	2	He	44.269	44.269	1.31	44865	0.10	2000	
La	139	1	nogas	36107.607	36107.607	3.01	160004	22.57	2000	>LDR
Au	197	1	nogas	-79.076	-79.076	-204.15	23	-338.90	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	285460	4.81	318818	89.54	70	125	
Ge	72	1	nogas	1596562	1.95	1556628	102.57	70	125	
In	115	1	nogas	1630663	2.45	1631900	99.92	70	125	
Bi	209	1	nogas	1499903	0.46	1453823	103.17	70	125	
Ge	72	2	He	120420	1.77	131050	91.89	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	154_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:12:25-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	91.001	2.438	263418	1.26	100	91.0	90	110	
Na	23	1	nogas	10391.556	4.112	126537819	2.25	10000	103.9	90	110	
Mg	24	1	nogas	9556.596	2.397	80239364	3.09	10000	95.6	90	110	
Al	27	1	nogas	108.427	3.316	973319	0.44	100	108.4	90	110	
K	39	1	nogas	10376.643	7.316	98620725	3.43	10000	103.8	90	110	
Ti	47	1	nogas	101.107	3.818	93129	0.64	100	101.1	90	110	
V	51	1	nogas	80.314	15.991	3238637	2.17	100	80.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	98.417	6.985	1174031	3.14	100	98.4	90	110	
Mn	55	1	nogas	105.252	4.963	1572056	2.69	100	105.3	90	110	
Co	59	1	nogas	105.198	3.952	1304655	0.90	100	105.2	90	110	
Ni	60	1	nogas	104.862	3.337	308705	0.63	100	104.9	90	110	
Cu	63	1	nogas	107.235	4.708	748508	1.04	100	107.2	90	110	
Zn	66	1	nogas	106.112	4.313	251046	0.71	100	106.1	90	110	
As	75	1	nogas	70.436	17.359	533078	3.37	100	70.4	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	108.166	3.344	1670715	4.39	100	108.2	90	110	
Ag	107	1	nogas	104.124	6.556	967480	3.04	100	104.1	90	110	
Cd	111	1	nogas	99.044	3.595	208973	2.89	100	99.0	90	110	
Sb	121	1	nogas	110.380	3.641	938859	0.10	100	110.4	90	110	CCV Main CR1-2 Failed
Tl	205	1	nogas	99.786	3.557	1566293	3.01	100	99.8	90	110	
Pb	208	1	nogas	98.563	2.879	2335439	2.30	100	98.6	90	110	
U	238	1	nogas	104.315	3.537	2362652	3.62	100	104.3	90	110	
[Pb]	206	1	nogas	99.903	1.244	590798	0.41	100	99.9	90	110	
[Pb]	207	1	nogas	94.321	0.851	513903	0.79	100	94.3	90	110	
Na	23	2	He	10508.427	1.108	2301175	2.08	10000	105.1	90	110	
Mg	24	2	He	9819.771	2.557	983109	2.68	10000	98.2	90	110	
Al	27	2	He	96.630	10.591	2674	9.29	100	96.6	90	110	
K	39	2	He	9163.424	1.509	568995	1.47	10000	91.6	90	110	
Ca	43	2	He	10352.961	2.128	1910	1.38	10000	103.5	90	110	
Ca	44	2	He	9400.409	2.057	31177	1.58	10000	94.0	90	110	
V	51	2	He	97.202	1.237	116198	2.08	100	97.2	90	110	
Cr	52	2	He	102.264	1.221	160555	2.12	100	102.3	90	110	
Mn	55	2	He	97.284	2.211	60417	1.19	100	97.3	90	110	
Fe	56	2	He	9919.853	2.126	11329007	1.40	10000	99.2	90	110	
Co	59	2	He	101.499	2.987	275367	2.05	100	101.5	90	110	
Ni	60	2	He	101.621	1.545	78174	1.86	100	101.6	90	110	
Cu	63	2	He	101.544	0.876	217471	0.86	100	101.5	90	110	
Zn	66	2	He	99.245	0.800	32693	1.52	100	99.2	90	110	
As	75	2	He	100.263	1.658	23508	0.73	100	100.3	90	110	
Se	78	2	He	98.156	5.974	876	5.98	100	98.2	90	110	
B	11	1	nogas	-9.318	-367.344	1286125	3.57	500	-1.9	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5376.335	4.412	22968754	0.87	5000	107.5	90	110	
Ca	43	1	nogas	10758.380	5.446	196650	2.02	10000	107.6	90	110	
Ca	44	1	nogas	10468.777	5.901	3097301	2.06	10000	104.7	90	110	
Fe	56	1	nogas	10269.074	4.282	137354045	1.97	10000	102.7	90	110	
Se	77	1	nogas	-5.836	-508.088	98493	4.85	100	-5.8	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	102.027	5.271	14419	1.44	100	102.0	90	110	
Mo	95	1	nogas	103.153	5.143	358479	2.08	100	103.2	90	110	
Sn	118	1	nogas	98.713	1.928	568284	0.45	100	98.7	90	110	
Ba	137	1	nogas	98.899	3.587	282396	2.43	100	98.9	90	110	
Sb	121	2	He	98.497	1.790	98117	2.29	100	98.5	90	110	
Li	7	1	nogas	98.959	1.872	708766	3.49	100	99.0	90	110	
P	31	1	nogas	507.742	7.334	383797	2.82	500	101.5	90	110	
La	139	1	nogas	164.346	18.099	790	15.40	100	164.3	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-478.127	-89.742	37	41.66	100	-478.1	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	340798	3.32	318818	106.89	70	125	
Ge	72	1	nogas	1506811	3.74	1556628	96.80	70	125	
In	115	1	nogas	1599964	1.68	1631900	98.04	70	125	
Bi	209	1	nogas	1453234	1.00	1453823	99.96	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	118778	1.01	131050	90.64	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	155_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:14:23-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.136	71.1	453	68.4	1	
Na	23	1	nogas	185.799	7.4	4001435	2.5	100	CCB Main CR1 Failed
Mg	24	1	nogas	20.331	57.8	180929	55.4	100	
Al	27	1	nogas	0.517	15.8	14633	6.1	5	
K	39	1	nogas	-43.487	-32.5	5076670	1.3	100	
Ti	47	1	nogas	0.205	20.6	490	9.4	2.5	
V	51	1	nogas	-12.514	-48.6	2001919	3.7	2.5	
Cr	52	1	nogas	-1.014	-11.1	44437	3.6	2.5	
Mn	55	1	nogas	0.403	22.2	15870	8.8	2.5	
Co	59	1	nogas	0.175	89.5	2614	81.5	2.5	
Ni	60	1	nogas	-0.143	-53.1	2800	5.6	2.5	
Cu	63	1	nogas	-0.001	-3718.3	5821	7.6	2.5	
Zn	66	1	nogas	-0.205	-48.8	1040	25.0	2.5	
As	75	1	nogas	-22.612	-21.1	268260	4.0	2.5	
Sr	88	1	nogas	0.270	41.7	4961	38.7	2.5	
Ag	107	1	nogas	0.117	67.7	1607	51.3	2.5	
Cd	111	1	nogas	0.194	61.6	433	63.5	1	
Sb	121	1	nogas	-0.051	-190.6	2444	37.7	2.5	
Tl	205	1	nogas	1.152	48.3	19277	49.6	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.162	67.5	4630	60.9	2.5	
U	238	1	nogas	0.173	82.2	5111	68.7	2.5	
[Pb]	206	1	nogas	0.157	73.7	1130	65.8	2.5	
[Pb]	207	1	nogas	0.161	59.1	1047	53.8	2.5	
Na	23	2	He	264.543	2.5	104910	0.4	100	CCB Main CR1 Failed
Mg	24	2	He	7.517	12.5	963	8.8	100	
Al	27	2	He	-0.869	-71.7	40	43.3	5	
K	39	2	He	-20.940	-61.0	14446	5.3	100	
Ca	43	2	He	20.435	450.5	10	173.2	100	
Ca	44	2	He	9.819	192.1	187	34.4	100	
V	51	2	He	0.431	21.2	1203	9.7	2.5	
Cr	52	2	He	0.119	24.5	1330	2.7	2.5	
Mn	55	2	He	0.089	107.2	240	25.0	2.5	
Fe	56	2	He	5.669	18.9	11187	10.2	100	
Co	59	2	He	0.036	61.9	120	50.0	2.5	
Ni	60	2	He	0.410	36.0	207	56.7	2.5	
Cu	63	2	He	0.121	62.6	863	19.3	2.5	
Zn	66	2	He	0.310	33.4	57	62.0	2.5	
As	75	2	He	-0.222	-18.3	61	16.7	2.5	
Se	78	2	He	0.111	302.2	7	45.8	2.5	
B	11	1	nogas	-374.271	-2.5	431981	1.7	10	
Si	28	1	nogas	-20.462	-56.2	1292803	2.2	5	
Ca	43	1	nogas	22.889	56.2	1613	14.8	100	
Ca	44	1	nogas	-538.670	-2.8	109126	2.3	100	
Fe	56	1	nogas	12.599	103.1	1259991	15.6	100	
Se	77	1	nogas	-63.729	-25.7	87828	4.2	2.5	
Se	82	1	nogas	-0.574	-31.2	547	2.8	2.5	
Mo	95	1	nogas	0.470	32.7	3077	20.0	2.5	
Sn	118	1	nogas	0.341	34.9	3031	25.3	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.151	61.3	620	47.1	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.163	-37.4	130	48.0	2.5	
P	31	1	nogas	3.332	118.0	54101	2.5	10	
La	139	1	nogas	-0.033	-21090.7	80	37.5	2.5	
Au	197	1	nogas	26.974	1983.3	20	100.0	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	368101	4.41	318818	115.46	70	125	
Ge	72	1	nogas	1599973	2.81	1556628	102.78	70	125	
In	115	1	nogas	1684259	2.27	1631900	103.21	70	125	
Bi	209	1	nogas	1516601	2.16	1453823	104.32	70	125	
Ge	72	2	He	120634	1.03	131050	92.05	70	125	

Sample Report

Sample Table

Sample Name	HS17111047-01MSD
Data File Name	157SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:18:26-06:00
Sample Type	Sample
Dilution	1
Comment	B122596 TW
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	50.847	50.847	5.70	132387	0.04	2000	
Na	23	1	nogas	218690.209	218690.209	4.02	2954391933	0.01	200000	>LDR
Mg	24	1	nogas	53733.139	53733.139	3.71	506484395	0.01	200000	
Al	27	1	nogas	4683.524	4683.524	3.12	44286171	0.01	2000	>LDR
K	39	1	nogas	5133.422	5133.422	3.45	54693851	0.01	200000	
Ti	47	1	nogas	227.888	227.888	2.73	222872	0.10	2000	
V	51	1	nogas	23.436	23.436	22.90	2562192	0.00	2000	
Cr	52	1	nogas	53.563	53.563	2.17	705822	0.01	2000	
Mn	55	1	nogas	355.366	355.366	3.57	5621822	0.01	2000	
Co	59	1	nogas	52.277	52.277	3.73	689491	0.01	2000	
Ni	60	1	nogas	65.019	65.019	3.53	204728	0.03	2000	
Cu	63	1	nogas	59.184	59.184	3.68	441919	0.01	2000	
Zn	66	1	nogas	78.353	78.353	3.20	197531	0.04	2000	
As	75	1	nogas	5.322	5.322	73.03	358229	0.00	2000	
Sr	88	1	nogas	1951.716	1951.716	4.07	32016950	0.01	2000	>LDR
Ag	107	1	nogas	48.390	48.390	2.67	478685	0.01	2000	
Cd	111	1	nogas	46.771	46.771	2.09	103626	0.05	2000	
Sb	121	1	nogas	47.558	47.558	4.73	431644	0.01	2000	
Tl	205	1	nogas	49.394	49.394	1.78	773646	0.01	2000	
Pb	208	1	nogas	51.868	51.868	1.43	1226280	0.00	2000	
U	238	1	nogas	106.621	106.621	0.61	2408611	0.00	2000	
[Pb]	206	1	nogas	51.629	51.629	0.25	304627	0.02	2000	
[Pb]	207	1	nogas	50.065	50.065	1.18	272131	0.02	2000	
Na	23	2	He	235135.341	235135.341	0.81	52324849	0.45	200000	>LDR
Mg	24	2	He	57968.100	57968.100	2.32	6011352	0.96	200000	
Al	27	2	He	4635.517	4635.517	3.70	129868	3.57	2000	>LDR
K	39	2	He	4825.729	4825.729	2.48	307086	1.57	200000	
Ca	43	2	He	85745.790	85745.790	1.99	16348	524.52	200000	
Ca	44	2	He	76621.173	76621.173	2.21	262192	29.22	200000	
V	51	2	He	70.924	70.924	3.96	87991	0.08	2000	
Cr	52	2	He	54.494	54.494	0.98	89196	0.06	2000	
Mn	55	2	He	357.143	357.143	2.86	229292	0.16	2000	
Fe	56	2	He	8965.564	8965.564	2.17	10609524	0.08	200000	
Co	59	2	He	50.823	50.823	5.74	142791	0.04	2000	
Ni	60	2	He	64.848	64.848	5.74	51610	0.13	2000	
Cu	63	2	He	56.384	56.384	1.65	125393	0.04	2000	
Zn	66	2	He	74.252	74.252	1.99	25331	0.29	2000	
As	75	2	He	49.502	49.502	2.13	12084	0.41	2000	
Se	78	2	He	49.184	49.184	2.55	458	10.74	2000	
B	11	1	nogas	91.770	91.770	41.90	1378081	0.01	2000	
Si	28	1	nogas	43248.435	43248.435	4.84	186699771	0.02	2000	>LDR
Ca	43	1	nogas	80900.496	80900.496	3.07	1565345	5.17	200000	
Ca	44	1	nogas	83886.390	83886.390	2.67	24545340	0.34	200000	
Fe	56	1	nogas	8833.190	8833.190	5.03	125763782	0.01	200000	
Se	77	1	nogas	-90.519	-90.519	-9.07	80102	-0.11	2000	
Se	82	1	nogas	48.911	48.911	6.70	7678	0.64	2000	

Sample Report

Mo	95	1	nogas	45.549	45.549	3.62	169090	0.03	2000	
Sn	118	1	nogas	81.330	81.330	4.15	491673	0.02	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Ba	137	1	nogas	111.298	111.298	3.85	333593	0.03	2000	
Sb	121	2	He	43.747	43.747	5.23	45292	0.10	2000	
La	139	1	nogas	34617.636	34617.636	6.47	157953	21.92	2000	>LDR
Au	197	1	nogas	-387.202	-387.202	-213.55	33	-1161.60	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	306636	3.34	318818	96.18	70	125	
Ge	72	1	nogas	1601301	2.07	1556628	102.87	70	125	
In	115	1	nogas	1680238	2.85	1631900	102.96	70	125	
Bi	209	1	nogas	1449483	1.03	1453823	99.70	70	125	
Ge	72	2	He	123105	2.91	131050	93.94	70	125	

Sample Report

Sample Table

Sample Name	HS17111047-01PDS
Data File Name	158SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:20:26-06:00
Sample Type	Sample
Dilution	1
Comment	B122596 TW
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	87.950	87.950	4.41	247615	0.04	2000	
Na	23	1	nogas	222442.187	222442.187	6.98	2973623066	0.01	200000	>LDR
Mg	24	1	nogas	54753.617	54753.617	2.91	511250978	0.01	200000	
Al	27	1	nogas	2435.361	2435.361	4.37	23184864	0.01	2000	>LDR
K	39	1	nogas	8886.737	8886.737	1.66	91291644	0.01	200000	
Ti	47	1	nogas	253.779	253.779	5.97	249671	0.10	2000	
V	51	1	nogas	51.624	51.624	23.89	3018719	0.00	2000	
Cr	52	1	nogas	88.324	88.324	5.97	1134160	0.01	2000	
Mn	55	1	nogas	380.226	380.226	3.88	6056443	0.01	2000	
Co	59	1	nogas	89.920	89.920	4.25	1194258	0.01	2000	
Ni	60	1	nogas	101.560	101.560	3.53	320108	0.03	2000	
Cu	63	1	nogas	98.134	98.134	4.75	733779	0.01	2000	
Zn	66	1	nogas	116.030	116.030	4.57	293699	0.04	2000	
As	75	1	nogas	37.437	37.437	13.37	464405	0.01	2000	
Sr	88	1	nogas	1877.718	1877.718	3.05	31012890	0.01	2000	>LDR
Ag	107	1	nogas	89.608	89.608	3.17	891949	0.01	2000	
Cd	111	1	nogas	88.276	88.276	1.53	192568	0.05	2000	
Sb	121	1	nogas	89.753	89.753	4.35	817621	0.01	2000	
Tl	205	1	nogas	91.836	91.836	3.25	1472427	0.01	2000	
Pb	208	1	nogas	93.569	93.569	7.42	2262250	0.00	2000	
U	238	1	nogas	9.616	9.616	2.43	223335	0.00	2000	
[Pb]	206	1	nogas	92.289	92.289	4.93	557201	0.02	2000	
[Pb]	207	1	nogas	91.856	91.856	5.14	510898	0.02	2000	
Na	23	2	He	234916.318	234916.318	0.94	51333433	0.46	200000	>LDR
Mg	24	2	He	61475.163	61475.163	0.69	6262235	0.98	200000	
Al	27	2	He	2439.813	2439.813	1.84	67191	3.63	2000	>LDR
K	39	2	He	8672.815	8672.815	2.05	539372	1.61	200000	
Ca	43	2	He	87845.374	87845.374	3.83	16448	534.09	200000	
Ca	44	2	He	80457.845	80457.845	0.50	270422	29.75	200000	
V	51	2	He	110.499	110.499	1.16	134314	0.08	2000	
Cr	52	2	He	95.374	95.374	2.10	152430	0.06	2000	
Mn	55	2	He	397.072	397.072	2.10	250408	0.16	2000	
Fe	56	2	He	12698.315	12698.315	4.55	14755934	0.09	200000	
Co	59	2	He	95.674	95.674	2.65	264163	0.04	2000	
Ni	60	2	He	108.149	108.149	0.92	84671	0.13	2000	
Cu	63	2	He	99.699	99.699	0.02	217308	0.05	2000	
Zn	66	2	He	109.958	109.958	2.76	36861	0.30	2000	
As	75	2	He	92.842	92.842	0.86	22164	0.42	2000	
Se	78	2	He	91.717	91.717	2.27	833	11.01	2000	
B	11	1	nogas	428.118	428.118	16.68	2283481	0.02	2000	
Si	28	1	nogas	40713.935	40713.935	2.45	177083424	0.02	2000	>LDR
Ca	43	1	nogas	80135.960	80135.960	3.57	1560842	5.13	200000	
Ca	44	1	nogas	84204.186	84204.186	3.67	24795625	0.34	200000	
Fe	56	1	nogas	12004.755	12004.755	3.66	171703241	0.01	200000	

Sample Report

Se	77	1	nogas	-92.601	-92.601	-23.34	79979	-0.12	2000	
Se	82	1	nogas	94.377	94.377	3.94	14336	0.66	2000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Mo	95	1	nogas	89.399	89.399	2.15	332898	0.03	2000	
Sn	118	1	nogas	87.916	87.916	1.46	523346	0.02	2000	
Ba	137	1	nogas	154.298	154.298	3.91	455390	0.03	2000	
Sb	121	2	He	85.184	85.184	2.02	86381	0.10	2000	
La	139	1	nogas	31734.812	31734.812	1.39	142684	22.24	2000	>LDR
Au	197	1	nogas	-89.115	-89.115	-207.60	23	-381.92	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	331795	5.15	318818	104.07	70	125	
Ge	72	1	nogas	1612083	2.12	1556628	103.56	70	125	
In	115	1	nogas	1653965	1.77	1631900	101.35	70	125	
Bi	209	1	nogas	1485327	3.73	1453823	102.17	70	125	
Ge	72	2	He	120875	0.92	131050	92.24	70	125	

Sample Report

Sample Table

Sample Name	HS17111047-02
Data File Name	160SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:24:25-06:00
Sample Type	Sample
Dilution	1
Comment	B122596 TW
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	0.639	0.639	6.81	1793	0.04	2000	
Na	23	1	nogas	232710.403	232710.403	4.45	3100340936	0.01	200000	>LDR
Mg	24	1	nogas	52769.816	52769.816	4.52	490287178	0.01	200000	
Al	27	1	nogas	2801.357	2801.357	5.60	27048560	0.01	2000	>LDR
K	39	1	nogas	618.567	618.567	8.20	11665484	0.01	200000	
Ti	47	1	nogas	81.269	81.269	2.57	81385	0.10	2000	
V	51	1	nogas	-24.410	-24.410	-34.69	1860187	0.00	2000	
Cr	52	1	nogas	4.501	4.501	7.47	113629	0.00	2000	
Mn	55	1	nogas	317.585	317.585	4.79	5129398	0.01	2000	
Co	59	1	nogas	11.321	11.321	32.18	151999	0.01	2000	
Ni	60	1	nogas	21.417	21.417	7.40	71026	0.03	2000	
Cu	63	1	nogas	11.824	11.824	4.33	94910	0.01	2000	
Zn	66	1	nogas	33.296	33.296	1.35	86674	0.04	2000	
As	75	1	nogas	-43.388	-43.388	-7.68	206324	-0.02	2000	
Sr	88	1	nogas	1932.005	1932.005	0.74	32386430	0.01	2000	>LDR
Ag	107	1	nogas	0.031	0.031	17.99	763	0.00	2000	
Cd	111	1	nogas	0.582	0.582	12.86	1293	0.05	2000	
Sb	121	1	nogas	0.430	0.430	14.72	6911	0.01	2000	
Tl	205	1	nogas	0.116	0.116	20.81	2137	0.01	2000	
Pb	208	1	nogas	3.530	3.530	5.39	86785	0.00	2000	
U	238	1	nogas	10.167	10.167	2.31	238531	0.00	2000	
[Pb]	206	1	nogas	3.709	3.709	4.59	22773	0.02	2000	
[Pb]	207	1	nogas	3.245	3.245	7.80	18324	0.02	2000	
Na	23	2	He	240863.805	240863.805	3.44	54096471	0.45	200000	>LDR
Mg	24	2	He	55109.336	55109.336	4.03	5769711	0.96	200000	
Al	27	2	He	2685.125	2685.125	1.90	76004	3.53	2000	>LDR
K	39	2	He	644.581	644.581	4.51	54630	1.18	200000	
Ca	43	2	He	83965.522	83965.522	3.16	16161	519.57	200000	
Ca	44	2	He	76746.966	76746.966	1.74	265143	28.95	200000	
V	51	2	He	22.579	22.579	1.11	28774	0.08	2000	
Cr	52	2	He	6.647	6.647	4.42	12017	0.06	2000	
Mn	55	2	He	323.902	323.902	1.35	210010	0.15	2000	
Fe	56	2	He	4517.347	4517.347	2.52	5399842	0.08	200000	
Co	59	2	He	6.869	6.869	4.70	19514	0.04	2000	
Ni	60	2	He	21.088	21.088	4.48	16878	0.12	2000	
Cu	63	2	He	11.149	11.149	1.61	25528	0.04	2000	
Zn	66	2	He	31.316	31.316	3.03	10757	0.29	2000	
As	75	2	He	1.200	1.200	18.61	410	0.29	2000	
Se	78	2	He	1.739	1.739	43.64	22	7.90	2000	
B	11	1	nogas	-337.991	-337.991	-1.09	467756	-0.07	2000	
Si	28	1	nogas	35375.756	35375.756	5.49	156204154	0.02	2000	>LDR
Ca	43	1	nogas	76794.736	76794.736	4.59	1517435	5.06	200000	
Ca	44	1	nogas	80619.429	80619.429	2.62	24101654	0.33	200000	
Fe	56	1	nogas	4314.879	4314.879	4.09	63293145	0.01	200000	
Se	77	1	nogas	-142.221	-142.221	-9.47	66452	-0.21	2000	
Se	82	1	nogas	0.382	0.382	172.83	700	0.05	2000	
Mo	95	1	nogas	2.619	2.619	38.10	11171	0.02	2000	
Sn	118	1	nogas	0.111	0.111	21.95	1637	0.01	2000	
Ba	137	1	nogas	74.678	74.678	5.41	224946	0.03	2000	

Sample Report

Sb	121	2	He	0.382	0.382	28.00	700	0.05	2000	
La	139	1	nogas	33200.244	33200.244	2.61	152398	21.79	2000	>LDR
Au	197	1	nogas	-289614.716	-289614.716	-34.46	10604	-2731.18	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	326201	2.02	318818	102.32	70	125	
Ge	72	1	nogas	1635750	3.51	1556628	105.08	70	125	
In	115	1	nogas	1689636	4.39	1631900	103.54	70	125	
Bi	209	1	nogas	1500712	5.09	1453823	103.23	70	125	
Ge	72	2	He	124259	0.92	131050	94.82	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	166_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:36:35-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	92.740	6.028	272103	2.89	100	92.7	90	110	
Na	23	1	nogas	10219.464	4.001	125106628	1.78	10000	102.2	90	110	
Mg	24	1	nogas	9679.950	5.120	81649727	3.75	10000	96.8	90	110	
Al	27	1	nogas	106.805	2.828	976734	1.04	100	106.8	90	110	
K	39	1	nogas	10139.243	7.804	98294154	5.17	10000	101.4	90	110	
Ti	47	1	nogas	102.963	3.188	96601	0.83	100	103.0	90	110	
V	51	1	nogas	73.895	6.799	3205757	1.16	100	73.9	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	100.865	6.072	1225681	6.00	100	100.9	90	110	
Mn	55	1	nogas	101.416	2.191	1543746	0.94	100	101.4	90	110	
Co	59	1	nogas	100.796	5.424	1273294	4.18	100	100.8	90	110	
Ni	60	1	nogas	101.539	5.314	304449	2.83	100	101.5	90	110	
Cu	63	1	nogas	106.225	6.163	755120	3.68	100	106.2	90	110	
Zn	66	1	nogas	105.080	5.561	253182	3.09	100	105.1	90	110	
As	75	1	nogas	69.702	13.117	541019	3.04	100	69.7	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	101.221	4.464	1591069	2.00	100	101.2	90	110	
Ag	107	1	nogas	102.999	3.118	975538	0.73	100	103.0	90	110	
Cd	111	1	nogas	97.280	1.220	209527	0.44	100	97.3	90	110	
Sb	121	1	nogas	107.993	4.885	935431	2.42	100	108.0	90	110	
Tl	205	1	nogas	103.983	5.240	1609679	1.99	100	104.0	90	110	
Pb	208	1	nogas	101.306	3.427	2368474	1.93	100	101.3	90	110	
U	238	1	nogas	101.044	3.551	2259066	4.47	100	101.0	90	110	
[Pb]	206	1	nogas	101.777	2.139	593936	1.18	100	101.8	90	110	
[Pb]	207	1	nogas	97.320	2.125	523224	1.20	100	97.3	90	110	
Na	23	2	He	10123.244	3.382	2234469	0.64	10000	101.2	90	110	
Mg	24	2	He	9796.481	3.046	988171	2.60	10000	98.0	90	110	
Al	27	2	He	91.208	10.912	2554	13.32	100	91.2	90	110	
K	39	2	He	9055.513	0.952	562480	0.93	10000	90.6	90	110	
Ca	43	2	He	9598.974	7.631	1783	5.30	10000	96.0	90	110	
Ca	44	2	He	9207.656	1.528	30786	3.54	10000	92.1	90	110	
V	51	2	He	98.756	2.260	118917	0.46	100	98.8	90	110	
Cr	52	2	He	101.147	1.763	160000	1.02	100	101.1	90	110	
Mn	55	2	He	96.169	4.542	60156	1.90	100	96.2	90	110	
Fe	56	2	He	9726.347	1.115	11194524	1.65	10000	97.3	90	110	
Co	59	2	He	100.688	2.691	275246	1.24	100	100.7	90	110	
Ni	60	2	He	102.683	3.166	79573	1.42	100	102.7	90	110	
Cu	63	2	He	103.272	2.327	222826	1.29	100	103.3	90	110	
Zn	66	2	He	99.540	2.077	33044	2.93	100	99.5	90	110	
As	75	2	He	98.748	0.332	23337	2.41	100	98.7	90	110	
Se	78	2	He	98.835	6.795	888	4.60	100	98.8	90	110	
B	11	1	nogas	-9.550	-482.910	1303461	5.72	500	-1.9	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5288.640	1.770	23045023	1.26	5000	105.8	90	110	
Ca	43	1	nogas	10445.417	5.356	194524	2.88	10000	104.5	90	110	
Ca	44	1	nogas	10226.101	4.771	3088333	1.96	10000	102.3	90	110	
Fe	56	1	nogas	9810.592	3.077	133722020	1.40	10000	98.1	90	110	
Se	77	1	nogas	-1.266	-1974.430	101649	4.48	100	-1.3	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	100.038	5.916	14413	3.40	100	100.0	90	110	
Mo	95	1	nogas	101.031	3.786	357729	1.32	100	101.0	90	110	
Sn	118	1	nogas	96.211	2.480	565378	1.63	100	96.2	90	110	
Ba	137	1	nogas	97.999	1.855	285678	1.48	100	98.0	90	110	
Sb	121	2	He	97.265	1.700	97625	1.37	100	97.3	90	110	
Li	7	1	nogas	99.413	2.437	721840	1.58	100	99.4	90	110	
P	31	1	nogas	502.083	4.290	387394	2.02	500	100.4	90	110	
La	139	1	nogas	88.430	18.887	470	14.89	100	88.4	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-5209.896	-13.269	200	15.00	100	-5209.9	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	345697	3.18	318818	108.43	70	125	
Ge	72	1	nogas	1534265	2.53	1556628	98.56	70	125	
In	115	1	nogas	1632985	0.85	1631900	100.07	70	125	
Bi	209	1	nogas	1434609	3.26	1453823	98.68	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	119711	2.70	131050	91.35	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	167_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T15:38:33-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.144	69.5	517	66.7	1	
Na	23	1	nogas	136.016	2.1	3499518	2.2	100	CCB Main CR1 Failed
Mg	24	1	nogas	17.761	54.8	167000	56.6	100	
Al	27	1	nogas	0.353	20.0	12651	4.6	5	
K	39	1	nogas	-7.031	-201.0	5250849	1.7	100	
Ti	47	1	nogas	0.251	86.8	517	39.0	2.5	
V	51	1	nogas	-19.777	-21.8	1829046	4.1	2.5	
Cr	52	1	nogas	-0.881	-3.1	44551	1.8	2.5	
Mn	55	1	nogas	0.420	34.2	15600	13.0	2.5	
Co	59	1	nogas	0.203	74.1	2854	65.8	2.5	
Ni	60	1	nogas	-0.137	-100.4	2734	15.2	2.5	
Cu	63	1	nogas	0.115	113.4	6451	13.3	2.5	
Zn	66	1	nogas	-0.143	-115.5	1153	33.6	2.5	
As	75	1	nogas	-23.035	-18.6	258476	5.7	2.5	
Sr	88	1	nogas	0.267	44.2	4737	38.4	2.5	
Ag	107	1	nogas	0.109	60.4	1463	41.9	2.5	
Cd	111	1	nogas	0.137	76.6	310	77.5	1	
Sb	121	1	nogas	-0.005	-1798.9	2750	26.2	2.5	
Tl	205	1	nogas	1.003	52.8	16971	52.4	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.152	78.8	4424	68.5	2.5	
U	238	1	nogas	0.176	84.9	5205	69.3	2.5	
[Pb]	206	1	nogas	0.162	69.7	1173	60.8	2.5	
[Pb]	207	1	nogas	0.154	79.6	1013	70.3	2.5	
Na	23	2	He	200.083	8.8	93539	0.7	100	CCB Main CR1 Failed
Mg	24	2	He	7.419	3.4	983	5.6	100	
Al	27	2	He	-0.434	-128.5	53	28.6	5	
K	39	2	He	-16.410	-19.1	14719	1.3	100	
Ca	43	2	He	19.997	270.6	10	100.0	100	
Ca	44	2	He	10.163	287.4	193	52.3	100	
V	51	2	He	0.304	19.3	1080	4.9	2.5	
Cr	52	2	He	0.121	131.7	1370	16.1	2.5	
Mn	55	2	He	-0.010	-184.5	183	8.3	2.5	
Fe	56	2	He	5.616	5.1	11467	3.4	100	
Co	59	2	He	0.042	66.2	143	59.3	2.5	
Ni	60	2	He	0.445	8.2	240	8.3	2.5	
Cu	63	2	He	0.132	5.9	913	5.2	2.5	
Zn	66	2	He	0.334	15.8	67	31.2	2.5	
As	75	2	He	-0.237	-31.5	59	29.0	2.5	
Se	78	2	He	-0.206	-178.1	4	86.6	2.5	
B	11	1	nogas	-397.802	-1.6	397756	1.9	10	
Si	28	1	nogas	-7.674	-222.1	1304114	4.6	5	
Ca	43	1	nogas	9.021	268.2	1300	33.6	100	
Ca	44	1	nogas	-541.188	-3.0	104909	3.5	100	
Fe	56	1	nogas	16.161	104.5	1265631	17.2	100	
Se	77	1	nogas	-66.253	-22.5	84325	5.4	2.5	
Se	82	1	nogas	-0.802	-94.7	497	20.3	2.5	
Mo	95	1	nogas	0.429	40.4	2824	21.0	2.5	
Sn	118	1	nogas	0.331	45.7	3010	31.8	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.138	66.8	587	49.0	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.087	-64.0	213	27.5	2.5	
P	31	1	nogas	7.430	24.0	55165	1.4	10	
La	139	1	nogas	-6.082	-82.9	53	43.3	2.5	
Au	197	1	nogas	-1863.679	-66.0	90	50.9	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	395107	3.28	318818	123.93	70	125	
Ge	72	1	nogas	1547933	1.09	1556628	99.44	70	125	
In	115	1	nogas	1709289	0.89	1631900	104.74	70	125	
Bi	209	1	nogas	1537351	0.81	1453823	105.75	70	125	
Ge	72	2	He	124306	3.87	131050	94.85	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	178_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:02:28-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	93.354	2.969	273537	2.14	100	93.4	90	110	
Na	23	1	nogas	10457.472	7.162	133192828	3.05	10000	104.6	90	110	
Mg	24	1	nogas	9677.800	6.288	84968669	1.91	10000	96.8	90	110	
Al	27	1	nogas	104.989	3.714	1013462	3.11	100	105.0	90	110	
K	39	1	nogas	9924.880	2.319	101733763	0.83	10000	99.2	90	110	
Ti	47	1	nogas	99.654	2.025	98728	3.43	100	99.7	90	110	
V	51	1	nogas	31.340	12.707	2715254	2.58	100	31.3	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	97.242	3.274	1248815	2.83	100	97.2	90	110	
Mn	55	1	nogas	99.822	2.088	1603721	1.62	100	99.8	90	110	
Co	59	1	nogas	96.428	4.065	1285527	2.62	100	96.4	90	110	
Ni	60	1	nogas	97.793	1.997	309714	0.64	100	97.8	90	110	
Cu	63	1	nogas	100.566	0.521	755346	0.97	100	100.6	90	110	
Zn	66	1	nogas	100.975	1.591	257027	2.79	100	101.0	90	110	
As	75	1	nogas	50.605	9.096	509202	2.04	100	50.6	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	95.856	1.349	1590802	0.64	100	95.9	90	110	
Ag	107	1	nogas	96.084	2.610	960561	1.90	100	96.1	90	110	
Cd	111	1	nogas	96.393	5.051	205402	3.57	100	96.4	90	110	
Sb	121	1	nogas	102.459	0.667	937282	0.96	100	102.5	90	110	
Tl	205	1	nogas	99.468	7.816	1548877	3.30	100	99.5	90	110	
Pb	208	1	nogas	100.265	4.003	2359717	1.52	100	100.3	90	110	
U	238	1	nogas	99.783	3.492	2244828	1.40	100	99.8	90	110	
[Pb]	206	1	nogas	100.609	7.873	590217	3.53	100	100.6	90	110	
[Pb]	207	1	nogas	95.812	7.559	517874	3.17	100	95.8	90	110	
Na	23	2	He	10239.524	0.939	2302449	0.84	10000	102.4	90	110	
Mg	24	2	He	9907.368	1.378	1017978	0.29	10000	99.1	90	110	
Al	27	2	He	96.063	8.093	2730	7.88	100	96.1	90	110	
K	39	2	He	9211.271	2.583	571884	2.51	10000	92.1	90	110	
Ca	43	2	He	9505.254	5.776	1800	4.84	10000	95.1	90	110	
Ca	44	2	He	9173.168	2.578	31230	2.18	10000	91.7	90	110	
V	51	2	He	98.031	0.783	120264	0.68	100	98.0	90	110	
Cr	52	2	He	99.826	0.552	160894	1.97	100	99.8	90	110	
Mn	55	2	He	97.012	4.182	61832	3.19	100	97.0	90	110	
Fe	56	2	He	9710.362	1.851	11382906	1.29	10000	97.1	90	110	
Co	59	2	He	98.833	2.403	275223	1.47	100	98.8	90	110	
Ni	60	2	He	100.351	0.532	79233	0.89	100	100.4	90	110	
Cu	63	2	He	101.518	1.034	223160	1.30	100	101.5	90	110	
Zn	66	2	He	103.065	1.044	34847	0.87	100	103.1	90	110	
As	75	2	He	100.797	2.761	24256	2.40	100	100.8	90	110	
Se	78	2	He	96.357	8.102	883	7.84	100	96.4	90	110	
B	11	1	nogas	16.068	223.750	1364006	2.79	500	3.2	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5127.718	1.136	23625770	2.44	5000	102.6	90	110	
Ca	43	1	nogas	10001.433	2.431	196722	2.02	10000	100.0	90	110	
Ca	44	1	nogas	9787.404	4.234	3132085	3.57	10000	97.9	90	110	
Fe	56	1	nogas	9521.342	2.920	136988728	1.48	10000	95.2	90	110	
Se	77	1	nogas	-71.275	-7.286	86682	1.04	100	-71.3	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	92.073	3.735	14059	3.67	100	92.1	90	110	
Mo	95	1	nogas	95.745	1.017	358001	1.90	100	95.7	90	110	
Sn	118	1	nogas	98.454	2.449	572558	0.62	100	98.5	90	110	
Ba	137	1	nogas	97.214	6.290	280227	3.37	100	97.2	90	110	
Sb	121	2	He	97.304	1.317	99480	0.69	100	97.3	90	110	
Li	7	1	nogas	98.927	1.646	717609	5.24	100	98.9	90	110	
P	31	1	nogas	479.631	2.260	392951	0.67	500	95.9	90	110	
La	139	1	nogas	116.272	14.279	587	9.99	100	116.3	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-969.567	-20.394	53	10.83	100	-969.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	345020	3.89	318818	108.22	70	125	
Ge	72	1	nogas	1618824	1.46	1556628	104.00	70	125	
In	115	1	nogas	1616686	3.05	1631900	99.07	70	125	
Bi	209	1	nogas	1444964	4.70	1453823	99.39	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	121918	1.43	131050	93.03	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	179_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:04:25-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.206	26.1	697	30.3	1	
Na	23	1	nogas	215.564	9.3	4530559	3.6	100	CCB Main CR1 Failed
Mg	24	1	nogas	23.167	46.7	213454	44.1	100	
Al	27	1	nogas	1.484	151.4	24120	87.2	5	
K	39	1	nogas	-30.856	-58.3	5339568	1.4	100	
Ti	47	1	nogas	0.188	99.7	483	36.4	2.5	
V	51	1	nogas	-60.616	-6.1	1291478	6.5	2.5	
Cr	52	1	nogas	-1.673	-3.3	37442	0.4	2.5	
Mn	55	1	nogas	0.363	36.8	15627	11.7	2.5	
Co	59	1	nogas	0.228	51.2	3370	44.6	2.5	
Ni	60	1	nogas	-0.104	-116.6	3004	11.6	2.5	
Cu	63	1	nogas	-0.035	-380.8	5711	15.7	2.5	
Zn	66	1	nogas	-0.122	-87.5	1280	19.5	2.5	
As	75	1	nogas	-42.944	-5.1	208867	5.0	2.5	
Sr	88	1	nogas	0.307	41.7	5691	35.5	2.5	
Ag	107	1	nogas	0.153	48.8	1993	35.9	2.5	
Cd	111	1	nogas	0.207	23.6	460	25.1	1	
Sb	121	1	nogas	0.018	726.4	3117	35.9	2.5	
Tl	205	1	nogas	1.075	53.0	17742	54.8	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.209	42.8	5691	41.0	2.5	
U	238	1	nogas	0.225	58.9	6232	52.5	2.5	
[Pb]	206	1	nogas	0.208	42.0	1420	39.9	2.5	
[Pb]	207	1	nogas	0.195	47.0	1220	45.4	2.5	
Na	23	2	He	264.711	2.5	106433	0.7	100	CCB Main CR1 Failed
Mg	24	2	He	9.000	20.8	1130	16.9	100	
Al	27	2	He	1.502	47.7	107	19.5	5	
K	39	2	He	-12.599	-60.2	14949	3.1	100	
Ca	43	2	He	-14.964	-205.5	3	173.2	100	
Ca	44	2	He	3.195	201.9	167	13.9	100	
V	51	2	He	0.026	94.6	725	4.4	2.5	
Cr	52	2	He	0.208	36.6	1493	9.0	2.5	
Mn	55	2	He	0.069	187.3	230	34.8	2.5	
Fe	56	2	He	9.104	13.5	15387	9.0	100	
Co	59	2	He	0.084	34.3	257	31.5	2.5	
Ni	60	2	He	0.504	16.6	283	23.5	2.5	
Cu	63	2	He	0.148	30.1	933	9.7	2.5	
Zn	66	2	He	0.328	18.9	63	32.9	2.5	
As	75	2	He	-0.290	-9.4	46	15.2	2.5	
Se	78	2	He	0.761	68.2	13	36.5	2.5	
B	11	1	nogas	-369.587	-3.0	456777	2.0	10	
Si	28	1	nogas	-42.711	-29.0	1230332	2.9	5	
Ca	43	1	nogas	9.303	100.7	1387	11.2	100	
Ca	44	1	nogas	-548.417	-3.7	109203	3.7	100	
Fe	56	1	nogas	9.716	154.9	1249257	15.5	100	
Se	77	1	nogas	-135.559	-6.7	68767	5.4	2.5	
Se	82	1	nogas	0.276	207.5	687	10.2	2.5	
Mo	95	1	nogas	0.453	56.7	3077	29.2	2.5	
Sn	118	1	nogas	0.318	31.8	2884	22.6	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.191	37.7	737	30.8	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.116	-14.5	180	9.6	2.5	
P	31	1	nogas	2.352	55.0	54910	0.8	10	
La	139	1	nogas	-4.479	-81.6	60	28.9	2.5	
Au	197	1	nogas	-808.455	-122.5	50	72.1	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	378668	5.02	318818	118.77	70	125	
Ge	72	1	nogas	1643658	2.08	1556628	105.59	70	125	
In	115	1	nogas	1681473	1.49	1631900	103.04	70	125	
Bi	209	1	nogas	1494307	3.18	1453823	102.78	70	125	
Ge	72	2	He	122339	0.84	131050	93.35	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	190_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:26:32-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	94.952	3.979	255694	1.71	100	95.0	90	110	
Na	23	1	nogas	10985.530	4.735	135190891	2.61	10000	109.9	90	110	
Mg	24	1	nogas	9606.059	5.037	81519768	2.88	10000	96.1	90	110	
Al	27	1	nogas	104.575	3.105	967859	1.73	100	104.6	90	110	
K	39	1	nogas	9672.553	2.843	95198669	1.49	10000	96.7	90	110	
Ti	47	1	nogas	100.619	2.799	95579	3.91	100	100.6	90	110	
V	51	1	nogas	120.142	3.438	3940316	1.38	100	120.1	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	97.729	4.881	1202844	3.64	100	97.7	90	110	
Mn	55	1	nogas	100.616	3.261	1549782	2.72	100	100.6	90	110	
Co	59	1	nogas	99.712	2.915	1274663	0.99	100	99.7	90	110	
Ni	60	1	nogas	97.604	0.985	296474	2.36	100	97.6	90	110	
Cu	63	1	nogas	101.477	1.641	730852	2.64	100	101.5	90	110	
Zn	66	1	nogas	102.317	3.441	249634	2.93	100	102.3	90	110	
As	75	1	nogas	78.971	9.821	576471	3.31	100	79.0	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	104.710	3.551	1665589	1.08	100	104.7	90	110	
Ag	107	1	nogas	98.601	3.502	945214	3.37	100	98.6	90	110	
Cd	111	1	nogas	98.718	2.315	206311	2.56	100	98.7	90	110	
Sb	121	1	nogas	104.920	1.459	920167	1.10	100	104.9	90	110	
Tl	205	1	nogas	99.369	4.938	1531936	1.74	100	99.4	90	110	
Pb	208	1	nogas	101.061	4.079	2352294	0.97	100	101.1	90	110	
U	238	1	nogas	97.235	3.603	2163744	2.11	100	97.2	90	110	
[Pb]	206	1	nogas	100.483	4.035	583707	1.03	100	100.5	90	110	
[Pb]	207	1	nogas	95.161	5.139	509153	1.96	100	95.2	90	110	
Na	23	2	He	11017.198	4.212	2361003	1.53	10000	110.2	90	110	CCV Main CR1-2 Failed
Mg	24	2	He	10209.401	2.875	1001576	1.60	10000	102.1	90	110	
Al	27	2	He	103.568	1.218	2807	3.42	100	103.6	90	110	
K	39	2	He	8863.707	1.845	550898	1.79	10000	88.6	90	110	CCV Main CR1-2 Failed
Ca	43	2	He	9351.915	7.325	1690	4.70	10000	93.5	90	110	
Ca	44	2	He	9258.856	0.546	30108	2.80	10000	92.6	90	110	
V	51	2	He	99.680	2.566	116765	2.69	100	99.7	90	110	
Cr	52	2	He	99.377	3.961	152868	1.49	100	99.4	90	110	
Mn	55	2	He	97.632	7.029	59380	4.58	100	97.6	90	110	
Fe	56	2	He	9682.119	4.304	10833422	1.95	10000	96.8	90	110	
Co	59	2	He	102.220	5.450	271696	3.45	100	102.2	90	110	
Ni	60	2	He	103.701	2.409	78173	0.25	100	103.7	90	110	
Cu	63	2	He	101.355	3.102	212692	1.06	100	101.4	90	110	
Zn	66	2	He	98.333	2.697	31741	1.58	100	98.3	90	110	
As	75	2	He	97.366	3.877	22371	1.76	100	97.4	90	110	
Se	78	2	He	92.646	4.521	811	4.44	100	92.6	90	110	
B	11	1	nogas	9.170	225.767	1239274	1.65	500	1.8	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5259.731	2.420	23194191	0.32	5000	105.2	90	110	
Ca	43	1	nogas	10016.414	1.471	188912	1.26	10000	100.2	90	110	
Ca	44	1	nogas	9728.171	2.080	2986570	1.38	10000	97.3	90	110	
Fe	56	1	nogas	9870.218	1.986	136139111	1.06	10000	98.7	90	110	
Se	77	1	nogas	41.125	41.673	114921	3.03	100	41.1	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.614	1.795	14536	2.75	100	99.6	90	110	
Mo	95	1	nogas	96.107	3.867	344409	2.21	100	96.1	90	110	
Sn	118	1	nogas	98.622	0.807	562352	1.20	100	98.6	90	110	
Ba	137	1	nogas	98.514	2.586	278628	2.23	100	98.5	90	110	
Sb	121	2	He	96.676	3.504	94353	1.08	100	96.7	90	110	
Li	7	1	nogas	101.499	3.864	675276	1.64	100	101.5	90	110	
P	31	1	nogas	488.902	4.697	382969	2.02	500	97.8	90	110	
La	139	1	nogas	116.313	17.591	577	15.74	100	116.3	90	110	CCV Main CR1-2 Failed
Au	197	1	nogas	-1082.643	-32.156	57	20.38	100	-1082.6	90	110	CCV Main CR1-2 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	317076	2.32	318818	99.45	70	125	
Ge	72	1	nogas	1552409	2.57	1556628	99.73	70	125	
In	115	1	nogas	1584359	0.45	1631900	97.09	70	125	
Bi	209	1	nogas	1428619	3.24	1453823	98.27	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	116438	2.57	131050	88.85	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	191_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:28:30-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.225	49.7	710	47.9	1	
Na	23	1	nogas	601.426	34.3	9189720	28.9	100	CCB Main CR1 Failed
Mg	24	1	nogas	110.825	71.7	972128	73.0	100	CCB Main CR1 Failed
Al	27	1	nogas	0.343	76.6	12781	20.6	5	
K	39	1	nogas	-14.204	-135.0	5263219	3.6	100	
Ti	47	1	nogas	0.245	68.7	520	32.1	2.5	
V	51	1	nogas	8.571	79.4	2288336	4.5	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	-0.794	-20.6	46248	3.3	2.5	
Mn	55	1	nogas	0.583	33.1	18406	17.2	2.5	
Co	59	1	nogas	0.251	68.4	3547	64.2	2.5	
Ni	60	1	nogas	0.355	37.8	4271	9.7	2.5	
Cu	63	1	nogas	0.158	106.1	6875	18.7	2.5	
Zn	66	1	nogas	0.211	91.2	2047	24.4	2.5	
As	75	1	nogas	-17.416	-26.5	279923	4.1	2.5	
Sr	88	1	nogas	4.377	70.1	71290	71.0	2.5	CCB Main CR1 Failed
Ag	107	1	nogas	0.190	66.0	2280	55.0	2.5	
Cd	111	1	nogas	0.230	52.9	510	54.2	1	
Sb	121	1	nogas	0.191	68.2	4534	26.6	2.5	
Tl	205	1	nogas	1.135	55.4	18230	59.2	1	CCB Main CR1 Failed
Pb	208	1	nogas	0.218	72.7	5801	70.0	2.5	
U	238	1	nogas	0.237	74.5	6359	68.0	2.5	
[Pb]	206	1	nogas	0.207	65.6	1383	62.7	2.5	
[Pb]	207	1	nogas	0.221	86.5	1343	83.1	2.5	
Na	23	2	He	445.807	1.8	141155	3.9	100	CCB Main CR1 Failed
Mg	24	2	He	14.671	16.0	1657	16.9	100	
Al	27	2	He	0.537	203.3	77	37.7	5	
K	39	2	He	-16.299	-31.5	14726	2.1	100	
Ca	43	2	He	110.965	145.5	27	114.6	100	CCB Main CR1 Failed
Ca	44	2	He	-4.228	-209.5	137	23.5	100	
V	51	2	He	0.624	13.8	1402	4.5	2.5	
Cr	52	2	He	0.192	11.3	1413	5.3	2.5	
Mn	55	2	He	0.071	100.7	223	18.6	2.5	
Fe	56	2	He	5.939	14.5	11264	11.7	100	
Co	59	2	He	0.049	42.6	153	39.3	2.5	
Ni	60	2	He	0.584	21.3	333	26.2	2.5	
Cu	63	2	He	0.067	64.9	727	10.0	2.5	
Zn	66	2	He	0.284	15.7	47	32.7	2.5	
As	75	2	He	-0.174	-69.8	70	37.8	2.5	
Se	78	2	He	0.048	911.3	6	66.7	2.5	
B	11	1	nogas	-392.883	-1.0	372913	2.4	10	
Si	28	1	nogas	-30.563	-49.2	1228122	5.9	5	
Ca	43	1	nogas	142.272	82.5	3864	59.1	100	CCB Main CR1 Failed
Ca	44	1	nogas	-409.182	-32.9	144280	27.8	100	
Fe	56	1	nogas	37.916	39.8	1588399	14.0	100	
Se	77	1	nogas	-43.256	-34.7	92159	4.0	2.5	
Se	82	1	nogas	-0.861	-80.0	497	19.9	2.5	
Mo	95	1	nogas	0.429	44.9	2870	25.3	2.5	
Sn	118	1	nogas	0.348	43.2	3054	31.3	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.238	66.1	877	55.1	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.005	-627.4	283	13.4	2.5	
P	31	1	nogas	3.306	70.9	53166	3.6	10	
La	139	1	nogas	-8.712	-45.5	40	43.3	2.5	
Au	197	1	nogas	85.633	197.5	17	34.6	2.5	CCB Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	357659	0.62	318818	112.18	70	125	
Ge	72	1	nogas	1571390	1.89	1556628	100.95	70	125	
In	115	1	nogas	1670583	3.08	1631900	102.37	70	125	
Bi	209	1	nogas	1439252	5.10	1453823	99.00	70	125	
Ge	72	2	He	117892	2.98	131050	89.96	70	125	

Continuing Calibration Verification (CCV) Report

Sample Table

Sample Name	CCV
Data File Name	200_CCV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:47:20-06:00
Sample Type	CCV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High2	QC Flag
Be	9	1	nogas	93.758	3.165	272160	1.71	100	93.8	90	110	
Na	23	1	nogas	10053.574	4.699	127287874	3.18	10000	100.5	90	110	
Mg	24	1	nogas	9624.357	1.692	83988602	2.89	10000	96.2	90	110	
Al	27	1	nogas	101.149	4.356	959858	4.78	100	101.1	90	110	
K	39	1	nogas	10343.865	2.446	103934829	1.08	10000	103.4	90	110	
Ti	47	1	nogas	99.210	4.211	96524	3.65	100	99.2	90	110	
V	51	1	nogas	120.577	6.852	4043205	1.88	100	120.6	90	110	CCV Main CR1-2 Failed
Cr	52	1	nogas	98.629	1.405	1243820	2.50	100	98.6	90	110	
Mn	55	1	nogas	101.771	1.916	1606320	2.37	100	101.8	90	110	
Co	59	1	nogas	102.127	2.647	1337732	1.02	100	102.1	90	110	
Ni	60	1	nogas	99.911	2.168	310778	0.08	100	99.9	90	110	
Cu	63	1	nogas	104.239	2.193	768830	0.10	100	104.2	90	110	
Zn	66	1	nogas	103.435	0.479	258622	2.27	100	103.4	90	110	
As	75	1	nogas	86.460	7.740	614483	1.91	100	86.5	90	110	CCV Main CR1-2 Failed
Sr	88	1	nogas	101.396	3.091	1652758	0.98	100	101.4	90	110	
Ag	107	1	nogas	100.143	0.263	983761	1.98	100	100.1	90	110	
Cd	111	1	nogas	96.692	1.139	213260	2.45	100	96.7	90	110	
Sb	121	1	nogas	106.528	4.261	956860	2.37	100	106.5	90	110	
Tl	205	1	nogas	100.334	3.805	1576803	2.61	100	100.3	90	110	
Pb	208	1	nogas	97.637	5.067	2315840	3.58	100	97.6	90	110	
U	238	1	nogas	101.116	3.284	2293345	3.41	100	101.1	90	110	
[Pb]	206	1	nogas	101.109	1.334	598757	1.41	100	101.1	90	110	
[Pb]	207	1	nogas	96.226	2.991	524839	0.72	100	96.2	90	110	
Na	23	2	He	10635.999	2.845	2356063	3.36	10000	106.4	90	110	
Mg	24	2	He	10068.514	2.073	1019790	1.24	10000	100.7	90	110	
Al	27	2	He	97.566	7.605	2734	8.23	100	97.6	90	110	
K	39	2	He	9322.057	1.997	578573	1.94	10000	93.2	90	110	
Ca	43	2	He	10696.626	1.252	1997	1.26	10000	107.0	90	110	
Ca	44	2	He	9403.567	3.196	31561	3.66	10000	94.0	90	110	
V	51	2	He	100.735	2.265	121793	1.32	100	100.7	90	110	
Cr	52	2	He	102.180	2.363	162311	2.74	100	102.2	90	110	
Mn	55	2	He	97.183	1.004	61076	1.46	100	97.2	90	110	
Fe	56	2	He	9755.773	1.740	11275005	2.30	10000	97.6	90	110	
Co	59	2	He	99.897	3.306	274235	2.79	100	99.9	90	110	
Ni	60	2	He	101.365	3.649	78892	3.50	100	101.4	90	110	
Cu	63	2	He	103.268	2.367	223769	2.46	100	103.3	90	110	
Zn	66	2	He	99.985	2.770	33331	3.72	100	100.0	90	110	
As	75	2	He	98.719	1.416	23421	0.48	100	98.7	90	110	
Se	78	2	He	91.326	8.301	825	7.36	100	91.3	90	110	
B	11	1	nogas	-31.970	-56.951	1235429	1.58	500	-6.4	90	110	CCV Main CR1-2 Failed
Si	28	1	nogas	5291.033	1.455	23910610	3.50	5000	105.8	90	110	
Ca	43	1	nogas	10298.661	4.340	198892	2.16	10000	103.0	90	110	
Ca	44	1	nogas	10090.121	3.438	3163346	0.94	10000	100.9	90	110	
Fe	56	1	nogas	9865.587	2.905	139420849	2.19	10000	98.7	90	110	
Se	77	1	nogas	65.361	27.329	124772	2.70	100	65.4	90	110	CCV Main CR1-2 Failed
Se	82	1	nogas	99.279	4.992	14836	2.96	100	99.3	90	110	
Mo	95	1	nogas	97.799	0.787	359245	2.17	100	97.8	90	110	
Sn	118	1	nogas	96.875	0.297	582948	1.68	100	96.9	90	110	
Ba	137	1	nogas	94.675	3.062	282518	1.73	100	94.7	90	110	
Sb	121	2	He	98.031	1.442	98807	2.03	100	98.0	90	110	
Li	7	1	nogas	100.365	1.238	720319	2.04	100	100.4	90	110	
P	31	1	nogas	507.107	2.165	405301	2.59	500	101.4	90	110	
La	139	1	nogas	105.682	16.854	560	14.62	100	105.7	90	110	
Au	197	1	nogas	93.125	171.436	17	34.64	100	93.1	90	110	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	341715	2.17	318818	107.18	70	125	
Ge	72	1	nogas	1590529	2.23	1556628	102.18	70	125	
In	115	1	nogas	1671950	1.52	1631900	102.45	70	125	
Bi	209	1	nogas	1455465	2.65	1453823	100.11	70	125	

Continuing Calibration Verification (CCV) Report

Ge	72	2	He	120180	0.95	131050	91.71	70	125	

Continuing Calibration Blank (CCB) Report

Sample Table

Sample Name	CCB
Data File Name	201_CCB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:49:17-06:00
Sample Type	CCB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.155	62.0	540	60.9	1	
Na	23	1	nogas	135.282	12.1	3475530	2.2	100	CCB Main CR1 Failed
Mg	24	1	nogas	19.081	56.2	174084	50.6	100	
Al	27	1	nogas	0.253	19.3	12438	7.5	5	
K	39	1	nogas	-50.743	-31.7	5125239	1.9	100	
Ti	47	1	nogas	0.199	65.1	497	27.9	2.5	
V	51	1	nogas	4.464	207.3	2317310	3.7	2.5	CCB Main CR1 Failed
Cr	52	1	nogas	-0.694	-20.1	49426	0.8	2.5	
Mn	55	1	nogas	0.495	14.8	17766	9.5	2.5	
Co	59	1	nogas	0.166	70.3	2574	64.9	2.5	
Ni	60	1	nogas	-0.301	-12.0	2370	5.2	2.5	
Cu	63	1	nogas	-0.143	-40.2	4904	12.6	2.5	
Zn	66	1	nogas	-0.080	-113.8	1390	20.5	2.5	
As	75	1	nogas	-15.816	-44.6	296606	3.8	2.5	
Sr	88	1	nogas	0.230	26.8	4424	26.6	2.5	
Ag	107	1	nogas	0.106	51.9	1537	39.7	2.5	
Cd	111	1	nogas	0.174	48.3	387	47.7	1	
Sb	121	1	nogas	-0.026	-269.0	2730	26.9	2.5	
Tl	205	1	nogas	0.932	52.6	16210	54.4	1	
Pb	208	1	nogas	0.155	62.9	4614	57.4	2.5	
U	238	1	nogas	0.157	73.8	4894	61.5	2.5	
[Pb]	206	1	nogas	0.145	55.3	1097	50.1	2.5	
[Pb]	207	1	nogas	0.168	59.6	1127	55.8	2.5	
Na	23	2	He	197.438	4.0	94984	1.5	100	CCB Main CR1 Failed
Mg	24	2	He	9.761	19.1	1257	17.8	100	
Al	27	2	He	-0.347	-319.9	57	53.9	5	
K	39	2	He	-24.090	-19.4	14256	2.0	100	
Ca	43	2	He	17.461	286.4	10	100.0	100	
Ca	44	2	He	-12.690	-72.4	117	27.6	100	
V	51	2	He	0.563	18.3	1431	7.3	2.5	
Cr	52	2	He	0.169	47.8	1483	9.9	2.5	
Mn	55	2	He	0.029	188.6	213	18.9	2.5	
Fe	56	2	He	8.323	6.5	15013	4.6	100	
Co	59	2	He	0.071	20.9	230	19.9	2.5	
Ni	60	2	He	0.438	17.9	240	27.3	2.5	
Cu	63	2	He	0.050	167.3	743	23.6	2.5	
Zn	66	2	He	0.426	33.2	100	50.0	2.5	
As	75	2	He	-0.158	-39.0	80	18.2	2.5	
Se	78	2	He	-0.139	-228.7	5	65.5	2.5	
B	11	1	nogas	-411.874	-1.0	350240	1.3	10	
Si	28	1	nogas	-85.066	-24.9	1042187	11.5	5	
Ca	43	1	nogas	9.028	33.7	1380	7.4	100	
Ca	44	1	nogas	-584.301	-1.7	98210	1.4	100	
Fe	56	1	nogas	25.487	24.6	1477002	9.2	100	
Se	77	1	nogas	-38.528	-69.5	97319	4.7	2.5	
Se	82	1	nogas	-0.867	-141.2	513	32.1	2.5	
Mo	95	1	nogas	0.268	32.9	2387	16.1	2.5	
Sn	118	1	nogas	0.505	26.9	4034	19.8	5	

Continuing Calibration Blank (CCB) Report

Ba	137	1	nogas	0.147	61.9	607	44.8	2.5	
Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Sb	121	2	He	-0.109	-48.4	193	26.5	2.5	
P	31	1	nogas	4.025	79.7	55897	3.1	10	
La	139	1	nogas	-7.468	-82.6	47	61.9	2.5	
Au	197	1	nogas	-750.525	-29.8	50	20.0	2.5	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	386243	2.16	318818	121.15	70	125	
Ge	72	1	nogas	1638224	4.13	1556628	105.24	70	125	
In	115	1	nogas	1692831	0.80	1631900	103.73	70	125	
Bi	209	1	nogas	1570548	3.13	1453823	108.03	70	125	
Ge	72	2	He	126920	2.19	131050	96.85	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Sample Table

Sample Name	LLCCV5
Data File Name	202LICV.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:51:16-06:00
Sample Type	LLICV
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	4.225	2.323	13682	3.24	5	84.5	70	130	
Na	23	1	nogas	655.933	4.067	10489515	1.80	500	131.2	70	130	LLICV Main CR1 Failed
Mg	24	1	nogas	505.176	1.663	4686287	2.07	500	101.0	70	130	
Al	27	1	nogas	6.172	1.280	71237	2.01	5	123.4	70	130	
K	39	1	nogas	452.988	7.562	10288304	1.01	500	90.6	70	130	
Ti	47	1	nogas	5.409	8.386	5828	7.83	5	108.2	70	130	
V	51	1	nogas	16.348	56.999	2563137	3.80	5	327.0	70	130	LLICV Main CR1 Failed
Cr	52	1	nogas	4.503	3.999	116415	1.43	5	90.1	70	130	
Mn	55	1	nogas	5.669	2.305	103586	0.90	5	113.4	70	130	
Co	59	1	nogas	5.591	4.829	77369	2.80	5	111.8	70	130	
Ni	60	1	nogas	4.857	5.407	19134	2.10	5	97.1	70	130	
Cu	63	1	nogas	5.299	5.630	46921	2.57	5	106.0	70	130	
Zn	66	1	nogas	5.385	4.290	15707	1.60	5	107.7	70	130	
As	75	1	nogas	-7.979	-80.198	329821	4.31	5	-159.6	70	130	LLICV Main CR1 Failed
Sr	88	1	nogas	5.477	3.467	94531	2.33	5	109.5	70	130	
Ag	107	1	nogas	5.299	1.612	55224	0.75	5	106.0	70	130	
Cd	111	1	nogas	5.233	0.365	11717	1.37	5	104.7	70	130	
Sb	121	1	nogas	5.028	2.877	50444	1.32	5	100.6	70	130	
Tl	205	1	nogas	5.275	5.705	87834	1.17	5	105.5	70	130	
Pb	208	1	nogas	5.298	2.819	133451	1.93	5	106.0	70	130	
U	238	1	nogas	5.366	3.514	129548	2.20	5	107.3	70	130	
[Pb]	206	1	nogas	5.216	3.408	32787	1.53	5	104.3	70	130	
[Pb]	207	1	nogas	5.157	4.134	29844	1.00	5	103.1	70	130	
Na	23	2	He	703.808	2.140	211448	0.68	500	140.8	70	130	LLICV Main CR1 Failed
Mg	24	2	He	522.805	3.955	56208	2.12	500	104.6	70	130	
Al	27	2	He	6.526	24.187	257	19.22	5	130.5	70	130	LLICV Main CR1 Failed
K	39	2	He	459.327	3.754	43444	2.40	500	91.9	70	130	
Ca	43	2	He	542.965	5.887	113	5.09	500	108.6	70	130	
Ca	44	2	He	466.308	4.874	1810	5.61	500	93.3	70	130	
V	51	2	He	5.454	5.340	7654	2.83	5	109.1	70	130	
Cr	52	2	He	5.388	4.046	10193	2.73	5	107.8	70	130	
Mn	55	2	He	4.955	7.220	3477	5.64	5	99.1	70	130	
Fe	56	2	He	536.560	5.578	660235	3.46	500	107.3	70	130	
Co	59	2	He	5.194	6.102	15103	5.09	5	103.9	70	130	
Ni	60	2	He	5.489	1.454	4407	3.55	5	109.8	70	130	
Cu	63	2	He	5.276	1.379	12698	2.51	5	105.5	70	130	
Zn	66	2	He	5.038	2.982	1730	5.20	5	100.8	70	130	
As	75	2	He	4.493	13.802	1240	10.35	5	89.9	70	130	
Se	78	2	He	4.151	24.547	45	20.85	5	83.0	70	130	
B	11	1	nogas	-397.063	-1.057	385114	2.04	25	-1588.3	70	130	LLICV Main CR1 Failed
Si	28	1	nogas	181.074	3.906	2257090	1.10	25	724.3	70	130	LLICV Main CR1 Failed
Ca	43	1	nogas	522.893	8.433	11791	5.28	500	104.6	70	130	
Ca	44	1	nogas	-17.577	-192.240	271887	1.42	500	-3.5	70	130	LLICV Main CR1 Failed
Fe	56	1	nogas	522.068	4.345	8836979	1.47	500	104.4	70	130	
Se	77	1	nogas	-22.039	-90.165	104636	3.58	5	-440.8	70	130	LLICV Main CR1 Failed
Se	82	1	nogas	3.665	18.868	1213	10.73	5	73.3	70	130	
Mo	95	1	nogas	5.068	3.193	20939	4.94	5	101.4	70	130	
Sn	118	1	nogas	5.179	3.695	32558	3.74	5	103.6	70	130	
Ba	137	1	nogas	5.123	3.906	15677	2.79	5	102.5	70	130	
Sb	121	2	He	4.699	8.294	5304	6.81	5	94.0	70	130	
Li	7	1	nogas	4.810	6.172	71959	3.64	5	96.2	70	130	
P	31	1	nogas	26.615	6.234	73761	0.76	25	106.5	70	130	
La	139	1	nogas	3.375	132.813	97	21.53	5	67.5	70	130	LLICV Main CR1 Failed
Au	197	1	nogas	120.705	249.334	17	69.28	5	2414.1	70	130	LLICV Main CR1 Failed

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	380290	1.11	318818	119.28	70	125	
Ge	72	1	nogas	1674592	2.30	1556628	107.58	70	125	
In	115	1	nogas	1697579	1.21	1631900	104.02	70	125	
Bi	209	1	nogas	1539311	4.62	1453823	105.88	70	125	

Low Level Initial Calibration Verification (LLICV) Report

Ge	72	2	He	127167	2.14	131050	97.04	70	125	

Sample Report

Sample Table

Sample Name	LLCCV2
Data File Name	203SMPL.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:53:15-06:00
Sample Type	Sample
Dilution	1
Comment	
ISTD Ref FileName	004CALB.d
Sample QC Pass/Fail	Pass
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Be	9	1	nogas	1.724	1.724	4.43	5658	0.03	2000	
Na	23	1	nogas	343.481	343.481	5.57	5993335	0.01	200000	
Mg	24	1	nogas	218.565	218.565	5.06	1916996	0.01	200000	
Al	27	1	nogas	3.877	3.877	12.32	47094	0.01	2000	
K	39	1	nogas	175.485	175.485	22.80	7291820	0.00	200000	
Ti	47	1	nogas	2.375	2.375	7.18	2650	0.09	2000	
V	51	1	nogas	18.054	18.054	49.80	2518132	0.00	2000	
Cr	52	1	nogas	1.707	1.707	13.85	78681	0.00	2000	
Mn	55	1	nogas	2.577	2.577	9.30	50978	0.01	2000	
Co	59	1	nogas	2.307	2.307	7.48	31160	0.01	2000	
Ni	60	1	nogas	1.848	1.848	8.56	9119	0.02	2000	
Cu	63	1	nogas	1.978	1.978	7.42	20729	0.01	2000	
Zn	66	1	nogas	2.093	2.093	9.78	6891	0.03	2000	
As	75	1	nogas	-8.619	-8.619	-55.27	318587	0.00	2000	
Sr	88	1	nogas	2.278	2.278	5.74	38496	0.01	2000	
Ag	107	1	nogas	2.227	2.227	1.55	22822	0.01	2000	
Cd	111	1	nogas	2.080	2.080	12.52	4601	0.05	2000	
Sb	121	1	nogas	1.959	1.959	7.60	20866	0.01	2000	
Tl	205	1	nogas	2.233	2.233	5.84	36819	0.01	2000	
Pb	208	1	nogas	2.101	2.101	1.17	52562	0.00	2000	
U	238	1	nogas	2.152	2.152	2.35	51802	0.00	2000	
[Pb]	206	1	nogas	2.021	2.021	2.83	12625	0.02	2000	
[Pb]	207	1	nogas	2.022	2.022	3.37	11611	0.02	2000	
Na	23	2	He	390.482	390.482	2.54	140954	0.28	200000	
Mg	24	2	He	215.931	215.931	2.60	23589	0.92	200000	
Al	27	2	He	1.786	1.786	71.16	120	1.49	2000	
K	39	2	He	178.906	178.906	8.54	26512	0.67	200000	
Ca	43	2	He	251.823	251.823	30.02	57	444.39	200000	
Ca	44	2	He	192.044	192.044	23.35	850	22.59	200000	
V	51	2	He	2.661	2.661	2.76	4147	0.06	2000	
Cr	52	2	He	2.067	2.067	2.52	4701	0.04	2000	
Mn	55	2	He	1.991	1.991	1.97	1530	0.13	2000	
Fe	56	2	He	218.589	218.589	3.16	274834	0.08	200000	
Co	59	2	He	2.150	2.150	5.68	6331	0.03	2000	
Ni	60	2	He	2.598	2.598	10.83	2043	0.13	2000	
Cu	63	2	He	2.022	2.022	3.22	5311	0.04	2000	
Zn	66	2	He	2.461	2.461	15.89	827	0.30	2000	
As	75	2	He	1.806	1.806	7.96	577	0.31	2000	
Se	78	2	He	1.388	1.388	108.78	19	7.18	2000	
B	11	1	nogas	-409.458	-409.458	-2.09	354920	-0.12	2000	
Si	28	1	nogas	34.871	34.871	68.12	1554671	0.00	2000	
Ca	43	1	nogas	219.946	219.946	3.79	5521	3.98	200000	

Sample Report

Ca	44	1	nogas	-354.744	-354.744	-7.52	165033	-0.21	200000	
Fe	56	1	nogas	225.482	225.482	6.27	4332715	0.01	200000	
Name	Mass	Tune Step	Tune Mode	Conc	FinalConc	Conc %RSD	CPS	%RSD	LDR	QC Flag
Se	77	1	nogas	-17.946	-17.946	-113.49	102913	-0.02	2000	
Se	82	1	nogas	1.011	1.011	62.99	787	0.13	2000	
Mo	95	1	nogas	2.111	2.111	1.57	9273	0.02	2000	
Sn	118	1	nogas	2.270	2.270	4.86	14690	0.02	2000	
Ba	137	1	nogas	2.043	2.043	6.67	6301	0.03	2000	
Sb	121	2	He	1.812	1.812	13.32	2260	0.08	2000	
La	139	1	nogas	-6.321	-6.321	-121.18	53	-11.85	2000	
Au	197	1	nogas	25.651	25.651	1004.64	20	128.25	2000	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	384528	3.63	318818	120.61	70	125	
Ge	72	1	nogas	1628465	4.84	1556628	104.61	70	125	
In	115	1	nogas	1686915	7.66	1631900	103.37	70	125	
Bi	209	1	nogas	1517248	3.82	1453823	104.36	70	125	
Ge	72	2	He	128479	0.90	131050	98.04	70	125	

Interference Check Solution A (ICS-A) Report

Sample Table

Sample Name	ICSA
Data File Name	204ICSA.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:55:14-06:00
Sample Type	ICSA
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Upper Limit	QC Flag
Be	9	1	nogas	0.034	22.9	133	24.1	0	ICSA Main CR1 Failed
Na	23	1	nogas	105098.625	0.8	1255531428	3.0	0	
Mg	24	1	nogas	100660.729	3.6	837915585	2.5	0	
Al	27	1	nogas	104092.348	4.7	938472679	3.8	0	
K	39	1	nogas	106252.738	5.7	976155388	4.3	0	
Ti	47	1	nogas	2091.983	3.1	1948697	2.3	0	
V	51	1	nogas	-28.450	-22.5	1676079	6.5	0	ICSA Main CR1 Failed
Cr	52	1	nogas	0.428	45.9	59065	2.9	0	ICSA Main CR1 Failed
Mn	55	1	nogas	0.529	6.3	17045	1.7	0	ICSA Main CR1 Failed
Co	59	1	nogas	0.097	9.7	1500	8.1	0	ICSA Main CR1 Failed
Ni	60	1	nogas	0.408	46.3	4301	11.2	0	ICSA Main CR1 Failed
Cu	63	1	nogas	0.450	18.8	8722	5.2	0	ICSA Main CR1 Failed
Zn	66	1	nogas	1.229	6.0	4414	2.9	0	ICSA Main CR1 Failed
As	75	1	nogas	-15.747	-18.1	277285	3.9	0	ICSA Main CR1 Failed
Sr	88	1	nogas	1.064	4.8	17145	3.4	0	ICSA Main CR1 Failed
Ag	107	1	nogas	0.014	28.4	553	6.3	0	ICSA Main CR1 Failed
Cd	111	1	nogas	1.105	6.1	2290	5.7	0	ICSA Main CR1 Failed
Sb	121	1	nogas	-0.159	-13.4	1387	13.3	0	ICSA Main CR1 Failed
Tl	205	1	nogas	0.053	46.0	1060	34.0	0	ICSA Main CR1 Failed
Pb	208	1	nogas	0.080	20.7	2373	15.3	0	ICSA Main CR1 Failed
[Pb]	206	1	nogas	0.090	35.6	653	27.4	0	ICSA Main CR1 Failed
[Pb]	207	1	nogas	0.068	23.2	470	16.6	0	ICSA Main CR1 Failed
Na	23	2	He	103048.144	1.2	21892064	0.8	0	
Mg	24	2	He	95128.231	1.5	9410280	2.0	0	
Al	27	2	He	90777.725	1.5	2425434	1.6	0	
K	39	2	He	89530.019	2.4	5421509	2.4	0	
Ca	43	2	He	93584.375	2.8	17015	2.2	0	
Ca	44	2	He	90034.591	1.5	293801	0.3	0	
V	51	2	He	0.151	15.3	843	4.4	0	ICSA Main CR1 Failed
Cr	52	2	He	1.404	3.5	3274	1.7	0	ICSA Main CR1 Failed
Mn	55	2	He	-0.009	-696.8	173	20.3	0	ICSA Main CR1 Failed
Fe	56	2	He	97310.357	2.9	109782462	2.3	0	
Co	59	2	He	0.017	10.4	67	8.7	0	ICSA Main CR1 Failed
Ni	60	2	He	0.567	5.7	320	6.2	0	ICSA Main CR1 Failed
Cu	63	2	He	0.143	7.5	887	3.4	0	ICSA Main CR1 Failed
Zn	66	2	He	0.671	37.9	173	49.1	0	ICSA Main CR1 Failed
As	75	2	He	-0.191	-40.6	67	27.8	0	ICSA Main CR1 Failed
Se	78	2	He	0.668	54.8	11	27.0	0	ICSA Main CR1 Failed
B	11	1	nogas	-406.916	-3.2	344346	4.3	0	ICSA Main CR1 Failed
Si	28	1	nogas	23.208	62.0	1412584	2.8	0	
Ca	43	1	nogas	103082.030	3.9	1902545	4.5	0	
Ca	44	1	nogas	106608.695	7.7	29695848	8.6	0	
Fe	56	1	nogas	99331.566	3.9	1338306997	2.9	0	
Se	77	1	nogas	-36.346	-22.8	91506	2.7	0	ICSA Main CR1 Failed
Se	82	1	nogas	-1.508	-15.4	393	6.4	0	ICSA Main CR1 Failed
Mo	95	1	nogas	2038.865	4.3	7161765	2.6	0	
Sn	118	1	nogas	0.262	14.4	2374	7.4	0	ICSA Main CR1 Failed
Ba	137	1	nogas	0.081	37.8	380	24.1	0	ICSA Main CR1 Failed
Sb	121	2	He	-0.160	-22.0	130	27.7	0	ICSA Main CR1 Failed

Interference Check Solution A (ICS-A) Report

P	31	1	nogas	96727.032	3.8	64821797	2.7	0	
La	139	1	nogas	53.623	33.3	303	23.4	0	

QC ISTD Table

Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	366671	5.67	318818	115.01	70	125	
Ge	72	1	nogas	1527043	1.69	1556628	98.10	70	125	
In	115	1	nogas	1571996	1.62	1631900	96.33	70	125	
Bi	209	1	nogas	1401303	1.26	1453823	96.39	70	125	
Ge	72	2	He	117385	1.57	131050	89.57	70	125	

Interference Check Solution AB (ICS-AB) Report

Sample Table

Sample Name	ICSAB
Data File Name	205ICSB.d
Data Path Name	C:\Agilent\ICPMH\1\DATA\112
Acq Date Time	2017-11-28T16:57:19-06:00
Sample Type	ICSB
Dilution	1
Comment	
ISTD Ref File Name	004CALB.d
Sample QC Pass/Fail	Fail
ISTD Pass/Fail	Pass

QC Analyte Table

Name	Mass	Tune Step	Tune Mode	Conc	Conc %RSD	CPS	CPS %RSD	Exp Value	%Rec	%Low	%High	QC Flag
Be	9	1	nogas	91.532	3.045	260317	1.45	100	91.5	80	120	
Na	23	1	nogas	121939.850	4.798	1436455432	2.84	100	121939.9	80	120	ICSB Main CR1 Failed
Mg	24	1	nogas	111285.985	4.504	914025487	1.65	100	111286.0	80	120	
Al	27	1	nogas	103472.285	3.389	958559479	1.07	100	103472.3	80	120	ICSB Main CR1 Failed
K	39	1	nogas	110747.739	2.872	1045749890	2.61	100	110747.7	80	120	ICSB Main CR1 Failed
Ti	47	1	nogas	2150.119	3.235	2058185	2.54	100	2150.1	80	120	ICSB Main CR1 Failed
V	51	1	nogas	37.339	20.735	2722019	2.51	100	37.3	80	120	ICSB Main CR1 Failed
Cr	52	1	nogas	91.333	2.047	1141039	4.57	100	91.3	80	120	
Mn	55	1	nogas	91.850	1.217	1431236	1.44	100	91.8	80	120	
Co	59	1	nogas	93.313	2.207	1206551	3.52	100	93.3	80	120	
Ni	60	1	nogas	92.288	3.902	283434	2.24	100	92.3	80	120	
Cu	63	1	nogas	96.503	4.967	702502	3.25	100	96.5	80	120	
Zn	66	1	nogas	99.721	2.997	245962	1.08	100	99.7	80	120	
As	75	1	nogas	55.578	3.068	509339	1.83	100	55.6	80	120	ICSB Main CR1 Failed
Sr	88	1	nogas	99.096	1.978	1594246	2.20	100	99.1	80	120	
Ag	107	1	nogas	95.411	1.771	924611	0.91	100	95.4	80	120	
Cd	111	1	nogas	99.899	1.556	200541	1.28	100	99.9	80	120	
Sb	121	1	nogas	101.187	1.794	897206	1.01	100	101.2	80	120	
Tl	205	1	nogas	94.531	4.791	1407665	3.41	100	94.5	80	120	
Pb	208	1	nogas	101.102	2.919	2273191	2.40	100	101.1	80	120	
U	238	1	nogas	104.044	1.289	2236216	1.88	100	104.0	80	120	
[Pb]	206	1	nogas	96.833	3.159	543343	2.45	100	96.8	80	120	
[Pb]	207	1	nogas	97.636	3.521	504685	2.53	100	97.6	80	120	
Na	23	2	He	115734.237	4.812	24007389	1.83	100	115734.2	80	120	ICSB Main CR1 Failed
Mg	24	2	He	109317.641	4.614	10560193	0.89	100	109317.6	80	120	ICSB Main CR1 Failed
Al	27	2	He	93863.574	6.296	2448081	2.42	100	93863.6	80	120	ICSB Main CR1 Failed
K	39	2	He	99692.956	3.265	6035144	3.26	100	99693.0	80	120	
Ca	43	2	He	104930.334	4.914	18633	2.23	100	104930.3	80	120	
Ca	44	2	He	104712.251	4.741	333715	1.95	100	104712.3	80	120	ICSB Main CR1 Failed
V	51	2	He	96.863	4.993	111733	1.28	100	96.9	80	120	
Cr	52	2	He	99.507	2.873	150855	1.26	100	99.5	80	120	
Mn	55	2	He	93.001	1.821	55795	2.14	100	93.0	80	120	
Fe	56	2	He	108782.605	4.345	119936202	4.13	100	108782.6	80	120	
Co	59	2	He	97.180	4.459	254510	1.50	100	97.2	80	120	
Ni	60	2	He	95.355	3.684	70802	0.66	100	95.4	80	120	
Cu	63	2	He	96.845	4.818	200182	0.93	100	96.8	80	120	
Zn	66	2	He	94.623	2.381	30105	3.48	100	94.6	80	120	
As	75	2	He	96.618	1.341	21887	2.75	100	96.6	80	120	
Se	78	2	He	94.574	5.482	815	2.52	100	94.6	80	120	
B	11	1	nogas	-17.513	-210.468	1243997	4.09	100	-17.5	80	120	ICSB Main CR1 Failed
Si	28	1	nogas	5115.358	1.719	22844384	1.03	100	5115.4	80	120	ICSB Main CR1 Failed
Ca	43	1	nogas	114732.442	2.392	2175292	1.27	100	114732.4	80	120	
Ca	44	1	nogas	116555.830	4.859	33304509	2.66	100	116555.8	80	120	
Fe	56	1	nogas	105933.557	1.457	1466954766	1.53	100	105933.6	80	120	ICSB Main CR1 Failed
Se	77	1	nogas	-37.086	-11.877	93821	1.62	100	-37.1	80	120	ICSB Main CR1 Failed
Se	82	1	nogas	93.381	4.500	13806	1.97	100	93.4	80	120	
Mo	95	1	nogas	2072.155	4.839	7478579	2.72	100	2072.2	80	120	ICSB Main CR1 Failed
Sn	118	1	nogas	100.736	0.418	551819	2.07	100	100.7	80	120	
Ba	137	1	nogas	99.081	1.810	269244	2.72	100	99.1	80	120	
Sb	121	2	He	95.243	4.579	91582	2.26	100	95.2	80	120	
La	139	1	nogas	164.432	6.492	753	7.78	100	164.4	80	120	

QC ISTD Table

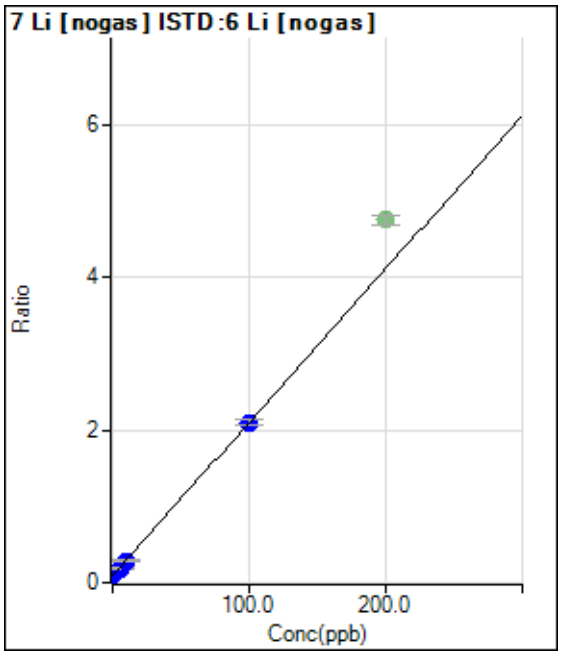
Name	Mass	Tune Step	Tune Mode	CPS	%RSD	Ref CPS	%Rec	%QC Low	%QC High	QC Flag
Li	6	1	nogas	334856	3.21	318818	105.03	70	125	
Ge	72	1	nogas	1569430	2.67	1556628	100.82	70	125	
In	115	1	nogas	1522236	2.45	1631900	93.28	70	125	
Bi	209	1	nogas	1379059	1.67	1453823	94.86	70	125	
Ge	72	2	He	114764	3.91	131050	87.57	70	125	

Calibration for 011_ICV.d

Batch Folder: C:\Agilent\ICPMH\1\DATA\112817A.b\
Analysis File: 112817A.batch.bin
DA Date-Time: 2017-11-28 12:05:55
Calibration Title:
Calibration Method: External Calibration
VIS Interpolation Fit:

Level	Standard Data File	Sample Name	Acq. Date-Time
1	004CALB.d	CAL BLK	2017-11-28 10:12:02
2	005CALS.d	2/10/200	2017-11-28 10:14:04
3	006CALS.d	5/25/500	2017-11-28 10:16:03
4	007CALS.d	10/50/1000	2017-11-28 10:18:01
5	008CALS.d	100/500/10K	2017-11-28 10:20:00
6	009CALS.d	200/1000/20K	2017-11-28 10:21:56
7			

