HEMMERA ENVIROCHEM INC.
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Date Received: 30-JUN-14
Report Date: 11-JUL-14 16:01 (MT)
Version: FINAL

Client Phone: 867-456-4865

Certificate of Analysis

Lab Work Order #: L1478849

Project P.O. #: NOT SUBMITTED
Job Reference: 1343-005.03
C of C Numbers: 1, 2
Legal Site Desc:

Brent Mack
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-1 Water 28-JUN-14 18:00 MW09-21	L1478849-2 Water 28-JUN-14 17:00 MP09-05	L1478849-3 Water 28-JUN-14 07:30 CH-P-13-03/50	L1478849-4 Water 28-JUN-14 11:40 MP09-04	L1478849-5 Water 28-JUN-14 10:20 MW09-24
WATER						
Physical Tests	Conductivity (uS/cm)	2500	2360	2130	1630	1430
	Hardness (as CaCO3) (mg/L)	1600	1360	1040	1070	907
	pH (pH)	7.40	7.68	8.07	7.92	8.06
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	359	330	338	243	272
	Ammonia, Total (as N) (mg/L)	11.6 DLA	8.16 DLA	0.153	0.0056 DLA	<0.0050 DLA
	Chloride (Cl) (mg/L)	<10 DLA	<10 DLA	21 DLA	<5.0 DLA	<5.0 DLA
	Fluoride (F) (mg/L)	<0.40 DLA	<0.40 DLA	<0.40 DLA	<0.20 DLA	<0.20 DLA
	Nitrate (as N) (mg/L)	<0.10 DLA	1.66	<0.10 DLA	0.478 DLA	1.45 DLA
	Nitrite (as N) (mg/L)	<0.020 DLA	0.035	<0.020 DLA	<0.010 DLA	<0.010 DLA
	Total Kjeldahl Nitrogen (mg/L)	16.8	12.4	3.20	0.199	0.331
	Sulfate (SO4) (mg/L)	1410	1310	1050	835	645
	Sulphide as S (mg/L)	<0.020	<0.020	0.027	<0.020	<0.020
	Anion Sum (meq/L)	36.5	34.0	29.3	22.3	19.0
	Cation Sum (meq/L)	37.2	33.0	27.4	22.0	18.5
	Cation - Anion Balance (%)	1.0	-1.5	-3.3	-0.7	-1.1
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0070 CNP	0.0054	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	0.0107 CNP	0.0366	0.0088	0.0078	<0.0050
	Thiocyanate (SCN) (mg/L)	0.58	<2.50 DLM	<0.50	<0.50	<0.50
	Cyanide, Free (mg/L)	0.0066 CNP	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	73.3	70.4	78.4	52.3	59.7
	Total Organic Carbon (mg/L)	23.8	24.1	28.9	5.48	6.44
Total Metals	Aluminum (Al)-Total (mg/L)					
	Antimony (Sb)-Total (mg/L)					
	Arsenic (As)-Total (mg/L)					
	Barium (Ba)-Total (mg/L)					
	Beryllium (Be)-Total (mg/L)					
	Bismuth (Bi)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					
	Lithium (Li)-Total (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478849-6	L1478849-7	L1478849-8	L1478849-9	L1478849-10
	Description	Water	Water	Water	Water	Water
	Sampled Date	28-JUN-14	28-JUN-14	28-JUN-14	28-JUN-14	28-JUN-14
	Sampled Time	07:40	12:41	11:40	12:00	12:41
	Client ID	MW09-23	MW09-08	FB-3	TRAVEL BLANK	DUP-5
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	2400	277	<2.0	<2.0	277
	Hardness (as CaCO3) (mg/L)	1350	139	<0.50	<0.50	139
	pH (pH)	7.83