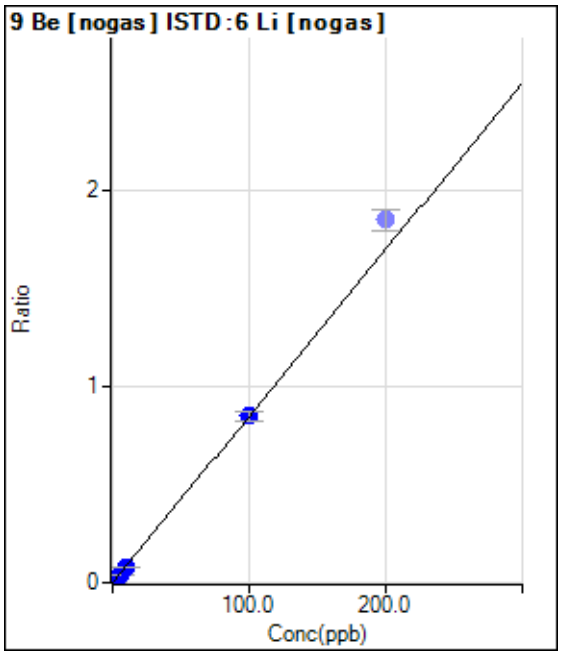
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	29530.11	0.0926	P	2.3
2	☐	2.000	1.899	42438.34	0.1308	P	0.8
3	☐	5.000	4.775	62086.85	0.1885	P	3.2
4	☐	10.000	9.721	96620.88	0.2878	P	5.0
5	☐	100.000	100.041	622500.98	2.1016	P	2.8
6	☑	200.000		1302232.53	4.7501	A	2.5
7	☐	1.000					

y = 0.0201 * x + 0.0926
R = 1.0000
DL = 0.3195
BEC = 4.612

Weight: <None>
Min Conc: <None>

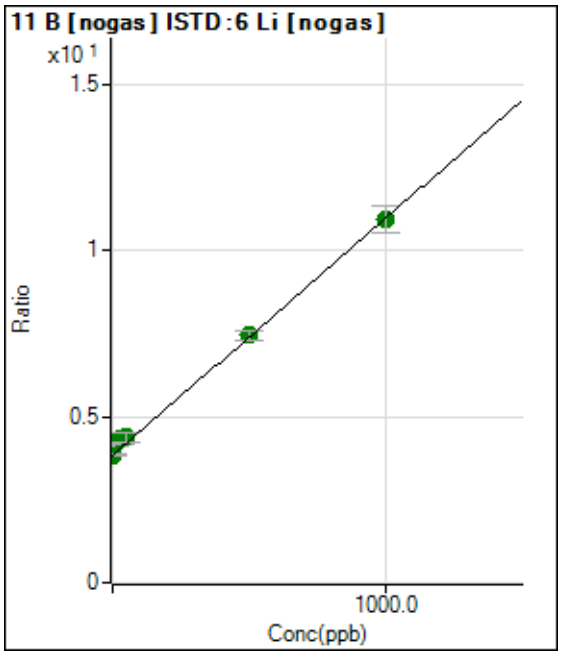


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0001	P	50.4
2	☐	2.000	1.934	5354.19	0.0165	P	5.5
3	☐	5.000	4.591	12871.27	0.0391	P	3.5
4	☐	10.000	9.286	26489.07	0.0790	P	7.7
5	☐	100.000	100.093	251763.04	0.8506	P	5.1
6	☑	200.000		507129.75	1.8513	P	5.6
7	☐	1.000					

y = 0.0085 * x + 7.3619E-005
R = 1.0000
DL = 0.01311
BEC = 0.008664

Weight: <None>
Min Conc: <None>

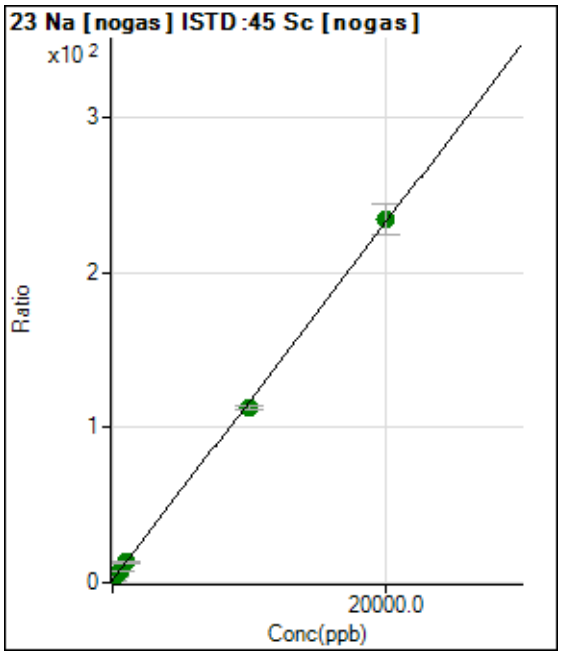
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1225558.32	3.8453	A	2.4
2	☐	10.000	45.124	1352964.33	4.1671	A	2.8
3	☐	25.000	72.261	1434487.64	4.3607	A	8.0
4	☐	50.000	74.458	1467926.23	4.3764	A	6.5
5	☐	500.000	507.478	2210182.57	7.4653	A	4.1
6	☐	1000.000	993.505	2991823.60	10.9323	A	7.3
7	☐	5.000					

y = 0.0071 * x + 3.8453
R = 0.9992
DL = 38.96
BEC = 539.1

Weight: <None>
Min Conc: <None>

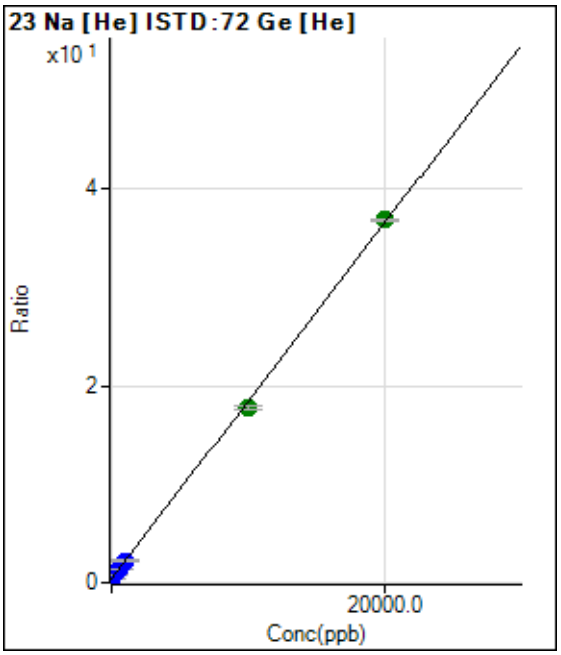


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1643380.93	1.5511	A	1.4
2	☐	200.000	185.362	4064482.77	3.6896	A	3.4
3	☐	500.000	478.177	7813691.84	7.0678	A	1.1
4	☐	1000.000	1011.537	14294786.78	13.2211	A	5.6
5	☐	10000.00	9683.287	123887848.6	113.265	A	2.7
6	☐	20000.00	20158.471	239036463.6	234.116	A	8.5
7	☐	100.000					

y = 0.0115 * x + 1.5511
R = 0.9998
DL = 5.602
BEC = 134.4

Weight: <None>
Min Conc: <None>

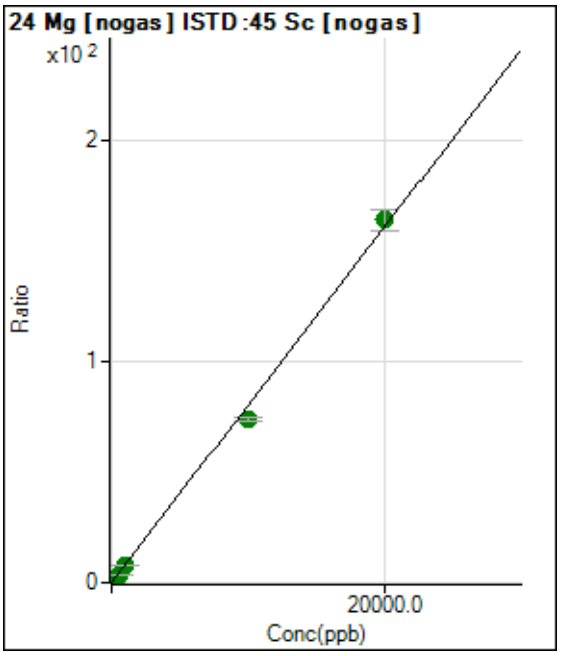
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	51353.09	0.3919	P	2.1
2	☐	200.000	195.714	102554.75	0.7454	P	2.7
3	☐	500.000	499.522	177965.43	1.2942	P	1.2
4	☐	1000.000	1016.987	305242.32	2.2288	P	4.5
5	☐	10000.00	9629.951	2347335.17	17.7856	A	2.0
6	☐	20000.00	20184.230	4697305.76	36.8488	A	0.2
7	☐	100.000					

y = 0.0018 * x + 0.3919
R = 0.9998
DL = 13.63
BEC = 217

Weight: <None>
Min Conc: <None>

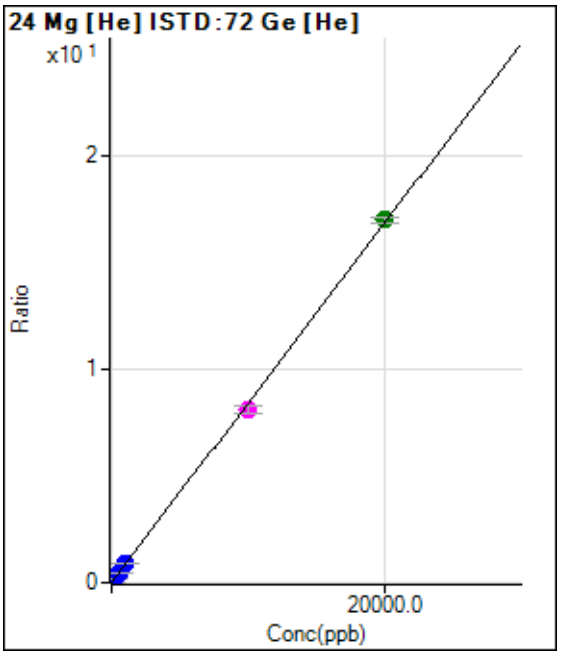


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	4401.52	0.0042	P	13.7
2	☐	200.000	189.361	1683985.78	1.5291	A	4.4
3	☐	500.000	479.100	4270067.80	3.8624	A	1.1
4	☐	1000.000	987.283	8602353.32	7.9549	A	4.6
5	☐	10000.00	9190.772	80951910.14	74.0193	A	3.2
6	☐	20000.00	20405.879	167936328.7	164.336	A	6.0
7	☐	100.000					

y = 0.0081 * x + 0.0042
R = 0.9989
DL = 0.213
BEC = 0.5167

Weight: <None>
Min Conc: <None>

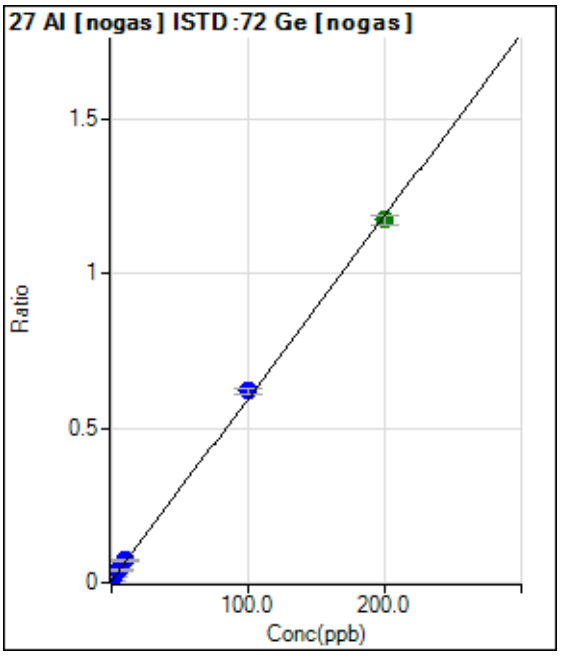
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	216.67	0.0017	P	52.6
2	☐	200.000	206.324	24155.91	0.1755	P	1.6
3	☐	500.000	524.640	61006.20	0.4438	P	4.0
4	☐	1000.000	1063.730	122945.12	0.8981	P	7.1
5	☐	10000.00	9627.305	1070031.62	8.1148	M	5.2
6	☐	20000.00	20182.482	2168394.81	17.0098	A	1.4
7	☐	100.000					

y = 8.4272E-004 * x + 0.0017
R = 0.9997
DL = 3.099
BEC = 1.965

Weight: <None>
Min Conc: <None>

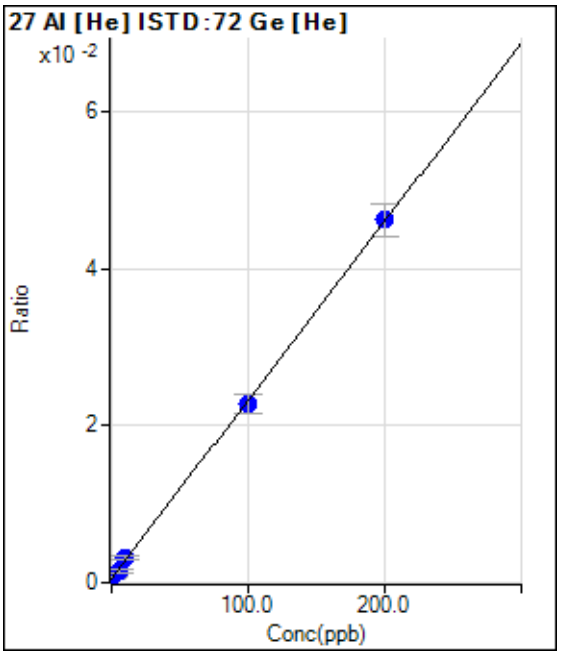


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9472.54	0.0061	P	5.4
2	☐	2.000	2.185	30081.34	0.0190	P	3.6
3	☐	5.000	5.857	65284.91	0.0407	P	3.1
4	☐	10.000	11.166	116706.96	0.0720	P	3.9
5	☐	100.000	103.983	987312.93	0.6202	P	2.5
6	☐	200.000	197.927	1853346.59	1.1751	A	3.0
7	☐	1.000					

y = 0.0059 * x + 0.0061
R = 0.9997
DL = 0.1656
BEC = 1.032

Weight: <None>
Min Conc: <None>

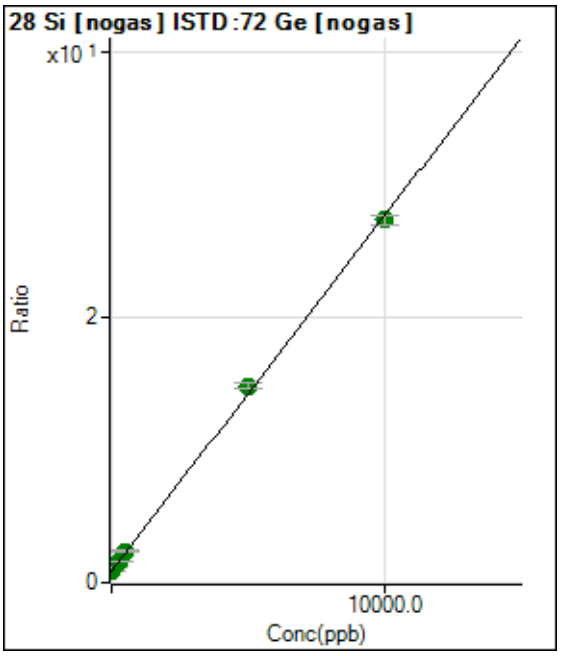
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.576	86.67	0.0007	P	22.9
2	☐	2.000	1.734	126.67	0.0009	P	29.0
3	☐	5.000	3.950	196.67	0.0014	P	25.0
4	☐	10.000	11.858	443.35	0.0032	P	10.1
5	☐	100.000	97.891	3003.63	0.0228	P	10.9
6	☐	200.000	200.990	5901.05	0.0463	P	8.7
7	☐	1.000					

y = 2.2762E-004 * x + 5.2911E-004
R = 0.9998
DL = 1.994
BEC = 2.324

Weight: <None>
Min Conc: <None>

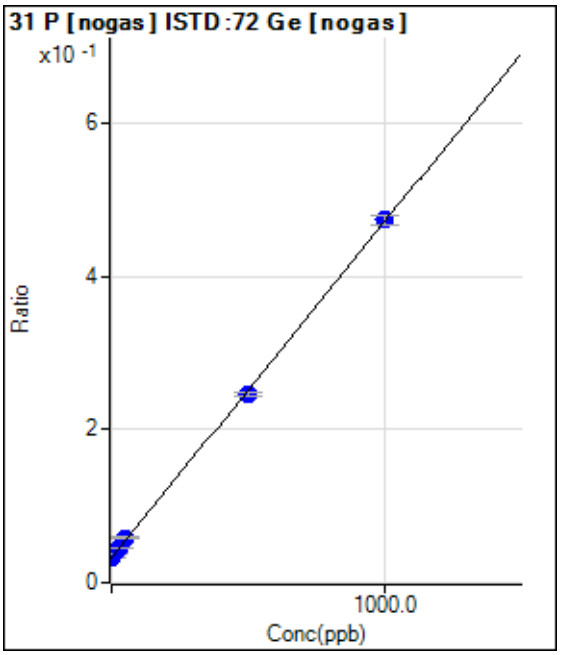


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1342846.96	0.8633	A	3.2
2	☐	100.000	101.956	1798540.39	1.1363	A	3.9
3	☐	250.000	271.577	2552097.30	1.5904	A	3.0
4	☐	500.000	556.806	3813322.44	2.3542	A	4.4
5	☐	5000.000	5221.552	23624266.31	14.8444	A	3.1
6	☐	10000.00	9885.825	43104447.69	27.3333	A	2.5
7	☐	5.000					

y = 0.0027 * x + 0.8633
R = 0.9997
DL = 31.37
BEC = 322.4

Weight: <None>
Min Conc: <None>

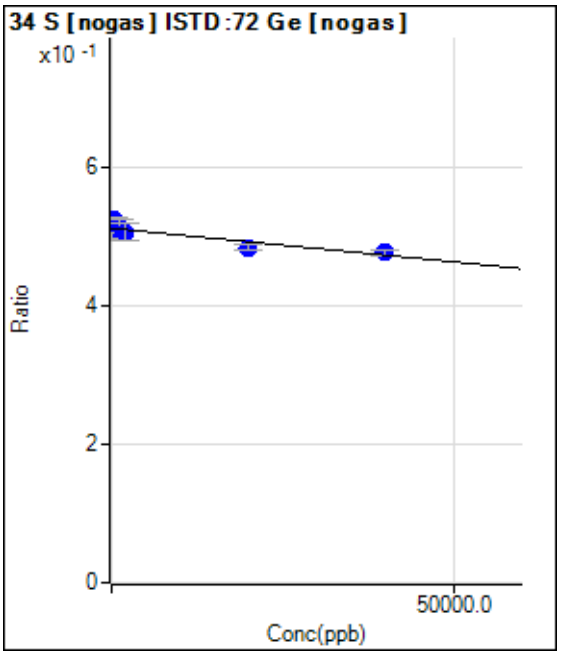
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	50357.84	0.0324	P	4.1
2	☐	10.000	11.146	59022.76	0.0373	P	1.0
3	☐	25.000	30.152	73192.00	0.0456	P	2.6
4	☐	50.000	60.160	95199.00	0.0588	P	4.6
5	☐	500.000	486.894	391507.83	0.2460	P	3.0
6	☐	1000.000	1005.905	746918.92	0.4736	P	2.7
7	☐	5.000					

y = 4.3867E-004 * x + 0.0324
R = 0.9998
DL = 9.149
BEC = 73.82

Weight: <None>
Min Conc: <None>

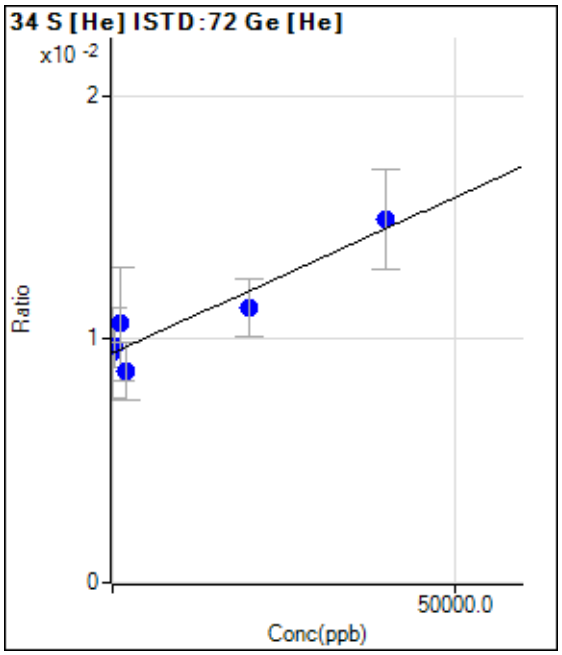


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	797657.38	0.5131	P	5.3
2	☐	400.000	-12169.01	831264.76	0.5250	P	1.7
3	☐	1000.000	-3063.754	827964.77	0.5161	P	3.7
4	☐	2000.000	5597.338	822135.79	0.5076	P	5.1
5	☐	20000.00	28701.988	772046.99	0.4850	P	2.0
6	☐	40000.00	35696.423	754147.51	0.4782	P	1.7
7	☐	100.000					

y = -9.7767E-007 * x + 0.5131
R = -0.9235
DL = -8.414E+04
BEC = -5.248E+05

Weight: <None>
Min Conc: <None>

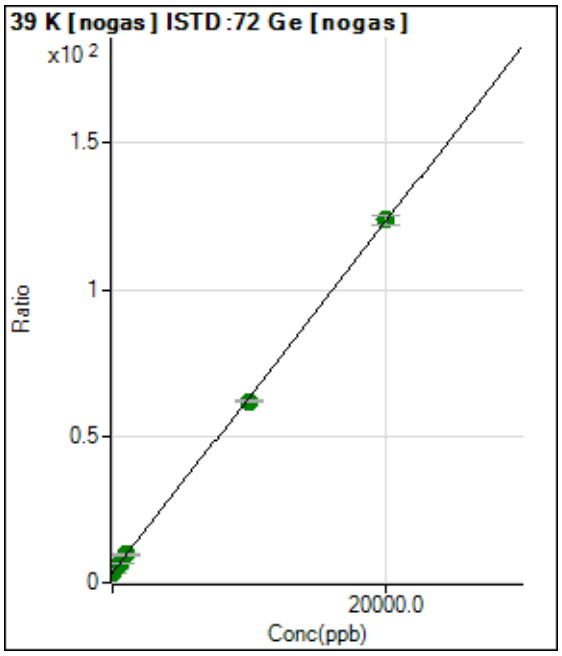
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1233.61	0.0094	P	38.9
2	☐	400.000	1887.327	1333.65	0.0097	P	17.9
3	☐	1000.000	9400.011	1467.04	0.0106	P	43.8
4	☐	2000.000	-5631.769	1200.27	0.0087	P	27.2
5	☐	20000.00	14680.378	1500.40	0.0113	P	20.8
6	☐	40000.00	42816.526	1900.46	0.0149	P	27.5
7	☐	100.000					

y = 1.2754E-007 * x + 0.0094
R = 0.9429
DL = 8.642E+04
BEC = 7.399E+04

Weight: <None>
Min Conc: <None>

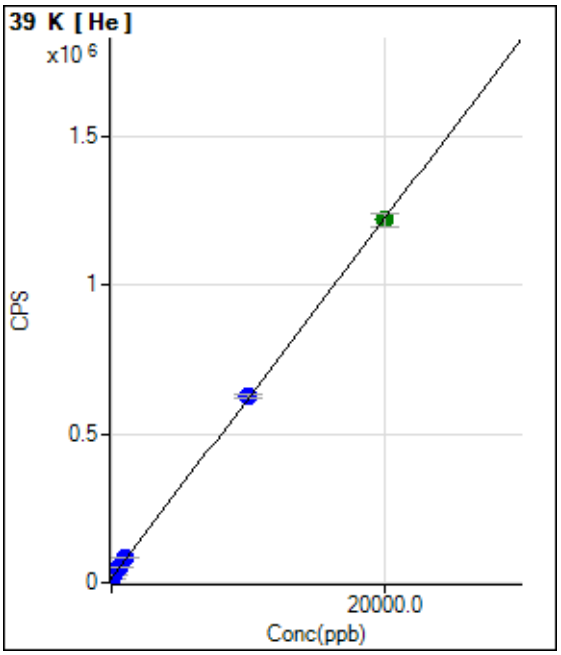


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5342222.77	3.4348	A	3.4
2	☐	200.000	207.025	7400025.17	4.6743	A	2.2
3	☐	500.000	501.113	10325634.35	6.4350	A	3.0
4	☐	1000.000	1042.782	15678664.41	9.6781	A	4.5
5	☐	10000.00	9781.276	98705412.62	61.9976	A	0.6
6	☐	20000.00	20107.125	195268491.8	123.820	A	2.3
7	☐	100.000					

y = 0.0060 * x + 3.4348
R = 0.9999
DL = 59.25
BEC = 573.7

Weight: <None>
Min Conc: <None>

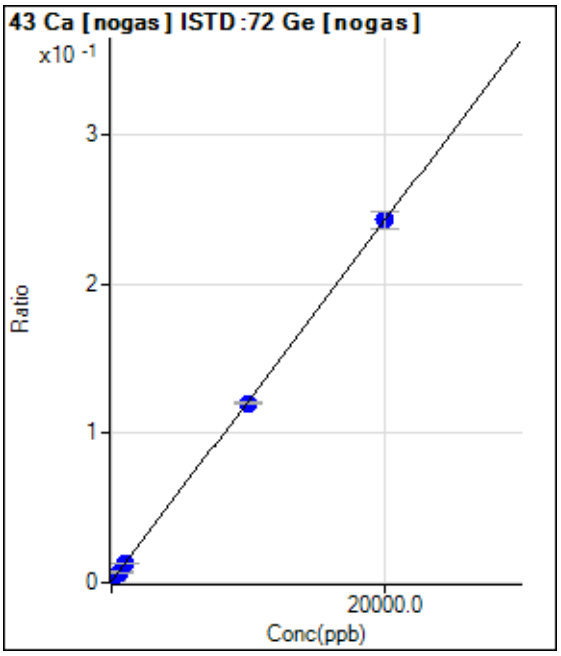
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	15710.16		P	1.0
2	☐	200.000	217.217	28825.65		P	1.6
3	☐	500.000	561.268	49599.36		P	1.8
4	☐	1000.000	1135.130	84249.02		P	1.9
5	☐	10000.00	10112.549	626303.20		P	2.0
6	☐	20000.00	19935.265	1219396.15		A	3.4
7	☐	100.000					

y = 60.3797 * x + 15710.1600
R = 1.0000
DL = 8.104
BEC = 260.2

Weight: <None>
Min Conc: <None>

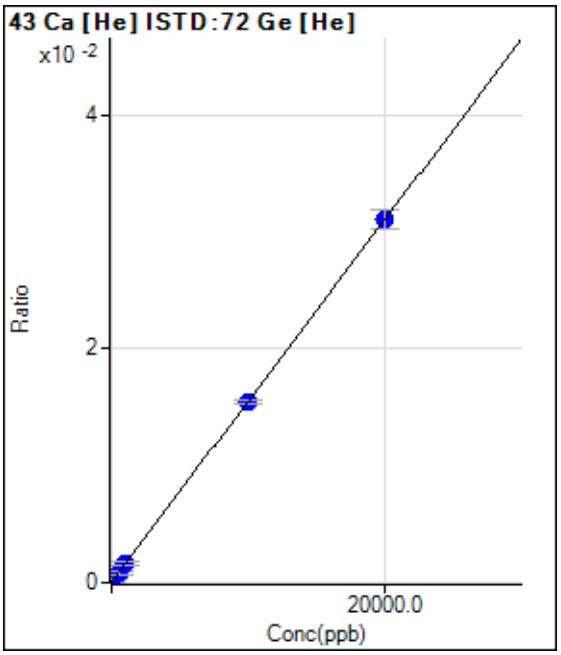


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1140.06	0.0007	P	8.3
2	☐	200.000	224.807	5457.57	0.0034	P	8.1
3	☐	500.000	518.786	11223.58	0.0070	P	6.3
4	☐	1000.000	1043.662	21626.35	0.0133	P	1.9
5	☐	10000.00	9897.773	191475.45	0.1203	P	1.8
6	☐	20000.00	20048.213	383084.65	0.2429	P	4.4
7	☐	100.000					

y = 1.2079E-005 * x + 7.3290E-004
R = 1.0000
DL = 15.09
BEC = 60.68

Weight: <None>
Min Conc: <None>

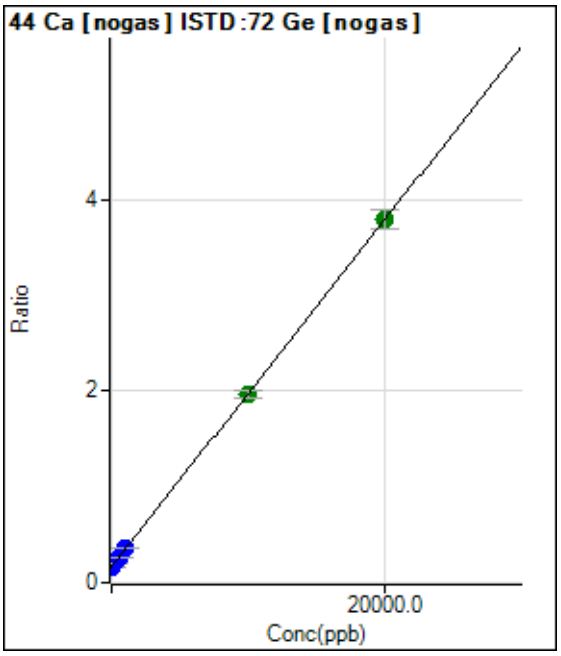
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	6.67	0.0001	P	86.6
2	☐	200.000	249.099	60.00	0.0004	P	58.0
3	☐	500.000	466.526	106.67	0.0008	P	42.9
4	☐	1000.000	1030.648	226.67	0.0016	P	26.6
5	☐	10000.00	9963.500	2043.48	0.0155	P	1.4
6	☐	20000.00	20017.064	3957.18	0.0310	P	5.3
7	☐	100.000					

y = 1.5486E-006 * x + 5.0662E-005
R = 1.0000
DL = 85
BEC = 32.71

Weight: <None>
Min Conc: <None>

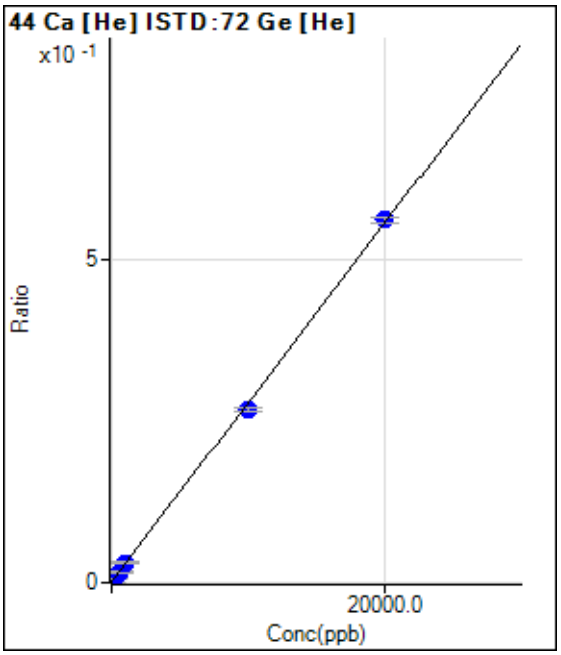


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	257630.22	0.1656	P	3.2
2	☐	200.000	196.579	318486.34	0.2012	P	2.1
3	☐	500.000	510.938	413814.38	0.2580	P	4.7
4	☐	1000.000	1097.907	590128.34	0.3641	P	2.1
5	☐	10000.00	9969.498	3131884.85	1.9680	A	3.5
6	☐	20000.00	20010.117	5966578.04	3.7832	A	5.3
7	☐	100.000					

y = 1.8079E-004 * x + 0.1656
R = 1.0000
DL = 86.79
BEC = 916.2

Weight: <None>
Min Conc: <None>

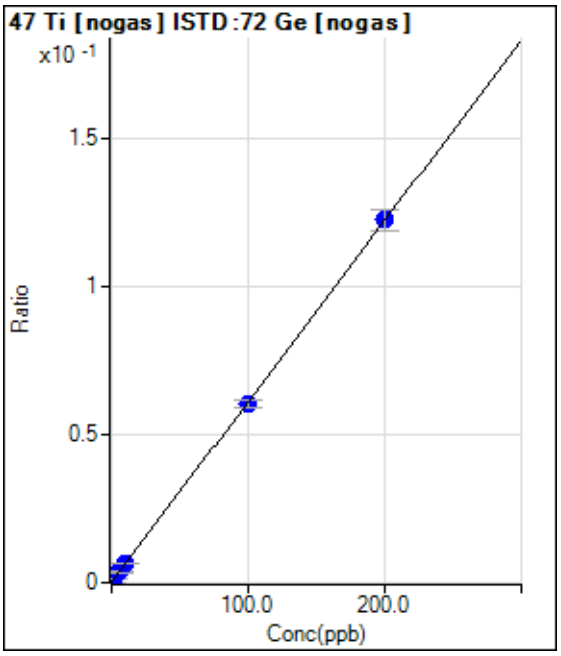
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	166.67	0.0013	P	10.2
2	☐	200.000	211.250	980.05	0.0071	P	15.1
3	☐	500.000	542.038	2246.86	0.0163	P	6.0
4	☐	1000.000	1063.759	4222.23	0.0308	P	13.1
5	☐	10000.00	9600.935	35374.32	0.2681	P	2.6
6	☐	20000.00	20195.181	71699.09	0.5625	P	1.5
7	☐	100.000					

y = 2.7789E-005 * x + 0.0013
R = 0.9997
DL = 13.96
BEC = 45.8

Weight: <None>
Min Conc: <None>

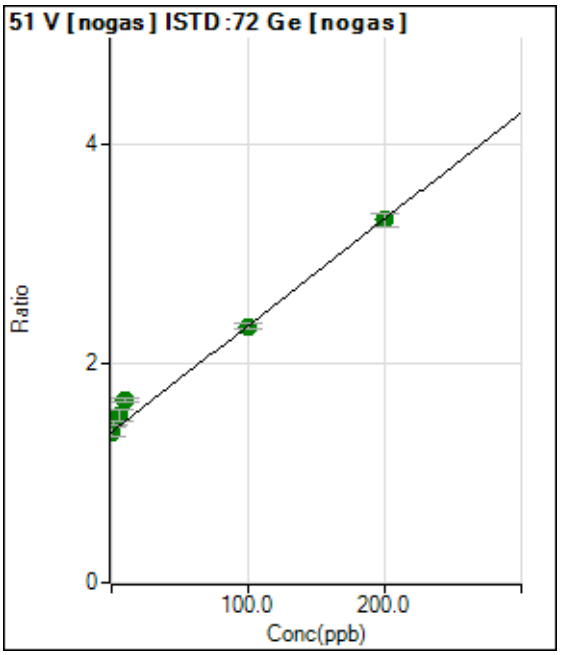


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	280.01	0.0002	P	30.7
2	☐	2.000	2.006	2226.84	0.0014	P	11.4
3	☐	5.000	5.610	5781.03	0.0036	P	5.5
4	☐	10.000	10.349	10529.87	0.0065	P	2.1
5	☐	100.000	98.659	96050.68	0.0604	P	4.9
6	☐	200.000	200.638	193249.49	0.1226	P	6.2
7	☐	1.000					

y = 6.1007E-004 * x + 1.8107E-004
R = 1.0000
DL = 0.2731
BEC = 0.2968

Weight: <None>
Min Conc: <None>

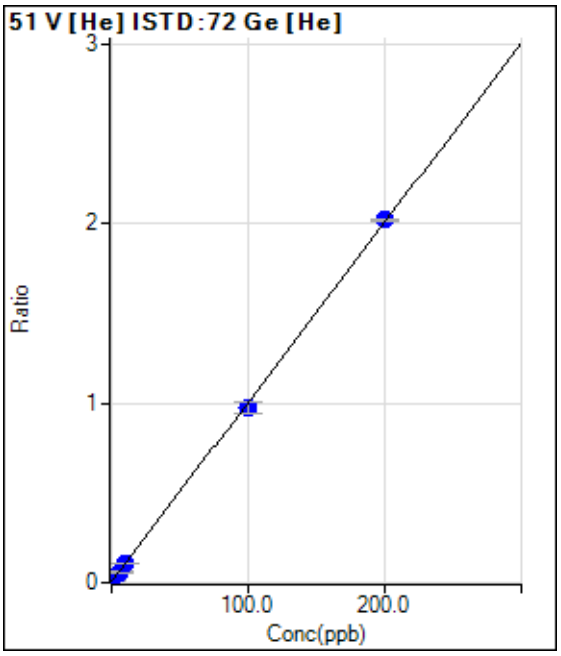
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2135940.67	1.3733	A	7.0
2	☐	2.000	11.671	2353103.83	1.4865	A	5.7
3	☐	5.000	16.082	2451672.84	1.5293	A	7.3
4	☐	10.000	29.665	2693625.19	1.6611	A	2.6
5	☐	100.000	99.161	3716705.81	2.3353	A	2.7
6	☐	200.000	199.063	5211661.84	3.3044	A	3.5
7	☐	1.000					

y = 0.0097 * x + 1.3733
R = 0.9961
DL = 29.8
BEC = 141.6

Weight: <None>
Min Conc: <None>

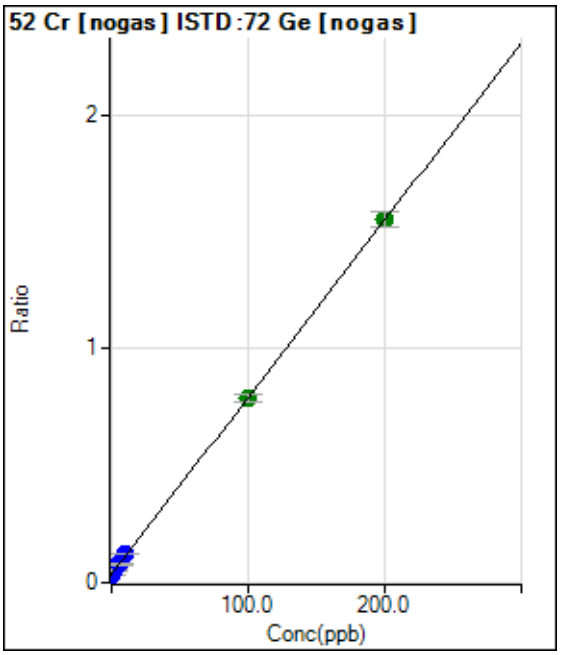


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.422	1295.38	0.0099	P	2.8
2	☐	2.000	2.329	3984.44	0.0290	P	2.8
3	☐	5.000	5.325	8103.12	0.0589	P	3.1
4	☐	10.000	10.532	15218.26	0.1110	P	1.0
5	☐	100.000	96.862	128499.17	0.9748	P	6.7
6	☐	200.000	201.531	257760.65	2.0221	P	0.7
7	☐	1.000					

y = 0.0100 * x + 0.0057
R = 0.9998
DL = 0.08348
BEC = 0.5659

Weight: <None>
Min Conc: <None>

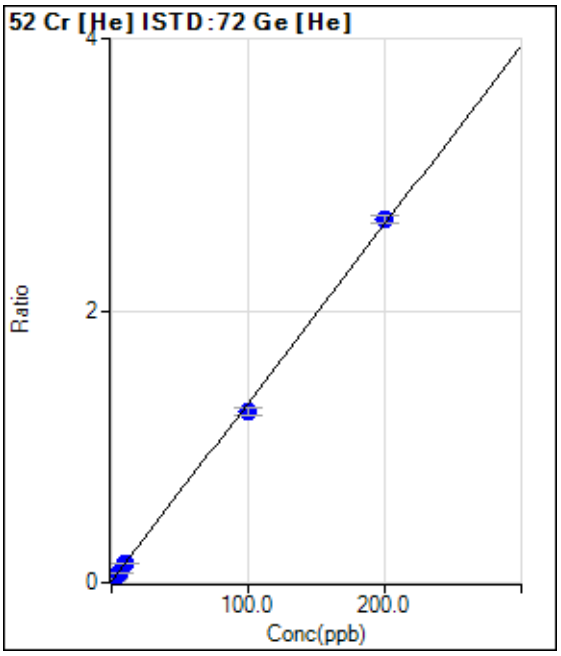
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	55149.05	0.0355	P	6.0
2	☐	2.000	2.374	84569.54	0.0534	P	3.6
3	☐	5.000	5.808	127389.32	0.0794	P	4.1
4	☐	10.000	11.713	201173.23	0.1241	P	3.0
5	☐	100.000	99.425	1254007.85	0.7881	A	3.9
6	☐	200.000	200.178	2445831.63	1.5507	A	4.3
7	☐	1.000					

y = 0.0076 * x + 0.0355
R = 1.0000
DL = 0.8415
BEC = 4.683

Weight: <None>
Min Conc: <None>

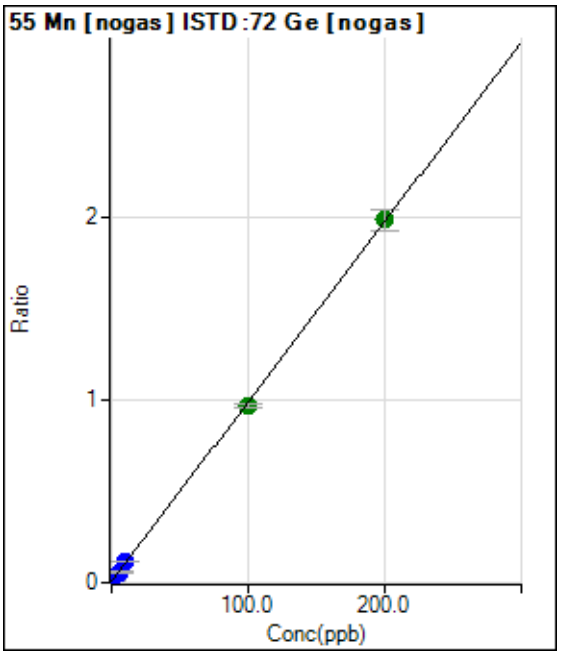


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1240.06	0.0095	P	6.9
2	☐	2.000	1.901	4734.03	0.0344	P	5.6
3	☐	5.000	4.885	10126.29	0.0736	P	6.0
4	☐	10.000	10.361	19924.51	0.1455	P	3.6
5	☐	100.000	95.025	165764.69	1.2566	P	3.8
6	☐	200.000	202.473	339926.39	2.6668	P	2.0
7	☐	1.000					

y = 0.0131 * x + 0.0095
R = 0.9996
DL = 0.1495
BEC = 0.7213

Weight: <None>
Min Conc: <None>

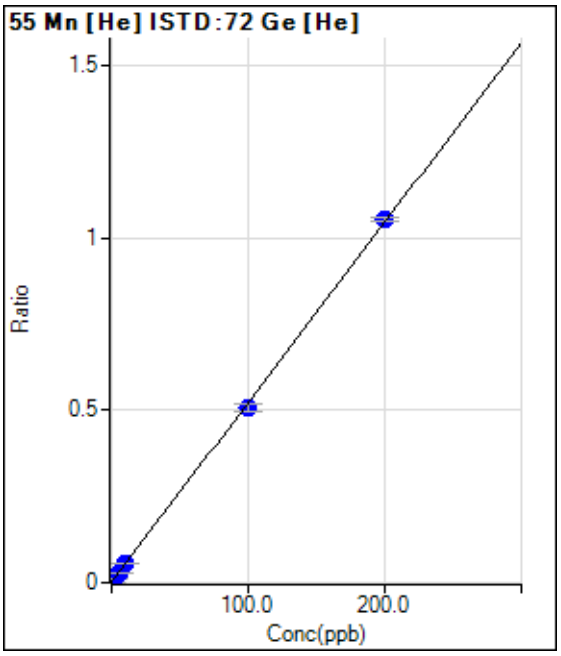
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	9255.80	0.0059	P	1.7
2	☐	2.000	2.170	43305.07	0.0274	P	3.4
3	☐	5.000	5.261	92889.75	0.0579	P	1.5
4	☐	10.000	10.976	185120.40	0.1142	P	4.0
5	☐	100.000	97.609	1542143.15	0.9690	A	2.8
6	☐	200.000	201.139	3139001.62	1.9904	A	5.9
7	☐	1.000					

y = 0.0099 * x + 0.0059
R = 0.9999
DL = 0.02991
BEC = 0.6029

Weight: <None>
Min Conc: <None>

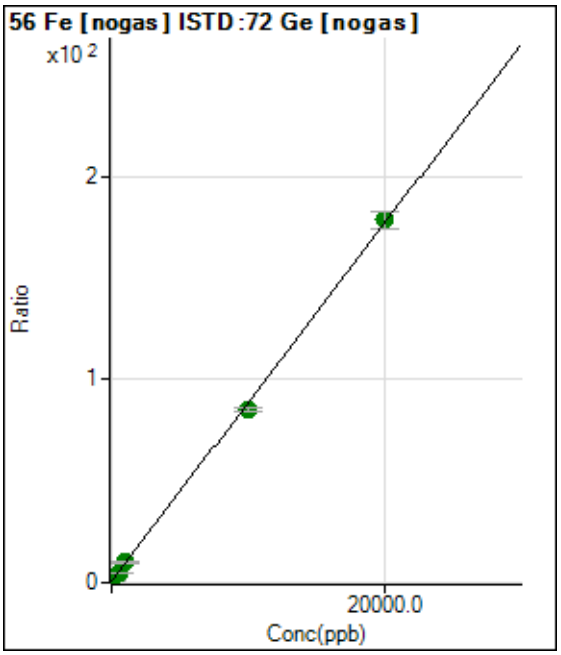


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	200.01	0.0015	P	4.9
2	☐	2.000	1.926	1590.10	0.0116	P	6.5
3	☐	5.000	5.187	3928.84	0.0286	P	5.4
4	☐	10.000	10.268	7541.68	0.0551	P	7.6
5	☐	100.000	97.016	66919.73	0.5073	P	4.4
6	☐	200.000	201.475	134095.72	1.0519	P	1.2
7	☐	1.000					

y = 0.0052 * x + 0.0015
R = 0.9998
DL = 0.04288
BEC = 0.2927

Weight: <None>
Min Conc: <None>

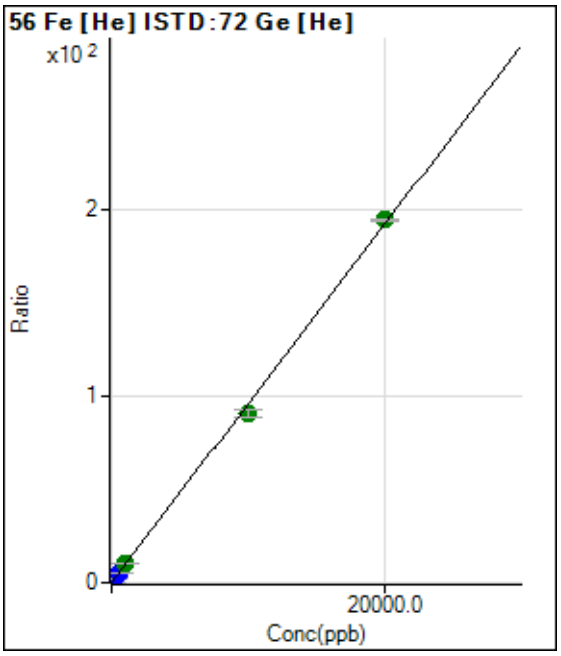
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1051763.63	0.6760	M	3.4
2	☐	200.000	210.087	4003592.80	2.5287	A	2.0
3	☐	500.000	504.959	8231547.58	5.1293	A	3.1
4	☐	1000.000	1054.175	16155708.70	9.9729	A	4.6
5	☐	10000.00	9605.143	135911361.3	85.3850	A	2.1
6	☐	20000.00	20194.495	281952647.9	178.773	A	4.6
7	☐	100.000					

y = 0.0088 * x + 0.6760
R = 0.9997
DL = 7.858
BEC = 76.65

Weight: <None>
Min Conc: <None>

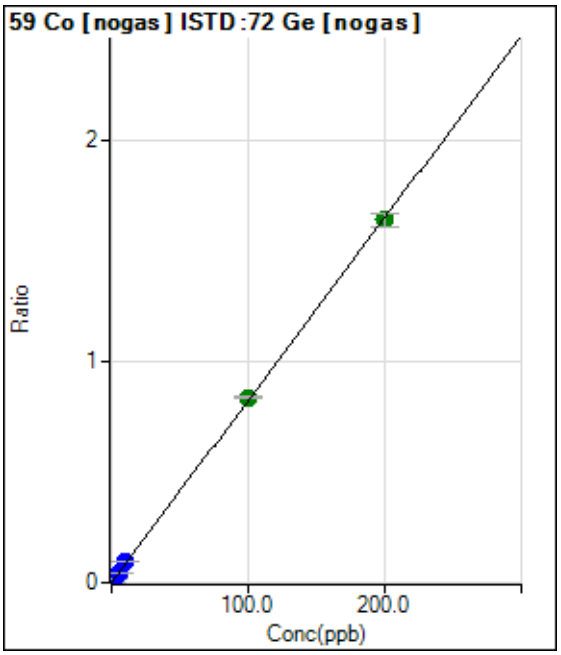


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5017.43	0.0383	P	5.7
2	☐	200.000	218.002	293527.46	2.1338	P	3.4
3	☐	500.000	544.680	725194.39	5.2739	P	1.8
4	☐	1000.000	1048.977	1386424.72	10.1214	A	3.7
5	☐	10000.00	9472.201	12014360.65	91.0878	A	4.5
6	☐	20000.00	20260.154	24830366.30	194.784	A	0.4
7	☐	100.000					

y = 0.0096 * x + 0.0383
R = 0.9995
DL = 0.6786
BEC = 3.985

Weight: <None>
Min Conc: <None>

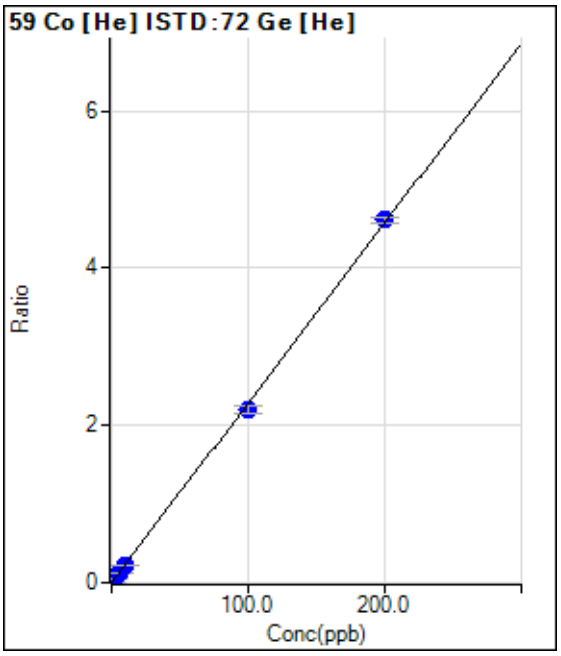
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	283.34	0.0002	P	7.8
2	☐	2.000	2.253	29671.24	0.0187	P	3.3
3	☐	5.000	5.629	74666.81	0.0465	P	4.0
4	☐	10.000	11.440	153003.40	0.0944	P	2.3
5	☐	100.000	101.761	1334753.68	0.8384	A	0.5
6	☐	200.000	199.029	2585196.89	1.6395	A	3.9
7	☐	1.000					

y = 0.0082 * x + 1.8183E-004
R = 0.9999
DL = 0.005194
BEC = 0.02208

Weight: <None>
Min Conc: <None>

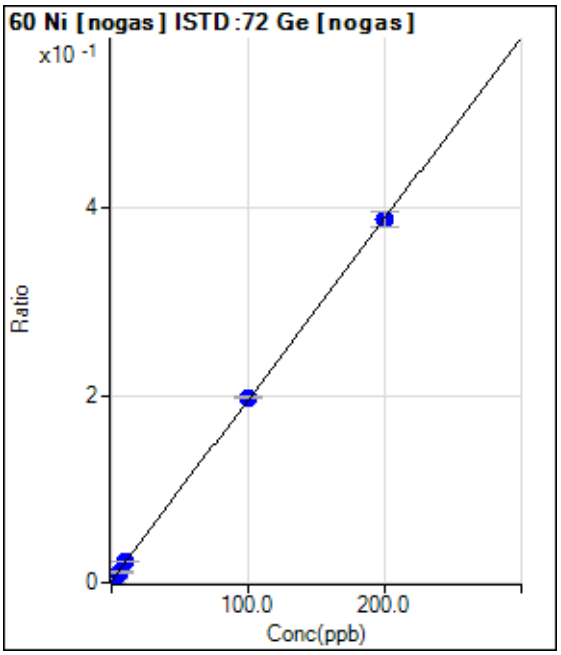


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	23.33	0.0002	P	65.7
2	☐	2.000	1.992	6284.55	0.0457	P	6.2
3	☐	5.000	5.013	15767.04	0.1147	P	6.1
4	☐	10.000	9.901	31006.61	0.2264	P	3.5
5	☐	100.000	96.245	289979.74	2.1988	P	4.6
6	☐	200.000	201.882	587873.95	4.6119	P	1.9
7	☐	1.000					

y = 0.0228 * x + 1.7802E-004
R = 0.9998
DL = 0.01537
BEC = 0.007793

Weight: <None>
Min Conc: <None>

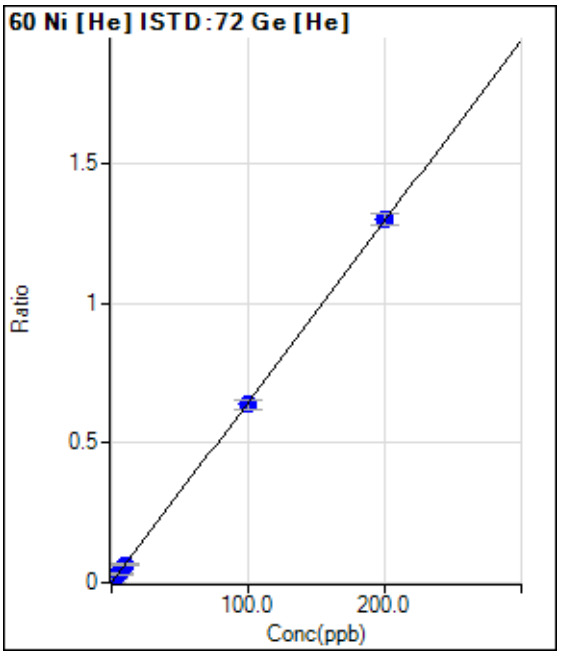
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.674	1123.39	0.0007	P	19.7
2	☐	2.000	1.585	8075.26	0.0051	P	3.0
3	☐	5.000	4.789	18116.03	0.0113	P	6.9
4	☐	10.000	10.657	36714.24	0.0227	P	3.8
5	☐	100.000	101.333	315517.85	0.1982	P	1.6
6	☐	200.000	199.310	611602.19	0.3879	P	4.2
7	☐	1.000					

y = 0.0019 * x + 0.0020
R = 0.9999
DL = 0.2214
BEC = 1.049

Weight: <None>
Min Conc: <None>

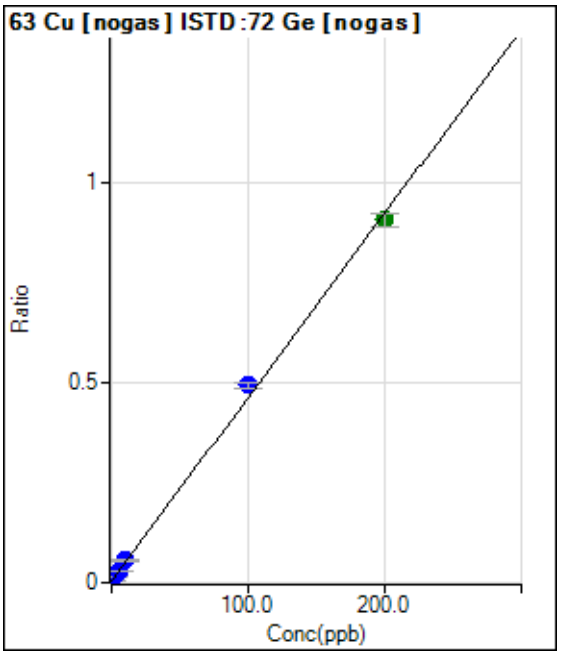


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.366	186.67	0.0014	P	11.7
2	☐	2.000	2.111	1753.46	0.0127	P	3.0
3	☐	5.000	5.025	4347.27	0.0316	P	8.4
4	☐	10.000	10.204	8932.32	0.0652	P	5.4
5	☐	100.000	98.612	84224.83	0.6386	P	4.7
6	☐	200.000	200.682	165782.30	1.3007	P	3.1
7	☐	1.000					

y = 0.0065 * x - 9.5071E-004
R = 1.0000
DL = 0.07728
BEC = -0.1466

Weight: <None>
Min Conc: <None>

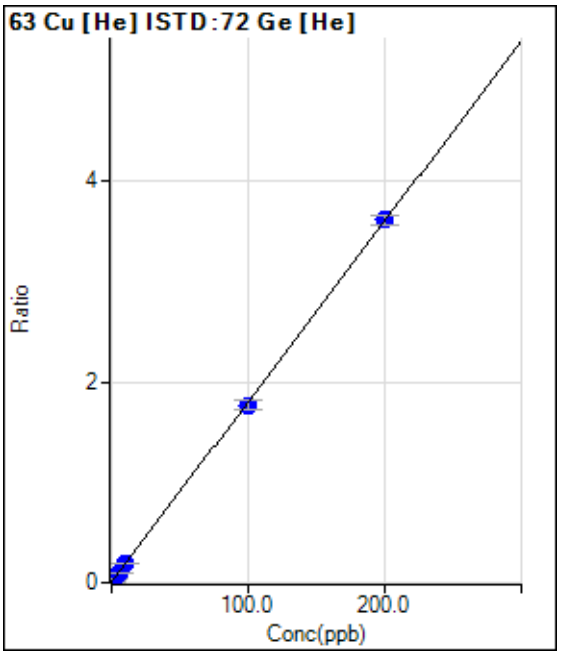
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	5664.30	0.0036	P	11.8
2	☐	2.000	2.151	21446.24	0.0135	P	3.2
3	☐	5.000	5.540	46720.67	0.0291	P	7.3
4	☐	10.000	11.347	90562.08	0.0559	P	2.5
5	☐	100.000	106.700	787527.59	0.4949	P	3.3
6	☐	200.000	196.567	1432624.40	0.9086	A	4.0
7	☐	1.000					

y = 0.0046 * x + 0.0036
R = 0.9992
DL = 0.2807
BEC = 0.7915

Weight: <None>
Min Conc: <None>

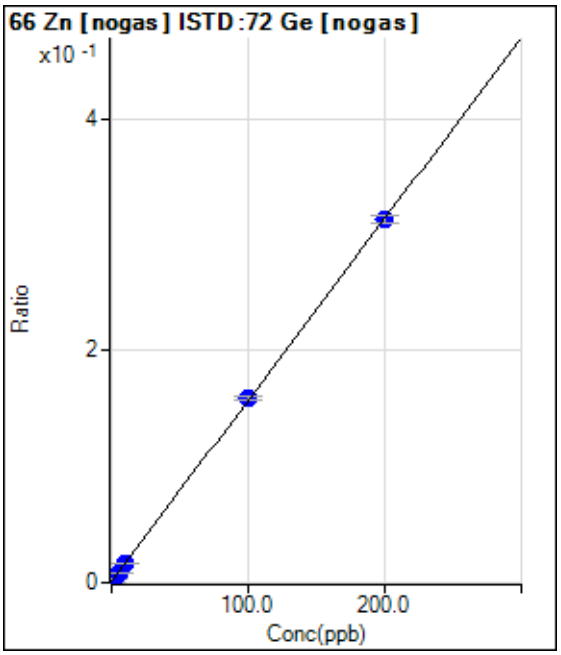


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.255	1253.40	0.0096	P	3.3
2	☐	2.000	2.215	6161.16	0.0448	P	4.7
3	☐	5.000	5.098	13291.71	0.0967	P	1.0
4	☐	10.000	10.328	26132.45	0.1907	P	2.4
5	☐	100.000	98.249	233646.11	1.7717	P	5.0
6	☐	200.000	200.854	461004.21	3.6168	P	2.9
7	☐	1.000					

y = 0.0180 * x + 0.0050
R = 0.9999
DL = 0.05273
BEC = 0.2767

Weight: <None>
Min Conc: <None>

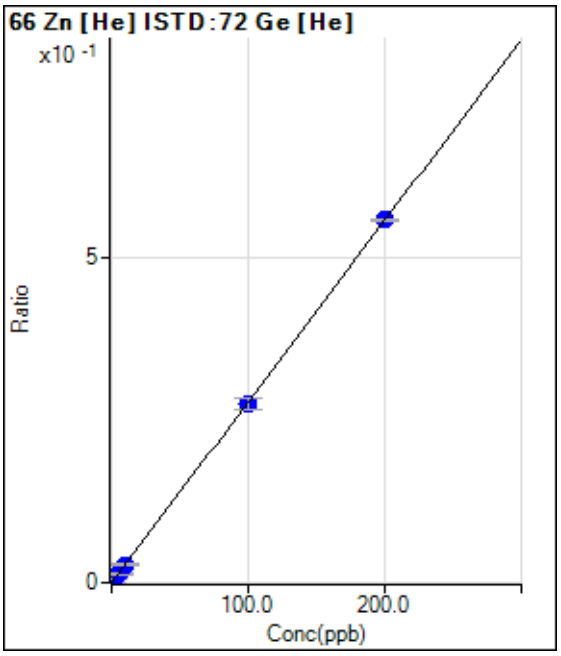
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.430	466.68	0.0003	P	19.4
2	☐	2.000	1.699	5741.03	0.0036	P	2.2
3	☐	5.000	4.981	14032.28	0.0088	P	7.3
4	☐	10.000	10.268	27568.15	0.0170	P	3.6
5	☐	100.000	100.982	252700.67	0.1588	P	2.4
6	☐	200.000	199.499	493155.61	0.3127	P	2.3
7	☐	1.000					

y = 0.0016 * x + 9.7064E-004
R = 1.0000
DL = 0.1118
BEC = 0.6212

Weight: <None>
Min Conc: <None>

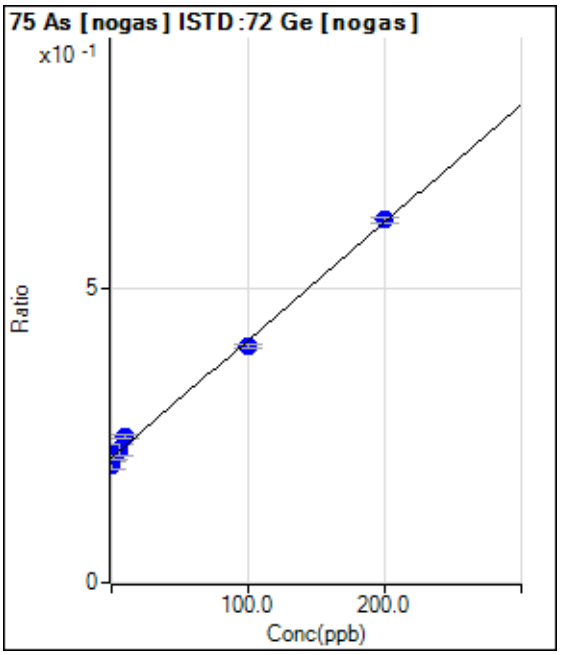


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.197	20.00	0.0002	P	173.
2	☐	2.000	2.312	826.70	0.0060	P	26.6
3	☐	5.000	4.930	1826.80	0.0133	P	9.7
4	☐	10.000	10.136	3800.46	0.0278	P	9.4
5	☐	100.000	98.865	36156.20	0.2742	P	6.2
6	☐	200.000	200.559	70952.22	0.5566	P	0.9
7	☐	1.000					

y = 0.0028 * x - 3.9408E-004
R = 1.0000
DL = 0.2865
BEC = -0.1419

Weight: <None>
Min Conc: <None>

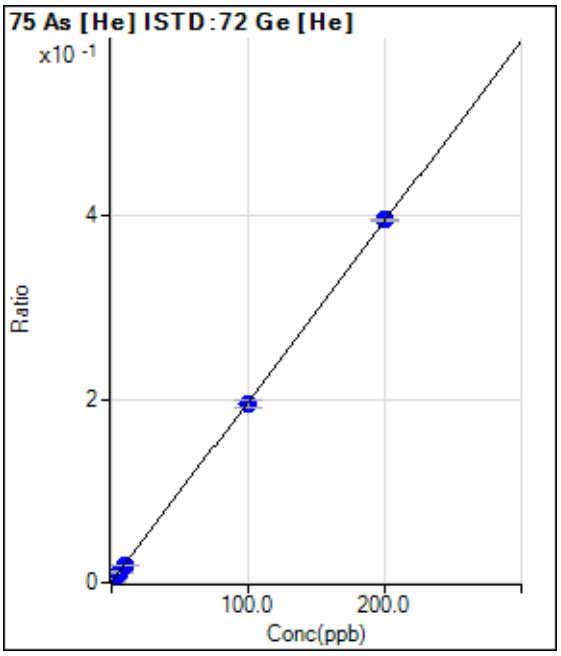
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-6.558	310922.00	0.2000	P	7.1
2	☐	2.000	1.776	343086.74	0.2167	P	5.3
3	☐	5.000	6.502	362578.36	0.2262	P	7.6
4	☐	10.000	18.156	404632.36	0.2496	P	1.9
5	☐	100.000	95.133	642975.94	0.4039	P	1.7
6	☐	200.000	201.991	975032.09	0.6182	P	1.9
7	☐	1.000					

y = 0.0020 * x + 0.2131
R = 0.9979
DL = 21.32
BEC = 106.3

Weight: <None>
Min Conc: <None>

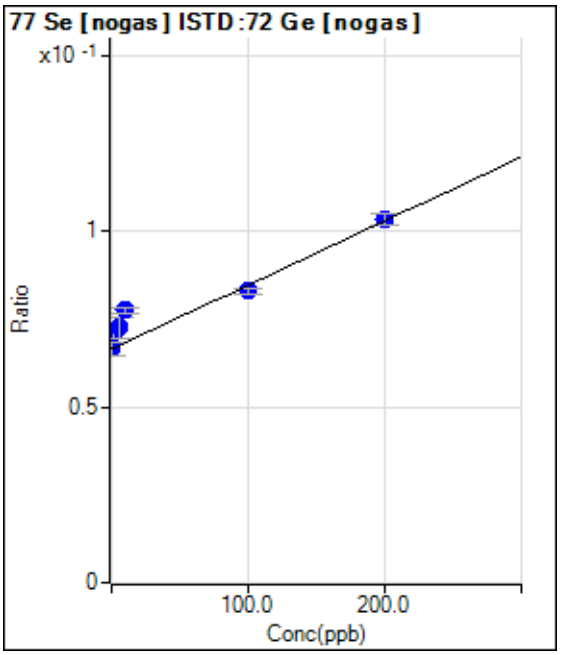


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	123.34	0.0009	P	36.5
2	☐	2.000	1.934	652.24	0.0047	P	5.3
3	☐	5.000	5.280	1556.74	0.0113	P	4.2
4	☐	10.000	9.134	2587.98	0.0189	P	3.8
5	☐	100.000	98.698	25705.90	0.1949	P	3.6
6	☐	200.000	200.688	50382.82	0.3952	P	0.6
7	☐	1.000					

y = 0.0020 * x + 9.4125E-004
R = 1.0000
DL = 0.5252
BEC = 0.4791

Weight: <None>
Min Conc: <None>

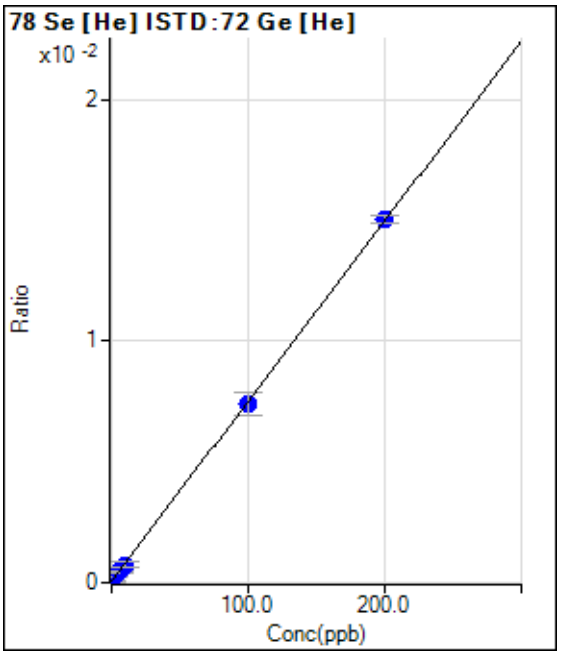
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	103499.56	0.0666	P	6.2
2	☐	2.000	25.618	112760.68	0.0712	P	5.1
3	☐	5.000	33.227	116406.64	0.0726	P	7.8
4	☐	10.000	60.281	125741.64	0.0776	P	2.3
5	☐	100.000	90.139	132163.28	0.0830	P	1.5
6	☐	200.000	201.474	162956.03	0.1033	P	3.4
7	☐	1.000					

y = 1.8248E-004 * x + 0.0666
R = 0.9651
DL = 67.81
BEC = 364.8

Weight: <None>
Min Conc: <None>

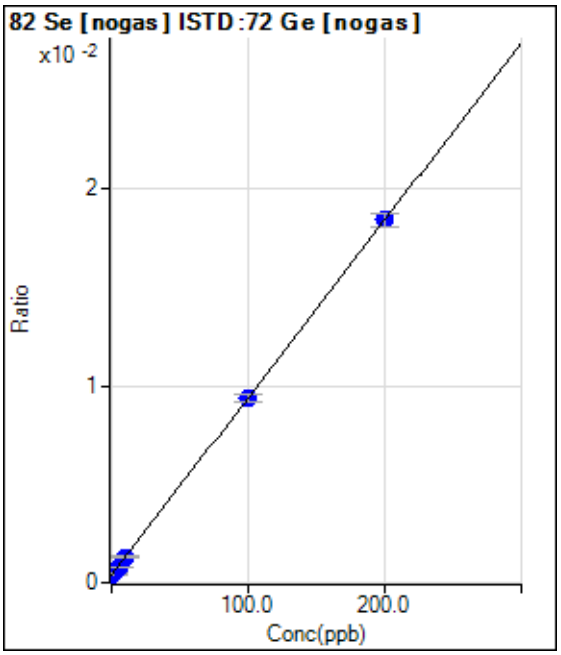


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	-0.017	6.00	0.0000	P	65.9
2	☐	2.000	2.909	36.67	0.0003	P	37.9
3	☐	5.000	5.268	60.67	0.0004	P	16.5
4	☐	10.000	9.503	103.33	0.0008	P	21.4
5	☐	100.000	98.655	977.03	0.0074	P	13.0
6	☐	200.000	200.681	1916.11	0.0150	P	2.3
7	☐	1.000					

y = 7.4662E-005 * x + 4.6938E-005
R = 0.9999
DL = 1.208
BEC = 0.6287

Weight: <None>
Min Conc: <None>

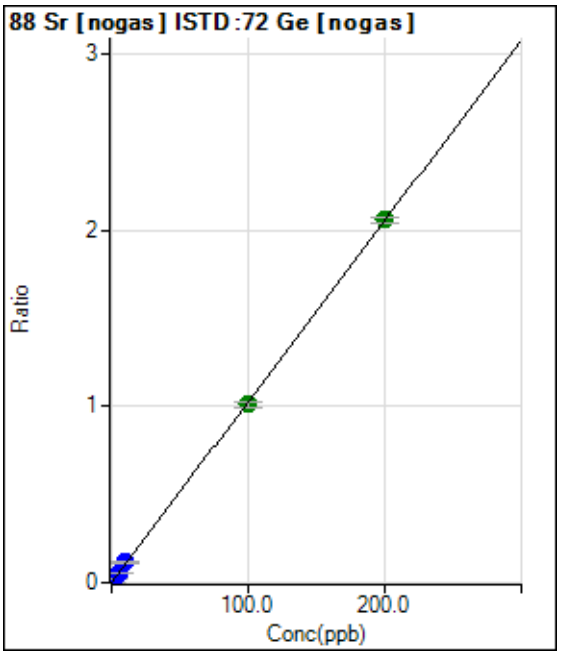
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	610.02	0.0004	P	18.2
2	☐	2.000	0.707	723.36	0.0005	P	11.6
3	☐	5.000	4.194	1240.07	0.0008	P	5.2
4	☐	10.000	10.090	2106.82	0.0013	P	10.2
5	☐	100.000	99.544	14889.76	0.0094	P	4.3
6	☐	200.000	200.257	29067.21	0.0184	P	3.8
7	☐	1.000					

y = 9.0054E-005 * x + 3.9362E-004
R = 1.0000
DL = 2.393
BEC = 4.371

Weight: <None>
Min Conc: <None>

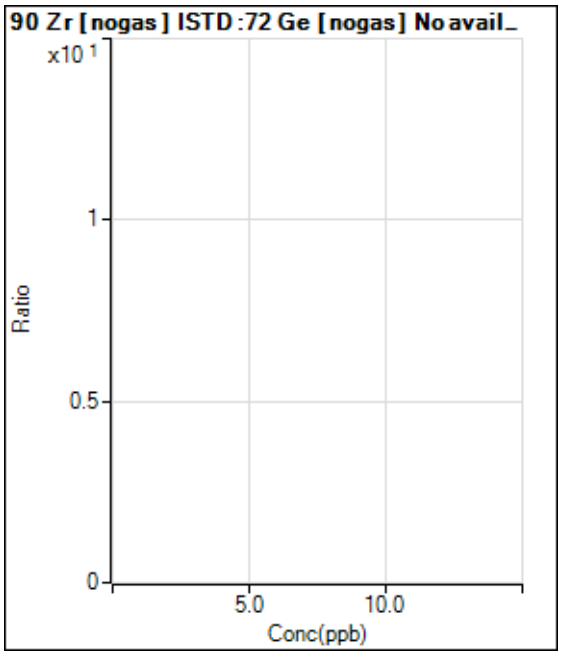


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	513.35	0.0003	P	11.1
2	☐	2.000	2.247	36972.50	0.0234	P	5.5
3	☐	5.000	5.504	90946.23	0.0567	P	7.5
4	☐	10.000	11.290	187990.56	0.1160	P	4.1
5	☐	100.000	98.531	1607772.37	1.0102	A	3.2
6	☐	200.000	200.655	3244111.41	2.0569	A	1.5
7	☐	1.000					

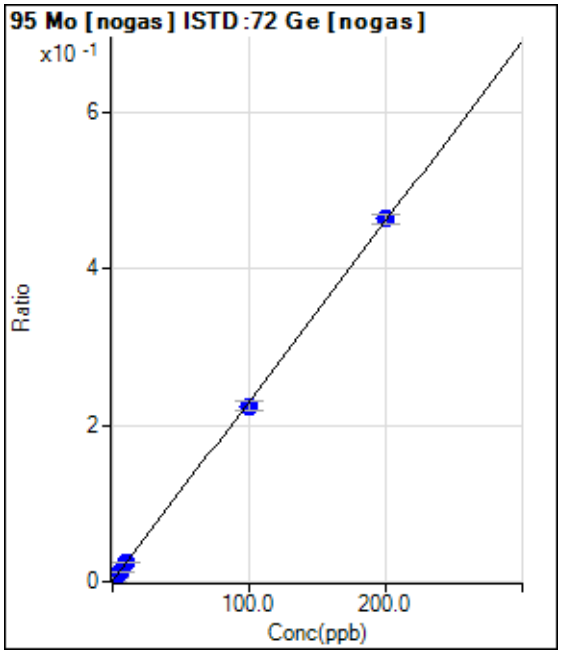
y = 0.0102 * x + 3.3058E-004
R = 0.9999
DL = 0.01071
BEC = 0.03225

Weight: <None>
Min Conc: <None>

Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000					
2	☐	2.000					
3	☐	5.000					
4	☐	10.000					
5	☐	100.000					
6	☐	200.000					
7	☐	1.000					

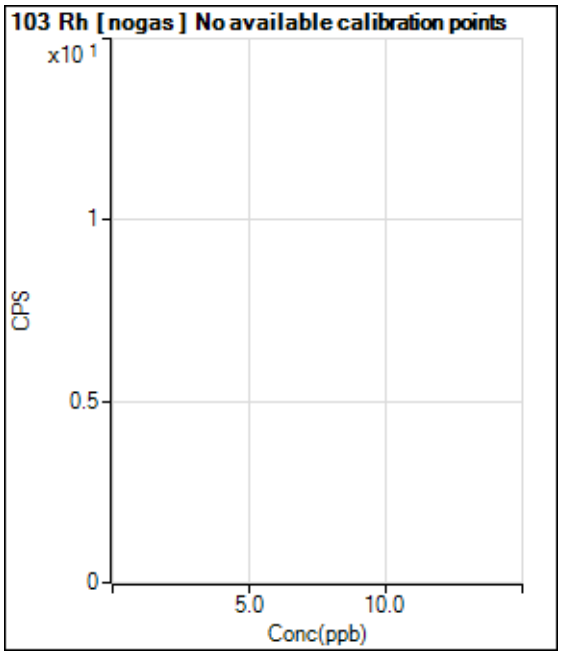


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	1300.07	0.0008	P	16.6
2	☐	2.000	2.046	8779.00	0.0055	P	3.9
3	☐	5.000	5.129	20281.91	0.0126	P	3.4
4	☐	10.000	10.352	39948.71	0.0247	P	3.5
5	☐	100.000	97.299	357518.06	0.2247	P	5.7
6	☐	200.000	201.329	731875.01	0.4641	P	2.4
7	☐	1.000					

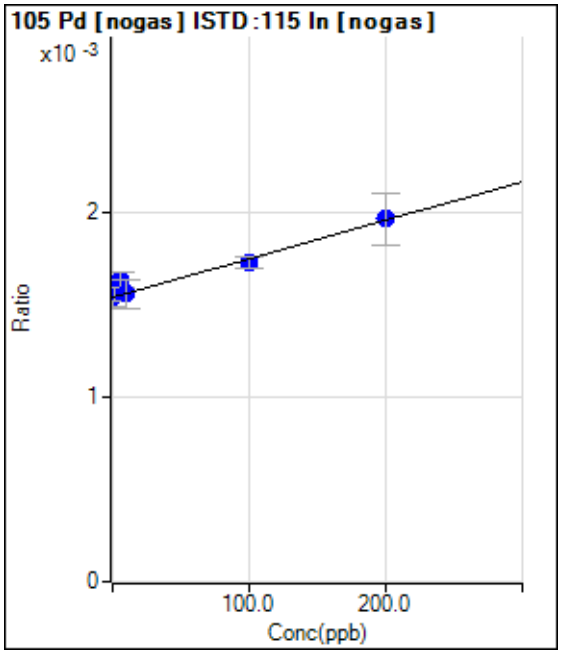
y = 0.0023 * x + 8.3805E-004
R = 0.9999
DL = 0.1818
BEC = 0.3642

Weight: <None>
Min Conc: <None>

Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			756.70		P	14.6
2	☐			643.36		P	0.9
3	☐			573.36		P	12.9
4	☐			536.69		P	13.1
5	☐			716.69		P	16.3
6	☐			766.70		P	13.3
7	☐						

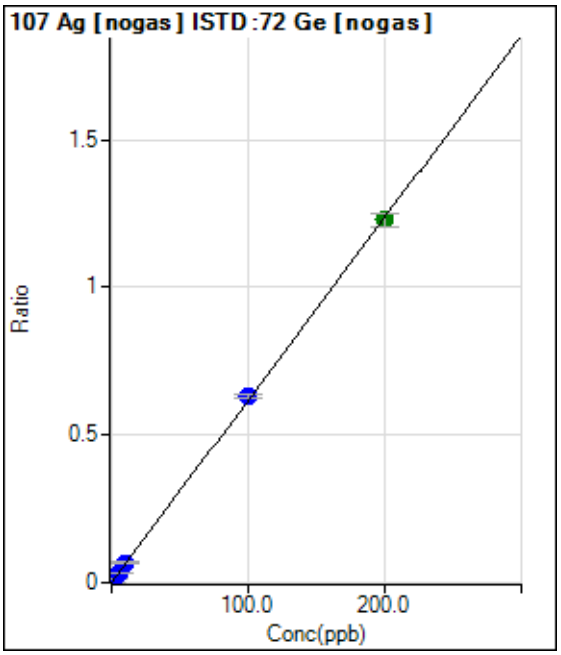


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2513.57	0.0015	P	6.1
2	☐	2.000	13.288	2660.25	0.0016	P	5.7
3	☐	5.000	44.009	2720.26	0.0016	P	5.0
4	☐	10.000	8.263	2620.25	0.0016	P	10.5
5	☐	100.000	91.392	2876.95	0.0017	P	3.9
6	☐	200.000	203.303	3110.34	0.0020	P	14.3
7	☐	1.000					

y = 2.0904E-006 * x + 0.0015
R = 0.9788
DL = 135.9
BEC = 738.3

Weight: <None>
Min Conc: <None>

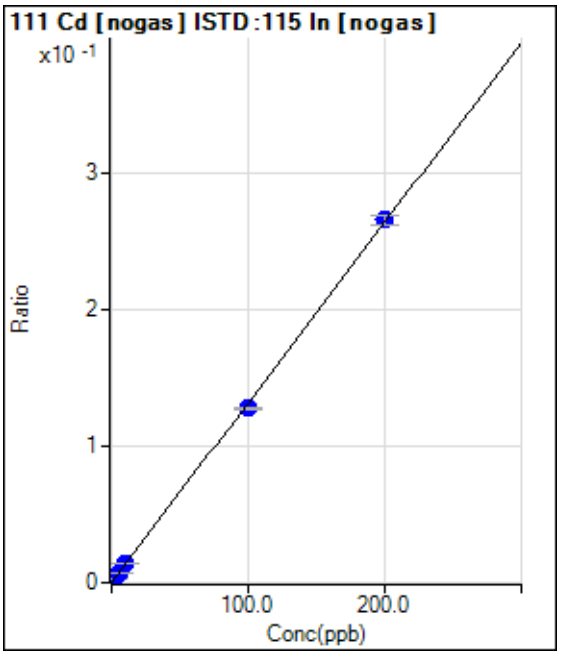
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	426.68	0.0003	P	3.5
2	☐	2.000	2.092	20886.24	0.0132	P	2.4
3	☐	5.000	5.384	53769.29	0.0335	P	4.1
4	☐	10.000	10.939	109923.89	0.0678	P	2.5
5	☐	100.000	102.114	1003982.57	0.6307	P	1.8
6	☐	200.000	198.885	1937250.39	1.2281	A	3.7
7	☐	1.000					

y = 0.0062 * x + 2.7387E-004
R = 0.9999
DL = 0.004625
BEC = 0.04436

Weight: <None>
Min Conc: <None>

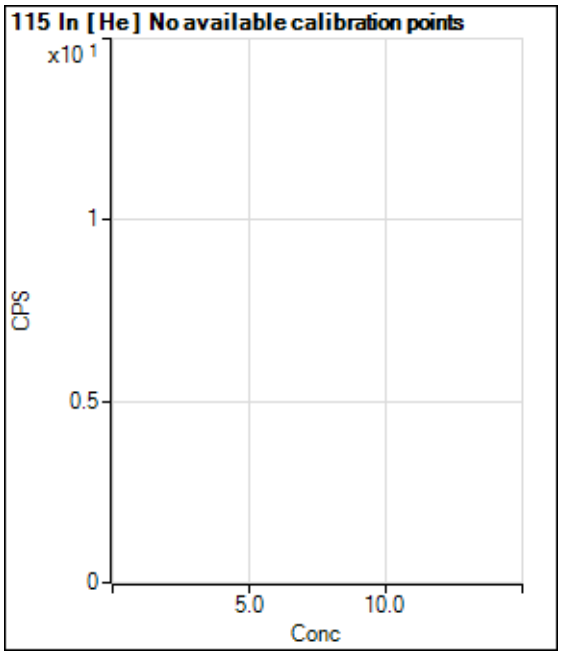


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	0.00	0.0000	P	
2	☐	2.000	1.868	4180.57	0.0025	P	4.8
3	☐	5.000	4.887	10730.14	0.0064	P	2.7
4	☐	10.000	10.288	22838.48	0.0136	P	2.2
5	☐	100.000	96.790	211767.84	0.1277	P	1.7
6	☐	200.000	201.595	420152.04	0.2659	P	2.8
7	☐	1.000					

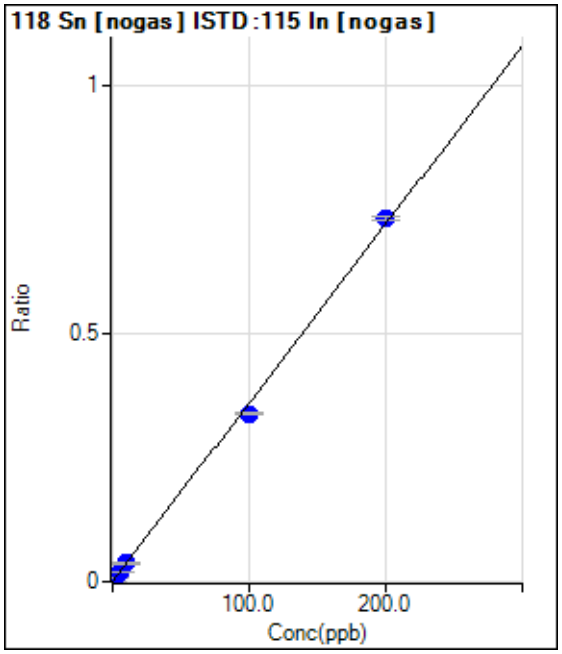
y = 0.0013 * x + 0.0000E+000
R = 0.9998
DL = 0
BEC = 0

Weight: <None>
Min Conc: <None>

Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			161040.69		P	2.0
2	☐			169790.27		P	0.9
3	☐			167628.21		P	1.2
4	☐			168399.91		P	1.2
5	☐			159804.08		P	2.0
6	☐			153047.33		P	0.4
7	☐						

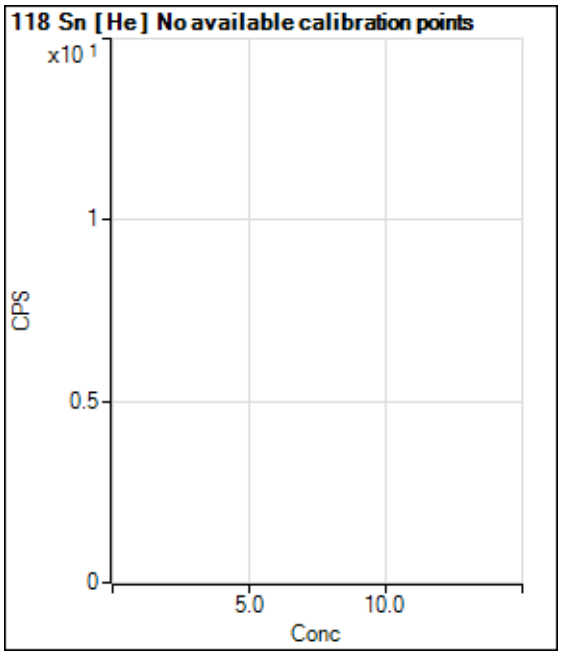


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	933.38	0.0006	P	20.6
2	☐	2.000	1.955	12878.35	0.0076	P	5.5
3	☐	5.000	4.991	30797.58	0.0185	P	1.5
4	☐	10.000	10.147	62241.66	0.0370	P	5.6
5	☐	100.000	93.755	559711.67	0.3374	P	1.2
6	☐	200.000	203.116	1154201.26	0.7304	P	1.2
7	☐	1.000					

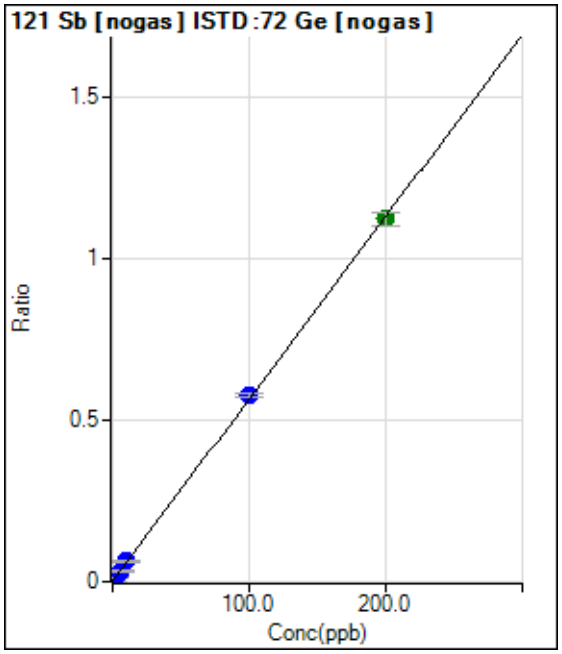
y = 0.0036 * x + 5.7047E-004
R = 0.9993
DL = 0.09831
BEC = 0.1588

Weight: <None>
Min Conc: <None>

Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			116.67		P	35.7
2	☐			1643.44		P	4.0
3	☐			3790.49		P	10.9
4	☐			7741.88		P	5.0
5	☐			70228.34		P	3.1
6	☐			145636.35		P	2.7
7	☐						

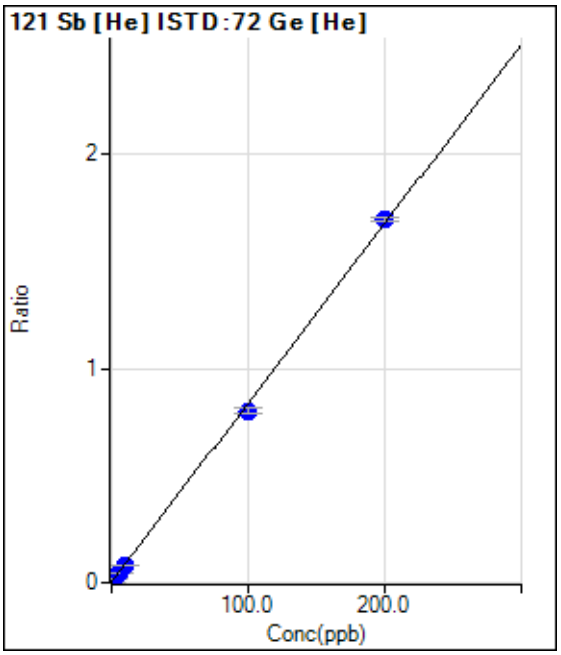


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	2806.94	0.0018	P	6.6
2	☐	2.000	2.164	22161.10	0.0140	P	1.0
3	☐	5.000	5.346	51175.89	0.0319	P	7.1
4	☐	10.000	10.928	102600.99	0.0634	P	6.4
5	☐	100.000	102.015	917596.06	0.5765	P	2.5
6	☐	200.000	198.936	1769970.24	1.1225	A	4.0
7	☐	1.000					

y = 0.0056 * x + 0.0018
R = 0.9999
DL = 0.06318
BEC = 0.3206

Weight: <None>
Min Conc: <None>

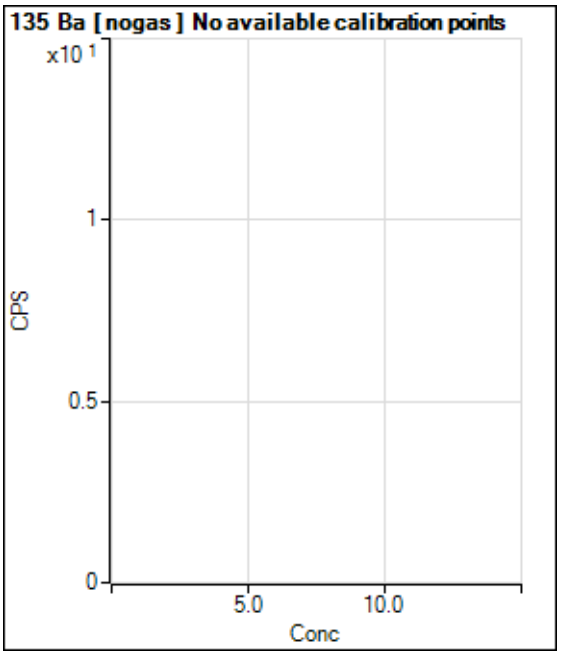
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	320.01	0.0024	P	2.5
2	☐	2.000	1.918	2540.23	0.0185	P	9.2
3	☐	5.000	5.184	6294.58	0.0458	P	3.6
4	☐	10.000	9.454	11163.77	0.0815	P	4.5
5	☐	100.000	95.634	105800.41	0.8021	P	4.0
6	☐	200.000	202.206	215834.64	1.6932	P	1.1
7	☐	1.000					

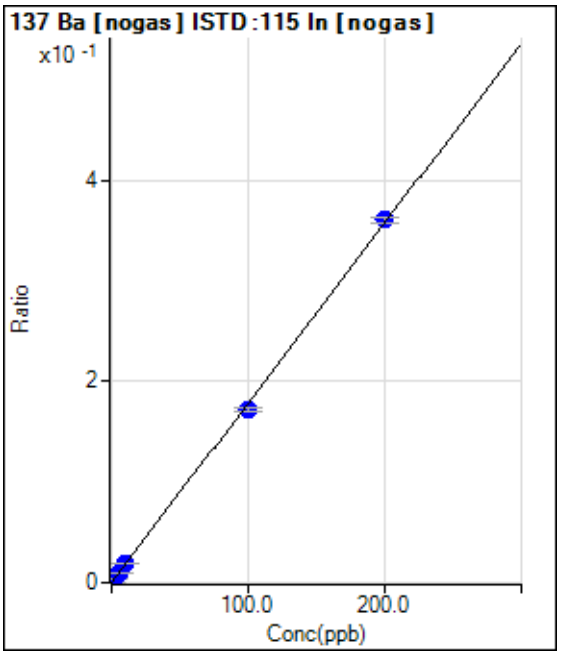
y = 0.0084 * x + 0.0024
R = 0.9997
DL = 0.0217
BEC = 0.292

Weight: <None>
Min Conc: <None>



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			83.33		P	18.3
2	☐			3350.39		P	10.6
3	☐			8462.27		P	7.7
4	☐			16832.02		P	2.2
5	☐			162414.89		P	2.4
6	☐			320148.90		P	0.8
7	☐						

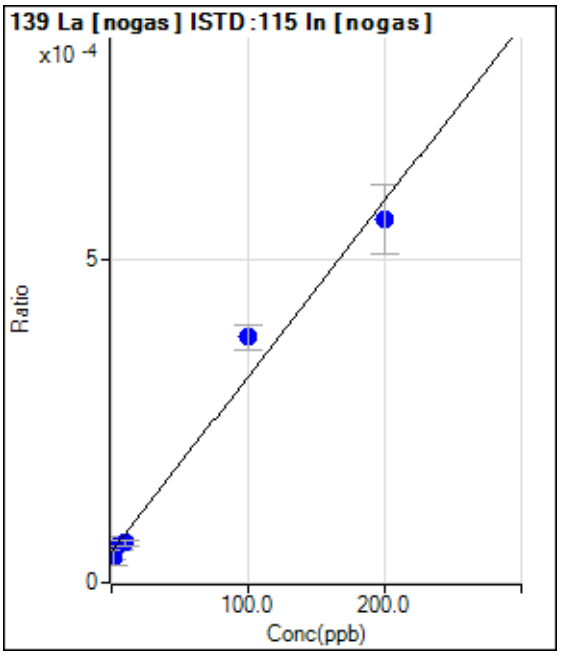
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	156.67	0.0001	P	10.3
2	☐	2.000	1.980	6144.52	0.0036	P	6.2
3	☐	5.000	4.930	14799.99	0.0089	P	0.7
4	☐	10.000	10.308	31112.13	0.0185	P	2.4
5	☐	100.000	96.119	284607.21	0.1716	P	1.7
6	☐	200.000	201.927	569467.61	0.3604	P	1.7
7	☐	1.000					

y = 0.0018 * x + 9.6112E-005
R = 0.9997
DL = 0.01659
BEC = 0.05387

Weight: <None>
Min Conc: <None>

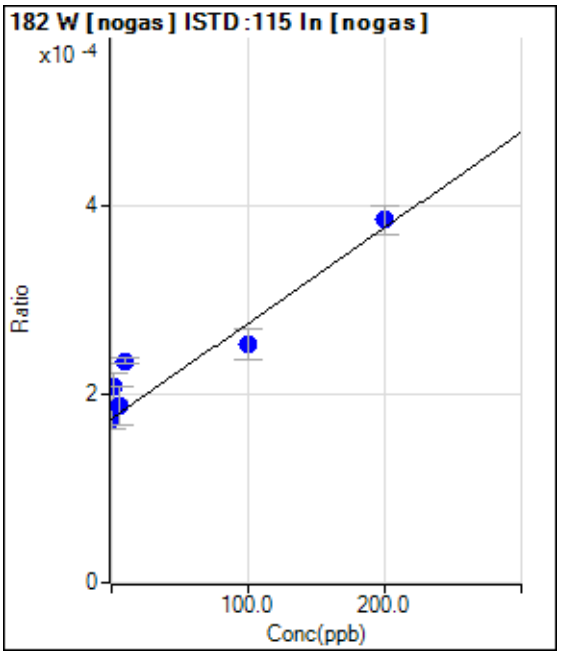


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	76.67	0.0000	P	49.1
2	☐	2.000	-3.104	66.67	0.0000	P	59.6
3	☐	5.000	4.523	100.00	0.0001	P	36.1
4	☐	10.000	4.941	103.33	0.0001	P	10.4
5	☐	100.000	122.302	630.02	0.0004	P	10.6
6	☐	200.000	189.165	890.04	0.0006	P	19.0
7	☐	100.000					

y = 2.7173E-006 * x + 4.7773E-005
R = 0.9901
DL = 25.91
BEC = 17.58

Weight: <None>
Min Conc: <None>

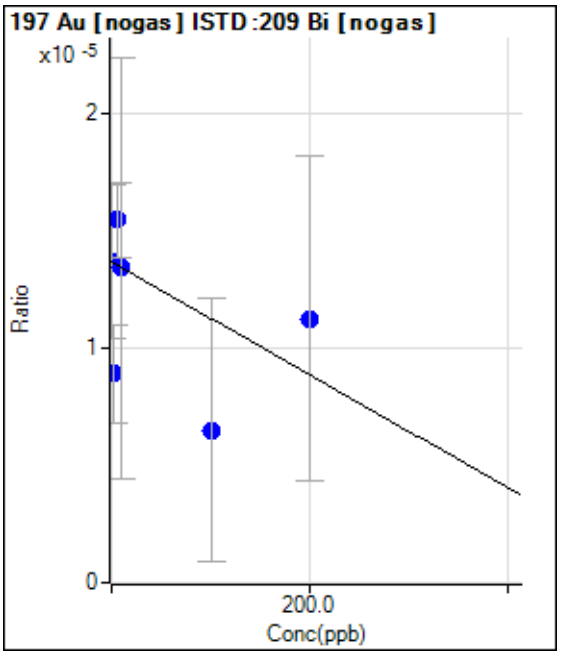
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	283.34	0.0002	P	13.4
2	☐	2.000	33.787	353.34	0.0002	P	14.2
3	☐	5.000	13.269	313.34	0.0002	P	21.8
4	☐	10.000	60.192	396.68	0.0002	P	3.0
5	☐	100.000	77.837	420.01	0.0003	P	13.4
6	☐	200.000	208.047	610.03	0.0004	P	8.0
7	☐	1.000					

y = 1.0149E-006 * x + 1.7442E-004
R = 0.9514
DL = 69.31
BEC = 171.9

Weight: <None>
Min Conc: <None>

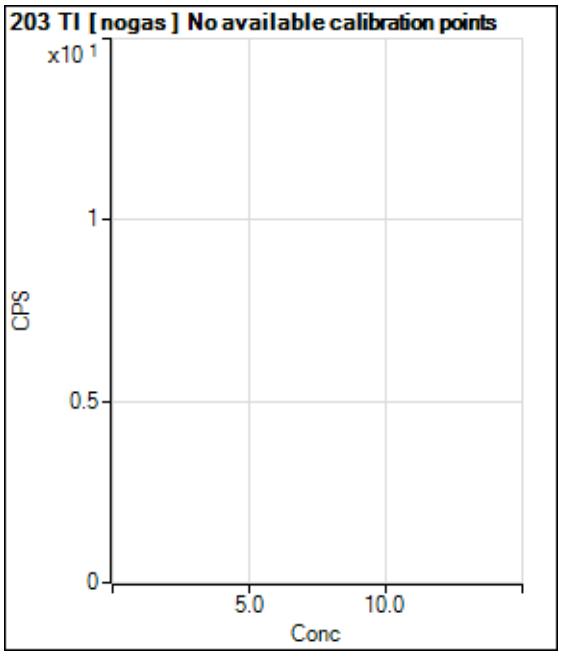


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	20.00	0.0000	P	48.1
2	☐	2.000	198.083	13.33	0.0000	P	46.9
3	☐	5.000	-74.170	23.33	0.0000	P	21.0
4	☐	10.000	10.105	20.00	0.0000	P	133.
5	☐	100.000	298.514	10.00	0.0000	P	173.
6	☐	200.000	100.756	16.67	0.0000	P	122.
7	☐	100.000					

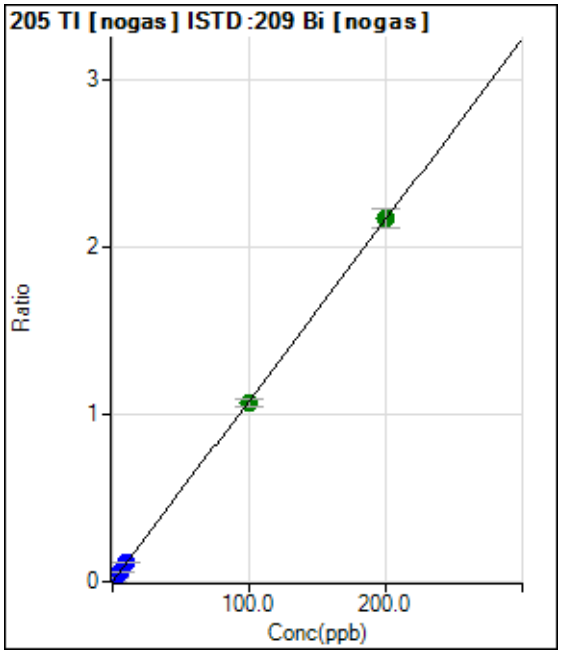
y = -2.4072E-008 * x + 1.3659E-005
R = -0.3864
DL = -818.1
BEC = -567.4

Weight: <None>
Min Conc: <None>

Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐			113.33		P	22.2
2	☐			14313.28		P	3.0
3	☐			36167.71		P	6.0
4	☐			74946.49		P	3.6
5	☐			729244.08		P	1.1
6	☐			1327610.66		A	4.0
7	☐						

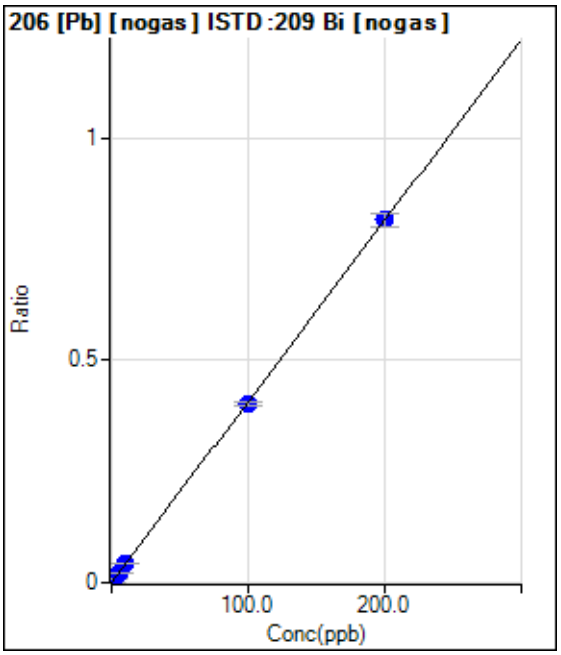


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	263.34	0.0002	P	10.1
2	☐	2.000	2.084	34323.43	0.0227	P	5.7
3	☐	5.000	5.300	86181.54	0.0574	P	8.3
4	☐	10.000	10.963	178023.98	0.1186	P	2.1
5	☐	100.000	98.965	1604717.89	1.0691	A	4.6
6	☐	200.000	200.461	3168932.56	2.1654	A	5.4
7	☐	1.000					

y = 0.0108 * x + 1.8141E-004
R = 1.0000
DL = 0.005068
BEC = 0.0168

Weight: <None>
Min Conc: <None>

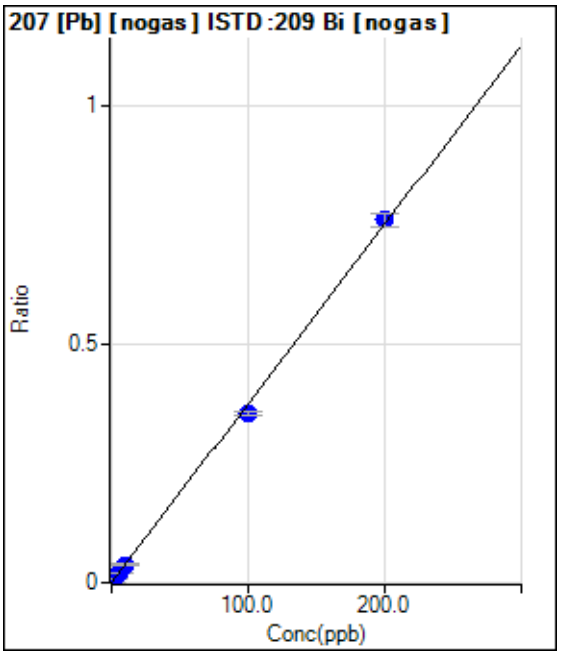
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	146.67	0.0001	P	23.8
2	☐	2.000	1.982	12364.94	0.0082	P	2.7
3	☐	5.000	5.126	31477.54	0.0210	P	4.4
4	☐	10.000	10.276	62892.06	0.0419	P	4.0
5	☐	100.000	99.075	605413.76	0.4032	P	2.6
6	☐	200.000	200.446	1194314.15	0.8156	P	3.5
7	☐	1.000					

y = 0.0041 * x + 1.0124E-004
R = 1.0000
DL = 0.01778
BEC = 0.02488

Weight: <None>
Min Conc: <None>

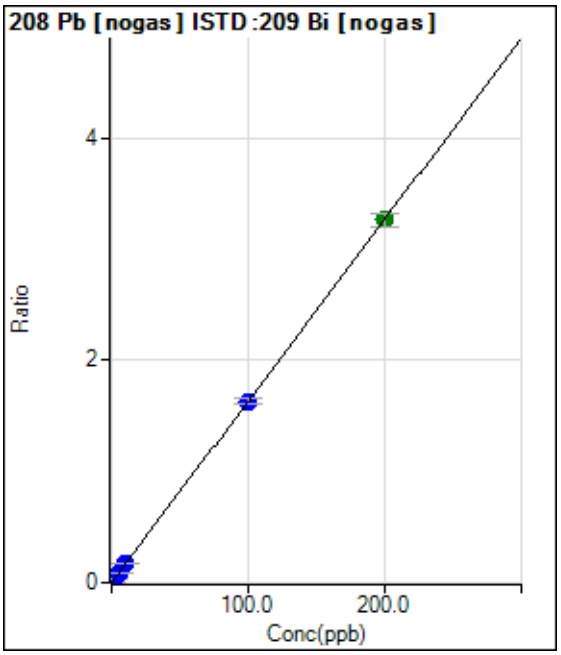


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	116.67	0.0001	P	34.4
2	☐	2.000	1.940	11120.72	0.0074	P	7.2
3	☐	5.000	5.219	29514.15	0.0196	P	4.1
4	☐	10.000	10.020	56482.46	0.0376	P	4.3
5	☐	100.000	94.777	533617.04	0.3554	P	1.9
6	☐	200.000	202.606	1111987.87	0.7595	P	3.7
7	☐	1.000					

y = 0.0037 * x + 8.0156E-005
R = 0.9995
DL = 0.02209
BEC = 0.02138

Weight: <None>
Min Conc: <None>

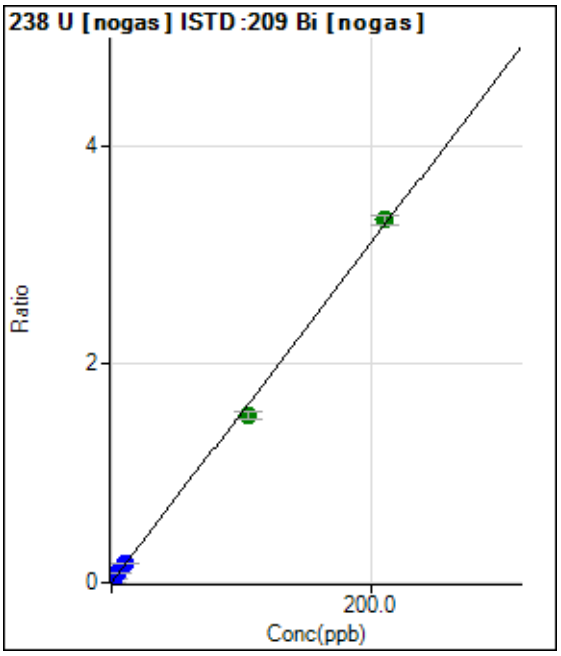
Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	563.34	0.0004	P	20.8
2	☐	2.000	2.044	51009.55	0.0337	P	5.0
3	☐	5.000	5.267	129587.48	0.0863	P	4.0
4	☐	10.000	10.568	259178.63	0.1727	P	3.1
5	☐	100.000	100.042	2449671.06	1.6314	P	2.4
6	☐	200.000	199.943	4772831.57	3.2601	A	3.6
7	☐	1.000					

y = 0.0163 * x + 3.8856E-004
R = 1.0000
DL = 0.01486
BEC = 0.02383

Weight: <None>
Min Conc: <None>

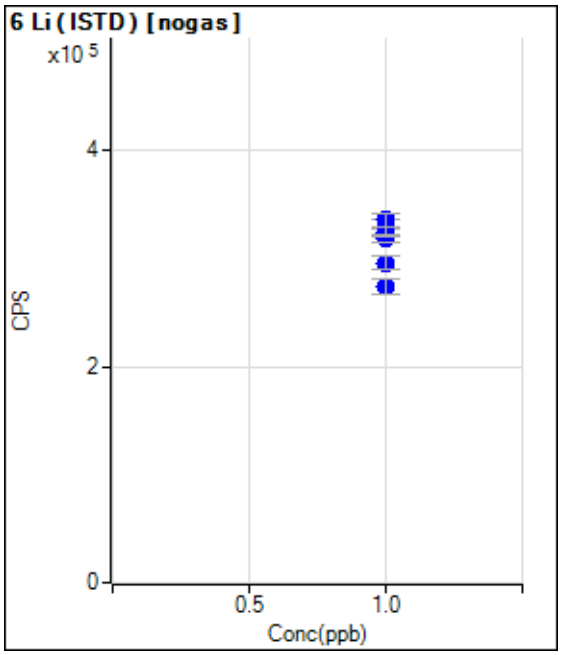


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	0.000	0.000	923.38	0.0006	P	9.5
2	☐	2.000	2.165	52026.51	0.0344	P	3.7
3	☐	5.000	5.324	125486.46	0.0836	P	6.1
4	☐	10.000	11.220	263289.65	0.1754	P	3.9
5	☐	105.000	98.526	2306163.45	1.5356	A	4.6
6	☐	210.000	213.170	4863539.72	3.3217	A	2.9
7	☐	1.000					

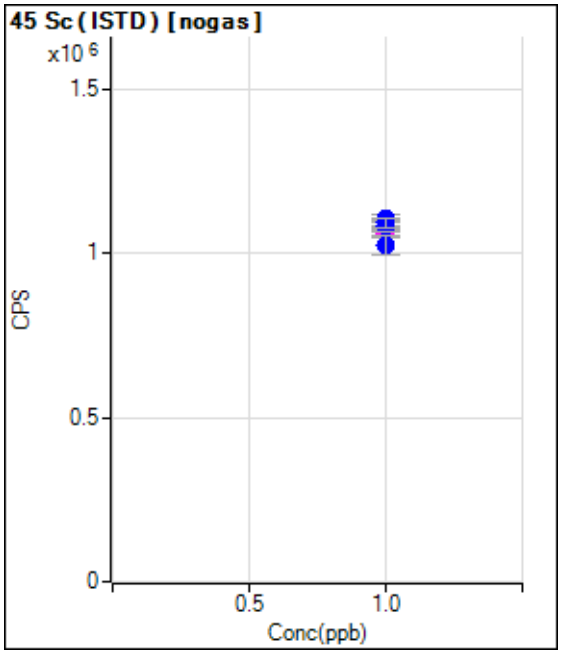
y = 0.0156 * x + 6.3512E-004
R = 0.9993
DL = 0.01163
BEC = 0.04077

Weight: <None>
Min Conc: <None>

Calibration for 011_ICV.d

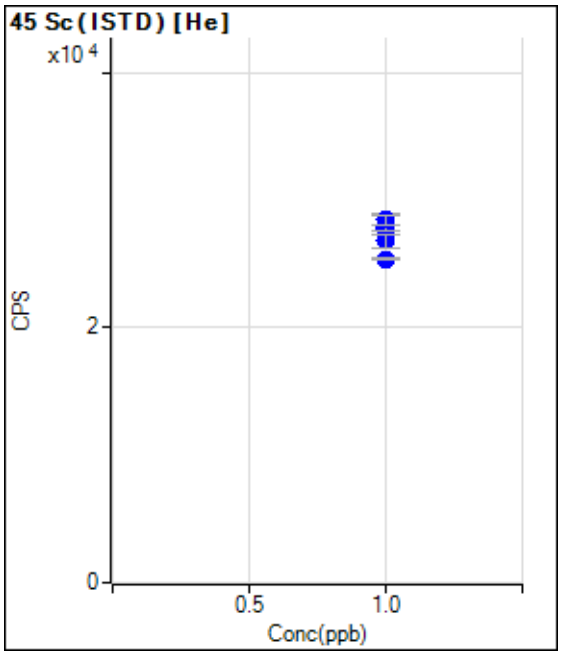


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		318818.41		P	2.0
2	☐	1.000		324537.86		P	2.2
3	☐	1.000		329596.05		P	3.9
4	☐	1.000		335902.08		P	3.4
5	☐	1.000		296363.56		P	3.8
6	☐	1.000		274309.00		P	5.2
7	☐	1.000					

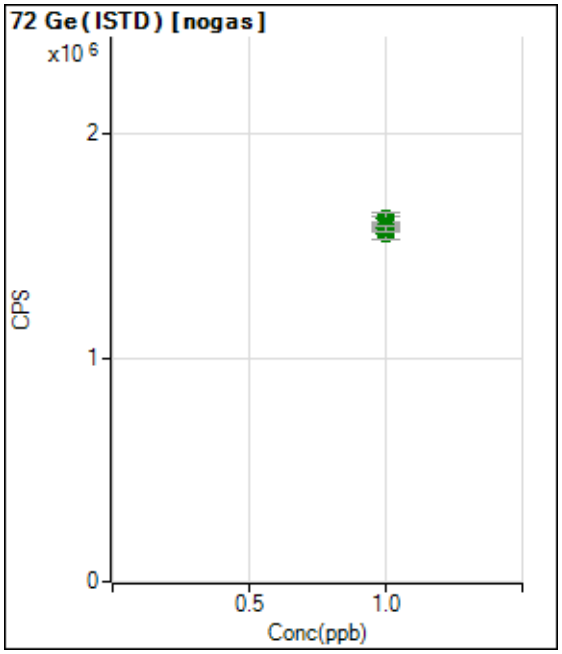


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1059568.37		M	1.9
2	☐	1.000		1102120.22		P	3.0
3	☐	1.000		1105547.04		P	0.3
4	☐	1.000		1082243.84		P	2.6
5	☐	1.000		1094251.21		P	2.7
6	☐	1.000		1024316.39		P	5.9
7	☐	1.000					

Calibration for 011_ICV.d

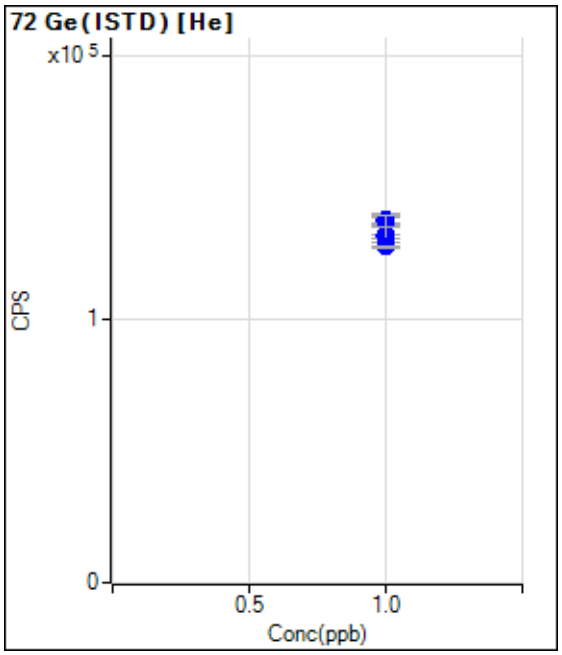


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		27784.71		P	1.7
2	☐	1.000		27834.73		P	1.8
3	☐	1.000		28432.38		P	3.3
4	☐	1.000		28412.35		P	2.5
5	☐	1.000		26749.67		P	3.7
6	☐	1.000		25384.33		P	0.3
7	☐	1.000					

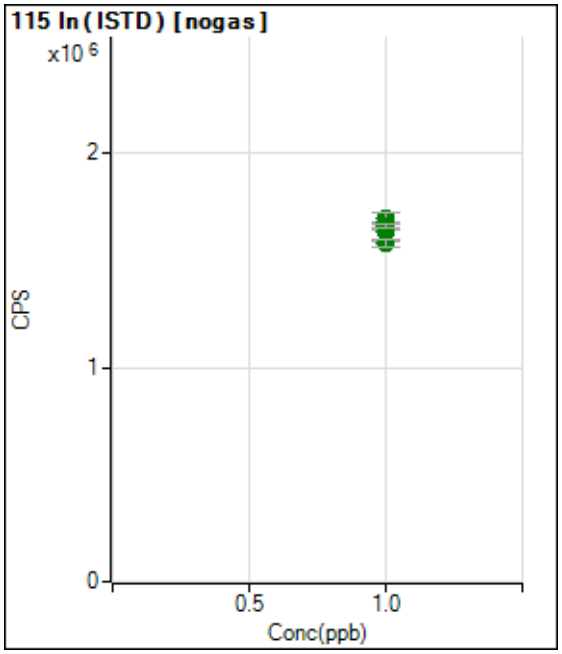


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1556627.84		A	3.7
2	☐	1.000		1583538.41		A	1.7
3	☐	1.000		1605796.23		A	3.8
4	☐	1.000		1621497.79		A	3.5
5	☐	1.000		1592215.24		A	2.3
6	☐	1.000		1577363.00		A	1.4
7	☐	1.000					

Calibration for 011_ICV.d

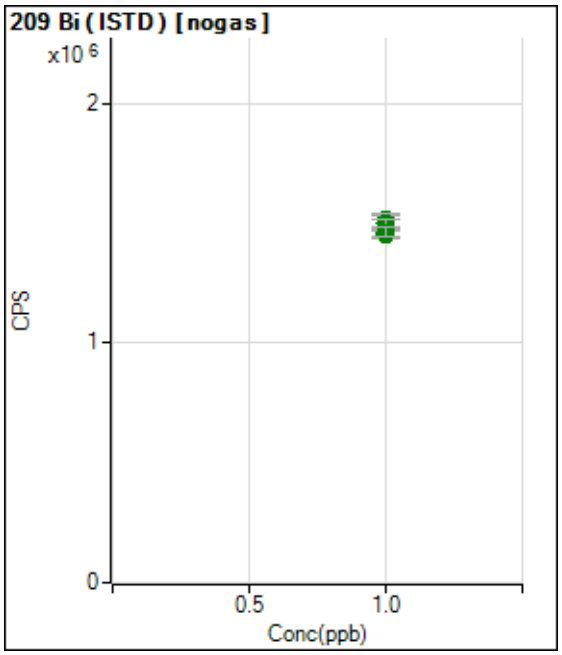


	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		131050.03		P	1.0
2	☐	1.000		137664.28		P	3.3
3	☐	1.000		137532.38		P	1.7
4	☐	1.000		137083.40		P	3.2
5	☐	1.000		132045.48		P	4.0
6	☐	1.000		127473.92		P	0.6
7	☐	1.000					



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1631899.78		A	5.5
2	☐	1.000		1695072.13		A	3.1
3	☐	1.000		1664097.61		A	1.9
4	☐	1.000		1684124.06		A	5.3
5	☐	1.000		1658738.08		A	1.2
6	☐	1.000		1580497.30		A	2.1
7	☐	1.000					

Calibration for 011_ICV.d



	Rjct	Conc.	Calc Conc.	CPS	Ratio	Det.	RSD
1	☐	1.000		1453823.26		A	2.3
2	☐	1.000		1515032.01		A	3.8
3	☐	1.000		1503748.78		A	3.8
4	☐	1.000		1501683.94		A	2.6
5	☐	1.000		1502149.82		A	2.5
6	☐	1.000		1464884.98		A	2.9
7	☐	1.000					

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 18, 2018

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS18040243**

Laboratory Results for: **LHAAP Site 02**

Dear Marcia,

ALS Environmental received 2 sample(s) on Apr 05, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Group Houston, Corp Date: 18-Apr-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 02
Work Order: HS18040243

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18040243-01	35AWW13_040418	Water		04-Apr-2018 12:25	05-Apr-2018 08:50	☐
HS18040243-02	35AWW13_040418_a	Water		04-Apr-2018 12:25	05-Apr-2018 08:50	☐

ALS Group Houston, Corp Date: 18-Apr-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 02
Work Order: HS18040243

CASE NARRATIVE

Metals by Method SW6020

Batch ID: 127364

Sample ID: 35AWW13_040418 (HS18040243-01MS)

- Lead failed in the MS/MSD but passed in the PDS.

ALS Group Houston, Corp

Date: 18-Apr-18

Client: Bhate Environmental Associates, Inc.

ANALYTICAL REPORT

Project: LHAAP Site 02

WorkOrder:HS18040243

Sample ID: 35AWW13_040418

Lab ID:HS18040243-01

Collection Date: 04-Apr-2018 12:25

Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**					Prep:SW3010A / 16-Apr-2018		Analyst: JDE
Arsenic	**0.000986**	J	**0.000400**	**0.00100**	**0.00200**	**mg/L**	1	17-Apr-2018 10:15
Lead	**0.00122**	J	**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	17-Apr-2018 10:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 18-Apr-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 02
Sample ID: 35AWW13_040418_a
Collection Date: 04-Apr-2018 12:25

ANALYTICAL REPORT
WorkOrder:HS18040243
Lab ID:HS18040243-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**					Prep:SW3010A / 16-Apr-2018		Analyst: JDE
Arsenic	**0.000895**	J	**0.000400**	**0.00100**	**0.00200**	**mg/L**	1	17-Apr-2018 10:30
Lead	**0.00109**	J	**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	17-Apr-2018 10:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 18-Apr-18

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 02
WorkOrder: HS18040243

Batch ID: 127364 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18040243-01	1	10	10 (mL)	1
HS18040243-02	1	10	10 (mL)	1

ALS Group Houston, Corp Date: 18-Apr-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 02
WorkOrder: HS18040243

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 127364	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS18040243-01	35AWW13_040418	04 Apr 2018 12:25		16 Apr 2018 11:14	17 Apr 2018 10:15	1
HS18040243-02	35AWW13_040418_a	04 Apr 2018 12:25		16 Apr 2018 11:14	17 Apr 2018 10:30	1

ALS Group Houston, Corp Date: 18-Apr-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 02
WorkOrder: HS18040243

QC BATCH REPORT

Batch ID: 127364 **Instrument: ICPMS05** **Method: SW6020**

MBLK Sample ID: **MBLK-127364** Units: **mg/L** Analysis Date: **17-Apr-2018 10:11**
Client ID: Run ID: **ICPMS05_314436** SeqNo: **4521824** PrepDate: **16-Apr-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.00100	0.00200								U
Lead	0.00100	0.00200								U

LCS Sample ID: **LCS-127364** Units: **mg/L** Analysis Date: **17-Apr-2018 10:13**
Client ID: Run ID: **ICPMS05_314436** SeqNo: **4521825** PrepDate: **16-Apr-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04559	0.00200	0.05	0	91.2	80 - 120				
Lead	0.04507	0.00200	0.05	0	90.1	80 - 120				

MS Sample ID: **HS18040243-01MS** Units: **mg/L** Analysis Date: **17-Apr-2018 10:20**
Client ID: **35AWW13_040418** Run ID: **ICPMS05_314436** SeqNo: **4521828** PrepDate: **16-Apr-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04782	0.00200	0.05	0.000986	93.7	80 - 120				
Lead	0.03944	0.00200	0.05	0.001216	76.5	80 - 120				S

MSD Sample ID: **HS18040243-01MSD** Units: **mg/L** Analysis Date: **17-Apr-2018 10:22**
Client ID: **35AWW13_040418** Run ID: **ICPMS05_314436** SeqNo: **4521829** PrepDate: **16-Apr-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04736	0.00200	0.05	0.000986	92.7	80 - 120	0.04782	0.981	20	
Lead	0.04056	0.00200	0.05	0.001216	78.7	80 - 120	0.03944	2.79	20	S

PDS Sample ID: **HS18040243-01PDS** Units: **mg/L** Analysis Date: **17-Apr-2018 10:28**
Client ID: **35AWW13_040418** Run ID: **ICPMS05_314436** SeqNo: **4521832** PrepDate: **16-Apr-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.09836	0.00200	0.1	0.000986	97.4	75 - 125				
Lead	0.08771	0.00200	0.1	0.001216	86.5	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 18-Apr-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 02
WorkOrder: HS18040243

QC BATCH REPORT

Batch ID: 127364 **Instrument: ICPMS05** **Method: SW6020**

SD Sample ID: **HS18040243-01SD** Units: **mg/L** Analysis Date: **17-Apr-2018 10:18**
Client ID: **35AWW13_040418** Run ID: **ICPMS05_314436** SeqNo: **4521827** PrepDate: **16-Apr-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.00500	0.0100					0.000986	0	10	U
Lead	0.00500	0.0100					0.001216	0	10	U

The following samples were analyzed in this batch: HS18040243-01 HS18040243-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 18-Apr-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP Site 02
WorkOrder: **HS18040243**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Group Houston, Corp Date: 18-Apr-18

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018
Arkansas	88-0356	27-Mar-2019

00897579

Date: 18-Apr-18

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS18040243
Date/Time Received: **05-Apr-2018 08:50**
Received by: **JRM**

Checklist completed by: *Pablo Marinez* eSignature — 5-Apr-2018 Date
Reviewed by: *RJ Modashia* eSignature — 6-Apr-2018 Date

Matrices: **WATER**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.4C/1.9C U/C	IR # 11	
Cooler(s)/Kit(s):	BLUE		
Date/Time sample(s) sent to storage:	4/5/2018 17:10		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00897580

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

Page: _____ of _____

Project/Phase No: NWO1312.0150

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

HS18040243

Bhate Environmental Associates, Inc.
LHAAP Site 02

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site [redacted] 02

Client Name:

Collected by: Kennie Moore

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	Sample Analysis Request: Arsenic & Lead								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW3_040418		04APR2018	1225	-	N	[redacted]	WG	1	✓											
35AWW3_040418-a		04APR2018	1225	-	FD		WG	1	✓											
35AWW3_040418_MS		04APR2018	1225	-	MS		WG	1	✓											
35AWW3-040418SD		04APR2018	1225		SD		WG	1	✓											
				-																
				-																
				-																
				-																
				-																
				-																

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Kennie Moore	4/4/18	1430	1. Jim	4/5/18	08:50
2.			2.		
3.			3.		

Cooler - Blue Temp 2.4 ice IR11 CF -0.5

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

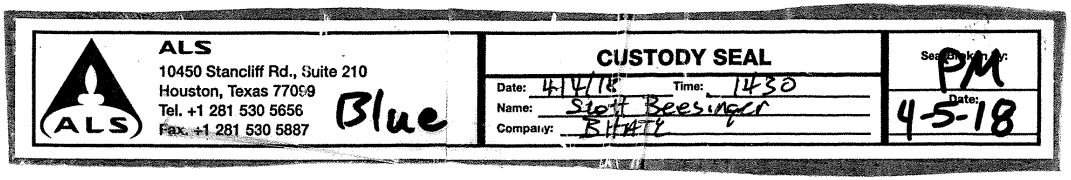
3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

00897581



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Blue

CUSTODY SEAL

Date: 4/4/18 Time: 1430
Name: Steff Beesinger
Company: BHATE

Seal Broken By: PM
Date: 4-5-18

FedEx
TRK# 0221 7376 9752 7495

THU - 05 APR 10:30A
PRIORITY OVERNIGHT

AB SGRA

Blue

77099
TX-US
IAH

FID 162705 04APR18 GGGA 546C1/9132/0C8A

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

August 27, 2018

DAIM-ODB-LO

Mr. Rich Mayer
US Environmental Protection Agency
Federal Facilities Section R6
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Draft Revised Proposed for LHAAP-29, Former TNT Production Area, Group 2, August 2018, Longhorn Army Ammunition Plant, Karnack, Texas

Dear Mr. Mayer,

The above-referenced document is being transmitted to you for review. In accordance with the FFA, please provide your comments by September 26, 2018.

The document was revised by HDR Environmental, Operations and Construction, Inc. (HDR) on behalf of the Army as part of HDR's contract for the facility. I ask that Phil Werner, HDR's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
A. Palmie, TCEQ, Austin, TX
P. Bruckwicki, Caddo Lake NWR, TX
P. Werner, HDR, Englewood, CO
A. Williams, USACE, Tulsa District, OK
N. Smith, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO (for project files)

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

August 27, 2018

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality Superfund Section – MC-136
Remediation Division
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Draft Revised Proposed for LHAAP-29, Former TNT Production Area, Group 2, August 2018, Longhorn Army Ammunition Plant, Karnack, Texas

Dear Ms. Palmie,

The above-referenced document is being transmitted to you for review. In accordance with the FFA, please provide your comments by September 26, 2018.

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Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
R. Mayer, USEPA Region 6, Dallas, TX
P. Bruckwicki, Caddo Lake NWR, TX
P. Werner, HDR, Englewood, CO
A. Williams, USACE, Tulsa District, OK
N. Smith, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO (for project files)

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

August 27, 2018

DAIM-ODB-LO

Mr. Rich Mayer
US Environmental Protection Agency
Federal Facilities Section R6
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Draft Final Remedial Action Completion Report, Contingency Remedy for Western Plume LHAAP-35A (58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, August 2018

Dear Mr. Mayer,

The above-referenced document is being transmitted to you for your records and includes revisions based upon your comments on the Draft. In accordance with the FFA, the Draft Final will be considered Final after 30 days without further comment.

The document was prepared by Bhate Environmental Associates, Inc., (Bhate) on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

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K. Nemmers, Bhate, Lakewood, CO (for project files)

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

August 27, 2018

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Draft Final Remedial Action Completion Report, Contingency Remedy for Western Plume LHAAP-35A (58), Shops Area, Group 4, Longhorn Army Ammunition Plant, Karnack, Texas, August 2018

Dear Ms. Palmie,

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The document was prepared by Bhate Environmental Associates, Inc., (Bhate) on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

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Longhorn AAP Site Manager

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N. Smith, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO (for project files)

Responses to Comments on
Draft Remedial Action Completion Report at LHAAP-35A(58), Shops Area
Longhorn Ammunition Plant, Karnack, Texas

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commenter Agrees (A) with response or Does not Agree (D) with response.

Comment #	Section/ Paragraph	Comment (August 13, 2018)	C, D, E or X[1]	Response (August 27, 2018)	A or D[2]	Comment	C, D, E or X[1]	Response	A or D[2]
Reviewer: April Palmie, TCEQ **Respondent:** Kim Nemmers, Bhate									
1	Page 1-4, First sentence, Section 1.3	Please revise the first sentence since EISB is a "contingency remedy" for only the western plume	C	The first paragraph in Section 1.3 will be revised to state: *The plume for the LHAAP-35A (58) site exists in two separate geographic areas: 1) eastern plume; and 2) western plume.* ***Figure 1-3*** *shows monitoring wells installed within the western plume area at the LHAAP-35A (58) site. The contingency remedy of EISB described herein applies to the western plume only.*					
2	Page 2-1, Section 2.1	Please revise the second sentence. As written, it seems like a table was completed to meet substantive requirements, rather than the requirements included in the table.	C	Concur. The second sentence in Section 2.1 will be revised to state: *The requirements described in Table 2-11, Description of ARARs for Selected Remedy requirements (USACE, September 2010), of the ROD were also completed prior to the EISB injections.*					
3.	Page 2-3, Section 2.7	I think the 2nd sentence in the 2nd paragraph (about nitrite) is supposed to be in the 4th paragraph. Clarify - 35AWW24 didn't have any anion or nitrite exceedances	C	Due to revised laboratory data packages, nitrite detections were determined to be false positives (see Response to EPA Comment 4 below for further explanation). Discussion on nitrite will be removed since no nitrite was detected in the groundwater samples analyzed.					
4.	Figure 2-1	Figures should include all wells within the scale of the map, not just those sampled or measured.	C	**Figure 2-1** will be revised to include all monitoring wells at LHAAP-58.					
		END of TCEQ Comments							

Responses to Comments on
Draft Remedial Action Completion Report at LHAAP-35A(58), Shops Area
Longhorn Ammunition Plant, Karnack, Texas

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commenter Agrees (A) with response or Does not Agree (D) with response.

Comment #	Section/ Paragraph	Comment (August 12, 2018)	C, D, E or X[1]	Response (August 27, 2018)	A or D[2]	Comment	C, D, E or X[1]	Response	A or D[2]
Reviewer: Richard Mayer, USEPA, Region 6 **Respondent:** Kim Nemmers, Bhate									
1	Appendix B	**Appendix B, Monitoring Well Installation Information:** Are the high DO and positive ORP results for newly installed monitoring wells 35AWW23 and 35AWW24 due to the development and surging of the wells? Please explain.	C	The positive ORP is typical at LHAAP-58 for areas of the plume that have not received an electron donor in the form of a carbon substrate. The following sentence will be added to Section 2.3: *Elevated dissolved oxygen (DO) levels were observed during development of these two new monitoring wells due to the surging of the wells. The DO was significantly lower during the baseline groundwater sampling event completed in March 2018, as documented in the groundwater sample collection forms presented in **Appendix C**.*					
2	Appendix C	**Appendix C, Groundwater Collection Forms:** Also, please add what type of samples were collected for documentation.	C	The sampling forms provided in the Draft Final document will be corrected to include the analysis. In addition, the March 2018 groundwater sample collections forms will be placed into a separate Appendix from the laboratory data reports to avoid confusion should the data packages be provided electronically only. Section 2.7 presents the laboratory analysis for the baseline sampling event but the March 2018 collection date will be clarified. The following sentences will be revised/added to Section 2.8.1: *On April 4, 2018, the DO and oxidation reduction potential (ORP) were measured in monitoring wells 35AWW11, 35AWW20, and LHSMW07 as part of a field screening event to verify reducing conditions. The field logs for the water quality evaluation following substrate injections are presented in **Appendix E**. No offsite groundwater analysis was completed during this April 2018 field screening event.*					
3	Page 1-1, Third Paragraph	Please add the AECOM, May 2016 reference to the reference page. Also, the Driscoll reference can be removed from references since it is not used anywhere in text.	C	Section 4, References, will be revised to include the AECOM, May 2016 reference as well as remove the Driscoll, F.6., 1986 reference.					
4	Page 2-3 and Table 2-2, Section 2.7, Second Paragraph	Nitrite is not a COC for this site or any other sites, but there are several wells exceeding the MCL at this site. EPA recommends listing the wells in this paragraph that had MCL exceedances for nitrite. Please explain why nitrite would exceed MCLs at this plume? These results were taken before any in-situ injections.	C	Due to revised laboratory data packages, nitrite detections were determined to be false positives. Discussion on nitrite will be removed since no nitrite was detected in the groundwater samples analyzed. The false positive occurred because the carbonate peak eluted right at the retention time of nitrite, causing the analyst to believe that it was the nitrite peak. Since the nitrite standard and sample had					

Responses to Comments on
Draft Remedial Action Completion Report at LHAAP-35A(58), Shops Area
Longhorn Ammunition Plant, Karnack, Texas

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X).
2. Commenter Agrees (A) with response or Does not Agree (D) with response.

Comment #	Section/ Paragraph	Comment (August 12, 2018)	C, D, E or X[1]	Response (August 27, 2018)	A or D[2]	Comment	C, D, E or X[1]	Response	A or D[2]
				similar retention times and were within peak window criteria it raised no red flags. Additionally, no QC issues were encountered during data validation that would infer any chromatography problems arose. Once the peaks were evaluated using zoom mode, the detection of nitrite was determined to be a false positive. Due to this analyst error, the laboratory is requiring analysts to verify any sample that has a hit for nitrite using zoom mode. In addition, the laboratory will verify each nitrite detection via method 353.2 (Colorimetric, Cadmium reduction).					
5		**Figure 2-1:** EPA would recommend using more than 6 wells for developing the groundwater contours in the future. EPA recommends collecting water levels at additional wells for better control on the northern and southern areas as well as the in-between wells.	C	Only baseline monitoring wells were evaluated in the RACR. RA(O) reports will include water levels from additional monitoring wells.					
		END of EPA Comments							

DRAFT FINAL REMEDIAL ACTION COMPLETION REPORT CONTINGENCY REMEDY FOR WESTERN PLUME LHAAP-35A (58), SHOPS AREA, GROUP 4 LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

AUGUST 2018

Prepared For:
U.S. Army Corps of Engineers
Tulsa District
1645 S 101 E Avenue
Tulsa, Oklahoma 74128-4609

Contract No: W9128F-13-D-0012
Delivery Order No: W912BV17F0150

By:

1608 13th Avenue South, Suite 300
Birmingham, Alabama 35205
1-800-806-4001 • www.bhate.com

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TABLE OF CONTENTS

Figures

Tables

Note: Table 1-1 is within the text of the document

Appendices

ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Technical Services, Inc.
ARAR	Applicable or Relevant and Appropriate Requirements
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of concern
DCA	Dichloroethane
DCE	Dichloroethene
DHB	Dehalobacter
DHC	Dehalococcoides
DO	Dissolved oxygen
DoD	Department of Defense
DPT	Direct push technology
EISB	Enhanced in-situ bioremediation
EVO	Emulsified Vegetable Oil
FFA	Federal Facility Agreement
ft	Feet or foot
gpm	Gallons per minute
IDM	Investigation-derived material
Jacobs	Jacobs Engineering Group, Inc.
LHAAP	Longhorn Army Ammunition Plant
LTM	Long-Term Monitoring
LUC	Land Use Control
MCL	Maximum Contaminant Level
µg/L	Micrograms per liter
mg/L	Milligrams per liter
mL	Milliliter
MNA	Monitored Natural Attenuation
MSC	Medium-Specific Concentration
msl	Mean sea level
mV	Millivolts
NCP	National Oil and Hazardous Substances Contingency Plan
NPL	National Priorities List
ORP	Oxidation Reduction Potential
PCE	Tetrachloroethene
PPE	Personal protective equipment
psi	Pounds per square inch
RACR	Remedial Action Completion Report
RAO	Remedial Action Objective
RA(O)	Remedial action-operation
RAWP	Remedial Action Work Plan
ROD	Record of Decision
Shaw	Shaw Environmental, Inc.
SOP	Standard operating procedure
TCA	Trichloroethane
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
TOC	Total Organic Carbon
U.S. Army	U.S. Department of the Army
USEPA	U.S. Environmental Protection Agency
UU/UE	Unrestricted use and unlimited exposure
VC	Vinyl chloride
VOC	Volatile Organic Compound

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1 INTRODUCTION

The former Longhorn Army Ammunition Plant (LHAAP) is an inactive, government-owned, formerly contractor operated and maintained, Department of Defense (DoD) facility located in central east Texas (**Figure 1-1**) in the northeast corner of Harrison County. LHAAP is approximately 14 miles northeast of Marshall, Texas, and approximately 40 miles west of Shreveport, Louisiana. The former United States Department of the Army (U.S. Army) installation occupied 8,416 acres between State Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake. The facility can be accessed via State Highways 43 and 134.

LHAAP was placed on the United States Environmental Protection Agency (USEPA) National Priorities List (NPL) on August 9, 1990. Activities to remediate contamination began in 1990. After its listing on the NPL, the U.S. Army, the USEPA, and the Texas Water Commission (currently known as the Texas Commission on Environmental Quality [TCEQ]) entered into a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120 Federal Facility Agreement (FFA) for remedial activities at LHAAP. The FFA became effective on December 30, 1991. LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property. The majority of LHAAP has been transferred by the U.S. Army to the U.S. Fish and Wildlife Service for management as the Caddo Lake National Wildlife Refuge.

Remedial activities are required under the Record of Decision (ROD) issued for the LHAAP-35A (58) site in September 2010 (U.S. Army Corps of Engineers [USACE], September 2010). The Remedial Action Work Plan (RAWP) for the entire site was prepared in August 2013 (AECOM Technical Services, Inc. [AECOM], August 2013) in accordance with the ROD and was implemented in September 2013. The monitored natural attenuation (MNA) remedy for the western plume at this site, as presented in the ROD, calls for an evaluation of the remedy after 2 years of MNA remedial action-operation (RA(O)) implementation. The ROD also provides for implementation of a contingency remedy to enhance MNA if MNA is found to be ineffective. RA(O) implementation for the site was completed between October 2013 and October 2015 and the 2nd year RA(O) report was finalized in May 2016 (AECOM, May 2016). After 2 years of MNA, the 2nd year RA(O) report concluded that MNA is ineffective and implementation of a contingency remedy was appropriate. The contingency remedy for the western plume at the site is enhanced in-situ bioremediation (EISB). The RAWP was revised to change the substrate from a sodium lactate to an emulsified vegetable oil (EVO) and was approved as a Revised Final RAWP (Bhate Environmental Associates, Inc. [Bhate], January 2018). Therefore, this Remedial Action Completion Report (RACR) presents the EISB implemented for the groundwater plume located on the western side of the site, in accordance with the Revised Final RAWP (Bhate, January 2018).

1.1 Organization of Remedial Action Completion Report

This report is comprised of the following sections:

- Section 1: "Introduction" presents the site background, contingency remedy including the chemicals of concern (COCs) and their respective cleanup levels, the nature and extent of contamination, site geology and hydrogeology, Remedial Action Objectives (RAOs), and the Land Use Control (LUC) Plan.
- Section 2: "Enhanced In-Situ Bioremediation Implementation" describes the injection of amendments to enhance microbial degradation of contaminants and groundwater monitoring associated with EISB in the western plume.
- Section 3: "Remedy Performance Evaluation and Reporting" describes the EISB performance evaluation reporting and five-year reviews to be performed for the contingency remedy.
- Section 4: "References" provides a list of references cited in this document.

Activities specified in this RACR were conducted in accordance with the Installation-Wide Work Plan (AECOM, July 2014) and the Revised Final RAWP (Bhate, January 2018).

1.2 LHAAP-35A (58) Background

The LHAAP-35A (58) site, also known as the Shops Area, is located in the north-central portion of LHAAP and currently covers an area of approximately 11 acres (**Figure 1-2**) (USACE, September 2010). The surface features include asphalt-paved roads, a parking area, and areas that are wooded and overgrown with grasses and other vegetation. The topography is relatively flat with the surface drainage flowing into the tributaries of Goose Prairie Creek, which eventually discharges into Caddo Lake.

The Shops Area, which is now designated as LHAAP-35A (58), was established in 1942 as part of the installation's initial construction (Shaw Environmental Inc. [Shaw], September 2011). The facility was used to provide plant-operated laundry, automotive, woodworking, metalworking, painting, refrigeration, and electrical services. The site was active throughout the LHAAP's mission and was deactivated along with the rest of the installation in 1996-1997. The LHAAP-35A (58) site boundary has changed over the years. Earlier investigations for LHAAP-35A (58) were performed in areas to the south that are no longer included within the site boundary. LHAAP-35A (58) includes the following sites:

- LHAAP-02, vacuum truck overnight parking;
- LHAAP-03, Paint Shop Building 722 (waste collection);
- LHAAP-60D, Former Storage Building 714;
- LHAAP-68, mobile storage tank parking area; and
- LHAAP-69, service station with underground storage tanks.

The following sites were within the historical LHAAP-35A (58) site boundary, but are not within the current site boundary:

- LHAAP-04, former Pilot Wastewater Treatment Plant
- LHAAP-56, vehicle wash rack and oil/water separator Building 744-A
- LHAAP-59, Storage Building 725
- LHAAP-60A, Building 411
- LHAAP-61, Water Treatment Plant
- LHAAP-66, Building 401-A

The following sites are within the LUC boundary for LHAAP-35A (58):

- LHAAP-02, vacuum truck overnight parking;
- LHAAP-03, Paint Shop Building 722 (waste collection);
- LHAAP-56, vehicle wash rack & oil/water separator Building 744-A
- LHAAP-59, Storage Building 725
- LHAAP-60D, Former Storage Building 714;
- LHAAP-65, Former Building 209 (flammable materials storehouse);
- LHAAP-68, mobile storage tank parking area; and
- LHAAP-69, service station with underground storage tanks.

LHAAP-60A, Building 411, which is located within the historical site boundary of LHAAP-35A (58), will be included within the final LUC boundary for LHAAP-04.

Between 1992 and 2015, multiple investigations were conducted in a phased approach to determine the nature and extent of contamination at LHAAP-35A (58). In 2009, a Feasibility Study was completed, which included a natural attenuation evaluation (Shaw, December 2009). These investigations concluded that the Shallow Zone groundwater was impacted with Volatile Organic Compounds (VOCs), however, the soil and former sump areas posed no unacceptable threat to human health or the environment (Shaw, September 2011).

The previous remedy implemented at LHAAP-35A (58) was developed and selected in accordance with the CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP) (40 Code of Federal Regulations Part 300). The selected remedy, finalized in the ROD was developed based on the industrial land use scenario, which is consistent with the anticipated future use as a national wildlife refuge (USACE, September 2010). A deed notice was recorded at the Harrison County Courthouse stating that the site is suitable for non-residential use. A groundwater use restriction was also recorded in the Harrison County Courthouse to ensure that

there is no withdrawal or use of groundwater beneath the site for anything other than environmental monitoring and testing until the cleanup levels are met. A restriction against residential use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow unrestricted use and unlimited exposure (UU/UE). The restriction and notification encompasses the sites within the LUC boundary of LHAAP-35A (58) listed above.

1.3 Contingency Remedy for the Western Plume at LHAAP-35A (58)

The plume for the LHAAP-35A (58) site exists in two separate geographic areas: 1) eastern plume; and 2) western plume. **Figure 1-3** shows monitoring wells installed within the western plume area at the LHAAP-35A (58) site. The contingency remedy of EISB described herein applies to the western plume only.

As discussed in the ROD and in the 2nd Annual Remedial Action Operation Report (AECOM, May 2016), the western groundwater plume at LHAAP-35A (58) is impacted with the following COCs: tetrachloroethene (PCE); trichloroethene (TCE); 1,1-dichloroethene (DCE); cis-1,2-DCE; and vinyl chloride (VC).

The Safe Drinking Water Act Maximum Contaminant Levels (MCLs) will be used as cleanup levels for VOCs in groundwater, as presented in **Table 1-1**.

Table 1-1: Groundwater Cleanup Levels

COC	Concentration (µg/L)	Basis
PCE	5	MCL
TCE	5	MCL
1,1-DCE	7	MCL
cis-1,2-DCE	70	MCL
VC	2	MCL
1,1,2-Trichloroethane [(a)]	5	MCL
1,2-Dichloroethane [(a)]	5	MCL

Notes: µg/L – micrograms per liter
[(a)] Not currently classified as a constituent of concern, but will be included in the list of chemicals for Long-Term Monitoring

In the western plume area, the highest concentrations of COCs have been observed in the Shallow Zone groundwater near monitoring well 35AWW20, which is located in the former vehicle wash rack and oil/water separator Building 744-A area (**Figure 1-3**). This area is also within the primary target area of the western plume, which is located in the western portion of the western plume, near wells 35AWW20, LHSMW07, and 35AWW06. In addition, 1,1-DCE has been detected above its MCL in monitoring wells 35AWW11 and 35AWW19, located on the eastern and southern boundaries of the western plume, respectively. The western plume contingency remedy includes EISB in the area with the highest levels of contamination.

The remedy for the western plume at LHAAP-35A (58) is intended to protect human health and the environment by preventing human exposure to the contaminated groundwater and preventing contaminated groundwater from migrating into nearby surface water. The final western plume remedy consists of LUC, EISB, MNA (ensuing EISB), and Long Term Monitoring (LTM)/Five-year Reviews.

The specific remedy components presented in the Final ROD (USACE, 2010) are discussed below:

- LUC in the impacted area will ensure protection of human health by restricting the use of groundwater to environmental monitoring and testing until cleanup levels are met. The LUC restricting residential use of groundwater will remain in effect until the levels of the COCs in groundwater and soil allow for UU/UE.
- EISB implemented in the western plume area. At LHAAP-35A (58), the highest concentrations of contaminants have been observed in the Shallow Zone groundwater in the vicinity of wells 35AWW20, LHSMW07, and 35AWW06. This area is designated as the western plume primary target area (**Figure 1-3**). EISB was also implemented near monitoring wells 35AWW11, 35AWW14, and near one proposed new monitoring well (35AWW23) location. EISB is the process of removing contaminant mass as a result of microbes utilizing contaminants in the groundwater during respiratory or metabolic activities. The treatment involves injecting amendments which may include microbial cultures, electron donor sources, and nutrients, into the subsurface.
- MNA constitutes a passive remedy that relies on natural biological, chemical, and physical processes that act to reduce the mass and concentrations of groundwater contaminants under favorable conditions. MNA will be implemented to verify that the western VOC plume is stable or shrinking and will not migrate to nearby surface water at levels that pose an unacceptable risk to human health or the environment. Natural attenuation is expected to reduce contaminant concentrations to their respective clean-up levels, and return groundwater to its beneficial use, wherever practicable, after the successful implementation of the EISB. MNA will be evaluated annually, with groundwater monitoring performed on a quarterly basis for 2 years. The groundwater monitoring data will be used to evaluate the effectiveness of EISB in meeting the RAOs and to determine if a second round of injections is necessary. Experience from the eastern plume indicates that one event is sufficient to achieve significant reduction in chlorinated VOCs. After the end of performance monitoring for EISB, the monitoring schedule for the western plume target area will be aligned with the schedule for the rest of the western plume.
- LTM/Five-year Reviews: If MNA is effective (after the 2 years of quarterly sampling), MNA monitoring will be performed at a semi-annual frequency for the following 3 years, then annually until the next Five-Year Review. LTM will continue at least once every 5 years until cleanup levels are achieved. A cleanup time has not been estimated for the western plume and will be evaluated following implementation of EISB.

1.4 Site Geology and Hydrogeology

The surface geology at LHAAP-35A (58) consists predominantly of clay and silty clays, with thin lenses of sand. The sand lenses are approximately 3 to 5 feet thick and the depth of occurrence varies across the site.

The site hydrogeology includes three water-bearing zones identified as the Shallow Zone, Intermediate Zone, and Deep Zone. The Shallow Zone extends to approximately 40 feet (ft) below ground surface (bgs). The lithology of the Shallow Zone is characterized by discontinuous, fine-grained layers of interbedded silt, sand, and clay.

The geology of the Intermediate and Deep Zones consists mostly of clay, with occasional silt and sand layers. The predominance of clay below the Shallow Zone creates a basal aquitard that impedes downward migration of groundwater from the Shallow Zone. Groundwater surface measurements for all three units are available for October 2013. The groundwater elevations for the Shallow Zone ranged from approximately 194 ft to 202 ft above mean sea level (msl). The elevation of the Intermediate Zone potentiometric surface was approximately 178 ft above msl, and the elevation of Deep Zone potentiometric surface was 175.75 ft above msl. The differences in groundwater elevations between the Intermediate and Deep Zones reflect an upward groundwater gradient between these two units.

Hydraulic conductivities in the Shallow Zone wells range from 3.5 x 10-5 to 1.4 x 10-3 centimeters per second (Jacobs Engineering Group, Inc. [Jacobs], January 2002). Using an estimated hydraulic gradient of 0.022 feet per foot and the range of hydraulic conductivities (Jacobs, 2002), the calculated groundwater flow velocity in the Shallow Zone ranges from 2.66 to 114 ft per year.

1.5 Remedial Action Objectives

The final remedy for groundwater at LHAAP-35A (58) will protect human health and meet Applicable or Relevant and Appropriate Requirements (ARARs). The site was determined to pose no significant ecological risks (Shaw, September 2011). The RAOs for LHAAP-35A (58) are consistent with the reasonably anticipated future use of the site as a national wildlife refuge and include:

- Protection of human health by preventing human exposure to the contaminated groundwater.
- Protection of human health and the environment by preventing contaminated groundwater from migrating to nearby surface water.
- Return of groundwater to its potential beneficial use as drinking water, wherever practicable.

1.6 Land Use Control Plan

The U.S. Army or its representatives are responsible for LUC implementation and certification, reporting, and enforcement. The U.S. Army will address any LUC problems within its control that are likely to impact remedy integrity as soon as practicable. The details of LUC components are provided in the RAWP (AECOM, August 2013). The continued successful implementation of LUC is presented in the annual RA(O) reports.

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2 ENHANCED IN-SITU BIOREMEDIATION IMPLEMENTATION

This section discusses the objectives and details implementation of EISB at Site LHAAP-35A (58) western plume only. EISB was performed in the western plume target area in March and April 2018. The purpose of EISB is to accelerate the rate of biological degradation of chlorinated ethenes and ethanes in the Shallow Zone groundwater. This area is characterized by relatively high concentrations of TCE; 1,1-DCE; cis-1,2-DCE; and VC.

In general, the EISB treatment implemented includes injection of a carbon substrate followed by an injection of a microbial consortium, which included dehalococcoides (DHC) and/or dehalobacter (DHB). It is well documented in the literature that DHC and DHB have demonstrated ability to reduce chlorinated ethenes and ethanes, respectively. The role of the carbon substrate is to provide a food source for indigenous and bio-augmented microorganisms. As the carbon substrate is metabolized by the microorganisms, hydrogen gas is produced, which provides available protons required for reductive dechlorination. Competing processes include those that involve other electron acceptors, such as oxygen and sulfate. Reductive dechlorination may be delayed until competing electron acceptors have sufficiently decreased to below competing levels.

During biological reductive dechlorination, the chlorinated ethenes (such as PCE) serve as an electron acceptor and chlorine atoms are sequentially replaced with protons to yield TCE; cis-1,2-DCE; VC; and ethene as daughter products. A common observation is that PCE and TCE are reductively dechlorinated under relatively mild reducing conditions (e.g., sulfate-reducing conditions), whereas reductive dechlorination of cis-1,2-DCE and VC generally require increasingly stronger reducing conditions (e.g. methanogenic conditions).

The following sections present the actions completed to implement the Revised Final RAWP (Bhate, January 2018). These include installation of two additional monitoring wells, baseline groundwater sampling, and EISB injections.

2.1 Substantive Requirements

Compliance with the substantive requirements of the Underground Injection Control Substantive Requirements for Class V Injection Well/Temporary Injection Points, 30 Texas Administrative Code Section 331.10, were met. The requirements described in Table 2-11, Description of ARARs for Selected Remedy requirements (USACE, September 2010), of the ROD were also completed prior to the EISB injections.

2.2 Site/Utility Clearance

Existing utility maps were used to locate subsurface utilities. The proposed locations of monitoring well borings and direct push technology (DPT) injection points were marked,

Underground Service Alert (One Call) was notified at least two working days prior to intrusive work, and the utility clearance standard operating procedures (SOPs) were followed.

2.3 Monitoring Well Installation

Per the Revised Final RAWP (Bhate, January 2018), two monitoring wells were installed on February 20, 2018, within the western portion of the site as shown on **Figure 1-3**. Monitoring well 35AWW23 is located southeast of 35AWW20 and was completed to a depth of 40.1 ft bgs. Monitoring well 35AWW24 is located downgradient of the plume to ensure plume definition and was completed to a depth of 32.1 feet bgs. Due to water not being observed nor saturated soils being encountered during the well installation at 35AWW23, the screen length is 15 feet. The screen length at monitoring well 35AWW24 is 10 feet. Following installation of the monitoring wells, registration was completed with the state of Texas licensed professional well driller. Well construction diagrams for these two new monitoring wells is presented in **Appendix B**.

The monitoring wells were developed on February 26 and 27, 2018, per the SOP. The forms documenting this development are presented in **Appendix B**. These two new monitoring wells were included in the baseline groundwater sampling event and the groundwater contour elevation assessment. Elevated dissolved oxygen (DO) levels were observed during development of these two new monitoring wells due to the surging of the wells. The DO was significantly lower during the baseline groundwater sampling event completed in March 2018, as documented in the groundwater sample collection forms presented in **Appendix C**.

2.4 Site Survey

The two new monitoring wells were surveyed by a licensed land surveyor. The survey activities (for location and elevation) were performed in accordance with the Installation-Wide Work Plan (AECOM, July 2014). The survey report is presented in **Appendix A**.

2.5 Investigation Derived Material

Investigation-derived material (IDM) generated during the investigation and monitoring activities included disposable sampling equipment, purge water, equipment decontamination fluids, drill cuttings, and used personal protective equipment (PPE). Drill cuttings are containerized and stored on-site pending analytical results and waste profiling. Groundwater purged from the monitoring well sampling was taken to the Groundwater Treatment Plant for treatment. Disposable sampling equipment and PPE was disposed of as general refuse. The IDM management, storage, and disposal was performed in accordance with the Installation-Wide Work Plan (AECOM, July 2014).

2.6 Groundwater Elevations and Flow Direction

During to the baseline groundwater sampling event in March 2018, the seven monitoring wells sampled in the western plume were measured for depth to water. The static depth of water varied from 18.97 to 31.03. Table 2-1 presents the groundwater elevation summary. Groundwater surface elevation contours for the Shallow Zone, based on March 2018 groundwater level measurements, are shown on Figure 2-1. Shallow groundwater flow within the western plume appears to be east – southeast.

2.7 Baseline Groundwater Sampling

A baseline groundwater sampling event was completed prior to EISB implementation to establish baseline COC concentrations and geochemical conditions. The sampling was specifically completed on March 7 and 8, 2018. A total of seven monitoring wells were sampled and included 35AWW06, 35AWW11, 35AWW19, 35AWW20, 35AWW23, 35AWW24, and LHSMW07. The baseline Groundwater Sample Collection Forms are presented in **Appendix C**. The data packages containing the analytical results from the offsite laboratory are presented in **Appendix D**. The results are presented in **Table 2-2** and are compared to the associated MCL/Medium-Specific Concentration (MSC). **Figure 2-2** presents the baseline analytical results on the site map. The baseline groundwater sampling results will be compared with monitoring results following substrate emplacement to assess the performance of EISB. The next performance monitoring event is planned for June 2018. Groundwater samples during the baseline event completed in March 2018 were analyzed for VOCs via USEPA Method 8260C by ALS Environmental and for the following biogeochemical parameters: alkalinity, common anions (chloride, sulfate, nitrate, nitrite), sulfide, Total Organic Carbon (TOC), dissolved iron and manganese, total phosphorus, carbon dioxide, dissolved gases (methane, ethane, and ethene), total iron and manganese, ferrous iron, volatile fatty acids, DHC, and DHB.

The baseline groundwater analytical results indicate that all but monitoring wells 35AWW06 and 35AWW24 exceeded the MCL for at least one chlorinated VOC. Monitoring well 35AWW24 was installed in February 2018 with the purpose of defining the extent of the plume. Based upon the initial baseline results, this RAWP goal was achieved.

The primary VOC exceedance was 1,1-DCE which has an MCL of 7 micrograms per liter (µg/L). The maximum detection of 1,1-DCE was in monitoring well 35AWW20 at 2,300 µg/L followed by LHSMW07 at 370 µg/L. For monitoring wells 35AWW11 and 35AWW19, 1,1-DCE was the only analyzed VOC with an exceedance. Monitoring wells 35AWW20, 35AWW23, and LHSMW07 also had exceedances of TCE and vinyl chloride. Monitoring well 35AWW20 was the most impacted and was the only monitoring well sampled that had 1,1,2-trichlorethane (TCA) and benzene detected above the MCL of 5 µg/L.

No anions were detected at levels that exceeded the screening levels in any of the monitoring wells sampled. Also, none of the screening levels for the metals iron and manganese or for the volatile fatty acid, propionic acid, were exceeded.

The bacteria analysis revealed that both DHC and DHB are currently present in the aquifer. At 35AWW20, both DHC and DHB is present with DHB present at 1,120 cells/milliliter (mL) and DHC at 5.5 cells/mL. DHC present in the aquifer during the baseline sampling event varied from non-detect in both monitoring wells 35AWW23 and 35AWW24 to 11.8 cells/mL in LHSMW07. DHB present in the aquifer varied from non-detect in monitoring wells 35AWW11, 35AWW19, 35AWW23, and LHSMW07 to 1,120 cells/mL in 35AWW20.

Only minor quality control issues were encountered in the validation process for this data. Namely, calibration recovery, matrix spike recovery, and field duplicate precision were qualified for being outside control limits and detailed in the Quality Control Summary Report provided in **Appendix F**. Otherwise the data quality objectives have been met for the project and the data are usable for the intended purpose.

2.8 EISB Injections

This section presents the EISB completed in March and April 2018. The remedy was implemented in two separate mobilizations. The first mobilization introduced the substrate to condition the aquifer ahead of bioaugmentation. The second mobilization included the injection of microbe populations of DHC and/or DHB.

The substrate and the bioaugmentation was injected into the subsurface through DPT injection points using a single point injection system. The injection system consisted of a bulk storage tank, mixing equipment, an injection pump, and volume metering and control equipment. The dilute substrate and bioaugmentation was pressure-fed into each injection point using a transfer pump and a portable polyethylene mixing tank.

For both the first and second mobilizations, the substrate solution was injected using a “bottom-up” approach at each proposed injection point at 1-foot intervals to cover the entire Shallow Zone groundwater treatment interval. Under this approach, the drill rods were advanced to the bottom portion of the injection interval. The DPT drill rods were pulled up exposing a stainless steel screen, between 2 and 5 ft in length, which acted as the temporary well screen. Injectate was then pumped down through the DPT drilling rods (acting as a temporary well casing) to the injection interval and injectate was forced through the stainless steel screen into the surrounding formation. The tools were then withdrawn to the next injection depth and the material again pumped through the rods. This cycle was repeated to provide coverage across the entire vertical treatment interval. Injection flow rates ranged from 5 to 10 gallons per minute (gpm) at injection pressures from 20 to 100 pounds per square inch (psi). Injections were conducted at the lowest pressure practical which yields an acceptable flow rate, which was 15 to 20 psi.

2.8.1 Substrate Injections

The substrate used at the LHAAP-58 western plume was SRS®-SD, Small Droplet EVO. An approximate working solution strength of 10 to 20 percent EVO-type substrate volume per volume of water was prepared in the field using a centrifugal pump. Deoxygenated water was used with the substrate to create the appropriate solution strength. The deoxygenated water was developed using sodium sulfite and water from the pump house serving the Groundwater Treatment Plant. The water used with the substrate was verified to have a DO of less than 0.5 milligrams per liter prior to use. The diluted substrate was injected into 36 injection points within the target treatment area as presented on **Figure 2-3** via 1-ft lifts from 30 to 20 ft bgs with a target volume of 24 gallons per foot over the 10 foot interval for a total of 240.96 gallons per point. **Table 2-3** presents the injection volumes by date and location.

Injections of the diluted substrate were completed from March 20, 2018, through March 25, 2018. On April 4, 2018, the DO and oxidation reduction potential (ORP) were measured in monitoring wells 35AWW11, 35AWW20, and LHSMW07 as part of a field screening event to verify reducing conditions. The field logs for the water quality evaluation following substrate injections are presented in **Appendix E**. No offsite groundwater analysis was completed during this April 2018 field screening event. The DO (0.0 mg/L in all three wells) and ORP (from -294 millivolts [mV] in 35AWW20 to -412 mV in LHSMW007) demonstrated reducing aquifer conditions (DO less than 1.0 mg/L and negative ORP) during this evaluation of the aquifer conditions following the conditioning injections. However, the pH was lower than ideal with pH varying from 4.88 to 5.61. This lower pH may inhibit the growth of the microbes but the relatively high alkalinity should provide some buffer over time. Both DHC and DHB were detected in the baseline groundwater samples presented in Section 2.7. Therefore, the natural occurrence of DHC and DHB prior to the implementation of the contingency remedy also supports that this lower pH is not likely a factor for survival of the bacteria.

2.8.2 Bioaugmentation Culture Injections

Based upon the baseline groundwater sampling, KB-1® Plus, a proprietary microbial culture comprised of a mix of DHC (bacteria well known for degradation of PCE/TCE; cis-1,2-DCE; and VC) and DHB (bacteria well known for degradation of TCA and 1,1-dichloroethane [DCA]) was injected in a portion of the plume while KB-1® was injected into the remaining portion of the plume. Only two monitoring wells (35AWW20 and LHSMW07) had 1,1-DCA present in the baseline samples. Therefore, the injection points upgradient of these monitoring wells received the KB-1® Plus specifically. Use of KB-1® Plus reduces the DHC within each canister to allow for the addition of DHB. Since DHB primarily degrades TCA and DCA, the KB-1® Plus was not appropriate for the entire site where PCE, TCE, and associated daughter products are biodegraded via DHC. Therefore, the remaining injection points used KB-1® which uses DHC only in the remaining injection points. The exception to this is that KB-1® Plus was also injected into R4-7 and R4-8 due to additional KB-1® Plus being available following injections in the intended points. **Table 2-3** presents the bioaugmentation by point, and **Figure 2-3** presents the location of the injection

points with the points named to match with **Table 2-3** as well as the locations that received KB-1® versus KB-1® Plus.

Bioaugmentation was completed on April 10-12, 2018, after reducing conditions were established (see field logs in **Appendix E**). The bacteria was injected with deoxygenated water and substrate. Approximately 5 gallons per 1-ft interval was injected over a 30 to 20 ft bgs vertical point. To avoid bacteria kill, KB-1 primer was used to deoxygenate the water used in the bioaugmentation. Sodium sulfite, at high enough levels, can inhibit or kill off the bacteria. KB-1 primer uses sodium sulfite and amino acids to deoxygenate the water as well as reduce the ORP to less than -100 mV.

Bioaugmentation involved injecting the microbial culture (KB-1® and KB-1® Plus) via the direct push points located generally at the same locations where the EISB injections were performed. The injection tubing was advanced into the drive point at the desired injection depth and purged with argon or nitrogen gas to displace oxygen from the column. The culture was then injected into the drive point with the compressed gas.

The microbial culture was injected under pressure in the same target depth intervals as the carbon substrate solution. Small quantities of the carbon substrate solution were injected into the same points during bioaugmentation, so that a sufficient 'food source' was provided to the microbial culture as soon as it entered the subsurface environment.

3 REMEDY PERFORMANCE EVALUATION AND REPORTING

Reporting will consist of formal annual reports, supplemented by distribution of validated data to the U.S. Army as they become available, to shorten the lag time between sampling and provide analytical results to the regulators.

3.1 EISB Performance Monitoring

Performance monitoring will be used to evaluate the effectiveness of the EISB treatment and to determine if additional substrate injections are necessary. The groundwater monitoring data will be used to evaluate the effectiveness of EISB in meeting the RAOs and to determine if a second round of injections is necessary.

Groundwater monitoring will be performed for eight quarterly events following implementation of EISB to demonstrate effectiveness of the EISB remedy. A total of six monitoring wells (35AWW20, LHSMW07, 35AWW06, 35AWW11, 35AWW19, and 35AWW23) are included in the EISB monitoring program for collection and analysis of groundwater samples for VOCs and biogeochemical parameters. These wells were selected for their placement relative to the VOC plumes to monitor the effectiveness of EISB at LHAAP-35A (58). Other monitoring wells included in the semi-annual sampling program for this site will continue to be sampled. The first performance monitoring event is planned for June 2018, which will be presented in the Annual RA(O) Report.

3.2 EISB Evaluation

Technical evaluations of EISB effectiveness will be performed at the end of the first year and the end of the second year. These evaluations will be documented in the Annual RA(O) Reports. The objective of the evaluations is to determine whether the injections in the western plume target area have been effective, or whether a second round of injections is needed to achieve RAOs. If there is a second round of injections, the design for the supplemental injections will be determined by the results of the groundwater sampling during performance monitoring. The Annual RA(O) Reports will be prepared as outlined in the Final Revised RAWP (Bhate, January 2018).

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4 REFERENCES

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FIGURES

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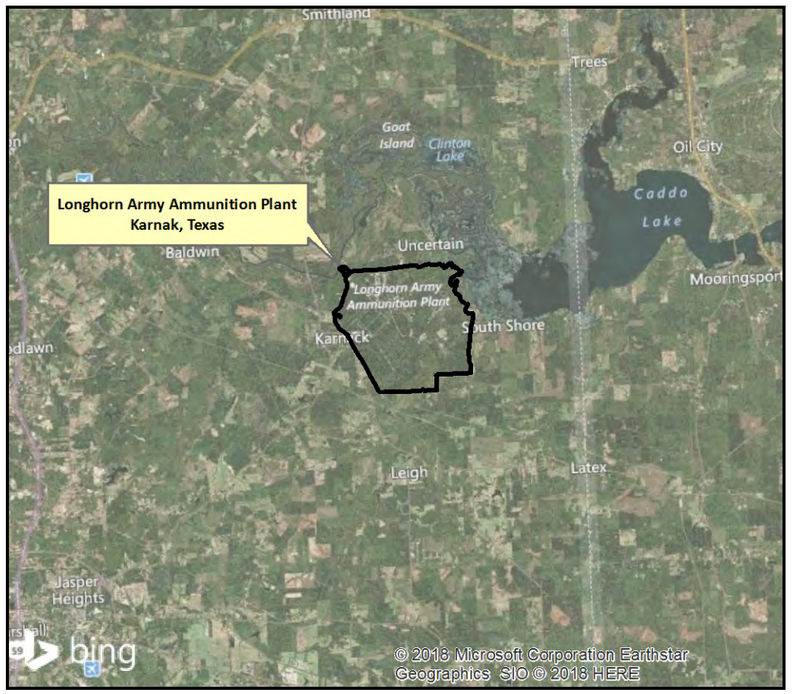

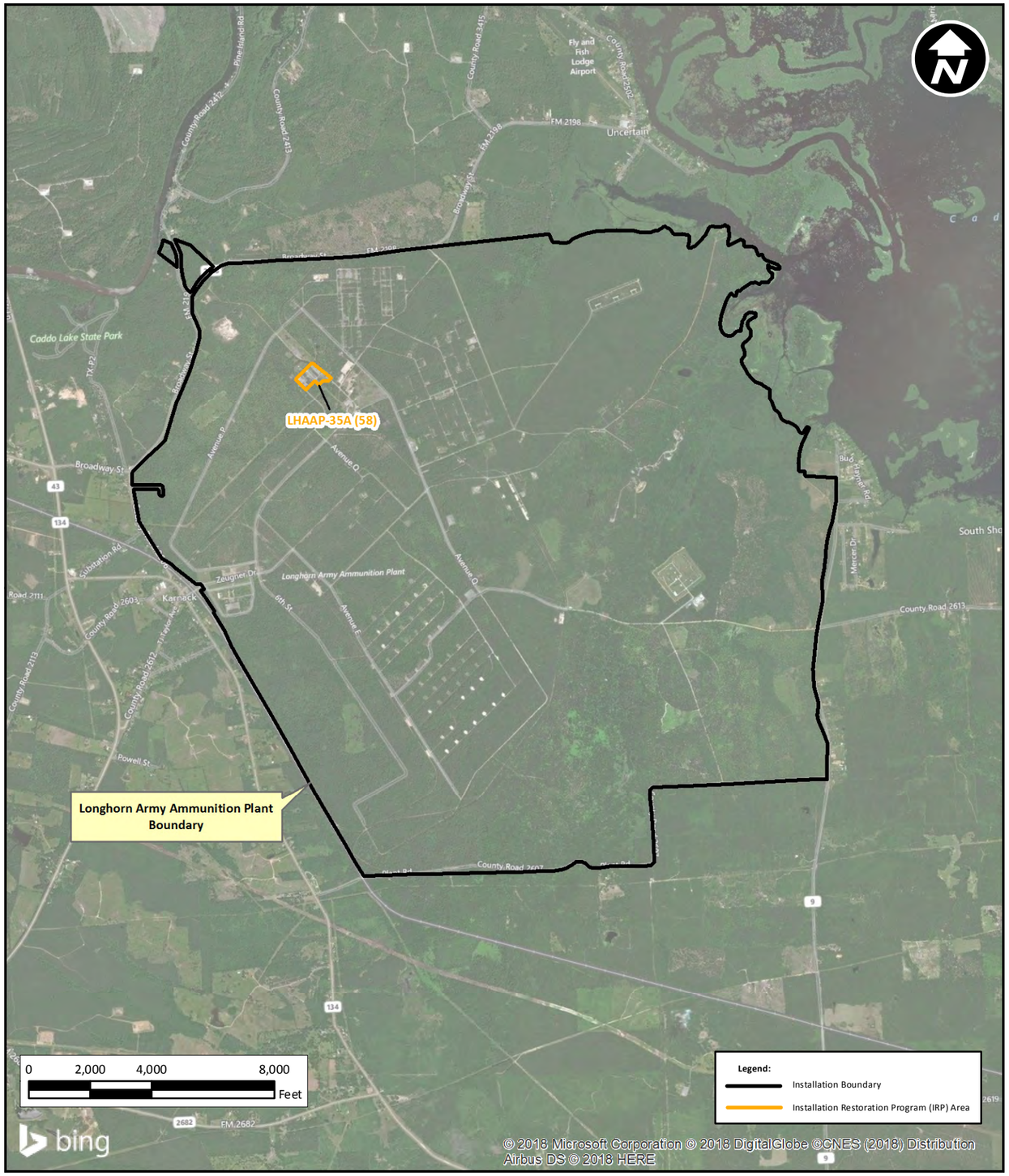

Site Area Map

Figure 1-1

LHAAP-35A (58) Remedial Action Completion Report
Contingency Remedy for Western Plume
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 5/11/2018

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.02

bhate ENVIRONMENT & INFRASTRUCTURE

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LHAAP-35A (58) Site Vicinity Map

Figure 1-2

LHAAP-35A (58) Remedial Action Completion Report
Contingency Remedy for Western Plume
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 5/11/2018

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.02

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Historical LHAAP-35A (58) Site Boundary

LHAAP-02
LHAAP-03
LHAAP-04
LHAAP-05
LHAAP-35A (58)
LHAAP-46
LHAAP-47
LHAAP-49
LHAAP-56
LHAAP-59
LHAAP-60A
LHAAP-60B
LHAAP-60C
LHAAP-60D
LHAAP-61
LHAAP-65
LHAAP-66
LHAAP-68
LHAAP-69

32ND ST.
TACKET DR
HARREL ST
10TH ST.
8TH ST.
5TH ST.
4TH ST.
11TH ST.
60TH ST.
6TH ST.
AVE "F"
AVE "G"
AVE "I"
AVE "H"
AVE "C"
GH-1
Goose Prairie Creek

0 125 250 500 Feet

Legend:
- Installation Restoration Program (IRP) Area
- Stream
- 401 Building Number
- 717 Former Building Location and Number

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

00897617

Location of Performance Monitoring Wells for Western Plume

Figure 1-3

LHAAP-35A (58) Remedial Action Completion Report
Contingency Remedy for Western Plume
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 5/11/2018

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.02

bhate ENVIRONMENT & INFRASTRUCTURE

Legend:

- Indicates Newly Installed Shallow Monitoring Well Location
- Shallow Monitoring Well Location
- Shallow Monitoring Well Location Included in Performance Monitoring
- Shallow Temporary Monitoring Well Location
- Intermediate Monitoring Well Location
- Deep Monitoring Well Location
- Surface Water Sample Location
- Installation Restoration Program (IRP) Area
- Stream
- 717 Former Building Location and Number

0 75 150 300 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

00897618

Shallow Zone Potentiometric Map (March 2018)

Figure 2-1

LHAAP-35A (58) Remedial Action Completion Report
Contingency Remedy for Western Plume
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 8/14/2018

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.02

bhate ENVIRONMENT & INFRASTRUCTURE

32ND ST.
HARRELL ST
TACKET DR
AVE "F"
AVE "G"
8TH ST.
9TH ST.
10TH ST.
11TH ST.
6TH ST.
4TH ST.
LHAAP-35A (58)

35AWW03 (NM)
35AWW13 (NM)
35AWW22 (NM)
35AWW07R (NM)
35AWW15 (NM)
35AWW10 (NM)
35AWW01 (NM)
35AWW02 (NM)
03WW01 (NM)
35AWW09 (NM)
LHSMW04 (NM)
35AWW12 (NM)
LHSMW05 (NM)
35AWW08 (NM)
LHSMW06 (NM)
1004TW001 (NM)
35AWW21 (NM)
35AWW20 (203.36)
35AWW11 (189.12)
1004TW006 (NM)
LHSMW03 (NM)
35AWW16 (NM)
35AWW14 (NM)
35AWW05 (NM)
LHSMW07 (202.30)
35AWW23 (199.92)
35AWW06 (200.48)
35AWW18 (NM)
35AWW17 (NM)
35AWW19 (190.84)
35AWW24 (192.19)
35AWW04 (NM)

203.00
202.00
201.00
200.00
199.00
198.00
197.00
196.00
195.00
194.00
193.00
192.00
191.00
190.00

0 75 150 300 Feet

Legend:

- Shallow Monitoring Well Location
- Shallow Temporary Monitoring Well Location
- Intermediate Monitoring Well Location
- Deep Monitoring Well Location
- (190.84) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- (NM) Not Measured
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Legend
J = Estimated value
U = Result is less than (<) the laboratory detection limit
COC = Chemical of Concern
MCL = Maximum Contaminant Level
DCE = Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride
Bold values are detected results
Red values exceed the MCL
All results and MCLs are reported in micrograms per liter (µg/L)

35AWW20	3/7/2018	
COC	**MCL**	**Result**
1,1-DCE	7	**2,300**
cis-1,2-DCE	70	**76**
PCE	5	<5.0 U
trans-1,2-DCE	100	<5.0 U
TCE	5	**330**
VC	2	**110**

LHSMW07	3/7/2018	
COC	**MCL**	**Result**
1,1-DCE	7	**370**
cis-1,2-DCE	70	**11**
PCE	5	<1.0 U
trans-1,2-DCE	100	<1.0 U
TCE	5	**34**
VC	2	**5**

35AWW06	3/8/2018	
COC	**MCL**	**Result**
1,1-DCE	7	**2.6**
cis-1,2-DCE	70	<1.0 U
PCE	5	<1.0 U
trans-1,2-DCE	100	<1.0 U
TCE	5	<1.0 U
VC	2	<1.0 U

35AWW23	3/8/2018	
COC	**MCL**	**Result**
1,1-DCE	7	**13**
cis-1,2-DCE	70	**21**
PCE	5	<1.0 U
trans-1,2-DCE	100	<1.0 U
TCE	5	**27**
VC	2	**3.1**

35AWW19	3/8/2018	
COC	**MCL**	**Result**
1,1-DCE	7	**9**
cis-1,2-DCE	70	<1.0 U
PCE	5	<1.0 U
trans-1,2-DCE	100	<1.0 U
TCE	5	<1.0 U
VC	2	<1.0 U

35AWW11	3/7/2018	
COC	**MCL**	**Result**
1,1-DCE	7	**10**
cis-1,2-DCE	70	<1.0 U
PCE	5	<1.0 U
trans-1,2-DCE	100	<1.0 U
TCE	5	<1.0 U
VC	2	<1.0 U

35AWW24	3/8/2018	
COC	**MCL**	**Result**
1,1-DCE	7	<1.0 U
cis-1,2-DCE	70	<1.0 U
PCE	5	<1.0 U
trans-1,2-DCE	100	<1.0 U
TCE	5	<1.0 U
VC	2	<1.0 U

0 100 200 400 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend:
Shallow Monitoring Well Location
Installation Restoration Program (IRP) Area
Stream
401 Building Number

Baseline COC Concentrations in Shallow Groundwater (March 2018)

Figure 2-2

LHAAP-35A (58) Remedial Action Completion Report
Contingency Remedy for Western Plume
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM
DATE: 5/11/2018
SCALE: As Shown
PROJECT NO: NWO1312.0150.012.0001.02

bhate ENVIRONMENT & INFRASTRUCTURE

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Completed Injection Locations (March and April 2018)

Figure 2-3

LHAAP-35A (58) Remedial Action Completion Report
Contingency Remedy for Western Plume
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 7/11/2018

SCALE: As Shown

PROJECT NO: NWO1312.0150.012.0001.02

bhate ENVIRONMENT & INFRASTRUCTURE

Legend:
- KB1® Plus Injection Point Locations
- KB1® Injection Point Locations
- Radius of Influence (10-ft Radius)
- Shallow Monitoring Well Location
- Shallow Temporary Monitoring Well Location
- Intermediate Monitoring Well Location
- Deep Monitoring Well Location
- Surface Water Sample Location
- Installation Restoration Program (IRP) Area
- Stream

0 75 150 300 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

TABLES

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Table 2-1
Baseline Groundwater Levels
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
RACR Contingency Remedy for Western Plume

Monitoring Well	Easting	Northing	Aquifer	Date	Screen Intervals (ft from Top of Casing)	TOC Elevation (NAVD 88)	Static Depth to Water (ft BTOC)	Groundwater Elevation (NAVD 88)
35AWW06	3304382.89	6959701.31	Shallow	3/8/2018	19.05 - 29.05	220.43	19.95	200.48
35AWW11	3304950.674	6959996.699	Shallow	3/7/2018	22.24 - 36.84	220.15	31.03	189.12
35AWW19	3304847.027	6959553.806	Shallow	3/7/2018	16.99 - 31.09	219.71	28.87	190.84
35AWW20	3304438.002	6960002.437	Shallow	3/7/2018	20.94 - 35.64	223.05	19.69	203.36
LHSMW07	3304408.12	6959841.17	Shallow	3/7/2018	19.73 - 29.73	221.27	18.97	202.30
35AWW23	3304645.82	6959822.16	Shallow	3/8/2018	25.20 - 40.20	223.07	23.15	199.92
35AWW24	3304912.93	6959464.09	Shallow	3/8/2018	22.10 - 32.10	219.04	26.85	192.19

Notes:
ft - feet
TOC - Top of casing
NAVD - North American Vertical Datum
BTOC - below top of casing

Table 2-2
Baseline Groundwater Sampling Results
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
RACR Contingency Remedy for Western Plume

Location ID: / Sample Date:	Units	MCL/MSC	35AWW06_030818 3/8/18	35AWW06_030818_a 3/8/18	35AWW11-030718 3/7/18	35AWW19_030818 3/8/18	35AWW20-030718 3/7/18	35AWW23_030818 3/8/18	35AWW24_030818 3/8/18	LHSMW07-030718 3/7/18
Location Description			Site 58 - SW, outside the site boundary.		Site 58 - SE, inside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary, between Buildings 716 and 113.	Site 58 -Shallow, new well south of Avenue G in center of Western Plume	Site 58 -Shallow, downgradient new Western Plume well	Site 58 - SW, outside site boundary.
Alkalinity (310.2/SM2320B)										
Alkalinity, Total	mg/L	NV	**666**	**663**	**446**	**159**	**848**	**608**	**66.5**	**757**
Phosphorus (365.3)										
Phosphorus	mg/L	NV	< 0.0250 U	< 0.0250 U	< 0.0250 U	**0.129**	< 0.0250 U	**0.153**	**0.0240 J**	< 0.0250 U
Total Organic Carbon (415.1)										
Total Organic Carbon	mg/L	NV	**1.89**	**2.32**	**5.28**	**2.51**	**14.5**	**3.31**	**1.45**	**6.67**
Metals (6020A)										
Total Iron	mg/L	NV	**0.249**	**0.196 J**	**0.445**	**1.52**	**0.660**	**0.619**	**0.475**	**0.417**
Total Manganese	mg/L	14	**0.236 J**	**0.226**	**0.383**	**0.546**	**1.34**	**0.502**	**0.369**	**0.119**
Dissolved Iron	mg/L	NV	**0.0954 J**	**0.0904 J**	**0.0143 J**	**0.304**	**0.463**	< 0.100 U	**0.0358 J**	**0.0325 J**
Dissolved Manganese	mg/L	14	**0.194**	**0.187**	**0.393**	**0.490**	**1.55**	**0.482**	**0.374**	**0.137**
Volatile Organic Compounds (8260C)										
1,1,1,2-Tetrachloroethane	µg/L	110	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,1-Trichloroethane	µg/L	200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,1,2-Trichloroethane	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**64**	< 1.0 U	< 1.0 U	**3.6**
1,1-Dichloroethane	µg/L	10,000	< 1.0 U	< 1.0	< 1.0 U	< 1.0 U	**310**	**8.1**	< 1.0 U	**51**
1,1-Dichloroethene	µg/L	7	**2.6**	**2.6**	**10**	**9.0**	**2,300**	**13**	< 1.0 U	**370**
1,1-Dichloropropene	µg/L	2.9	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichlorobenzene	µg/L	310	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,3-Trichloropropane	µg/L	0.041	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trichlorobenzene	µg/L	70	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dibromoethane	µg/L	0.05	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichlorobenzene	µg/L	600	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	**9.9**	< 1.0 U	< 1.0 U	< 1.0 U
1,2-Dichloroethane	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	**1.9**	**14**	< 1.0 U	< 1.0 U	**2.0**
1,2-Dichloropropane	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichlorobenzene	µg/L	3,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,3-Dichloropropane	µg/L	29	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
1,4-Dichlorobenzene	µg/L	75	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2,2-Dichloropropane	µg/L	42	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Butanone	µg/L	61,000	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U
2-Chlorotoluene	µg/L	2,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Hexanone	µg/L	6,100	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U
4-Chlorotoluene	µg/L	2,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Isopropyltoluene	µg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Methyl-2-pentanone	µg/L	8,200	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U
Acetone	µg/L	92,000	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U
Benzene	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**5.2**	< 1.0 U	< 1.0 U	**0.63 J**
Bromobenzene	µg/L	2,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromochloromethane	µg/L	4,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromodichloromethane	µg/L	4.6	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U

Table 2-2
Baseline Groundwater Sampling Results
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
RACR Contingency Remedy for Western Plume

Location ID: / Sample Date:	Units	MCL/MSC	35AWW06_030818 3/8/18	35AWW06_030818_a 3/8/18	35AWW11-030718 3/7/18	35AWW19_030818 3/8/18	35AWW20-030718 3/7/18	35AWW23_030818 3/8/18	35AWW24_030818 3/8/18	LHSMW07-030718 3/7/18
Location Description			Site 58 - SW, outside the site boundary.		Site 58 - SE, inside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary, between Buildings 716 and 113.	Site 58 -Shallow, new well south of Avenue G in center of Western Plume	Site 58 -Shallow, downgradient new Western Plume well	Site 58 - SW, outside site boundary.
Bromoform	µg/L	36	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Bromomethane	µg/L	140	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon disulfide	µg/L	10,000	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U
Carbon tetrachloride	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chlorobenzene	µg/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroethane	µg/L	41,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloroform	µg/L	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Chloromethane	µg/L	220	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
cis-1,2-Dichloroethene	µg/L	70	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**76**	**21**	< 1.0 U	**11**
cis-1,3-Dichloropropene	µg/L	5.3	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromochloromethane	µg/L	34	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dibromomethane	µg/L	380	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dichlorodifluoromethane	µg/L	20,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Ethylbenzene	µg/L	700	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Hexachlorobutadiene	µg/L	20	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
m,p-Xylene	µg/L	10,000*	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U
Methylene chloride	µg/L	5	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 UJ	< 10 U	< 2.0 U	< 2.0 U	< 2.0 U
Naphthalene	µg/L	2,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Butylbenzene	µg/L	4,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
n-Propylbenzene	µg/L	4,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
o-Xylene	µg/L	10,000*	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
sec-Butylbenzene	µg/L	4,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Styrene	µg/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
tert-Butylbenzene	µg/L	4,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Tetrachloroethene	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Toluene	µg/L	1,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,2-Dichloroethene	µg/L	100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
trans-1,3-Dichloropropene	µg/L	29	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Trichloroethene	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**330**	**27**	< 1.0 U	**34**
Trichlorofluoromethane	µg/L	31,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Vinyl chloride	mg/L	2	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**110**	**3.1**	< 1.0 U	**5.0**
Volatile Fatty Acids (HPLC-METACIDS)										
Acetic Acid	mg/L	NV	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Butyric Acid	mg/L	NV	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Lactic Acid	mg/L	NV	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Propionic Acid	mg/L	51	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ
Pyruvic Acid	mg/L	NV	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U	< 0.10 U

Table 2-2
Baseline Groundwater Sampling Results
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
RACR Contingency Remedy for Western Plume

Location ID: / Sample Date:	Units	MCL/MSC	35AWW06_030818 3/8/18	35AWW06_030818_a 3/8/18	35AWW11-030718 3/7/18	35AWW19_030818 3/8/18	35AWW20-030718 3/7/18	35AWW23_030818 3/8/18	35AWW24_030818 3/8/18	LHSMW07-030718 3/7/18
Location Description			Site 58 - SW, outside the site boundary.		Site 58 - SE, inside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary, between Buildings 716 and 113.	Site 58 -Shallow, new well south of Avenue G in center of Western Plume	Site 58 -Shallow, downgradient new Western Plume well	Site 58 - SW, outside site boundary.
Anions (9056A)										
Chloride	mg/L	NV	**1,000**	**957**	**2,530**	**1,430**	**1,510**	**487**	**119**	**2,420**
Nitrate	mg/L	10	< 0.0500 U	< 0.0500 U	< 0.0500 U	< 0.0500 U	< 0.0500 U	**1.20**	**0.110**	< 0.0500 U
Nitrite	mg/L	1	**4.12**	**3.56**	**14.6**	**5.58**	**6.90**	**2.29**	**0.213**	**11.7**
Sulfate	mg/L	NV	**1,480**	**1,460**	**1,260**	**1,220**	**1,840**	**761**	**85.7**	**2,700**
Dissolved Gases (RSK-175)										
Carbon Dioxide	µg/L	NV	**500,000 J**	**310,000 J**	**360,000**	**97,000**	**370,000**	**500,000**	**290,000**	**350,000**
Ethane	µg/L	NV	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U
Ethene	µg/L	NV	< 0.55 U	< 0.55 U	**0.38 J**	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U	< 0.55 U
Methane	µg/L	NV	< 1.0 U	< 1.0 U	**16**	< 1.0 U	< 1.3 U	< 1.0 U	< 1.0 U	**3**
Ferrous Iron (SM3500Fe)										
Ferrous Iron	mg/L	NV	**0.08 J**	**0.12 J**	**0.10 J**	**1.10 J**	**0.69 J**	**0.13 J**	**0.33 J**	**0.07 J**
Sulfide (376.1)										
Sulfide	mg/L	NV	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Dechlorinating Bacteria										
BAV1 Vinyl Chloride Reductase	cells/mL	NV	< 0.5 U	< 0.5 U	< 0.5 U	< 1.2 U	< 0.5 U	< 0.5 U	< 2.0 U	< 0.5 U
Dehalobacter spp.	cells/mL	NV	**291**	**218**	< 5.0 U	< 11.9 U	**1,120**	< 4.8 U	**79.9**	< 4.8 U
Dehalococoides	cells/mL	NV	**1.4**	**1.5**	**0.6**	**0.4 J**	**5.5**	< 0.5 U	< 2.0 U	**11.8**
tceA Reductase	cells/mL	NV	**0.1 J**	< 0.5 U	< 0.5 U	< 1.2 U	< 0.5 U	< 0.5 U	< 2.0 U	< 0.5 U
Vinyl Chloride Reductase	cells/mL	NV	< 0.5 U	< 0.5 U	< 0.5 U	< 1.2 U	< 0.5 U	< 0.5 U	< 2.0 U	< 0.5 U

Notes:

Bold values indicate detections

Blue highlighting Indicates concentrations above the MCL/MSC

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentration

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

* - value is for total xylenes

Table 2-3
Injection Volumes by Point
LHAAP-58, Longhorn Army Ammunition Plant, Karnack, Texas
RACR Contingency Remedy for Western Plume

	Depth (20-30 ft bgs) 24 gallons per 1 foot interval				Depth (20-30 ft bgs) 5 gallons per 1 foot interval					
Injection point	Date	EVO (gallons)	Water (gallons)	Total (gallons)	Date	EVO (gallons)	Water (gallons)	Total (gallons)	KB-1 (mL)	KB-1+ (mL)
R1-1	3/20/2018	40.16	200.8	240.96	4/10/2018	7.5	42.5	50	0	200
R1-2	3/20/2018	40.16	200.8	240.96	4/10/2018	7.5	42.5	50	0	200
R1-3	3/21/2018	40.16	200.8	240.96	4/10/2018	7.5	42.5	50	0	200
R1-4	3/21/2018	40.16	200.8	240.96	4/10/2018	7.5	42.5	50	0	200
R2-1	3/21/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R2-2	3/21/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R2-3	3/21/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R2-4	3/21/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R3-1	3/22/2018	40.16	200.8	240.96	4/10/2018	7.5	42.5	50	0	200
R3-2	3/22/2018	40.16	200.8	240.96	4/10/2018	7.5	42.5	50	0	200
R3-3	3/22/2018	40.16	200.8	240.96	4/10/2018	7.5	42.5	50	0	200
R3-4	3/22/2018	40.16	200.8	240.96	4/10/2018	7.5	42.5	50	0	200
R4-1	3/25/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R4-2	3/25/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R4-3	3/25/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R4-4	3/25/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R5-1	3/24/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R5-2	3/24/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R5-3	3/25/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R5-4	3/25/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R4-5	3/22/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R4-6	3/22/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	0
R4-7	3/22/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	430
R4-8	3/22/2018	40.16	200.8	240.96	4/11/2018	7.5	42.5	50	329	400
R4-9	3/24/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R4-10	3/24/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R4-11	3/24/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R4-12	3/24/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R5-5	3/23/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R5-6	3/23/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R5-7	3/23/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R5-8	3/23/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R6-1	3/23/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R6-2	3/23/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	1179	0
R6-3	3/23/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0
R6-4	3/23/2018	40.16	200.8	240.96	4/12/2018	7.5	42.5	50	329	0

Notes: KB-1 and KB-1+ were introduced with approximately 25 gallons of remaining injectant left.
ft bgs - feet below ground surface
EVO - Emulsified Vegetable Oil
mL - Milliliters

APPENDIX A
SURVEY REPORT

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Pathfinder Land Surveying, Inc.
505 East Travis Street, Suite #214
Marshall, Texas 75670
Firm Reg. No.100110-00

Phone: 903.934.9003
Fax: 903.472.4303
www.pathfindersurveying.com

April. 17, 2018

BHATE
Attn: Kim Nemmers

Survey Report

Datum used: (U.S. Feet)
State Plane Coordinate System NAD 83, Texas North Central Zone (4202)
Vertical-NAVD 88

35AWW23 (Top of Casing)
N=6959822.16
E=3304645.82
Elevation=223.07

35AWW24 (Top of Casing)
N=6959464.09
E=3304912.93
Elevation=219.04

The above coordinates/elevations were established by setting a GPS base near the site and running Static Sessions for a combined 11 ½ hours, over 3 days, at different times of the day. Those Static Sessions were then sent to OPUS for post processing, and we then averaged the findings determined over those 3 days to establish a base location/elevation. We then ran level loops from the base to the top of the casing on the above 2 wells to establish elevations and tied them with GPS for horizontal location and for a check on the elevations.

There were two reasons for establishing a new GPS base rather than using the monument BG-1.
The first was that the coordinates given us for the Monument BG-1 were approximately 4 feet away from where we found the monument, and that monument was found to have been disturbed (appeared to have been hit by a mower or other piece of equipment and moved from it's original location).
The second was that the distance from the Monument BG-1 was over 2 miles away from the site of the above two wells.
We did check the elevation (with GPS) of the Monument BG-1 and found it to be only 0.045' different from the given elevation, however, with the 4 foot difference in horizontal location, and the fact that it was not permanently solid (easily moved around), we believed it unwise to use it for control.

We also tied in the concrete pad and natural ground elevations at the above 2 wells, and will provide those elevations if needed.

Feel free to contact me at (903)407-0257 or brandon@pathfindersurveying.com with any questions, etc.

Brandon Clynch, RPLS
TX 5512, LA 4877

APPENDIX B
MONITORING WELL INSTALLATION INFORMATION

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bhate ENVIRONMENT INFRASTRUCTURE

BORING NUMBER 35AWW23

CLIENT AFCEC
PROJECT NAME Longhorn Army Ammunition Plant
PROJECT NUMBER NWO1312.0150.012.0001.02
PROJECT LOCATION 15600 FM 134 Karnack, Texas 75661
DATE STARTED 2/20/18 **COMPLETED** 2/20/18
GROUND ELEVATION _____ **HOLE SIZE** 6
DRILLING CONTRACTOR Walker Hill
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe - Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY J. Cook
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)
0						
		100	CL-ML		Dark brown silty clay. Moist. 7.5 YR 2.5/2	0.6
					4.0	
5		100	CL-ML		Light brown silty clay. Clay 7' dense low plasticity. Dry 7.5 YR 4/4	0.2
		100				0.1
					8.0	
		100	CL		Dark red/brown clay. Dense low plasticity. Dry. 7.5 YR 2.5/3	0.1
10		100				0.3
					12.0	
		100	CL		Grey/brown clay. Medium plasticity. Dry. 7.5 YR 3/1	1.5
15		100				2.4
					16.0	
		100	CL-ML		Dark red/brown silty clay. Dry. 7.5 YR 2/3	5.0
					18.0	
		100	CL-ML		Light brown/grey silty clay. Medium plasticity. Dry. 7.5 YR 6/1	5.3
20					20.0	
		100	CL-ML		Light brown silty clay. Medium plasticity. Dry. 7.5 YR 5/6	0.8
		100				3.2
					24.0	
25		100	CL		Grey clay. Low plasticity. Dry. 7.5 YR 5/1	2.3
		100				4.1
					27.5	
			ML		28.0 Dark grey silt. Dense low plasticity. Dry. 7.5 YR 3/1	
30		100	CL-ML		Dark grey dense silty clay. Medium plasticity. Dry. 7.5 YR 3/1	8.7
		100				8.9
		100				5.3
					34.0	
35			CL-		Light grey silty clay. Medium plasticity. Dry. 7.5 YR 5/1	

(Continued Next Page)

bhate ENVIRONMENT INFRASTRUCTURE

BORING NUMBER 35AWW23

CLIENT AFCEC **PROJECT NAME** Longhorn Army Ammunition Plant

PROJECT NUMBER NWO1312.0150.012.0001.02 **PROJECT LOCATION** 15600 FM 134 Karnack, Texas 75661

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)
35		100	ML		Light grey silty clay. *(continued)*	5.4
		100	CL-ML			2.4
		100				2.2
40					40.0 Bottom of hole at 40.1 feet.	

bhate ENVIRONMENT INFRASTRUCTURE

BORING NUMBER 35AWW24

CLIENT AFCEC
PROJECT NAME Longhorn Army Ammunition Plant
PROJECT NUMBER NWO1312.0150.012.0001.02
PROJECT LOCATION 15600 FM 134 Karnack, Texas 75661
DATE STARTED 2/20/18 **COMPLETED** 2/20/18
GROUND ELEVATION _____ **HOLE SIZE** 6
DRILLING CONTRACTOR Walker Hill
GROUND WATER LEVELS:
DRILLING METHOD Geoprobe - Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY J. Cook
AT END OF DRILLING ---
NOTES
AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	RECOVERY %	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	PID (ppm)
0		100	CL-ML		Dark brown silty clay/ organics. High plasticity. Wet. 7.5 YR 2.5/2	0
					2.0	
		100	CL		Light brown high plasticity clay. High plasticity. Moist. 7.5 YR 4/4	0
					4.0	
5		100	CL		Grey/red brown clay. Medium plasticity. Dry. 7.5 YR 4/1	0
					6.0	
		100	CL-ML		Light grey silty clay. Low plasticity. Dry. 7.5 YR 5/1	0
		100				0
10					10.0	
		100	CL		Light grey/brown silty clay. Dry. 7.5 YR 6/1	0
		100				0
					14.0	
15		100	CL-ML		Light brown silty clay. Medium plasticity. Dry. 7.5 YR 5/6	0
		100				0
		100				0
20					20.0	
		100			Light brown sandy clay. Dry. 7.5 YR 5/6	0
					22.0	
		100	CL-ML		Brown high plasticity silty clay. High plasticity. Moist. 7.5 YR 4/3	0
					24.0	
25		100	CL-ML		Light brown silty clay. High plasticity. Wet at 26'. 7.5 YR 4/4	0
					26.0	
		100	CL-ML		Light grey/brown silty clay. High plasticity. Wet. 7.5 YR 5/1	0
		100				0
30						
		100				0
					32.0	
					Bottom of hole at 32.1 feet.	

00897637

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: 58		LocID: 35AWW24		Date: 2/26/18
	Project Name: Longhorn Army Ammunition Plant		Project #: NW01312.0150		Recorded By: BASSINGER Checked By:
EQUIPMENT	Water Quality Meter Type/ID #: U-52 HORIBA			Water Level Indicator Type/ID #: Solinst 101	
	Equipment Group: NA			Equpment Group: NA	
	Development Equipment: SURGE Block & MONSOON Pump			Equipment Decon.: LIQUINOX & DI WATER	
WELL INFO	Casing I.D. (in) [a]: 2"		Unit Casing Volume (gal/lin ft) [b]: 7.89		Initial Depth to Water (ft) [c]: 27.11
	Total Well Depth (ft) [d]: 35.00		Water Column Thickness (ft) [d-c]:		Well Volume (gal) {[d-c] x b}: 1.26
	Ground Condition of Well:			Remarks:	

CASING INFO											
Casing I.D. (in) [a]:	1.5	**2.0**	2.2	3.0	**4.0**	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (gal/lin ft) [b]:	0.09	**0.16**	0.20	0.37	**0.65**	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conduc-tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Radiation ( )	Remarks (odor, clarity, etc.)
2/26/18	1400	Pump	31.60	5	.5	22.28	7.53	0.511	11.53	1000+	184		
2/26/18	1415	Pump	32.60	7.5	.5	23.70	7.02	0.468	10.58	1000+	191		
2/26/18	1430	Pump	33.77	7.5	.5	23.51	6.91	0.395	10.46	1000+	199		
2/27/18	0830	Pump	31.70	7.5	.5	16.28	6.85	0.524	10.12	1000+	224		
2/27/18	0840	Pump	32.50	5	.5	18.30	6.80	0.577	10.05	777	229		
2/27/18	0850	Pump	33.00	5	.5	18.80	6.72	0.585	10.00	403	230		
2/27/18	0900	Pump	33.71	5	.5	18.98	6.70	0.600	9.85	200	235		
2/27/18	0905	Pump	34.45	5	.5	19.05	6.65	0.608	9.80	107	239		
2/27/18	1330	Pump	27.12	5	.5	19.31	6.61	0.612	9.71	66.7	243		
2/27/18	1340	Pump	29.15	5	.5	19.40	6.57	0.617	9.65	29.3	248		
2/27/18	1350	Pump	30.40	5	.5	19.50	6.55	0.620	9.60	12.1	251		
2/27/18	1400	Pump	30.89	5	.5	19.61	6.52	0.623	9.54	8.6	253		

Development Criteria: **1)** sediment <0.75 mL/L, **2)** turbidity within 10 NTU range for 30 minutes, **3)** +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, **AND**
4) remove water added during drilling and construction

00897638

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: 58	LocID: 35AWW23	Date: 2/27/18
	Project Name: Longhorn Army Ammunition Plant	Project #: NW01312.0150	Recorded By: Bresinger Checked By:
EQUIPMENT	Water Quality Meter Type/ID #: U-52 HORIBA	Water Level Indicator Type/ID #: Solinist 101	
	Equipment Group: NA	Equpment Group: NA	
	Development Equipment: Surge Block & 3 monsoon Pump	Equipment Decon.: Liquinox 3 DI WATER	
WELL INFO	Casing I.D. (in) [a]:	Unit Casing Volume (gal/lin ft) [b]: 20.45	Initial Depth to Water (ft) [c]: 23.26
	Total Well Depth (ft) [d]: 43.71	Water Column Thickness (ft) [d-c]:	Well Volume (gal) {[d-c] x b}: 3.27
	Ground Condition of Well:	Remarks:	

CASING INFO											
Casing I.D. (in) [a]:	1.5	**2.0**	2.2	3.0	**4.0**	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (gal/lin ft) [b]:	0.09	**0.16**	0.20	0.37	**0.65**	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conduc-tivity (mS/cm)	DO (mg/L)	Turb. (NTU)	ORP (mv)	Radiation ( )	Remarks (odor, clarity, etc.)
2/27/18	1025	Pump	30.55	5	.5	19.81	7.28	4.72	10.31	1000+	199		
2/27/18	1035	Pump	34.05	5	.5	20.28	7.62	4.24	10.12	1000+	192		
2/27/18	1045	Pump	38.25	5	.5	19.91	7.76	5.46	10.05	1000+	196		
2/27/18	1055	Pump	39.00	5	.5	20.21	7.70	5.55	9.87	603	199		
2/27/18	1105	Pump	42.30	5	.5	20.35	7.69	5.61	9.71	381	202		
2/27/18	1215	Pump	36.11	5	.5	20.40	7.65	5.70	9.65	177	207		
2/27/18	1225	Pump	36.92	5	.5	20.55	7.70	5.73	9.60	83.1	209		
2/27/18	1235	Pump	37.51	5	.5	20.71	7.72	5.80	9.47	44.5	212		
2/27/18	1245	Pump	37.90	5	.5	20.79	7.69	5.83	9.40	18.1	215		
2/27/18	1255	Pump	38.12	5	.5	20.83	7.61	5.87	9.31	10.2	217		
2/27/18	1305	Pump	38.40	5	.5	20.77	7.59	5.90	9.25	9.6	218		
2/27/18	1315	Pump	38.63	5	.5	20.80	7.57	5.95	9.20	8.5	219		

Development Criteria: **1)** sediment <0.75 mL/L, **2)** turbidity within 10 NTU range for 30 minutes, **3)** +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, **AND** **4)** remove water added during drilling and construction

STATE OF TEXAS WELL REPORT for Tracking #472957

Owner:	**USACE**	Owner Well #:	**35AWW23**
Address:	**1645 S. 101st. East Ave. Tulsa, OK 74128**	Grid #:	**35-23-6**
Well Location:	**15600 FM 134 Karnack, TX 75661**	Latitude:	**32° 41' 06.21" N**
		Longitude:	**094° 09' 20.84" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **2/19/2018** Drilling End Date: **2/23/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**8**	**0**	**40**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**23**	**40**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**20**	**Cement 7 Bags/Sacks**
	20	**23**	**Bentonite 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **No Data**

Water Level: **23.6 ft.** below land surface on **2018-02-23** Measurement Method: **Electric Line**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Walker-Hill Environmental, Inc.**

PO 1147
Foxworth, MS 39483

Driller Name: **Gary P Hill** License Number: **58141**

Apprentice Name: **Eric Meitzler**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**8**	**CL-ML, Dark Brown, Silty Clay**
8	**14**	**CL, Dark Red/Brown, Clay**
14	**16**	**CL, Grey/Brown, Clay**
16	**22**	**CL-ML, Light Brown/Grey, Silty Clay**
22	**24**	**CL-ML, Light Brown, Silty Clay**
24	**27**	**CL, Grey, CLay**
27	**30**	**ML, Dark Grey, Silt**
30	**36**	**CL-ML, Dark Grey, Dense silty Clay**
36	**38**	**CL-ML, Light Grey, Silty Clay**
38	**40**	**CL-ML, Light Grey Silty CLay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**25**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**25**	**40**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #472959

Owner:	**USACE**	Owner Well #:	**35AWW24**
Address:	**1645 S. 101st. East Ave. Tulsa, OK 74128**	Grid #:	**35-23-6**
Well Location:	**15600 FM 134 Karnack, TX 75661**	Latitude:	**32° 41' 02.9" N**
		Longitude:	**094° 09' 18.16" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **2/19/2018** Drilling End Date: **2/23/2018**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**8**	**0**	**32**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**20**	**32**	**Sand**	**20/40**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**15**	**Cement 5 Bags/Sacks**
	15	**20**	**Bentonite 0 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **26.98 ft.** below land surface on **2018-02-23** Measurement Method: **Electric Line**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Walker-Hill Environmental, Inc.**

PO 1147
Foxworth, MS 39483

Driller Name: **Gary P Hill** License Number: **58141**

Apprentice Name: **Eric Meitzler**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**2**	**CL-ML, Dark Brown, Silty Clay**
2	**4**	**CL, Light brown, high plasticity clay**
4	**8**	**CL grey,reddish brown, Clay**
8	**12**	**CL-ML, Light grey, silty clay**
12	**18**	**CL-ML, Light grewy/brown, silty clay**
18	**20**	**CL-ML, Light Brown, Silty Clay**
20	**22**	**CLS, Light Brown, Sandy Clay**
22	**24**	**CL-ML, Brown, High plasticity, Silty clay**
24	**28**	**CL-ML, Light Brown, silty clay**
28	**32**	**CL-ML, Light Grey/Brown, Silty Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**22**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**22**	**32**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

APPENDIX C
GROUNDWATER SAMPLE COLLECTION FORMS

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GROUNDWATER SAMPLE COLLECTION FORM

Page _____ of _____

LOCATION	Site: LHAAP - 58	Location ID: 35AMW11	Date: 3/7/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba / 21354	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.16	Initial Depth to Water (ft) (B): 31.17
	Total Well Depth (ft) (C): 38.08	Water Column Thickness (ft) (C-B): 6.91	Well Volume (gal) (A*(C-B)): 1.11
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal):
	Weather: CLEAR | COLD	Well Condition: GOOD	Comments: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/7/18	1155	31.24	.13	100	17.21	6.16	9.58	1.43	220	196	
	1200	31.30	.26	100	17.89	5.91	9.64	1.01	207	210	
	1205	31.34	.39	100	18.25	5.92	9.60	0.89	116	213	
	1210	31.37	.52	100	18.28	5.93	9.50	0.61	92.0	212	
	1215	31.39	.65	100	18.32	5.93	9.50	0.60	91.7	211	
	1220	31.40	.78	100	18.35	5.94	9.49	0.60	91.3	211	
	1225	31.41	.91	100	18.37	5.94	9.49	0.59	90.8	211	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type		Preserv.	Filter (Y/N)	Method	Parameter(s)
~~1~~	~~125 ml~~ ~~Perc~~	→			
	250 ml Phosphorus	H_2SO_4		365.3	
	250 ml Ferrous	HCl		SM 3500	
	250 ml Anions / Alk	—		9056A / 2320B	
	40 ml VOA TOC	H_2SO_4		415.1	
	40 ml VOA VOCs	HCl		8260	
	40 ml VFAs	—		Organic Acids	
Sample ID: 35MWW11-030718			Sample Time: 1225		

40 ml Dissolved gases HCl RSK-175
500 ml Sulfide NaOH/Zn Ac 376.1
60 ml Metals HNO_3 6020
1 L DHB / DHC — CENSUS

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHSMW07	Date: 3/7/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba / 21354	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 4" PVC	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 19.13
	Total Well Depth (ft) (C): 30.46	Water Column Thickness (ft) (C-B): 11.33	Well Volume (gal) (A*(C-B)): 7.39
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal):
	Weather: CLEAR / COLD	Well Condition: GOOD	Comments: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/7/18	1040	19.20	.13	100	17.08	7.16	11.1	1.77	20.1	139	
	1045	19.25	.26	100	18.44	6.38	11.8	1.12	8.6	156	
	1050	19.30	.39	100	17.98	6.16	12.4	0.91	7.3	174	
	1055	19.32	.52	100	18.12	6.11	12.2	0.67	7.0	179	
	1100	19.34	.65	100	18.19	6.10	12.1	0.66	6.5	179	
	1105	19.35	.78	100	18.23	6.10	12.1	0.66	5.8	180	
	1110	19.35	.91	100	18.28	6.10	12.1	0.65	5.1	180	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type		**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
~~125 ml~~	~~Perc~~				
250 ml	Phos	H_2SO_4			
250 ml	Ferros	HCL			
250 ml	Anions / Alk	—			
40 ml VOA	TOC	H_2SO_4			
40 ml VOA	VOCs	HCL			
40 ml	~~VFAs~~	—			
Sample ID: LHSMW07-030718		Sample Time: 1110			

40 ml Diss Gases HCL
500 ml Sulfide NaOH / Zn Ac
100 ml Metals HNO_3
1 L DHB IDHC —

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW20	Date: 3/7/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba / 21354	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 2"	Unit Casing Volume (gal/lin ft) (A): 0.16	Initial Depth to Water (ft) (B): 20.15
	Total Well Depth (ft) (C): 36.20	Water Column Thickness (ft) (C-B): 16.05	Well Volume (gal) (A*(C-B)): 2.57
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal):
	Weather: CLEAR / COLD	Well Condition:	Comments: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/7/18	0930	20.22	.13	100	17.58	6.60	8.54	1.63	86.4	105	
	0935	20.27	.26	100	18.86	6.37	8.24	1.13	82.3	98	
	0940	20.31	.39	100	19.42	6.21	8.10	0.88	79.3	100	
	0945	20.33	.52	100	19.40	6.18	7.98	0.63	23.0	104	
	0950	20.34	.65	100	19.37	6.17	7.98	0.61	22.5	105	
	0955	20.35	.78	100	19.35	6.17	7.97	0.60	21.9	105	
	1000	20.35	.84	100	19.32	6.16	7.97	0.60	21.3	106	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type		Preserv.	Filter (Y/N)	Method	Parameter(s)
~~105 ml~~	~~PETC~~	—			
250	PNOs	H_2SO_4			
250	TEPHOS FE	HCL			
250	ANIONS / AIL	—			
40 ml VOA	TOC	H_2SO_4			
40 ml VOA	VOCs	HCL			
40 ml	VFAs	—			

Sample ID: 35AWW20_030718 — Sample Time: 1000

40 ml Diss Gases HCL
500 ml Sulfide NaOH / ZnAc
60 ml Metals HNO_3
1 L DH B / DHC —

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GROUNDWATER SAMPLE COLLECTION FORM

Page _____ of _____

LOCATION	Site: LHAAP - 58	Location ID: 35AWW19	Date: 3/7/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba / 21354	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.16	Initial Depth to Water (ft) (B): 27.81
	Total Well Depth (ft) (C): 32.53	Water Column Thickness (ft) (C-B): 4.72	Well Volume (gal) (A*(C-B)): 0.76
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal):
	Weather: CLEAR / COOL	Well Condition: GOOD	Comments: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/7/18	1255	27.81	NA	NA							BAILING WELL
3/7/18	1300	32.39	2.25	NA							WELL RAN DRY
3/8/18	0815	27.81	NA	NA	16.76	5.28	10.08	NA	26.4	NA	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	Stabilization Criteria			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
	250 ml	Phos	H_2SO_4			
	250 "	Ferrous Fe	HCL			
	250 "	Anions/Alk	—			
	40ml VOA	TOC	H_2SO_4			
	40ml VOA	VOC	HCL			
	40 ml	VFAs	—			
	40 ml	Dissolved Gases	HCL			
Sample ID: 35AWW19_030818				Sample Time: 0815		

500ml	Sulfide	NaOH/ZnAc
60ml	Metals	HNO_3
1L	DHB/Alk	—

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GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35A WW06	Date: 3/8/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba / 21354	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 20.05
	Total Well Depth (ft) (C): 30.36	Water Column Thickness (ft) (C-B): 10.31	Well Volume (gal) (A*(C-B)): 6.72
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: CLEAR / COLD	Well Condition: GOOD	Comments: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/8/18	0900	20.11	.13	100	14.50	6.11	6.25	1.33	20.4	132	
	0905	20.15	.26	100	15.84	5.87	6.05	0.87	15.2	122	
	0910	20.20	.59	100	17.29	5.70	6.02	0.41	8.7	130	
	0915	20.22	.52	100	17.75	5.69	5.92	0.28	6.3	135	
	0920	20.23	.65	100	17.83	5.68	5.91	0.27	5.5	135	
	0925	20.24	.78	100	17.87	5.67	5.91	0.26	4.9	136	
	0930	20.25	.91	100	17.91	5.67	5.91	0.26	4.4	136	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
	250	Total Phos	H_2SO_4			
	250	Ferrous Fe	HCl			
	250	Anions / Alk	—			
	40 ml VOA	TDC	H_2SO_4			
	40 ml VOA	VOC	HCl			
	40 ml	VFAs	—			
	40 ml	Diss Gases	HCl			

Sample ID: 35A WW06-030818

Sample Time: 0930

500 ml Sulfide NaOH/ZnAc
60 ml Metals HNO_3
1L DHB/DRC —

00897652

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW23	Date: 3/8/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba / 21354	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.16	Initial Depth to Water (ft) (B): 23.15
	Total Well Depth (ft) (C): 43.71	Water Column Thickness (ft) (C-B): 20.56	Well Volume (gal) (A*(C-B)): 3.29
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: CLEAR / COOL	Well Condition: GOOD	Comments: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/8/18	1030	23.20	.13	100	18.10	6.39	3.65	1.35	102	139	
	1035	23.25	.26	100	18.35	5.92	3.64	1.00	105	168	
	1040	23.30	.39	100	18.48	5.87	3.61	0.85	95.3	180	
	1045	23.33	.52	100	18.52	5.90	3.59	0.78	91.5	183	
	1050	23.35	.65	100	18.57	5.91	3.58	0.77	90.3	184	
	1055	23.36	.78	100	18.60	5.92	3.58	0.77	89.9	185	
	1100	23.37	.91	100	18.63	5.92	3.58	0.76	89.5	185	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
	250 ml	Phos	H_2SO_4			
	250	Ferrous	HCL			
	250	Anions / Alk	—			
	40ml VOA	TOC	H_2SO_4			
	40 ml VOA	VOC	HCL			
	40 ml	VFAs	—			
	40 ml	Dissolved Gases	HCL			
	500 ml	Sulfide	NaOH / Zn Ac			
	60 ml	Metals	HNO_3			
	1 L	DHB / DHC	—			

Sample ID: 35AWW23-030818 Sample Time: 1100

00897653

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35AWW24	Date: 3/8/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Scott Beesinger
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba / 21354	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): PVC 2"	Unit Casing Volume (gal/lin ft) (A): 0.16	Initial Depth to Water (ft) (B): 26.85
	Total Well Depth (ft) (C): 35.00	Water Column Thickness (ft) (C-B): 8.15	Well Volume (gal) (A*(C-B)): 1.30
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Clear / Cool	Well Condition: Good	Comments: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
3/8/18	1140	26.81	.13	100	18.34	5.96	0.549	1.44	203	180	
	1145	26.96	.26	100	19.37	5.39	0.491	0.93	154	217	
	1150	27.01	.39	100	19.52	5.31	0.490	0.75	115	225	
	1155	27.05	.52	100	19.67	5.31	0.488	0.67	101	225	
	1200	27.08	.65	100	19.75	5.31	0.487	0.67	100	225	
	1205	27.10	.78	100	19.80	5.31	0.487	0.66	100	224	
	1210	27.12	.91	100	19.84	5.31	0.487	0.66	99.5	224	

Colorimeter Results

Time	Analyte	Dilution	Result	Units

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
	250ml	Phos	H_2SO_4			
	250	Ferrous	HCl			
	250	Anions / Alk	–			
	40ml VOA	TOC	H_2SO_4			
	40 ml VOA	VOC	HCl			
	40 ml	VFAs	–			
	40 ml	Dissolved	HCl			
	500ml	Sulfide	NaOH / Zn Ac			
	60 ml	Metals	HNO_3			
	1L	DRO/GRO	–			

Sample ID: 35AWW24-030818 Sample Time: 1210

APPENDIX D
BASELINE GROUNDWATER SAMPLING ANALYTICAL RESULTS

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10450 Stancliff Rd. Suite 210
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March 30, 2018

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS18030365**

Laboratory Results for: **LHAAP-58**

Dear Marcia,

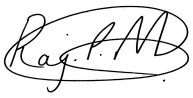
ALS Environmental received 4 sample(s) on Mar 08, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18030365

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18030365-01	35AWW20-030718	Groundwater		07-Mar-2018 10:00	08-Mar-2018 09:30	☐
HS18030365-02	LHSMW07-030718	Groundwater		07-Mar-2018 11:10	08-Mar-2018 09:30	☐
HS18030365-03	35AWW11-030718	Groundwater		07-Mar-2018 12:25	08-Mar-2018 09:30	☐
HS18030365-04	Trip Blank	Water	ALS-021518-87	07-Mar-2018 00:01	08-Mar-2018 09:30	☐

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP-58
Work Order: HS18030365

Work Order Comments

- The analyses for RSK-175 Dissolved Gases and CO2 were subcontracted to ALS Environmental in Simi Valley, CA. Final Report attached.

- The analyses for Ferrous Iron and Volatile Fatty Acids were subcontracted to ALS Environmental in Rochester, NY. Final Report attached.

- The analyses for DHC/DHB were subcontracted to Microbial Insights in Knoxville, TN. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R312577

Sample ID: HS18030510-01MS

- MS and MSD are for an unrelated sample

Metals by Method SW6020

Batch ID: 126134

Sample ID: 35AWW20-030718 (HS18030365-01MS)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Manganese.

Batch ID: 126131

Sample ID: HS18030472-02MSD

- MSD is for an unrelated sample

WetChemistry by Method E415.1

Batch ID: R312878

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R312306

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E376.1

Batch ID: R312697

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM2320B

Batch ID: R312233

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: 126467

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18030365

CASE NARRATIVE

WetChemistry by Method E365.3

Batch ID: 126467

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20-030718
Collection Date: 07-Mar-2018 10:00

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,1,1-Trichloroethane	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,1,2,2-Tetrachloroethane	2.5	U	2.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,1,2-Trichloroethane	**64**		**1.5**	**2.5**	**5.0**	**ug/L**	5	15-Mar-2018 16:56
1,1-Dichloroethane	**310**		**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Mar-2018 16:56
1,1-Dichloroethene	**2,300**		**10**	**25**	**50**	**ug/L**	50	15-Mar-2018 17:23
1,1-Dichloropropene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,2,3-Trichlorobenzene	2.5	U	2.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,2,3-Trichloropropane	2.5	U	2.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,2,4-Trichlorobenzene	2.5	U	2.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,2,4-Trimethylbenzene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,2-Dibromo-3-chloropropane	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,2-Dibromoethane	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,2-Dichlorobenzene	**9.9**		**2.5**	**2.5**	**5.0**	**ug/L**	5	15-Mar-2018 16:56
1,2-Dichloroethane	**14**		**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Mar-2018 16:56
1,2-Dichloropropane	2.5	U	2.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,3,5-Trimethylbenzene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,3-Dichlorobenzene	2.5	U	2.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,3-Dichloropropane	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
1,4-Dichlorobenzene	2.5	U	2.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
2,2-Dichloropropane	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
2-Butanone	5.0	U	2.5	5.0	10	ug/L	5	15-Mar-2018 16:56
2-Chlorotoluene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
2-Hexanone	5.0	U	5.0	5.0	10	ug/L	5	15-Mar-2018 16:56
4-Chlorotoluene	2.5	U	2.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
4-Isopropyltoluene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
4-Methyl-2-pentanone	5.0	U	3.5	5.0	10	ug/L	5	15-Mar-2018 16:56
Acetone	5.0	U	2.0	5.0	10	ug/L	5	15-Mar-2018 16:56
Benzene	**5.2**		**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Mar-2018 16:56
Bromobenzene	2.5	U	2.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Bromochloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Bromodichloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Bromoform	2.5	U	2.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Bromomethane	2.5	U	2.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Carbon disulfide	5.0	U	3.0	5.0	10	ug/L	5	15-Mar-2018 16:56
Carbon tetrachloride	2.5	U	2.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Chlorobenzene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Chloroethane	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20-030718
Collection Date: 07-Mar-2018 10:00

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Chloromethane	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
cis-1,2-Dichloroethene	**76**		**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Mar-2018 16:56
cis-1,3-Dichloropropene	2.5	U	0.50	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Dibromochloromethane	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Dibromomethane	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Dichlorodifluoromethane	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Ethylbenzene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Hexachlorobutadiene	2.5	U	5.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Isopropylbenzene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
m,p-Xylene	5.0	U	2.5	5.0	10	ug/L	5	15-Mar-2018 16:56
Methylene chloride	5.0	U	2.0	5.0	10	ug/L	5	15-Mar-2018 16:56
n-Butylbenzene	2.5	U	2.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
n-Propylbenzene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Naphthalene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
o-Xylene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
sec-Butylbenzene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Styrene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
tert-Butylbenzene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Tetrachloroethene	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Toluene	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
trans-1,2-Dichloroethene	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
trans-1,3-Dichloropropene	2.5	U	1.0	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Trichloroethene	**330**		**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Mar-2018 16:56
Trichlorofluoromethane	2.5	U	1.5	2.5	5.0	ug/L	5	15-Mar-2018 16:56
Vinyl chloride	**110**		**1.0**	**2.5**	**5.0**	**ug/L**	5	15-Mar-2018 16:56
Surr: 1,2-Dichloroethane-d4	*85.0*			**0**	*81-118*	*%REC*	*5*	*15-Mar-2018 16:56*
Surr: 1,2-Dichloroethane-d4	*84.0*			**0**	*81-118*	*%REC*	*50*	*15-Mar-2018 17:23*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*50*	*15-Mar-2018 17:23*
Surr: 4-Bromofluorobenzene	*95.5*			**0**	*85-114*	*%REC*	*5*	*15-Mar-2018 16:56*
Surr: Dibromofluoromethane	*86.3*			**0**	*80-119*	*%REC*	*5*	*15-Mar-2018 16:56*
Surr: Dibromofluoromethane	*86.1*			**0**	*80-119*	*%REC*	*50*	*15-Mar-2018 17:23*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*50*	*15-Mar-2018 17:23*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*5*	*15-Mar-2018 16:56*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Mar-2018		Analyst: JCJ
Iron	**0.660**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	15-Mar-2018 20:27
Manganese	**1.34**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	15-Mar-2018 20:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW20-030718
Collection Date: 07-Mar-2018 10:00

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**					Prep:SW3010A / 13-Mar-2018		Analyst: JDE
Iron	**0.463**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	20-Mar-2018 16:57
Manganese	**1.55**		**0.00350**	**0.00500**	**0.0250**	**mg/L**	5	21-Mar-2018 12:56
PHOSPHORUS BY E365.3	**Method:E365.3**					Prep:E365.3 / 21-Mar-2018		Analyst: MZD
Phosphorus, Total (As P)	0.0250	U	0.0200	0.0250	0.0500	mg/L	1	22-Mar-2018 14:17
SULFIDE BY E376.1	**Method:E376.1**							Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	13-Mar-2018 17:05
TOTAL ORGANIC CARBON BY E415.1	**Method:E415.1**							Analyst: KMU
Organic Carbon, Total	**14.5**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Mar-2018 20:31
ALKALINITY BY SM2320B	**Method:SM2320B**							Analyst: AJH
Alkalinity, Total (As CaCO3)	**848**		**5.00**	**5.00**	**5.00**	**mg/L**	1	08-Mar-2018 23:14
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Chloride	**1,510**		**4.00**	**5.00**	**10.0**	**mg/L**	20	09-Mar-2018 01:00
Nitrogen, Nitrate (As N)	0.0500	U	0.0300	0.0500	0.100	mg/L	1	09-Mar-2018 00:45
Nitrogen, Nitrite (As N)	**6.90**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	09-Mar-2018 00:45
Sulfate	**1,840**		**4.00**	**5.00**	**10.0**	**mg/L**	20	09-Mar-2018 01:00
SUBCONTRACT ANALYSIS - DHC/DHB	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	14-Mar-2018 08:55
SUBCONTRACT ANALYSIS - FERROUS IRON	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Mar-2018 15:32
SUBCONTRACT ANALYSIS - RSK	**Method:NA**							Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 08:05
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Mar-2018 15:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07-030718
Collection Date: 07-Mar-2018 11:10

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,1,2-Trichloroethane	**3.6**		**0.30**	**0.50**	**1.0**	**ug/L**	1	15-Mar-2018 16:02
1,1-Dichloroethane	**51**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Mar-2018 16:02
1,1-Dichloroethene	**370**		**2.0**	**5.0**	**10**	**ug/L**	10	15-Mar-2018 16:29
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,2-Dichloroethane	**2.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Mar-2018 16:02
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 16:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	15-Mar-2018 16:02
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	15-Mar-2018 16:02
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 16:02
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	15-Mar-2018 16:02
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	15-Mar-2018 16:02
Benzene	**0.63**	J	**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Mar-2018 16:02
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	15-Mar-2018 16:02
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07-030718
Collection Date: 07-Mar-2018 11:10

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
cis-1,2-Dichloroethene	**11**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Mar-2018 16:02
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	15-Mar-2018 16:02
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	15-Mar-2018 16:02
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 16:02
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Trichloroethene	**34**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Mar-2018 16:02
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 16:02
Vinyl chloride	**5.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Mar-2018 16:02
Surr: 1,2-Dichloroethane-d4	*85.0*			**0**	*81-118*	*%REC*	*1*	*15-Mar-2018 16:02*
Surr: 1,2-Dichloroethane-d4	*85.4*			**0**	*81-118*	*%REC*	*10*	*15-Mar-2018 16:29*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*10*	*15-Mar-2018 16:29*
Surr: 4-Bromofluorobenzene	*96.7*			**0**	*85-114*	*%REC*	*1*	*15-Mar-2018 16:02*
Surr: Dibromofluoromethane	*85.5*			**0**	*80-119*	*%REC*	*1*	*15-Mar-2018 16:02*
Surr: Dibromofluoromethane	*85.1*			**0**	*80-119*	*%REC*	*10*	*15-Mar-2018 16:29*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*10*	*15-Mar-2018 16:29*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Mar-2018 16:02*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Mar-2018		Analyst: JCJ
Iron	**0.417**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	15-Mar-2018 20:30
Manganese	**0.119**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	15-Mar-2018 20:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: LHSMW07-030718
Collection Date: 07-Mar-2018 11:10

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**					Prep:SW3010A / 13-Mar-2018		Analyst: JDE
Iron	**0.0325**	J	**0.0120**	**0.100**	**0.200**	**mg/L**	1	20-Mar-2018 17:07
Manganese	**0.137**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	20-Mar-2018 17:07
PHOSPHORUS BY E365.3	**Method:E365.3**					Prep:E365.3 / 21-Mar-2018		Analyst: MZD
Phosphorus, Total (As P)	0.0250	U	0.0200	0.0250	0.0500	mg/L	1	22-Mar-2018 14:17
SULFIDE BY E376.1	**Method:E376.1**							Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	13-Mar-2018 17:05
TOTAL ORGANIC CARBON BY E415.1	**Method:E415.1**							Analyst: KMU
Organic Carbon, Total	**6.67**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Mar-2018 20:44
ALKALINITY BY SM2320B	**Method:SM2320B**							Analyst: AJH
Alkalinity, Total (As CaCO3)	**757**		**5.00**	**5.00**	**5.00**	**mg/L**	1	08-Mar-2018 23:22
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Chloride	**2,420**		**8.00**	**10.0**	**20.0**	**mg/L**	40	16-Mar-2018 20:43
Nitrogen, Nitrate (As N)	0.0500	U	0.0300	0.0500	0.100	mg/L	1	09-Mar-2018 01:15
Nitrogen, Nitrite (As N)	**11.7**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	09-Mar-2018 01:15
Sulfate	**2,700**		**8.00**	**10.0**	**20.0**	**mg/L**	40	16-Mar-2018 20:43
SUBCONTRACT ANALYSIS - DHC/DHB	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	14-Mar-2018 08:55
SUBCONTRACT ANALYSIS - FERROUS IRON	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Mar-2018 15:32
SUBCONTRACT ANALYSIS - RSK	**Method:NA**							Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 08:05
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Mar-2018 15:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11-030718
Collection Date: 07-Mar-2018 12:25

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,1-Dichloroethene	**10**		**0.20**	**0.50**	**1.0**	**ug/L**	1	15-Mar-2018 15:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 15:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	15-Mar-2018 15:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	15-Mar-2018 15:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 15:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	15-Mar-2018 15:37
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	15-Mar-2018 15:37
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	15-Mar-2018 15:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11-030718
Collection Date: 07-Mar-2018 12:25

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	15-Mar-2018 15:37
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	15-Mar-2018 15:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	15-Mar-2018 15:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	15-Mar-2018 15:37
Surr: 1,2-Dichloroethane-d4	*85.6*			**0**	*81-118*	*%REC*	*1*	*15-Mar-2018 15:37*
Surr: 4-Bromofluorobenzene	*96.7*			**0**	*85-114*	*%REC*	*1*	*15-Mar-2018 15:37*
Surr: Dibromofluoromethane	*88.5*			**0**	*80-119*	*%REC*	*1*	*15-Mar-2018 15:37*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*15-Mar-2018 15:37*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Mar-2018		Analyst: JCJ
Iron	**0.445**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	15-Mar-2018 20:32
Manganese	**0.383**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	15-Mar-2018 20:32
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-Mar-2018		Analyst: JDE
Iron	**0.0143**	J	**0.0120**	**0.100**	**0.200**	**mg/L**	1	20-Mar-2018 17:09
Manganese	**0.393**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	20-Mar-2018 17:09
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 21-Mar-2018		Analyst: MZD
Phosphorus, Total (As P)	0.0250	U	0.0200	0.0250	0.0500	mg/L	1	22-Mar-2018 14:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW11-030718
Collection Date: 07-Mar-2018 12:25

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	13-Mar-2018 17:05
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: KMU
Organic Carbon, Total	**5.28**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Mar-2018 21:00
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**446**		**5.00**	**5.00**	**5.00**	**mg/L**	1	08-Mar-2018 23:28
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**2,530**		**8.00**	**10.0**	**20.0**	**mg/L**	40	16-Mar-2018 20:57
Nitrogen, Nitrate (As N)	0.0500	U	0.0300	0.0500	0.100	mg/L	1	09-Mar-2018 01:44
Nitrogen, Nitrite (As N)	**14.6**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	09-Mar-2018 01:44
Sulfate	**1,260**		**4.00**	**5.00**	**10.0**	**mg/L**	20	09-Mar-2018 01:58
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	14-Mar-2018 08:55
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Mar-2018 15:32
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUBCA
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 08:05
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	27-Mar-2018 15:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 07-Mar-2018 00:01

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
1,1,1-Trichloroethane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
1,1,2,2-Tetrachloroethane	25	U	25	25	50	ug/L	50	15-Mar-2018 13:57
1,1,2-Trichloroethane	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
1,1-Dichloroethane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
1,1-Dichloroethene	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
1,1-Dichloropropene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
1,2,3-Trichlorobenzene	25	U	20	25	50	ug/L	50	15-Mar-2018 13:57
1,2,3-Trichloropropane	25	U	25	25	50	ug/L	50	15-Mar-2018 13:57
1,2,4-Trichlorobenzene	25	U	25	25	50	ug/L	50	15-Mar-2018 13:57
1,2,4-Trimethylbenzene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
1,2-Dibromo-3-chloropropane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
1,2-Dibromoethane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
1,2-Dichlorobenzene	25	U	25	25	50	ug/L	50	15-Mar-2018 13:57
1,2-Dichloroethane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
1,2-Dichloropropane	25	U	25	25	50	ug/L	50	15-Mar-2018 13:57
1,3,5-Trimethylbenzene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
1,3-Dichlorobenzene	25	U	20	25	50	ug/L	50	15-Mar-2018 13:57
1,3-Dichloropropane	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
1,4-Dichlorobenzene	25	U	20	25	50	ug/L	50	15-Mar-2018 13:57
2,2-Dichloropropane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
2-Butanone	50	U	25	50	100	ug/L	50	15-Mar-2018 13:57
2-Chlorotoluene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
2-Hexanone	50	U	50	50	100	ug/L	50	15-Mar-2018 13:57
4-Chlorotoluene	25	U	20	25	50	ug/L	50	15-Mar-2018 13:57
4-Isopropyltoluene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
4-Methyl-2-pentanone	50	U	35	50	100	ug/L	50	15-Mar-2018 13:57
Acetone	50	U	20	50	100	ug/L	50	15-Mar-2018 13:57
Benzene	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
Bromobenzene	25	U	20	25	50	ug/L	50	15-Mar-2018 13:57
Bromochloromethane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
Bromodichloromethane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
Bromoform	25	U	20	25	50	ug/L	50	15-Mar-2018 13:57
Bromomethane	25	U	20	25	50	ug/L	50	15-Mar-2018 13:57
Carbon disulfide	50	U	30	50	100	ug/L	50	15-Mar-2018 13:57
Carbon tetrachloride	25	U	25	25	50	ug/L	50	15-Mar-2018 13:57
Chlorobenzene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Chloroethane	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 07-Mar-2018 00:01

ANALYTICAL REPORT
WorkOrder:HS18030365
Lab ID:HS18030365-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
Chloroform	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
Chloromethane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
cis-1,2-Dichloroethene	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
cis-1,3-Dichloropropene	25	U	5.0	25	50	ug/L	50	15-Mar-2018 13:57
Dibromochloromethane	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Dibromomethane	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
Dichlorodifluoromethane	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Ethylbenzene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Hexachlorobutadiene	25	U	50	25	50	ug/L	50	15-Mar-2018 13:57
Isopropylbenzene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
m,p-Xylene	50	U	25	50	100	ug/L	50	15-Mar-2018 13:57
Methylene chloride	50	U	20	50	100	ug/L	50	15-Mar-2018 13:57
n-Butylbenzene	25	U	20	25	50	ug/L	50	15-Mar-2018 13:57
n-Propylbenzene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Naphthalene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
o-Xylene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
sec-Butylbenzene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Styrene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
tert-Butylbenzene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Tetrachloroethene	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Toluene	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
trans-1,2-Dichloroethene	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
trans-1,3-Dichloropropene	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
Trichloroethene	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
Trichlorofluoromethane	25	U	15	25	50	ug/L	50	15-Mar-2018 13:57
Vinyl chloride	25	U	10	25	50	ug/L	50	15-Mar-2018 13:57
Surr: 1,2-Dichloroethane-d4	*83.1*			**0**	*81-118*	*%REC*	*50*	*15-Mar-2018 13:57*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*50*	*15-Mar-2018 13:57*
Surr: Dibromofluoromethane	*86.4*			**0**	*80-119*	*%REC*	*50*	*15-Mar-2018 13:57*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*50*	*15-Mar-2018 13:57*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 30-Mar-18

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

Batch ID: 126131 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18030365-01	1	10	10 (mL)	1
HS18030365-02	1	10	10 (mL)	1
HS18030365-03	1	10	10 (mL)	1

Batch ID: 126134 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18030365-01	1	10	10 (mL)	1
HS18030365-02	1	10	10 (mL)	1
HS18030365-03	1	10	10 (mL)	1

Batch ID: 126467 **Method:** PHOSPHORUS BY E365.3 **Prep:** P_TW_PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18030365-01	1	50	50 (mL)	1
HS18030365-02	1	50	50 (mL)	1
HS18030365-03	1	50	50 (mL)	1

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 126131	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00		13 Mar 2018 11:00	15 Mar 2018 20:27	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10		13 Mar 2018 11:00	15 Mar 2018 20:30	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25		13 Mar 2018 11:00	15 Mar 2018 20:32	1
Batch ID 126134	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Groundwater		
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00		13 Mar 2018 11:00	21 Mar 2018 12:56	5
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00		13 Mar 2018 11:00	20 Mar 2018 16:57	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10		13 Mar 2018 11:00	20 Mar 2018 17:07	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25		13 Mar 2018 11:00	20 Mar 2018 17:09	1
Batch ID 126467	**Test Name :** PHOSPHORUS BY E365.3			**Matrix:** Groundwater		
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00		21 Mar 2018 14:00	22 Mar 2018 14:17	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10		21 Mar 2018 14:00	22 Mar 2018 14:17	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25		21 Mar 2018 14:00	22 Mar 2018 14:17	1
Batch ID R312233	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Groundwater		
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			08 Mar 2018 23:14	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			08 Mar 2018 23:22	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			08 Mar 2018 23:28	1
Batch ID R312306	**Test Name :** ANIONS BY SW9056A			**Matrix:** Groundwater		
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			09 Mar 2018 01:00	20
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			09 Mar 2018 00:45	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			16 Mar 2018 20:43	40
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			09 Mar 2018 01:15	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			16 Mar 2018 20:57	40
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			09 Mar 2018 01:58	20
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			09 Mar 2018 01:44	1
Batch ID R312419	**Test Name :** SUBCONTRACT ANALYSIS - DHC/DHB			**Matrix:** Groundwater		
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			14 Mar 2018 08:55	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			14 Mar 2018 08:55	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			14 Mar 2018 08:55	1
Batch ID R312577	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS18030365-04	Trip Blank	07 Mar 2018 00:01			15 Mar 2018 13:57	50
Batch ID R312577	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Groundwater		
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			15 Mar 2018 17:23	50
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			15 Mar 2018 16:56	5
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			15 Mar 2018 16:29	10
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			15 Mar 2018 16:02	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			15 Mar 2018 15:37	1

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R312697	**Test Name :** SULFIDE BY E376.1				**Matrix:** Groundwater	
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			13 Mar 2018 17:05	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			13 Mar 2018 17:05	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			13 Mar 2018 17:05	1
Batch ID R312878	**Test Name :** TOTAL ORGANIC CARBON BY E415.1				**Matrix:** Groundwater	
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			20 Mar 2018 20:31	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			20 Mar 2018 20:44	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			20 Mar 2018 21:00	1
Batch ID R313200	**Test Name :** SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS				**Matrix:** Groundwater	
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			27 Mar 2018 15:32	1
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			27 Mar 2018 15:32	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			27 Mar 2018 15:32	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			27 Mar 2018 15:32	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			27 Mar 2018 15:32	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			27 Mar 2018 15:32	1
Batch ID R313388	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS18030365-01	35AWW20-030718	07 Mar 2018 10:00			30 Mar 2018 08:05	1
HS18030365-02	LHSMW07-030718	07 Mar 2018 11:10			30 Mar 2018 08:05	1
HS18030365-03	35AWW11-030718	07 Mar 2018 12:25			30 Mar 2018 08:05	1

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: 126131 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-126131** Units: **mg/L** Analysis Date: **15-Mar-2018 14:28**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475111** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-126131** Units: **mg/L** Analysis Date: **15-Mar-2018 14:30**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475112** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.028	0.200	5	0	101	80 - 120				
Manganese	0.04894	0.00500	0.05	0	97.9	80 - 120				

MS Sample ID: **HS18030472-02MS** Units: **mg/L** Analysis Date: **15-Mar-2018 14:41**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475117** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.792	0.200	5	0.2489	90.9	80 - 120				
Manganese	0.2801	0.00500	0.05	0.2357	88.8	80 - 120				O

MSD Sample ID: **HS18030472-02MSD** Units: **mg/L** Analysis Date: **15-Mar-2018 14:43**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475118** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.716	0.200	5	0.2489	89.3	80 - 120	4.792	1.6	20	
Manganese	0.2738	0.00500	0.05	0.2357	76.1	80 - 120	0.2801	2.3	20	SO

PDS Sample ID: **HS18030472-02PDS** Units: **mg/L** Analysis Date: **15-Mar-2018 14:46**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475119** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	8.895	0.200	10	0.2489	86.5	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: 126131 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS18030472-02PDS** Units: **mg/L** Analysis Date: **15-Mar-2018 15:57**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475373** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	0.3109	0.00500	0.1	0.2357	75.1	75 - 125				

SD Sample ID: **HS18030472-02SD** Units: **mg/L** Analysis Date: **15-Mar-2018 14:39**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475116** PrepDate: **13-Mar-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	0.2493	1.00					0.2489	0	10	J
Manganese	0.2312	0.0250					0.2357	1.91	10	

The following samples were analyzed in this batch: HS18030365-01 HS18030365-02 HS18030365-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: 126134 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-126134** Units: **mg/L** Analysis Date: **20-Mar-2018 16:53**
Client ID: Run ID: **ICPMS05_312756** SeqNo: **4481013** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-126134** Units: **mg/L** Analysis Date: **20-Mar-2018 16:55**
Client ID: Run ID: **ICPMS05_312756** SeqNo: **4481014** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.152	0.200	5	0	103	80 - 120				
Manganese	0.05024	0.00500	0.05	0	100	80 - 120				

MS Sample ID: **HS18030365-01MS** Units: **mg/L** Analysis Date: **20-Mar-2018 17:01**
Client ID: **35AWW20-030718** Run ID: **ICPMS05_312756** SeqNo: **4481017** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.17	0.200	5	0.4629	94.1	75 - 125				
Manganese	1.735	0.00500	0.05	1.729	13.1	75 - 125				SO

MSD Sample ID: **HS18030365-01MSD** Units: **mg/L** Analysis Date: **20-Mar-2018 17:03**
Client ID: **35AWW20-030718** Run ID: **ICPMS05_312756** SeqNo: **4481018** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.252	0.200	5	0.4629	95.8	75 - 125	5.17	1.58	20	
Manganese	1.754	0.00500	0.05	1.729	50.9	75 - 125	1.735	1.08	20	SO

PDS Sample ID: **HS18030365-01PDS** Units: **mg/L** Analysis Date: **20-Mar-2018 17:05**
Client ID: **35AWW20-030718** Run ID: **ICPMS05_312756** SeqNo: **4481019** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	9.775	0.200	10	0.4629	93.1	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: 126134 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18030365-01PDS** Units: **mg/L** Analysis Date: **21-Mar-2018 13:00**
Client ID: **35AWW20-030718** Run ID: **ICPMS05_312849** SeqNo: **4482372** PrepDate: **13-Mar-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	2.022	0.0250	0.5	1.552	94.1	75 - 125				

SD Sample ID: **HS18030365-01SD** Units: **mg/L** Analysis Date: **20-Mar-2018 16:59**
Client ID: **35AWW20-030718** Run ID: **ICPMS05_312756** SeqNo: **4481016** PrepDate: **13-Mar-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	0.4875	1.00					0.4629	0	10	J

SD Sample ID: **HS18030365-01SD** Units: **mg/L** Analysis Date: **21-Mar-2018 12:58**
Client ID: **35AWW20-030718** Run ID: **ICPMS05_312849** SeqNo: **4482371** PrepDate: **13-Mar-2018** DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Manganese	1.534	0.125					1.552	1.13	10	

The following samples were analyzed in this batch: HS18030365-01 HS18030365-02 HS18030365-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

MBLK Sample ID: **VBLKW-180315** Units: **ug/L** Analysis Date: **15-Mar-2018 12:38**
Client ID: Run ID: **VOA2_312577** SeqNo: **4475726** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

MBLK Sample ID: **VBLKW-180315** Units: **ug/L** Analysis Date: **15-Mar-2018 12:38**
Client ID: Run ID: **VOA2_312577** SeqNo: **4475726** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.41*	*1.0*	*50*	*0*	*84.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.42*	*1.0*	*50*	*0*	*96.8*	*85 - 114*				
Surr: Dibromofluoromethane	*43.03*	*1.0*	*50*	*0*	*86.1*	*80 - 119*				
Surr: Toluene-d8	*52.87*	*1.0*	*50*	*0*	*106*	*89 - 112*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

LCS Sample ID: **VLCSW-180315** Units: **ug/L** Analysis Date: **15-Mar-2018 11:49**
Client ID: Run ID: **VOA2_312577** SeqNo: **4475724** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	46.9	1.0	50	0	93.8	78 - 124				
1,1,1-Trichloroethane	48.62	1.0	50	0	97.2	74 - 131				
1,1,2,2-Tetrachloroethane	40.04	1.0	50	0	80.1	71 - 121				
1,1,2-Trichloroethane	44.36	1.0	50	0	88.7	80 - 119				
1,1-Dichloroethane	45.15	1.0	50	0	90.3	77 - 125				
1,1-Dichloroethene	48.64	1.0	50	0	97.3	71 - 131				
1,1-Dichloropropene	49.8	1.0	50	0	99.6	79 - 125				
1,2,3-Trichlorobenzene	45.7	1.0	50	0	91.4	69 - 129				
1,2,3-Trichloropropane	42.06	1.0	50	0	84.1	73 - 122				
1,2,4-Trichlorobenzene	46.53	1.0	50	0	93.1	69 - 130				
1,2,4-Trimethylbenzene	46.96	1.0	50	0	93.9	76 - 124				
1,2-Dibromo-3-chloropropane	42.54	1.0	50	0	85.1	62 - 128				
1,2-Dibromoethane	47.61	1.0	50	0	95.2	77 - 121				
1,2-Dichlorobenzene	41.55	1.0	50	0	83.1	80 - 119				
1,2-Dichloroethane	47.6	1.0	50	0	95.2	73 - 128				
1,2-Dichloropropane	46.23	1.0	50	0	92.5	78 - 122				
1,3,5-Trimethylbenzene	47.07	1.0	50	0	94.1	75 - 124				
1,3-Dichlorobenzene	42.67	1.0	50	0	85.3	80 - 119				
1,3-Dichloropropane	44.23	1.0	50	0	88.5	80 - 119				
1,4-Dichlorobenzene	41.9	1.0	50	0	83.8	79 - 118				
2,2-Dichloropropane	48.57	1.0	50	0	97.1	60 - 139				
2-Butanone	97.52	2.0	100	0	97.5	56 - 143				
2-Chlorotoluene	45.8	1.0	50	0	91.6	79 - 122				
2-Hexanone	96.27	2.0	100	0	96.3	57 - 139				
4-Chlorotoluene	46.79	1.0	50	0	93.6	78 - 122				
4-Isopropyltoluene	41.7	1.0	50	0	83.4	77 - 127				
4-Methyl-2-pentanone	88.67	2.0	100	0	88.7	67 - 130				
Acetone	94.99	2.0	100	0	95.0	39 - 160				
Benzene	46.74	1.0	50	0	93.5	79 - 120				
Bromobenzene	41.2	1.0	50	0	82.4	80 - 120				
Bromochloromethane	51.12	1.0	50	0	102	78 - 123				
Bromodichloromethane	49.03	1.0	50	0	98.1	79 - 125				
Bromoform	50.72	1.0	50	0	101	66 - 130				
Bromomethane	50.13	1.0	50	0	100	53 - 141				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

LCS Sample ID: **VLCSW-180315** Units: **ug/L** Analysis Date: **15-Mar-2018 11:49**
Client ID: Run ID: **VOA2_312577** SeqNo: **4475724** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	93.95	2.0	100	0	94.0	64 - 133				
Carbon tetrachloride	47.17	1.0	50	0	94.3	72 - 136				
Chlorobenzene	45.46	1.0	50	0	90.9	80 - 120				
Chloroethane	44.39	1.0	50	0	88.8	82 - 118				
Chloroform	45.1	1.0	50	0	90.2	79 - 124				
Chloromethane	47.55	1.0	50	0	95.1	50 - 139				
cis-1,2-Dichloroethene	48.83	1.0	50	0	97.7	78 - 123				
cis-1,3-Dichloropropene	51.57	1.0	50	0	103	75 - 124				
Dibromochloromethane	48.68	1.0	50	0	97.4	74 - 126				
Dibromomethane	51.31	1.0	50	0	103	79 - 123				
Dichlorodifluoromethane	42.06	1.0	50	0	84.1	32 - 152				
Ethylbenzene	50.71	1.0	50	0	101	79 - 121				
Hexachlorobutadiene	44.18	1.0	50	0	88.4	66 - 134				
Isopropylbenzene	45.52	1.0	50	0	91.0	72 - 131				
m,p-Xylene	89.33	2.0	100	0	89.3	80 - 121				
Methylene chloride	43.49	2.0	50	0	87.0	74 - 124				
Naphthalene	49.21	1.0	50	0	98.4	61 - 128				
n-Butylbenzene	43.51	1.0	50	0	87.0	75 - 128				
n-Propylbenzene	40.94	1.0	50	0	81.9	76 - 126				
o-Xylene	45.48	1.0	50	0	91.0	78 - 122				
sec-Butylbenzene	42.56	1.0	50	0	85.1	77 - 126				
Styrene	45.91	1.0	50	0	91.8	78 - 128				
tert-Butylbenzene	41.51	1.0	50	0	83.0	78 - 124				
Tetrachloroethene	46.69	1.0	50	0	93.4	74 - 129				
Toluene	43.54	1.0	50	0	87.1	80 - 121				
trans-1,2-Dichloroethene	49.48	1.0	50	0	99.0	75 - 124				
trans-1,3-Dichloropropene	52.61	1.0	50	0	105	73 - 127				
Trichloroethene	49.31	1.0	50	0	98.6	79 - 123				
Trichlorofluoromethane	46.07	1.0	50	0	92.1	65 - 141				
Vinyl chloride	46.38	1.0	50	0	92.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.43*	*1.0*	*50*	*0*	*88.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.09*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*42.16*	*1.0*	*50*	*0*	*84.3*	*80 - 119*				
Surr: Toluene-d8	*50.57*	*1.0*	*50*	*0*	*101*	*89 - 112*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

MS Sample ID: **HS18030510-01MS** Units: **ug/L** Analysis Date: **15-Mar-2018 14:21**
Client ID: Run ID: **VOA2_312577** SeqNo: **4475730** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	428.8	10	500	0	85.8	78 - 124				
1,1,1-Trichloroethane	472.8	10	500	0	94.6	74 - 131				
1,1,2,2-Tetrachloroethane	344.7	10	500	0	68.9	71 - 121				S
1,1,2-Trichloroethane	383.7	10	500	0	76.7	80 - 119				S
1,1-Dichloroethane	419.6	10	500	0	83.9	77 - 125				
1,1-Dichloroethene	465.6	10	500	0	93.1	71 - 131				
1,1-Dichloropropene	497.8	10	500	0	99.6	79 - 125				
1,2,3-Trichlorobenzene	414	10	500	0	82.8	69 - 129				
1,2,3-Trichloropropane	365.5	10	500	0	73.1	73 - 122				
1,2,4-Trichlorobenzene	428	10	500	0	85.6	69 - 130				
1,2,4-Trimethylbenzene	448.6	10	500	0	89.7	76 - 124				
1,2-Dibromo-3-chloropropane	338.4	10	500	0	67.7	62 - 128				
1,2-Dibromoethane	411	10	500	0	82.2	77 - 121				
1,2-Dichlorobenzene	387.6	10	500	0	77.5	80 - 119				S
1,2-Dichloroethane	402	10	500	0	80.4	73 - 128				
1,2-Dichloropropane	405.8	10	500	0	81.2	78 - 122				
1,3,5-Trimethylbenzene	458.9	10	500	0	91.8	75 - 124				
1,3-Dichlorobenzene	402.7	10	500	0	80.5	80 - 119				
1,3-Dichloropropane	384.2	10	500	0	76.8	80 - 119				S
1,4-Dichlorobenzene	388.1	10	500	0	77.6	79 - 118				S
2,2-Dichloropropane	465.6	10	500	0	93.1	60 - 139				
2-Butanone	734.4	20	1000	0	73.4	56 - 143				
2-Chlorotoluene	450.7	10	500	0	90.1	79 - 122				
2-Hexanone	729.4	20	1000	0	72.9	57 - 139				
4-Chlorotoluene	445.5	10	500	0	89.1	78 - 122				
4-Isopropyltoluene	411.8	10	500	0	82.4	77 - 127				
4-Methyl-2-pentanone	756.3	20	1000	0	75.6	67 - 130				
Acetone	811.6	20	1000	0	81.2	39 - 160				
Benzene	430.7	10	500	0	86.1	79 - 120				
Bromobenzene	388.1	10	500	0	77.6	80 - 120				S
Bromochloromethane	454.9	10	500	0	91.0	78 - 123				
Bromodichloromethane	441.7	10	500	0	88.3	79 - 125				
Bromoform	438.8	10	500	0	87.8	66 - 130				
Bromomethane	415	10	500	0	83.0	53 - 141				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

MS Sample ID: **HS18030510-01MS** Units: **ug/L** Analysis Date: **15-Mar-2018 14:21**
Client ID: Run ID: **VOA2_312577** SeqNo: **4475730** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	905.3	20	1000	0	90.5	64 - 133				
Carbon tetrachloride	491.3	10	500	0	98.3	72 - 136				
Chlorobenzene	418.2	10	500	0	83.6	80 - 120				
Chloroethane	392.5	10	500	0	78.5	82 - 118				S
Chloroform	413.5	10	500	0	82.7	79 - 124				
Chloromethane	449.7	10	500	0	89.9	50 - 139				
cis-1,2-Dichloroethene	446.5	10	500	0	89.3	78 - 123				
cis-1,3-Dichloropropene	453.4	10	500	0	90.7	75 - 124				
Dibromochloromethane	435.7	10	500	0	87.1	74 - 126				
Dibromomethane	431.1	10	500	0	86.2	79 - 123				
Dichlorodifluoromethane	441.2	10	500	0	88.2	32 - 152				
Ethylbenzene	489	10	500	0	97.8	79 - 121				
Hexachlorobutadiene	469.4	10	500	0	93.9	66 - 134				
Isopropylbenzene	443.1	10	500	0	88.6	72 - 131				
m,p-Xylene	852.3	20	1000	0	85.2	80 - 121				
Methylene chloride	409.5	20	500	0	81.9	74 - 124				
Naphthalene	407	10	500	0	81.4	61 - 128				
n-Butylbenzene	436.3	10	500	0	87.3	75 - 128				
n-Propylbenzene	405.9	10	500	0	81.2	76 - 126				
o-Xylene	423.5	10	500	0	84.7	78 - 122				
sec-Butylbenzene	430.2	10	500	0	86.0	77 - 126				
Styrene	408.4	10	500	0	81.7	78 - 128				
tert-Butylbenzene	417.2	10	500	0	83.4	78 - 124				
Tetrachloroethene	464.1	10	500	0	92.8	74 - 129				
Toluene	413.1	10	500	0	82.6	80 - 121				
trans-1,2-Dichloroethene	471.4	10	500	0	94.3	75 - 124				
trans-1,3-Dichloropropene	461.9	10	500	0	92.4	73 - 127				
Trichloroethene	477.2	10	500	0	95.4	79 - 123				
Trichlorofluoromethane	479.7	10	500	0	95.9	65 - 141				
Vinyl chloride	466.2	10	500	0	93.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*436.7*	*10*	*500*	*0*	*87.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*499.9*	*10*	*500*	*0*	*100.0*	*85 - 114*				
Surr: Dibromofluoromethane	*409.6*	*10*	*500*	*0*	*81.9*	*80 - 119*				
Surr: Toluene-d8	*506.9*	*10*	*500*	*0*	*101*	*89 - 112*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

MSD Sample ID: **HS18030510-01MSD** Units: **ug/L** Analysis Date: **15-Mar-2018 14:46**
Client ID: Run ID: **VOA2_312577** SeqNo: **4475731** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	429.9	10	500	0	86.0	78 - 124	428.8	0.267	20	
1,1,1-Trichloroethane	462.7	10	500	0	92.5	74 - 131	472.8	2.17	20	
1,1,2,2-Tetrachloroethane	346.9	10	500	0	69.4	71 - 121	344.7	0.638	20	S
1,1,2-Trichloroethane	390.4	10	500	0	78.1	80 - 119	383.7	1.71	20	S
1,1-Dichloroethane	420.9	10	500	0	84.2	77 - 125	419.6	0.32	20	
1,1-Dichloroethene	462	10	500	0	92.4	71 - 131	465.6	0.778	20	
1,1-Dichloropropene	473.8	10	500	0	94.8	79 - 125	497.8	4.94	20	
1,2,3-Trichlorobenzene	414.7	10	500	0	82.9	69 - 129	414	0.189	20	
1,2,3-Trichloropropane	372.1	10	500	0	74.4	73 - 122	365.5	1.78	20	
1,2,4-Trichlorobenzene	430	10	500	0	86.0	69 - 130	428	0.485	20	
1,2,4-Trimethylbenzene	445	10	500	0	89.0	76 - 124	448.6	0.815	20	
1,2-Dibromo-3-chloropropane	351.7	10	500	0	70.3	62 - 128	338.4	3.87	20	
1,2-Dibromoethane	407	10	500	0	81.4	77 - 121	411	0.99	20	
1,2-Dichlorobenzene	381.1	10	500	0	76.2	80 - 119	387.6	1.69	20	S
1,2-Dichloroethane	418.5	10	500	0	83.7	73 - 128	402	4.03	20	
1,2-Dichloropropane	406.7	10	500	0	81.3	78 - 122	405.8	0.227	20	
1,3,5-Trimethylbenzene	446.4	10	500	0	89.3	75 - 124	458.9	2.77	20	
1,3-Dichlorobenzene	396.1	10	500	0	79.2	80 - 119	402.7	1.66	20	S
1,3-Dichloropropane	386.2	10	500	0	77.2	80 - 119	384.2	0.511	20	S
1,4-Dichlorobenzene	386.3	10	500	0	77.3	79 - 118	388.1	0.46	20	S
2,2-Dichloropropane	470.2	10	500	0	94.0	60 - 139	465.6	0.982	20	
2-Butanone	784.2	20	1000	0	78.4	56 - 143	734.4	6.57	20	
2-Chlorotoluene	435.4	10	500	0	87.1	79 - 122	450.7	3.45	20	
2-Hexanone	782.3	20	1000	0	78.2	57 - 139	729.4	7	20	
4-Chlorotoluene	435.7	10	500	0	87.1	78 - 122	445.5	2.23	20	
4-Isopropyltoluene	400.7	10	500	0	80.1	77 - 127	411.8	2.73	20	
4-Methyl-2-pentanone	766.4	20	1000	0	76.6	67 - 130	756.3	1.32	20	
Acetone	792.8	20	1000	0	79.3	39 - 160	811.6	2.34	20	
Benzene	418.6	10	500	0	83.7	79 - 120	430.7	2.85	20	
Bromobenzene	381.9	10	500	0	76.4	80 - 120	388.1	1.6	20	S
Bromochloromethane	456.6	10	500	0	91.3	78 - 123	454.9	0.363	20	
Bromodichloromethane	436.5	10	500	0	87.3	79 - 125	441.7	1.18	20	
Bromoform	440.1	10	500	0	88.0	66 - 130	438.8	0.307	20	
Bromomethane	409.5	10	500	0	81.9	53 - 141	415	1.34	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

MSD Sample ID: **HS18030510-01MSD** Units: **ug/L** Analysis Date: **15-Mar-2018 14:46**
Client ID: Run ID: **VOA2_312577** SeqNo: **4475731** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	900.1	20	1000	0	90.0	64 - 133	905.3	0.578	20	
Carbon tetrachloride	494.8	10	500	0	99.0	72 - 136	491.3	0.71	20	
Chlorobenzene	413.4	10	500	0	82.7	80 - 120	418.2	1.14	20	
Chloroethane	368.8	10	500	0	73.8	82 - 118	392.5	6.24	20	S
Chloroform	407.2	10	500	0	81.4	79 - 124	413.5	1.54	20	
Chloromethane	424.4	10	500	0	84.9	50 - 139	449.7	5.79	20	
cis-1,2-Dichloroethene	448.1	10	500	0	89.6	78 - 123	446.5	0.362	20	
cis-1,3-Dichloropropene	458.1	10	500	0	91.6	75 - 124	453.4	1.04	20	
Dibromochloromethane	434.1	10	500	0	86.8	74 - 126	435.7	0.372	20	
Dibromomethane	434.7	10	500	0	86.9	79 - 123	431.1	0.827	20	
Dichlorodifluoromethane	419.5	10	500	0	83.9	32 - 152	441.2	5.04	20	
Ethylbenzene	465.9	10	500	0	93.2	79 - 121	489	4.85	20	
Hexachlorobutadiene	462.1	10	500	0	92.4	66 - 134	469.4	1.57	20	
Isopropylbenzene	431.7	10	500	0	86.3	72 - 131	443.1	2.61	20	
m,p-Xylene	834	20	1000	0	83.4	80 - 121	852.3	2.18	20	
Methylene chloride	396.9	20	500	0	79.4	74 - 124	409.5	3.11	20	
Naphthalene	419	10	500	0	83.8	61 - 128	407	2.9	20	
n-Butylbenzene	423.5	10	500	0	84.7	75 - 128	436.3	2.98	20	
n-Propylbenzene	398.2	10	500	0	79.6	76 - 126	405.9	1.91	20	
o-Xylene	418.5	10	500	0	83.7	78 - 122	423.5	1.18	20	
sec-Butylbenzene	419.9	10	500	0	84.0	77 - 126	430.2	2.43	20	
Styrene	403.3	10	500	0	80.7	78 - 128	408.4	1.25	20	
tert-Butylbenzene	404.6	10	500	0	80.9	78 - 124	417.2	3.06	20	
Tetrachloroethene	450.4	10	500	0	90.1	74 - 129	464.1	2.98	20	
Toluene	400.5	10	500	0	80.1	80 - 121	413.1	3.08	20	
trans-1,2-Dichloroethene	475	10	500	0	95.0	75 - 124	471.4	0.762	20	
trans-1,3-Dichloropropene	466.3	10	500	0	93.3	73 - 127	461.9	0.949	20	
Trichloroethene	467	10	500	0	93.4	79 - 123	477.2	2.17	20	
Trichlorofluoromethane	478.2	10	500	0	95.6	65 - 141	479.7	0.313	20	
Vinyl chloride	458.7	10	500	0	91.7	58 - 137	466.2	1.61	20	
Surr: 1,2-Dichloroethane-d4	*431.3*	*10*	*500*	*0*	*86.3*	*81 - 118*	*436.7*	*1.24*	*20*	
Surr: 4-Bromofluorobenzene	*501.5*	*10*	*500*	*0*	*100*	*85 - 114*	*499.9*	*0.319*	*20*	
Surr: Dibromofluoromethane	*418.2*	*10*	*500*	*0*	*83.6*	*80 - 119*	*409.6*	*2.09*	*20*	
Surr: Toluene-d8	*500*	*10*	*500*	*0*	*100.0*	*89 - 112*	*506.9*	*1.38*	*20*	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312577 **Instrument: VOA2** **Method: SW8260**

The following samples were analyzed in this batch:	HS18030365-01	HS18030365-02	HS18030365-03	HS18030365-04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: 126467 **Instrument: UV-2450** **Method: E365.3**

MBLK Sample ID: **MBLK-126467** Units: **mg/L** Analysis Date: **22-Mar-2018 14:17**
Client ID: Run ID: **UV-2450_312946** SeqNo: **4484200** PrepDate: **21-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.0250	0.0500								U

LCS Sample ID: **LCS-126467** Units: **mg/L** Analysis Date: **22-Mar-2018 14:17**
Client ID: Run ID: **UV-2450_312946** SeqNo: **4484199** PrepDate: **21-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.244	0.0500	0.25	0	97.6	80 - 120				

MS Sample ID: **HS18030917-01MS** Units: **mg/L** Analysis Date: **22-Mar-2018 14:17**
Client ID: Run ID: **UV-2450_312946** SeqNo: **4484197** PrepDate: **21-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.345	0.0500	0.25	0.136	83.6	80 - 120				

MSD Sample ID: **HS18030917-01MSD** Units: **mg/L** Analysis Date: **22-Mar-2018 14:17**
Client ID: Run ID: **UV-2450_312946** SeqNo: **4484198** PrepDate: **21-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.352	0.0500	0.25	0.136	86.4	80 - 120	0.345	2.01	20	

The following samples were analyzed in this batch: HS18030365-01 HS18030365-02 HS18030365-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312233 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-180308** Units: **mg/L** Analysis Date: **08-Mar-2018 20:29**
Client ID: Run ID: **ManTech01_312233** SeqNo: **4467205** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS1-180308** Units: **mg/L** Analysis Date: **08-Mar-2018 20:38**
Client ID: Run ID: **ManTech01_312233** SeqNo: **4467206** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1087	5.00	1000	0	109	85 - 115				

LCSD Sample ID: **LCSD1-180308** Units: **mg/L** Analysis Date: **08-Mar-2018 20:46**
Client ID: Run ID: **ManTech01_312233** SeqNo: **4467207** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1097	5.00	1000	0	110	85 - 115	1087	0.902	20	

DUP Sample ID: **HS18030295-06DUP** Units: **mg/L** Analysis Date: **08-Mar-2018 21:15**
Client ID: Run ID: **ManTech01_312233** SeqNo: **4467212** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	150.9	5.00					150.6	0.199	20	

The following samples were analyzed in this batch: HS18030365-01 HS18030365-02 HS18030365-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312306 **Instrument: ICS2100** **Method: SW9056**

MBLK Sample ID: **WBLKW1-030818** Units: **mg/L** Analysis Date: **09-Mar-2018 00:02**
Client ID: Run ID: **ICS2100_312306** SeqNo: **4469079** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.250	0.500								U
Nitrogen, Nitrate (As N)	0.0500	0.100								U
Nitrogen, Nitrite (As N)	0.0500	0.100								U
Sulfate	0.250	0.500								U

LCS Sample ID: **WLCSW1-030818** Units: **mg/L** Analysis Date: **09-Mar-2018 00:16**
Client ID: Run ID: **ICS2100_312306** SeqNo: **4469080** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.53	0.500	20	0	103	80 - 120				
Nitrogen, Nitrate (As N)	4.153	0.100	4	0	104	80 - 120				
Nitrogen, Nitrite (As N)	4.287	0.100	4	0	107	80 - 120				
Sulfate	20.79	0.500	20	0	104	80 - 120				

LCSD Sample ID: **WLCSDW1-030818** Units: **mg/L** Analysis Date: **09-Mar-2018 00:31**
Client ID: Run ID: **ICS2100_312306** SeqNo: **4469081** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.97	0.500	20	0	99.9	80 - 120	20.53	2.77	20	
Nitrogen, Nitrate (As N)	4.126	0.100	4	0	103	80 - 120	4.153	0.652	20	
Nitrogen, Nitrite (As N)	4.233	0.100	4	0	106	80 - 120	4.287	1.27	20	
Sulfate	20.81	0.500	20	0	104	80 - 120	20.79	0.0673	20	

MS Sample ID: **HS18030366-03MS** Units: **mg/L** Analysis Date: **09-Mar-2018 04:24**
Client ID: Run ID: **ICS2100_312306** SeqNo: **4469095** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	61.04	0.500	10	49.24	118	80 - 120				O
Nitrogen, Nitrate (As N)	2.111	0.100	2	0	106	80 - 120				
Nitrogen, Nitrite (As N)	2.122	0.100	2	0.067	103	80 - 120				
Sulfate	51.89	0.500	10	40.12	118	80 - 120				O

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312306 **Instrument: ICS2100** **Method: SW9056**

MSD Sample ID: **HS18030366-03MSD** Units: **mg/L** Analysis Date: **09-Mar-2018 04:38**
Client ID: Run ID: **ICS2100_312306** SeqNo: **4469096** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	60.9	0.500	10	49.24	117	80 - 120	61.04	0.23	20	O
Nitrogen, Nitrate (As N)	2.052	0.100	2	0	103	80 - 120	2.111	2.83	20	
Nitrogen, Nitrite (As N)	2.184	0.100	2	0.067	106	80 - 120	2.122	2.88	20	
Sulfate	51.71	0.500	10	40.12	116	80 - 120	51.89	0.349	20	O

The following samples were analyzed in this batch: HS18030365-01 HS18030365-02 HS18030365-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312697 **Instrument: WetChem_HS** **Method: E376.1**

MBLK Sample ID: **MBLK-312697** Units: **mg/L** Analysis Date: **13-Mar-2018 17:05**
Client ID: Run ID: **WetChem_HS_312697** SeqNo: **4478369** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	1.00	1.00								U

LCS Sample ID: **LCS-312697** Units: **mg/L** Analysis Date: **13-Mar-2018 17:05**
Client ID: Run ID: **WetChem_HS_312697** SeqNo: **4478370** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	23.36	1.00	25	0	93.4	80 - 120				

LCSD Sample ID: **LCSD-312697** Units: **mg/L** Analysis Date: **13-Mar-2018 17:05**
Client ID: Run ID: **WetChem_HS_312697** SeqNo: **4478371** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	23.16	1.00	25	0	92.6	80 - 120	23.36	0.86	20	

MS Sample ID: **HS18030365-03MS** Units: **mg/L** Analysis Date: **13-Mar-2018 17:05**
Client ID: **35AWW11-030718** Run ID: **WetChem_HS_312697** SeqNo: **4478372** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.76	1.00	25	-0.44	92.8	80 - 120				

The following samples were analyzed in this batch: HS18030365-01 HS18030365-02 HS18030365-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030365

QC BATCH REPORT

Batch ID: R312878 **Instrument: TOC_02** **Method: E415.1**

MBLK Sample ID: **WBLKW1-032018** Units: **mg/L** Analysis Date: **20-Mar-2018 19:47**
Client ID: Run ID: **TOC_02_312878** SeqNo: **4482712** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **WLCSW1-032018** Units: **mg/L** Analysis Date: **20-Mar-2018 20:03**
Client ID: Run ID: **TOC_02_312878** SeqNo: **4482713** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.15	1.00	10	0	102	80 - 120				

LCSD Sample ID: **WLCSDW1-032018** Units: **mg/L** Analysis Date: **20-Mar-2018 20:18**
Client ID: Run ID: **TOC_02_312878** SeqNo: **4482714** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.34	1.00	10	0	103	80 - 120	10.15	1.85	20	

MS Sample ID: **HS18030472-05MS** Units: **mg/L** Analysis Date: **20-Mar-2018 23:17**
Client ID: Run ID: **TOC_02_312878** SeqNo: **4482726** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.7	1.00	10	1.447	92.5	80 - 120				

The following samples were analyzed in this batch: HS18030365-01 HS18030365-02 HS18030365-03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS18030365**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Group Houston, Corp Date: 30-Mar-18

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18030365

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	WET228
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	Sub
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	Sub
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	B040
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	MET008
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	MET008
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	WET228
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	WET228
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	Sub
HS18030365-01	35AWW20-030718	Login	3/8/2018 12:31:44 PM	JML	WET228
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	WET228
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	Sub
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	Sub
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	B040
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	MET008
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	MET008
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	WET228
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	WET228
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	Sub
HS18030365-02	LHSMW07-030718	Login	3/8/2018 12:31:44 PM	JML	WET228
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	WET228
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	Sub
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	Sub
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	B040
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	MET008
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	MET008
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	WET228
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	WET228
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	Sub
HS18030365-03	35AWW11-030718	Login	3/8/2018 12:31:45 PM	JML	WET228
HS18030365-04	Trip Blank	Login	3/8/2018 12:31:45 PM	JML	B040

00897696

Date: 30-Mar-18

Sample Receipt Checklist

Client Name:	Bhate Environmental	Date/Time Received:	**08-Mar-2018 09:30**
Work Order:	HS18030365	Received by:	**RPG**

Checklist completed by: *Paresh M. Giga* (eSignature) 8-Mar-2018 (Date)

Reviewed by: (eSignature) (Date)

Matrices: **Groundwater/Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.8c/1.2c U/c	IR30	
Cooler(s)/Kit(s):	9221		
Date/Time sample(s) sent to storage:	3/8/18 13:15		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: No CO2 neat vials received. Split into neat vials for CO2 analysis

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00897697

bhate
ENVIRONMENTAL CONSTRUCTION ENLIGN

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	TOC	MEE / CO2	Anions / Alkalinity	Sulfide	Phosphorous	Dissolved Mn & Fe	Total Mn & Fe			Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
Sample Analysis Requested (5)																			Quality Assurance Samples (6)			
35AWW20_030718		07 MAR 2018	1000	-	N		WG	12	X	X	X	X	X	X	X	X						
35AWS14SMW07_030718		07 MAR 2018	1110	-	N		WG	12	X	X	X	X	X	X	X	X						
35AWW11_030718		07 MAR 2018	1225	-	N		WG	12	X	X	X	X	X	X	X	X						
Trip Blank		07 MAR 2018			TB		W	2	X													
				-																		
				-																		
				-																		
				-																		
				-																		
				-																		

HS18030365
Bhate Environmental Associates, Inc.
LHAAP-58

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	3/7/18	1430	1. R Cuss	3/8/18	09:30
2.			2.		TEMP 0-6C
3.			3.		ice 30 of 10-4
					COC = 9221

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

00897698

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

9221

CUSTODY SEAL

Date: 3/7/18 Time: 1430
Name: Scott Beasley
Company: BHATS

Seal Broken By: SM
Date: 03/08/18

9221 MAR 0 8 2018

FedEx
TRK# 0221 7376 9752 7543

THU - 08 MAR 10:30A
PRIORITY OVERNIGHT

AB SGRA 9221

77099
TX-US
IAH

FID 162705 07MAR18 GGGA 546C1/07F5/0C0A

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
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www.alsglobal.com

LABORATORY REPORT

March 29, 2018

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS18030365

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on March 9, 2018. For your reference, these analyses have been assigned our service request number P1801149.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Kelly Horiuchi at 3:18 pm, Mar 29, 2018

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: ALS Laboratory Group
Project: HS18030365

Service Request No: P1801149

CASE NARRATIVE

The samples were received intact under chain of custody on March 9, 2018 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

Three of the samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

Methane, Ethene and Ethane Analysis

The other three samples were analyzed for methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1347317
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-17-8
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA016272017-8
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS18030365

Service Request: P1801149

Date Received: 3/9/2018
Time Received: 09:15

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - Gases	RSK 175 - CO2
35AWW20-030718	P1801149-001	Water	3/7/2018	10:00	X	
35AWW20-030718	P1801149-002	Water	3/7/2018	10:00		X
LHSMW07-030718	P1801149-003	Water	3/7/2018	11:10	X	
LHSMW07-030718	P1801149-004	Water	3/7/2018	11:10		X
35AWW11-030718	P1801149-005	Water	3/7/2018	12:25	X	
35AWW11-030718	P1801149-006	Water	3/7/2018	12:25		X

P1801149

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 8725

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18030365
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18030365-01**	**35AWW20-030718**	**Groundwater**	**07 Mar 2018 10:00**
	MEE plus CO2 Sub to ALS SimiValley			22 Mar 2018
2.	**HS18030365-02**	**LHSMW07-030718**	**Groundwater**	**07 Mar 2018 11:10**
	MEE plus CO2 Sub to ALS SimiValley			22 Mar 2018
3.	**HS18030365-03**	**35AWW11-030718**	**Groundwater**	**07 Mar 2018 12:25**
	MEE plus CO2 Sub to ALS SimiValley			22 Mar 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above. HCL vials for MEE. Neat Vials for CO2

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Modashia Date/Time: 3/8/18 18:00

Received By: Date/Time: 3-9-18 0915 2° WT ICE

Cooler ID(s): Temperature(s):

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1801149

Project: HS18030365

Sample(s) received on: 3/9/18 Date opened: 3/9/18 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: ° C Blank Temperature: 2° C **Wet Ice**			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? _____ Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☒	☐	☐
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1801149-001.01	40ml VOA HCL		1		A	MC 3/14/2018
P1801149-001.02	40ml VOA HCL				A	
P1801149-002.01	40mL VOA NP		7		A	MC 3/13/2018
P1801149-002.02	40mL VOA NP				A	
P1801149-003.01	40ml VOA HCL		1		A	MC 3/14/2018
P1801149-003.02	40ml VOA HCL				A	
P1801149-004.01	40mL VOA NP		7		A	MC 3/13/2018
P1801149-004.02	40mL VOA NP				A	
P1801149-005.01	40ml VOA HCL		1		A	MC 3/14/2018
P1801149-005.02	40ml VOA HCL				A	
P1801149-006.01	40mL VOA NP		7		A	MC 3/13/2018
P1801149-006.02	40mL VOA NP				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS18030365** ALS Project ID: P1801149

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD Date(s) Collected: 3/7/18
Analyst: Mike Conejo Date Received: 3/9/18
Matrix: Water Date Analyzed: 3/13/18
Test Notes:

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
35AWW20-030718	P1801149-002	0.10	**370,000**	1,000	760	370	
LHSMW07-030718	P1801149-004	0.10	**350,000**	1,000	760	370	
35AWW11-030718	P1801149-006	0.10	**360,000**	1,000	760	370	
Method Control Sample	P180313-MB	0.10	760	1,000	760	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P1801149
Client Project ID: **HS18030365** ALS Sample ID: P180313-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Mike Conejo Date Analyzed: 3/13/18
Matrix: Water Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result[1] LCS ug/L	Result[1] DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	20,400	21,300	**89**	**93**	80-122	4	15	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW20-030718**
Client Project ID: **HS18030365**

ALS Project ID: P1801149
ALS Sample ID: P1801149-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: 3/7/18
Date Received: 3/9/18
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **LHSMW07-030718**
Client Project ID: **HS18030365**

ALS Project ID: P1801149
ALS Sample ID: P1801149-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: 3/7/18
Date Received: 3/9/18
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**3.0**	1.3	1.0	0.51	
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW11-030718**
Client Project ID: **HS18030365**

ALS Project ID: P1801149
ALS Sample ID: P1801149-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: 3/7/18
Date Received: 3/9/18
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	**16**	1.3	1.0	0.51	
74-85-1	Ethene	**0.38**	1.0	0.55	0.24	**J**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample** ALS Project ID: P1801149
Client Project ID: **HS18030365** ALS Sample ID: P180314-MB

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/FID Date Received: NA
Analyst: Mike Conejo Date Analyzed: 3/14/18
Matrix: Water Volume(s) Analyzed: 0.10 ml(s)
Test Notes:

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS18030365**

ALS Project ID: P1801149
ALS Sample ID: P180314-LCS
P180314-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result[1] LCS µg/L	Result[1] DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.50	2.31	2.33	**92**	**93**	73-125	1	12	
74-85-1	Ethene	4.37	4.82	4.84	**110**	**111**	72-133	0.9	7	
74-84-0	Ethane	4.69	4.70	4.81	**100**	**103**	74-131	3	6	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

March 26, 2018 Service Re uest No:R1802037

R Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: LHAAP / Site 58 HS18030365

Dear R ,

Enclosed are the results of the sample(s) submitted to our laboratory March 08, 2018
For your reference, these analyses have been assigned our service re uest number **R1802037.**

All analyses were performed according to our laboratory s uality assurance program. The test results meet re uirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as C failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any uestions. My extension is 7472. ou may also contact me via email at anice. aeger alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

anice aeger
Pro ect Manager

ADDRESS 1565 efferson Road, Building 300, Suite 360, Rochester, N 14623
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dba ALS Environmental

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Narrative Documents

ALS Environmental—Rochester Laboratory
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1565 Jefferson Rd, Building 300, Rochester, NY 14623 | 585-288-5380 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: LHAAP / Site 58 HS18030365
Sample Matrix: Water

Service Request: R1802037
Date Received: 03/08/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV, validation deliverables including all summary forms and associated raw data. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 03/08/2018. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at 6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

Semivoa GC:

Method Organic Acids, 03/14/2018: The upper control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question above the Method Reporting Limit (MRL). Since the exceedance equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Method Organic Acids, 03/14/2018: The upper control criterion was exceeded for one or more analytes in the Laboratory Control Sample (LCS). There were no detections of the analyte(s) in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.

General Chemistry:

Ferrous Iron was analyzed upon receipt in the laboratory.

Approved by _____ Date 03/26/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: 35AWW20_030718			Lab ID: R1802037-001			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.69		0.03	0.10	mg/L	SM 3500-Fe B.4.c

CLIENT ID: LHSMW07_030718			Lab ID: R1802037-002			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.07		0.03	0.10	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW11_030718			Lab ID: R1802037-003			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.10		0.03	0.10	mg/L	SM 3500-Fe B.4.c

Sample Receipt Information

ALS Environmental—Rochester Laboratory
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Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: ALS Environmental - US **Service Request:**R1802037

Project: LHAAP / Site 58 HS18030365/N 01312.0150

SAMPLE CROSS-REFERENCE

SAMPLE	CLIENT SAMPLE ID	DATE	TIME
R1802037-001	35A 20 030718	3/7/2018	1000
R1802037-002	LHSM 07 030718	3/7/2018	1110
R1802037-003	35A 11 030718	3/7/2018	1225

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Sample Analysis Requested (5): Number of containers	VFA	Ferrous Iron	Quality Assurance Samples (6): Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AMW20_030718		07 MAR2018	1000	-	N		WG	2	✓	✓				
LHSMW07_030718		07 MAR2018	1110	-	N		WG	2	✓	✓				
35AMW11_030718		07 MAR2018	1225	-	N		WG	2	✓	✓				
				-										
				-										
				-										
				-										
				-										
				-										
				-										
				-										

R1802037 5
ALS Group USA, Corp.
LHAAP / Site 58

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (Signed)	Date	Time
1.	Scott Beesinger	3/7/18	1430		3-8-18	
2.						1010S
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

00897722

Cooler Receipt and Preservation Check Form

R1802037 5

ALS Group USA, Corp.
LHAAP / Site 58

Project/Client Bhate Environmental Folder Number RB-2037

Cooler received on 3-8-18 by: ME

COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	(Y)	N
2	**Custody papers** properly completed (ink, signed)?	(Y)	N
3	Did all bottles arrive in good **condition** (unbroken)?	(Y)	N
4	Circle: (**Wet Ice**) **Dry Ice** **Gel packs** present?	(Y)	N

5a	**Perchlorate** samples have required headspace?	Y	N	(NA)
5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y	N	(NA)
6	Where did the bottles originate?	(ALS/ROC)	(CLIENT)	
7	Soil VOA received as: Bulk Encore 5035set	(NA)		

8. Temperature Readings Date: 3-8-18 Time: 10:35 ID: (IR#7) IR#9 From: (Temp Blank) Sample Bottle

Observed Temp (°C)	1.4						
Correction Factor (°C)	0						
Corrected Temp (°C)	1.4						
Temp from:Type of bottle	—						
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R-002 by ME on 3-8-18 at 10:38
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown: Date: 3/8/18 Time: 1710 by: DAW

9. Were all bottle labels complete (*i.e.* analysis, preservation, etc.)? (YES) NO
10. Did all bottle labels and tags agree with custody papers? (YES) NO
11. Were correct containers used for the tests indicated? (YES) NO
12. Were 5035 vials acceptable (no extra labels, not leaking)? YES NO (N/A)
13. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated (N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
Residual Chlorine (-)		For CN Phenol and 522			If +, contact PM to add $Na_2S_2O_3$ (CN), ascorbic (phenol).					
		$Na_2S_2O_3$	-	-						
		ZnAcetate	-	-						
		HCl	**	**						

**Not to be tested before analysis – pH tested and recorded by VOAs on a separate worksheet

Bottle lot numbers: 101607-1BMC

Explain all Discrepancies/ Other Comments:

CLRES	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: DAW

PC Secondary Review: JMW 3/9/18

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1802037
Project: LHAAP / Site 58 HS18030365/NW01312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1802037-001.01					
	SM 3500-Fe B.4.c				
		3/8/2018	1730	SMO / DWARD	
		3/13/2018	1416	RT000261 / DWARD	
		3/13/2018	1417	R-015 / DWARD	
R1802037-001.02					
	Organic Acids				
		3/8/2018	1730	SMO / DWARD	
		3/8/2018	1730	R-002 / DWARD	
		3/14/2018	1337	In Lab / BALLGEIER	
		3/14/2018	1431	R-002 / BALLGEIER	
R1802037-002.01					
	SM 3500-Fe B.4.c				
		3/8/2018	1730	SMO / DWARD	
		3/13/2018	1416	RT000261 / DWARD	
		3/13/2018	1417	R-015 / DWARD	
R1802037-002.02					
	Organic Acids				
		3/8/2018	1730	SMO / DWARD	
		3/8/2018	1730	R-002 / DWARD	
		3/14/2018	1337	In Lab / BALLGEIER	
		3/14/2018	1431	R-002 / BALLGEIER	
R1802037-003.01					
	SM 3500-Fe B.4.c				
		3/8/2018	1730	SMO / DWARD	
		3/13/2018	1416	RT000261 / DWARD	
		3/13/2018	1417	R-015 / DWARD	
R1802037-003.02					
	Organic Acids				
		3/8/2018	1730	SMO / DWARD	
		3/8/2018	1730	R-002 / DWARD	
		3/14/2018	1337	In Lab / BALLGEIER	
		3/14/2018	1431	R-002 / BALLGEIER	

Miscellaneous Forms

ALS Environmental—Rochester Laboratory
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Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Environmental

REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the ñNotesò column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an ñimmediateò hold time criteria.

Spike was diluted out.

\+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (Ó100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	New Hampshire ID # 294100 A/B
Delaware Approved	New Jersey ID # NY004	
DoD ELAP #65817	New York ID # 10145	Pennsylvania ID# 68-786
Florida ID # E87674	North Carolina #676	Rhode Island ID # 158
		Virginia #460167

[1] Analyses were performed according to our laboratoryôs NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150		

Sample Name:	35AWW20_030718	**Date Collected:**	03/7/18
Lab Code:	R1802037-001	**Date Received:**	03/8/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name:	LHSMW07_030718	**Date Collected:**	03/7/18
Lab Code:	R1802037-002	**Date Received:**	03/8/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name:	35AWW11_030718	**Date Collected:**	03/7/18
Lab Code:	R1802037-003	**Date Received:**	03/8/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

Sample Results

ALS Environmental—Rochester Laboratory
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www.alsglobal.com

Semivolatile Organic Compounds by GC

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	03/07/18 10:00
Sample Matrix:	Water	**Date Received:**	03/08/18 10:05
Sample Name:	35AWW20_030718	**Units:**	mg/L
Lab Code:	R1802037-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 16:39	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 16:39	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 16:39	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 16:39	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 16:39	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	03/07/18 11:10
Sample Matrix:	Water	**Date Received:**	03/08/18 10:05
Sample Name:	LHSMW07_030718	**Units:**	mg/L
Lab Code:	R1802037-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 17:17	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 17:17	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 17:17	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 17:17	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 17:17	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	03/07/18 12:25
Sample Matrix:	Water	**Date Received:**	03/08/18 10:05
Sample Name:	35AWW11_030718	**Units:**	mg/L
Lab Code:	R1802037-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 17:52	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 17:52	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 17:52	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 17:52	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 17:52	

General Chemistry

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	03/07/18 10:00
Sample Matrix:	Water	**Date Received:**	03/08/18 10:05
Sample Name:	35AWW20_030718	**Basis:**	NA
Lab Code:	R1802037-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.69**	mg/L	0.10	0.08	0.03	1	03/08/18 16:32	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	03/07/18 11:10
Sample Matrix:	Water	**Date Received:**	03/08/18 10:05
Sample Name:	LHSMW07_030718	**Basis:**	NA
Lab Code:	R1802037-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.07 J**	mg/L	0.10	0.08	0.03	1	03/08/18 16:32	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	03/07/18 12:25
Sample Matrix:	Water	**Date Received:**	03/08/18 10:05
Sample Name:	35AWW11_030718	**Basis:**	NA
Lab Code:	R1802037-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.10 J**	mg/L	0.10	0.08	0.03	1	03/08/18 16:32	*

QC Summary Forms

ALS Environmental—Rochester Laboratory
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Semivolatile Organic Compounds by GC

ALS Environmental—Rochester Laboratory
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ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Analyzed:**	03/14/18 14:45
Sample Matrix:	Water		

Method Blank Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	Method Blank	**Instrument ID:**	R-HPLC-05
Lab Code:	RQ1802335-01	**File ID:**	I:\ACQUDATA\hplc05\data\031418\A0001466.D\
Analysis Method:	Organic Acids	**Analysis Lot:**	583688

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1802335-02	I:\ACQUDATA\hplc05\data\031418\A0001467.D\	03/14/18 15:20
Duplicate Lab Control Sample	RQ1802335-03	I:\ACQUDATA\hplc05\data\031418\A0001468.D\	03/14/18 16:01
35AWW20_030718	R1802037-001	I:\ACQUDATA\hplc05\data\031418\A0001469.D\	03/14/18 16:39
LHSMW07_030718	R1802037-002	I:\ACQUDATA\hplc05\data\031418\A0001470.D\	03/14/18 17:17
35AWW11_030718	R1802037-003	I:\ACQUDATA\hplc05\data\031418\A0001471.D\	03/14/18 17:52

ALS Group USA, Corp.
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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ1802335-01	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result		LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND	U	0.20	0.10	0.016	1	03/14/18 14:45	
Acetic Acid	ND	U	4.0	2.0	1.0	1	03/14/18 14:45	
Butanoic Acid (Butyric Acid)	ND	U	2.0	1.0	0.32	1	03/14/18 14:45	
Lactic Acid	ND	U	2.0	1.0	0.14	1	03/14/18 14:45	
Propionic Acid	ND	U	2.0	1.0	0.19	1	03/14/18 14:45	

ALS Group USA, Corp.
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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58 HS18030365/NW01312.0150
Sample Matrix: Water

Service Request: R1802037
Date Analyzed: 03/14/18 15:20

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Lab Control Sample
Lab Code: RQ1802335-02

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\031418\A0001467.D\

Analysis Method: Organic Acids
Analysis Lot:583688

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1802335-01	I:\ACQUDATA\hplc05\data\031418\A0001466.D\	03/14/18 14:45
Duplicate Lab Control Sample	RQ1802335-03	I:\ACQUDATA\hplc05\data\031418\A0001468.D\	03/14/18 16:01
35AWW20_030718	R1802037-001	I:\ACQUDATA\hplc05\data\031418\A0001469.D\	03/14/18 16:39
LHSMW07_030718	R1802037-002	I:\ACQUDATA\hplc05\data\031418\A0001470.D\	03/14/18 17:17
35AWW11_030718	R1802037-003	I:\ACQUDATA\hplc05\data\031418\A0001471.D\	03/14/18 17:52

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58 HS18030365/NW01312.0150
Sample Matrix: Water

Service Request: R1802037
Date Analyzed: 03/14/18

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample			Duplicate Lab Control Sample					
		RQ1802335-02			RQ1802335-03					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	1.98	2.04	97	1.98	2.04	97	70-130	<1	30
Acetic Acid	Organic Acids	19.8	20.0	99	19.8	20.0	99	70-130	<1	30
Butanoic Acid (Butyric Acid)	Organic Acids	20.8	20.1	104	20.6	20.1	103	70-130	<1	30
Lactic Acid	Organic Acids	18.6	20.0	93	18.6	20.0	93	70-130	<1	30
Propionic Acid	Organic Acids	30.6	20.0	153 *	30.3	20.0	151 *	70-130	<1	30

General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1802037-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	ND U	mg/L	0.10	0.08	0.03	1	03/08/18 16:32	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1802037
Project:	LHAAP / Site 58 HS18030365/NW01312.0150	**Date Collected:**	03/07/18
Sample Matrix:	Water	**Date Received:**	03/08/18
		Date Analyzed:	03/8/18

Duplicate Matrix Spike Summary
Iron, Divalent (Ferrous Iron)

Sample Name:	LHSMW07_030718	**Units:**	mg/L
Lab Code:	R1802037-002	**Basis:**	NA
Analysis Method:	SM 3500-Fe B.4.c		

		Matrix Spike R1802037-002MS			Duplicate Matrix Spike R1802037-002DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Iron, Divalent (Ferrous Iron)	0.07 J	0.74	0.40	167 *	0.72	0.40	162 *	67-129	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP / Site 58 HS18030365/NW01312.0150
Sample Matrix: Water

Service Request: R1802037
Date Analyzed: 03/08/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1802037-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	0.418	0.40	105	67-129

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**R1802037
Project: LHAAP / Site 58 HS18030365/NW01312.0150

Continuing Calibration Blank (CCB) Summary
Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	584246	RQ1802611-02	03/08/18 16:32	0.10	0.08	0.03	ND	U
CCB2	584246	RQ1802611-05	03/08/18 16:32	0.10	0.08	0.03	ND	U

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** R1802037
Project: LHAAP / Site 58 HS18030365/NW01312.0150

Continuing Calibration Verification (CCV) Summary

Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	584246	RQ1802611-01	03/08/18 16:32	2.00	2.09	105	90-110
CCV2	584246	RQ1802611-06	03/08/18 16:32	2.00	2.08	104	90-110

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client: RJ Modashia
ALS Laboratory Group
10450 Stancliff Rd
Suite 210
Houston, TX 77040

Phone: 281-575-2279

Fax:

Identifier: 035PC **Date Rec:** 03/08/2018 **Report Date:** 03/14/2018

Client Project #: NWD1312.0150 **Client Project Name:** LHAAP-58

Purchase Order #: HS18030365

Analysis Requested: CENSUS

Reviewed By:

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP-58

MI Project Number: **035PC**
Date Received: 03/08/2018

Sample Information

Client Sample ID:		**35AWW20_030718**	**LHSMW07_030718**	**35AWW11_030718**
Sample Date:		03/07/2018	03/07/2018	03/07/2018
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS
Dechlorinating Bacteria				
Dehalococcoides	*DHC*	**5.50E+00**	**1.18E+01**	**6.00E-01**
tceA Reductase	TCE	<5.00E-01	<5.00E-01	<5.00E-01
BAV1 Vinyl Chloride Reductase	BVC	<5.00E-01	<5.00E-01	<5.00E-01
Vinyl Chloride Reductase	VCR	<5.00E-01	<5.00E-01	<5.00E-01
Dehalobacter spp.	*DHBt*	**1.12E+03**	<4.80E+00	<5.00E+00

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **3/8/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
BVC	03/08/2018	03/14/2018	0 °C	102%	non-detect	non-detect
TCE	03/08/2018	03/14/2018	0 °C	101%	non-detect	non-detect
VCR	03/08/2018	03/14/2018	0 °C	103%	non-detect	non-detect
DHBt	03/08/2018	03/14/2018	0 °C	106%	non-detect	non-detect
DHC	03/08/2018	03/14/2018	0 °C	104%	non-detect	non-detect

00897753

REPORT TO:
Name: MARCIA OLIVE
Company: BHATE
Address: 445 UNION BLVD. STE 129
LAKEWOOD, CO. 80228
email: molive@BHATE.com
Phone: 205-918-4000
Fax:

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)
Name:
Company:
Address:
email:
Phone:
Fax:

microbialinsights
10515 Research Dr
Knoxville, TN 37932
865-573-8188
www.microbe.com

Project Manager: Kim Nemmers
Project Name: LHAAP-58
Project No.: NW01312.0150

Purchase Order No.
Subcontract No.
MI Quote No.

Please Check One:
☑ More samples to follow
☐ No Additional Samples

Report Type: ☑ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (30%)
EDD type: ☐ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information					Analyses					CENSUS: Please select the target organism/gene																								
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tca, vcr)	DHBt (Dehalobacter)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Denitrifiers-nirS and nirK)	AOB (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
035PC1	35AWW20_030718	3/7/18	1000	W						✓		✓																						
2	LHSMW07_030718	3/7/18	1110	W						✓		✓																						
3	35AWW11_030718	3/7/18	1225	W						✓		✓																						

Relinquished by: Sara Bissey 3/7/18 1430
Received by: [illegible] Date 3/8/18 9:44

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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F: +1 281 530 5887

March 30, 2018

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS18030472**

Laboratory Results for: **LHAAP-58**

Dear Marcia,

ALS Environmental received 6 sample(s) on Mar 09, 2018 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18030472

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18030472-01	35AWW19_030818	Water		08-Mar-2018 08:15	09-Mar-2018 08:50	☐
HS18030472-02	35AWW06_030818	Water		08-Mar-2018 09:30	09-Mar-2018 08:50	☐
HS18030472-03	35AWW06_030818_a	Water		08-Mar-2018 09:30	09-Mar-2018 08:50	☐
HS18030472-04	35AWW23_030818	Water		08-Mar-2018 11:00	09-Mar-2018 08:50	☐
HS18030472-05	35AWW24_030818	Water		08-Mar-2018 12:10	09-Mar-2018 08:50	☐
HS18030472-06	Trip Blank	Water	ALS-021518-48	08-Mar-2018 00:00	09-Mar-2018 08:50	☐

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18030472

CASE NARRATIVE

Work Order Comments

- The analyses for DHC/DHB were subcontracted to Microbial Insights in Knoxville, TN. Final Report attached.
- The analyses for Ferrous Iron and Volatile Fatty Acids were subcontracted to ALS Environmental in Rochester, NY. Final Report attached.
- The analyses for RSK-175 Dissolved Gases and CO2 were subcontracted to ALS Environmental in Simi Valley, CA. Final Report attached.

GCMS Volatiles by Method SW8260

Batch ID: R312915

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R312659

Sample ID: 35AWW19_030818 (HS18030472-01MS)

- MS and/or MSD recovered outside control limits for multiple compounds

Metals by Method SW6020

Batch ID: 126134

Sample ID: HS18030365-01MS

- MS and MSD are for an unrelated sample

Batch ID: 126131

Sample ID: 35AWW06_030818 (HS18030472-02MSD)

- Manganese failed on the MSD but passed on the MS and PDS.

WetChemistry by Method E415.1

Batch ID: R312878

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R312607

Sample ID: 35AWW24_030818 (HS18030472-05MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Chloride,Sulfate)

Sample ID: CCB

- All reported samples bracketed by this CCB are 10 times greater than the Chloride and Sulfate content in this CCB.

WetChemistry by Method E376.1

Batch ID: R312695

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18030472

CASE NARRATIVE

WetChemistry by Method SM2320B

Batch ID: R312300

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: 126467

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_030818
Collection Date: 08-Mar-2018 08:15

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,1-Dichloroethene	**9.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 15:09
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,2-Dichloroethane	**1.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 15:09
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 15:09
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 15:09
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	16-Mar-2018 15:09
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 15:09
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	16-Mar-2018 15:09
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 15:09
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	16-Mar-2018 15:09
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW19_030818
Collection Date: 08-Mar-2018 08:15

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 15:09
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 15:09
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 15:09
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 15:09
Surr: 1,2-Dichloroethane-d4	*85.6*			**0**	*81-118*	*%REC*	*1*	*16-Mar-2018 15:09*
Surr: 4-Bromofluorobenzene	*97.9*			**0**	*85-114*	*%REC*	*1*	*16-Mar-2018 15:09*
Surr: Dibromofluoromethane	*86.1*			**0**	*80-119*	*%REC*	*1*	*16-Mar-2018 15:09*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*16-Mar-2018 15:09*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Mar-2018		Analyst: JCJ
Iron	**1.52**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	15-Mar-2018 20:34
Manganese	**0.546**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	15-Mar-2018 20:34
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-Mar-2018		Analyst: JDE
Iron	**0.304**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	20-Mar-2018 17:11
Manganese	**0.490**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	20-Mar-2018 17:11
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 21-Mar-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.129**		**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	22-Mar-2018 14:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.

ANALYTICAL REPORT

Project: LHAAP-58

WorkOrder:HS18030472

Sample ID: 35AWW19_030818

Lab ID:HS18030472-01

Collection Date: 08-Mar-2018 08:15

Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	15-Mar-2018 16:58
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: KMU
Organic Carbon, Total	**2.51**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Mar-2018 21:30
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**159**		**5.00**	**5.00**	**5.00**	**mg/L**	1	10-Mar-2018 19:42
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**1,430**		**4.00**	**5.00**	**10.0**	**mg/L**	20	09-Mar-2018 23:15
Nitrogen, Nitrate (As N)	0.0500	U	0.0300	0.0500	0.100	mg/L	1	09-Mar-2018 23:00
Nitrogen, Nitrite (As N)	**5.58**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	09-Mar-2018 23:00
Sulfate	**1,220**		**4.00**	**5.00**	**10.0**	**mg/L**	20	09-Mar-2018 23:15
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Mar-2018 17:41
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Mar-2018 14:54
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS18030472
Sample ID: 35AWW06_030818 Lab ID:HS18030472-02
Collection Date: 08-Mar-2018 09:30 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,1-Dichloroethene	**2.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 17:15
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:15
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 17:15
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	16-Mar-2018 17:15
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:15
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	16-Mar-2018 17:15
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 17:15
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Mar-2018 23:51
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	16-Mar-2018 17:15
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_030818
Collection Date: 08-Mar-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 17:15
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 17:15
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:15
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:15
Surr: 1,2-Dichloroethane-d4	*85.4*			**0**	*81-118*	*%REC*	*1*	*16-Mar-2018 17:15*
Surr: 1,2-Dichloroethane-d4	*85.2*			**0**	*81-118*	*%REC*	*1*	*21-Mar-2018 23:51*
Surr: 4-Bromofluorobenzene	*97.3*			**0**	*85-114*	*%REC*	*1*	*16-Mar-2018 17:15*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*1*	*21-Mar-2018 23:51*
Surr: Dibromofluoromethane	*86.1*			**0**	*80-119*	*%REC*	*1*	*16-Mar-2018 17:15*
Surr: Dibromofluoromethane	*87.6*			**0**	*80-119*	*%REC*	*1*	*21-Mar-2018 23:51*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*16-Mar-2018 17:15*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*21-Mar-2018 23:51*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Mar-2018		Analyst: JCJ
Iron	**0.249**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	15-Mar-2018 14:37
Manganese	**0.236**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	15-Mar-2018 14:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_030818
Collection Date: 08-Mar-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**					Prep:SW3010A / 13-Mar-2018		Analyst: JDE
Iron	**0.0954**	J	**0.0120**	**0.100**	**0.200**	**mg/L**	1	20-Mar-2018 17:17
Manganese	**0.194**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	20-Mar-2018 17:17
PHOSPHORUS BY E365.3	**Method:E365.3**					Prep:E365.3 / 21-Mar-2018		Analyst: MZD
Phosphorus, Total (As P)	0.0250	U	0.0200	0.0250	0.0500	mg/L	1	22-Mar-2018 14:17
SULFIDE BY E376.1	**Method:E376.1**							Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	15-Mar-2018 16:58
TOTAL ORGANIC CARBON BY E415.1	**Method:E415.1**							Analyst: KMU
Organic Carbon, Total	**1.89**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Mar-2018 21:45
ALKALINITY BY SM2320B	**Method:SM2320B**							Analyst: AJH
Alkalinity, Total (As CaCO3)	**666**		**5.00**	**5.00**	**5.00**	**mg/L**	1	10-Mar-2018 19:50
ANIONS BY SW9056A	**Method:SW9056**							Analyst: KMU
Chloride	**1,000**		**4.00**	**5.00**	**10.0**	**mg/L**	20	09-Mar-2018 23:59
Nitrogen, Nitrate (As N)	0.0500	U	0.0300	0.0500	0.100	mg/L	1	09-Mar-2018 23:44
Nitrogen, Nitrite (As N)	**4.12**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	09-Mar-2018 23:44
Sulfate	**1,480**		**4.00**	**5.00**	**10.0**	**mg/L**	20	09-Mar-2018 23:59
SUBCONTRACT ANALYSIS - DHC/DHB	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Mar-2018 17:41
SUBCONTRACT ANALYSIS - FERROUS IRON	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41
SUBCONTRACT ANALYSIS - RSK	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Mar-2018 14:54
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP-58 WorkOrder:HS18030472
Sample ID: 35AWW06_030818_a Lab ID:HS18030472-03
Collection Date: 08-Mar-2018 09:30 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,1-Dichloroethene	**2.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 17:39
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:39
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 17:39
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	16-Mar-2018 17:39
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:39
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	16-Mar-2018 17:39
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 17:39
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	16-Mar-2018 17:39
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_030818_a
Collection Date: 08-Mar-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 17:39
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 17:39
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 17:39
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 17:39
Surr: 1,2-Dichloroethane-d4	*84.1*			**0**	*81-118*	*%REC*	*1*	*16-Mar-2018 17:39*
Surr: 4-Bromofluorobenzene	*95.9*			**0**	*85-114*	*%REC*	*1*	*16-Mar-2018 17:39*
Surr: Dibromofluoromethane	*85.2*			**0**	*80-119*	*%REC*	*1*	*16-Mar-2018 17:39*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*16-Mar-2018 17:39*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Mar-2018		Analyst: JCJ
Iron	**0.196**	J	**0.0120**	**0.100**	**0.200**	**mg/L**	1	15-Mar-2018 20:36
Manganese	**0.226**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	15-Mar-2018 20:36
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-Mar-2018		Analyst: JDE
Iron	**0.0904**	J	**0.0120**	**0.100**	**0.200**	**mg/L**	1	20-Mar-2018 17:19
Manganese	**0.187**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	20-Mar-2018 17:19
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 21-Mar-2018		Analyst: MZD
Phosphorus, Total (As P)	0.0250	U	0.0200	0.0250	0.0500	mg/L	1	22-Mar-2018 14:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW06_030818_a
Collection Date: 08-Mar-2018 09:30

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	15-Mar-2018 16:58
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: KMU
Organic Carbon, Total	**2.32**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Mar-2018 22:01
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**663**		**5.00**	**5.00**	**5.00**	**mg/L**	1	10-Mar-2018 19:57
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**957**		**4.00**	**5.00**	**10.0**	**mg/L**	20	10-Mar-2018 03:08
Nitrogen, Nitrate (As N)	0.0500	U	0.0300	0.0500	0.100	mg/L	1	10-Mar-2018 02:53
Nitrogen, Nitrite (As N)	**3.56**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	10-Mar-2018 02:53
Sulfate	**1,460**		**4.00**	**5.00**	**10.0**	**mg/L**	20	10-Mar-2018 03:08
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Mar-2018 17:41
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Mar-2018 14:54
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP-58
WorkOrder:HS18030472
Sample ID: 35AWW23_030818
Lab ID:HS18030472-04
Collection Date: 08-Mar-2018 11:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,1-Dichloroethane	**8.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 18:04
1,1-Dichloroethene	**13**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 18:04
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:04
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 18:04
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	16-Mar-2018 18:04
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:04
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	16-Mar-2018 18:04
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 18:04
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	16-Mar-2018 18:04
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_030818
Collection Date: 08-Mar-2018 11:00

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
cis-1,2-Dichloroethene	**21**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 18:04
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 18:04
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 18:04
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:04
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Trichloroethene	**27**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 18:04
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:04
Vinyl chloride	**3.1**		**0.20**	**0.50**	**1.0**	**ug/L**	1	16-Mar-2018 18:04
Surr: 1,2-Dichloroethane-d4	*86.7*			**0**	*81-118*	*%REC*	*1*	*16-Mar-2018 18:04*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*1*	*16-Mar-2018 18:04*
Surr: Dibromofluoromethane	*84.1*			**0**	*80-119*	*%REC*	*1*	*16-Mar-2018 18:04*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*16-Mar-2018 18:04*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Mar-2018		Analyst: JCJ
Iron	**0.619**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	15-Mar-2018 20:38
Manganese	**0.502**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	15-Mar-2018 20:38
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-Mar-2018		Analyst: JDE
Iron	0.100	U	0.0120	0.100	0.200	mg/L	1	20-Mar-2018 17:21
Manganese	**0.482**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	20-Mar-2018 17:21
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 21-Mar-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.153**		**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	22-Mar-2018 14:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW23_030818
Collection Date: 08-Mar-2018 11:00

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	15-Mar-2018 16:58
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: KMU
Organic Carbon, Total	**3.31**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Mar-2018 22:46
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**608**		**5.00**	**5.00**	**5.00**	**mg/L**	1	10-Mar-2018 20:03
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**487**		**4.00**	**5.00**	**10.0**	**mg/L**	20	12-Mar-2018 14:19
Nitrogen, Nitrate (As N)	**1.20**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	10-Mar-2018 04:50
Nitrogen, Nitrite (As N)	**2.29**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	10-Mar-2018 04:50
Sulfate	**761**		**4.00**	**5.00**	**10.0**	**mg/L**	20	12-Mar-2018 14:19
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Mar-2018 17:41
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Mar-2018 14:54
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP-58 WorkOrder:HS18030472
Sample ID: 35AWW24_030818 Lab ID:HS18030472-05
Collection Date: 08-Mar-2018 12:10 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:28
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 18:28
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	16-Mar-2018 18:28
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:28
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	16-Mar-2018 18:28
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 18:28
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	16-Mar-2018 18:28
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_030818
Collection Date: 08-Mar-2018 12:10

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 18:28
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 18:28
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 18:28
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 18:28
Surr: 1,2-Dichloroethane-d4	*85.6*			**0**	*81-118*	*%REC*	*1*	*16-Mar-2018 18:28*
Surr: 4-Bromofluorobenzene	*97.4*			**0**	*85-114*	*%REC*	*1*	*16-Mar-2018 18:28*
Surr: Dibromofluoromethane	*85.6*			**0**	*80-119*	*%REC*	*1*	*16-Mar-2018 18:28*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*16-Mar-2018 18:28*
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-Mar-2018		Analyst: JCJ
Iron	**0.475**		**0.0120**	**0.100**	**0.200**	**mg/L**	1	15-Mar-2018 20:41
Manganese	**0.369**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	15-Mar-2018 20:41
DISSOLVED METALS BY SW6020A		**Method:SW6020 (dissolved)**				Prep:SW3010A / 13-Mar-2018		Analyst: JDE
Iron	**0.0358**	J	**0.0120**	**0.100**	**0.200**	**mg/L**	1	20-Mar-2018 17:23
Manganese	**0.374**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	20-Mar-2018 17:23
PHOSPHORUS BY E365.3		**Method:E365.3**				Prep:E365.3 / 21-Mar-2018		Analyst: MZD
Phosphorus, Total (As P)	**0.0240**	J	**0.0200**	**0.0250**	**0.0500**	**mg/L**	1	22-Mar-2018 14:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: 35AWW24_030818
Collection Date: 08-Mar-2018 12:10

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SULFIDE BY E376.1		**Method:E376.1**						Analyst: JHD
Sulfide	1.00	U	1.00	1.00	1.00	mg/L	1	15-Mar-2018 16:58
TOTAL ORGANIC CARBON BY E415.1		**Method:E415.1**						Analyst: KMU
Organic Carbon, Total	**1.45**		**0.500**	**0.500**	**1.00**	**mg/L**	1	20-Mar-2018 23:02
ALKALINITY BY SM2320B		**Method:SM2320B**						Analyst: AJH
Alkalinity, Total (As CaCO3)	**66.5**		**5.00**	**5.00**	**5.00**	**mg/L**	1	10-Mar-2018 20:08
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**119**		**2.00**	**2.50**	**5.00**	**mg/L**	10	09-Mar-2018 21:33
Nitrogen, Nitrate (As N)	**0.110**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	09-Mar-2018 20:49
Nitrogen, Nitrite (As N)	**0.213**		**0.0300**	**0.0500**	**0.100**	**mg/L**	1	09-Mar-2018 20:49
Sulfate	**85.7**		**0.200**	**0.250**	**0.500**	**mg/L**	1	09-Mar-2018 20:49
SUBCONTRACT ANALYSIS - DHC/DHB		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	28-Mar-2018 17:41
SUBCONTRACT ANALYSIS - FERROUS IRON		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-Mar-2018 14:54
SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Mar-2018 15:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 08-Mar-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 13:55
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 13:55
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	16-Mar-2018 13:55
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 13:55
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	16-Mar-2018 13:55
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 13:55
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	16-Mar-2018 13:55
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Sample ID: Trip Blank
Collection Date: 08-Mar-2018 00:00

ANALYTICAL REPORT
WorkOrder:HS18030472
Lab ID:HS18030472-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	16-Mar-2018 13:55
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	16-Mar-2018 13:55
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	16-Mar-2018 13:55
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	16-Mar-2018 13:55
Surr: 1,2-Dichloroethane-d4	*84.5*			**0**	*81-118*	*%REC*	*1*	*16-Mar-2018 13:55*
Surr: 4-Bromofluorobenzene	*95.5*			**0**	*85-114*	*%REC*	*1*	*16-Mar-2018 13:55*
Surr: Dibromofluoromethane	*85.3*			**0**	*80-119*	*%REC*	*1*	*16-Mar-2018 13:55*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*16-Mar-2018 13:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

Batch ID: 126131 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18030472-01	1	10	10 (mL)	1
HS18030472-02	1	10	10 (mL)	1
HS18030472-03	1	10	10 (mL)	1
HS18030472-04	1	10	10 (mL)	1
HS18030472-05	1	10	10 (mL)	1

Batch ID: 126134 **Method:** DISSOLVED METALS BY SW6020A **Prep:** 3010A DISS

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18030472-01	1	10	10 (mL)	1
HS18030472-02	1	10	10 (mL)	1
HS18030472-03	1	10	10 (mL)	1
HS18030472-04	1	10	10 (mL)	1
HS18030472-05	1	10	10 (mL)	1

Batch ID: 126467 **Method:** PHOSPHORUS BY E365.3 **Prep:** P_TW_PR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18030472-01	1	50	50 (mL)	1
HS18030472-02	1	50	50 (mL)	1
HS18030472-03	1	50	50 (mL)	1
HS18030472-04	1	50	50 (mL)	1
HS18030472-05	1	50	50 (mL)	1

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 126131	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15		13 Mar 2018 11:00	15 Mar 2018 20:34	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30		13 Mar 2018 11:00	15 Mar 2018 14:37	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30		13 Mar 2018 11:00	15 Mar 2018 20:36	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00		13 Mar 2018 11:00	15 Mar 2018 20:38	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10		13 Mar 2018 11:00	15 Mar 2018 20:41	1
Batch ID 126134	**Test Name :** DISSOLVED METALS BY SW6020A			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15		13 Mar 2018 11:00	20 Mar 2018 17:11	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30		13 Mar 2018 11:00	20 Mar 2018 17:17	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30		13 Mar 2018 11:00	20 Mar 2018 17:19	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00		13 Mar 2018 11:00	20 Mar 2018 17:21	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10		13 Mar 2018 11:00	20 Mar 2018 17:23	1
Batch ID 126467	**Test Name :** PHOSPHORUS BY E365.3			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15		21 Mar 2018 14:00	22 Mar 2018 14:17	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30		21 Mar 2018 14:00	22 Mar 2018 14:17	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30		21 Mar 2018 14:00	22 Mar 2018 14:17	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00		21 Mar 2018 14:00	22 Mar 2018 14:17	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10		21 Mar 2018 14:00	22 Mar 2018 14:17	1
Batch ID R312300	**Test Name :** ALKALINITY BY SM2320B			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			10 Mar 2018 19:42	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			10 Mar 2018 19:50	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			10 Mar 2018 19:57	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			10 Mar 2018 20:03	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			10 Mar 2018 20:08	1
Batch ID R312607	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			09 Mar 2018 23:15	20
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			09 Mar 2018 23:00	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			09 Mar 2018 23:59	20
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			09 Mar 2018 23:44	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			10 Mar 2018 03:08	20
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			10 Mar 2018 02:53	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			12 Mar 2018 14:19	20
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			10 Mar 2018 04:50	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			09 Mar 2018 21:33	10
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			09 Mar 2018 20:49	1

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R312659	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			16 Mar 2018 15:09	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			16 Mar 2018 17:15	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			16 Mar 2018 17:39	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			16 Mar 2018 18:04	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			16 Mar 2018 18:28	1
HS18030472-06	Trip Blank	08 Mar 2018 00:00			16 Mar 2018 13:55	1
Batch ID R312695	**Test Name :** SULFIDE BY E376.1			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			15 Mar 2018 16:58	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			15 Mar 2018 16:58	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			15 Mar 2018 16:58	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			15 Mar 2018 16:58	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			15 Mar 2018 16:58	1
Batch ID R312878	**Test Name :** TOTAL ORGANIC CARBON BY E415.1			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			20 Mar 2018 21:30	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			20 Mar 2018 21:45	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			20 Mar 2018 22:01	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			20 Mar 2018 22:46	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			20 Mar 2018 23:02	1
Batch ID R312915	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			21 Mar 2018 23:51	1
Batch ID R313033	**Test Name :** SUBCONTRACT ANALYSIS - RSK			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			23 Mar 2018 14:54	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			23 Mar 2018 14:54	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			23 Mar 2018 14:54	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			23 Mar 2018 14:54	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			23 Mar 2018 14:54	1
Batch ID R313295	**Test Name :** SUBCONTRACT ANALYSIS - DHC/DHB			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			28 Mar 2018 17:41	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			28 Mar 2018 17:41	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			28 Mar 2018 17:41	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			28 Mar 2018 17:41	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			28 Mar 2018 17:41	1

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R313455	**Test Name :** SUBCONTRACT ANALYSIS - VOLATILE FATTY ACIDS			**Matrix:** Water		
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			30 Mar 2018 15:41	1
HS18030472-01	35AWW19_030818	08 Mar 2018 08:15			30 Mar 2018 15:41	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			30 Mar 2018 15:41	1
HS18030472-02	35AWW06_030818	08 Mar 2018 09:30			30 Mar 2018 15:41	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			30 Mar 2018 15:41	1
HS18030472-03	35AWW06_030818_a	08 Mar 2018 09:30			30 Mar 2018 15:41	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			30 Mar 2018 15:41	1
HS18030472-04	35AWW23_030818	08 Mar 2018 11:00			30 Mar 2018 15:41	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			30 Mar 2018 15:41	1
HS18030472-05	35AWW24_030818	08 Mar 2018 12:10			30 Mar 2018 15:41	1

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: 126131 **Instrument: ICPMS04** **Method: SW6020**

MBLK Sample ID: **MBLK-126131** Units: **mg/L** Analysis Date: **15-Mar-2018 14:28**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475111** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-126131** Units: **mg/L** Analysis Date: **15-Mar-2018 14:30**
Client ID: Run ID: **ICPMS04_312510** SeqNo: **4475112** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.028	0.200	5	0	101	80 - 120				
Manganese	0.04894	0.00500	0.05	0	97.9	80 - 120				

MS Sample ID: **HS18030472-02MS** Units: **mg/L** Analysis Date: **15-Mar-2018 14:41**
Client ID: **35AWW06_030818** Run ID: **ICPMS04_312510** SeqNo: **4475117** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.792	0.200	5	0.2489	90.9	80 - 120				
Manganese	0.2801	0.00500	0.05	0.2357	88.8	80 - 120				O

MSD Sample ID: **HS18030472-02MSD** Units: **mg/L** Analysis Date: **15-Mar-2018 14:43**
Client ID: **35AWW06_030818** Run ID: **ICPMS04_312510** SeqNo: **4475118** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	4.716	0.200	5	0.2489	89.3	80 - 120	4.792	1.6	20	
Manganese	0.2738	0.00500	0.05	0.2357	76.1	80 - 120	0.2801	2.3	20	SO

PDS Sample ID: **HS18030472-02PDS** Units: **mg/L** Analysis Date: **15-Mar-2018 14:46**
Client ID: **35AWW06_030818** Run ID: **ICPMS04_312510** SeqNo: **4475119** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	8.895	0.200	10	0.2489	86.5	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: 126131 **Instrument: ICPMS04** **Method: SW6020**

PDS Sample ID: **HS18030472-02PDS** Units: **mg/L** Analysis Date: **15-Mar-2018 15:57**
Client ID: **35AWW06_030818** Run ID: **ICPMS04_312510** SeqNo: **4475373** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	0.3109	0.00500	0.1	0.2357	75.1	75 - 125				

SD Sample ID: **HS18030472-02SD** Units: **mg/L** Analysis Date: **15-Mar-2018 14:39**
Client ID: **35AWW06_030818** Run ID: **ICPMS04_312510** SeqNo: **4475116** PrepDate: **13-Mar-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	0.2493	1.00					0.2489	0	10	J
Manganese	0.2312	0.0250					0.2357	1.91	10	

The following samples were analyzed in this batch: HS18030472-01 HS18030472-02 HS18030472-03 HS18030472-04 HS18030472-05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: 126134 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

MBLK Sample ID: **MBLK-126134** Units: **mg/L** Analysis Date: **20-Mar-2018 16:53**
Client ID: Run ID: **ICPMS05_312756** SeqNo: **4481013** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	0.100	0.200								U
Manganese	0.00100	0.00500								U

LCS Sample ID: **LCS-126134** Units: **mg/L** Analysis Date: **20-Mar-2018 16:55**
Client ID: Run ID: **ICPMS05_312756** SeqNo: **4481014** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.152	0.200	5	0	103	80 - 120				
Manganese	0.05024	0.00500	0.05	0	100	80 - 120				

MS Sample ID: **HS18030365-01MS** Units: **mg/L** Analysis Date: **20-Mar-2018 17:01**
Client ID: Run ID: **ICPMS05_312756** SeqNo: **4481017** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.17	0.200	5	0.4629	94.1	75 - 125				
Manganese	1.735	0.00500	0.05	1.729	13.1	75 - 125				SO

MSD Sample ID: **HS18030365-01MSD** Units: **mg/L** Analysis Date: **20-Mar-2018 17:03**
Client ID: Run ID: **ICPMS05_312756** SeqNo: **4481018** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	5.252	0.200	5	0.4629	95.8	75 - 125	5.17	1.58	20	
Manganese	1.754	0.00500	0.05	1.729	50.9	75 - 125	1.735	1.08	20	SO

PDS Sample ID: **HS18030365-01PDS** Units: **mg/L** Analysis Date: **20-Mar-2018 17:05**
Client ID: Run ID: **ICPMS05_312756** SeqNo: **4481019** PrepDate: **13-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Iron	9.775	0.200	10	0.4629	93.1	75 - 125				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: 126134 **Instrument: ICPMS05** **Method: SW6020 (dissolved) (DISSOLVED)**

PDS Sample ID: **HS18030365-01PDS** Units: **mg/L** Analysis Date: **21-Mar-2018 13:00**
Client ID: Run ID: **ICPMS05_312849** SeqNo: **4482372** PrepDate: **13-Mar-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Manganese	2.022	0.0250	0.5	1.552	94.1	75 - 125				

SD Sample ID: **HS18030365-01SD** Units: **mg/L** Analysis Date: **20-Mar-2018 16:59**
Client ID: Run ID: **ICPMS05_312756** SeqNo: **4481016** PrepDate: **13-Mar-2018** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Iron	0.4875	1.00					0.4629	0	10	J

SD Sample ID: **HS18030365-01SD** Units: **mg/L** Analysis Date: **21-Mar-2018 12:58**
Client ID: Run ID: **ICPMS05_312849** SeqNo: **4482371** PrepDate: **13-Mar-2018** DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Manganese	1.534	0.125					1.552	1.13	10	

The following samples were analyzed in this batch: HS18030472-01 HS18030472-02 HS18030472-03 HS18030472-04 HS18030472-05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

MBLK Sample ID: **VBLKW-180316** Units: **ug/L** Analysis Date: **16-Mar-2018 13:06**
Client ID: Run ID: **VOA2_312659** SeqNo: **4477674** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

MBLK Sample ID: **VBLKW-180316** Units: **ug/L** Analysis Date: **16-Mar-2018 13:06**
Client ID: Run ID: **VOA2_312659** SeqNo: **4477674** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	0.50	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.05*	*1.0*	*50*	*0*	*84.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.34*	*1.0*	*50*	*0*	*96.7*	*85 - 114*				
Surr: Dibromofluoromethane	*42.08*	*1.0*	*50*	*0*	*84.2*	*80 - 119*				
Surr: Toluene-d8	*52.32*	*1.0*	*50*	*0*	*105*	*89 - 112*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

LCS Sample ID: **VLCSW-180316** Units: **ug/L** Analysis Date: **16-Mar-2018 12:17**
Client ID: Run ID: **VOA2_312659** SeqNo: **4477672** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	47.23	1.0	50	0	94.5	78 - 124				
1,1,1-Trichloroethane	48.66	1.0	50	0	97.3	74 - 131				
1,1,2,2-Tetrachloroethane	40.32	1.0	50	0	80.6	71 - 121				
1,1,2-Trichloroethane	44.46	1.0	50	0	88.9	80 - 119				
1,1-Dichloroethane	44.71	1.0	50	0	89.4	77 - 125				
1,1-Dichloroethene	46.74	1.0	50	0	93.5	71 - 131				
1,1-Dichloropropene	49.83	1.0	50	0	99.7	79 - 125				
1,2,3-Trichlorobenzene	46.11	1.0	50	0	92.2	69 - 129				
1,2,3-Trichloropropane	42.02	1.0	50	0	84.0	73 - 122				
1,2,4-Trichlorobenzene	47.21	1.0	50	0	94.4	69 - 130				
1,2,4-Trimethylbenzene	47.92	1.0	50	0	95.8	76 - 124				
1,2-Dibromo-3-chloropropane	43.02	1.0	50	0	86.0	62 - 128				
1,2-Dibromoethane	46.94	1.0	50	0	93.9	77 - 121				
1,2-Dichlorobenzene	42.24	1.0	50	0	84.5	80 - 119				
1,2-Dichloroethane	47.83	1.0	50	0	95.7	73 - 128				
1,2-Dichloropropane	45.76	1.0	50	0	91.5	78 - 122				
1,3,5-Trimethylbenzene	48.43	1.0	50	0	96.9	75 - 124				
1,3-Dichlorobenzene	43.72	1.0	50	0	87.4	80 - 119				
1,3-Dichloropropane	43.57	1.0	50	0	87.1	80 - 119				
1,4-Dichlorobenzene	42.53	1.0	50	0	85.1	79 - 118				
2,2-Dichloropropane	46.59	1.0	50	0	93.2	60 - 139				
2-Butanone	92.97	2.0	100	0	93.0	56 - 143				
2-Chlorotoluene	47.14	1.0	50	0	94.3	79 - 122				
2-Hexanone	93.66	2.0	100	0	93.7	57 - 139				
4-Chlorotoluene	47.54	1.0	50	0	95.1	78 - 122				
4-Isopropyltoluene	43.19	1.0	50	0	86.4	77 - 127				
4-Methyl-2-pentanone	86.34	2.0	100	0	86.3	67 - 130				
Acetone	96.25	2.0	100	0	96.2	39 - 160				
Benzene	46.24	1.0	50	0	92.5	79 - 120				
Bromobenzene	41.88	1.0	50	0	83.8	80 - 120				
Bromochloromethane	50.78	1.0	50	0	102	78 - 123				
Bromodichloromethane	49.07	1.0	50	0	98.1	79 - 125				
Bromoform	50.32	1.0	50	0	101	66 - 130				
Bromomethane	50.85	1.0	50	0	102	53 - 141				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

LCS Sample ID: **VLCSW-180316** Units: **ug/L** Analysis Date: **16-Mar-2018 12:17**
Client ID: Run ID: **VOA2_312659** SeqNo: **4477672** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	90.86	2.0	100	0	90.9	64 - 133				
Carbon tetrachloride	47.92	1.0	50	0	95.8	72 - 136				
Chlorobenzene	45.41	1.0	50	0	90.8	80 - 120				
Chloroethane	42.7	1.0	50	0	85.4	82 - 118				
Chloroform	44.24	1.0	50	0	88.5	79 - 124				
Chloromethane	46.84	1.0	50	0	93.7	50 - 139				
cis-1,2-Dichloroethene	48.47	1.0	50	0	96.9	78 - 123				
cis-1,3-Dichloropropene	50.21	1.0	50	0	100	75 - 124				
Dibromochloromethane	48.12	1.0	50	0	96.2	74 - 126				
Dibromomethane	51.61	1.0	50	0	103	79 - 123				
Dichlorodifluoromethane	40.68	1.0	50	0	81.4	32 - 152				
Ethylbenzene	51.29	1.0	50	0	103	79 - 121				
Hexachlorobutadiene	46.29	1.0	50	0	92.6	66 - 134				
Isopropylbenzene	46.53	1.0	50	0	93.1	72 - 131				
m,p-Xylene	89.9	2.0	100	0	89.9	80 - 121				
Methylene chloride	43.13	2.0	50	0	86.3	74 - 124				
Naphthalene	49.17	1.0	50	0	98.3	61 - 128				
n-Butylbenzene	44.74	1.0	50	0	89.5	75 - 128				
n-Propylbenzene	42.11	1.0	50	0	84.2	76 - 126				
o-Xylene	45.86	1.0	50	0	91.7	78 - 122				
sec-Butylbenzene	44.43	1.0	50	0	88.9	77 - 126				
Styrene	45.68	1.0	50	0	91.4	78 - 128				
tert-Butylbenzene	42.92	1.0	50	0	85.8	78 - 124				
Tetrachloroethene	46.83	1.0	50	0	93.7	74 - 129				
Toluene	43.52	1.0	50	0	87.0	80 - 121				
trans-1,2-Dichloroethene	49.3	1.0	50	0	98.6	75 - 124				
trans-1,3-Dichloropropene	52.97	1.0	50	0	106	73 - 127				
Trichloroethene	49.58	1.0	50	0	99.2	79 - 123				
Trichlorofluoromethane	47.28	1.0	50	0	94.6	65 - 141				
Vinyl chloride	45.51	1.0	50	0	91.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.66*	*1.0*	*50*	*0*	*87.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.08*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*41.09*	*1.0*	*50*	*0*	*82.2*	*80 - 119*				
Surr: Toluene-d8	*50.44*	*1.0*	*50*	*0*	*101*	*89 - 112*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

MS Sample ID: **HS18030472-01MS** Units: **ug/L** Analysis Date: **16-Mar-2018 15:58**
Client ID: **35AWW19_030818** Run ID: **VOA2_312659** SeqNo: **4477681** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	43.46	1.0	50	0	86.9	78 - 124				
1,1,1-Trichloroethane	46.73	1.0	50	0	93.5	74 - 131				
1,1,2,2-Tetrachloroethane	37.92	1.0	50	0	75.8	71 - 121				
1,1,2-Trichloroethane	40.81	1.0	50	0	81.6	80 - 119				
1,1-Dichloroethane	43.79	1.0	50	0	87.6	77 - 125				
1,1-Dichloroethene	54.72	1.0	50	9.032	91.4	71 - 131				
1,1-Dichloropropene	46.9	1.0	50	0	93.8	79 - 125				
1,2,3-Trichlorobenzene	40.65	1.0	50	0	81.3	69 - 129				
1,2,3-Trichloropropane	38.96	1.0	50	0	77.9	73 - 122				
1,2,4-Trichlorobenzene	41.37	1.0	50	0	82.7	69 - 130				
1,2,4-Trimethylbenzene	43.59	1.0	50	0	87.2	76 - 124				
1,2-Dibromo-3-chloropropane	41.62	1.0	50	0	83.2	62 - 128				
1,2-Dibromoethane	43.82	1.0	50	0	87.6	77 - 121				
1,2-Dichlorobenzene	38.26	1.0	50	0	76.5	80 - 119				S
1,2-Dichloroethane	43.58	1.0	50	1.942	83.3	73 - 128				
1,2-Dichloropropane	41.62	1.0	50	0	83.2	78 - 122				
1,3,5-Trimethylbenzene	44.04	1.0	50	0	88.1	75 - 124				
1,3-Dichlorobenzene	38.47	1.0	50	0	76.9	80 - 119				S
1,3-Dichloropropane	40.21	1.0	50	0	80.4	80 - 119				
1,4-Dichlorobenzene	37.29	1.0	50	0	74.6	79 - 118				S
2,2-Dichloropropane	44.91	1.0	50	0	89.8	60 - 139				
2-Butanone	92.32	2.0	100	0	92.3	56 - 143				
2-Chlorotoluene	42.52	1.0	50	0	85.0	79 - 122				
2-Hexanone	92.7	2.0	100	0	92.7	57 - 139				
4-Chlorotoluene	42.99	1.0	50	0	86.0	78 - 122				
4-Isopropyltoluene	38.85	1.0	50	0	77.7	77 - 127				
4-Methyl-2-pentanone	85.96	2.0	100	0	86.0	67 - 130				
Acetone	85.8	2.0	100	0	85.8	39 - 160				
Benzene	42.79	1.0	50	0	85.6	79 - 120				
Bromobenzene	37.85	1.0	50	0	75.7	80 - 120				S
Bromochloromethane	46.43	1.0	50	0	92.9	78 - 123				
Bromodichloromethane	44.5	1.0	50	0	89.0	79 - 125				
Bromoform	47.64	1.0	50	0	95.3	66 - 130				
Bromomethane	36.6	1.0	50	0	73.2	53 - 141				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

MS Sample ID: **HS18030472-01MS** Units: **ug/L** Analysis Date: **16-Mar-2018 15:58**
Client ID: **35AWW19_030818** Run ID: **VOA2_312659** SeqNo: **4477681** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	89.2	2.0	100	0	89.2	64 - 133				
Carbon tetrachloride	49.42	1.0	50	0	98.8	72 - 136				
Chlorobenzene	41.46	1.0	50	0	82.9	80 - 120				
Chloroethane	43.86	1.0	50	0	87.7	82 - 118				
Chloroform	41.06	1.0	50	0	82.1	79 - 124				
Chloromethane	40.5	1.0	50	0	81.0	50 - 139				
cis-1,2-Dichloroethene	44.07	1.0	50	0	88.1	78 - 123				
cis-1,3-Dichloropropene	44.61	1.0	50	0	89.2	75 - 124				
Dibromochloromethane	44.38	1.0	50	0	88.8	74 - 126				
Dibromomethane	45.52	1.0	50	0	91.0	79 - 123				
Dichlorodifluoromethane	38.78	1.0	50	0	77.6	32 - 152				
Ethylbenzene	47.94	1.0	50	0	95.9	79 - 121				
Hexachlorobutadiene	37.33	1.0	50	0	74.7	66 - 134				
Isopropylbenzene	43.96	1.0	50	0	87.9	72 - 131				
m,p-Xylene	84.19	2.0	100	0	84.2	80 - 121				
Methylene chloride	38.21	2.0	50	0	76.4	74 - 124				
Naphthalene	44.6	1.0	50	0	89.2	61 - 128				
n-Butylbenzene	39.59	1.0	50	0	79.2	75 - 128				
n-Propylbenzene	38.87	1.0	50	0	77.7	76 - 126				
o-Xylene	42.25	1.0	50	0	84.5	78 - 122				
sec-Butylbenzene	40.11	1.0	50	0	80.2	77 - 126				
Styrene	41.69	1.0	50	0	83.4	78 - 128				
tert-Butylbenzene	39.61	1.0	50	0	79.2	78 - 124				
Tetrachloroethene	45.99	1.0	50	0	92.0	74 - 129				
Toluene	41.1	1.0	50	0	82.2	80 - 121				
trans-1,2-Dichloroethene	45.27	1.0	50	0	90.5	75 - 124				
trans-1,3-Dichloropropene	45.76	1.0	50	0	91.5	73 - 127				
Trichloroethene	47.78	1.0	50	0	95.6	79 - 123				
Trichlorofluoromethane	44.84	1.0	50	0	89.7	65 - 141				
Vinyl chloride	42.85	1.0	50	0	85.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.54*	*1.0*	*50*	*0*	*87.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.42*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*40.9*	*1.0*	*50*	*0*	*81.8*	*80 - 119*				
Surr: Toluene-d8	*51.22*	*1.0*	*50*	*0*	*102*	*89 - 112*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

MSD Sample ID: **HS18030472-01MSD** Units: **ug/L** Analysis Date: **16-Mar-2018 16:23**
Client ID: **35AWW19_030818** Run ID: **VOA2_312659** SeqNo: **4477682** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	42.17	1.0	50	0	84.3	78 - 124	43.46	3.01	20	
1,1,1-Trichloroethane	45.35	1.0	50	0	90.7	74 - 131	46.73	3	20	
1,1,2,2-Tetrachloroethane	38.19	1.0	50	0	76.4	71 - 121	37.92	0.693	20	
1,1,2-Trichloroethane	40.18	1.0	50	0	80.4	80 - 119	40.81	1.54	20	
1,1-Dichloroethane	41.98	1.0	50	0	84.0	77 - 125	43.79	4.24	20	
1,1-Dichloroethene	53.29	1.0	50	9.032	88.5	71 - 131	54.72	2.66	20	
1,1-Dichloropropene	47.67	1.0	50	0	95.3	79 - 125	46.9	1.65	20	
1,2,3-Trichlorobenzene	42.96	1.0	50	0	85.9	69 - 129	40.65	5.53	20	
1,2,3-Trichloropropane	39.21	1.0	50	0	78.4	73 - 122	38.96	0.64	20	
1,2,4-Trichlorobenzene	42.1	1.0	50	0	84.2	69 - 130	41.37	1.75	20	
1,2,4-Trimethylbenzene	43.66	1.0	50	0	87.3	76 - 124	43.59	0.145	20	
1,2-Dibromo-3-chloropropane	41.84	1.0	50	0	83.7	62 - 128	41.62	0.532	20	
1,2-Dibromoethane	43.28	1.0	50	0	86.6	77 - 121	43.82	1.25	20	
1,2-Dichlorobenzene	38.46	1.0	50	0	76.9	80 - 119	38.26	0.517	20	S
1,2-Dichloroethane	43.96	1.0	50	1.942	84.0	73 - 128	43.58	0.862	20	
1,2-Dichloropropane	41.54	1.0	50	0	83.1	78 - 122	41.62	0.195	20	
1,3,5-Trimethylbenzene	44.52	1.0	50	0	89.0	75 - 124	44.04	1.08	20	
1,3-Dichlorobenzene	39.26	1.0	50	0	78.5	80 - 119	38.47	2.02	20	S
1,3-Dichloropropane	39.37	1.0	50	0	78.7	80 - 119	40.21	2.1	20	S
1,4-Dichlorobenzene	37.91	1.0	50	0	75.8	79 - 118	37.29	1.64	20	S
2,2-Dichloropropane	43.11	1.0	50	0	86.2	60 - 139	44.91	4.07	20	
2-Butanone	90.7	2.0	100	0	90.7	56 - 143	92.32	1.77	20	
2-Chlorotoluene	42.31	1.0	50	0	84.6	79 - 122	42.52	0.499	20	
2-Hexanone	93.02	2.0	100	0	93.0	57 - 139	92.7	0.341	20	
4-Chlorotoluene	42.73	1.0	50	0	85.5	78 - 122	42.99	0.61	20	
4-Isopropyltoluene	38.76	1.0	50	0	77.5	77 - 127	38.85	0.239	20	
4-Methyl-2-pentanone	86.29	2.0	100	0	86.3	67 - 130	85.96	0.383	20	
Acetone	86.03	2.0	100	0	86.0	39 - 160	85.8	0.266	20	
Benzene	41.78	1.0	50	0	83.6	79 - 120	42.79	2.38	20	
Bromobenzene	38.2	1.0	50	0	76.4	80 - 120	37.85	0.933	20	S
Bromochloromethane	43.77	1.0	50	0	87.5	78 - 123	46.43	5.9	20	
Bromodichloromethane	43.81	1.0	50	0	87.6	79 - 125	44.5	1.56	20	
Bromoform	46.58	1.0	50	0	93.2	66 - 130	47.64	2.25	20	
Bromomethane	41.19	1.0	50	0	82.4	53 - 141	36.6	11.8	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

MSD Sample ID: **HS18030472-01MSD** Units: **ug/L** Analysis Date: **16-Mar-2018 16:23**
Client ID: **35AWW19_030818** Run ID: **VOA2_312659** SeqNo: **4477682** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	86.07	2.0	100	0	86.1	64 - 133	89.2	3.57	20	
Carbon tetrachloride	45.56	1.0	50	0	91.1	72 - 136	49.42	8.15	20	
Chlorobenzene	41.06	1.0	50	0	82.1	80 - 120	41.46	0.982	20	
Chloroethane	48	1.0	50	0	96.0	82 - 118	43.86	9	20	
Chloroform	39.68	1.0	50	0	79.4	79 - 124	41.06	3.41	20	
Chloromethane	37.43	1.0	50	0	74.9	50 - 139	40.5	7.89	20	
cis-1,2-Dichloroethene	42.71	1.0	50	0	85.4	78 - 123	44.07	3.13	20	
cis-1,3-Dichloropropene	44.11	1.0	50	0	88.2	75 - 124	44.61	1.13	20	
Dibromochloromethane	43.16	1.0	50	0	86.3	74 - 126	44.38	2.77	20	
Dibromomethane	45.18	1.0	50	0	90.4	79 - 123	45.52	0.759	20	
Dichlorodifluoromethane	36.78	1.0	50	0	73.6	32 - 152	38.78	5.31	20	
Ethylbenzene	47	1.0	50	0	94.0	79 - 121	47.94	1.97	20	
Hexachlorobutadiene	37.98	1.0	50	0	76.0	66 - 134	37.33	1.7	20	
Isopropylbenzene	42.71	1.0	50	0	85.4	72 - 131	43.96	2.9	20	
m,p-Xylene	82.12	2.0	100	0	82.1	80 - 121	84.19	2.49	20	
Methylene chloride	36.93	2.0	50	0	73.9	74 - 124	38.21	3.43	20	S
Naphthalene	47.08	1.0	50	0	94.2	61 - 128	44.6	5.41	20	
n-Butylbenzene	39.64	1.0	50	0	79.3	75 - 128	39.59	0.13	20	
n-Propylbenzene	38.91	1.0	50	0	77.8	76 - 126	38.87	0.0939	20	
o-Xylene	41.56	1.0	50	0	83.1	78 - 122	42.25	1.66	20	
sec-Butylbenzene	40.38	1.0	50	0	80.8	77 - 126	40.11	0.659	20	
Styrene	41.18	1.0	50	0	82.4	78 - 128	41.69	1.22	20	
tert-Butylbenzene	39.92	1.0	50	0	79.8	78 - 124	39.61	0.788	20	
Tetrachloroethene	44.23	1.0	50	0	88.5	74 - 129	45.99	3.9	20	
Toluene	39.9	1.0	50	0	79.8	80 - 121	41.1	2.96	20	S
trans-1,2-Dichloroethene	43.82	1.0	50	0	87.6	75 - 124	45.27	3.24	20	
trans-1,3-Dichloropropene	45.71	1.0	50	0	91.4	73 - 127	45.76	0.0971	20	
Trichloroethene	46.64	1.0	50	0	93.3	79 - 123	47.78	2.42	20	
Trichlorofluoromethane	44.64	1.0	50	0	89.3	65 - 141	44.84	0.443	20	
Vinyl chloride	40.98	1.0	50	0	82.0	58 - 137	42.85	4.45	20	
Surr: 1,2-Dichloroethane-d4	*43.11*	*1.0*	*50*	*0*	*86.2*	*81 - 118*	*43.54*	*0.989*	*20*	
Surr: 4-Bromofluorobenzene	*49.75*	*1.0*	*50*	*0*	*99.5*	*85 - 114*	*50.42*	*1.34*	*20*	
Surr: Dibromofluoromethane	*41.21*	*1.0*	*50*	*0*	*82.4*	*80 - 119*	*40.9*	*0.765*	*20*	
Surr: Toluene-d8	*50.8*	*1.0*	*50*	*0*	*102*	*89 - 112*	*51.22*	*0.815*	*20*	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312659 **Instrument: VOA2** **Method: SW8260**

The following samples were analyzed in this batch:				
	HS18030472-01	HS18030472-02	HS18030472-03	HS18030472-04
	HS18030472-05	HS18030472-06		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312915 **Instrument: VOA2** **Method: SW8260**

MBLK Sample ID: **VBLKW-180321** Units: **ug/L** Analysis Date: **21-Mar-2018 22:13**
Client ID: Run ID: **VOA2_312915** SeqNo: **4483532** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.33*	*1.0*	*50*	*0*	*84.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.85*	*1.0*	*50*	*0*	*97.7*	*85 - 114*				
Surr: Dibromofluoromethane	*43.64*	*1.0*	*50*	*0*	*87.3*	*80 - 119*				
Surr: Toluene-d8	*52.82*	*1.0*	*50*	*0*	*106*	*89 - 112*				

LCS Sample ID: **VLCSW-180321** Units: **ug/L** Analysis Date: **21-Mar-2018 21:24**
Client ID: Run ID: **VOA2_312915** SeqNo: **4483530** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	44.16	1.0	50	0	88.3	79 - 120				
Surr: 1,2-Dichloroethane-d4	*43.87*	*1.0*	*50*	*0*	*87.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.86*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*41.88*	*1.0*	*50*	*0*	*83.8*	*80 - 119*				
Surr: Toluene-d8	*50.49*	*1.0*	*50*	*0*	*101*	*89 - 112*				

MS Sample ID: **HS18030822-05MS** Units: **ug/L** Analysis Date: **22-Mar-2018 01:05**
Client ID: Run ID: **VOA2_312915** SeqNo: **4483539** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	44.92	1.0	50	0	89.8	79 - 120				
Surr: 1,2-Dichloroethane-d4	*44.79*	*1.0*	*50*	*0*	*89.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.82*	*1.0*	*50*	*0*	*99.6*	*85 - 114*				
Surr: Dibromofluoromethane	*42.25*	*1.0*	*50*	*0*	*84.5*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312915 **Instrument: VOA2** **Method: SW8260**

MSD Sample ID: **HS18030822-05MSD** Units: **ug/L** Analysis Date: **22-Mar-2018 01:30**
Client ID: Run ID: **VOA2_312915** SeqNo: **4483540** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	41.99	1.0	50	0	84.0	79 - 120	44.92	6.73	20	
Surr: 1,2-Dichloroethane-d4	*43.68*	*1.0*	*50*	*0*	*87.4*	*81 - 118*	*44.79*	*2.51*	*20*	
Surr: 4-Bromofluorobenzene	*49.72*	*1.0*	*50*	*0*	*99.4*	*85 - 114*	*49.82*	*0.201*	*20*	
Surr: Dibromofluoromethane	*42*	*1.0*	*50*	*0*	*84.0*	*80 - 119*	*42.25*	*0.598*	*20*	
Surr: Toluene-d8	*50.29*	*1.0*	*50*	*0*	*101*	*89 - 112*	*49.81*	*0.957*	*20*	

The following samples were analyzed in this batch: HS18030472-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: 126467 **Instrument: UV-2450** **Method: E365.3**

MBLK Sample ID: **MBLK-126467** Units: **mg/L** Analysis Date: **22-Mar-2018 14:17**
Client ID: Run ID: **UV-2450_312946** SeqNo: **4484200** PrepDate: **21-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.0250	0.0500								U

LCS Sample ID: **LCS-126467** Units: **mg/L** Analysis Date: **22-Mar-2018 14:17**
Client ID: Run ID: **UV-2450_312946** SeqNo: **4484199** PrepDate: **21-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.244	0.0500	0.25	0	97.6	80 - 120				

MS Sample ID: **HS18030917-01MS** Units: **mg/L** Analysis Date: **22-Mar-2018 14:17**
Client ID: Run ID: **UV-2450_312946** SeqNo: **4484197** PrepDate: **21-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.345	0.0500	0.25	0.136	83.6	80 - 120				

MSD Sample ID: **HS18030917-01MSD** Units: **mg/L** Analysis Date: **22-Mar-2018 14:17**
Client ID: Run ID: **UV-2450_312946** SeqNo: **4484198** PrepDate: **21-Mar-2018** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total (As P)	0.352	0.0500	0.25	0.136	86.4	80 - 120	0.345	2.01	20	

The following samples were analyzed in this batch: HS18030472-01 HS18030472-02 HS18030472-03 HS18030472-04 HS18030472-05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312300 **Instrument: ManTech01** **Method: SM2320B**

MBLK Sample ID: **WBLKW1-180310** Units: **mg/L** Analysis Date: **10-Mar-2018 16:37**
Client ID: Run ID: **ManTech01_312300** SeqNo: **4468968** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	5.00	5.00								U

LCS Sample ID: **LCS-ALK1-180310** Units: **mg/L** Analysis Date: **10-Mar-2018 16:46**
Client ID: Run ID: **ManTech01_312300** SeqNo: **4468969** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1096	5.00	1000	0	110	85 - 115				

LCSD Sample ID: **LCSD-ALK1-180310** Units: **mg/L** Analysis Date: **10-Mar-2018 16:55**
Client ID: Run ID: **ManTech01_312300** SeqNo: **4468970** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	1097	5.00	1000	0	110	85 - 115	1096	0.135	20	

DUP Sample ID: **HS18030437-01DUP** Units: **mg/L** Analysis Date: **10-Mar-2018 18:40**
Client ID: Run ID: **ManTech01_312300** SeqNo: **4468983** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Total (As CaCO3)	198.9	5.00					198.2	0.337	20	

The following samples were analyzed in this batch: HS18030472-01 HS18030472-02 HS18030472-03 HS18030472-04 HS18030472-05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312607 **Instrument: ICS2100** **Method: SW9056**

MBLK Sample ID: **WBLKW1-030918** Units: **mg/L** Analysis Date: **09-Mar-2018 19:59**
Client ID: Run ID: **ICS2100_312607** SeqNo: **4476354** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.250	0.500								U
Nitrogen, Nitrate (As N)	0.0500	0.100								U
Nitrogen, Nitrite (As N)	0.0500	0.100								U
Sulfate	0.250	0.500								U

LCS Sample ID: **WLCSW1-030918** Units: **mg/L** Analysis Date: **09-Mar-2018 20:20**
Client ID: Run ID: **ICS2100_312607** SeqNo: **4476355** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.06	0.500	20	0	100	80 - 120				
Nitrogen, Nitrate (As N)	4.06	0.100	4	0	102	80 - 120				
Nitrogen, Nitrite (As N)	4.273	0.100	4	0	107	80 - 120				
Sulfate	20.32	0.500	20	0	102	80 - 120				

LCSD Sample ID: **WLCSDW1-030918** Units: **mg/L** Analysis Date: **09-Mar-2018 20:35**
Client ID: Run ID: **ICS2100_312607** SeqNo: **4476356** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	21.62	0.500	20	0	108	80 - 120	20.06	7.47	20	
Nitrogen, Nitrate (As N)	4.358	0.100	4	0	109	80 - 120	4.06	7.08	20	
Nitrogen, Nitrite (As N)	4.387	0.100	4	0	110	80 - 120	4.273	2.63	20	
Sulfate	21.83	0.500	20	0	109	80 - 120	20.32	7.19	20	

MS Sample ID: **HS18030472-05MS** Units: **mg/L** Analysis Date: **09-Mar-2018 21:04**
Client ID: **35AWW24_030818** Run ID: **ICS2100_312607** SeqNo: **4476358** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	130.3	0.500	10	122.8	75.7	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.124	0.100	2	0.11	101	80 - 120				
Nitrogen, Nitrite (As N)	2.259	0.100	2	0.213	102	80 - 120				
Sulfate	93.66	0.500	10	85.66	80.0	80 - 120				SO

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312607 **Instrument: ICS2100** **Method: SW9056**

MSD Sample ID: **HS18030472-05MSD** Units: **mg/L** Analysis Date: **09-Mar-2018 21:19**
Client ID: **35AWW24_030818** Run ID: **ICS2100_312607** SeqNo: **4476359** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	128.8	0.500	10	122.8	59.8	80 - 120	130.3	1.23	20	SEO
Nitrogen, Nitrate (As N)	2.129	0.100	2	0.11	101	80 - 120	2.124	0.235	20	
Nitrogen, Nitrite (As N)	2.301	0.100	2	0.213	104	80 - 120	2.259	1.84	20	
Sulfate	92.9	0.500	10	85.66	72.5	80 - 120	93.66	0.804	20	SO

The following samples were analyzed in this batch: HS18030472-01 HS18030472-02 HS18030472-03 HS18030472-04 HS18030472-05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312695 **Instrument: WetChem_HS** **Method: E376.1**

MBLK Sample ID: **MBLK-312695** Units: **mg/L** Analysis Date: **15-Mar-2018 16:58**
Client ID: Run ID: **WetChem_HS_312695** SeqNo: **4478357** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	1.00	1.00								U

LCS Sample ID: **LCS-312695** Units: **mg/L** Analysis Date: **15-Mar-2018 16:58**
Client ID: Run ID: **WetChem_HS_312695** SeqNo: **4478358** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	24.24	1.00	25	0	97.0	80 - 120				

LCSD Sample ID: **LCSD-312695** Units: **mg/L** Analysis Date: **15-Mar-2018 16:58**
Client ID: Run ID: **WetChem_HS_312695** SeqNo: **4478359** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	24.44	1.00	25	0	97.8	80 - 120	24.24	0.822	20	

MS Sample ID: **HS18030472-05MS** Units: **mg/L** Analysis Date: **15-Mar-2018 16:58**
Client ID: **35AWW24_030818** Run ID: **WetChem_HS_312695** SeqNo: **4478360** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.64	1.00	25	0.44	88.8	80 - 120				

The following samples were analyzed in this batch: HS18030472-01 HS18030472-02 HS18030472-03 HS18030472-04 HS18030472-05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: HS18030472

QC BATCH REPORT

Batch ID: R312878 **Instrument: TOC_02** **Method: E415.1**

MBLK Sample ID: **WBLKW1-032018** Units: **mg/L** Analysis Date: **20-Mar-2018 19:47**
Client ID: Run ID: **TOC_02_312878** SeqNo: **4482712** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	0.500	1.00								U

LCS Sample ID: **WLCSW1-032018** Units: **mg/L** Analysis Date: **20-Mar-2018 20:03**
Client ID: Run ID: **TOC_02_312878** SeqNo: **4482713** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.15	1.00	10	0	102	80 - 120				

LCSD Sample ID: **WLCSDW1-032018** Units: **mg/L** Analysis Date: **20-Mar-2018 20:18**
Client ID: Run ID: **TOC_02_312878** SeqNo: **4482714** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.34	1.00	10	0	103	80 - 120	10.15	1.85	20	

MS Sample ID: **HS18030472-05MS** Units: **mg/L** Analysis Date: **20-Mar-2018 23:17**
Client ID: **35AWW24_030818** Run ID: **TOC_02_312878** SeqNo: **4482726** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.7	1.00	10	1.447	92.5	80 - 120				

The following samples were analyzed in this batch: HS18030472-01 HS18030472-02 HS18030472-03 HS18030472-04 HS18030472-05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
WorkOrder: **HS18030472**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Group Houston, Corp Date: 30-Mar-18

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18030472

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	MET014
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	MET014
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	VOA020
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-01	35AWW19_030818	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	MET014
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	MET014
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	VOA020
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-02	35AWW06_030818	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	MET014
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	MET014
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	VOA020
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	Sub
HS18030472-03	35AWW06_030818_a	Login	3/9/2018 4:40:50 PM	JML	WET269
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	WET269
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	Sub
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	WET269
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	WET269
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	MET014
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	MET014
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	VOA020
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	Sub
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	Sub
HS18030472-04	35AWW23_030818	Login	3/9/2018 4:40:51 PM	JML	WET269

ALS Group Houston, Corp Date: 30-Mar-18

Client: Bhate Environmental Associates, Inc.
Project: LHAAP-58
Work Order: HS18030472

SAMPLE TRACKING

HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	WET269
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	Sub
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	WET269
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	WET269
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	MET014
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	MET014
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	VOA020
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	Sub
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	Sub
HS18030472-05	35AWW24_030818	Login	3/9/2018 4:40:51 PM	JML	WET269
HS18030472-06	Trip Blank	Login	3/9/2018 4:40:51 PM	JML	VOA020

00897804

Date: 30-Mar-18

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS18030472
Date/Time Received: **09-Mar-2018 08:50**
Received by: **PJM**

Checklist completed by: *Pablo Marinez* eSignature — 9-Mar-2018 Date
Reviewed by: *RJ Modashia* eSignature — 12-Mar-2018 Date

Matrices: **WATER**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☑
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.3C/0.7C UC/C	IR # 25	
Cooler(s)/Kit(s):	25795		
Date/Time sample(s) sent to storage:	3/9/2018 17:00		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00897805

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Page: _____ of _____

Project/Phase No: NWO1312.0150

Chain of Custody and Analytical Request

HS18030472

Bhate Environmental Associates, Inc.
LHAAP-58

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Sample Analysis Requested (5): Number of containers	VOC	TOC	MEE / CO2	Anions / Alkalinity	Sulfide	Phosphorous	Dissolved Mn & Fe	Total Mn & Fe	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
35AWW19_030818		08MAR2018	0815	-	N		WG	12	X	X	X	X	X	X	X	X				
35AWW06_030818		08 MAR 2018	0930	-	N		WG	12	X	X	X	X	X	X	X	X				
35AWW06_030818_a		08MAR2018	0930	-	FD		WG	12	X	X	X	X	X	X	X	X				
35AWW23_030818		08MAR2018	1100	-	N		WG	12	X	X	X	X	X	X	X	X				
35AWW24_030818		08 MAR 2018	1210	-	N		WG	12	X	X	X	X	X	X	X	X				
TRIP BLANK		08 MAR 2018		-	TB		W	2	X											
				-																
				-																
				-																
				-																
				-																

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
Scott Beesinger	3/8/18	1430	1.		
2.			2.		
3.			3. PM	3-9-18	8:50

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

25795 UC 1.3C

IR25 CF-0.6

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

25795

CUSTODY SEAL

Date: 3/8/18 Time: 1430
Name: Scott Boesinger
Company: BHATE

Seal Broken By:

Date: 03/09/18

25795 MAR 09 2018

FedEx
TRK# 0221 7376 9752 7521

FRI - 09 MAR 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA 25795

FID 162705 08MAR18 GGGA 546C1/07F5/0C8A

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www.alsglobal.com

LABORATORY REPORT

March 23, 2018

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS18030472

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on March 14, 2018. For your reference, these analyses have been assigned our service request number P1801237.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: ALS Laboratory Group
Project: HS18030472

Service Request No: P1801237

CASE NARRATIVE

The samples were received intact under chain of custody on March 14, 2018 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Carbon Dioxide Analysis

The samples were analyzed for carbon dioxide using a gas chromatograph equipped with a thermal conductivity detector (TCD). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least four hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gas (carbon dioxide) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175 as described in laboratory SOP VOA-DISGAS. This analyte is included on the laboratory's NELAP and DoD-ELAP scope of accreditation.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1347317
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-17-8
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA016272017-8
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS18030472

Service Request: P1801237

Date Received: 3/14/2018
Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - CO2
35AWW19_030818	P1801237-001	Water	3/8/2018	08:15	X
35AWW06_030818	P1801237-002	Water	3/8/2018	09:30	X
35AWW06_030818_a	P1801237-003	Water	3/8/2018	09:30	X
35AWW23_030818	P1801237-004	Water	3/8/2018	11:00	X
35AWW24_030818	P1801237-005	Water	3/8/2018	12:10	X

00897811

P180 1237

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 8738

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18030472
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18030472-01**	**35AWW19_030818**	**Water**	**08 Mar 2018 08:15**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018
2.	**HS18030472-02**	**35AWW06_030818**	**Water**	**08 Mar 2018 09:30**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018
3.	**HS18030472-03**	**35AWW06_030818_a**	**Water**	**08 Mar 2018 09:30**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018
4.	**HS18030472-04**	**35AWW23_030818**	**Water**	**08 Mar 2018 11:00**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018
5.	**HS18030472-05**	**35AWW24_030818**	**Water**	**08 Mar 2018 12:10**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

COC ID: 8738

Relinquished By: J. MACLEAN Date/Time: 3/13/18 18:00

Received By: Date/Time: 3-14-18 0930 3° NOT ICE

Cooler ID(s): Temperature(s):

Neat vials for CO2 analysis

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1801237

Project: HS18030472

Sample(s) received on: 3/14/18 Date opened: 3/14/18 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: ° C Blank Temperature: 3° C **Gel Packs**			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Cooler lid. Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1801237-001.01	40mL VOA NP		7		A	wh 3/15/18
P1801237-001.02	40mL VOA NP		7		A	wh 3/22/18
P1801237-002.01	40mL VOA NP		7		A	wh 3/15/18
P1801237-002.02	40mL VOA NP		7		A	wh 3/22/18
P1801237-003.01	40mL VOA NP		7		A	wh 3/15/18
P1801237-003.02	40mL VOA NP		7		A	wh 3/22/18
P1801237-004.01	40mL VOA NP		7		A	wh 3/15/18
P1801237-004.02	40mL VOA NP		7		A	wh 3/22/18
P1801237-005.01	40mL VOA NP		7		A	wh 3/15/18
P1801237-005.02	40mL VOA NP		7		A	wh 3/22/18

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Project ID: **HS18030472** ALS Project ID: P1801237

Carbon Dioxide

Test Code: RSK 175
Instrument ID: HP5890A/GC10/TCD Date(s) Collected: 3/8/18
Analyst: Wade Henton Date Received: 3/14/18
Matrix: Water Date Analyzed: 3/22/18
Test Notes:

Client Sample ID	ALS Sample ID	Injection Volume ml(s)	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
35AWW19_030818	P1801237-001	0.10	**97,000**	1,000	760	370	
35AWW06_030818	P1801237-002	0.10	**500,000**	1,000	760	370	
35AWW06_030818_a	P1801237-003	0.050	**310,000**	2,000	1,500	740	
35AWW23_030818	P1801237-004	0.10	**500,000**	1,000	760	370	
35AWW24_030818	P1801237-005	0.10	**290,000**	1,000	760	370	
Method Control Sample	P180322-MB	0.10	760	1,000	760	370	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P1801237
Client Project ID: **HS18030472** ALS Sample ID: P180322-DLCS

Test Code: RSK 175 Date Collected: NA
Instrument ID: HP5890A/GC10/TCD Date Received: NA
Analyst: Wade Henton Date Analyzed: 3/22/18
Matrix: Water Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ug/L	Result[1] LCS ug/L	Result[1] DLCS ug/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
124-38-9	Carbon Dioxide	22,900	24,400	22,800	**107**	**100**	80-122	7	15	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

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www.alsglobal.com

LABORATORY REPORT

March 23, 2018

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road Suite 210
Houston, TX 77099-4338

RE: HS18030472

Dear RJ:

Enclosed are the results of the samples submitted to our laboratory on March 10, 2018. For your reference, these analyses have been assigned our service request number P1801167.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Kelly Horiuchi
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
F: +1 805 526 7270
www.alsglobal.com

Client: ALS Laboratory Group
Project: HS18030472

Service Request No: P1801167

CASE NARRATIVE

The samples were received intact under chain of custody on March 10, 2018 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Methane, Ethene and Ethane Analysis

The samples were also analyzed for methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). A known amount of liquid was displaced by injecting 8.0 milliliters of helium creating a headspace in the sample vial. Each sample vial was agitated using a sonic disrupter for fifteen minutes and then allowed to equilibrate for at least two hours. A volume of the headspace was withdrawn using a gas-tight syringe and analyzed using a manual injection technique. The amount of dissolved gases (methane, ethene and ethane) in the original sample was calculated using Henry's Law. This method was performed with guidance from RSK 175. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP accreditation.

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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2016036
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1347317
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-005
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-17-8
Utah DOH (NELAP)	http://health.utah.gov/lab/environmental-lab-certification/	CA016272017-8
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: ALS Laboratory Group
Project ID: HS18030472

Service Request: P1801167

Date Received: 3/10/2018
Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	RSK 175 - Gases
35AWW19_030818	P1801167-001	Water	3/8/2018	08:15	X
35AWW06_030818	P1801167-002	Water	3/8/2018	09:30	X
35AWW06_030818_a	P1801167-003	Water	3/8/2018	09:30	X
35AWW23_030818	P1801167-004	Water	3/8/2018	11:00	X
35AWW24_030818	P1801167-005	Water	3/8/2018	12:10	X

P1301167

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 8738

SUBCONTRACT TO:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS18030472
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS18030472-01**	**35AWW19_030818**	**Water**	**08 Mar 2018 08:15**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018
2.	**HS18030472-02**	**35AWW06_030818**	**Water**	**08 Mar 2018 09:30**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018
3.	**HS18030472-03**	**35AWW06_030818_a**	**Water**	**08 Mar 2018 09:30**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018
4.	**HS18030472-04**	**35AWW23_030818**	**Water**	**08 Mar 2018 11:00**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018
5.	**HS18030472-05**	**35AWW24_030818**	**Water**	**08 Mar 2018 12:10**
	MEE plus CO2 Sub to ALS SimiValley			23 Mar 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

P1801167

Subcontract Chain of Custody

COC ID: 8738

Relinquished By:	J. MACKEEN	Date/Time:	3/9/18 18:00
Received By:	Samantha Hyam	Date/Time:	3/10/18 1000
Cooler ID(s):		Temperature(s):	4°C

P1301167

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Purchase Order

PO: HS18030472

VENDOR:

ALS Environmental
2655 Park Center Drive, Suite A
Simi Valley, CA 93065

Phone: +1 805 526 7161

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	8738
TSR:	Danielle Winnings

	Item	Catalog No	Unit Price	Quantity	Ext Price
1.	MEE plus CO2 Sub to ALS SimiValley	NA	$41.25	5	$206.25
				Order Total:	$206.25

ALS Environmental
Sample Acceptance Check Form

Client: ALS Laboratory Group Work order: P1801167

Project: Houston-RSK CO2

Sample(s) received on: 3/10/18 Date opened: 3/10/18 by: E.PEREZ

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 4° C Blank Temperature: ° C **Wet Ice**			
8	Were **custody seals** on outside of cooler/Box/Container?	☒	☐	☐
	Location of seal(s)? Sealing Lid Sealing Lid?	☒	☐	☐
	Were signature and date included?	☒	☐	☐
	Were seals intact?	☒	☐	☐
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☒	☐	☐
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☒	☐
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1801167-001.01	40ml VOA HCL		1		A	MC 3/14/2018
P1801167-001.02	40ml VOA HCL				A	
P1801167-002.01	40ml VOA HCL		1		A	MC 3/14/2018
P1801167-002.02	40ml VOA HCL				A	
P1801167-003.01	40ml VOA HCL		1		A	MC 3/14/2018
P1801167-003.02	40ml VOA HCL				A	
P1801167-004.01	40ml VOA HCL		1		A	MC 3/14/2018
P1801167-004.02	40ml VOA HCL				A	
P1801167-005.01	40ml VOA HCL		1		A	MC 3/14/2018
P1801167-005.02	40ml VOA HCL				A	

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW19_030818**
Client Project ID: **HS18030472**

ALS Project ID: P1801167
ALS Sample ID: P1801167-001

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: 3/8/18
Date Received: 3/10/18
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW06_030818**
Client Project ID: **HS18030472**

ALS Project ID: P1801167
ALS Sample ID: P1801167-002

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: 3/8/18
Date Received: 3/10/18
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW06_030818_a**
Client Project ID: **HS18030472**

ALS Project ID: P1801167
ALS Sample ID: P1801167-003

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: 3/8/18
Date Received: 3/10/18
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW23_030818**
Client Project ID: **HS18030472**

ALS Project ID: P1801167
ALS Sample ID: P1801167-004

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: 3/8/18
Date Received: 3/10/18
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **35AWW24_030818**
Client Project ID: **HS18030472**

ALS Project ID: P1801167
ALS Sample ID: P1801167-005

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: 3/8/18
Date Received: 3/10/18
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **ALS Laboratory Group**
Client Sample ID: **Method Control Sample**
Client Project ID: **HS18030472**

ALS Project ID: P1801167
ALS Sample ID: P180314-MB

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Result µg/L	LOQ µg/L	LOD µg/L	MDL µg/L	Data Qualifier
74-82-8	Methane	1.0	1.3	1.0	0.51	**U**
74-85-1	Ethene	0.55	1.0	0.55	0.24	**U**
74-84-0	Ethane	0.47	0.60	0.47	0.16	**U**

The Method Control Sample is laboratory water carried through the entire analytical process.
U = Compound was analyzed for, but not detected above the laboratory detection limit.
LOQ = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **ALS Laboratory Group**
Client Sample ID: **Duplicate Lab Control Sample**
Client Project ID: **HS18030472**

ALS Project ID: P1801167
ALS Sample ID: P180314-LCS
P180314-DLCS

Test Code: RSK 175
Instrument ID: HP5890A/GC10/FID
Analyst: Mike Conejo
Matrix: Water
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 3/14/18
Volume(s) Analyzed: 0.10 ml(s)

CAS #	Compound	Spike Amount LCS / DLCS µg/L	Result[1] LCS µg/L	Result[1] DLCS µg/L	% Recovery LCS	% Recovery DLCS	DOD Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	2.50	2.31	2.33	**92**	**93**	73-125	1	12	
74-85-1	Ethene	4.37	4.82	4.84	**110**	**111**	72-133	0.9	7	
74-84-0	Ethane	4.69	4.70	4.81	**100**	**103**	74-131	3	6	

[1] = The concentration shown includes a subtraction of the Method Control Sample value, even if the result is less than the MRL.

March 29, 2018 Service Re uest No:R1802087

R Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: LHAAP Site 58 HS18030472

Dear R ,

Enclosed are the results of the sample(s) submitted to our laboratory March 09, 2018
For your reference, these analyses have been assigned our service re uest number **R1802087.**

All analyses were performed according to our laboratory s uality assurance program. The test results meet re uirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as C failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any uestions. My extension is 7472. ou may also contact me via email at anice. aeger alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

anice aeger
Pro ect Manager

ADDRESS 1565 efferson Road, Building 300, Suite 360, Rochester, N 14623
PHONE 1 585 288 5380 FAX 1 585 288 8475
ALS Group USA, Corp.
dba ALS Environmental

ALS Environmental
ALS Group USA, Corp
1565 efferson Road, Building 300, Suite 360
Rochester, N 14623
T : 1 585 288 5380
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www.alsglobal.com

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Narrative Documents

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

1565 Jefferson Rd, Building 300, Rochester, NY 14623 | 585-288-5380 | www.alsglobal.com

ALS Environmental

Client: ALS Environmental - US
Project: LHAAP Site 58 HS18030472
Sample Matrix: Water

Service Request: R1802087
Date Received: 03/09/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV, validation deliverables including all summary forms and associated raw data. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

Sample Receipt:

Five water samples were received for analysis at ALS Environmental on 03/09/2018. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at 6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

Semivoa GC:

Method Organic Acids, 03/14/2018: The upper control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question above the Method Reporting Limit (MRL). Since the exceedance equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Method Organic Acids, 03/14/2018: The upper control criterion was exceeded for one or more analytes in the Laboratory Control Sample (LCS). There were no detections of the analyte(s) in the associated field samples. The error associated with elevated recovery equates to a high bias. The sample data is not significantly affected. No further corrective action was appropriate.

General Chemistry:

Ferrous Iron samples were analyzed upon receipt in the laboratory.

Approved by _____ Date 03/26/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: 35AWW19_030818			Lab ID: R1802087-001			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	1.10		0.03	0.10	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW06_030818			Lab ID: R1802087-002			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.08		0.03	0.10	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW06_030818_A			Lab ID: R1802087-003			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.12		0.03	0.10	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW23_030818			Lab ID: R1802087-004			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.13		0.03	0.10	mg/L	SM 3500-Fe B.4.c

CLIENT ID: 35AWW24_030818			Lab ID: R1802087-005			
Analyte	**Results**	**Flag**	**MDL**	**PQL**	**Units**	**Method**
Iron, Divalent (Ferrous Iron)	0.33		0.03	0.10	mg/L	SM 3500-Fe B.4.c

Sample Receipt Information

ALS Environmental—Rochester Laboratory
1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623
Phone (585) 288-5380 Fax (585) 288-8475
www.alsglobal.com

Client: ALS Environmental - US **Service Request:**R1802087
Project: LHAAP Site 58 HS18030472/N O1312.0150

SAMPLE CROSS-REFERENCE

SAMPLE	CLIENT SAMPLE ID	DATE	TIME
R1802087-001	35A 19 030818	3/8/2018	0815
R1802087-002	35A 06 030818	3/8/2018	0930
R1802087-003	35A 06 030818 A	3/8/2018	0930
R1802087-004	35A 23 030818	3/8/2018	1100
R1802087-005	35A 24 030818	3/8/2018	1210

00897840

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 58

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VFA	Ferrous Iron								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
								Sample Analysis Requested (5)										Quality Assurance Samples (6)			
35AWW19_030818		08MAR2018	0815	-	N		WG	2	X	X											
35AWW06_030818		08MAR2018	0930	-	N		WG	2	X	X											
35AWW06_030818_a		08MAR2018	0930	-	FD		WG	2	X	X											
35AWW23_030818		08MAR2018	1100		N		WG	2	X	X											
35AWW24_030818		08MAR2018	1210		N		WG	2	X	X											
				-																	
				-																	
				-																	
				-																	
				-																	
				-																	

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (Signed)	Date	Time
1.	Scott Beesinger	3/8/18	1430		3-9-18	0915
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill ____ Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONJA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient F

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment

R1802087 5
ALS Group USA, Corp.
LHAAP Site 58

00897841

R1802087 5
ALS Group USA, Corp.
LHAAP Site 58

Cooler Receipt and Preservation Check Form

Project/Client Bhate Env. Folder Number R1802087

Cooler received on 3-9-18 by: RE

COURIER: ALS UPS (FEDEX) VELOCITY CLIENT

1	Were **Custody seals** on outside of cooler?	(Y)	N
2	**Custody papers** properly completed (ink, signed)?	(Y)	N
3	Did all bottles arrive in good **condition** (unbroken)?	(Y)	N
4	Circle: (**Wet Ice**) **Dry Ice** **Gel packs** present?	(Y)	N

5a	**Perchlorate** samples have required headspace?	Y	N	(NA)
5b	Did VOA vials, Alk,or Sulfide have sig* **bubbles**?	Y	N	(NA)
6	Where did the bottles originate?	(ALS/ROC)	(CLIENT)	
7	Soil VOA received as: Bulk Encore 5035set	(NA)		

8. Temperature Readings Date: 3-9-18 Time: 10:28 ID: (IR#7) IR#9 From: (Temp Blank) Sample Bottle

Observed Temp (°C)	3.4						
Correction Factor (°C)	0						
Corrected Temp (°C)	3.4						
Temp from:Type of bottle							
Within 0-6°C?	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
If <0°C, were samples frozen?	Y N	Y N	Y N	Y N	Y N	Y N	Y N

If out of Temperature, note packing/ice condition: _____ Ice melted Poorly Packed (described below) Same Day Rule

&Client Approval to Run Samples: _____ Standing Approval Client aware at drop-off Client notified by: _____

All samples held in storage location: R-002 by RE on 3-9-18 at 10:31
5035 samples placed in storage location: _____ by _____ on _____ at _____

Cooler Breakdown: Date: 3-9-18 Time: 13:39 by: RE

9.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	(YES)	NO
10.	Did all bottle labels and tags agree with custody papers?	(YES)	NO
11.	Were correct containers used for the tests indicated?	(YES)	NO
12.	Were 5035 vials acceptable (no extra labels, not leaking)?	YES	NO
13.	Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated		(N/A)

pH	Lot of test paper	Reagent	Preserved? Yes	Preserved? No	Lot Received	Exp	Sample ID	Vol. Added	Lot Added	Final pH
≥12		NaOH								
≤2		HNO_3								
≤2		H_2SO_4								
<4		$NaHSO_4$								
Residual Chlorine (-)		For CN Phenol and 522			If +, contact PM to add $Na_2S_2O_3$ (CN), ascorbic (phenol).					
		$Na_2S_2O_3$	-	-						
		ZnAcetate	-	-						
		HCl	**	**	Client Bottles					

**Not to be tested before analysis – pH tested and recorded by VOAs on a separate worksheet

Bottle lot numbers: 101617-1BHC, 80617-02

Explain all Discrepancies/ Other Comments:

H_3PO_4 Lot 195422 exp 01/19

CLRES	BULK
DO	FLDT
HPROD	HGFB
HTR	LL3541
PH	SUB
SO3	MARRS
ALS	REV

Labels secondary reviewed by: RE
PC Secondary Review: [illegible] 3/12/18

*significant air bubbles: VOA > 5-6 mm : WC >1 in. diameter

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1802087
Project: LHAAP Site 58 HS18030472/NWO1312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1802087-001.01					
	SM 3500-Fe B.4.c				
		3/9/2018	1341	SMO / GESMERIAN	
		3/13/2018	1416	RT000261 / DWARD	
		3/13/2018	1417	R-015 / DWARD	
R1802087-001.02					
	Organic Acids				
		3/9/2018	1341	SMO / GESMERIAN	
		3/9/2018	1342	R-002 / GESMERIAN	
		3/14/2018	1337	In Lab / BALLGEIER	
		3/14/2018	1431	R-002 / BALLGEIER	
R1802087-002.01					
	SM 3500-Fe B.4.c				
		3/9/2018	1341	SMO / GESMERIAN	
		3/13/2018	1416	RT000261 / DWARD	
		3/13/2018	1417	R-015 / DWARD	
R1802087-002.02					
	Organic Acids				
		3/9/2018	1341	SMO / GESMERIAN	
		3/9/2018	1342	R-002 / GESMERIAN	
		3/14/2018	1337	In Lab / BALLGEIER	
		3/14/2018	1431	R-002 / BALLGEIER	
R1802087-003.01					
	SM 3500-Fe B.4.c				
		3/9/2018	1341	SMO / GESMERIAN	
		3/13/2018	1416	RT000261 / DWARD	
		3/13/2018	1417	R-015 / DWARD	
R1802087-003.02					
	Organic Acids				
		3/9/2018	1341	SMO / GESMERIAN	
		3/9/2018	1342	R-002 / GESMERIAN	
		3/14/2018	1337	In Lab / BALLGEIER	
		3/14/2018	1431	R-002 / BALLGEIER	
R1802087-004.01					
	SM 3500-Fe B.4.c				
		3/9/2018	1341	SMO / GESMERIAN	
		3/13/2018	1416	RT000261 / DWARD	
		3/13/2018	1417	R-015 / DWARD	
R1802087-004.02					
	Organic Acids				
		3/9/2018	1341	SMO / GESMERIAN	

ALS Group USA, Corp.
dba ALS Environmental

Internal Chain of Custody Report

Client: ALS Laboratory Group **Service Request:** R1802087
Project: LHAAP Site 58 HS18030472/NWO1312.0150

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
	Organic Acids				
		3/9/2018	1342	R-002 / GESMERIAN	
		3/14/2018	1337	In Lab / BALLGEIER	
		3/14/2018	1431	R-002 / BALLGEIER	
R1802087-005.01					
	SM 3500-Fe B.4.c				
		3/9/2018	1341	SMO / GESMERIAN	
		3/13/2018	1416	RT000261 / DWARD	
		3/13/2018	1417	R-015 / DWARD	
R1802087-005.02					
	Organic Acids				
		3/9/2018	1341	SMO / GESMERIAN	
		3/9/2018	1342	R-002 / GESMERIAN	
		3/14/2018	1337	In Lab / BALLGEIER	
		3/14/2018	1431	R-002 / BALLGEIER	

Miscellaneous Forms

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REPORT QUALIFIERS AND DEFINITIONS

U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.

J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).

B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.

E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.

E Organics- Concentration has exceeded the calibration range for that specific analysis.

D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.

* Indicates that a quality control parameter has exceeded laboratory limits. Under the ñNotesò column of the Form I, this qualifier denotes analysis was performed out of Holding Time.

H Analysis was performed out of hold time for tests that have an ñimmediateò hold time criteria.

Spike was diluted out.

\+ Correlation coefficient for MSA is <0.995.

N Inorganics- Matrix spike recovery was outside laboratory limits.

N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.

S Concentration has been determined using Method of Standard Additions (MSA).

W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.

P Concentration >40% difference between the two GC columns.

C Confirmed by GC/MS

Q DoD reports: indicates a pesticide/Aroclor is not confirmed (Ó100% Difference between two GC columns).

X See Case Narrative for discussion.

MRL Method Reporting Limit. Also known as:
LOQ Limit of Quantitation (LOQ)
The lowest concentration at which the method analyte may be reliably quantified under the method conditions.

MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).

LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.

ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.

ACCREDITED IN ACCORDANCE WITH nelac

Rochester Lab ID # for State Certifications[1]

Connecticut ID # PH0556	Maine ID #NY0032	New Hampshire ID # 294100 A/B
Delaware Approved	New Jersey ID # NY004	
DoD ELAP #65817	New York ID # 10145	Pennsylvania ID# 68-786
Florida ID # E87674	North Carolina #676	Rhode Island ID # 158
		Virginia #460167

[1] Analyses were performed according to our laboratoryôs NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to https://www.alsglobal.com/locations/americas/north-america/usa/new-york/rochester-environmental

ALS Laboratory Group

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: ALS Environmental - US
Service Request: R1802087
Project: LHAAP Site 58 HS18030472/NWO1312.0150

Sample Name: 35AWW19_030818
Lab Code: R1802087-001
Sample Matrix: Water
Date Collected: 03/8/18
Date Received: 03/9/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW06_030818
Lab Code: R1802087-002
Sample Matrix: Water
Date Collected: 03/8/18
Date Received: 03/9/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW06_030818_A
Lab Code: R1802087-003
Sample Matrix: Water
Date Collected: 03/8/18
Date Received: 03/9/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

Sample Name: 35AWW23_030818
Lab Code: R1802087-004
Sample Matrix: Water
Date Collected: 03/8/18
Date Received: 03/9/18

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150		

Sample Name:	35AWW24_030818	**Date Collected:**	03/8/18
Lab Code:	R1802087-005	**Date Received:**	03/9/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
Organic Acids		BALLGEIER
SM 3500-Fe B.4.c		MROGERSON

INORGANIC PREPARATION METHODS

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid Soluble	9030B
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual Cyanide	SM 4500-CN-G
SM 4500-CN-E WAD Cyanide	SM 4500-CN-I

Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311) extract	3005A/3010A
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.

Sample Results

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Semivolatile Organic Compounds by GC

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ALS Group USA, Corp.
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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 08:15
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW19_030818	**Units:**	mg/L
Lab Code:	R1802087-001	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 18:33	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 18:33	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 18:33	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 18:33	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 18:33	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 09:30
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW06_030818	**Units:**	mg/L
Lab Code:	R1802087-002	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 19:10	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 19:10	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 19:10	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 19:10	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 19:10	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 09:30
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW06_030818_A	**Units:**	mg/L
Lab Code:	R1802087-003	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 19:45	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 19:45	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 19:45	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 19:45	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 19:45	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 11:00
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW23_030818	**Units:**	mg/L
Lab Code:	R1802087-004	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 20:27	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 20:27	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 20:27	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 20:27	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 20:27	

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 12:10
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW24_030818	**Units:**	mg/L
Lab Code:	R1802087-005	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 21:45	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 21:45	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 21:45	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 21:45	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 21:45	

General Chemistry

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 08:15
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW19_030818	**Basis:**	NA
Lab Code:	R1802087-001		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**1.10**	mg/L	0.10	0.08	0.03	1	03/09/18 16:32	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 09:30
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW06_030818	**Basis:**	NA
Lab Code:	R1802087-002		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.08 J**	mg/L	0.10	0.08	0.03	1	03/09/18 16:32	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 09:30
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW06_030818_A	**Basis:**	NA
Lab Code:	R1802087-003		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.12**	mg/L	0.10	0.08	0.03	1	03/09/18 16:32	*

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 11:00
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW23_030818	**Basis:**	NA
Lab Code:	R1802087-004		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.13**	mg/L	0.10	0.08	0.03	1	03/09/18 16:32	*

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18 12:10
Sample Matrix:	Water	**Date Received:**	03/09/18 09:55
Sample Name:	35AWW24_030818	**Basis:**	NA
Lab Code:	R1802087-005		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	**0.33**	mg/L	0.10	0.08	0.03	1	03/09/18 16:32	*

QC Summary Forms

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Semivolatile Organic Compounds by GC

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ALS Group USA, Corp.
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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18
Sample Matrix:	Water	**Date Received:**	03/09/18
		Date Analyzed:	03/14/18

Duplicate Matrix Spike Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	35AWW24_030818	**Units:**	mg/L
Lab Code:	R1802087-005	**Basis:**	NA
Analysis Method:	Organic Acids		

		Matrix Spike RQ1802335-04			Duplicate Matrix Spike RQ1802335-05					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	ND U	1.87	2.04	92	1.86	2.04	91	70-130	<1	30
Acetic Acid	ND U	19.7	20.0	98	19.6	20.0	98	70-130	<1	30
Butanoic Acid (Butyric Acid)	ND U	20.6	20.1	103	20.5	20.1	102	70-130	<1	30
Lactic Acid	ND U	18.4	20.0	92	18.3	20.0	91	70-130	<1	30
Propionic Acid	ND U	30.4	20.0	152 *	29.9	20.0	149 *	70-130	2	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: LHAAP Site 58 HS18030472/NWO1312.0150
Sample Matrix: Water

Service Request: R1802087
Date Analyzed: 03/14/18 14:45

Method Blank Summary

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name: Method Blank
Lab Code: RQ1802335-01

Instrument ID:R-HPLC-05
File ID:I:\ACQUDATA\hplc05\data\031418\A0001466.D\

Analysis Method: Organic Acids
Analysis Lot:583688

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1802335-02	I:\ACQUDATA\hplc05\data\031418\A0001467.D\	03/14/18 15:20
Duplicate Lab Control Sample	RQ1802335-03	I:\ACQUDATA\hplc05\data\031418\A0001468.D\	03/14/18 16:01
35AWW19_030818	R1802087-001	I:\ACQUDATA\hplc05\data\031418\A0001472.D\	03/14/18 18:33
35AWW06_030818	R1802087-002	I:\ACQUDATA\hplc05\data\031418\A0001473.D\	03/14/18 19:10
35AWW06_030818_A	R1802087-003	I:\ACQUDATA\hplc05\data\031418\A0001474.D\	03/14/18 19:45
35AWW23_030818	R1802087-004	I:\ACQUDATA\hplc05\data\031418\A0001475.D\	03/14/18 20:27
35AWW24_030818	R1802087-005	I:\ACQUDATA\hplc05\data\031418\A0001477.D\	03/14/18 21:45
35AWW24_030818	RQ1802335-04	I:\ACQUDATA\hplc05\data\031418\A0001478.D\	03/14/18 22:20
35AWW24_030818	RQ1802335-05	I:\ACQUDATA\hplc05\data\031418\A0001479.D\	03/14/18 22:58

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	mg/L
Lab Code:	RQ1802335-01	**Basis:**	NA

Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Analysis Method: Organic Acids

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Pyruvic Acid	ND U	0.20	0.10	0.016	1	03/14/18 14:45	
Acetic Acid	ND U	4.0	2.0	1.0	1	03/14/18 14:45	
Butanoic Acid (Butyric Acid)	ND U	2.0	1.0	0.32	1	03/14/18 14:45	
Lactic Acid	ND U	2.0	1.0	0.14	1	03/14/18 14:45	
Propionic Acid	ND U	2.0	1.0	0.19	1	03/14/18 14:45	

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QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Analyzed:**	03/14/18 15:20
Sample Matrix:	Water		

Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Sample Name:	Lab Control Sample	**Instrument ID:**	R-HPLC-05
Lab Code:	RQ1802335-02	**File ID:**	I:\ACQUDATA\hplc05\data\031418\A0001467.D\
Analysis Method:	Organic Acids	**Analysis Lot:**	583688

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1802335-01	I:\ACQUDATA\hplc05\data\031418\A0001466.D\	03/14/18 14:45
Duplicate Lab Control Sample	RQ1802335-03	I:\ACQUDATA\hplc05\data\031418\A0001468.D\	03/14/18 16:01
35AWW19_030818	R1802087-001	I:\ACQUDATA\hplc05\data\031418\A0001472.D\	03/14/18 18:33
35AWW06_030818	R1802087-002	I:\ACQUDATA\hplc05\data\031418\A0001473.D\	03/14/18 19:10
35AWW06_030818_A	R1802087-003	I:\ACQUDATA\hplc05\data\031418\A0001474.D\	03/14/18 19:45
35AWW23_030818	R1802087-004	I:\ACQUDATA\hplc05\data\031418\A0001475.D\	03/14/18 20:27
35AWW24_030818	R1802087-005	I:\ACQUDATA\hplc05\data\031418\A0001477.D\	03/14/18 21:45
35AWW24_030818	RQ1802335-04	I:\ACQUDATA\hplc05\data\031418\A0001478.D\	03/14/18 22:20
35AWW24_030818	RQ1802335-05	I:\ACQUDATA\hplc05\data\031418\A0001479.D\	03/14/18 22:58

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP Site 58 HS18030472/NWO1312.0150
Sample Matrix: Water

Service Request: R1802087
Date Analyzed: 03/14/18

Duplicate Lab Control Sample Summary
Organic Acids in Aqueous Matrices by High Performance Liquid Chromatography (HPLC) 28 Day Hold Time

Units:mg/L
Basis:NA

		Lab Control Sample			Duplicate Lab Control Sample					
		RQ1802335-02			RQ1802335-03					
Analyte Name	**Analytical Method**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Pyruvic Acid	Organic Acids	1.98	2.04	97	1.98	2.04	97	70-130	<1	30
Acetic Acid	Organic Acids	19.8	20.0	99	19.8	20.0	99	70-130	<1	30
Butanoic Acid (Butyric Acid)	Organic Acids	20.8	20.1	104	20.6	20.1	103	70-130	<1	30
Lactic Acid	Organic Acids	18.6	20.0	93	18.6	20.0	93	70-130	<1	30
Propionic Acid	Organic Acids	30.6	20.0	153 *	30.3	20.0	151 *	70-130	<1	30

General Chemistry

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Analytical Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	R1802087-MB		

Inorganic Parameters

Analyte Name	Analysis Method	Result	Units	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	ND U	mg/L	0.10	0.08	0.03	1	03/09/18 16:32	

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dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	R1802087
Project:	LHAAP Site 58 HS18030472/NWO1312.0150	**Date Collected:**	03/08/18
Sample Matrix:	Water	**Date Received:**	03/09/18
		Date Analyzed:	03/9/18

Duplicate Matrix Spike Summary
Iron, Divalent (Ferrous Iron)

Sample Name:	35AWW06_030818	**Units:**	mg/L
Lab Code:	R1802087-002	**Basis:**	NA
Analysis Method:	SM 3500-Fe B.4.c		

		Matrix Spike R1802087-002MS			Duplicate Matrix Spike R1802087-002DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Iron, Divalent (Ferrous Iron)	0.08 J	0.60	0.40	130 *	0.62	0.40	135 *	67-129	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: ALS Environmental - US
Project: LHAAP Site 58 HS18030472/NWO1312.0150
Sample Matrix: Water

Service Request: R1802087
Date Analyzed: 03/09/18

Lab Control Sample Summary
General Chemistry Parameters

Units:mg/L
Basis:NA

Lab Control Sample
R1802087-LCS

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Iron, Divalent (Ferrous Iron)	SM 3500-Fe B.4.c	0.408	0.40	102	67-129

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QA/QC Report

Client: ALS Environmental - US **Service Request:**R1802087
Project: LHAAP Site 58 HS18030472/NWO1312.0150

Continuing Calibration Blank (CCB) Summary
Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	584590	RQ1802612-02	03/09/18 16:32	0.10	0.08	0.03	ND	U
CCB2	584590	RQ1802612-05	03/09/18 16:32	0.10	0.08	0.03	ND	U

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QA/QC Report

Client: ALS Environmental - US **Service Request:** R1802087
Project: LHAAP Site 58 HS18030472/NWO1312.0150

Continuing Calibration Verification (CCV) Summary

Iron, Divalent (Ferrous Iron)

Analysis Method: SM 3500-Fe B.4.c **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	584590	RQ1802612-01	03/09/18 16:32	2.00	2.10	105	90-110
CCV2	584590	RQ1802612-06	03/09/18 16:32	2.00	2.09	105	90-110

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Client: RJ Modashia
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Phone: 281-575-2279

Fax:

Identifier: 043PC **Date Rec:** 03/09/2018 **Report Date:** 03/14/2018

Client Project #: NWD1312.0150 **Client Project Name:** LHAAP-58

Purchase Order #: HS18030472

Analysis Requested: CENSUS

Reviewed By:

MICROBIAL INSIGHTS, INC.

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Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **ALS Laboratory Group**
Project: LHAAP-58

MI Project Number: **043PC**
Date Received: 03/09/2018

Sample Information

Client Sample ID:		**35AWW19_030818**	**35AWW06_030818**	**35AWW06_030818_a**	**35AWW23_030818**	**35AWW24_030818**
Sample Date:		03/08/2018	03/08/2018	03/08/2018	03/08/2018	03/08/2018
Units:		cells/mL	cells/mL	cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		JS	JS	JS	JS	JS
Dechlorinating Bacteria						
Dehalococcoides	*DHC*	**4.00E-01 (J)**	**1.40E+00**	**1.50E+00**	<5.00E-01	<2.00E+00
tceA Reductase	TCE	<1.20E+00	**1.00E-01 (J)**	<5.00E-01	<5.00E-01	<2.00E+00
BAV1 Vinyl Chloride Reductase	BVC	<1.20E+00	<5.00E-01	<5.00E-01	<5.00E-01	<2.00E+00
Vinyl Chloride Reductase	VCR	<1.20E+00	<5.00E-01	<5.00E-01	<5.00E-01	<2.00E+00
Dehalobacter spp.	*DHBt*	<1.19E+01	**2.91E+02**	**2.18E+02**	<4.80E+00	**7.99E+01**

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **3/9/2018**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	03/09/2018	03/14/2018	0 °C	101%	non-detect	non-detect
BVC	03/09/2018	03/14/2018	0 °C	102%	non-detect	non-detect
DHBt	03/09/2018	03/14/2018	0 °C	106%	non-detect	non-detect
TCE	03/09/2018	03/14/2018	0 °C	101%	non-detect	non-detect
VCR	03/09/2018	03/14/2018	0 °C	103%	non-detect	non-detect

00897879

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INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)
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Project Manager: Kim Nemmers
Project Name: LHAAP-58
Project No.: NW01312.0150

Purchase Order No.
Subcontract No.
MI Quote No.

Please Check One:
☐ More samples to follow
☑ No Additional Samples

Report Type: ☑ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (30%)
EDD type: ☐ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information					Analyses					CENSUS: Please select the target organism/gene																								
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	PLFA	DGGE+3ID	DGGE+5ID	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirK)	AOB (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
043PC 1	35AWW19-030818	3/8/18	0815							✓		✓																						
2	35AWW06-030818	3/8/18	0930							✓		✓																						
3	35AWW06-030818-a	3/8/18	0930							✓		✓																						
4	35AWW23-030818	3/8/18	1100							✓		✓																						
5	35AWW24-030818	3/8/18	1210							✓		✓																						

Relinquished by: [signature] 3/8/18 1430
Received by: [signature] Date 3/9/18 930

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

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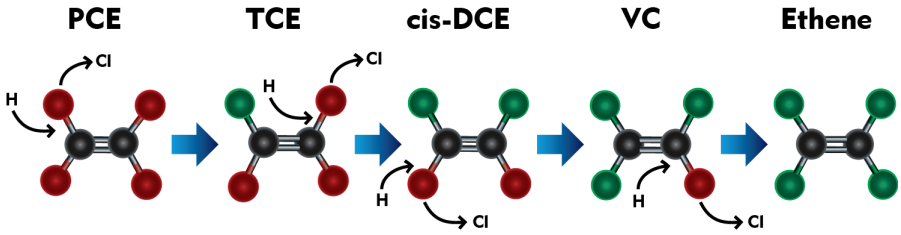
DHC Interpretation

Dehalococcoides 16S rRNA gene (qDHC)

Under anaerobic conditions, tetrachloroethene (PCE) and trichloroethene (TCE) can undergo sequential reductive dechlorination through the daughter products *cis*-dichloroethene (*cis*-DCE) and vinyl chloride to nontoxic ethene (1,2).



While a number of bacterial cultures capable of utilizing PCE and TCE as growth supporting electron acceptors have been isolated (3-7), *Dehalococcoides* spp. may be the most important because they are the only bacterial group that has been isolated to date which is capable of complete reductive dechlorination of PCE to ethene (8). In fact, the presence of *Dehalococcoides* spp. has been associated with complete dechlorination to ethene at sites across North America and Europe (9).

Status	*Dehalococcoides spp.*	Observation
	**≥ 10^4** (cells/mL)	Lu et al. proposed that a concentration of 1 x 10^4 DHC cells/mL could be used as a screening criterion to identify sites where reductive dechlorination will yield a generally useful biodegradation rate (10). Similarly, in an internal study conducted with nearly 1000 groundwater samples obtained from sites across the US, ethene production was observed in approximately 80% of samples in which CENSUS® qDHC results were greater than or equal to 10^4 DHC cells/mL.
	**10^1 to < 10^4** (cells/mL)	When vinyl chloride reductase genes (See DHC functional genes discussion below) are also detected, complete reductive dechlorination of PCE and TCE to ethene may still occur even with moderate DHC concentrations. When the DHC population is below the 10^4 cells/mL criterion proposed by Lu et al. (10), project managers should carefully consider other site-specific data to determine whether subsurface conditions may be limiting reductive dechlorination. For example, the addition of an electron donor may be able to stimulate DHC growth and enhance anaerobic bioremediation.
	**< 10^1** (cells/mL)	DHC concentrations are low suggesting that complete reductive dechlorination of PCE and TCE to ethene is unlikely to occur under existing conditions. Enhanced anaerobic bioremediation options (biostimulation or bioaugmentation) may need to be considered.

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DHC Interpretation

DHC Functional Genes (*tce*A, *bvc*A, *vcr*A)

A "stall" where daughter products *cis*-DCE and vinyl chloride accumulate can occur at PCE- and TCE-impacted sites especially under MNA conditions. The accumulation of vinyl chloride, generally considered more carcinogenic than the parent compounds, is particularly problematic. Although elevated *Dehalococcoides* concentrations correspond to ethene production in numerous studies, the range of chlorinated ethenes metabolized and cometabolized varies among species and strains within the *Dehalococcoides* genus. For example, *Dehalococcoides ethenogenes* str. 195 metabolizes PCE, TCE, and *cis*-DCE and cometabolizes vinyl chloride (8) to produce ethene. Conversely, *Dehalococcoides* sp. CBDB1 utilizes PCE and TCE but does not cometabolize additional chloroethenes (11). Other *Dehalococcoides* strains, such as BAV1, GT and VS, are known to fully dechlorinate cis-DCE and VC to ethene (14,16,19). Quantification of reductive dehalogenase genes is used to more definitively confirm the potential for reductive dechlorination of TCE, cis-DCE, and vinyl chloride (12-15).

Functional Gene	Observation
TCE Reductase	
***tce*A gene**	The *tce*A gene encodes the enzyme responsible for reductive dechlorination of TCE to *cis*-DCE in some strains of *Dehalococcoides*. Absence of *tce*A does not preclude the potential for reductive dechlorination of TCE in the field since the *tce*A gene is not universally distributed among all DHC and is not present in other microorganisms capable of reductive dechlorination of TCE (e.g. *Dehalobacter*). Detection of the *tce*A gene provides an additional line of evidence indicating the potential for dechlorination of TCE.
Vinyl Chloride Reductase	
***bvc*A gene**	The *bvc*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of vinyl chloride to ethene by *Dehalococcoides* sp. str. BAV1 (16). Presence of *bvc*A gene indicates the potential for reductive dechlorination of VC to ethene. Absence of both *bvc*A and *vcr*A genes suggests VC may accumulate. An internal study with ~1,000 samples showed ethene production was observed in 80% of the samples that the DHC population was greater than or equal to 10^4 cells/mL. The *bvc*A gene was detected in over 50% of these samples. Van Der Zaan et al (17) noted that the bvcA gene was the only VC reductase gene detected at three of their sites. Alfred Spormann's laboratory at Stanford University (18) reported that the *bvc*A gene was the most abundant and active at the outflow of a PCE fed column study. This section of the column was in the DCE to VC stages of reductive dechlorination thus confirming the importance of the *bvc*A gene for complete reductive dechlorination.
***vcr*A gene**	The *vcr*A gene encodes the vinyl chloride reductase enzyme responsible for reductive dechlorination of *cis*-DCE and vinyl chloride by *Dehalococcoides* sp. strain VS (14). Presence of *vcr*A gene indicates the potential for reductive dechlorination of DCE and/or VC to ethene. Absence of both *bvc*A and *vcr*A genes suggest VC may accumulate. As with the *bvc*A gene, detection of the *vcr*A gene is associated with ethene production in internal studies (67%) and vinyl chloride reduction in independent studies (14, 17).

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DHC Interpretation

Reporting

Microbial Insights can provide a variety of data packages and reporting levels to suit the needs of any project. Data packages range from simple analytical reports with results only to more complex data packages that include a report narrative, analytical results, QC data, and supporting materials including all raw data and chain-of-custody documentation. The figure below shows our standard report and explains the way values are reported.

Microbial Insights, Inc.

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CENSUS

Client: Company Name
Project: Your Project Name

MI Project Number: Unique Laboratory Identifier
Date Received: Date Samples Arrived

Sample Information

Client Sample ID:		Sample A	Sample B	Sample C
Sample Date:		00/00/0000	00/00/0000	00/00/0000
Units:		cells/mL	cells/mL	cells/mL
Analyst:		Intials	Intials	Intials
Dechlorinating Bacteria				
Dehalococcoides spp.	DHC	**1.84E+05**	**2.76E+02**	**2.28E+01 (J)**
Functional Genes				
tceA Reductase	TCE	**6.00E+01**	**3.23E+01**	<4.00E-01
bvcA Reductase	BVC	**1.17E+04**	**1.81E+01**	<4.00E-01
vcrA Reducatase	VCR	**8.42E+04**	**1.74E+02**	<4.00E-01

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

"J" value
Result is an estimated value. This data qualifier (flag) is used when the target gene is detected but at a concentration or abundance below the practical quantification limit (PQL).

< value
The target gene was not detected at the limit of quantitation (LOQ) reported for that sample.

"I" value
QA Procedure indicated that the sample may have exhibited PCR inhibition. Although relatively rare, PCR inhibition can occur due to the presence of metals or humic acids at high concentrations in the sample.

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DHC Interpretation

Quality Assurance

Microbial Insights' comprehensive Quality Assurance (QA) Program is the foundation of all laboratory analyses, ensuring that our clients receive high-quality analytical services that are timely, reliable, and meet their intended purpose in a cost effective manner. MI is committed to providing quality data that surpasses regulatory and industry standards, thus enabling the client to make well-informed decisions. MI maintains strict standard operating procedures and QA/QC measures throughout all of the analyses offered. The following Table details specific QA/QC procedures that are used for CENSUS.

QA/QC	Description
Date of Extraction	DNA and RNA extractions are performed the day the samples are received by MI to minimize the possibility of any changes to the microbial community prior to analysis.
Laboratory Method Blanks	An extraction blank (no sample added) is processed alongside each set of field samples from DNA extraction through CENSUS® analysis to ensure that cross contamination has not occurred. Although MI has never experienced this issue, the detection of the CENSUS® target (e.g. *Dehalococcoides*) in an extraction blank is direct evidence of cross contamination with a sample or contamination of a reagent and would invalidate the results. If this were to occur, MI would re-extract the sample. If not possible to re-extract, MI would contact the client immediately and notate it on the laboratory report.
Laboratory Control Samples (LCS)	A laboratory control sample (LCS) or positive control (target DNA) is included with each CENSUS® plate to confirm amplification and as a continuing calibration check.
Negative Controls	A negative control (no DNA) is included with each CENSUS plate to ensure that cross contamination has not occurred during amplification. As with the extraction blank, detection of CENSUS target (e.g. DHC) in a negative control is direct evidence of contamination and would invalidate the results. If this were to occur, MI would rerun the analysis.

References

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7. Löffler, F.E., R.A. Sanford, and J.M. Tiedje. 1996. Initial characterization of a reductive dehalogenase from *Desulfitobacterium chlororespirans* Co23. Applied and Environmental Microbiology 62(10): 3809–3813.

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9. Hendrickson, E.R., J. Payne, R.M. Young, M.G. Starr, M.P. Perry, S. Fahnestock, D.E. Ellis, and R.C. Eversole. 2002. Molecular analysis of *Dehalococcoides* 16S ribosomal DNA from chloroethene-contaminated sites throughout North America and Europe. Applied and Environmental Microbiology 68(2): 485-495.

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How to Retrieve and Use Estimated Percentile Ranks from the Microbial Insights Database

The MI Database

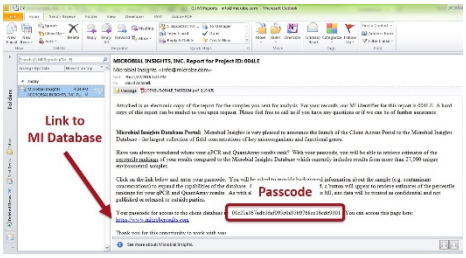
The Microbial Insights Database is the largest collection of field concentrations of key microorganisms and functional genes currently containing qPCR and QuantArray results for more than 40,000 unique groundwater, soil, and sediment samples from all 50 states and 33 countries worldwide.

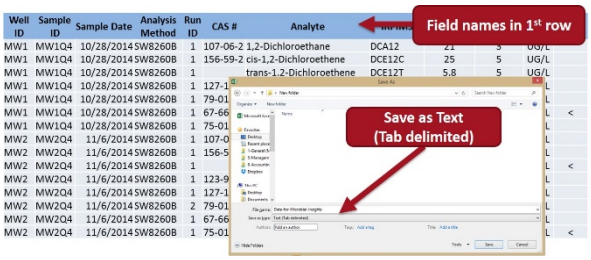
Is that low, medium or high?

In practice, biodegradation depends not just on the presence but the actual concentrations of the contaminant degrading microorganisms. The estimated percentile ranks retrieved from the MI Database answer the question "Is that low, medium or high?" by comparing your results to those of the literally thousands of other environmental samples submitted to MI for analysis over the last 20+ years.

Retrieving Estimated Percentile Ranks

With your report, you were emailed a passcode and link enabling you to login to the Client Portal. Just enter basic information about the sample (e.g. contaminant concentrations) to aid in understanding the links between environmental conditions and microbial populations and you can retrieve estimates of the percentile ranks of your results based on those compiled in the MI database at no additional charge.





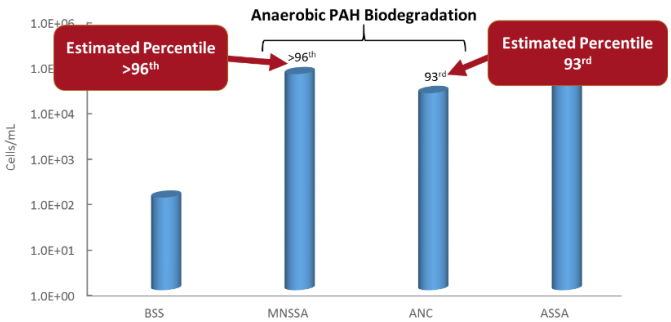
All site specific data will be treated as confidential and uploading is easy.

You can even upload chemical and geochemical data from EDDs. Just save as a Tab Delimited text file.

Example - Using Estimated Percentile for MNA Assessment at an MGP Site

CENSUS® qPCR was performed to quantify anaerobic naphthalene carboxylase (ANC) and naphthyl-2-methylsuccinate synthase (MNSSA) to assess anaerobic biodegradation of naphthalene and methyl-naphthalene under existing site conditions.

- Not only were ANC and MNSSA genes detected, but these functional genes responsible for anaerobic biodegradation of PAHs were present at concentrations "far better than average" based on the estimated percentile ranks.
- Demonstrating high concentrations of ANC and MNSSA gave an additional line of evidence indicating growth substantial populations of anaerobic PAH degraders and suggested a greater probability that monitored natural attenuation (MNA) will be successful.



APPENDIX E
FIELD LOGS FOR WATER QUALITY EVALUATION

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bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35A WW 11	Date: 4/4/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Kennie Moore
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 29.91
	Total Well Depth (ft) (C): 38.06	Water Column Thickness (ft) (C-B): 8.15	Well Volume (gal) (A*(C-B)): 1.30
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Clear / cool	Well Condition: Good	Comments:

CASING INFO	Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
	Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
4/4/18	1050	29.97	.13	100	16.89	5.14	8.66	0.68	414	-256	
	1055	30.05	.26	100	17.20	4.99	8.65	0.00	347	-275	
	1100	30.10	.39	100	17.37	4.92	8.65	0.00	251	-293	
	1105	30.12	.52	100	17.38	4.89	8.65	0.00	191	-318	
	1110	30.14	.65	100	17.44	4.86	8.64	0.00	143	-321	
	1115	30.16	.78	100	17.37	4.87	8.64	0.00	132	-323	
	1120	30.19	.91	100	17.19	4.88	8.63	0.00	118	-325	

Colorimeter Results					No. Containers/Volume/Type			Preserv.	Filter (Y/N)	Method	Parameter(s)
Time	Analyte	Dilution	Result	Units							

Conversions	Stabilization Criteria									
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%						
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%						
	Cond	+/- 10%	ORP	+/- 10	Sample ID:				Sample Time:		

00897889

bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: 35A MW 20	Date: 4/4/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Kennie Moore
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 2"	Unit Casing Volume (gal/lin ft) (A): 0.160	Initial Depth to Water (ft) (B): 19.53
	Total Well Depth (ft) (C): 36.20	Water Column Thickness (ft) (C-B): 16.67	Well Volume (gal) (A*(C-B)): 2.66
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Clear/cool	Well Condition: Good	Comments:

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
4/4/18	0955	19.60	.13	100	19.86	5.75	8.83	0.00	150	-282	
	1000	19.65	.26	100	20.46	5.67	8.85	0.00	130	-284	
	1005	19.70	.39	100	20.88	5.63	8.86	0.00	103	-288	
	1010	19.72	.52	100	20.91	5.62	8.91	0.00	74.1	-289	
	1015	19.73	.65	100	20.73	5.61	8.93	0.00	66.8	-294	
	1020	19.75	.78	100	20.77	5.61	8.93	0.00	60.7	-294	

Colorimeter Results					**No. Containers/Volume/Type**			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Time	**Analyte**	**Dilution**	**Result**	**Units**							

Conversions	**Stabilization Criteria**									
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%						
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%						
	Cond	+/- 10%	ORP	+/- 10	Sample ID:				Sample Time:		

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bhate ENVIRONMENT INFRASTRUCTURE

GROUNDWATER SAMPLE COLLECTION FORM

LOCATION	Site: LHAAP - 58	Location ID: LHS MW07	Date: 4/4/18
	Project Name: LHAAP	Project No./Phase: NWO1312.0150	Recorded By: Kennie Moore
EQUIPMENT	Pump Type/ID#: Bladder Pump / SamplePro	Water Quality Meter/ID#: U-52 Horiba	PID Type/ID#: NA
	Water Level Indicator Type/ID#: Solinist 101	Other Equipment/ID#: NA	Decon Method: Liquinox & DI water
	Tubing Type/Diameter (in): 1/4"	Other Equipment/ID#: NA	PPE: Level D
WELL INFO	Casing Type / ID (in): 4"	Unit Casing Volume (gal/lin ft) (A): 0.652	Initial Depth to Water (ft) (B): 18.51
	Total Well Depth (ft) (C): 30.46	Water Column Thickness (ft) (C-B): 11.95	Well Volume (gal) (A*(C-B)): 7.79
	Ambient PID (ppm): NA	Well Mouth PID (ppm): NA	System Volume (gal): NA
	Weather: Clear/cool	Well Condition: Good	Comments: NA

CASING INFO											
Casing ID (in)	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	6.0	8.0
Unit Casing Volume (gal/lin ft)	0.016	0.020	0.043	0.103	0.160	0.378	0.652	1.03	1.48	2.57

DATE	TIME (24 Hr)	Water Level (BTOC)	Volume Removed (Gals)	Pumping Rate (ml/min)	Temp (C)	pH	Cond (mS/cm)	DO (mg/l)	Turb (NTU)	ORP (mV)	Remarks (odor, clarity, etc.)
4/4/18	0855	18.59	0.13	100	13.74	7.41	10.7	1.60	366	-138	
	0900	18.65	0.26	100	16.23	5.12	10.5	1.43	440	-395	
	0905	18.69	0.39	100	16.42	5.07	10.5	0.24	375	-410	
	0910	18.71	0.52	100	16.49	5.07	10.5	0.02	361	-411	
	0915	18.73	0.65	100	16.72	5.05	10.5	0.01	354	-413	
	0920	18.76	0.78	100	16.96	5.03	10.5	0.00	352	-414	
	0925	18.78	0.91	100	17.14	5.02	10.5	0.00	350	-412	

Colorimeter Results				
Time	**Analyte**	**Dilution**	**Result**	**Units**

Conversions	**Stabilization Criteria**			
1 L = 0.26 gals	Temp	+/- 10%	DO	+/- 10%
1 gal = 3.79 L	pH	+/- 0.1	Turb	+/- 10%
	Cond	+/- 10%	ORP	+/- 10

No. Containers/Volume/Type			**Preserv.**	**Filter (Y/N)**	**Method**	**Parameter(s)**
Sample ID:				Sample Time:		

APPENDIX F
QUALITY CONTROL SUMMARY REPORT

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QUALITY CONTROL SUMMARY REPORT
LHAAP-58 MARCH 2018
BASELINE SAMPLING EVENT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

August 2018

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

Prepared By:

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Table of Contents

Tables

1 INTRODUCTION

Bhate reviewed two data packages from ALS Environmental, Houston, Texas with the analyses for ferrous iron and volatile fatty acids subcontracted to ALS Rochester, NY, and the analyses of dissolved gases to ALS Simi Valley, CA. The dechlorinating bacteria analysis was subcontracted to Microbial Insights in Knoxville, TN. Groundwater samples were collected March 7-8, 2018, from Site LHAAP-58 at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: [United States Environmental Protection Agency] *USEPA Contract Laboratory Program* [CLP] *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the *Army Draft Basewide Uniform Federal Policy (UFP) – Quality Assurance Project Plan (QAPP) Longhorn Army Ammunition Plant* (Bhate, November 2017).

1.1 Intended Use of Data

The objective of sampling at LHAAP-58 in March 2018 was to establish the baseline event.

Analyses performed include:

- SM2320B– Alkalinity
- E365.3 – Phosphorus
- RSK175 – Dissolved Gases
- E415.1– Total Organic Carbon
- SW8260C – Volatiles Organic Compounds (VOCs)
- SM3500Fe- Ferrous Iron
- SW6020A – Total and Dissolved Metals (Iron and Manganese)
- SW9056A – Anions
- E376.1 – Sulfide
- HPLC-METACIDS – Volatile Fatty Acids (VFAs)
- CENSUS – Dechlorinating Bacteria (Dehalococcoides [DHC]/Dehalobacter [DHB])

Table 1 lists the sample identification (ID) numbers and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

1.2 Preservation and Holding Times

Sample IDs were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time with the following exception.

- The analysis for ferrous iron was outside the requisite 24 hours hold time and all results were qualified as estimated, "J".

1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range.

Samples were diluted, if necessary, to bring analyte responses within the calibration range.

1.3.1 Continuing Calibration Verifications

The calibrations must meet the following criteria otherwise the compound is qualified J or UJ: The continuing calibration verification (CCV) criteria are 20 percent difference (%D) for VOCs and 50% for closing CCVs. Metals and general chemistry are 10 %D; and VFAs, dissolved gases, and TOC are 15 %D.

The CCV for propionic acid was above control limits in both laboratory packages. This compound was qualified as estimated non-detect, "UJ", in all samples.

1.4 Blanks

If the analyte result for an associated sample was less than 5 times (10 times for common laboratory contaminants) the analyte concentration in the blank, that result was qualified "UB" and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5 times the amount in the blank, no qualifier was applied.

No compounds were qualified due to blank contamination.

1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

No surrogates were reported outside control limits.

1.6 Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

LCS/LCSD recoveries were evaluated using limits defined in the project-specific QAPP Worksheet 15.

All sample recoveries were within control limits.

1.7 Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)

MS/MSD recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4 times the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data.

1.7.1 SW8260C

The MS and/or MSD recoveries for 1,2-dichlorobenzene (76.5%/76.9%); 1,3-dichlorobenzene (76.9%/78.5%); 1,4-dichlorobenzene (74.6%/75.8%); 1,3-dichloropropane (/78.7%), bromobenzene (75.7%/76.4%); methylene chloride (/73.9%); and toluene (/79.8%) were below control limits. These compounds were qualified as estimated non-detected, "UJ", in the spike sample 35AWW19_030818.

1.7.2 SW6020A

The MSD recovery (76.1%) for total manganese in spike sample 35AWW06_030818 was below control limits and was qualified as estimated, "J".

1.7.3 SM3500Fe

The MS and MSD recoveries (130%/135%) for ferrous iron were above control limits and ferrous iron was qualified as estimated, "J", in the spike sample 35AWW06_030818.

1.8 Internal Standards

If the percent recovery (%R) for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

Internal standards were within acceptance criteria for the associated compounds.

1.9 Field Precision

Precision is the measure of variability of individual sample measurements. Evaluation of field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater matrices.

1.9.1 RSK-175

The RPD, between 35AWW06_030818 and its duplicate, was exceeded for carbon dioxide (46.9%). This compound was qualified as estimated, "J", in both sample and duplicate.

1.9.2 SM3500Fe

The RPD for ferrous iron was 40% and exceeded the project defined control limits. This analyte was qualified as estimated, "J", in the sample (35AWW06_030818) and duplicate.

2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (see Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Packages

Client Sample ID	Lab Package-ID	SM2320B	E365.3	E415.1	SW6020A	SW8260C	HPLC-METACIDS	SW9056A	RSK-175	SM3500Fe	E376.1	CENSUS
35AWW06_030818	HS18030472-02	X	X	X	X	X	X	X	X	X	X	X
35AWW06_030818_a	HS18030472-03	X	X	X	X	X	X	X	X	X	X	X
35AWW11-030718	HS18030365-03	X	X	X	X	X	X	X	X	X	X	X
35AWW19_030818	HS18030472-01	X	X	X	X	X	X	X	X	X	X	X
35AWW20-030718	HS18030365-01	X	X	X	X	X	X	X	X		X	X
35AWW23_030818	HS18030472-04	X	X	X	X	X	X	X	X	X	X	X
35AWW24_030818	HS18030472-05	X	X	X	X	X	X	X	X	X	X	X
LHSMW07-030718	HS18030365-02	X	X	X	X	X	X	X	X	X	X	X

Notes: MW - Monitoring Well, SM - Standard Method, SW - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, E - U.S. Environmental Protection Agency Method, HS – Houston, HPLC - High Performance Liquid Chromatography

Table 2: Qualified Data

Client Sample ID Laboratory	Laboratory Package-ID	Analyte Name	Data Validation Qualifier	Reason for Qualification
35AWW19_030818	HS18030472-01	Ferrous iron	1.1 J	HT
		Propionic acid	1.0 UJ	CCV
		1,2-Dichlorobenzene	0.5 UJ	MS/MSD <
		1,3-Dichlorobenzene	0.5 UJ	MS/MSD <
		1,4-Dichlorobenzene	0.5 UJ	MS/MSD <
		1,3-Dichloropropane	0.5 UJ	MSD <
		Bromobenzene	0.5 UJ	MS/MSD <
		Methylene chloride	1.0 UJ	MSD <
		Toluene	0.5 UJ	MSD <
35AWW06_030818	HS18030472-02	Ferrous iron	0.08 J	HT/Dup RPD/MS/MSD>
		Propionic acid	1.0 UJ	CCV
		Carbon dioxide	500,000 J	Dup RPD
		Total manganese	0.236 J	MSD <
35AWW06_030818_a	HS18030472-03	Ferrous iron	0.12 J	HT/Dup RPD
		Propionic acid	1.0 UJ	CCV
		Carbon dioxide	310,000 J	Dup RPD
35AWW23_030818	HS18030472-04	Ferrous iron	0.13 J	HT
		Propionic acid	1.0 UJ	CCV
35AWW24_030818	HS18030472-05	Ferrous iron	0.33 J	HT
		Propionic acid	1.0 UJ	CCV
35AWW20-030718	HS18030365-01	Ferrous iron	0.69 J	HT
		Propionic acid	1.0 UJ	CCV
LHSMW07-030718	HS18030365-02	Ferrous iron	0.07 J	HT
		Propionic Acid	1.0 UJ	CCV
35AWW11-030718	HS18030365-03	Ferrous iron	0.1 J	HT
		Propionic acid	1.0 UJ	CCV

Notes: J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ – The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
MS/MSD >/<– Matrix spike/duplicate recoveries above/below control limits,
Dup RPD – the relative percent difference between sample and duplicate was outside control limits
HT – exceeded recommended holt time, CCV – continuing calibration verification outside control limits

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
SM2320B	0	100
E365.3	0	100
E415.1	0	100
SW6020A	0	100
SW8260C	0	100
HPLC-METACIDS	0	100
SW9056A	0	100
RSK-175	0	100
SM3500Fe	0	100
E376.1	0	100
CENSUS	0	100

Subject:	**Final Minutes, Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Via Conference Call-In 267-930-4000 with code 041-819-550**
Date of Meeting:	**August 15, 2018 – 1:00 PM Central Daylight Time (CDT)**

Attendees:

Army BRAC:	Rose Zeiler (RMZ)
EPA:	Rich Mayer (RM)
TCEQ:	April Palmie (AP)
USGS:	Kent Becher (KB)
USFWS:	Paul Bruckwicki (PB)
USACE:	Aaron Williams (AW)
Bhate:	Kim Nemmers (KN)
APTIM:	Bill Foss (BF) and Praveen Srivastav (PS)

Action Items

Army

- RMZ welcomed everyone to start the MMM.
  - **LHAAP Enforceable Schedule**:
  - RMZ stated that Site LHAAP-29 Proposed Plan (PP) will be sent out as draft once RMZ receives word from the In Progress Review (IPR) Group at Office of the Chief of Staff for Installation Management (OACSIM).

Defense Environmental Restoration Program (DERP) Performance Based Remediation (PBR) Update

KN asked everyone to refer to the Document and Issues Tracking Table dated 15 August 2018.

AP thanked PS for putting the laboratory package together in one PDF for Site LHAAP-50. AP requested that everything within a document be printed except for the data packages.

- **Task 1** (Project Management) -
  - KN stated that the prior meeting minutes for the July 2018 MMM and Restoration Advisory Board (RAB) were submitted to the EPA and TCEQ on 8 August 2018.
  - KN stated that responses to the Regulatory comments on the revisions to the Standard Operating Procedures (SOP) A19 were sent to the Regulators on 9 August 2018. KN stated that AP had concurrence with the changes made based upon her comments. RM stated that he needed to check in with KB to ensure EPA comments are addressed. AP asked if KN plans to do the revision as a change page to which KN concurred.
- **Task 2** (LHAAP-02 Semi-Annual Groundwater Monitoring Report) – KN stated that TCEQ concurrence was received on 2 August 2018. AW stated that the technical memorandum is silent to whether the document is "Draft" or "Final." Based upon discussions, it was decided that a new transmittal would be prepared that would state that the technical memorandum was final and provided for the record. This new letter along with the technical memorandum would then be placed into the administrative record (AR).
- **Task 3** (LHAAP-03 ROD and Explanation of Significant Difference [ESD]) – RMZ asked that the sheet with the ROD signatures be placed into the Final ROD and the document be issued for everyone's records.

- **Task 4** (LHAAP-04 Remedial Design [RD]/Remedial Action Work Plan [RAWP]) – PS stated that a contract modification is expected to be awarded by the Army for the additional investigation at LHAAP-04 but has not yet been awarded. PS stated that, upon award of the modification, a technical memorandum will be prepared for plume delineation and Regulatory review in September 2018. PS stated that there has already been discussion on planned location of direct push technology (DPT) points and that the technical memorandum would reflect those agreed upon locations.
- **Task 5** (LHAAP-12 Annual Remedial Action – Operation [RA-O] Report) – PS stated that the draft RA-O Report was sent to the Regulators on 10 July 2018. PS stated that AP had provided an email on 9 August 2018 that she had no comments. RM stated that he had sent an email out. AP stated that she didn't have anything from RM so RM said he would look through his emails.
- **Task 6** (LHAAP-16 RAWP) – PS stated RAWP is now final and will be posted onto the AR. KN stated that the LHAAP-16 annual compliance sampling data is included in the First Quarter 2018 Report for the Groundwater Treatment Plant (GWTP) that is currently under Regulatory Review.
- **Task 7** (LHAAP-17 Pre-Design Investigation [PDI] Report) - PS stated that the PDI Report is in Regulator review. RM expected to have comments later in the day. AP stated she had not started her review but planned to have her review completed by the deadline (8/16/2018).
- **Task 9** (LHAAP-37) – PS stated that Year 1 Quarter 4 sampling was planned to be completed this month. The analytical data should be available for the September 2018 MMM.
- **Task 10** (LHAAP-46) Year 4 RA-O Report – PS stated that Year 4 semi-annual sampling is scheduled for August. The analytical data should be available for the September 2018 MMM.
- **Task 11** (LHAAP-50 RA-O Report) –AP and RM stated that the replacement page for Table 2-4 was acceptable. Therefore, PS stated that the Year 3 RA-O Report is considered final. The Year 4 RA-0 Report is under Army review and should be released for Regulatory review towards the end of September 2018.
- **Task 12** (LHAAP-58) – KN stated that Year 4 RA-O Report is being prepared. However, the validated data is provided as part of the August 2018 MMM and shows reduction in lateral extent as wells as concentrations in both the eastern and western plume areas. KN stated that the next sampling event at LHAAP-58 is planned for October 2018. KN also stated that comments on the RACR were received from both the TCEQ and EPA and are being addressed. RM stated that he had looked at the validated data and notice the reductions. KN stated that Bhate had prepared a plume comparison map that compares the 2016 to the 2018 plume, which will be included in the Year 4 RA-O Report and might be good to present at the next RAB meeting to show the visual changes in the plume laterally.
- **Task 13** (LHAAP-67) – PS stated that the Year 4 RA-O Report is planned for submittal to the Army within the next week. After Army's review, PS stated that the report will be released to the Regulators.
- **Task 16** (GWTP) **–** KN stated that the 2nd Quarter 2018 GWTP was being prepared and that the 1st Quarter 2018 GWTP is under Regulatory review currently. As previously mentioned, KN stated that the 1st Quarter 2-018 GWTP Report also includes LHAAP-16 groundwater data. The June 2018 GWTP data is included with the validated data. KN explained that the July 2018 GWTP data will be provided in August 2018 but that the data will be limited due to repairs attempted and completed on the fluidized bed reactor (FBR).

- **Task 19** (Surface Water) **–** KN stated that the surface water sampling had been completed the day prior, 14 August 2018, due to flow in the creek following recent precipitation events.
- **Administrative Record (AR) –** PS stated that the last update is completed and included documents through February 2018. The next update is being prepared and will include March through May 2018.

Field Work in August 2018

- **LHAAP-16:** PS explained that the area on the east side of Harrison Bayou at Site LHAAP-16 was too wet earlier to clear the path to install the two remaining wells. However, this area dried up and the clearing was completed last week. So, the two wells on the east side of the creek and the remaining wells at LHAAP-16 will be installed once mobilization is set with the new driller being selected for the injection. Once a firm date is set, PS stated that he will provide that to everyone. The plan is to install the remaining 11 wells and then continue with the injections, which PS explained will be about a month of field work.
- **LHAAP-17:** BF stated that the soil samples from the area previously inaccessible due to standing water were collected using a hand auger. At 2.0-2.5 feet, bricks, rocks, or a similar hard material was encountered in some of the borings. BF stated that the hand auger was able to get through at two of the five locations. The water table is at about 7 feet below ground surface based upon the nearest well. BF explained that when the hand auger reached the saturated zone, the saturated soil would create a vacuum that was pulling the soil back out of the auger when it was pulled up. BF explained that the collected soils samples will be analyzed to determine if there is a need for deeper samples at those locations. If additional soil data is needed, then this data will be collected using a drill rig or a DPT rig to be mobilized for activities at LHAAP-04 or LHAAP-16.
- **LHAAP-**37 and 46: PS stated that groundwater sampling is being performed this month. KN stated that sampling at one of the sites was planned for sampling this week following some bush hogging.
- **GWTP:** KN stated that the FBR had maintenance completed at the end of July 2018. KN explained that all of the nozzles and laterals were replaced. The FBR was back online within a few days the start of the maintenance activities. KN explained that the initial effluent sample from the FBR was non-detect but cautioned that this data is not representative since the FBR had been in recycle for several days following the maintenance activities. KN explained that perchlorate will be analyzed on a rush turn-around basis until the non-detect results observed can be confirmed over several weeks. RMZ asked if the INF Pond could discharge to the bayou. KN stated that this was a good idea and that she would speak with Scott Beesinger.

  RM asked about the potable water pressure. KN explained that recent storms had caused the pressure to go up and down but that it is holding steady at about 40 pounds per square inch (psi). KN explained that the water pressure didn't end up being a big issue with removal and replacement of the carbon within the FBR. KN stated that a tank with potable water was stored near the FBR and did help ensure that sufficient water and pressure was available during the removal and replacement of the carbon. KN explained that bioaugmenation was completed when the carbon was placed back into the FBR.

Other Site Updates

- **Site LHAAP-47** – AW stated that all of the monitoring wells were sampled based upon the Work Plan had been collected and analyzed, along with some new wells, and the data was in the process of being validated. AW stated that once the data is validated that it will be

shared with the group. RM then asked about whether the groundwater samples for perchlorate were being filtered. PB stated that he heard HDR say that the samples were being sent to the laboratory unfiltered. AW asked if filtering was a requirement to filter the samples. RM stated that Scott Beesinger was filtering the samples. AW stated that the Installation Wide Work Plan (IWWP) reads that if you are going to filter then a specific filtering size is required. RM stated that the EPA filters perchlorate samples collected from LHAAP and that he just wanted to mention it. RMZ stated that the Army would look into it.

AP asked why groundwater sampled for perchlorate is filtered. AW stated that the particular micron filter removes any bugs that could deplete the perchlorate. KB mentioned a comparison completed where groundwater was split between samples that were filtered and unfiltered. KB stated that the result was a clearly higher concentration of perchlorate in the filtered samples. AW explained that the groundwater samples are being analyzed on a quick turnaround such that the likelihood of the degradation occurring is limited. AP clarified that the concern is degradation and not competing ions. KB confirmed that the concern is microbial. RMZ stated that if the data is being used to determine if new wells are needed then maybe the data is acceptable but that future sampling may need to be filtered so that it is consistent with other data being collected. However, RMZ clarified that she also needs to look into the issue, including the work plan for the site.

KB stated that the laboratory uses 0.45 or 0.2 micron filter to avoid instrumentation issues. KB stated that he thought the perchlorate splits were evaluated about four years ago at Site LHAAP-18/24 and that he would try to find the data. KB stated that he thought he did a field report on the effort also.

AW stated that the six additional wells are being installed in the next few weeks and then those wells will be sampled. AW stated that all the DPT locations had been advanced. RM stated that he had thought additional DPT locations were being considered but AW and RMZ were unaware of any additional locations. RMZ thought that perhaps the DPT locations could have been meant the additional wells being installed.

- **Site LHAAP-29** – RMZ is awaiting confirmation that the PP can be released. The Department of Defense assessment panel process is in flux. RMZ stated that her informal response back is that the PP is ready to be released but she will have to wait for some sort of formal statement to that effect. RM asked if the PP will be considered draft and RMZ confirmed that it would.
- **Site LHAAP 18/24** – RMZ and AW confirmed that the PP comments from the Army have not been addressed. After the Army comments are addressed, the PP will need to go to ELD. AW stated that it is good that there is a time gap between the PP for LHAAP-29 and LHAAP-18/24.
- **Five Year Review (FYR)** – AW stated that the Army is awaiting their draft copy of the FYR, which is expected at the end of August. AW stated that the plan is still to provide the FYR to the Regulators at the end of November 2018. RMZ explained that there are several layers of review for the Army. AP stated that she had a lengthy discussion with the contractor performing the FYR regarding the TCEQ rules and what cleanup levels apply where. KB stated he was also contacted. AP stated that there was a summary of cleanup goals that she reviewed and discussed with the contractor performing the FYR.
- **USFWS Update.** RMZ explained that Sites LHAAP-19, the Pistol Range and the two Military Munitions Response sites will be transferred to the USFWS, which is approximately 150 acres.

Schedule Next Managers' Meeting

The next MMM will be held on September 20, 2018 via conference call at 1:00 PM CDT.

ACRONYM LIST

AP	April Palmie
AR	Administrative Record
AW	Aaron Williams
BF	Bill Foss
Bhate	Bhate Environmental Associates, Inc.
BRAC	Base Realignment and Closure
CDT	Central Daylight Time
DERP	Defense Environmental Restoration Program
DPT	Direct push technology
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FBR	Fluidized bed reactor
FYR	Five Year Review
GWTP	Ground Water Treatment Plant
IPR	In Progress Review
IRP	Installation Restoration Program
IWWP	Installation Wide Work Plan
KN	Kim Nemmers
LHAAP	Longhorn Army Ammunition Plant
MMM	Monthly Managers' Meeting
NPL	National Priorities List
OACSIM	Office of the Chief of Staff for Installation Management
PB	Paul Bruckwicki
PBR	Performance-Based Remediation
PDI	Pre-Design Investigation
PP	Proposed Plan
PS	Praveen Srivastav
PSI	Pounds per square inch
RACR	Remedial Action Completion Report
RA	Remedial Action
RAB	Restoration Advisory Board
RA-O	remedial action – operation
RAWP	Remedial Action Work Plan
RD	Remedial Design
ROD	Record of Decision
RM	Rich Mayer
RMZ	Rose M. Zeiler
SOP	standard operating procedure
TCEQ	Texas Commission on Environmental Quality
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

LHAAP Data Validated
June 2018

GWTP Effluent	*Weekly Perchlorate Sampling – June 2018* Perchlorate (6850)
GWTP Effluent	*Weekly, Bi-Weekly, and Monthly Sampling – June 2018* Ammonia (350.3) Ortho-Phosphate (365.3) Organic Carbon (415.1) VOC (8260C) Metals (6020A) Hexavalent Chromium (7196A) 1,4-Dioxane (8270D-SIM) Anions (9056)
GWTP Influent	*Monthly Sampling – June 2018* Metals (6020A) Perchlorate (6850) Hexavalent Chromium (7196A)
GWTP Quarterly	*Influent and Effluent – June 2018* Oil and Grease (1664A) Perchlorate (6850) Metals (6020A) 1,4-Dioxane (8270D-SIM) Chemical Oxygen Demand (410.4) VOC (8260C) Anions (9056)
LHAAP-18/24	*Sampling – June 2018* Perchlorate (6850) Metals (6020A) VOCs (8260C) 1,4- Dioxane (8270D SIM)
LHAAP-58	*Semi-Annual Sampling Event– June 2018* Alkalinity (310.2/SM2320B) Phosphorus (365.4) Anions (9056) Metals (6020A) VOC (8260C) Total Organic Carbon (415.1) Metabolic Acids (HPLC-METACIDS) Dechlorinating Bacteria (CENSUS) Dissolved Gases (RSK-175) Ferrous Iron (SM3500FE) Sulfide (376.1)

GWTP Weekly Sampling - June 2018

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_060618 6/6/18	LH18/24-SP650_061318 6/13/18	LH18/24-SP650_062018 6/20/18	LH18/24-SP650_062718 6/27/18
Location Description			**GWTP–Collected from a spigot on the discharge of effluent TK-650. Sampled Weekly.**			
Ammonia as N (350.3)						
Ammonia as N	mg/L	NV	**20**	**36**	**16**	**12**
Ortho-Phosphate (365.3)						
Ortho-Phosphate	mg/L	NV	**2.59**	**2.17**	**3.34**	**2.84**
Organic Carbon (415.1)						
Total Organic Carbon (TOC)	mg/L	NV	**161**	**165**	**18.4**	**34**

mg/L - milligrams per liter

NV - No Value

GWTP Bi-Weekly Sampling - June 2018

Location ID: / Sample Date:	Units	Daily Maximum Conc	LH 18/24-SP650_061318 6/13/18	LH18/24-SP650_062718 6/27/18
Location Description			**GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled Biweekly.**	
Volatile Organic Compounds (8260C)				
1,1,1-Trichloroethane	µg/L	7,230	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	216.9	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	14,032	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	253	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	181	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U
Acetone	µg/L	2,395	**7.7**	**6.0**
Benzene	µg/L	181	< 0.5 U	< 0.5 U
Carbon tetrachloride	µg/L	181	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	47,180	< 0.5 U	< 0.5 U
Chloroform	µg/L	3,615	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	57,025	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	83.6	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	1,699	< 1.0 U	< 1.0 U
o-Xylene	µg/L	83.6	< 0.5 U	< 0.5 U
Styrene	µg/L	5,987	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	180.7	< 0.5 U	< 0.5 U
Toluene	µg/L	4,189	**0.40 J**	< 0.5 U
Trichloroethene	µg/L	181	**1.2**	**1.9**
Vinyl chloride	µg/L	72	< 0.5 U	< 0.5 U
Anions (9056)				
Chloride	mg/L	NV	**473**	**536**
Sulfate	mg/L	NV	**40.2**	**87.9**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected.

NV - No Value

J - Estimated value

GWTP Monthly Effluent Sampling - June 2018

Location ID: / Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_060618 6/6/18
Location Description			**GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled Quarterly.**
Volatile Organic Compounds (8260C)			
1,1,1-Trichloroethane	µg/L	7,230	< 0.5 U
1,1,2-Trichloroethane	µg/L	216.9	< 0.5 U
1,1-Dichloroethane	µg/L	14,032	< 0.5 U
1,1-Dichloroethene	µg/L	253	< 0.5 U
1,2-Dichloroethane	µg/L	181	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U
Acetone	µg/L	2,395	**9.7**
Benzene	µg/L	181	< 0.5 U
Carbon tetrachloride	µg/L	181	< 0.5 U
Chlorobenzene	µg/L	47,180	< 0.5 U
Chloroform	µg/L	3,615	< 0.5 U
Ethylbenzene	µg/L	57,025	< 0.5 U
m,p-Xylene	µg/L	83.6	< 1.0 U
Methylene chloride	µg/L	1,699	< 1.0 U
o-Xylene	µg/L	83.6	< 0.5 U
Styrene	µg/L	5,987	< 0.5 U
Tetrachloroethene	µg/L	180.7	< 0.5 U
Toluene	µg/L	4,189	**0.36 J**
Trichloroethene	µg/L	181	**4.2**
Vinyl chloride	µg/L	72	**1.5**
Metals (6020A)			
Barium	mg/L	2	**0.0999**
Lead	mg/L	0.0046	< 0.00100 U
Selenium	mg/L	0.012	**0.00111 J**
Silver	mg/L	0.003	< 0.00100 U
Hexavalent Chromium (7196A)			
Hexavalent Chromium	mg/L	0.1244	< 0.0100 U
Semi-Volatile Organic Compounds (8270D SIM)			
1,4-Dioxane	µg/L	134.2	**4.8**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected.

J - Estimated value

GWTP Monthly Influent Sampling - June 2018

Location ID: Sample Date:	Units	LH18/24-SP140_060618 6/6/18
Location Description		**GWTP – Collected from a spigot on the influent to TK-140. Sampled Monthly.**
Metals (6020A)		
Selenium	mg/L	< 0.00200 U
Silver	mg/L	< 0.00100 U
Hexavalent Chromium (7196A)		
Hexavalent Chromium	mg/L	< 0.0100 U
Perchlorate (6850)		
Perchlorate	µg/L	**21,000**

mg/L - milligrams per liter

µg/L - micrograms per liter

U- Undetected: The analyte was analyzed for, but not detected.

GWTP Weekly/Effluent Perchlorate Sampling - June 2018

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_060618 6/6/18	LH18/24-SP650_060618 6/6/18	LH18/24-SP650_061218 6/12/18	LH18/24-SP650_061318 6/13/18	LH18/24-SP650_061818 6/18/18	LH18/24-SP650_062018 6/20/18	LH18/24-SP650_062018 6/20/18	LH18/24-SP650_062618 6/26/18
Location Description			**Collected from a spigot on the discharge of effluent TK-650.**							
			Weekly after IX	Monthly EFF after IX	Weekly RUSH after IX	Weekly after IX	Weekly RUSH after IX	Quarterly EFF before IX	Weekly before IX	Weekly RUSH after IX
Perchlorate (6850)										
Perchlorate	µg/L	589	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	**15**	**13**	< 10 U

µg/L - micrograms per liter

U- Undetected: The analyte was analyzed for, but not detected.

IX - ion exchange

GWTP Quarterly Effluent Sampling - June 2018

Location ID: / Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_062018 6/20/18
Location Description			**GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled Quarterly.**
Oil and Grease (1664A)			
Oil & Grease	mg/L	15	**2.92**
Chemical Oxygen Demand (410.4)			
Chemical Oxygen Demand	mg/L	200	**66**
Volatile Organic Compounds (8260C)			
1,1,1-Trichloroethane	µg/L	7,230	< 0.5 U
1,1,2-Trichloroethane	µg/L	216.9	< 0.5 U
1,1-Dichloroethane	µg/L	14,032	< 0.5 U
1,1-Dichloroethene	µg/L	253	< 0.5 U
1,2-Dichloroethane	µg/L	181	**0.59 J**
1,2-Dichloropropane	µg/L	5	< 0.5 U
Acetone	µg/L	2,395	< 1.0 U
Benzene	µg/L	181	< 0.5 U
Carbon tetrachloride	µg/L	181	< 0.5 U
Chlorobenzene	µg/L	47,180	< 0.5 U
Chloroform	µg/L	3,615	< 0.5 U
Ethylbenzene	µg/L	57,025	< 0.5 U
m,p-Xylene	µg/L	83.6	< 1.0 U
Methylene chloride	µg/L	1,699	< 1.0 U
o-Xylene	µg/L	83.6	< 0.5 U
Styrene	µg/L	5,987	< 0.5 U
Tetrachloroethene	µg/L	180.7	< 0.5 U
Toluene	µg/L	4,189	< 0.5 U
Trichloroethene	µg/L	181	**2.2**
Vinyl chloride	µg/L	72	< 0.5 U
Metals (6020A)			
Aluminum	mg/L	1.644	0.0170 UB
Antimony	mg/L	NV	< 0.00100 U
Arsenic	mg/L	0.722	**0.00110 J**
Barium	mg/L	2	**0.0709**
Beryllium	mg/L	NV	< 0.00100 U
Cadmium	mg/L	0.0034	**0.000222 J**
Calcium	mg/L	NV	**7.66**
Chromium	mg/L	0.752	**0.00540**
Cobalt	mg/L	11.495	**0.00222 J**
Iron	mg/L	2.395	**0.261**
Lead	mg/L	0.0046	< 0.00100 U

Magnesium	mg/L	NV	**19.0**
Manganese	mg/L	15.494	**0.0777**
Nickel	mg/L	0.184	**0.0125**
Potassium	mg/L	NV	**1.82**
Selenium	mg/L	0.012	**0.00150 J**
Silver	mg/L	0.003	< 0.00100 U
Sodium	mg/L	NV	**334**
Thallium	mg/L	NV	< 0.00100 U
Vanadium	mg/L	3.592	**0.00143 J**
Zinc	mg/L	0.31	**0.455**
Mercury	mg/L	NV	< 0.0000500 U
Anions (9056)			
Chloride	mg/L	NV	**427**
Sulfate	mg/L	NV	**7.17**
Semi-Volatile Organic Compounds (8270D SIM)			
1,4-Dioxane	µg/L	134.2	**4.5**

µg/L - micrograms per liter

mg/L - milligrams per liter

J - estimated value between the limit of quantitation and the detection limit

UB - considered non-detect due to blank contamination

NV - No Value

U- Undetected: The analyte was analyzed for, but not detected.

GWTP Quarterly Influent Sampling - June 2018

Location ID: / Sample Date:	Units	LH18/24_SP140_062018 6/20/18
Location Description		**GWTP – Collected from a spigot on the influent to TK-140. Sampled Quarterly.**
Oil and Grease (1664A)		
Oil & Grease	mg/L	**0.625 J**
Chemical Oxygen Demand (410.4)		
Chemical Oxygen Demand	mg/L	**12 J**
Perchlorate (6850)		
Perchlorate	µg/L	**9,400**
Volatile Organic Compounds (8260C)		
1,1,1,2-Tetrachloroethane	µg/L	< 10 U
1,1,1-Trichloroethane	µg/L	< 10 U
1,1,2,2-Tetrachloroethane	µg/L	< 10 U
1,1,2-Trichloroethane	µg/L	< 10 U
1,1-Dichloroethane	µg/L	**8.9 J**
1,1-Dichloroethene	µg/L	< 10 U
1,1-Dichloropropene	µg/L	< 10 U
1,2,3-Trichlorobenzene	µg/L	< 10 U
1,2,3-Trichloropropane	µg/L	< 10 U
1,2,4-Trichlorobenzene	µg/L	< 10 U
1,2,4-Trimethylbenzene	µg/L	< 10 U
1,2-Dibromo-3-chloropropane	µg/L	< 10 U
1,2-Dibromoethane	µg/L	< 10 U
1,2-Dichlorobenzene	µg/L	< 10 U
1,2-Dichloroethane	µg/L	**56**
1,2-Dichloropropane	µg/L	< 10 U
1,3,5-Trimethylbenzene	µg/L	< 10 U
1,3-Dichlorobenzene	µg/L	< 10 U
1,3-Dichloropropane	µg/L	< 10 U
1,4-Dichlorobenzene	µg/L	< 10 U
2,2-Dichloropropane	µg/L	< 10 U
2-Butanone	µg/L	< 20 U
2-Chlorotoluene	µg/L	< 10 U
2-Hexanone	µg/L	< 20 U
4-Chlorotoluene	µg/L	< 10 U
4-Isopropyltoluene	µg/L	< 10 U
4-Methyl-2-pentanone	µg/L	< 20 U
Acetone	µg/L	< 20 U
Benzene	µg/L	< 10 U
Bromobenzene	µg/L	< 10 U
Bromochloromethane	µg/L	< 10 U
Bromodichloromethane	µg/L	< 10 U

Bromoform	µg/L	< 10 U
Bromomethane	µg/L	< 10 U
Carbon disulfide	µg/L	< 20 U
Carbon tetrachloride	µg/L	< 10 U
Chlorobenzene	µg/L	< 10 U
Chloroethane	µg/L	< 10 U
Chloroform	µg/L	< 10 U
Chloromethane	µg/L	< 10 U
cis-1,2-Dichloroethene	µg/L	**3100**
cis-1,3-Dichloropropene	µg/L	< 10 U
Dibromochloromethane	µg/L	< 10 U
Dibromomethane	µg/L	< 10 U
Dichlorodifluoromethane	µg/L	< 10 U
Ethylbenzene	µg/L	< 10 U
Hexachlorobutadiene	µg/L	< 10 U
Isopropylbenzene	µg/L	< 10 U
m,p-Xylene	µg/L	< 20 U
Methylene chloride	µg/L	**28 J**
Naphthalene	µg/L	< 10 UJ
n-Butylbenzene	µg/L	< 10 U
n-Propylbenzene	µg/L	< 10 U
o-Xylene	µg/L	< 10 U
sec-Butylbenzene	µg/L	< 10 U
Styrene	µg/L	< 10 U
tert-Butylbenzene	µg/L	< 10 U
Tetrachloroethene	µg/L	**51**
Toluene	µg/L	< 10 U
trans-1,2-Dichloroethene	µg/L	**10 J**
trans-1,3-Dichloropropene	µg/L	< 10 U
Trichloroethene	µg/L	**6000**
Trichlorofluoromethane	µg/L	< 10 U
Vinyl chloride	µg/L	**33**
Metals (6020A)		
Aluminum	mg/L	0.0160 UB
Antimony	mg/L	**0.000585 J**
Arsenic	mg/L	**0.000735 J**
Barium	mg/L	**0.440**
Beryllium	mg/L	< 0.00100 U
Cadmium	mg/L	**0.00103 J**
Calcium	mg/L	**33.4**
Chromium	mg/L	**0.00147 J**
Cobalt	mg/L	**0.0128**
Iron	mg/L	**0.283**
Lead	mg/L	< 0.00100 U
Magnesium	mg/L	**25.0**
Manganese	mg/L	**0.637**

Nickel	mg/L	**0.0296**
Potassium	mg/L	**1.63**
Selenium	mg/L	**0.00199 J**
Silver	mg/L	< 0.00100 U
Sodium	mg/L	**177**
Thallium	mg/L	**0.000338 J**
Vanadium	mg/L	< 0.00100 U
Zinc	mg/L	**0.651**
Mercury	mg/L	**0.0000640 J**
Anions (9056)		
Chloride	mg/L	**374**
Sulfate	mg/L	**50.6**
Semi-Volatile Organic Compounds (8270D SIM)		
1,4-Dioxane	µg/L	**13**

µg/L - micrograms per liter

mg/L - milligrams per liter

J - estimated value between the limit of quantitation and the detection limit

U- Undetected: The analyte was analyzed for, but not detected.

UB - considered non-detect due to blank contamination

UJ - estimated non-detect due to quality control outliers

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	AWD1_061218 6/12/18	AWD3_061818 6/18/18	AWD4_061918 6/19/18	18CPTMW01DW_060618 6/6/18	18CPTMW01SW_060618 6/6/18	18CPTMW03SW_061118 6/11/18	18CPTMW04_060718 6/7/18	18CPTMW04_060718_a 6/7/18	18CPTMW04SW_060718 6/7/18	18CPTMW06_060718 6/7/18	18CPTMW07_061418 6/14/18	18CPTMW08SW-060418 6/4/18	18CPTMW08DW-060418+ 6/4/18
Lab Package			HS18060613	HS18060954	HS18060947	HS18060352	HS18060352	HS18060552	HS18060425	HS18060425	HS18060425	HS18060425	HS18060725	HS18060188	HS18060188
Perchlorate (6850)															
Perchlorate	mg/L	17*	NA	**250**	< 2.0 U	< 2.0 U	< 2.0 U	**62**	**410**	**430**	< 2.0 U	< 2.0 U	**2.1 J**	**61,000**	**1,000**
Volatile Organic Compounds (8260C)															
1,1,1,2-Tetrachloroethane	mg/L	110	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	mg/L	200	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	mg/L	14	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	mg/L	5	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1-Dichloroethane	mg/L	10,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1-Dichloroethene	mg/L	7	NA	< 0.5 U	< 0.5 U	< 0.5 U	**79**	< 0.5 U	**2.1**	**2.0**	< 0.5 U	< 0.5 U	< 0.5 UJ	**3.4**	< 0.5 U
1,1-Dichloropropene	mg/L	2.9	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	mg/L	310	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	mg/L	0.041	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	mg/L	70	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	mg/L	5,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	mg/L	0.2	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	mg/L	0.05	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	mg/L	600	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2-Dichloroethane	mg/L	5	NA	**1.8**	< 0.5 U	< 0.5 U	< 25 U	**2.9**	**3.3**	**3.3**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	mg/L	5	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	mg/L	5,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	mg/L	3,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,3-Dichloropropane	mg/L	29	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	mg/L	75	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
2,2-Dichloropropane	mg/L	42	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
2-Butanone	mg/L	61,000	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	mg/L	2,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
2-Hexanone	mg/L	6,100	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	mg/L	2,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
4-Isopropyltoluene	mg/L	10,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	mg/L	8,200	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	mg/L	92,000	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	mg/L	5	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	**1.4**	**0.59 J**	**0.55 J**	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromobenzene	mg/L	2,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromochloromethane	mg/L	4,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromodichloromethane	mg/L	4.6	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromoform	mg/L	36	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	mg/L	140	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	mg/L	10,000	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	mg/L	5	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Chlorobenzene	mg/L	100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Chloroethane	mg/L	41,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	mg/L	1,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	**1.3**	**1.2**	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Chloromethane	mg/L	220	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	mg/L	70	NA	**4.3**	**0.71 J**	< 0.5 U	< 25 U	**4.9**	**42**	**42**	< 0.5 U	< 0.5 U	< 0.5 UJ	**11**	< 0.5 U
cis-1,3-Dichloropropene	mg/L	5.3	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Dibromochloromethane	mg/L	34	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Dibromomethane	mg/L	380	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	mg/L	20,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	mg/L	700	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Hexachlorobutadiene	mg/L	20	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Isopropylbenzene	mg/L	10,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
m,p-Xylene	mg/L	10,000**	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Methylene chloride	mg/L	5	NA	< 1.0 U	< 1.0 U	**2.1**	**840**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U
Naphthalene	mg/L	2,000	NA	< 0.5 UJ	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	mg/L	4,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	AWD1_061218 6/12/18	AWD3_061818 6/18/18	AWD4_061918 6/19/18	18CPTMW01DW_060618 6/6/18	18CPTMW01SW_060618 6/6/18	18CPTMW03SW_061118 6/11/18	18CPTMW04_060718 6/7/18	18CPTMW04_060718_a 6/7/18	18CPTMW04SW_060718 6/7/18	18CPTMW06_060718 6/7/18	18CPTMW07_061418 6/14/18	18CPTMW08SW-060418 6/4/18	18CPTMW08DW-060418+ 6/4/18
n-Propylbenzene	mg/L	4,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
o-Xylene	mg/L	10,000**	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
sec-Butylbenzene	mg/L	4,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Styrene	mg/L	100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
tert-Butylbenzene	mg/L	4,100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Tetrachloroethene	mg/L	5	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Toluene	mg/L	1,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	mg/L	100	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	**1.4**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	mg/L	29	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Trichloroethene	mg/L	5	NA	**100**	**1.8**	< 0.5 U	**81**	**28**	**800**	**790**	< 0.5 U	< 0.5 U	< 0.5 UJ	**43**	< 0.5 U
Trichlorofluoromethane	mg/L	31,000	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U
Vinyl chloride	mg/L	2	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 25 U	< 0.5 U	**0.66 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**1.9**	< 0.5 U
Metals (6020A)															
Aluminum	mg/L	100	NA	**0.980**	**1.66**	**0.0444**	**0.0185**	0.0131 UB	NA	NA	**0.117**	NA	NA	NA	NA
Antimony	mg/L	0.006	NA	< 0.00200 U	< 0.00200 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	NA
Arsenic	mg/L	0.01	NA	**0.00142 J**	**0.000586 J**	**0.00249**	**0.0131**	< 0.00100 U	NA	NA	**0.00327**	NA	NA	NA	NA
Barium	mg/L	2	NA	**0.0750**	**0.253**	**0.109**	**0.991**	**0.564**	NA	NA	**0.888**	NA	NA	NA	NA
Beryllium	mg/L	0.004	NA	**0.000409 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	NA
Cadmium	mg/L	0.005	NA	< 0.00100 U	< 0.00100 U	**0.000206 J**	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	NA
Calcium	mg/L	NV	NA	**1.15**	**9.37**	**7.11**	**31.0**	**44.2**	NA	NA	**29.4**	NA	NA	NA	NA
Chromium	mg/L	0.1	NA	**1.68**	**1.22**	**0.0172**	< 0.00100 U	**0.00748**	NA	NA	**0.0104**	NA	NA	NA	NA
Cobalt	mg/L	6.1	NA	**0.00769**	**0.0219**	**0.000456 J**	**0.000762 J**	**0.00104 J**	NA	NA	**0.0140**	NA	NA	NA	NA
Copper	mg/L	1.3	NA	**0.0212**	**0.0148**	< 0.00200 U	< 0.00200 U	< 0.00200 U	NA	NA	< 0.00200 U	NA	NA	NA	NA
Iron	mg/L	NV	NA	**7.23**	**9.66**	**0.837**	**58.5**	**6.15**	NA	NA	**14.3**	NA	NA	NA	NA
Lead	mg/L	0.015	NA	**0.000822 J**	**0.000652 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	NA
Magnesium	mg/L	NV	NA	**0.721**	**5.53**	**4.85**	**19.0**	**18.8**	NA	NA	**16.8**	NA	NA	NA	NA
Manganese	mg/L	1.1*	NA	**0.0833**	**0.179**	**0.0264**	**0.632**	**0.287**	NA	NA	**0.713**	NA	NA	NA	NA
Nickel	mg/L	0.49*	NA	**0.277**	**1.37**	**0.00235**	**0.00125 J**	**0.00461**	NA	NA	**0.00849**	NA	NA	NA	NA
Potassium	mg/L	NV	NA	**0.736**	**0.647**	**184**	**4.95**	**165**	NA	NA	**70.9**	NA	NA	NA	NA
Selenium	mg/L	0.05	NA	**0.00365**	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	NA	NA	< 0.00200 U	NA	NA	NA	NA
Silver	mg/L	0.51	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	NA
Sodium	mg/L	NV	NA	**28.5**	**56.9**	**291**	**103**	**250**	NA	NA	**116**	NA	NA	NA	NA
Thallium	mg/L	0.002	NA	< 0.00100 U	< 0.00100 U	**0.000383 J**	< 0.00100 U	**0.000295 J**	NA	NA	< 0.00100 U	NA	NA	NA	NA
Vanadium	mg/L	0.72	NA	**0.00559**	**0.00258 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	**0.000798 J**	NA	NA	NA	NA
Zinc	mg/L	31	NA	**0.0128**	**0.00749**	**0.00393 J**	**0.00504**	**0.00617**	NA	NA	**0.0279**	NA	NA	NA	NA
Mercury	mg/L	0.002	NA	< 0.000500 U	0.0000930 UB	< 0.0000500 U	< 0.0000500 U	< 0.000500 U	NA	NA	< 0.0000500 U	NA	NA	NA	NA
1,4-Dioxane (8270D SIM)															
1,4-Dioxane	mg/L	9.1	**8.3**	NA	**0.055**	**0.016**	< 0.010 U	**0.48**	**2.8**	**3.4**	< 0.010 U	**0.78**	< 0.010 U	**0.38**	**0.15**

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

a - duplicate sample

+ - VOCs were inadvertently analyzed

Wells 18WW16 and MW-125 were dry

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	18CPTMW10SW_062118 6/21/18	18CPTMW10DW_062118 6/21/18	18CPTMW12SW_061818 6/18/18	18CPTMW12DW_061818 6/18/18	18CPTMW14_061318 6/13/18	18CPTMW15_060618 6/6/18	18CPTMW15_06062018_a 6/6/18	18CPTMW16_061518 6/15/18	18CPTMW18_061118 6/11/18	18CPTMW19_061218 6/12/18	18CPTMW19SW_061218 6/12/18	18CPTMW22R_061518 6/15/18	18CPTMW22SW_061518 6/15/18
Lab Package			HS18061144	HS18061144	HS18060954	HS18060954	HS18060669	HS18060352	HS18060352	HS18060825	HS18060552	HS18060613	HS18060613	HS18060825	HS18060825
Perchlorate (6850)															
Perchlorate	mg/L	17*	< 2.0 U	**12**	**1.0 J**	**3.0 J**	**1,600**	**380**	**400**	< 200 U	<2.0 U	**15**	**5.9**	< 200 U	**4,800**
Volatile Organic Compounds (8260C)															
1,1,1,2-Tetrachloroethane	mg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,1,1-Trichloroethane	mg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,1,2,2-Tetrachloroethane	mg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,1,2-Trichloroethane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,1-Dichloroethane	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,1-Dichloroethene	mg/L	7	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.97 J**	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,1-Dichloropropene	mg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,2,3-Trichlorobenzene	mg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,2,3-Trichloropropane	mg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,2,4-Trichlorobenzene	mg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,2,4-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,2-Dibromo-3-chloropropane	mg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	mg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,2-Dichlorobenzene	mg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,2-Dichloroethane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**4.9**	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,2-Dichloropropane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,3,5-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,3-Dichlorobenzene	mg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,3-Dichloropropane	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
1,4-Dichlorobenzene	mg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
2,2-Dichloropropane	mg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
2-Butanone	mg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
2-Hexanone	mg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
4-Isopropyltoluene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
4-Methyl-2-pentanone	mg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	mg/L	92,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.43 J**	**3.3 J**	**1.4 J**	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Bromobenzene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Bromochloromethane	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Bromodichloromethane	mg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Bromoform	mg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	mg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	mg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ
Carbon tetrachloride	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Chlorobenzene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Chloroethane	mg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	mg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**7.8**	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Chloromethane	mg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	mg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**3.1**	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
cis-1,3-Dichloropropene	mg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Dibromochloromethane	mg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Dibromomethane	mg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Dichlorodifluoromethane	mg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	mg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Hexachlorobutadiene	mg/L	20	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Isopropylbenzene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
m,p-Xylene	mg/L	10,000**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ
Methylene chloride	mg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ
Naphthalene	mg/L	2,000	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	18CPTMW10SW_062118 6/21/18	18CPTMW10DW_062118 6/21/18	18CPTMW12SW_061818 6/18/18	18CPTMW12DW_061818 6/18/18	18CPTMW14_061318 6/13/18	18CPTMW15_060618 6/6/18	18CPTMW15_06062018_a 6/6/18	18CPTMW16_061518 6/15/18	18CPTMW18_061118 6/11/18	18CPTMW19_061218 6/12/18	18CPTMW19SW_061218 6/12/18	18CPTMW22R_061518 6/15/18	18CPTMW22SW_061518 6/15/18
n-Propylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
o-Xylene	mg/L	10,000**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
sec-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Styrene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
tert-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Tetrachloroethene	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**16**	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Toluene	mg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
trans-1,2-Dichloroethene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
trans-1,3-Dichloropropene	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Trichloroethene	mg/L	5	< 0.5 U	**1.9**	< 0.5 U	< 0.5 U	**600**	**1.8**	**1.8**	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**2.0 J**
Trichlorofluoromethane	mg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ
Vinyl chloride	mg/L	2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Metals (6020A)															
Aluminum	mg/L	100	NA	**0.201**	**0.0208**	0.0124 UB	**1.40**	NA	NA	NA	**0.0252**	NA	**0.622**	**13.5**	**0.174**
Antimony	mg/L	0.006	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.000451 J**	NA	NA	NA	< 0.00100 U	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U
Arsenic	mg/L	0.01	NA	**0.00231**	**0.00137 J**	**0.00304**	**0.00217**	NA	NA	NA	**0.00145 J**	NA	**0.00310**	**0.00347**	**0.000721 J**
Barium	mg/L	2	NA	**0.119**	**0.810**	**0.124**	**2.05**	NA	NA	NA	**0.665**	NA	**0.164**	**0.280**	**0.242**
Beryllium	mg/L	0.004	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	NA	< 0.00100 U	NA	< 0.00100 U	**0.00150 J**	< 0.00100 U
Cadmium	mg/L	0.005	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	NA	< 0.00100 U	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U
Calcium	mg/L	NV	NA	**7.34**	**54.4**	**6.71**	**268**	NA	NA	NA	**292**	NA	**11.2**	**2.72**	**141**
Chromium	mg/L	0.1	NA	**0.00681**	**0.0109**	**0.00984**	**0.0545**	NA	NA	NA	**0.00831**	NA	**0.00557**	**0.0156**	**0.0374**
Cobalt	mg/L	6.1	NA	**0.000471 J**	**0.00532**	< 0.00100 U	**0.00219 J**	NA	NA	NA	**0.0150**	NA	**0.00700**	**0.0199**	< 0.00100 U
Copper	mg/L	1.3	NA	**0.00138 J**	< 0.00200 U	< 0.00200 U	**0.00191 J**	NA	NA	NA	< 0.00200 U	NA	**0.00371**	**0.0120**	< 0.00200 U
Iron	mg/L	NV	NA	**3.41**	**2.03**	**1.10**	**0.919**	NA	NA	NA	**1.02**	NA	**9.75**	**16.8**	**0.109 J**
Lead	mg/L	0.015	NA	**0.000748 J**	< 0.00100 U	< 0.00100 U	**0.000625 J**	NA	NA	NA	< 0.00100 U	NA	**0.000870 J**	**0.0107**	< 0.00100 U
Magnesium	mg/L	NV	NA	**5.33**	**33.9**	**3.84**	**43.2**	NA	NA	NA	**182**	NA	**5.44**	**2.93**	**6.60**
Manganese	mg/L	1.1*	NA	**0.0734**	**0.835**	**0.0395**	**0.0800**	NA	NA	NA	**2.06**	NA	**0.391**	**0.145**	**0.0895**
Nickel	mg/L	0.49*	NA	**0.00219**	**0.00772**	< 0.00100 U	**0.00223**	NA	NA	NA	**0.0131**	NA	**0.00241**	**0.0156**	< 0.00100 U
Potassium	mg/L	NV	NA	**92.7**	**59.4**	**96.1**	**17.9**	NA	NA	NA	**4.87**	NA	**2.05**	**1.35**	**159**
Selenium	mg/L	0.05	NA	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	NA	NA	NA	< 0.00200 U	NA	< 0.00200 U	< 0.00200 U	< 0.00200 U
Silver	mg/L	0.51	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	NA	< 0.00100 U	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U
Sodium	mg/L	NV	NA	**176**	**236**	**179**	**358**	NA	NA	NA	**737**	NA	**25.7**	**23.0**	**266**
Thallium	mg/L	0.002	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	NA	< 0.00100 U	NA	< 0.00100 U	**0.000223 J**	< 0.00100 U
Vanadium	mg/L	0.72	NA	**0.00162 J**	< 0.00100 U	< 0.00100 U	**0.00188 J**	NA	NA	NA	< 0.00100 U	NA	< 0.00100 U	**0.0248**	< 0.00100 U
Zinc	mg/L	31	NA	**0.00500**	**0.0130**	**0.00336 J**	**0.00521**	NA	NA	NA	**0.0131**	NA	**0.0153**	**0.0473**	**0.00543**
Mercury	mg/L	0.002	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
1,4-Dioxane (8270D SIM)															
1,4-Dioxane	mg/L	9.1	< 0.010 U	NA	**0.05**	**0.084**	< 0.010 U	**0.065 J**	**0.031 J**	< 0.010 U	< 0.010 U	< 0.010 U	< 0.010 U	< 0.010 U	**0.43**

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential

a - duplicate sample

+ - VOCs were inadvertently analyzed

Wells 18WW16 and MW-125 were dry

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	18CPTMW22DW_061518 6/15/18	18CPTMW23-060418 6/4/18	18CPTMW23SW-060418 6/4/18	18CPTMW24_061318 6/13/18	18CPTMW26SW_061418 6/14/18	17WW08_061418 6/14/18	18WW02_061918 6/19/18	18WW03_061218 6/12/18	18WW03_061218_a 6/12/18	18WW06_061918 6/19/18	18WW08_060718 6/7/18	18WW09_060718 6/7/18	18WW14_061918 6/19/18	18WW17_060618 6/6/18
Lab Package			HS18060825	HS18060188	HS18060188	HS18060669	HS18060725	HS18060725	HS18060947	HS18060613	HS18060613	HS18060947	HS18060425	HS18060425	HS18060947	HS18060352
Perchlorate (6850)																
Perchlorate	mg/L	17*	< 2,000 U	**5,700**	< 2.0 U	**23**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**2,400**	**130**	< 2.0 U	< 2.0 U	**97,000**
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	mg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,1,1-Trichloroethane	mg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,1,2,2-Tetrachloroethane	mg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,1,2-Trichloroethane	mg/L	5	< 0.5 U	**0.93 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,1-Dichloroethane	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,1-Dichloroethene	mg/L	7	< 0.5 U	**7.6**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,1-Dichloropropene	mg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2,3-Trichlorobenzene	mg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2,3-Trichloropropane	mg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2,4-Trichlorobenzene	mg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2,4-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2-Dibromo-3-chloropropane	mg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2-Dibromoethane	mg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2-Dichlorobenzene	mg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2-Dichloroethane	mg/L	5	< 0.5 U	**250**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,2-Dichloropropane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,3,5-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,3-Dichlorobenzene	mg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,3-Dichloropropane	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
1,4-Dichlorobenzene	mg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
2,2-Dichloropropane	mg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
2-Butanone	mg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	< 1.0 U
2-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
2-Hexanone	mg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	< 1.0 U
4-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
4-Isopropyltoluene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
4-Methyl-2-pentanone	mg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	< 1.0 U
Acetone	mg/L	92,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	< 1.0 U
Benzene	mg/L	5	< 0.5 U	**1.5**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	**0.50 J**
Bromobenzene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Bromochloromethane	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Bromodichloromethane	mg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Bromoform	mg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Bromomethane	mg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Carbon disulfide	mg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	< 1.0 U
Carbon tetrachloride	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Chlorobenzene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Chloroethane	mg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Chloroform	mg/L	1,000	< 0.5 U	**4.1**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Chloromethane	mg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
cis-1,2-Dichloroethene	mg/L	70	< 0.5 U	**180**	< 0.5 U	**23**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	**0.83 J**
cis-1,3-Dichloropropene	mg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Dibromochloromethane	mg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Dibromomethane	mg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Dichlorodifluoromethane	mg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Ethylbenzene	mg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Hexachlorobutadiene	mg/L	20	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Isopropylbenzene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
m,p-Xylene	mg/L	10,000**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	< 1.0 U
Methylene chloride	mg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	NA	< 1.0 U
Naphthalene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
n-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	18CPTMW22DW_061518 6/15/18	18CPTMW23-060418 6/4/18	18CPTMW23SW-060418 6/4/18	18CPTMW24_061318 6/13/18	18CPTMW26SW_061418 6/14/18	17WW08_061418 6/14/18	18WW02_061918 6/19/18	18WW03_061218 6/12/18	18WW03_061218_a 6/12/18	18WW06_061918 6/19/18	18WW08_060718 6/7/18	18WW09_060718 6/7/18	18WW14_061918 6/19/18	18WW17_060618 6/6/18
n-Propylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
o-Xylene	mg/L	10,000**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
sec-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Styrene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
tert-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Tetrachloroethene	mg/L	5	< 0.5 U	**0.96 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Toluene	mg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
trans-1,2-Dichloroethene	mg/L	100	< 0.5 U	**3.5**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
trans-1,3-Dichloropropene	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Trichloroethene	mg/L	5	< 0.5 U	**3,400**	< 0.5 U	**8**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	**40**
Trichlorofluoromethane	mg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Vinyl chloride	mg/L	2	< 0.5 U	**2.9**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Metals (6020A)																
Aluminum	mg/L	100	**0.121**	NA	NA	NA	NA	**0.406**	**0.537**	0.0100 UB	0.0103 UB	NA	NA	**1.71**	**1.26**	**0.00998 J**
Antimony	mg/L	0.006	< 0.00100 U	NA	NA	NA	NA	**0.000565 J**	**0.000755 J**	< 0.00100 U	< 0.00100 U	NA	NA	**0.00153 J**	< 0.00100 U	< 0.00100 U
Arsenic	mg/L	0.01	**0.00702**	NA	NA	NA	NA	**0.0101**	**0.000533 J**	< 0.00100 U	< 0.00100 U	NA	NA	**0.00741**	**0.00205**	**0.000631 J**
Barium	mg/L	2	**0.101**	NA	NA	NA	NA	**0.487**	**0.0477**	**0.169**	**0.164**	NA	NA	**0.293**	**1.02**	**3.43**
Beryllium	mg/L	0.004	< 0.00100 U	NA	NA	NA	NA	< 0.00100 U	< 0.0100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	**0.000202 J**	< 0.00100 U
Cadmium	mg/L	0.005	< 0.00100 U	NA	NA	NA	NA	**0.000425 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	**0.000617 J**	**0.000580 J**	**0.000414 J**
Calcium	mg/L	NV	**11.7**	NA	NA	NA	NA	**94.4**	**7.27**	**7.71**	**7.69**	NA	NA	**19.2**	**41.8**	**332**
Chromium	mg/L	0.1	< 0.00100 U	NA	NA	NA	NA	**1.23**	**0.00569**	**0.00150 J**	**0.00126 J**	NA	NA	**0.0417**	**2.05**	**0.0452**
Cobalt	mg/L	6.1	**0.000655 J**	NA	NA	NA	NA	**0.0172**	**0.000277 J**	< 0.00100 U	< 0.00100 U	NA	NA	**0.00287 J**	**0.0106**	**0.000732 J**
Copper	mg/L	1.3	< 0.00200 U	NA	NA	NA	NA	**0.0198**	**0.00601**	< 0.00200 U	< 0.00200 U	NA	NA	**0.00262**	**0.0369**	**0.00112 J**
Iron	mg/L	NV	**2.73**	NA	NA	NA	NA	**31.6**	**2.11**	**4.17**	**4.36**	NA	NA	**45.1**	**8.78**	**0.294**
Lead	mg/L	0.015	< 0.00100 U	NA	NA	NA	NA	**0.000947 J**	**0.00136 J**	< 0.00100 U	< 0.00100 U	NA	NA	**0.00192 J**	**0.00128 J**	< 0.00100 U
Magnesium	mg/L	NV	**5.26**	NA	NA	NA	NA	**57.8**	**1.26**	**5.27**	**5.15**	NA	NA	**10.3**	**30.7**	**217**
Manganese	mg/L	1.1*	**0.101**	NA	NA	NA	NA	**1.35**	**0.0905**	**0.0854**	**0.0864**	NA	NA	**0.874**	**0.514**	**0.0362**
Nickel	mg/L	0.49*	< 0.00100 U	NA	NA	NA	NA	**0.559**	**0.00282**	< 0.00100 U	< 0.00100 U	NA	NA	**0.0403**	**0.304**	**0.0512**
Potassium	mg/L	NV	**2.49**	NA	NA	NA	NA	**2.10**	**1.89**	**1.88**	**1.88**	NA	NA	**3.16**	**3.95**	**1.72**
Selenium	mg/L	0.05	< 0.00200 U	NA	NA	NA	NA	**0.00226**	< 0.00200 U	< 0.00200 U	< 0.00200 U	NA	NA	< 0.00200 U	< 0.00200 U	**0.0122**
Silver	mg/L	0.51	< 0.00100 U	NA	NA	NA	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U
Sodium	mg/L	NV	**231**	NA	NA	NA	NA	**411**	**19.8**	**98.5**	**97.5**	NA	NA	**38.5**	**109**	**1,060**
Thallium	mg/L	0.002	< 0.00100 U	NA	NA	NA	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U
Vanadium	mg/L	0.72	< 0.00100 U	NA	NA	NA	NA	**0.00153 J**	**0.000628 J**	< 0.00100 U	< 0.00100 U	NA	NA	**0.00666**	**0.00956**	**0.00233 J**
Zinc	mg/L	31	**0.00401**	NA	NA	NA	NA	**0.0161**	**0.00605**	< 0.00250 U	**0.00206 J**	NA	NA	**0.0128**	**0.0241**	**0.0367**
Mercury	mg/L	0.002	< 0.000500 U	NA	NA	NA	NA	< 0.000500 U	0.0000600 UB	< 0.000500 U	< 0.000500 U	NA	NA	< 0.0000500 U	0.0000410 UB	< 0.0000500 U
1,4-Dioxane (8270D SIM)																
1,4-Dioxane	mg/L	9.1	< 0.010 U	**3.9**	< 0.010 U	< 0.010 U	< 0.010 U	NA	0.012	< 0.010 U	< 0.010 U	**0.018**	< 0.010 U	< 0.010 U	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential

a - duplicate sample

+ - VOCs were inadvertently analyzed

Wells 18WW16 and MW-125 were dry

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	18WW18_060618 6/6/18	18WW19_061918 6/19/18	18WW19_061918_a 6/19/18	18WW20_061918 6/19/18	18WW22_061118 6/11/18	18WW24_060418 6/4/18	18WW25_060418 6/4/18	C01_062018 6/20/18	C02_061818 6/18/18	C03_061118 6/11/18	C04_060618 6/6/18	C06_062018 6/20/18	C08_061318 6/13/18	C09_062018 6/20/18
Lab Package			HS18060352	HD18060947	HS18060947	HS18060947	HS18060552	HS18060188	HS18060188	HS18061144	HS18060954	HS18060552	HS18060352	HS18061144	HS18060669	HS18061144
Perchlorate (6850)																
Perchlorate	mg/L	17*	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	<2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**29**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	mg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	mg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	mg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethene	mg/L	7	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloropropene	mg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	mg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	mg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	mg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	mg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	mg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	mg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	mg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	mg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	mg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	mg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	mg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	mg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	mg/L	92,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Benzene	mg/L	5	**0.75 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	mg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	mg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	mg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	mg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	mg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	mg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	mg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	mg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	mg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	mg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	mg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	mg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	mg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Hexachlorobutadiene	mg/L	20	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Isopropylbenzene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	mg/L	10,000**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methylene chloride	mg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 UJ
n-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	18WW18_060618 6/6/18	18WW19_061918 6/19/18	18WW19_061918_a 6/19/18	18WW20_061918 6/19/18	18WW22_061118 6/11/18	18WW24_060418 6/4/18	18WW25_060418 6/4/18	C01_062018 6/20/18	C02_061818 6/18/18	C03_061118 6/11/18	C04_060618 6/6/18	C06_062018 6/20/18	C08_061318 6/13/18	C09_062018 6/20/18
n-Propylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	mg/L	10,000**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	mg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	mg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride	mg/L	2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Metals (6020A)																
Aluminum	mg/L	100	**0.466**	**0.592 J**	**0.836 J**	**0.0783**	**0.433**	**0.195**	**0.110**	NA	NA	0.00810 UB	NA	0.0181 UB	NA	**0.325**
Antimony	mg/L	0.006	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U
Arsenic	mg/L	0.01	**0.00589**	**0.000726 J**	**0.000632 J**	< 0.00100 U	**0.00182 J**	**0.000955 J**	**0.0166**	NA	NA	**0.00168 J**	NA	**0.000942 J**	NA	**0.000406 J**
Barium	mg/L	2	**1.30**	**0.129**	**0.127**	**0.111**	**0.179**	**0.0467**	**0.646**	NA	NA	**1.44**	NA	**0.876**	NA	**0.125**
Beryllium	mg/L	0.004	**0.000218 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.00131 J**	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U
Cadmium	mg/L	0.005	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	**0.000303 J**	NA	< 0.00100 U	NA	**0.000203 J**
Calcium	mg/L	NV	**54.4**	**6.98**	**7.07**	**2.74**	**53.4**	**44.4**	**27.0**	NA	NA	**51.2**	NA	**21.7**	NA	**39.7**
Chromium	mg/L	0.1	**0.0161**	**0.0127**	**0.0141**	**0.00471**	**0.0303**	**0.000925 J**	**0.000504 J**	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA	**0.00271 J**
Cobalt	mg/L	6.1	**0.000661 J**	**0.000584 J**	**0.000640 J**	**0.00126 J**	**0.000415 J**	**0.0109**	**0.00464 J**	NA	NA	**0.000367 J**	NA	**0.00173 J**	NA	**0.000582 J**
Copper	mg/L	1.3	**0.00480**	**0.00173 J**	**0.00196 J**	< 0.00200 U	**0.00135 J**	< 0.00200 U	< 0.00200 U	NA	NA	< 0.00200 U	NA	< 0.00200 U	NA	< 0.00200 U
Iron	mg/L	NV	**102**	**17.7**	**18.6**	**12.8**	**0.0590 J**	**0.195 J**	**45.5**	NA	NA	**81.7**	NA	**43.7**	NA	**0.280**
Lead	mg/L	0.015	**0.000775 J**	**0.00102 J**	**0.00110 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U
Magnesium	mg/L	NV	**32.4**	**3.25**	**3.36**	**1.75**	**1.29**	**38.4**	**16.1**	NA	NA	**30.1**	NA	**9.40**	NA	**9.50**
Manganese	mg/L	1.1*	**2.12**	**0.270**	**0.287**	**0.182**	**0.00264 J**	**0.932**	**3.60**	NA	NA	**1.48**	NA	**0.760**	NA	**0.0365**
Nickel	mg/L	0.49*	**0.00906**	**0.00222**	**0.00274**	**0.00259**	< 0.00100 U	**0.0508**	**0.00157 J**	NA	NA	< 0.00100 U	NA	**0.00176 J**	NA	**0.00157 J**
Potassium	mg/L	NV	**3.58**	**2.08**	**2.15**	**1.45**	**6.20**	**0.604**	**1.36**	NA	NA	**3.28**	NA	**3.25**	NA	**0.530**
Selenium	mg/L	0.05	**0.00151 J**	< 0.00200 U	< 0.00200 U	< 0.00200 U	**0.00164 J**	**0.00409**	< 0.00200 U	NA	NA	< 0.00200 U	NA	< 0.00200 U	NA	**0.00131 J**
Silver	mg/L	0.51	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U
Sodium	mg/L	NV	**143**	**19.9**	**20.5**	**25.6**	**56.6**	**699**	**41.1**	NA	NA	**149**	NA	**168**	NA	**46.9**
Thallium	mg/L	0.002	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.000463 J**	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U
Vanadium	mg/L	0.72	< 0.00100 U	**0.00117 J**	**0.00106 J**	< 0.00100 U	**0.0285**	**0.00156 J**	**0.000965 J**	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA	**0.00212 J**
Zinc	mg/L	31	**0.00670**	**0.00762**	**0.00690**	**0.00501**	< 0.00250 U	**0.0355**	**0.00422**	NA	NA	**0.00764**	NA	**0.00697**	NA	**0.00397 J**
Mercury	mg/L	0.002	**0.0000530 J**	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.0000500 U	< 0.0000500 U	NA	NA	< 0.000500 U	NA	**0.000186 J**	NA	< 0.000500 U
1,4-Dioxane (8270D SIM)																
1,4-Dioxane	mg/L	9.1	< 0.010 U	NA	NA	< 0.010 U	< 0.010 U	NA	**0.13**	NA	NA	< 0.010 U	NA	NA	< 0.010 U	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential

a - duplicate sample

+ - VOCs were inadvertently analyzed

Wells 18WW16 and MW-125 were dry

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	MW1_061118 6/11/18	MW1_061118_a 6/11/18	MW2_060618 6/6/18	MW3_061418 6/14/18	MW5_060418 6/4/18	MW6_062018 6/20/18	MW7_061818 6/18/18	MW8_060518 6/5/18	MW9_062118 6/21/18	MW10_061118 6/11/18	MW12_061318 6/13/18	MW12_061318_a 6/13/18	MW13_061818 6/18/18	MW14_061218 6/12/18
Lab Package			HS18060552	HS18060552	HS18060352	HS18060725	HS18060188	HS18061144	HS18060954	HS18060281	HS18061144	HS18060552	HS18060669	HS18060669	HS18060954	HS18060613
Perchlorate (6850)																
Perchlorate	mg/L	17*	**5,900**	**6,000**	**1.3 J**	**16,000**	**41,000**	**5,600**	**21,000**	**8,800 J**	**590**	<2.0 U	<2.0 U	<2.0 U	< 2.0 U	**94,000**
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	mg/L	110	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,1,1-Trichloroethane	mg/L	200	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,1,2,2-Tetrachloroethane	mg/L	14	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,1,2-Trichloroethane	mg/L	5	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,1-Dichloroethane	mg/L	10,000	< 5.0 U	< 5.0 U	< 250 U	**3.7**	**2.2**	**2.0**	**1.1**	< 0.5 U	**0.41 J**	< 0.5 U	**1.5**	< 0.5 U	< 0.5 U	**18**
1,1-Dichloroethene	mg/L	7	< 5.0 U	< 5.0 U	< 250 U	**21**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**3.0**	**2.7**	< 0.5 U	**75**
1,1-Dichloropropene	mg/L	2.9	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,2,3-Trichlorobenzene	mg/L	310	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,2,3-Trichloropropane	mg/L	0.041	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,2,4-Trichlorobenzene	mg/L	70	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,2,4-Trimethylbenzene	mg/L	5,100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,2-Dibromo-3-chloropropane	mg/L	0.2	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,2-Dibromoethane	mg/L	0.05	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,2-Dichlorobenzene	mg/L	600	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,2-Dichloroethane	mg/L	5	**240**	**240**	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	**13**	**3.8**	< 0.5 U	< 0.5 U	**1.4**	**1.4**	< 0.5 U	**50**
1,2-Dichloropropane	mg/L	5	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,3,5-Trimethylbenzene	mg/L	5,100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,3-Dichlorobenzene	mg/L	3,100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	**0.87 J**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,3-Dichloropropane	mg/L	29	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
1,4-Dichlorobenzene	mg/L	75	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
2,2-Dichloropropane	mg/L	42	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
2-Butanone	mg/L	61,000	< 10 U	< 10 U	< 500 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U
2-Chlorotoluene	mg/L	2,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
2-Hexanone	mg/L	6,100	< 10 U	< 10 U	< 500 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U
4-Chlorotoluene	mg/L	2,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
4-Isopropyltoluene	mg/L	10,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
4-Methyl-2-pentanone	mg/L	8,200	< 10 U	< 10 U	< 500 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U
Acetone	mg/L	92,000	< 10 U	< 10 U	< 500 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U
Benzene	mg/L	5	**2.8 J**	**3.0 J**	< 250 U	**0.28 J**	< 0.5 U	< 0.5 U	< 0.5 U	**0.45 J**	< 0.5 U	< 0.5 U	**0.23 J**	< 0.5 U	< 0.5 U	**3.0 J**
Bromobenzene	mg/L	2,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Bromochloromethane	mg/L	4,100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Bromodichloromethane	mg/L	4.6	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Bromoform	mg/L	36	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Bromomethane	mg/L	140	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Carbon disulfide	mg/L	10,000	< 5.0 U	< 5.0 U	< 500 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U
Carbon tetrachloride	mg/L	5	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Chlorobenzene	mg/L	100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Chloroethane	mg/L	41,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Chloroform	mg/L	1,000	**9.3 J**	**8.5 J**	< 250 U	**1.3**	< 0.5 U	< 0.5 U	**5.1**	< 0.5 U	**2.5**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Chloromethane	mg/L	220	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
cis-1,2-Dichloroethene	mg/L	70	**1,900**	**1,900**	**34,000**	**76**	**8.7**	**5.9**	**4.7**	**6.8**	**45**	< 0.5 U	**23**	**22**	< 0.5 U	**1,800**
cis-1,3-Dichloropropene	mg/L	5.3	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Dibromochloromethane	mg/L	34	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Dibromomethane	mg/L	380	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Dichlorodifluoromethane	mg/L	20,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Ethylbenzene	mg/L	700	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Hexachlorobutadiene	mg/L	20	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Isopropylbenzene	mg/L	10,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
m,p-Xylene	mg/L	10,000**	< 10 U	< 10 U	< 500 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U
Methylene chloride	mg/L	5	< 10 U	< 10 U	**240,000**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U
Naphthalene	mg/L	2,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 5.0 U
n-Butylbenzene	mg/L	4,100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	MW1_061118 6/11/18	MW1_061118_a 6/11/18	MW2_060618 6/6/18	MW3_061418 6/14/18	MW5_060418 6/4/18	MW6_062018 6/20/18	MW7_061818 6/18/18	MW8_060518 6/5/18	MW9_062118 6/21/18	MW10_061118 6/11/18	MW12_061318 6/13/18	MW12_061318_a 6/13/18	MW13_061818 6/18/18	MW14_061218 6/12/18
n-Propylbenzene	mg/L	4,100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
o-Xylene	mg/L	10,000**	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
sec-Butylbenzene	mg/L	4,100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Styrene	mg/L	100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
tert-Butylbenzene	mg/L	4,100	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Tetrachloroethene	mg/L	5	< 5.0 U	< 5.0 U	< 250 U	**1**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Toluene	mg/L	1,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
trans-1,2-Dichloroethene	mg/L	100	< 5.0 U	< 5.0 U	< 250 U	**2.6**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.56 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
trans-1,3-Dichloropropene	mg/L	29	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Trichloroethene	mg/L	5	**5,900**	**6,100**	**5,000**	**300**	**27**	**15**	**420**	**190**	**1,200**	< 0.5 U	**230**	**220**	< 0.5 U	**7,300**
Trichlorofluoromethane	mg/L	31,000	< 5.0 U	< 5.0 U	< 250 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Vinyl chloride	mg/L	2	< 5.0 U	< 5.0 U	< 250 U	**6.5**	**1.1**	**0.99 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U
Metals (6020A)																
Aluminum	mg/L	100	**0.0481**	**0.0444**	NA	0.00590 UB	NA	0.0103 UB	NA	NA	0.0221 UB	NA	NA	NA	**0.169**	**0.0347**
Antimony	mg/L	0.006	**0.00102 J**	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U	< 0.00100 U
Arsenic	mg/L	0.01	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	**0.00103 J**	NA	NA	< 0.00100 U	NA	NA	NA	**0.000572 J**	**0.00498**
Barium	mg/L	2	**1.09**	**1.12**	NA	**0.516**	NA	**0.780**	NA	NA	**0.0897**	NA	NA	NA	**0.574**	**0.451**
Beryllium	mg/L	0.004	< 0.00200 U	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U	< 0.00100 U
Cadmium	mg/L	0.005	**0.000510 J**	**0.000461 J**	NA	**0.000290 J**	NA	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	**0.000228 J**	**0.000588 J**
Calcium	mg/L	NV	**38.1**	**37.5**	NA	**26.2**	NA	**26.7**	NA	NA	**7.70**	NA	NA	NA	**29.3**	**86.4**
Chromium	mg/L	0.1	**1.60**	**1.63**	NA	**0.00722**	NA	**0.0977**	NA	NA	**0.136**	NA	NA	NA	**0.0461**	**0.133**
Cobalt	mg/L	6.1	**0.0353**	**0.0322**	NA	**0.00544**	NA	**0.00132 J**	NA	NA	**0.000476 J**	NA	NA	NA	**0.000805 J**	**0.0250**
Copper	mg/L	1.3	**0.0101**	**0.0103**	NA	< 0.00200 U	NA	**0.00176 J**	NA	NA	**0.00178 J**	NA	NA	NA	**0.00328**	**0.00292**
Iron	mg/L	NV	**11.1**	**9.74**	NA	**0.723**	NA	**0.992**	NA	NA	**0.898**	NA	NA	NA	**97.4**	**67.3**
Lead	mg/L	0.015	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U	< 0.00100 U
Magnesium	mg/L	NV	**31.1**	**32.7**	NA	**15.4**	NA	**22.6**	NA	NA	**2.43**	NA	NA	NA	**13.4**	**36.9**
Manganese	mg/L	1.1*	**1.51**	**1.47**	NA	**1.03**	NA	**0.0568**	NA	NA	**0.0206**	NA	NA	NA	**1.28**	**2.53**
Nickel	mg/L	0.49*	**1.31**	**1.18**	NA	**0.00392**	NA	**0.0214**	NA	NA	**0.0292**	NA	NA	NA	**0.0265**	**0.292**
Potassium	mg/L	NV	**3.06**	**3.03**	NA	**1.54**	NA	**2.22**	NA	NA	**0.459**	NA	NA	NA	**3.76**	**21.2**
Selenium	mg/L	0.05	< 0.00200 U	< 0.00200 U	NA	< 0.00200 U	NA	< 0.00200 U	NA	NA	< 0.00200 U	NA	NA	NA	< 0.00200 U	< 0.00200 U
Silver	mg/L	0.51	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U	< 0.00100 U
Sodium	mg/L	NV	**244**	**243**	NA	**223**	NA	**201**	NA	NA	**13.8**	NA	NA	NA	**88.8**	**275**
Thallium	mg/L	0.002	**0.000289 J**	< 0.00100 U	NA	< 0.00100 U	NA	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U	< 0.00100 U
Vanadium	mg/L	0.72	**0.00273 J**	**0.00270 J**	NA	< 0.00100 U	NA	**0.00130 J**	NA	NA	**0.00199 J**	NA	NA	NA	< 0.00100 U	< 0.00100 U
Zinc	mg/L	31	**0.00879**	**0.00847**	NA	**0.00618**	NA	**0.00958**	NA	NA	**0.00307 J**	NA	NA	NA	**0.0120**	**0.413**
Mercury	mg/L	0.002	< 0.000500 U	< 0.000500 U	NA	**0.0000980 J**	NA	< 0.000500 U	NA	NA	< 0.000500 U	NA	NA	NA	< 0.000500 U	< 0.000500 U
1,4-Dioxane (8270D SIM)																
1,4-Dioxane	mg/L	9.1	NA	NA	**4.5**	NA	**0.29**	NA	**5.1**	**2.2**	**0.5**	< 0.010 U	NA	NA	NA	**120**

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential

a - duplicate sample

+ - VOCs were inadvertently analyzed

Wells 18WW16 and MW-125 were dry

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	MW16_061318 6/13/18	MW17_061818 6/18/18	MW18_060718 6/7/18	MW19_061418 6/14/18	MW20_061518 6/15/18	MW21-060518 6/5/18	MW21-060518-a 6/5/18	MW22_060718 6/7/18	MW23_061118 6/11/18	102_061318 6/13/18	109_061418 6/14/18	120_061418 6/14/18	123_061418 6/14/18	126_061518 6/15/18
Lab Package			HS18060669	HS18060954	HS18060425	HS18060725	HS18060825	HS18060281	HS18060281	HS18060425	HS18060552	HS18060669	HS18060725	HS18060725	HS18060725	HS18060825
Perchlorate (6850)																
Perchlorate	mg/L	17*	< 2.0 U	< 2.0 U	<2.0 U	<2.0 U	< 2,000 U	**35,000**	**36,000**	**66 J**	**91,000**	**170**	**4,300**	**26,000**	**59**	< 2,000 U
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	mg/L	110	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	mg/L	200	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,1,2,2-Tetrachloroethane	mg/L	14	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,1,2-Trichloroethane	mg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	**9.9**	**9.9**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,1-Dichloroethane	mg/L	10,000	**1.2**	NA	< 0.5 U	< 0.5 U	< 0.5 U	**1.9**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**28**	< 5.0 U	< 0.5 U
1,1-Dichloroethene	mg/L	7	**7.3**	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**10**	< 0.5 U	< 0.5 U	< 0.5 U	**1.3**	**150**	< 5.0 U	< 0.5 U
1,1-Dichloropropene	mg/L	2.9	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,2,3-Trichlorobenzene	mg/L	310	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,2,3-Trichloropropane	mg/L	0.041	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,2,4-Trichlorobenzene	mg/L	70	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,2,4-Trimethylbenzene	mg/L	5,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	**0.65 J**	< 5.0 U	< 5.0 U	< 0.5 U
1,2-Dibromo-3-chloropropane	mg/L	0.2	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,2-Dibromoethane	mg/L	0.05	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,2-Dichlorobenzene	mg/L	600	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,2-Dichloroethane	mg/L	5	**47**	NA	< 0.5 U	< 0.5 U	< 0.5 U	**27**	**26**	**4.7**	**58**	< 0.5 U	< 0.5 U	**38**	**2**	< 0.5 U
1,2-Dichloropropane	mg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,3,5-Trimethylbenzene	mg/L	5,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,3-Dichlorobenzene	mg/L	3,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,3-Dichloropropane	mg/L	29	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
1,4-Dichlorobenzene	mg/L	75	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
2,2-Dichloropropane	mg/L	42	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
2-Butanone	mg/L	61,000	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	mg/L	2,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
2-Hexanone	mg/L	6,100	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	mg/L	2,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
4-Isopropyltoluene	mg/L	10,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
4-Methyl-2-pentanone	mg/L	8,200	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
Acetone	mg/L	92,000	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	**47**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
Benzene	mg/L	5	**0.24 J**	NA	**0.22 J**	< 0.5 U	< 0.5 U	**2.2**	**2.2**	**0.29 J**	**0.81 J**	< 0.5 U	< 0.5 U	**5.4 J**	< 5.0 U	< 0.5 U
Bromobenzene	mg/L	2,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Bromochloromethane	mg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Bromodichloromethane	mg/L	4.6	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Bromoform	mg/L	36	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Bromomethane	mg/L	140	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Carbon disulfide	mg/L	10,000	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	mg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Chlorobenzene	mg/L	100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Chloroethane	mg/L	41,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Chloroform	mg/L	1,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	**9.4**	**9.1**	**2.6**	**5.2**	< 0.5 U	**1.3**	**41**	< 5.0 U	< 0.5 U
Chloromethane	mg/L	220	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
cis-1,2-Dichloroethene	mg/L	70	**23**	NA	**0.62 J**	**2.2**	< 0.5 U	**110**	**110**	**3.0**	**9.6**	< 0.5 U	**110**	**1,700**	**6.6**	< 0.5 U
cis-1,3-Dichloropropene	mg/L	5.3	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Dibromochloromethane	mg/L	34	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Dibromomethane	mg/L	380	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Dichlorodifluoromethane	mg/L	20,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**4.8**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Ethylbenzene	mg/L	700	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Hexachlorobutadiene	mg/L	20	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
Isopropylbenzene	mg/L	10,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
m,p-Xylene	mg/L	10,000**	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
Methylene chloride	mg/L	5	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	**1.5 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
Naphthalene	mg/L	2,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U	< 0.5 U
n-Butylbenzene	mg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	MW16_061318 6/13/18	MW17_061818 6/18/18	MW18_060718 6/7/18	MW19_061418 6/14/18	MW20_061518 6/15/18	MW21-060518 6/5/18	MW21-060518-a 6/5/18	MW22_060718 6/7/18	MW23_061118 6/11/18	102_061318 6/13/18	109_061418 6/14/18	120_061418 6/14/18	123_061418 6/14/18	126_061518 6/15/18
n-Propylbenzene	mg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	0.5 U	< 0.5 U
o-Xylene	mg/L	10,000**	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	0.5 U	< 0.5 U
sec-Butylbenzene	mg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	0.5 U	< 0.5 U
Styrene	mg/L	100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	0.5 U	< 0.5 U
tert-Butylbenzene	mg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	0.5 U	< 0.5 U
Tetrachloroethene	mg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	0.5 U	< 0.5 U
Toluene	mg/L	1,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.58 J**	< 5.0 U	0.5 U	< 0.5 U
trans-1,2-Dichloroethene	mg/L	100	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	**4.6**	**4.7**	< 0.5 U	**1.5**	< 0.5 U	**1.1**	**17**	0.5 U	< 0.5 U
trans-1,3-Dichloropropene	mg/L	29	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	0.5 U	< 0.5 U
Trichloroethene	mg/L	5	**520**	NA	**5.3**	**1.6**	< 0.5 U	**4,800**	**4,700**	**260**	**1,500**	< 0.5 U	**670**	**17,000**	**70**	< 0.5 U
Trichlorofluoromethane	mg/L	31,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	0.5 U	< 0.5 U
Vinyl chloride	mg/L	2	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	**15**	**14**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**82**	0.5 U	< 0.5 U
Metals (6020A)																
Aluminum	mg/L	100	NA	NA	NA	**1.58**	**1.15**	**0.0426 J**	**0.0406 J**	**0.0139**	NA	**0.0370**	NA	NA	NA	**0.0446**
Antimony	mg/L	0.006	NA	NA	NA	**0.00220**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U
Arsenic	mg/L	0.01	NA	NA	NA	**0.0111**	**0.000508 J**	**0.000547 J**	**0.000540 J**	**0.000914 J**	NA	< 0.00100 U	NA	NA	NA	**0.00266**
Barium	mg/L	2	NA	NA	NA	**0.534**	**0.469**	**6.46**	**6.40**	**1.00**	NA	**0.170**	NA	NA	NA	**9.13**
Beryllium	mg/L	0.004	NA	NA	NA	**0.000296 J**	< 0.00100 U	**0.000227 J**	**0.000230 J**	< 0.00100 U	NA	**0.000289 J**	NA	NA	NA	< 0.00100 U
Cadmium	mg/L	0.005	NA	NA	NA	**0.00195 J**	**0.000301 J**	**0.000789 J**	**0.000792 J**	**0.00128 J**	NA	< 0.00100 U	NA	NA	NA	**0.000521 J**
Calcium	mg/L	NV	NA	NA	NA	**48.6**	**41.4**	**168**	**167**	**107**	NA	**4.39**	NA	NA	NA	**292**
Chromium	mg/L	0.1	NA	NA	NA	**0.882**	**0.0140**	**0.602**	**0.557**	**0.181 J**	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U
Cobalt	mg/L	6.1	NA	NA	NA	**0.0237**	**0.0219**	**0.0699**	**0.0669**	**0.00531**	NA	**0.00416 J**	NA	NA	NA	**0.0113**
Copper	mg/L	1.3	NA	NA	NA	**0.0209**	**0.00362**	**0.0444**	**0.0423**	**0.00366**	NA	< 0.00200 U	NA	NA	NA	< 0.00200 U
Iron	mg/L	NV	NA	NA	NA	**48.5**	**2.16**	**4.45**	**4.12**	**0.872**	NA	**0.0294 J**	NA	NA	NA	**2.26**
Lead	mg/L	0.015	NA	NA	NA	**0.00235**	**0.00145 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U
Magnesium	mg/L	NV	NA	NA	NA	**25.5**	**11.3**	**138**	**130**	**32.5**	NA	**3.72**	NA	NA	NA	**231**
Manganese	mg/L	1.1*	NA	NA	NA	**2.22**	**0.294**	**1.81**	**1.80**	**0.0744**	NA	**0.0127**	NA	NA	NA	**0.197**
Nickel	mg/L	0.49*	NA	NA	NA	**0.324**	**0.554**	**0.736**	**0.683**	**0.321**	NA	**0.00850**	NA	NA	NA	**0.0131**
Potassium	mg/L	NV	**NA**	**NA**	NA	**3.64**	**0.855**	**2.13**	**2.08**	**2.26**	NA	**0.684**	NA	NA	NA	**3.54**
Selenium	mg/L	0.05	NA	NA	NA	**0.00192 J**	< 0.00200 U	**0.00489**	**0.00481**	< 0.00200 U	NA	< 0.00200 U	NA	NA	NA	< 0.00200 U
Silver	mg/L	0.51	NA	NA	NA	< 0.00100 U	< 0.0100	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U
Sodium	mg/L	NV	NA	NA	NA	**432**	**58.9**	**452**	**453**	**378**	NA	**43.7**	NA	NA	NA	**787**
Thallium	mg/L	0.002	NA	NA	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U
Vanadium	mg/L	0.72	NA	NA	NA	**0.00674**	< 0.00100 U	**0.00271 J**	**0.00303 J**	**0.00242 J**	NA	< 0.00100 U	NA	NA	NA	< 0.00100 U
Zinc	mg/L	31	NA	NA	NA	**0.0183**	**0.00850**	**0.0238**	**0.0221**	**0.0125**	NA	**0.00497**	NA	NA	NA	**0.0372**
Mercury	mg/L	0.002	NA	NA	NA	**0.0000300 J**	< 0.000500 U	< 0.0000500 U	< 0.0000500 U	< 0.0000500 U	NA	< 0.000500 U	NA	NA	NA	**0.0000380 J**
1,4-Dioxane (8270D SIM)																
1,4-Dioxane	mg/L	9.1	< 0.010 U	< 0.010 U	NA	NA	NA	**0.77**	**0.57**	NA	NA	NA	**0.090**	**120**	< 0.010 U	< 0.010 U

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential

a - duplicate sample

+ - VOCs were inadvertently analyzed

Wells 18WW16 and MW-125 were dry

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	126_061518_a 6/15/18	129_061418 6/14/18	130_062118 6/21/18	ICT2_062818 6/28/18	ICT4_062818 6/28/18	ICT7_062818 6/28/18	ICT8_062818 6/28/18	ICT8_062818_a 6/28/18	ICT11_062818 6/28/18	ICT12B_062818 6/28/18	ICT12C_062818 6/28/18	ICT12D_062818 6/28/18	ICT12E_062818 6/28/18	ICT13A_062818 6/28/18
Lab Package			HS18060825	HS18060725	HS18061144	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493
Perchlorate (6850)																
Perchlorate	mg/L	17*	< 2,000 U	3,900	5.6	6,200	14,000	350	1,900	1,800	17,000	19,000	10,000	73,000	81,000	24,000
Volatile Organic Compounds (8260C)																
1,1,1,2-Tetrachloroethane	mg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,1,1-Trichloroethane	mg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,1,2,2-Tetrachloroethane	mg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,1,2-Trichloroethane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,1-Dichloroethane	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	**0.47 J**	< 12 U	< 0.5 U	< 50 U	< 50 U	**0.47 J**	< 0.5 U	< 5.0 U	< 50 U	**130**	**19**
1,1-Dichloroethene	mg/L	7	< 0.5 U	< 0.5 U	< 0.5 U	**3.9**	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	**570**	**46**
1,1-Dichloropropene	mg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,2,3-Trichlorobenzene	mg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,2,3-Trichloropropane	mg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,2,4-Trichlorobenzene	mg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,2,4-Trimethylbenzene	mg/L	5,100	< 0.5 U	**0.56 J**	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,2-Dibromo-3-chloropropane	mg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 12 UJ	< 0.5 UJ	< 50 UJ	< 50 UJ	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,2-Dibromoethane	mg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,2-Dichlorobenzene	mg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,2-Dichloroethane	mg/L	5	< 0.5 U	**11**	< 0.5 U	**49**	**200**	< 0.5 U	**87 J**	**81 J**	**9.8**	**7.9**	**42**	**340**	**230**	**83**
1,2-Dichloropropane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,3,5-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,3-Dichlorobenzene	mg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,3-Dichloropropane	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
1,4-Dichlorobenzene	mg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
2,2-Dichloropropane	mg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
2-Butanone	mg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 10 U	< 50 U	< 50 U	< 10 U
2-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
2-Hexanone	mg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 10 U	< 50 U	< 50 U	< 10 U
4-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
4-Isopropyltoluene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
4-Methyl-2-pentanone	mg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 10 U	< 50 U	< 50 U	< 10 U
Acetone	mg/L	92,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 10 U	< 50 U	< 50 U	< 10 U
Benzene	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Bromobenzene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Bromochloromethane	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	**270 J**	**87 J**	< 0.5 U	< 0.5 U	< 5.0 U	**120**	**340**	< 5.0 U
Bromodichloromethane	mg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Bromoform	mg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Bromomethane	mg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 UJ	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Carbon disulfide	mg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 100 U	< 100 U	< 1.0 U	< 1.0 U	< 10 U	< 100 U	< 100 U	< 10 U
Carbon tetrachloride	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	**1.7**	**7.4**	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Chlorobenzene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Chloroethane	mg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Chloroform	mg/L	1,000	< 0.5 U	**1.9**	< 0.5 U	**0.78 J**	< 12 U	< 0.5 U	< 50 U	< 50 U	**4.7**	**7.5**	< 5.0 U	< 50 U	**76 J**	**12**
Chloromethane	mg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
cis-1,2-Dichloroethene	mg/L	70	< 0.5 U	**3.9**	< 0.5 U	**66**	**1,300**	< 0.5 U	**17,000 J**	**10,000 J**	**140**	**41**	**23**	**13,000**	**11,000**	**930**
cis-1,3-Dichloropropene	mg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Dibromochloromethane	mg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Dibromomethane	mg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Dichlorodifluoromethane	mg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Ethylbenzene	mg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Hexachlorobutadiene	mg/L	20	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Isopropylbenzene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
m,p-Xylene	mg/L	10,000**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 100 U	< 100 U	< 1.0 U	< 1.0 U	< 10 U	< 100 U	< 100 U	< 10 U
Methylene chloride	mg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**53**	< 1.0 U	**100,000 J**	**56,000 J**	< 1.0 U	**39**	< 10 U	**77,000**	**120,000**	< 10 U
Naphthalene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 12 UJ	< 0.5 UJ	< 50 UJ	< 50 UJ	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
n-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	126_061518_a 6/15/18	129_061418 6/14/18	130_062118 6/21/18	ICT2_062818 6/28/18	ICT4_062818 6/28/18	ICT7_062818 6/28/18	ICT8_062818 6/28/18	ICT8_062818_a 6/28/18	ICT11_062818 6/28/18	ICT12B_062818 6/28/18	ICT12C_062818 6/28/18	ICT12D_062818 6/28/18	ICT12E_062818 6/28/18	ICT13A_062818 6/28/18
n-Propylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
o-Xylene	mg/L	10,000**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
sec-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Styrene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
tert-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Tetrachloroethene	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	**1.7**	< 12 U	< 0.5 U	**260 J**	**380**	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Toluene	mg/L	1,000	< 0.5 U	**0.47 J**	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
trans-1,2-Dichloroethene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	**1.5**	< 12 U	< 0.5 U	< 50 U	< 50 U	**1.7**	< 0.5 U	< 5.0 U	< 50 U	< 50 U	**7.2 J**
trans-1,3-Dichloropropene	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Trichloroethene	mg/L	5	< 0.5 U	**890**	**0.70 J**	**750**	**7,400**	**0.52 J**	**8,400**	**11,000**	**1,300**	**1,200**	**5,800**	**70,000**	**65,000**	**9,600**
Trichlorofluoromethane	mg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 50 U	< 50 U	< 0.5 U	< 0.5 U	< 5.0 U	< 50 U	< 50 U	< 5.0 U
Vinyl chloride	mg/L	2	< 0.5 U	< 0.5 U	< 0.5 U	**1.8**	**23 J**	< 0.5 U	**86 J**	**66 J**	**0.57 J**	**2.2**	< 5.0 U	**300**	**410**	**18**
Metals (6020A)																
Aluminum	mg/L	100	**0.0405**	**0.182**	**0.196**	**0.0425**	0.00509 UB	**4.70**	**0.0172**	**0.0129**	0.00386 UB	**0.0184**	**0.144**	**0.0803**	**0.0816**	0.00923 UB
Antimony	mg/L	0.006	< 0.00200 U	< 0.00100 U	**0.000558 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.00120 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U
Arsenic	mg/L	0.01	**0.00281**	< 0.00100 U	**0.00228**	**0.0116**	**0.000422 J**	**0.00128 J**	**0.00236**	**0.00254**	< 0.00100 U	**0.000625 J**	**0.00236**	**0.00307**	**0.000675 J**	**0.000962 J**
Barium	mg/L	2	**9.03**	**0.156**	**0.0998**	**0.360**	**0.128**	**0.107**	**0.975**	**0.958**	**0.847**	**0.327**	**0.143**	**0.327**	**0.274**	**0.173**
Beryllium	mg/L	0.004	< 0.00200 U	< 0.00100 U	< 0.00100 U	**0.000200 J**	< 0.00100 U	**0.000482 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.000260 J**	**0.000238 J**	**0.000577 J**	< 0.00100 U
Cadmium	mg/L	0.005	**0.000481 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.000527 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.000208 J**	**0.000396 J**	**0.000588 J**	**0.000240 J**
Calcium	mg/L	NV	**286**	**6.80**	**37.2**	**26.3**	**30.8**	**2.30**	**28.6**	**27.9**	**24.4**	**9.74**	**8.57**	**25.2**	**37.1**	**27.3**
Chromium	mg/L	0.1	< 0.00400	**0.00162 J**	**0.00172 J**	**0.0401**	**0.0170**	**0.00765**	**0.000861 J**	**0.00155 J**	**0.00522**	**0.0449**	**0.599**	**0.00264 J**	**0.0179**	**0.00465**
Cobalt	mg/L	6.1	**0.0109**	**0.000396 J**	**0.0137**	**0.0167**	**0.00798**	**0.00232 J**	**0.0101**	**0.0102**	**0.000245 J**	**0.00207 J**	**0.00523**	**0.0343**	**0.0304**	**0.0273**
Copper	mg/L	1.3	< 0.00200 U	< 0.00200 U	< 0.00200 U	**0.112**	< 0.00200 U	**0.00462**	< 0.00200 U	< 0.00200 U	**0.178**	**0.0739**	**0.00440**	**0.00206**	**0.00498**	**0.0105**
Iron	mg/L	NV	**2.27**	**0.223**	**1.34**	**31.2**	**0.103 J**	**5.50**	**3.43**	**3.54**	**0.0390 J**	**1.52**	**7.41**	**3.78**	**0.449**	**6.83**
Lead	mg/L	0.015	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.00259**	< 0.00100 U	< 0.00100 U	**0.000735 J**	**0.00236**	**0.000882 J**	< 0.00100 U	**0.000706 J**	< 0.00100 U
Magnesium	mg/L	NV	**226**	**5.02**	**25.2**	**26.9**	**28.2**	**2.45**	**23.6**	**23.8**	**19.4**	**7.04**	**6.27**	**24.0**	**29.7**	**23.1**
Manganese	mg/L	1.1*	**0.197**	**0.00458 J**	**1.06**	**0.576**	**0.455**	**0.0650**	**0.668**	**0.681**	**0.0387**	**0.123**	**0.222**	**1.45**	**1.51**	**0.520**
Nickel	mg/L	0.49*	**0.0133**	**0.00170 J**	**0.00421**	**0.0252**	**0.0117**	**0.00827**	**0.00845**	**0.00885**	**0.0153**	**0.0663**	**0.187**	**0.0165**	**0.0223**	**0.0481**
Potassium	mg/L	NV	**3.54**	**0.240**	**0.607**	**1.23**	**1.04**	**1.07**	**1.50**	**1.45**	**1.40**	**0.859**	**0.501**	**0.432**	**1.67**	**1.65**
Selenium	mg/L	0.05	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	**0.00255**	< 0.00200 U
Silver	mg/L	0.51	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U
Sodium	mg/L	NV	**793**	**106**	**656**	**243**	**233**	**23.5**	**123**	**123**	**125**	**86.4**	**83.6**	**99.7**	**405**	**404**
Thallium	mg/L	0.002	< 0.00100 U	**0.000427 J**	< 0.00200 U	**0.000399 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U
Vanadium	mg/L	0.72	< 0.00100 U	< 0.00100 U	**0.00213 J**	**0.0103**	< 0.00100 U	**0.00767**	**0.000887 J**	**0.00106 J**	< 0.00100 U	**0.00125 J**	**0.00562**	**0.00126 J**	**0.000628 J**	**0.00248 J**
Zinc	mg/L	31	**0.0372**	**0.00291 J**	**0.00987**	**0.694**	**0.00661**	**0.0238**	**0.00261 J**	**0.00205 J**	**0.626**	**0.0232**	**0.0119**	**0.0155**	**0.0211**	**0.0719**
Mercury	mg/L	0.002	**0.0000300 J**	**0.000216**	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.0000630 J**	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U
1,4-Dioxane (8270D SIM)																
1,4-Dioxane	mg/L	9.1	< 0.010 U	**4.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential

a - duplicate sample

+ - VOCs were inadvertently analyzed

Wells 18WW16 and MW-125 were dry

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	ICT13B_062818 6/28/18	ICT13B_062818_a 6/28/18	ICT13D_062818 6/28/18	ICT13E_062818 6/28/18	ICT13F_062818 6/28/18	ICT14B_062818 6/28/18	ICT14C_062818 6/28/18	ICT14D_062818 6/28/18
Lab Package			HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493	HS18061493
Perchlorate (6850)										
Perchlorate	mg/L	17*	**700**	**540**	< 2.0 U	< 2.0 U	**56**	**6,800**	**710 J**	**1.9 J**
Volatile Organic Compounds (8260C)										
1,1,1,2-Tetrachloroethane	mg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,1,1-Trichloroethane	mg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,1,2,2-Tetrachloroethane	mg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,1,2-Trichloroethane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	**1.6**
1,1-Dichloroethane	mg/L	10,000	**1.2**	**0.94 J**	< 0.5 U	< 0.5 U	< 0.5 U	**2.1**	< 12 U	**5.6**
1,1-Dichloroethene	mg/L	7	**5.4**	**4.5**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**56**	< 0.5 U
1,1-Dichloropropene	mg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,2,3-Trichlorobenzene	mg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,2,3-Trichloropropane	mg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,2,4-Trichlorobenzene	mg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,2,4-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,2-Dibromo-3-chloropropane	mg/L	0.2	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 12 UJ	< 0.5 U
1,2-Dibromoethane	mg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,2-Dichlorobenzene	mg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,2-Dichloroethane	mg/L	5	**50**	**50**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	**2.8**
1,2-Dichloropropane	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,3,5-Trimethylbenzene	mg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,3-Dichlorobenzene	mg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,3-Dichloropropane	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
1,4-Dichlorobenzene	mg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
2,2-Dichloropropane	mg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
2-Butanone	mg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U
2-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
2-Hexanone	mg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U
4-Chlorotoluene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	0.5 U
4-Isopropyltoluene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	0.5 U
4-Methyl-2-pentanone	mg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U
Acetone	mg/L	92,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U
Benzene	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	**0.80 J**
Bromobenzene	mg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Bromochloromethane	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**51**	< 0.5 U
Bromodichloromethane	mg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Bromoform	mg/L	36	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Bromomethane	mg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Carbon disulfide	mg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U
Carbon tetrachloride	mg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Chlorobenzene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Chloroethane	mg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Chloroform	mg/L	1,000	**0.97 J**	**0.95 J**	< 0.5 U	< 0.5 U	< 0.5 U	**1.2**	< 12 U	**5.9**
Chloromethane	mg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
cis-1,2-Dichloroethene	mg/L	70	**150**	**150**	**0.69 J**	< 0.5 U	< 0.5 U	**180**	**2,900 J**	**1,700**
cis-1,3-Dichloropropene	mg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Dibromochloromethane	mg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Dibromomethane	mg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Dichlorodifluoromethane	mg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Ethylbenzene	mg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Hexachlorobutadiene	mg/L	20	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Isopropylbenzene	mg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
m,p-Xylene	mg/L	10,000**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U
Methylene chloride	mg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**7,000 J**	< 1.0 U
Naphthalene	mg/L	2,000	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 12 UJ	< 0.5 U
n-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U

LHAAP-18/24 Sampling Event - June 2018

Location ID: / Sample Date:	Units	MCL/MSC/PCL	ICT13B_062818 6/28/18	ICT13B_062818_a 6/28/18	ICT13D_062818 6/28/18	ICT13E_062818 6/28/18	ICT13F_062818 6/28/18	ICT14B_062818 6/28/18	ICT14C_062818 6/28/18	ICT14D_062818 6/28/18
n-Propylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
o-Xylene	mg/L	10,000**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
sec-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Styrene	mg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.77 J**	< 0.5 U	< 12 U	< 0.5 U
tert-Butylbenzene	mg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Tetrachloroethene	mg/L	5	**1.1**	**0.98 J**	< 0.5 U	< 0.5 U	< 0.5 U	**1.1**	< 12 U	**8.9**
Toluene	mg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	**0.62 J**
trans-1,2-Dichloroethene	mg/L	100	**1.3**	**1.2**	< 0.5 U	< 0.5 U	< 0.5 U	**2.3**	**18 J**	**16**
trans-1,3-Dichloropropene	mg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U
Trichloroethene	mg/L	5	**1,200**	**910**	**2.9**	< 0.5 U	< 0.5 U	**410**	**1,800 J**	**530**
Trichlorofluoromethane	mg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	0.5 U	0.5 U	0.5 U	< 12 U	0.5 U
Vinyl chloride	mg/L	2	**4.8**	**3.9**	< 0.5 U	0.5 U	0.5 U	**9.8**	**530**	**790**
Metals (6020A)										
Aluminum	mg/L	100	**0.0370**	**0.0397**	**0.0191**	**8.58**	**2.17**	**0.0271**	**0.526**	**0.0263**
Antimony	mg/L	0.006	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.00431**	< 0.00100 U	**0.000461 J**	**0.00110 J**
Arsenic	mg/L	0.01	**0.0521**	**0.0559**	**0.00397**	**0.00303**	**0.000491 J**	**0.000700 J**	**0.149**	**0.0167**
Barium	mg/L	2	**0.171**	**0.180**	**0.186**	**0.138**	**0.0736**	**0.365**	**2.21**	**1.01**
Beryllium	mg/L	0.004	**0.00154 J**	**0.00160 J**	< 0.00100 U	**0.000960 J**	**0.000353 J**	< 0.00200 U	**0.00766**	**0.000288 J**
Cadmium	mg/L	0.005	**0.000219 J**	**0.000244 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.00862**	< 0.00200 U
Calcium	mg/L	NV	**13.1**	**13.0**	**4.70**	**1.20**	**0.946**	**9.99**	**68.5**	**81.8**
Chromium	mg/L	0.1	**0.0151**	**0.0189**	**0.00682**	**0.0323**	**0.00579**	**0.0288**	**0.470**	**0.00513**
Cobalt	mg/L	6.1	**0.0224**	**0.0225**	**0.00917**	**0.00529**	**0.00371 J**	**0.00202 J**	**0.0179**	**0.0236**
Copper	mg/L	1.3	**0.00619**	**0.00660**	**0.00122 J**	**0.0135**	**0.266**	< 0.00200 U	**0.0228**	**0.00474**
Iron	mg/L	NV	**148**	**167**	**12.3**	**12.8**	**2.65**	**0.457**	**70.6**	**39.9**
Lead	mg/L	0.015	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.0102**	**0.00547**	< 0.00100 U	**0.00473**	< 0.00100 U
Magnesium	mg/L	NV	**16.3**	**15.7**	**4.97**	**1.51**	**0.828**	**8.82**	**52.0**	**64.8**
Manganese	mg/L	1.1*	**0.533**	**0.509**	**0.148**	**0.0603**	**0.0500**	**0.123**	**1.21**	**1.63**
Nickel	mg/L	0.49*	**0.0155**	**0.0156**	**0.0149**	**0.0223**	**0.0848**	**0.00611**	**0.0849**	**0.0518**
Potassium	mg/L	NV	**1.81**	**1.80**	**0.826**	**1.76**	**0.950**	**0.322**	**1.76**	**2.09**
Selenium	mg/L	0.05	**0.00212**	**0.00210**	< 0.00200 U	< 0.00200 U	< 0.00200 U	< 0.00200 U	**0.00119 J**	< 0.00200 U
Silver	mg/L	0.51	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.000213 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U
Sodium	mg/L	NV	**107**	**102**	**48.4**	**8.66**	**8.34**	**85.5**	**230**	**321**
Thallium	mg/L	0.002	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.000445 J**
Vanadium	mg/L	0.72	**0.00342 J**	**0.00365 J**	< 0.00100 U	**0.0232**	**0.00369 J**	**0.00100 J**	**0.0400**	< 0.00100 U
Zinc	mg/L	31	**0.0362**	**0.0372**	**0.0128**	**0.0454**	**1.69**	**0.00500**	**0.121**	**0.0332**
Mercury	mg/L	0.002	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000235**	< 0.000500 U
1,4-Dioxane (8270D SIM)										
1,4-Dioxane	mg/L	9.1	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential

a - duplicate sample

+ - VOCs were inadvertently analyzed

Wells 18WW16 and MW-125 were dry

LHAAP-58 Remedial Action Operation Validated Data - June/July 2018

Location ID: / Sample Date:	Units	MCL/MSC	03WW01_071818 7/18/18	35AWW01_070218 7/2/18	35AWW05_070218 7/2/18	35AWW05_070218_a 7/2/18	35AWW06_071818 7/18/18	35AWW08_071818 7/18/18	35AWW09_071618 7/16/18	35AWW10_071218 7/12/18	35AWW11_071618 7/16/18	35AWW12_062918 6/29/18	35AWW13_062918 6/29/18	35AWW14_071818 7/18/18	35AWW15_071818 7/18/18	35AWW15_071818_a 7/18/18	35AWW16_062918 6/29/18	35AWW16_062918_a 6/29/18
Location Description			Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary. Duplicate	Site 58 - SW, outside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - S, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - E, outside site boundary.	Site 58 - E, inside site boundary.	Site 58 - S, outside site boundary.	Site 58 - W, inside site boundary.	Site 58 - W, inside site boundary. Duplicate	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary. Duplicate
Location Depth			Shallow	Intermediate	Intermediate	Intermediate	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18070996	HS18070079	HS18070079	HS18070079	HS18070996	HS18070996	HS18070743	HS18070607	HS18070743	HS18070002	HS18070002	HS18070996	HS18070996	HS18070996	HS18070002	HS18070002
Alkalinity (310.2/SM2320B)																		
Alkalinity, Total	mg/L	NV	**2290**	NA	NA	NA	386	< 5.0 U	**290**	**98.9**	**649**	NA	NA	NA	NA	NA	NA	NA
Phosphorus (365.3)																		
Phosphorus	mg/L	NV	**1.89**	NA	NA	NA	3.90	**4.23**	**0.122**	**0.314**	**0.500**	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (415.1)																		
Total Organic Carbon	mg/L	NV	**118 J**	NA	NA	NA	**4200 J**	**484 J**	**5.76**	**3.21**	**1,650**	NA	NA	NA	NA	NA	NA	NA
Metals (6020A)																		
Total Iron	mg/L	NV	**42.4**	NA	NA	NA	**9.27**	**40.5**	**6.31**	**0.859**	**25.6**	NA	NA	NA	NA	NA	NA	NA
Total Manganese	mg/L	14	**8.64**	NA	NA	NA	**9.11**	**4.52**	**0.162**	**0.0648**	**5.18**	NA	NA	NA	NA	NA	NA	NA
Dissolved Iron	mg/L	NV	**43**	NA	NA	NA	**15.4**	**39.6**	**0.334**	< 0.100 U	**25.5**	NA	NA	NA	NA	NA	NA	NA
Dissolved Manganese	mg/L	14	**7.42**	NA	NA	NA	**9.52**	**4.41**	**0.119**	**0.0580**	**5.18**	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (8260C)																		
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**10 J**	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	7	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	**2.7**	< 0.5 U	**9.3**	< 0.5 U	< 0.5 U	**9.7 J**	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61000	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**100 J**	< 5.0 U	< 1.0 U	< 1.0 U	**140**	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6100	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8200	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
Acetone	µg/L	92000	18 UB	< 1.0 U	< 1.0 U	< 1.0 U	**600 J**	< 10 UJ	< 1.0 U	< 1.0 U	**170**	< 1.0 U	< 1.0 U	20 UB	7.1 UB	12 UB	< 1.0 U	< 1.0 U
Benzene	µg/L	5	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10000	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Chloroform	µg/L	1000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	**5.3 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	**12 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**4.0 J**	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/L	20	< 1.0 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 5.0 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Isopropylbenzene	µg/L	10000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10000	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 5.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 UJ	< 1.0 UJ	< 1.0 U	< 1.0 U
Naphthalene	µg/L	2000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	**0.53 J**	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	**140**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Toluene	µg/L	1000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	**19 J**	**51**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**8.4 J**	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Trichlorofluoromethane	µg/L	31000	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 2.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U
Vinyl chloride		2	**4.8 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	**9.0 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U

LHAAP-58 Remedial Action Operation Validated Data - June/July 2018

Location ID: / Sample Date:	Units	MCL/MSC	03WW01_071818 7/18/18	35AWW01_070218 7/2/18	35AWW05_070218 7/2/18	35AWW05_070218_a 7/2/18	35AWW06_071818 7/18/18	35AWW08_071818 7/18/18	35AWW09_071618 7/16/18	35AWW10_071218 7/12/18	35AWW11_071618 7/16/18	35AWW12_062918 6/29/18	35AWW13_062918 6/29/18	35AWW14_071818 7/18/18	35AWW15_071818 7/18/18	35AWW15_071818_a 7/18/18	35AWW16_062918 6/29/18	35AWW16_062918_a 6/29/18
Location Description			Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary. Duplicate	Site 58 - SW, outside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - S, inside site boundary.	Site 58 - SE, inside site boundary.	Site 58 - E, outside site boundary.	Site 58 - E, inside site boundary.	Site 58 - S, outside site boundary.	Site 58 - W, inside site boundary.	Site 58 - W, inside site boundary. Duplicate	Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary. Duplicate
Location Depth			Shallow	Intermediate	Intermediate	Intermediate	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Arsenic (6020A)																		
Arsenic	mg/L		NA	**0.000648 J**	NA	NA	NA	**0.122**	**0.00198 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Fatty Acids (HPLC-METACIDS)																		
Acetic Acid	mg/L	NV	**2.9 J**	NA	NA	NA	**1100**	**66**	< 2.0 U	< 2.0 U	**960**	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	mg/L	NV	**21**	NA	NA	NA	**2300**	**50**	< 1.0 U	< 1.0 U	**880**	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	mg/L	NV	**6.6**	NA	NA	NA	< 20 U	**55**	< 1.0 U	< 1.0 U	< 10 U	NA	NA	NA	NA	NA	NA	NA
Propionic Acid	mg/L	51	< 1.0 U	NA	NA	NA	**270**	< 1.0 U	< 1.0 U	< 1.0 U	**350**	NA	NA	NA	NA	NA	NA	NA
Pyruvic Acid	mg/L	NV	< 0.10 U	NA	NA	NA	< 2.0 U	< 0.10 U	< 0.10 U	< 0.10 U	< 1.0 U	NA	NA	NA	NA	NA	NA	NA
Anions (9056A)																		
Chloride	mg/L	NV	977	NA	NA	NA	**904**	**2460**	**1,470**	**7.51**	**2,440**	NA	NA	NA	NA	NA	NA	NA
Nitrate	mg/L	10	< 0.200 UJ	NA	NA	NA	< 0.200 UJ	< 0.200 UJ	**0.0590 J**	**0.0690 J**	< 0.100 U	NA	NA	NA	NA	NA	NA	NA
Nitrite	mg/L	1	< 0.200 UJ	NA	NA	NA	< 0.200 UJ	< 0.200 UJ	< 0.100 U	< 0.100 U	< 0.100 U	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/L	NV	161	NA	NA	NA	**811**	**0.900**	**940**	**63.8**	**652**	NA	NA	NA	NA	NA	NA	NA
Dissolved Gases (RSK-175)																		
Carbon Dioxide	µg/L	NV	**490000**	NA	NA	NA	**780000 J**	**350000**	**340,000**	**380,000**	**450,000**	NA	NA	NA	NA	NA	NA	NA
Ethane	µg/L	NV	< 0.47 U	NA	NA	NA	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	< 0.47 U	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/L	NV	**0.89 J**	NA	NA	NA	**0.58 J**	**0.49 J**	< 0.55 U	< 0.55 U	< 0.55 U	NA	NA	NA	NA	NA	NA	NA
Methane	µg/L	NV	**590**	NA	NA	NA	< 1.0 U	**920**	< 1.0 U	< 1.0 U	0.80 J	NA	NA	NA	NA	NA	NA	NA
Ferrous Iron (SM3500Fe)																		
Ferrous Iron	mg/L	NV	**40 J**	NA	NA	NA	**14 J**	**13.7 J**	**0.16 J**	**0.21 J**	**27.6 J**	NA	NA	NA	NA	NA	NA	NA
Sulfide (376.1)																		
Sulfide	mg/L	NV	**24.4**	NA	NA	NA	**4.04**	< 1.00 U	< 1.00 U	**5.84**	**8.04**	NA	NA	NA	NA	NA	NA	NA
Dechlorinating Bacteria																		
BAV1 Vinyl Chloride Reductase	cells/mL	NV	< 0.5 U	NA	NA	NA	< 1.8 U	< 3.8 U	< 0.5 U	< 1.10 U	**0.7 J**	NA	NA	NA	NA	NA	NA	NA
Dehalobacter spp.	cells/mL	NV	**5.5**	NA	NA	NA	**52900**	**47000**	**0.8 J**	< 10.6 U	**910000**	NA	NA	NA	NA	NA	NA	NA
Dehalococoides	cells/mL	NV	**7.5**	NA	NA	NA	< 1.8 U	**1410000**	< 0.5 U	< 1.10 U	**4.60**	NA	NA	NA	NA	NA	NA	NA
tceA Reductase	cells/mL	NV	< 0.5 U	NA	NA	NA	< 1.8 U	**333000**	< 0.5 U	< 1.10 U	< 1.30 U	NA	NA	NA	NA	NA	NA	NA
Vinyl Chloride Reductase	cells/mL	NV	**10.9**	NA	NA	NA	< 1.8 U	**428000**	< 0.5 U	< 1.10 U	**1.90**	NA	NA	NA	NA	NA	NA	NA

Blue Highlighting Indicates concentrations above the MCL/MSC

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

LHAAP-58 Remedial Action Operation Validated Data - June/July 2018

Location ID: / Sample Date:	Units	MCL/MSC	35AWW17_062918 6/29/18	35AWW18_062918 6/29/18	35AWW19_071818 7/18/18	35AWW20_071618 7/16/18	35AWW21_062918 6/29/18	35AWW22_071818 7/18/18	35AWW23_071718 7/17/18	35AWW24_071718 7/17/18	LHSMW06_070218 7/2/18	LHSMW07_071718 7/17/18
Location Description			Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - E, outside site boundary.	New Wells South of Avenue G in center of Western Plume	Downgradient Western Plume well	Site 58 - SW, inside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Lab Package			HS18070002	HS18070002	HS18070996	HS18070743	HS18070002	HS18070996	HS18070846	HS18070846	HS18070079	HS18070846
Alkalinity (310.2/SM2320B)												
Alkalinity, Total	mg/L	NV	NA	NA	**199**	**1,450**	NA	NA	**914**	**52.4**	NA	**1,990**
Phosphorus (365.3)												
Phosphorus	mg/L	NV	NA	NA	**0.0780**	**0.144**	NA	NA	**3.56**	**0.0610**	NA	**0.307**
Total Organic Carbon (415.1)												
Total Organic Carbon	mg/L	NV	NA	NA	**2.38 J**	**43.0**	NA	NA	**856**	**1.58**	NA	**321**
Metals (6020A)												
Total Iron	mg/L	NV	NA	NA	**3.26**	**1.12**	NA	NA	**21.1**	**18.0**	NA	**6.44**
Total Manganese	mg/L	14	NA	NA	**4.56**	**8.43**	NA	NA	**3.53**	**0.197**	NA	**13.7**
Dissolved Iron	mg/L	NV	NA	NA	**3.54**	**0.917**	NA	NA	**23.9**	**12.9**	NA	**0.29**
Dissolved Manganese	mg/L	14	NA	NA	**3.32**	**9.00**	NA	NA	**4.68**	**0.190**	NA	**13.4**
Volatile Organic Compounds (8260C)												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	**60**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	**1.3**
1,1-Dichloroethane	µg/L	10000	< 0.5 U	< 0.5 U	**2.5 J**	**300**	< 0.5 U	< 0.5 UJ	**3.1**	< 0.5 U	**2.2**	**24**
1,1-Dichloroethene	µg/L	7	< 0.5 U	**1.2**	**13 J**	**1400**	< 0.5 U	< 0.5 UJ	**2.1**	< 0.5 U	**2.3**	**56**
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 UJ	**8.3**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	**3.2 J**	**16**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	**1.2**
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 UJ	**1.3**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61000	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	**47**	< 1.0 U	< 1.0 U	**31**
2-Chlorotoluene	µg/L	2000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6100	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8200	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92000	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	**9.2**	< 1.0 U	< 1.0 U	**31**
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	**4.4**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	**0.26 J**
Bromobenzene	µg/L	2000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10000	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 UJ	**69**	< 0.5 U	< 0.5 UJ	**12**	< 0.5 U	**12**	**5.0**
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/L	20	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Isopropylbenzene	µg/L	10000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10000	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 UJ	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	µg/L	2000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4100	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 UJ	**2.9**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 UJ	**270**	< 0.5 U	< 0.5 UJ	**2.6**	< 0.5 U	**2.8**	**12**
Trichlorofluoromethane	µg/L	31000	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride		2	< 0.5 U	< 0.5 U	< 0.5 UJ	**71**	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

LHAAP-58 Remedial Action Operation Validated Data - June/July 2018

Location ID: / Sample Date:	Units	MCL/MSC	35AWW17_062918 6/29/18	35AWW18_062918 6/29/18	35AWW19_071818 7/18/18	35AWW20_071618 7/16/18	35AWW21_062918 6/29/18	35AWW22_071818 7/18/18	35AWW23_071718 7/17/18	35AWW24_071718 7/17/18	LHSMW06_070218 7/2/18	LHSMW07_071718 7/17/18
Location Description			Site 58 - SW, outside site boundary.	Site 58 - SW, outside site boundary.	Site 58 - S, outside site boundary.	Site 58 - SW, inside site boundary.	Site 58 - SE, outside site boundary.	Site 58 - E, outside site boundary.	New Wells South of Avenue G in center of Western Plume	Downgradient Western Plume well	Site 58 - SW, inside site boundary.	Site 58 - SW, outside site boundary.
Location Depth			Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Arsenic (6020A)												
Arsenic	mg/L		NA	NA	NA	NA	NA	NA	NA	NA	**0.00186 J**	NA
Volatile Fatty Acids (HPLC-METACIDS)												
Acetic Acid	mg/L	NV	NA	NA	< 2.0 U	**240**	NA	NA	**580**	< 2.0 U	NA	**460**
Butyric Acid	mg/L	NV	NA	NA	< 1.0 U	< 5.0 U	NA	NA	**180**	< 1.0 U	NA	< 5.0 U
Lactic Acid	mg/L	NV	NA	NA	< 1.0 U	< 5.0 U	NA	NA	< 5.0 U	< 1.0 U	NA	< 5.0 U
Propionic Acid	mg/L	51	NA	NA	< 1.0 U	**6.6 J**	NA	NA	**580**	< 1.0 U	NA	**190**
Pyruvic Acid	mg/L	NV	NA	NA	< 0.10 U	< 0.5 U	NA	NA	< 0.5 U	< 0.10 U	NA	< 0.5 U
Anions (9056A)												
Chloride	mg/L	NV	NA	NA	**1370**	**1,420**	NA	NA	**482**	**117**	NA	**2,270**
Nitrate	mg/L	10	NA	NA	< 0.200 UJ	< 0.100 U	NA	NA	< 0.100 U	**0.0640 J**	NA	< 0.200 U
Nitrite	mg/L	1	NA	NA	< 0.200 UJ	< 0.100 U	NA	NA	< 0.100 U	< 0.100 U	NA	< 0.200 U
Sulfate	mg/L	NV	NA	NA	**983**	**882**	NA	NA	< 0.500 U	**73.6**	NA	**1,090**
Dissolved Gases (RSK-175)												
Carbon Dioxide	µg/L	NV	NA	NA	**180000 J**	**360,000**	NA	NA	**370,000**	**430,000**	NA	**540,000**
Ethane	µg/L	NV	NA	NA	< 0.47 U	< 0.47 U	NA	NA	< 0.47 U	< 0.47 U	NA	< 0.47 U
Ethene	µg/L	NV	NA	NA	< 0.55 U	< 0.55 U	NA	NA	**0.38 J**	< 0.55 U	NA	< 0.55 U
Methane	µg/L	NV	NA	NA	**0.65 J**	**0.93 J**	NA	NA	**49**	< 1.0 U	NA	**1.4**
Ferrous Iron (SM3500Fe)												
Ferrous Iron	mg/L	NV	NA	NA	**2.78 J**	**1.18 J**	NA	NA	**25.1 J**	**0.16 J**	NA	**2.58 J**
Sulfide (376.1)												
Sulfide	mg/L	NV	NA	NA	< 1.0 U	**13.0**	NA	NA	< 1.00 U	< 1.00 U	NA	**42.6**
Dechlorinating Bacteria												
BAV1 Vinyl Chloride Reductase	cells/mL	NV	NA	NA	< 0.5 U	< 0.9 U	NA	NA	**1.7 J**	< 1.90 U	NA	**1.30 J**
Dehalobacter spp.	cells/mL	NV	NA	NA	**20400**	**5970000**	NA	NA	**9530**	**137**	NA	**6570000**
Dehalococoides	cells/mL	NV	NA	NA	**0.30 J**	**1.50**	NA	NA	**45.1**	< 1.90 U	NA	**17**
tceA Reductase	cells/mL	NV	NA	NA	**0.097 J**	< 0.9 U	NA	NA	< 2.5 U	< 1.90 U	NA	< 1.30 U
Vinyl Chloride Reductase	cells/mL	NV	NA	NA	< 0.5 U	< 0.9 U	NA	NA	**12.7**	< 1.90 U	NA	**3.9**

Blue Highlighting Indicates concentrations above the MCL/MSC

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: Between the method detection limit and reporting limit and/or due to disc

UJ - The analyte was not detected; however, the result is estimated due to discrepancies

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

December 12, 2018

DAIM-BD-LO

Mr. Rich Mayer
US Environmental Protection Agency
Superfund Division (6SF-AT)
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Environmental Condition of Property VII (ECP VII), Longhorn Army Ammunition Plant, Karnack, Texas, August 2018

Dear Mr. Mayer,

Thank you for your review of the above-referenced document. With this transmittal, the signed ECP VII document is being provided for your file. Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

One Enclosure
Copies furnished:
April Palmie, TCEQ
Erik Duerkop, Caddo Lake NWR, TX
Aaron Williams, COE – Tulsa District, OK
Kim Nemmers, Project File

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

December 12, 2018

DAIM-BD-LO

Ms. April Palmie
Texas Commission on Environmental Quality (TCEQ)
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Environmental Condition of Property VII (ECP VII), Longhorn Army Ammunition Plant, Karnack, Texas, August 2018

Dear Ms. Palmie,

Thank you for your review of the above-referenced document. With this transmittal, the signed ECP VII document is being provided for your file. Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

One Enclosure
Copies furnished:
Rich Mayer, USEPA Region 6, Dallas, TX
Erik Duerkop, Caddo Lake NWR, TX
Aaron Williams, COE – Tulsa District, OK
Kim Nemmers, Project File

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

December 12, 2018

DAIM-BD-LO

Erik Duerkop
Refuge Manager
Caddo Lake National Wildlife Refuge
Post Office Box 230
Karnack, Texas 75661-0230

Re: Environmental Condition of Property VII (ECP VII), Longhorn Army Ammunition Plant, Karnack, Texas, August 2018

Dear Mr. Duerkop,

Thank you for your review of the above-referenced document. With this transmittal, the signed ECP VII document is being provided for your file. Point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Enclosures: One
Copies furnished:
J. Paul Cornes, USFWS – ALB
April Palmie, TCEQ, Austin, TX
Rich Mayer, EPA Region 6
Aaron K. Williams, COE-Tulsa District, OK
Kim Nemmers, Project File

ENVIRONMENTAL CONDITION OF PROPERTY VII (ECP VII)

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

August 2018

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Table of Contents

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Acronyms and Abbreviations

ACM	Asbestos-Containing Material
AEDB-R	Army Environmental Database-Restoration
AST	aboveground storage tank
BERA	Baseline Ecological Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLNWR	Caddo Lake National Wildlife Refuge
CFR	Code of Federal Regulations
DMM	Discarded Military Munitions
DNT	Dinitrotoluene
DoD	Department of Defense
DOI	Department of the Interior
ECP	Environmental Condition of Property
EE/CA	Engineering Evaluation/Cost Analysis
ESA	Environmental Site Assessment
FFA	Federal Facility Agreement
HHRA	Human Health Risk Assessment
INF	Intermediate Range Nuclear Forces
IRP	Installation Restoration Program
LBP	Lead-based paint
LHAAP	Longhorn Army Ammunition Plant
LTM	long term monitoring (LTM)
LUC	Land Use Control
MC	munitions constituents
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
MRS	munitions response site
MSC	medium-specific concentration
MSSL	Medium-Specific Screening Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NPL	National Priority List
NRHP	National Register of Historic Places
PA	Preliminary Assessment
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Royal Demolition Explosive
RI	Remedial Investigation

ROD	Record of Decision
SARA	Superfund Amendment and Reauthorization Act
SI	Site Investigation
SPLP	Synthetic Precipitation Leaching Procedure
TCEQ	Texas Commission on Environmental Quality
TNT	Trinitrotoluene
TRRR	Texas Risk Reduction Rule
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UXO	Unexploded Ordnance
WP	white phosphorous

ENVIRONMENTAL CONDITION OF PROPERTY

(ECP VII)

Longhorn Army Ammunition Plant, Karnack, Texas

August 2018

1.0 PURPOSE

The purpose of this Environmental Condition of Property (ECP) is to document the environmental condition of the described land (the Property) which comprises part of Longhorn Army Ammunition Plant (LHAAP) for transfer. The property has been determined to be suitable for nonresidential use. The Property for transfer consists of four parcels, Demolition Debris Landfill Area; Ground Signal Test Area; Pistol Range Area; and, South Test/Bomb Area (**Figure 2**), which are known collectively as the Property. Existing information was used to summarize the historical, cultural, and environmental conditions of the Property.

This ECP Report complies with applicable American Society for Testing and Materials (ASTM) Standards [ASTM E1527, E1903, and D6008], and is consistent with the DOD Base Redevelopment and Realignment Manual (DoD 4165.66-M, March 1, 2006) Section C8.3 (BRRM) for BRAC actions.

The transfer is consistent with the Department of Defense (DoD) and U.S. Army (Army) Policy. The determination of the suitability for nonresidential use is based primarily upon the results of six documents. The first is the Environmental Baseline Survey (Sverdrup, 1998). The final five documents are decision documents that presented no further action (NFA) decisions for six environmental sites located on the Property (U.S. Army, 1998; Shaw, 2010b; USACE, 2014; U.S. Army, 2014; and U.S. Army, 2016).

2.0 PROPERTY DESCRIPTION

LHAAP is located in central-east Texas in the northeastern corner of Harrison County, between State Highway 43 at Karnack, Texas and the western shore of Caddo Lake **(Figure 1)**. The facility is approximately 40 miles west of Shreveport, Louisiana. The former U.S. Army installation occupied 8,416 acres between State Highway 43 at Karnack, Texas, and the southwestern shore of Caddo Lake. Access to the facility is by State Highway 43 and 134. As shown on **Figure 2**, the Property for transfer consists of approximately 165.8 acres distributed among four separate parcels including the 13.03-acre Demolition Debris Landfill Area; the 1.10-acre Pistol Range Area, the 72.14-acre South Test/Bomb Test Area, and the 79.53-acre Ground Signal Test Area. With the exception of the north boundary of the Demolition Debris Landfill Area, the Property is surrounded by land that has already been transferred to U. S. Fish and Wildlife Service (USFWS) for management as the Caddo Lake National Wildlife Refuge (CLNWR).

The proposed reuse for the Property is as a wildlife refuge under the administration of the USFWS.

2.1 Demolition Debris Landfill Area Parcel

The Demolition Debris Landfill Area Parcel is a 13.03-acre site located in the southeastern portion of LHAAP, north of the Ground Signal Test Area **(Figure 2** and **Figure 3)**. This site is bounded on the east and west by an area transferred by the Army to the USFWS for management as the CLNWR. To the north is LHAAP-18/24 and the Groundwater Treatment Plant. To the south is the Ground Signal Test Area. Located within the Demolition Debris Landfill tract is the site of an Installation Restoration Program

(IRP) site, LHAAP-19, the Demolition Debris Landfill, which comprises 7.91 of the parcel's 13.03 acres. Haystack Road, an unimproved dirt road, runs north-south along the west boundary of the parcel. The north end of the parcel is forested. Other than a fence that surrounds the landfill, no buildings or structures are located on the parcel including sumps, waste rack sumps or septic tanks.

The Demolition Debris Landfill was sporadically active from 1985 until closure activities were conducted in 2009 (USACE, 2014). The landfill was permitted by rule to receive non-friable asbestos and other demolition debris. Historical information on physical site characteristics and closure activities is sourced in the Final Cover Evaluation and Final Landfill Closure Report (ECC, 2010). **Table 1** contains a description of the Demolition Debris Landfill processes and the results of investigations conducted at the landfill.

2.2 Pistol Range Area Parcel

The Pistol Range Area Parcel is comprised of 1.10 acres and is located in the southeastern portion of LHAAP, approximately 280 feet south of Avenue Q at the end of Robert Avenue **(Figure 2** and **Figure 4).** This site is surrounded by acreage already transferred by the Army to USFWS. The parcel is the site of a 0.3879-acre Military Munitions Response Program (MMRP) site, the Former Pistol Range, LHAAP-004-R.

Most of the parcel is a cleared, grassy area, but is forested as it approaches Harrison Bayou, along the western boundary. LHAAP-004-R, the Former Pistol Range, is a rectangular field approximately 110 feet north to south by 150 feet east to west located in the eastern portion of the parcel is. It was established in the 1950s and was used intermittently through 2004 (Shaw, 2009), when it was officially closed. A natural wooded slope along the eastern boundary of the parcel served as the target area for the pistol range. The range was known to have been used by LHAAP security personnel for small arms target qualification and recertification. There are no buildings, sumps, waste rack sumps, or septic tanks associated with this site.

Table 1 contains a description of the Pistol Range Area Parcel and the results of investigations conducted at LHAAP-004-R, the Former Pistol Range.

2.3 South Test /Bomb Area Parcel

The South Test/Bomb Area Parcel is a 72.14-acre site located in the southern portion of LHAAP (**Figure 2** and **Figure 5)** south of the Magazine Area. This site is surrounded by acreage already transferred by the Army to the USFWS for management as the CLNWR. The South Test/Bomb Area parcel is comprised entirely of an IRP site, LHAAP-27 and a co-located MMRP site, LHAAP-001-R, which extends outside the parcel. A deteriorated asphalt and gravel road provides access to the site from Avenue P and extends to the center of the parcel where the former test pad is located**.**

The South Test/Bomb Area was constructed in 1954 and was used by Universal Match Corporation for testing photoflash bombs that were produced at LHAAP until 1956. The bombs were tested by exploding them in the air over an elevated, semi-elliptical earthen test pad. During the late 1950s, illuminating signal devices were also demilitarized within pits excavated in the vicinity of the test pad. During the early 1960s, leaking production items may have been demilitarized by detonation. Leaking White Phosphorus (WP) munitions were reportedly disposed in the site although no primary source documentation was located (e2M, 2005). A 1984 LHAAP Contamination Survey stated the area had been relatively inactive since the early 1960s and no disposal or testing activities were carried out in the parcel (EPS, 1984).

A circular, 50-foot wide fire lane with a 2,000-foot diameter centered at the test pad forms a perimeter road that defines the parcel boundary. Concrete bunkers were located just outside and an observation building just inside the perimeter road boundary at the entrance to the range. The observation building has been demolished except for the concrete walls and foundation, but the bunkers remain. The site is overgrown with brush and trees. Munitions and Explosives of Concern (MEC) warning signage has been

placed every 200 feet along the perimeter road, which is maintained for visibility of the signs. There are no sumps, waste rack sumps, or septic tanks associated with this site.

Table 1 contains a description of the South Test/Bomb Area activities and the results of investigations conducted at LHAAP-27 and co-located LHAAP-001-R, the South Test/Bomb Test Area.

2.4 Ground Signal Test Area Parcel

The Ground Signal Test Area is a 79.53-acre site located in the southeastern portion of LHAAP, south of the Demolition Debris Landfill Parcel **(Figure 2 and Figure 6)**. This site is surrounded by acreage already transferred by the Army to the USFWS for management as the CLNWR with the exception of the land to the north which is the Demolition Debris Landfill Parcel. The Ground Signal Test Area Parcel is comprised entirely of an IRP site, LHAAP-54 and a co-located MMRP site, LHAAP-003-R. Haystack Road provides access to the site from Avenue Q and bisects the parcel from north to south.

The Ground Signal Test Area was used intermittently starting in 1963 for aerial and on-ground testing and destruction of a variety of devices, including pyrotechnic signal devices, red phosphorus smoke wedges, infrared flares, illuminating mortar shells and cartridges, button bombs, and various types of explosives simulators (e2M, 2005). The site was also used intermittently over a 20-year period for testing and burn-out of rocket motors. From late 1988 through 1991, the site was used for burn-out of Pershing missile rocket motors. Occasionally, leaking WP munitions were burned at the site as a demilitarization activity. A perimeter road surrounds the test area forming a circular site boundary. MEC warning signage has been placed every 200 feet along the perimeter road, which is maintained for visibility of the signs. The Ground Signal Test Area had two observation stations near the entrance, and several earthen and concrete bunkers (e2M, 2002). There are no sumps, waste rack sumps, or septic tanks associated with this site. **Table 1** contains a description of the Ground Signal Test Area activities and the results of investigations conducted at LHAAP-54 and co-located LHAAP-003-R, the Ground Signal Test Area.

3.0 ENVIRONMENTAL CONDITION OF PROPERTY

The Army has determined the Property's environmental condition through information obtained during the course of a series of environmental investigations that commenced at LHAAP in 1988. These investigations have included: Resource Conservation and Recovery Act (RCRA) Facility Assessment, Remedial Investigation, and Phase I and Phase II Site Assessments. The conditions of the Property are presented in the Environmental Baseline Survey (EBS) (Sverdrup, 1998). The EBS meets the requirements of an Environmental Baseline Survey for the four parcels. A comprehensive list of the documents reviewed in determining the environmental condition of the Property is listed in **Attachment 1.** The DOD Environmental Condition of Property (ECP) category for the property is as follows:

ECP Category 1: 5.83 acres as follows: Demolition Debris Landfill Area parcel – 5.12 acres and 0.71 acre of the Pistol Range Area parcel.

ECP Category 1 is defined as areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas).

ECP Category 4: Approximately 159.97 acres as follows: Demolition Debris Landfill – LHAAP-019 – 7.91 acres; Former Pistol Range – LHAAP-004-R, 0.39 acre; South Test Area/Bomb Test Area – LHAAP-001-R, 72.14 acres (includes the co-located LHAAP-27); Ground Signal Test Area – LHAAP-003-R, 79.53 acres (includes the co-located LHAAP-54).

ECP Category 4 is defined as areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions to protect human health and the environment have been taken.

Lead was detected in the surface soil at the Former Pistol Range, LHAAP-004-R, above the soil Medium-Specific Concentration (MSC) for industrial use based on inhalation, ingestion, and dermal contact (CES, 2004). A non-time critical removal action was implemented at the Former Pistol Range in 2009. Soil with lead concentrations exceeding 1,000 milligrams per kilogram (mg/kg) was excavated and disposed of off-site (Shaw, 2010).

MEC items were found at the South Test Area/Bomb Test Area, LHAAP-001-R, and the Ground Signal Test Area, LHAAP-003-R, during the Engineering Evaluation/Cost Analysis (EE/CA) investigations (CAPE, 2007). Subsequently, MEC items were located and removed during surface removals over the entire areas of LHAAP-001-R and LHAAP-003-R, and a subsurface removal to depth in the open burn/open detonation (OB/OD) area within LHAAP-001-R (EODT, 2009). Although these removal actions provide an effective solution for reducing risk of exposure by reducing the potential for any direct contact with MEC or material potentially presenting explosive hazard (MPPEH), there is the potential that some MEC remains.

A list of the seven ECP Categories is shown on **Attachment 2**. A detailed description of the property is provided in **Table 1** – Description of Property.

4.0 ENVIRONMENTAL SITES AND INFORMATION

Discussion of the six environmental sites located on the Property is provided in Section 4.1 and the locations are shown on **Figures 3 through 6.** Other environmental information related to the parcels is presented in Sections 4.2 through 4.10.

4.1 Environmental Sites

All six environmental sites on the Property are no further action, long term monitoring (LTM) sites and are suitable for nonresidential use. The environmental sites are described in the following text.

4.1.1 LHAAP-19, Demolition Debris Landfill

LHAAP-19, the Demolition Debris Landfill, is 7.91 acres in size and is located in the southeastern portion of LHAAP within the Demolition Debris Landfill Area Parcel **(Figure 2 and Figure 3)**. The Demolition Debris Landfill is a non-National Priority List (NPL) and IRP site.

The landfill (formerly referred to as LHAAP-26) was evaluated in 1988. A Preliminary Review Unit Checklist, completed in 1988, states that a trench was excavated to receive one week's waste and was covered at the end of each week. The recent operations included the demolition debris from production area buildings that were razed from 1999 to 2006. The materials deposited in this landfill were what is normally classified as Construction and Demolition Debris (C&D) consisting of wood and metal studs, corrugated metal walls and roofs, concrete rubble, steel re-bar, drywall, transite siding, cardboard, Class 2 paper, packing, plastics, foil, wood packaging, wood debris, bricks, cement, and other inert constituents (USACE, 2014). An assessment of soil and groundwater initiated in 2009 (Alamo 1, 2010) to determine if a release had occurred and to support closure of the landfill concluded that the concentrations met the remediation standards for Risk Reduction Standard No 2 based on residential land use with no further action warranted. Historical information on physical site characteristics and closure activities is sourced in the Final Cover Evaluation and Final Landfill Closure Report, Longhorn Army Ammunition Plant, Karnack, Texas (ECC, 2010). There are no buildings, sumps, waste rack sumps, or septic tanks associated with this site

Table 1 contains a description of the landfill processes and the results of investigations conducted at LHAAP-19. The concentrations detected in the environmental media (soil and groundwater) do not exceed the Medium Specific Concentrations (MSCs) for Risk Reduction Standard No. 2 based on residential land use. However, since the construction and demolition wastes were left in place and an

engineering control (i.e., a cap) was required, the landfill closure met the requirements of Risk Reduction Standard Number 3 – Closure/Remediation with Controls. The controls for the closure being the compacted soil cap and topsoil cover (ECC, 2010).

LHAAP-19 was included with LHAAP-56, LHAAP-65, and LHAAP-69 in a no action Decision Document (DD) (USACE, 2014) under CERCLA as a non-NPL environmental site. The TCEQ concurred with the decision that no CERCLA action was necessary. Documentation in the Administrative Record file for LHAAP-19 that supports the NFA decision includes, but is not limited to, RCRA Facility Assessment (RFA) (TWC, 1988), DERPMIS/RMIS Resolution Document (USACE, 1996), Final Cover Evaluation and Landfill Closure Report (ECC, 2010), and other LHAAP-19 related documents. The DD includes limited monitoring in the form of inspections of the landfill cap and any maintenance required to maintain the cap integrity for a period of 5 years. It requires that Army correct, as needed, erosion of cover material, lack of vegetative growth, and subsidence or ponding of water. If any of these problems occur after the end of the five-year post-closure period or persist for longer than the first five years of post-closure care, the owner or operator is responsible for their correction until all problems have been adequately resolved. In accordance with 30 Texas Administrative Code §335.566, a notification has been recorded in Harrison County records stating that the site is suitable for nonresidential use only (USACE, 2014). The notification states that institutional controls are placed on the property to ensure appropriate future use including that the use must remain nonresidential (excludes residential use including, but not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12) and that no activity will be conducted or permitted that would damage the integrity of the landfill cover (i.e. unauthorized digging or disturbing the existing cover or contents of the landfill). These restrictions will be placed in the deed transferring any part of the property out of federal ownership. A copy of notification is available in the Comprehensive land use control (LUC) Management Plan (U.S. Army, 2014). Limited monitoring in the form of Letters of Certification to the State of Texas every five years is required to verify that the use of LHAAP-19 remains consistent with the industrial/recreational exposure scenario and the requirements of the notification.

4.1.2 LHAAP-004-R, Former Pistol Range

The Former Pistol Range is a NPL and MMRP site, LHAAP-004-R. It is a 0.3879-acre former pistol range located in the Pistol Range Area Parcel (**Figure 2 and Figure 4**). The range was officially closed in 2009 and later designated a MMRP site.

Table 1 contains a detailed description of the Former Pistol Range activities and the results of investigations conducted at the Former Pistol Range. A 1995 preliminary site investigation revealed the presence of lead fragments in the target area. In 2006, additional sampling of the range took place. The results identified areas where the surface and near surface soil was contaminated with lead levels that exceeded the TCEQ MSC for industrial use. A non-time critical removal action was completed and the IRA became the final remedial action. Because the risk evaluation was based on reasonably anticipated future use as a wildlife refuge, lead remained in the soil at the site above levels that allow for unlimited use and unrestricted exposure.

LHAAP-004-R was the subject of a no further action (NFA) Record of Decision (Shaw, 2010). This document was issued by the Army, the lead agency for this installation and co-signed by USEPA. TCEQ concurred with the selected no further action decision. The recommendation for no further action is consistent with the criteria required under CERCLA. Documentation in the Administrative Record files for LHAAP-004-R that supports the NFA decision includes, but is not limited to, remedial investigation (RI) (Shaw, 2006), installation-wide baseline ecological risk assessment (BERA) report (Shaw, 2007), engineering evaluation cost analysis (EECA) (Shaw, 2009), action memorandum (Shaw, 2009a), completion report (Shaw, 2010), proposed plan (Shaw, 2010a) and other LHAAP-004-R related documents. The NFA ROD requires five-year reviews to ensure protection of human health and the environment under CERCLA 121(c), 42 U.S.C. 9621(c). In accordance with 30 Texas Administrative

Code §335.566, a notification was recorded in Harrison County records stating that the site is suitable for nonresidential use only (where residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12). A copy of the notification can be found in the Comprehensive LUC Management Plan (U.S. Army, 2014). The site is in the LTM phase which includes Five-Year Review reports in the form of a letter stating the use of the site remains non-residential. LTM is expected to continue indefinitely.

4.1.3 LHAAP-27, South Test Area/Bomb Test Area

LHAAP-27, the South Test Area/Bomb Test Area, is in the southern portion of LHAAP (**Figure 2** and **Figure 5).** LHAAP-27 is a NPL and IRP site and is co-located with a MMRP site, LHAAP-001-R. MEC was not addressed under LHAAP-27, nor were perchlorate and WP.

Table 1 contains a detailed description of the South Test/Bomb Area activities and the results of investigations conducted at LHAAP-27, the South Test/Bomb Area.

Based on an analysis of site data and criteria for performing a risk analysis based on a future industrial land use, it was concluded that the conditions at the site do not pose an unacceptable risk to human health. A screening-level ecological assessment concluded that little or no ecological concerns are associated with Site 27 and that further ecological evaluations and remediation were unwarranted. No further action for soil and groundwater was recommended.

LHAAP-27 (South Test Area/Bomb Test Area) was the subject of a no further action (NFA) Record of Decision (U.S. Army, 1998). This document was issued by the Army, the lead agency for the installation and co-signed by USEPA. TCEQ concurred with the selected no further action decision. The recommendation for no further action is consistent with the criteria required under CERCLA. Documentation in the Administrative Record files for LHAAP-27, South Test Area/Bomb Test Area that supports the NFA decision includes, but is not limited to, remedial investigation (RI) (U.S. Army, 1997a), baseline risk assessment (U.S. Army, 1997b), Proposed Plan (U.S. Army, 1997c) and other LHAAP-27 related documents. However perchlorate was identified as an emerging contaminant and perchlorate data for environmental media was collected after the 1998 NFA ROD was signed (SHAW, Aug 2016).

4.1.4 LHAAP-54, Ground Signal Test Area

LHAAP-54 is in the southern portion of LHAAP (**Figure 2** and **Figure 6)**. It is a NPL and IRP site and is co-located with a MMRP site, LHAAP-003-R. MEC was not addressed under LHAAP-54, nor were WP and perchlorate.

Table 1 contains a detailed description of the Ground Signal Test Area activities and the results of investigations conducted at LHAAP-54, the Ground Signal Test Area. Based on an analysis of site data and criteria for performing a risk analysis based on a future industrial land use, it was concluded that the conditions at the site do not pose an unacceptable risk to human health. A screening-level ecological assessment concluded that little or no ecological concerns are associated with LHAAP-54 and that further ecological evaluations and remediation are unwarranted. No further action for soil and groundwater was recommended.

LHAAP-54 was the subject of a no further action (NFA) Record of Decision (U.S. Army, 1998). This document was issued by the Army, the lead agency for this installation and co-signed by USEPA. TCEQ concurred with the selected no further action decision. The recommendation for no further action is consistent with the criteria required under CERCLA. Documentation in the Administrative Record files for LHAAP-54, Ground Signal Test Area that supports the NFA decision includes, but is not limited to, remedial investigation (RI) (U.S. Army, 1997a), baseline risk assessment (U.S. Army, 1997b), Proposed Plan (U.S. Army, 1997c) and other LHAAP-54 related documents. However perchlorate was identified as an emerging contaminant and perchlorate data for environmental media was collected after the 1998 NFA ROD was signed (SHAW, Aug 2016).

4.1.5 LHAAP-001-R, South Test Area/Bomb Test Area

LHAAP-001-R, the South Test Area/Bomb Test Area, is located within the 79.53 acre South Test/Bomb Test Area Parcel (**Figure 2** and **Figure 5).** LHAAP-001-R is a NPL and MMRP site and is co-located with IRP site, LHAAP-27. The South Test Area/Bomb Test Area was designated a MMRP site because of the photoflash bomb testing and photoflash cartridge detonation activities conducted at the site. From 2002 to 2007, investigations related to the MMRP were conducted at LHAAP to determine the presence or absence of MEC, and to address the identified data gaps including WP and perchlorate.

In the early 1980s, approximately 52,000 one- and two-pound photoflash cartridges were destroyed in a 500-square foot area situated about 300 feet east of the observation building. The South Test Area was last used in the 1980s (U.S. Army, 1998). **Table 1** contains a description of the South Test Area/Bomb Test Area activities and the results of investigations conducted at LHAAP-001-R.

In 2005, an SI (e^2M, 2005) confirmed the presence of MEC at the South Test/Bomb Test Area. MEC items were also found at LHAAP-001-R during the EE/CA investigations (CAPE, 2007) resulting in an action memorandum for a non-time critical removal action. Environmental sampling results at LHAAP-001-R indicate that there is no risk to human health and safety from perchlorate or WP. Subsequently, MEC items were located and removed during surface removals over the entire area of LHAAP-001-R and a subsurface removal to depth in the open burn/open detonation (OB/OD) area within LHAAP-001-R (EODT, 2009). Although these removal actions provide an effective solution for reducing risk of exposure by reducing the potential for any direct contact with MEC or material potentially presenting explosive hazard (MPPEH), there is the potential that some MEC remains. Therefore, the site is not suitable for unrestricted use. The Action Memorandum also required LUCs for the sites including 1) restrictions against intrusive activities include digging, 2) restriction to nonresidential use only, 3) warning signage at the perimeter of the site, and, 4) education programs pamphlets and a videos) for future refuge visitors, staff, and volunteers (EODT, 2009).

LHAAP-001-R was included with LHAAP-003-R in a Record of Decision Document that presents the basis for the decision for LUCs and limited groundwater monitoring (Shaw, 2016). This document was issued by the Army, the lead agency for this installation and co-signed by USEPA. TCEQ concurred with the decision. Documentation in the Administrative Record file for LHAAP-001-R, South Test Area/Bomb Test Area, that support the decision include, but is not limited to, site inspection report (E2M, 2005), EE/CA (Cape, 2007), action memorandum (U.S. Army, 2007), the munitions constituents data summary report (Shaw, 2011), the munitions and explosives of concern (MEC) removal action report (EODT, 2009), the installation-wide baseline ecological risk assessment (BERA) report (Shaw, 2007), the proposed plan (U.S. Army, 2011), and other LHAAP-001-R related documents.

Environmental sampling results at LHAAP-001-R indicate that there is no risk to human health and safety from perchlorate or WP. Limited groundwater monitoring is intended to confirm perchlorate levels in groundwater are below the PCL to verify protection of human health and the environment. Two rounds of groundwater sampling have been completed with no exceedances of the 17 micrograms per liter (µg/L) Protective Concentration Limit (PCL) for perchlorate. If, after three rounds of groundwater sampling at LHAAP-001-R, the results that are evaluated on or before the first five year review indicate detections at levels below the PCL, groundwater monitoring will cease and the wells will be plugged and abandoned.

The LUCs implemented at the site include restriction against intrusive activities, including digging; signage at perimeters of MRSs with a maximum spacing of 100 feet which serve as the physical demarcation of the controlled areas; and an education program which includes informational safety pamphlets and a 5 minute safety video warning of the potential presence of UXO; and presenting examples of MEC that was or may be found at the sites (EODT, 2009). LUCs were designed and constructed to promote ongoing protection of human safety against potential explosive hazards that may remain at the MMRP sites by prohibiting the development and use of the property for residential housing,

elementary and secondary schools, and child care facilities and playgrounds, and to prohibit intrusive activities such as digging or any other activity which could result in explosive safety risks (Shaw, 2016). Intrusive subsurface activities may occur however, provided that the Army and the EPA approve such intrusive subsurface activities before they are commenced and provided that they are undertaken by qualified personnel who are trained in explosives safety measures (Shaw, 2016). The limited groundwater monitoring will confirm that the levels of perchlorate in groundwater are protective of human health. The LUC to prohibit intrusive subsurface activities, including digging, will remain in place until it is demonstrated that the MEC no longer present an explosive hazard, and the LUC restricting land use to nonresidential will remain in place until it is demonstrated that the MEC no longer presents a threat to public/human safety (Shaw, 2016).

It is expected that LTM will continue indefinitely and will include LUC maintenance and Five-Year Reviews (CIP, 2017). Monitoring in the form of Five-Year Reviews will be conducted to ensure that the LUCs are specified, implemented, monitored, reported on, and enforced in an efficient, cost effective manner that ensures long-term protectiveness under CERCLA 121(c), 42 U.S.C. 9621(c). In accordance with 30 Texas Administrative Code §335.566, a notification was recorded in Harrison County records identifying the LUCs for LHAAP-001-R, a copy of which was included in the Comprehensive LUC Management Plan (U.S. Army, 2018).

4.1.6 LHAAP-003-R, Ground Signal Test Area

LHAAP-003-R, the Ground Signal Test Area, is located in the southeastern portion of LHAAP, south of the Demolition Debris Landfill **(Figure 2 and Figure 6)**. LHAAP-003-R is a NPL and MMRP site and is co-located with IRP site, LHAAP-54. The Ground Signal Test Area was designated a MMRP site because of the testing and destruction of various munitions items and burn-out of rocket motors conducted at the site. From 2002 to 2007, investigations related to the MMRP were conducted at LHAAP. Investigations were conducted to determine the presence or absence of MEC, and to address the identified data gaps including WP and perchlorate.

The Ground Signal Test Area was used intermittently starting in 1963 for aerial and on-ground testing and destruction of a variety of devices, including pyrotechnic signal devices, red phosphorus smoke wedges, infrared flares, illuminating mortar shells and cartridges, button bombs, and various types of explosives simulators (e2M, 2005). The site was also used intermittently over a 20-year period for testing and burn-out of rocket motors. From late 1988 through 1991, the site was also used for burn-out of Pershing missile rocket motors. Occasionally, leaking WP munitions were burned at the site as a demilitarization activity. Large cultural debris (CD) such as concrete foundations, metal fence posts, power poles, and sandbag structures were visually inspected during the MEC Removal Action to ensure no MEC/MPPEH/MD were present, but the CD was left in place (EODT, 2009). There are no sumps, waste rack sumps, or septic tanks associated with this site.

Table 1 contains a description of the Ground Signal Test Area activities and the results of investigations conducted at LHAAP-003-R. From 2002 to 2007, investigations related to the MMRP were conducted at LHAAP. Investigations were conducted to determine the presence or absence of Munitions and Explosives of Concern (MEC), and to address the identified data gaps including WP and perchlorate. MEC items were found at LHAAP-003-R during the EE/CA investigations (CAPE, 2007). Subsequently, MEC items were located and removed during surface removals over the entire area of LHAAP-003-R (EODT, 2009). Although these removal actions provide an effective solution for reducing risk of exposure by reducing the potential for any direct contact with MEC or material potentially presenting explosive hazard (MPPEH), there is the potential that some MEC remains. Therefore, the site is not suitable for unrestricted use. LUCs for LHAAP-003-R promote ongoing protection of human safety against potential explosive hazards that may have remained at the site after the 2008 removal action. The LUCs are: 1) restrictions against intrusive activities include digging, 2) restriction to nonresidential use

only, 3) warning signage at the perimeter of the site, and, 4) education programs for future refuge visitors, staff, and volunteers (EODT, 2009).

LHAAP-003-R was included with LHAAP-001-R in a Record of Decision Document that presents the basis for the decision for LUCs and limited groundwater monitoring (Shaw, 2016). This document was issued by the Army, the lead agency for this installation and co-signed by USEPA. TCEQ concurred with the decision. Documentation in the Administrative Record file for LHAAP-003-R, Ground Signal Test Area, that support the decision include, but is not limited to, site inspection report (E2M, 2005), EE/CA (Cape, 2007), action memorandum (U.S. Army, 2007), the munitions constituents data summary report (Shaw, 2011), the munitions and explosives of concern (MEC) removal action report (EODT, 2009), the installation-wide baseline ecological risk assessment (BERA) report (Shaw, 2007), the proposed plan (U.S. Army, 2011), and other LHAAP-003-R related documents.

Environmental sampling results at LHAAP-003-R indicate that there is no risk to human health and safety from perchlorate or WP. Historical and recent (September 2016) analytical results for perchlorate in shallow groundwater at LHAAP-003-R indicate perchlorate does not pose an unacceptable risk to human health and the environment. Therefore, groundwater monitoring at LHAAP-003-R has ceased and the wells will be plugged and abandoned. Five-Year Reviews will be conducted to ensure that the LUCs ensure long-term protectiveness (Shaw, 2016).

Monitoring in the form of Five-Year Reviews will be conducted to ensure that the LUCs are specified, implemented, monitored, reported on, and enforced in an efficient, cost effective manner that ensures long-term protectiveness under CERCLA 121(c), 42 U.S.C. 9621(c). In accordance with 30 Texas Administrative Code §335.566, a notification has been recorded in Harrison County records identifying the LUCs for LHAAP-001-R, a copy of which will be included in the Comprehensive LUC Management Plan (U.S. Army, 2018).

4.2 Storage, Release, or Disposal of Hazardous Substances

The storage, release, or disposal of hazardous substances is recorded in **Table 2**. **Table 2** contains a detailed list (by parcel) of the storage, release, or disposal of hazardous substances, including the product name, approximate date, quantity and remedial action, if required. Details of these releases are to be found in **Tables 1 and 2**.

Lead was detected in the surface soil at the Former Pistol Range above the soil Medium-Specific Concentration (MSC) for industrial use based on inhalation, ingestion, and dermal contact (CES, 2004). A non-time critical removal action was implemented at the Former Pistol Range in 2009. Soil with lead concentrations exceeding 1,000 milligrams per kilogram (mg/kg) was excavated and disposed of off-site (Shaw, 2010). LHAAP-004-R now does not have contaminated soils requiring remediation nor does the underlying groundwater contain contamination requiring remediation measures based on conclusions from the Final Engineering Evaluation/Cost Analysis (EECA) (Shaw, 2009).

During the 2007 EE/CA twenty-one (21) MEC and MPPEH items along with 700 pounds of munitions debris (MD) were recovered at the surface or within the top 6 inches of the soil at LHAAP-001-R, the South Test/South Bomb Area; and fourteen (14) MEC and MPPEH items along with 513 pounds of MD were recovered from LHAAP-003-R, the Signal Test Area (EODT, 2009).

During the 2008 MEC non-time-critical removal action at LHAAP-001-R, a total of 90 MEC/MPPEH items were located and destroyed during the course of surface clearance at LHAAP-001-R. Twelve MEC/MPPEH items and one inert item located and destroyed during the surface clearance at LHAAP-003-R, the South Test/South Bomb Area, during the course of the surface clearance.

A total of 294 MEC/MPPEH items and 14 inert items were located, excavated, and removed during the course of subsurface clearance at LHAAP-001-R. Soil sample analytical results indicated that neither WP nor explosives were identified at concentrations above detection limits in any soil samples at the site. In addition, there was no indication of the presence of explosives in any of the pre- or post-detonation samples at either LHAAP-001-R or LHAAP-003-R (Shaw, 2016).

The intrusive clearance for the OB/OD area within the South Test/Bomb Area investigated and explosively investigated 294 MEC/MPPEH items and 14 inert items.

Table 2 details chemicals stored, released or disposed at each parcel.

4.3 Petroleum and Petroleum Products

4.3.1 Underground and Above-Ground Storage Tanks (UST/AST)

There are no underground and/or aboveground petroleum storage tanks (UST/AST) on the Property. There is no evidence of petroleum releases from these sites.

Current UST/AST Sites -There are no underground and/or aboveground petroleum storage tanks (UST/AST) remaining on the Property. There is no evidence of petroleum releases from these sites.

Former UST/AST Sites - There is no evidence that non-UST/AST petroleum products in excess of 55 gallons were stored for one year or more on the Property.

4.3.2 Non-UST/AST Storage, Release, or Disposal of Petroleum Products

There is no evidence that non-UST/AST petroleum products in excess of 55 gallons were stored for one year or more on the Property.

4.4 Polychlorinated Biphenyls

There is no evidence of a PCB release from these sites.

4.5 Asbestos

There are no structures on the Pistol Range Area Parcel and the Demolition Debris Landfill Parcel and there is no evidence that Asbestos Containing Material (ACM) was used or stored there. No buildings remain on the Signal Test Area and South Test/Bomb Area Parcels.

In 1999, the Army contracted the demolition of specified structurally unsafe buildings. In 2003, the demolition of all remaining buildings began, and all planned demolition has taken place.
ACM was removed from the buildings prior to demolition of structurally unsafe structures down to the concrete foundation (EFI, May 2004). The ACM abated by EFI (2004) included transite siding and roofing (interior & exterior) panels, ceiling tile, vinyl sheet flooring, floor tile/ mastic, thermal system insulation (piping & equipment), and roofing components from Building IST-2 at the South Test Area and from building TS-62 at the Ground Signal Test Area. Friable ACM was properly disposed off-site, while the non-friable ACM was disposed in the Demolition Debris Landfill (EFI, 2004).

The LHAAP-19 Demolition Debris Landfill was permitted by rule to receive non-friable asbestos and other demolition debris. Based on this information and certification by the owner, this landfill is classified as Non-Hazardous Class 2 (ETTL, 2010). A summary of the asbestos abatement for the buildings in the EFI (2004) abatement document is presented in **Table 3**.

4.6 Lead-Based Paint

There were not and are not now structures on the Pistol Range Area Parcel and the Demolition Debris Landfill Parcel, and there is no evidence that lead-based paint or sources were used or stored on the

Property.

The Signal Test Area Parcel and the South Test/Bomb Area buildings have been demolished. Some paint may remain on the surfaces of any remaining slabs or monolithic concrete walls and concrete roofs of structures remaining on the Property. Therefore, all remaining painted surfaces should be presumed to contain one or more coats of lead-based paint (LBP) until tested and determined otherwise. None of the buildings on the Property were sampled and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) for lead during the ACM abatement conducted by EFI in 2004.

In accordance with the Residential Lead-Based Paint Reduction Act of 1992, the Army does not intend to abate the LBP presumed to be present on these structures because they are not intended to be used as residences. No sampling related to LBP in soil has occurred on the property. In conformance with DoD policy, the subject property is to be transferred "as is" regarding any LBP contained in buildings and associated structures. The appropriate LBP notice and covenant for inclusion into the transfer letter is provided in the Environmental Protection Provisions (**Attachment 3**).

4.7 Radiological Materials

There is no evidence that radioactive material or sources were stored on the Property.

4.8 Radon

The USEPA assigned Harrison County as a Radon Zone 3 county as it is within an area identified as a low potential for radon. Zone 3 indicates the average short-term radon measurement is expected to be less than 2 pCi/L in a building without the implementation of radon control methods. Although LHAAP is within a county with a predicted low radon potential, radon surveys were conducted at LHAAP for verification. Fifty representative buildings located installation-wide were surveyed between 1991 and 1992. Radon was not detected at or above the USEPA residential action level of 4 picocuries per liter (pCi/L) in these buildings.

4.9 Munitions and Explosives of Concern (MEC)

MEC, which distinguishes categories of military munitions that may pose unique explosives safety risks, means: (A) unexploded ordinance (UXO), as defined in 10 U.S.C. §101(e)(5); (B) discarded military munitions (DMM), as defined in 10 U.S.C. §2710(E)(2); or (C) munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard. Three Munitions Response sites (MRSs) are located on the Property. MEC were found at two of them, LHAAP-001-R located in the South Test/Bomb Area Parcel and LHAAP-003-R located in the Signal Test Area Parcel. MEC clearance and removal activities were conducted. LUCs considered necessary to protect the public health and safety from explosive hazards that may have remained at the sites after the 2008 removal action were included in the ROD. No MEC were identified or recovered at the third MRS, LHAAP-004-R which underwent a removal action for lead-contaminated soil.
The letter of transfer will contain the notice for the potential presence of MEC and the LUCs at LHAAP-001-R and LHAAP-003-R provided in the Environmental Protection Provisions **(Attachment 3).**

4.10 Other Property Concerns

There are no other hazardous conditions on the Property that present an unacceptable risk to human health and the environment.

5.0 ADJACENT PROPERTY CONDITIONS

With the exception of the north boundary of the Demolition Debris Landfill Area, the Demolition Debris Landfill Area, Pistol Range Area, South Test /Bomb Area, and the Ground Signal Test Area

Parcels are completely surrounded by property previously transferred to the USFWS (**Table 4**). There are no hazardous conditions adjacent to these sites that present an unacceptable risk to human health and the environment.

6.0 ENVIRONMENTAL REMEDIATION AGREEMENTS

The LHAAP Federal Facility Agreement (FFA), effective as of December 30, 1991, by and between the LHAAP, the Texas Water Commission (currently known as the TCEQ), and the USEPA Region 6 applies to the Property, except the Demolition Debris Landfill Area Parcel which is not part of the NPL listing. No further investigation or remedial action is required for the Property proposed for transfer. The Letter of Transfer will include a provision reserving the Army's right to conduct remediation activities, if necessary, in the future.

7.0 GROUNDWATER MONITORING WELLS

The property proposed for transfer contains 12 monitoring wells as shown on **Figures 5 and 6.** A list of monitoring wells including survey information is provided in **Table 5.** The letter of transfer will include the groundwater monitoring well notice and covenant provided in the Environmental Protection Provisions **(Attachment 3)**.

8.0 POTENTIAL WETLANDS

Although an official wetland survey has not been conducted, an unofficial wetland delineation obtained from the USFWS National Wetlands Inventory (USFWS, 2016) indicates there may potentially be wetlands on some of the parcels. There have been no requests to exercise jurisdiction over potential wetlands (i.e. for redevelopment of the property) on the property and therefore there has been no official wetland survey conducted by the U.S. Army Corps of Engineers.

9.0 ENDANGERED OR THREATENED SPECIES

No federally endangered species have been confirmed on the Property proposed for transfer. Following is a list of federally threatened species that are known or suspected to occur in the vicinity of LHAAP (species that have been confirmed are listed in *italics*);

Federal Listed Threatened Species:
None.

Following is a list of State threatened species that are known or suspected to occur in the vicinity of LHAAP. Two State endangered species (in *italics*) have been confirmed on Longhorn and are potentially present on the Property proposed for transfer:

State Listed Threatened Species:

Louisiana Black Bear
Bald Eagle
Rafinesque Big-Eared Bat
Alligator Snapping Turtle
Timber Rattlesnake
Bluehead Shiner

Some evidence is available regarding presence of the Timber Rattlesnake at Longhorn. This State-listed species is described in historical site documents as being confirmed present on the site on a visual observation documented in 1993. Wildlife experts familiar with the site have indicated that potential habitat suitable for the Timber Rattlesnake is present on the LHAAP site and LHAAP is within this species' historical range. However, there is no recent documented evidence of this species being present on site and it has not been observed by USFWS wildlife personnel stationed at the installation. It is

assumed that the Timber Rattlesnake is potentially present (Shaw, 2007c).

10.0 HISTORICAL, CULTURAL, AND ARCHEOLOGICAL PROPERTIES

The Property is located in an eroded upland zone and contains the most varied environment of the zones within the plant confines. According to Peter & Styles-Hanson, (1990), there is a potential for finding evidence of prehistoric occupation, primarily campsites, along the higher elevations (200 ft amsl) adjacent to the main stream channels and along the shore of Caddo Lake. The potential for finding other similar localities in this area is high. Cultural resources at LHAAP are federally regulated under the National Historic Preservation Act, Archaeological Resources Protection Act, and the Native American graves Protection and Repatriation Act.

The Property does not contain any buildings that are eligible for inclusion in the National Register of Historic Places (NRHP).

10.1 Archeological Resources

The former Pistol Range (LHAAP-004-R) falls into an "undetermined" category for archaeological significance, justifying protection pending further investigation. Archaeological Site 41HS240, located within MU 36, is situated adjacent to the Former Pistol Range (USACE, March 1995). The Pistol Range is contained within a very small area, however clearing from the road south and from the upland bluff west has destroyed much of the pristine environment (Peter & Styles-Hanson, 1990). Site 41HS240, also referred to as the Harrison Bayou Site, is a prehistoric campsite recognized as a significant cultural property which yielded Late Pleistocene – Early Holocene period artifacts which contributed to the development of the Caddo Complex concept and the definition of the Bossier focus. However, Site 41HS240 has been impacted by a fire lane, Plant activities, and uncontrolled artifact collection lending to the present potential of the site for low NRHP eligibility, unless the role of the site in the development of archeological constructs for the region is considered (Peter & Styles-Hanson, 1990).

The Ground Signal Test Area (LHAAP-003-R) contains one historic archeologic site and two archival sites (Peter & Styles-Hanson, 1990). The two archival sites plotted as dwellings on the 1913 soil survey map for Harrison County are considered late 19th to early 20th century farmsteads that were severely disturbed by installation activities since 1942 (Peter & Styles-Hanson, 1990). The two archival sites are regarded as lacking contextual integrity and therefore are considered ineligible for nomination to the NRHP (Peter & Styles-Hanson, 1990).

The South Test Area/Bomb Test Area (LHAAP-27/-001-R) was cleared and subsequent testing activities have probably disturbed most of the potential archeological matrix (A-horizon) within this area (Peter & Styles-Hanson, 1990).

There are no archeological sites within LHAAP-19, the Demolition Debris Landfill.

10.2 Native American Graves Protection and Repatriation Act (NAGPRA)

Public Law (P.L.) 1010-601 (NAGPRA) requires that federal agencies engage in active consultation with Native Americans with federally recognized tribes and/or lineal descendants who may be culturally affiliated with the archaeological collections from the installation.

The Caddo, a federally recognized Native American tribe, exclusively inhabited the area occupied by the LHAAP (USACE, 1995). Archeological investigations on lands occupied by the LHAAP started in 1935 (USACE, 1995). No human skeletal remains, funerary objects, sacred objects or objects of cultural patrimony were identified in the archeological records of investigations conducted after the Army took possession of the land in 1941 (USACE, 1995). The contents of the collections prior to that time are unknown (USACE, 1995).

11.0 REGULATORY COORDINATION

LHAAP-27 and -54 and LHAAP-004-R (U.S. Army, 1998; Shaw, 2010) were included in No Further Action Decision documents. LHAAP-001-R and LHAAP-3-R, MMRP sites, were included in a ROD with LUCs and limited groundwater monitoring (Shaw, August, 2016. These documents were issued by the Army, the lead agency for this installation and were co-signed by USEPA with TCEQ concurring. USEPA Region 6 and the Texas Commission on Environmental Quality (TCEQ) are the regulatory agencies providing technical support, project review and comment, and oversight of the Army cleanup programs. In accordance with the LUC RDs for LHAAP-001-R and LHAAP-003-R, the USEPA Region 6 and TCEQ have been provided a copy of this ECP VII for regulatory review of all LUC-related provisions. Copies have also been provided to the USFWS and the Restoration Advisory Board for information.

LHAAP-19, (USACE, 2014) was included in No Further Action Decision document which was issued by the Army and concurred by TCEQ. The recommendation for no further action is consistent with the criteria required under CERCLA. No CERCLA remedial action is necessary for LHAAP-19, a Type IV (C&D) landfill, which was closed in 2010 (ECC, 2010) in accordance with 30 Texas Administrative Code (TAC) §335.566 and more specifically the requirements of 30 TAC §330.463(a).

12.0 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

The environmental impacts associated with the proposed transfer of the Property have been analyzed in accordance with the National Environmental Policy Act. The results of this analysis have been documented in the Categorical Exclusion and Record of Environmental Consideration (U.S. Army, 2018) which is supported by the Final Environmental Baseline Survey (Sverdrup, 1998). Other than notification of the archaeological sites (41HS240) adjacent to the Pistol Range and the Ground Signal Test Area, there were no encumbrances or conditions identified in the NEPA analysis as necessary to protect human health or the environment.

13.0 ENVIRONMENTAL PROTECTION PROVISIONS

On the basis of the above results from the five Decision Documents for the environmental sites that comprise most of the Property and the Environmental Baseline Survey as well as other environmental studies, and in consideration of the intended use of the Property as a wildlife refuge under the Administration of the U. S. Fish & Wildlife Service, certain terms and conditions are required for the proposed transfer. These terms and conditions will be set forth in the Environmental Protection Provisions **(Attachment 3)** and will be included in the Letter of Transfer. In the event that the Property or any part thereof, is sold, conveyed, transferred, leased, or otherwise disposed of, the notices, covenants, and restrictions contained in the Environmental Protection Provisions **(Attachment 3)** shall be inserted in any instrument of conveyance.

14.0 CONCLUSIONS

Based on the above, the Property is determined to be suitable for transfer to the U. S. Fish & Wildlife Service for nonresidential use.

John Tesner,
DASA-ESOH (Acting)
United States Army

Tables

TABLE 1 – DESCRIPTION OF PROPERTY
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Parcel	Property Description	ECP Category	Remedial Actions
Demolition Debris Landfill Area	**Demolition Debris Landfill Area** is a 13.03 acre tract of land which is the site of a 7.91-acre permit-by-rule landfill. Haystack Road, an unimproved dirt road, runs north-south along the west boundary of the parcel (Figures 2 and 3). The north end of the parcel is forested and the southern end abuts the Signal Test Area. The Demolition Debris Landfill is also referred to as the C&D Landfill and was formerly referred to as LHAAP-26 The landfill was active at the time of the 1988 RFA and the design features included a 400 x 800 ft fenced area of which 400 x 100 ft was in use. The maximum depth of the landfill is thought to be less than 15 feet below the ground surface. The landfill contained demolition and construction debris and (inert) empty paint cans. It was operated as a trench and cover landfill with trenches sized large enough to receive 1 week's waste and covered at the end of each week. Rainwater was noted as collecting in the trench and required periodic pumping. At the time of the 1988 RFA, landfill controls and leachate collection devices were not used. Although a Visual site inspection was recommended, no further RFA action was recommended. The final cover system consists of 18 inches of compacted soil cover overlaid with topsoil capable of sustaining plant growth. As a part of the final closure of this facility, three (3) groundwater monitoring wells installed during the field investigation were removed and plugged in accordance with State of Texas requirements.	4	**LHAAP-19, Demolition Debris Landfill**, is located within the Demolition Debris Landfill Area parcel (**Figure 3**). LHAAP-19 covers most of the transfer parcel. The C&D landfill was sporadically active from 1985 until closure activities in 2009. It was permitted by rule to receive non-friable asbestos and other demolition debris. The Demolition Debris Landfill closure activities began in 2009 with a closure assessment (Alamo 1, 2010). A total of ten (10) borings were drilled immediately adjacent to, but outside of, the known footprint of the landfill. Seven (7) soil borings were drilled to a depth of 15 feet bgs. Three borings (B2, B5, and B9) were drilled to 30 feet bgs. Twenty-two soil samples were analyzed for TAL Metals, VOCs and S-VOCs analyses. Twenty-one soil samples were analyzed for explosive and perchlorate analyses. The depths to water, measured in the monitoring wells in September 2009, ranged from 22.83 (MW2) to 28.34 (MW3) feet bgs. Based on these measurements, the groundwater appears to be unconfined and the groundwater flow direction is northeast. VOCs, perchlorate, and explosives were not detected in any of the soil or groundwater samples collected at the site. The concentrations detected in the environmental media (soil and ground water) do not exceed the MSCs for Risk Reduction Standard No. 2 based on residential land use. No further action for soil and groundwater was recommended. Contaminant concentrations in soil and groundwater adjacent to the landfill meet standards for residential land use purposes. A Final Cover Evaluation and Landfill Closure Report was completed in 2010 (ECC, 2010). The Closure Report documents that the landfill is classified as Non-Hazardous Class 2, however, since the construction and demolition wastes were left in place and an engineering control (i.e., a cap) was required, the landfill closure met the requirements of Risk Reduction Standard Number 3 – Closure/Remediation with Controls. The controls for the closure being the compacted soil cap and topsoil cover (ECC, 2010. In 2009 the soil cover was constructed in parallel or monolithic lifts. An Ingersoll-Rand Pad Foot compressor was used to compact each layer to a minimum of 95% of the maximum Proctor density with soil cover thickness of 18 inches. Based on the observations made during the testing and evaluation of the final cover system, and reviewing the test results; the cover system meets or exceeds the requirements of 30 TAC 335.8 for Risk Reduction Standard 3 and the landfill closure plan (ECC, 2010). A no further action Decision Document (DD) was signed by the Army (USACE, 2014) with TCEQ concurring that no CERCLA action was necessary. The DD includes any maintenance required to maintain the cap integrity for a period of 5 years. It requires that Army correct, as needed, erosion of cover material, lack of vegetative growth, and subsidence or ponding of water. If any of these problems occur after the end of the five-year post-closure period or persist for longer than the first five years of post-closure care, the owner or operator is responsible for their correction until all problems have been adequately resolved. In accordance with the DD and 30 Texas Administrative Code §335.566, a notification has been recorded in Harrison County records stating that the site is suitable for nonresidential use only. The notification states that institutional controls are placed on the property to ensure appropriate future use including that the use must remain nonresidential (excludes residential use including, but not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12) and that no activity will be conducted or permitted that would damage the integrity of the landfill cover (i.e. unauthorized digging or disturbing the existing cover or contents of the landfill). A copy of notification is available in the Comprehensive land use control (LUC) Management Plan (U.S. Army, 2014). Limited monitoring in the form of Letters of Certification to the State of Texas every five years is required to verify that the use of LHAAP-19 remains consistent with the industrial/recreational exposure scenario and the requirements of the notification.

Parcel	Property Description	ECP Category	Remedial Actions
Pistol Range Area	The Pistol Range Area Parcel is comprised of 1.10 acres and is located in the southeastern portion of LHAAP, approximately 280 feet south of Avenue Q at the end of Robert Avenue **(Figure 2** and **Figure 4).** Most of the parcel is a cleared, grassy area, but is forested as it approaches Harrison Bayou, along the western boundary. This site is surrounded by acreage already transferred by the Army to USFWS. The parcel is the site of a 0.3879-acre Military Munitions Response Program (MMRP) site, the Former Pistol Range, LHAAP-004-R. LHAAP-004-R, the Former Pistol Range, is a rectangular field approximately 110 feet north to south by 150 feet east to west located in the eastern portion of the parcel. The Range was established in the 1950s and was used intermittently through 2004 (Shaw, 2009). It was used by LHAAP security personnel for small arms target practice and qualifying tests. . The western end of the range slopes gently upward, increasing approximately 10 feet at the eastern end. This slope constituted the target portion of the Pistol Range. The flat portion of the site is covered by grass while the eastern slope (the target embankment) is forested. (USACE 1998).	4	**LHAAP-004-R, Former Pistol Range**, is located within the Pistol Range Area parcel (**Figure 4**). The Pistol Range was first investigated in 1995 when soil samples were collected from the target embankment and were subjected to the toxicity characteristic leaching procedure (TCLP). The leachate was analyzed for lead. Results of the analysis indicated that lead contamination was limited to the surface where lead bullets were located. In addition, results indicated that soil, if excavated from the target embankment, would likely be hazardous if the soil contained lead fragments (Thiokol, 1995 and CES, 2004). These investigations showed that lead contamination in surface and near surface soil was the only environmental concern at the site. A non-time critical removal action was implemented in 2009 to address a potential threat to public health through exposure to high levels of lead in soil. The potential threat was eliminated through soil removal. Soil with lead concentrations exceeding 1,000 milligrams per kilograms (mg/kg) was excavated and disposed of off-site. In 2006, 88 soil samples from 52 locations in a grid pattern were collected and field screened. The grid extended outside the site to ensure that the extent of contamination was fully delineated. Three of the soil samples were collected within the ditch that runs south of the site. Samples were screened with x-ray fluorescence for lead, copper, arsenic, nickel and zinc. Except for lead, all the other metals were detected in the soil at concentrations that were below their respective SAI-Ind (TCEQ, 2006). Lead exceeded the soil medium specific concentration for industrial use with a maximum concentration of 5,240 mg/kg. Lead concentrations exceeding the SAI-Ind value of 1,000 mg/kg were found at three locations at and near the target embankment at the eastern end of the former Pistol Range. Three of nine soil samples that exhibited the highest lead concentration exceeded the TCLP limit for lead. In 2007, vertical delineation soil samples were collected in the vicinity of the highest surface soil lead concentrations and a monitoring well screened in the shallow groundwater zone was installed. Lead contamination did not exceed the SAI-Ind value in any sample deeper than 12 inches. Groundwater samples were collected twice from the newly installed monitoring well. Total lead was detected in the first sample at a concentration of 17.2 (µg/L), exceeding the Groundwater MSC for Industrial Use (GW-Ind) value of 15 µg/L, but was determined to be associated with high sample turbidity. Dissolved lead was well below the GW-Ind. Confirmation samples for total and dissolved lead were at 5.41 and 0.5 µg/L, respectively, and were well below the GW-Ind value. The investigations showed that there had been no impact to groundwater, but identified areas where the soil was contaminated with lead at levels that exceeded the SAI-Ind under 30 TAC §335.558(d). In 2009, an EE/CA concluded surface and near-surface soil at and near portions of the target embankment were contaminated with lead at levels exceeding the SAI-Ind. • Sediment, surface water, and groundwater had not been adversely impacted. • Vertical migration of lead would not cause the groundwater to exceed the GW-Ind (i.e., the maximum contaminant level) for lead in the future. • If excavated, soil exceeding the SAI-Ind would likely be a RCRA hazardous waste due to lead contamination. The EE/CA recommended excavation of surface and near surface soil contaminated with lead exceeding industrial use levels and proper disposal of that soil off site at a permitted landfill. In August 2009, a non-time critical removal action was conducted which included excavation of contaminated soil, confirmation sampling, and site restoration. Soil with lead contamination above the cleanup level (SAI-Ind) was excavated. Excavation activities were terminated where confirmation sampling results indicated that the cleanup level had been achieved. The removal action objective of protection of human health from lead at unacceptable concentrations had been achieved as demonstrated by the confirmation soil analytical results. The site was restored by backfilling with clean soil, covering the sloped area of the excavation with erosion control fabric, seeding, and mulching. Transport of excavated soil and proper disposal activities were completed on October 6, 2009. A no further action (NFA) Record of Decision (Shaw, 2010) was issued by the Army and co-signed by USEPA with TCEQ concurring. Five-year reviews are required to ensure protection of human health and the environment under CERCLA 121(c), 42 U.S.C. 9621(c). In accordance with 30 Texas Administrative Code §335.566, a notification was recorded in Harrison County records stating that the site is suitable for nonresidential use only (where residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades

			kindergarten through 12). A copy of the notification can be found in the Comprehensive LUC Management Plan (U.S. Army, 2014). The site is in the LTM phase which includes Five-Year Review reports in the form of a letter stating the use of the site remains nonresidential. LTM is expected to continue indefinitely. The cleanup/exit strategy for LHAAP-004-R-01 is continued LTM in the form of Five-Year Reviews (CIP, 2017).

Parcel	Property Description	ECP Category	Remedial Actions
South Test/Bomb Test Area Parcel	**South Test Area/Bomb Test Area** is 72.14 acres located southeast of Avenue P and the magazine area at the end of 70th Street, near the southern boundary of LHAAP (Figure 2). This site is completely surrounded by an area (approximately 7,000 acres) that was transferred by the Army to the USFWS for management as the CLNWR. The topography slopes gently to the east and surface water runoff from the hillside flows generally to the southeast and into Harrison Bayou. A circular, 50-foot wide fire lane with a 2,000-foot diameter centered at the test pad forms a perimeter road that defines the parcel boundary. MEC warning signage is located along the perimeter, approximately 100 feet apart Two co-located environmental sites, Installation Restoration Program (IRP) site LHAAP-27 and MMRP site LHAAP-001-R each occupy the entire parcel. Testing in the South Test/South Bomb Area was observed and controlled from a building on a hilltop 1,000 feet west-northwest of the test pad (USACE 1992; USACE 1998). Bombs were tested by exploding them in the air over an elevated, semi-elliptical earthen test pad. During the late 1950s, illuminating signal devices were also demilitarized within pits excavated in the vicinity of the test pad. Bombs awaiting testing were stored in three earth-covered concrete bunkers a few hundred feet west of the Observation Building (USACE 1992; USACE 1998) and outside of the parcel. A small reinforced concrete building with blast shield once used for temporary storage of these bombs as they were awaiting testing was removed from its original location on the test pad and was relocated to the floodplain east of the site (USACE 1992). The South Test/South Bomb Area was first investigated as IRP site LHAAP-27. Later it was identified as a MEC area of concern based on the reported presence of MEC. Because of the potential presence of WP and to address the WP data gap, the South Test/South Bomb Area was also a MMRP site, LHAAP-001-R.	4	**South Test Area/Bomb Test Area, LHAAP-27/-001-R,** A release, disposal, and/or migration of hazardous substances have occurred at LHAAP-27, but at concentrations that do not require a removal or remedial action. Previous investigations were conducted by Shaw and others from 1982 through 2009 (Shaw, 2011). Between 1982 and 1996 several investigations were conducted in a phased approach to determine the nature and extent of contamination at LHAAP-27. Media investigated included soil, groundwater, surface water and sediment (USACE, 1997). No unacceptable risks to human health were identified for LHAAP Site 27 during the 1997 – Group 1 Baseline Risk Assessment and the findings failed to support evidence of a chemical release of metals at the site (USACE 1997 BERA). Results from the1982 soil and groundwater investigation identified explosives, metals, chloride, and sulfate above background levels in the soil. In the 1993 RI, soil sample results showed no detectable explosives, VOCs, Pesticides or herbicides, although low levels of phthalates were detected in several samples. The groundwater results showed explosives compounds in one sample located west of the test pad resulting in the installation of 4 monitoring wells. Explosives and SVOCs were not detected in monitoring well samples but most of the samples contained elevated levels of nickel, nitrate, and chloride. Low levels of metals and anions were detected in the sediment and surface water samples. Although elevated concentrations of metals were detected, no explosive compounds were detected in the surface soil samples during the 1996 or 1997 sampling events. The 1997 Final RI Report concluded the presence of explosives, VOCs, SVOCs, and metals were not confirmed and recommended NFA. In January 1998, an NFA ROD based on future industrial land use was signed by the Army and co-signed by USEPA with TCEQ (formerly Texas Natural Resources Conservation Commission (TNRCC)) concurrence. After the ROD was signed perchlorate was identified as an emerging contaminant. In May and October 2000, a total of 26 soil samples were collected from 13 soil borings and analyzed for perchlorate (STEP, 2005). Perchlorate was detected in one of the 26 soil samples at a concentration lower than the GWP-Ind value. During three consecutive quarterly sampling events, groundwater samples were collected from existing shallow monitoring wells. During the first quarter (April – May 2000), four groundwater samples were collected from four existing monitoring wells. Perchlorate was detected in two of the wells at concentrations below the GW-Ind value. Perchlorate concentrations were below detection limits in all the six monitoring wells sampled during the second quarter (August through October 2000). During the third quarter, January through February 2001, perchlorate was not detected in the groundwater samples collected from three sampled wells. Between 2002 and 2004, a Military Munitions Response Program (MMRP) SI for LHAAP-001-R was conducted. Spent flares, a 155 millimeter (mm) WP projectile, shrapnel from photoflash bombs, and ordnance related scrap were found during site visits. The MMRP SI recommended further investigation be conducted to address a data gap for the analysis of the munitions constituent (MC) white phosphorous (WP) to be performed at the site. In March 2003, U.S. Fish and Wildlife Service (USFWS) collected soil samples from five locations within the South Test Area/Bomb Test Area. Metals and SVOCs were detected at low concentrations, and the site was not included as one of the areas requiring further evaluation. Perchlorate was not detected above the reporting limit. In the 2005 Environmental Baseline Survey a demolition site was identified on the northwest perimeter of the site and was added to the investigation. Eighteen of the surface soil samples (0 to 0.5 feet) and 13 subsurface soil samples (1 to 2 feet) were analyzed for perchlorate at the 18 locations. The sample locations were spread across the entire site. Perchlorate was detected in one of the 31 samples at a concentration well below its GWP-Ind value. An additional two soil samples were collected during the EE/CA field activities (2006) to determine the presence of WP and if MC existed in areas where MC was likely to exist based on heaviest MPPEH; near the center of the open burn/open detonation area and a scarred area previously noted as photo flash cartridge disposal area. No WP or MC was identified in the soil samples and there was no indication of the presence of MC in any pre- or post-detonation samples. In October 2009, perchlorate was detected above the GW-Ind value of 72 µg/L in one of six wells sampled by USEPA. The USEPA's perchlorate detection of 76 µg/L

			was an estimate from a diluted sample. The Army collected split samples at the same time that the USEPA collected samples from the six monitoring wells. Perchlorate was detected in two wells for the Army split samples, with a maximum concentration below the GW-Ind value of 72 µg/L (Shaw, 2011). The ROD for LHAAP-001-R was signed by Army and co-signed by USEPA with TCEQ concurrence in December 2016 and included limited groundwater monitoring for perchlorate and LUCs (restrictions against digging and residential use, and MEC signage maintenance) (**Figure 5**). The LUC RD/RACR was finalized in May 2018 and the LUCs were recorded in Harrison County, Texas in April 2018. The RD requirements and the Harrison County recordation of LUCs will be included in the FY2018 update of the Sitewide LUC Management Plan. The cleanup/exit strategy for LHAAP-001-R-01 involves one more year of post-ROD groundwater monitoring. With two sampling rounds below the TRRP residential PCL of 17 ug/L for all of the wells, groundwater monitoring will cease if the third round is below the PCL and the wells will be abandoned. It is expected that LTM of LUC maintenance and Five-Year Reviews will continue indefinitely.

Parcel	Property Description	ECP Category	Remedial Actions
Ground Signal Test Area	**Former Ground Signal Test Area** encompasses 79.53 acres and is located in the southeastern portion of LHAAP (Figure 2). A perimeter road surrounds the test area forming a circular site boundary. Haystack Road bisects the site from north to south. MEC warning signage has been placed every 200 feet along the perimeter road, which is maintained for visibility of the signs. The site is located within the watersheds of Saunders Branch and Harrison Bayou. Surface water runoff from the site is towards drainage ditches located alongside the circular dirt road forming the outer margin of the site. Two co-located environmental sites, LHAAP-27 (IRP) and LHAAP-001-R (MMRP) each occupy the entire parcel. The Signal Test Area was used intermittently starting in April 1963 for aerial and on- ground testing and destruction of a variety of devices, including pyrotechnic signal devices, red phosphorus smoke wedges, infrared flares, illuminating 60 and 81 millimeters (mm) mortar shells, illuminating 40 to 155 mm cartridges, button bombs, and various types of explosive simulators. The site was also used intermittently over a 20-year period for testing and burn-out of rocket motors from Nike-Hercules, Pershing, and Sergeant missiles. Around 1970, a Sergeant rocket motor reportedly exploded in an excavated pit near the center of the site, however, later MEC clearance to depth in the area found no rocket motor. Debris was reportedly placed in the resulting crater and backfilled. From late 1988 through 1991, the site was also used for burn-out of rocket motors in Pershing missiles destroyed in accordance with the Intermediate-Range Nuclear Forces Treaty between the U.S. and the former Soviet Union. Occasionally, leaking WP munitions were burned at the site as a demilitarization activity. The Ground Signal Test Area was first investigated as IRP site LHAAP-54. Later it was identified as a MEC area of concern based on the reported presence of MEC. Because of the potential presence of WP and to address the WP data gap, the Ground Signal Test Area was also a MMRP site, LHAAP-003-R.	4	**Former Ground Signal Test Area (LHAAP-54).** LHAAP-003-R is co-located with the IRP site LHAAP-54. Between 1982 and 1996 several investigations were conducted in a phased approach to determine the nature and extent of contamination. Media investigated included soil, groundwater, surface water and sediment. Seven groundwater grab samples and two groundwater monitoring well samples were collected during the 1997 RI. No organics or explosives were detected in groundwater. Metals and anions (barium, nickel, sulfates, and chlorides) were detected at or below background levels in groundwater. A NFA ROD under CERCLA for HTRW was signed by the Army and co-signed by USEPA, with TCEQ (formerly TNRCC) concurring in January 1998 (USACE, 1998) based on a future industrial land use. Perchlorate was identified as an emerging contaminant after the 1998 ROD was signed, therefore perchlorate data for environmental media was collected. Between May 2000 and June 2001, during four quarterly sampling events, twelve groundwater samples were collected from three existing shallow monitoring wells and three geoprobe points to determine whether perchlorate was present in the underlying groundwater as a result of past historical activities (STEP, 2005). The monitoring wells and geoprobe points are located adjacent to the three surface water features that drain the entire Ground Signal Test Area. Because the shallow groundwater flow pattern reflects surface topography, groundwater samples from these wells represent groundwater from the entire site. Perchlorate was detected during the first quarter sampling event at a maximum concentration that was well below the GW-Ind value of 72 µg/L. During the second quarter sampling event, perchlorate was not detected in any of the water samples. Perchlorate was detected during the third quarter sampling event in one well at a concentration that was well below the GW-Ind value and not at all during the fourth quarter event. Between 2002 and 2004, a MMRP SI was conducted for LHAAP-003-R to determine the presence or absence of MEC and/or MC at the site which may have remained from activities conducted by the DOD during operations of the MRS. The 2005 SI verified MEC presence at the site (e2M). In March 2003, soil samples collected from two locations confirming previous findings of low metals concentrations (USFWS, 2003). Perchlorate was not detected. In 2007, an EE/CA was conducted to characterize MEC and addressed the WP data gap and facilitate completion of a non-time critical removal action of MEC at the site (CAPE, 2007a). Fourteen (14) MEC and MPPEH items were recovered at the surface or within the top 6 inches of the soil. One soil sample was collected within the area identified as the mortar firing range. A second soil sample was collected in a scarred area identified as the Rocket Motor Area. In addition, pre- and post-detonation samples were collected in association with explosive demolition of MPPEH recovered during the field activities. Soil samples were collected from 0 to 6-inches bgs. WP and explosives were not identified at concentrations above detection limits in any soil samples at the site. The EE/CA recommended surface clearance of MEC items with LUCs to reduce the risk within LHAAP-003-R. The MEC removal action was conducted in 2008 and LUCs were developed (EODT, 2009). Surface clearance was performed and a total of 12 MEC/MPPEH items and one inert item were located and destroyed and 6,880 pounds of MD and 5,981 pounds of CD were removed. In addition, LUCs were designed that include restrictions against intrusive activities including digging; signage at the perimeter of the site; and education programs for future refuge visitors, staff, and volunteers (EODT, 2009). In 2009, perchlorate was detected in one well by USEPA at a concentration that was well below the 17 µg/L PCL, confirmed with split samples collected by the. Army. The baseline risk assessment indicated low MEC risk to human health for LHAAP-003-R. The surface MEC removal action located and removed MEC items thereby reducing the risk to the future land user. The ROD was signed in December 2016 and included limited groundwater monitoring for perchlorate and LUCs (restrictions against digging and residential use, and signage maintenance) (**Figure 6**). The LUC RD/RACR was finalized in May 2018 and the LUCs were recorded in Harrison County, Texas in April 2018. The RD requirements and the Harrison County recordation of LUCs will be included in the FY2018 update of the Sitewide LUC Management Plan. No exceedances of the TRRP residential PCL of 17 ug/L for perchlorate in groundwater were detected during post-ROD sampling and no further groundwater monitoring is required. The wells are planned for abandonment. It is expected that LTM will continue indefinitely and will include LUC maintenance and Five-Year Reviews (CIP, 2017).

TABLE 2
STORAGE, RELEASE, OR DISPOSAL OF HAZARDOUS SUBSTANCES
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Parcel	Building or Tank ID	AST/UST	Name of Product(s)	Date of Storage, Release, or Disposal	Quantity / Size	Remedial Actions
Demolition Debris Landfill	**None**	**None**	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Former Pistol Range	**None**	**None**	Lead	1950 to 2004	Not Applicable	A non-time critical removal action was implemented in 2009. Soil with lead concentrations exceeding 1,000 milligrams per kilogram (mg/kg) was excavated and disposed of off-site
South Test Area/Bomb Test Area Parcel	**None**	**None**	MEC, MD, MC, WP	1952 to 1991	Unknown	Surface clearance and subsurface clearance of MEC, MD, MC, WP along with MEC signage., and education
Ground Signal Test Area Parcel	**None**	**None**	MEC, MD, MC, WP	1952 to 1991	Unknown	Surface clearance and subsurface clearance of MEC, MD, MC, WP along with MEC signage., and education

*The information contained in this notice is required under the authority of regulations promulgated under section 120(h) of the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA or "Superfund") 42 U.S.C. section 9620(h). This table provides information on the storage of hazardous substances for one year or more in quantities greater than or equal to 1,000 kilograms or the hazardous substances' CERCLA reportable quantity (whichever is greater).

TABLE 3
ASBESTOS
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Building Number	Building Name	Site ID	Building Status	Friable Asbestos	Non-Friable Asbestos	Comments
TS-62	Shed	Ground Signal Test Area	Demolished	Assumed	Assumed	Transite Siding/Roof/Ceiling/Wall (100 S.F. +/-), Floor Tile & Mastic (50 S.F. +/-)
IST-62	Ammunition Quality Building	South Test/Bomb Area	Demolished	Assumed	Assumed	Transite Siding/Roof/Ceiling/Wall (300 S.F. +/-), TSI – Steam (100 L.F. +/-

Source: EFI, 2004.
Note: No buildings remain on the Property.

TABLE 4
ADJACENT PROPERTIES‡
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Site No.	Site Name	ECP Category
LHAAP-19	Construction and Demolition Debris Landfill tract	4*
LHAAP-54 / -003-R	Ground Signal Test Area	4*

h‡Refer to **Figure 2** for location of adjacent properties in reference to transfer parcels.

*ECP Category 4; Areas where release, disposal, and or migration has occurred, and all removal or remedial actions to protect human health and the environment have taken place.

TABLE 5
GROUNDWATER MONITORING WELL LOCATIONS
LONGHORN ARMY AMMUNITION PLANT (LHAAP)
KARNACK, TEXAS

Monitoring Well ID	Site ID	Depth (feet)	Installation Date (month/year)	Easting X Coordinate	Northing Y Coordinate
131	LHAAP-27/001-R	23	6/8/1982	3312624.62	6947154.87
132	LHAAP-27/001-R	26	6/9/1982	3312583.66	6946967.93
27WW01	LHAAP-27/001-R	27	8/19/1994	3312277.30	6947117.00
27WW02	LHAAP-27/001-R	17	8/19/1994	3312377.22	6947155.22
27WW03	LHAAP-27/001-R	18	8/19/1994	3312344.63	6947049.40
27WW04	LHAAP-27/001-R	17	8/24/1994	3312418.83	6947224.88
27WW06	LHAAP-27/001-R	0	--	3312575.16	6946967.18
27WW07	LHAAP-27/001-R	0	--	3312629.55	6947149.65
127	LHAAP-54/003-R	25	7/9/1982	3316163.50	6949777.64
128	LHAAP-54/003-R	32.5	7/9/1982	3317708.99	6951120.12
18WW01	LHAAP-54/003-R	109	3/22/1995	3316988.00	6951297.55
18WW16	LHAAP-54/003-R	32	3/2/1995	3316913.33	6951330.91

Figures

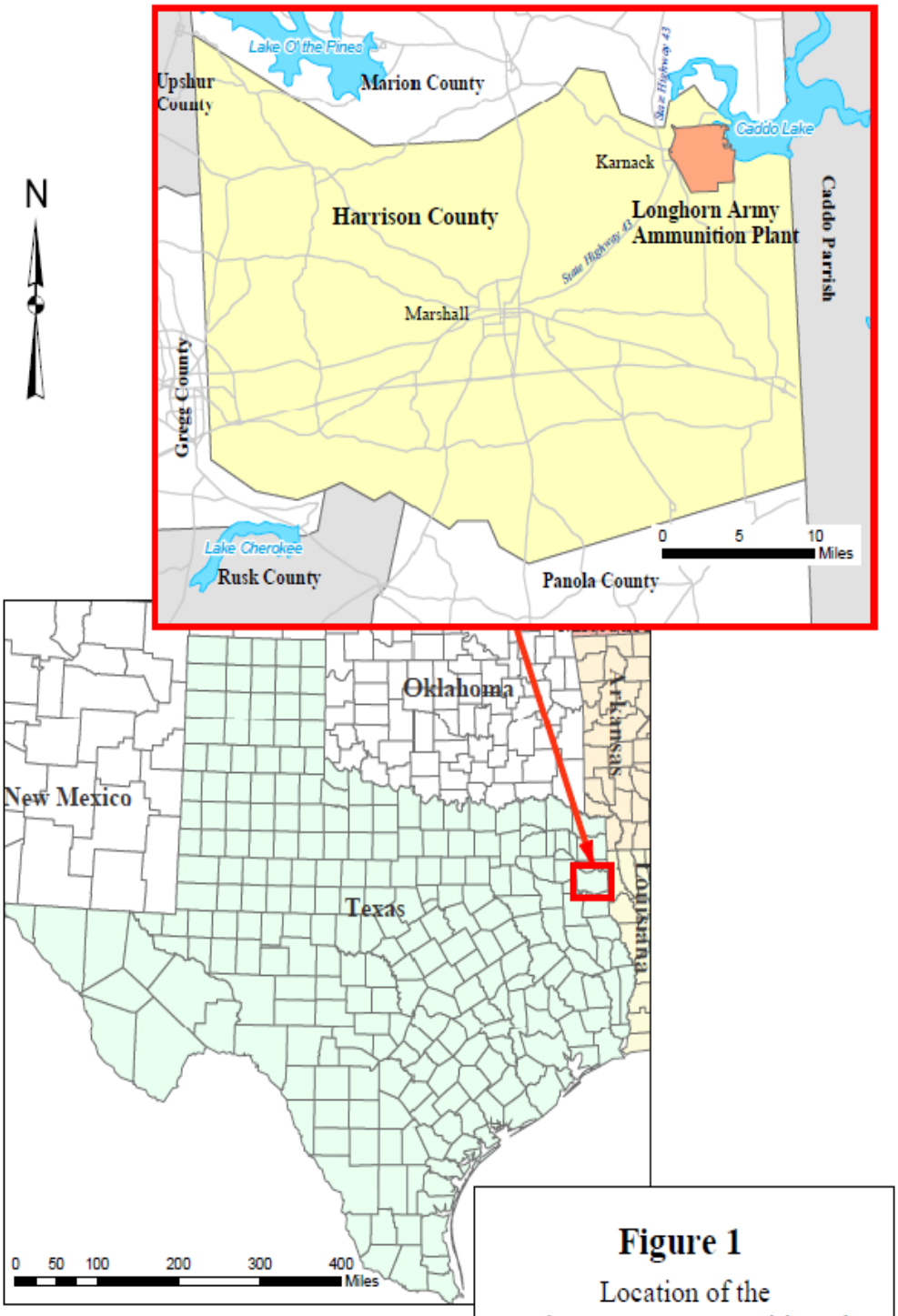
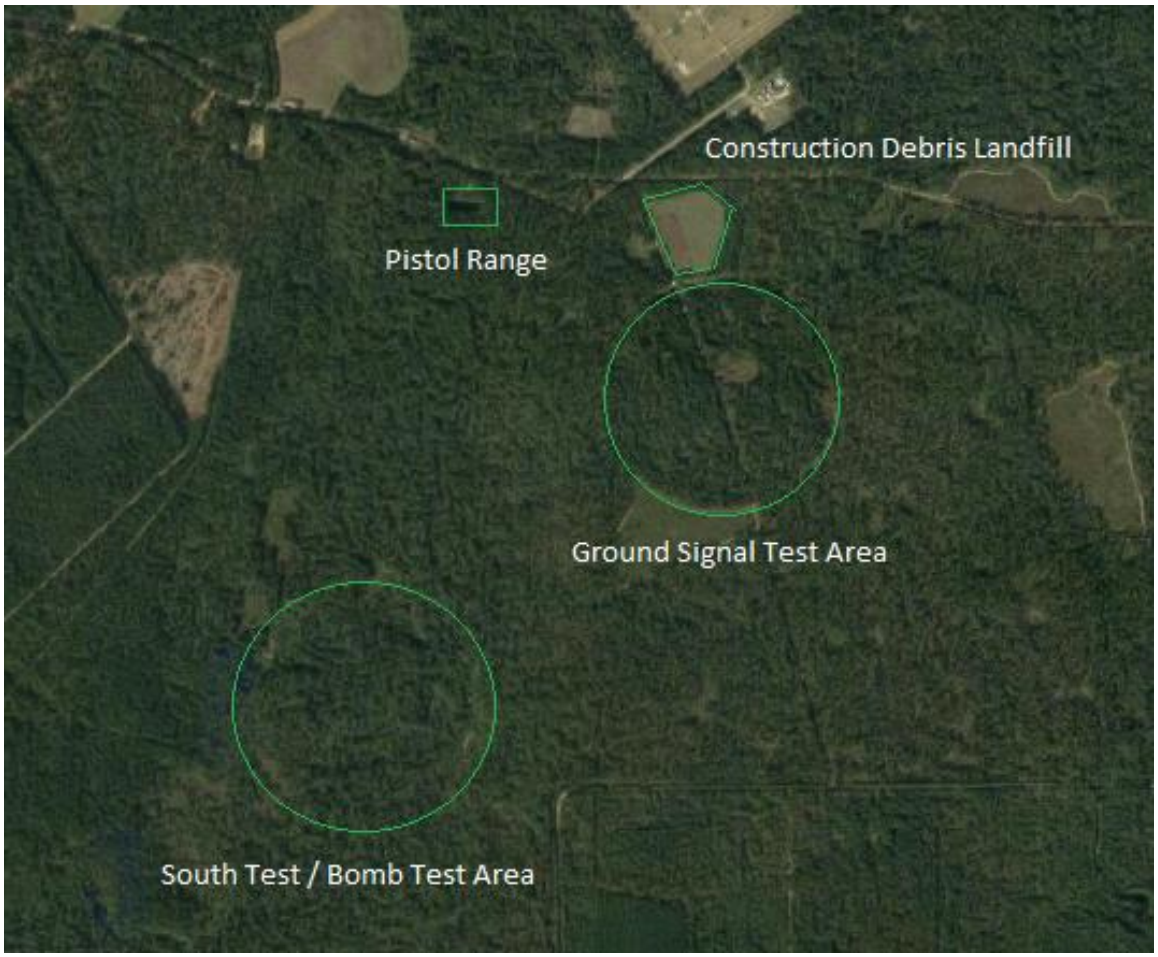


Figure 1

Location of the
Longhorn Army Ammunition Plant
Harrison County, Texas



U.S. ARMY CORPS OF ENGINEERS
Fort Worth DISTRICT
TULSA, OKLAHOMA

FIGURE 2
SITE LOCATION MAP
PROPERTY TRANSFER AREA
165.8 ACRES
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

00897973

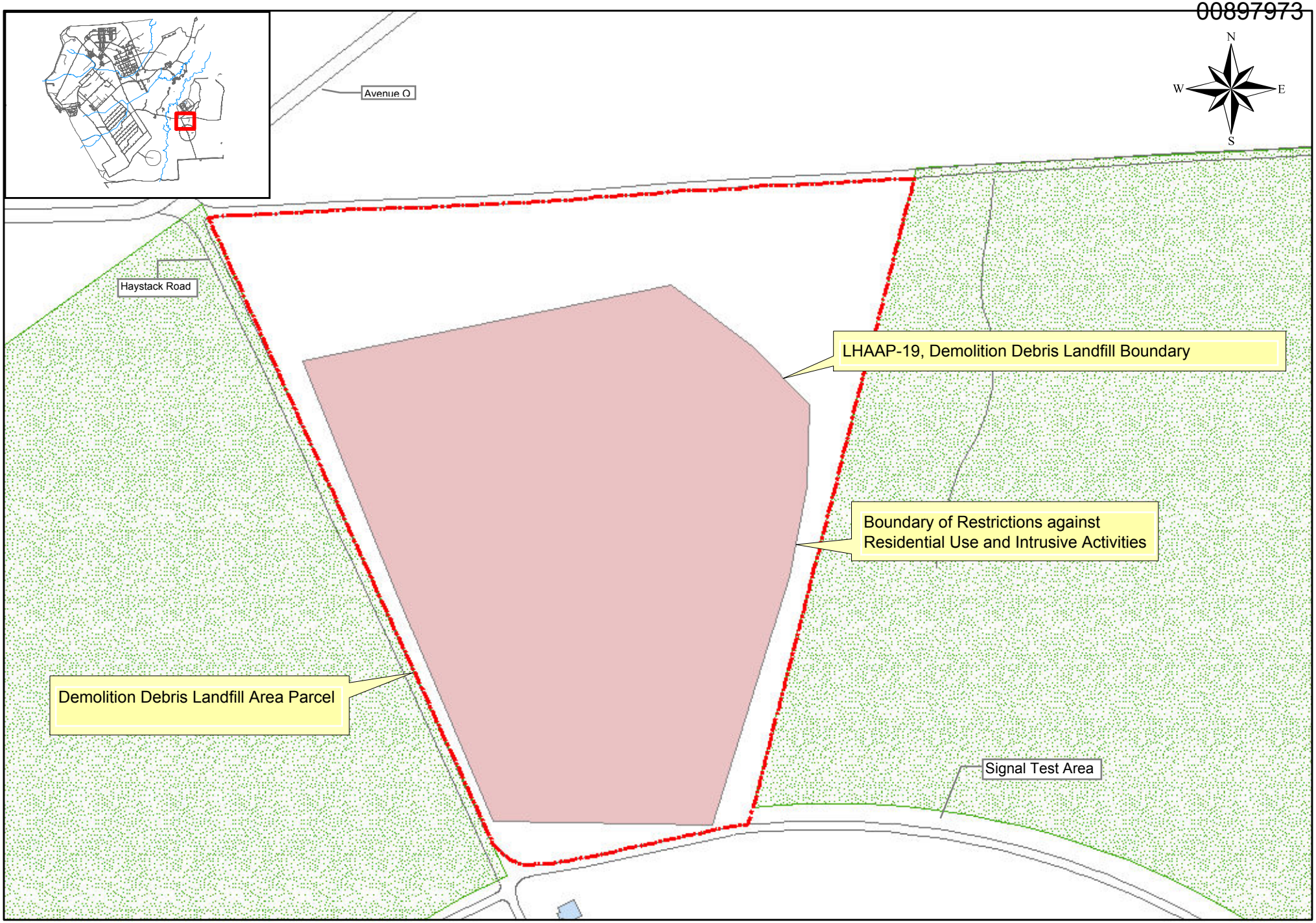


FIGURE 3

DEMOLITION DEBRIS LANDFILL PARCEL, LONGHORN ARMY AMMUNITION PLANT

HARRISON COUNTY, TEXAS

FIGURE 3

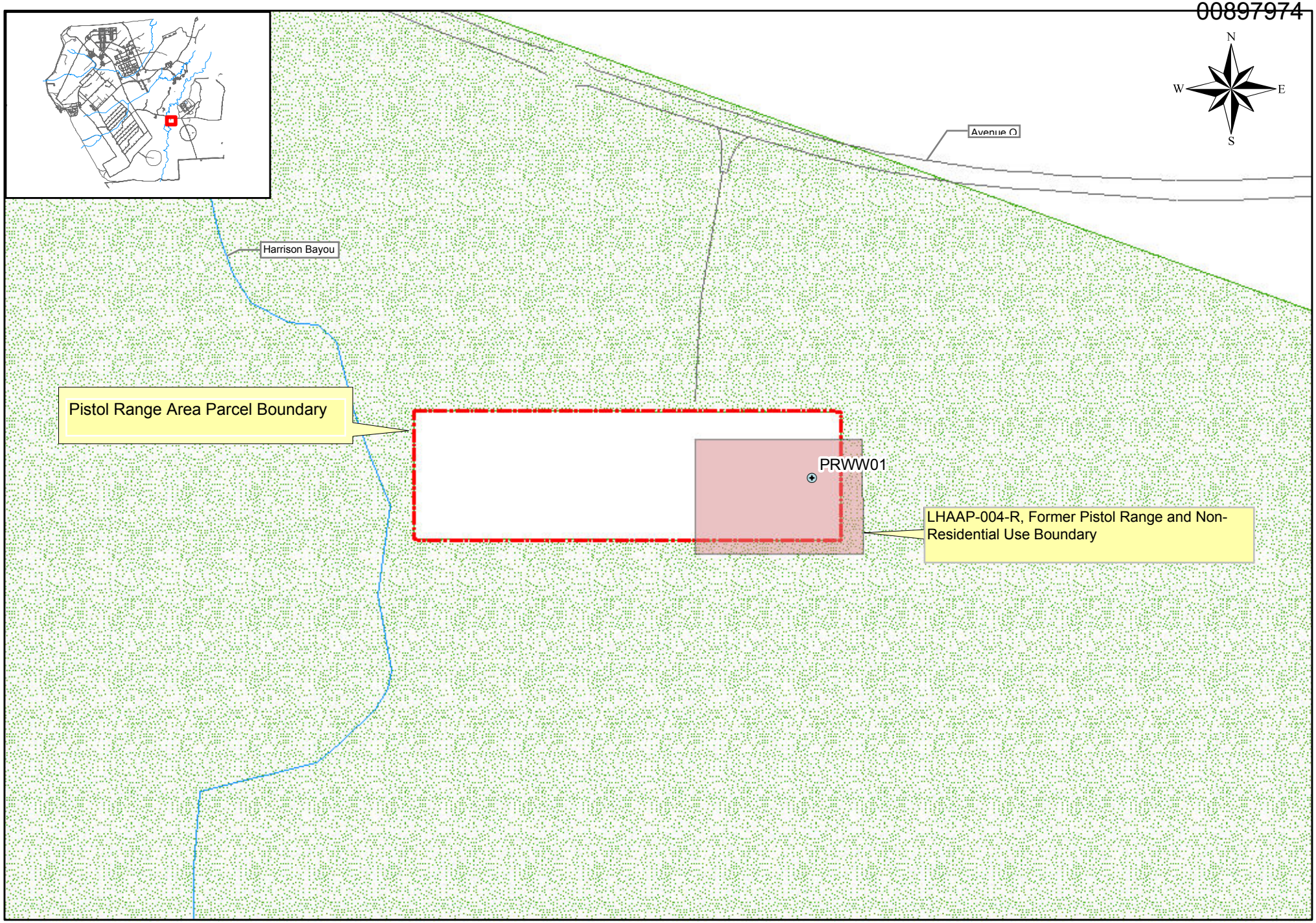
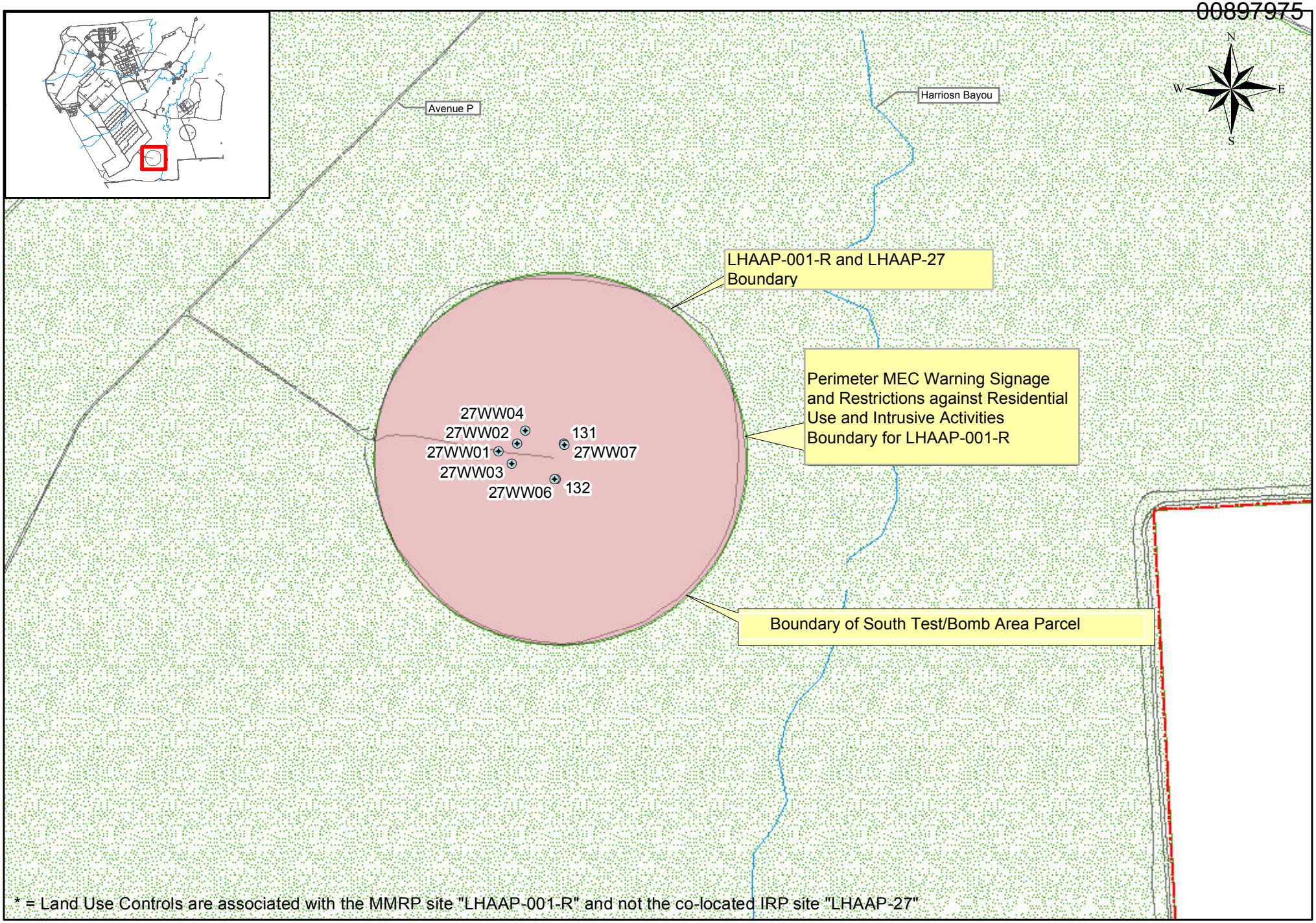


FIGURE 4

PISTOL RANGE AREA PARCEL, LONGHORN ARMY AMMUNITION PLANT

HARRISON COUNTY, TEXAS

FIGURE 4



Legend

- Environmental Site
- CLNWR_Property_revisedMay2015
- Groundwater Monitoring Well

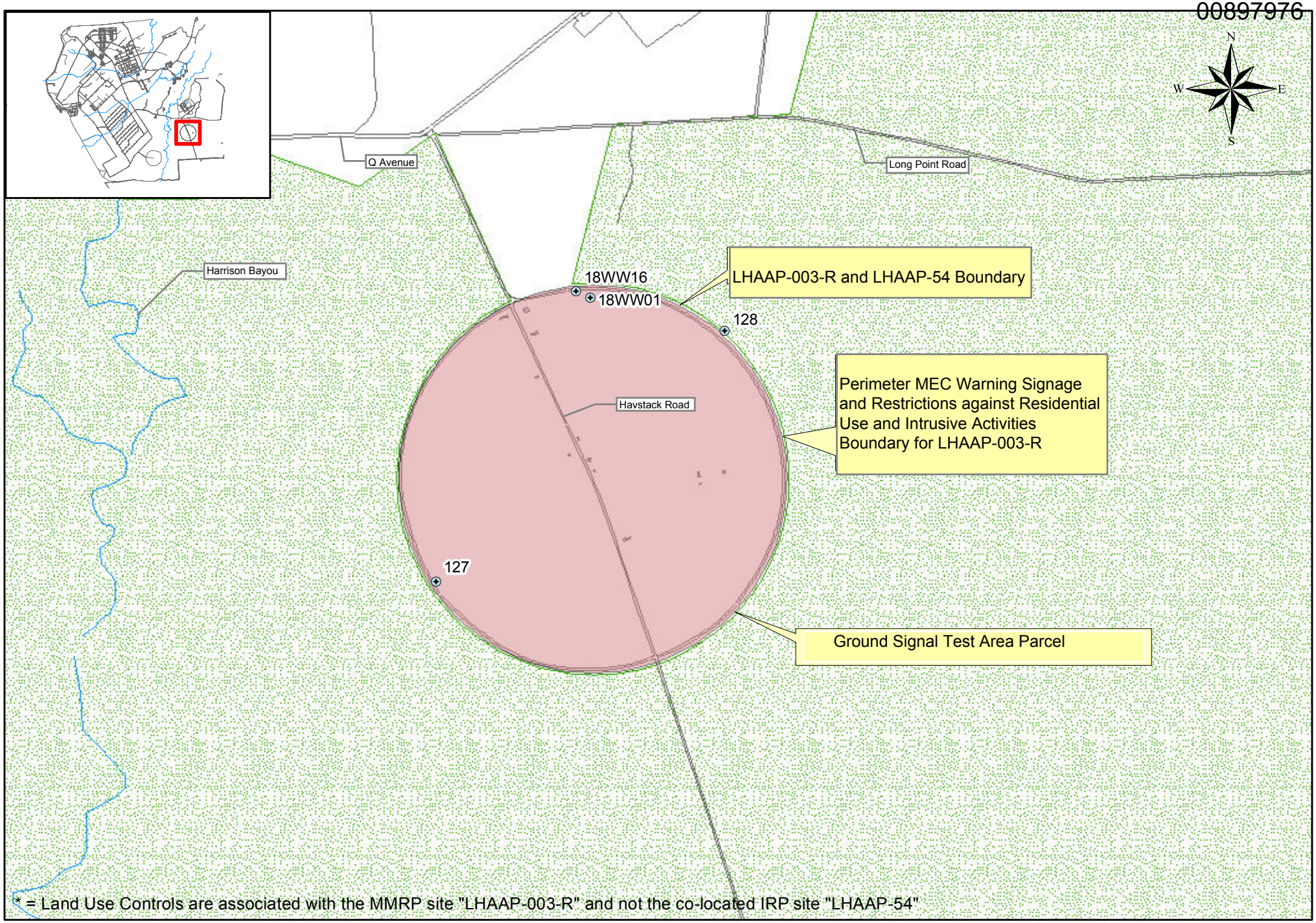
FIGURE 5

SOUTH TEST/BOMB AREA PARCEL, LONGHORN ARMY AMMUNITION PLANT

HARRISON COUNTY, TEXAS

0 125250 500 750 1,000 Feet

FIGURE 5



Legend

- Environmental Site
- CLNWR_Property_revisedMay2015
- Groundwater Monitoring Well

0 125250 500 750 1,000 Feet

FIGURE 6

SIGNAL TEST AREA PARCEL, LONGHORN ARMY AMMUNITION PLANT

HARRISON COUNTY, TEXAS

FIGURE 6

Attachment 1
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Attachment 2
DOD Environmental Condition of Property (ECP) Categories

DOD Environmental Condition of Property Categories

Category	Description
Category 1	Areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas).
Category 2	Areas where only release of disposal of petroleum products has occurred.
Category 3	Areas where release, disposal, and or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response.
Category 4	Areas where release, disposal, and or migration has occurred, and all removal or remedial actions to protect human health and the environment have taken place.
Category 5	Areas where release, disposal, and or migration has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken.
Category 6	Areas where release, disposal, and or migration has occurred, but required actions have not yet been implemented.
Category 7	Areas that are not evaluated or require additional evaluation.

Attachment 3
Environmental Protection Provisions

Environmental Protection Provisions

The following conditions, restrictions, and notifications will be incorporated by reference into the Letter of Transfer from the Department of the U.S. Army to the transferee, U. S. Fish and Wildlife Service (USFWS) to ensure the protection of human health and the environment and in furtherance of ongoing and completed remediation activities at the Property.

1. Inclusion of Provisions:

The transferee, USFWS, to whom the Property is transferred shall neither transfer the Property, lease the Property, nor grant any interest, privilege, or license whatsoever in connection with the Property without the inclusion of the environmental protection provisions contained herein, and shall require the inclusion of such environmental protection provisions in all further deeds, transfers, leases, or grant of any interest, privilege, or license, unless there is a specific legal finding authorizing a change and specifically addressing any liabilities that will result from the change.

2. Federal Facility Agreement:

The U.S. Army acknowledges that portions of Longhorn Army Ammunition Plant have been identified as National Priorities List (NPL) sites under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended. The transferee, USFWS, acknowledges that the U.S. Army has provided it with a copy of the LHAAP Federal Facility Agreement (FFA) dated December 30, 1991 and will provide the transferee with a copy of any amendments thereto. The transferee, its successors and assigns, agree that should any conflict arise between the terms of the FFA as they presently exist or may be amended, and the provisions of this property transfer, the terms of the FFA will take precedence. The transferee, its successors and assigns, further agree that notwithstanding any other provisions of the transfer, the U.S. Army assumes no liability to the transferee, its successors and assigns, should implementation of the FFA interfere with the use of the Property. The transferee, its successors and assigns, shall have no claim on account of any such interference against the U.S. Army or any officer, agent, employee or contractor thereof.

3. No Liability for Non-Army Contamination:

The U.S. Army shall not incur liability for response action or corrective action found to be necessary after the date of transfer, in any case in which the transferee to whom the Property is transferred, or other non-Army person or entity, is identified as the party responsible for contamination of the Property.

4. CERCLA Access Notice:

The USEPA and TCEQ and their officers, agents, employees, contractors, and subcontractors

have the right, upon reasonable notice to the transferee, to enter upon the Property in any case in which a response action or corrective action is found to be necessary after the date of transfer of the Property, or such access is necessary to carry out a response action or corrective action on adjoining property, including, without limitation, the following purposes:

To conduct investigations and surveys, including, where necessary, drilling, soil and water sampling, testing-pitting, test soil borings and other activities;

To inspect field activities of the U.S. Army and its contractors and subcontractors;

To conduct any test or survey related to the environmental conditions at the transferred Property or to verify any data submitted to the USEPA or TCEQ by the U.S. Army relating to such conditions;

To construct, operate, maintain or undertake any other response or remedial actions as required or necessary including, but not limited to, monitoring wells, pumping wells and treatment facilities.

5. Land Use Restrictions and Covenants:

A. USFWS is hereby informed and acknowledges that there is the potential that some Munitions and Explosives of Concern (MEC) remains at the Ground Signal Test Area (LHAAP-001-R) and the South Test/South Bomb Area (LHAAP-003-R). The United States Department of the Army has undertaken careful environmental study of LHAAP-001-R and LHAAP-003-R and concluded that LUCs should remain in place until it is demonstrated that MEC no longer presents an explosive hazard. Future use of these sites is intended as a national wildlife refuge consistent with industrial or recreational activities and not for residential purposes. The USFWS, its successors or assigns, shall not undertake nor allow any activity on or use the property that would violate the land use restrictions contained herein. The land use restriction boundaries have been surveyed and metes and bounds established and recorded in Harrison County, Texas. Maps depicting restriction locations are provided as Figures 5 and 6. The LUCs placed on the property to ensure appropriate future use include:

(1) Residential Use Restriction. Use must remain nonresidential as described above. For purposes of this provision residential includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12. This LUC will remain in place until it is demonstrated that the MEC no longer present a threat to human safety/health.

(**2) Intrusive Activity Restriction.** No intrusive activity shall be permitted, which includes digging or any other activity which could result in explosive safety risks, without prior consent. This LUC will remain in place until it is demonstrated that the MEC no longer present an explosive hazard. Intrusive subsurface activities may occur provided that the Army and the EPA approve such intrusive subsurface activities before they are commenced and provided that they are undertaken by qualified personnel who are trained in explosives safety measures.

B. Modifying Restrictions. USFWS, its successors and assigns, shall not, without U.S. Army and USEPA concurrence, terminate a LUC, or make a land use change inconsistent with the LUC objectives and use assumptions of the selected remedy. LUCs will remain in effect until such time the U.S. Army and USEPA agree that the potential for explosive safety risks has been reduced to levels that allow for unlimited exposure and unrestricted use. When the decision has been made to terminate the LUC, the U.S. Army will provide to the Transferee an appropriate release for recordation pertaining to the site and will also timely advise other local stakeholders of the action.

C. LUC Obligations. The LUC objectives specified in the Final ROD for LHAAP-001-R and LHAAP-003-R were designed and constructed to promote ongoing protection of human safety against potential explosive hazards that may remain at the MMRP sites. The LUCs' performance objectives are to prohibit the development and use of the property for residential housing, elementary and secondary schools, and child care facilities and playgrounds, and to prohibit intrusive activities such as digging or any other activity which could result in explosive safety risks. LUC implementation and maintenance requirements are set forth in the Remedial Design (RD)/Remedial Action Construction Report (RACR) for LHAAP-001-R and LHAAP-003-R (Bhate, 2018) a primary document of the FFA. The USFWS acknowledges that the U.S. Army has provided a copy of the RD/RACR dated May 2018 and will provide USFWS a copy of any amendments thereto. Implementation, maintenance, inspection, reporting, and enforcement of LUCs are required to ensure protection of the remedy and to promote ongoing protection of human safety against potential explosive hazards that may remain at the sites. In compliance with the LUCs, the USFWS, its successors and assigns, covenants and agrees to implement the LHAAP-001-R and LHAAP-003-R LUCs through the following:

- Prohibit any activities that would damage the MEC warning signs along the sites' perimeters
- Prohibit any intrusive activities that would potentially result in explosive safety risks, such as digging
- Prohibit any residential use

The USFWS, its successors and assigns, also covenants and agrees to the following LUC inspection and reporting responsibilities:

- Conduct periodic physical inspections (no less than an annual basis) to determine whether the required LUC mechanism remains effective
- Report any evidence of intrusive activity to the U.S. Army, USEPA and TCEQ
- Prepare annual inspection reports confirming that LUCs implemented on the property are in compliance and upon request provide copies to the U.S. Army, USEPA, and TCEQ
- Retain copies of each report with availability to the Army during preparation of CERCLA Five Year Reviews

The U.S. Army will remain responsible for: (1) conducting CERCLA 121© five year reviews; (2) notification of the appropriate regulators of any known LUC deficiencies or violations; (3) access to the property to conduct any necessary response; (4) reservation of the authority to change, modify or terminate LUCs and any related transfer or lease provisions; and (5) ensuring that the LUC objectives are met to protect the integrity of the selected remedy.

6. Notice of the Potential for the Presence of Munitions and Explosives Concern, and Covenant:

Based upon a review of existing records and available information, the Demolition Debris Landfill Area Parcel is not known or suspected to contain munitions and explosives of concern (MEC). Although MEC was located and removed at the Signal Test Area and the South Test/Bomb Area Parcels through removal actions conducted in 2007 and 2008, there is a potential that some MEC remains. Although no MEC was found at the Pistol Range Parcel, a removal action was conducted for lead, a munitions constituent (MC). The term MEC means specific categories of military munitions that may pose unique explosives safety risks and includes: (1) Unexploded Ordnance (UXO), as defined in 10 U.S.C. §101(e)(5); (2) Discarded military munitions (DMM), as defined in 10 U.S.C. §2710(e)(2); or (3) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard. In the event that transferee, its successors, or assign should discover any MEC on the Property, they shall immediately stop any intrusive or ground-disturbing work in the area or in any adjacent areas and shall not attempt to remove or destroy it, but shall immediately notify the Harrison County Sheriff's Department (phone number: 903-923-4000), so that appropriate explosive ordnance disposal personnel can be dispatched to address such MEC as required under applicable law and regulations. An alternate contact is the City of Marshall Fire Department (phone number: 903-938-6711). Local authorities must contact the CBRNE (Chemical, Biological, Radiological, Nuclear, and High Yield Explosive) Command, Emergency Operations Center, U.S. Army at phone number 410-436-6200.

7. Notice of the Presence of Asbestos and Covenant:

A. The Grantee is hereby informed and does acknowledge that friable and non-friable asbestos-containing material ("ACM") has been found on the Property. Although the buildings have been demolished, the Property may contain other improvements such as equipment, facilities, and pipelines, above and below the ground, that contain non-friable asbestos or ACM. The Occupational Safety and Health Administration and the Environmental Protection Agency have determined that such unprotected or unregulated exposure to airborne asbestos fibers increases the risk of asbestos-related diseases, including certain cancers that can result in disability or death.

B. The Grantee covenants and agrees that its use and occupancy of the Property will be in compliance with all applicable laws relating to asbestos. The Grantee agrees to be responsible for any remediation or abatement of asbestos found to be necessary on the Property, to include ACM in or on buried pipelines, which may be required under applicable law or regulation.

C. The Grantee acknowledges that it has inspected or has had the opportunity to inspect the Property as to its asbestos and ACM condition and any hazardous or environmental conditions relating thereto. The Grantee shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any asbestos or ACM hazards or concerns.

8. Notice of the Presence of Lead-Based Paint and Covenant Against the Use of Property for Residential Purpose

A. The buildings located on the Property have been demolished; however, the Grantee is hereby informed and does acknowledge that all remaining structures (i.e., monolithic walls, slabs, equipment, etc.) on the Property, which were constructed or rehabilitated prior to 1978, are presumed to contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not managed properly. Every purchaser of any interest in Residential Real Property on which a residential dwelling was built prior to 1978 is notified that there is a risk of exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning.

B. The Grantee covenants and agrees that it shall not permit the occupancy or use of any structures on the Property as Residential Property, as defined under 24 Code of Federal Regulations Part 35, without complying with this section and all applicable Federal, State, and local laws and regulations pertaining to lead-based paint and/or lead-based paint hazards. Prior to permitting the occupancy of the Property where its use subsequent to sale is intended for residential habitation, the Grantee specifically agrees to perform, at its sole expense, the Army's abatement requirements under Title X of the Housing and Community Development Act of 1992 (Residential Lead-Based Paint Hazard Reduction Act of 1992).

C. The Grantee acknowledges that it has inspected or has had the opportunity to inspect the Property as to its lead-based paint content and condition and any hazardous or environmental conditions relating thereto. The Grantee shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any lead-based paint hazards or concerns.

9. Notice of the Presence of Groundwater Monitoring Wells and Covenant:

a. The transferee is hereby informed and does acknowledge the presence on the Property of thirteen (13) groundwater monitoring wells that may be necessary for the U.S. Army to complete monitoring after the date of transfer of title to the Property, or portions thereof.

b. Promptly upon the determination by the U.S. Army that a well is no longer necessary for monitoring, the U.S. Army will close such well at the U.S. Army’s sole cost and expense in accordance with applicable laws, regulations, and ordinances.

10. Notice of Archaeological Property and Preservation Covenant:

The archaeological site 41HS240 is located in the County of Harrison, Texas, the transferee hereby covenants on behalf of itself, its heirs, successors, and assigns at all times to the Texas State Historic Preservation Officer, to maintain and preserve the archaeological properties. The transferee will honor its responsibilities under the National Historic Preservation Act and will coordin0ate all activities in furtherance of its responsibilities with the Texas State Historic Preservation Office, appropriately federally recognized tribes and other interested parties.

11. Conditions, Restrictions, and Covenants Binding and Enforceable:

These restrictions and covenants are binding on the transferee, its successors and assigns, and shall be included in subsequent deeds; shall run with the land; are forever enforceable; shall benefit the public in general and the territory surrounding the Property, including lands retained by the U.S. Army; and shall further the common environmental objectives of the U.S. Army and the State of Texas and are therefore enforceable by the U.S. Army and the State of Texas.

In accordance with 30 Texas Administrative Code (TAC) §335.566, notifications have been recorded in the Harrison County, Texas stating that LHAAP-19 and LHAAP-004-R are suitable for nonresidential use. Limited monitoring will be conducted to ensure that the use of the sites remain consistent with the nonresidential use exposure scenarios evaluated in the risk evaluation and will be documented in the form of Letters of Certification transmitted every five years to TCEQ. Although the Army may later pass these procedural responsibilities to the designated transferee, in conjunction with the property transfer, the Army shall retain responsibility for future environmental response actions.

The restrictions for the Demolition Debris Landfill require the property use must remain non-residential (excludes residential use including, but not limited to, single family or multifamily residences; child care facilities; and nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12) and that no activity will be conducted or permitted that would damage the integrity of the landfill cover (i.e. unauthorized digging or disturbing the existing cover or contents of the landfill). These restrictions will be placed in the deed transferring any part of the property out of federal ownership. Limited monitoring in the form of Letters of Certification to the State of Texas every five years is required to verify that the use of LHAAP-19 remains consistent with the industrial/recreational exposure scenario and the requirements of the notification.

The restrictions for the Former Pistol Range require the property use must remain nonresidential use only (where residential use includes, but is not limited to, single family or multi-family residences; child care facilities; nursing home or assisted living facilities; and any type of educational purpose for children/young adults in grades kindergarten through 12). The site is in

the LTM phase which includes Five-Year Review reports in the form of a letter stating the use of the site remains nonresidential. LTM is expected to continue indefinitely. The cleanup/exit strategy for LHAAP-004-R-01 is continued LTM in the form of Five-Year Reviews (CIP, 2017).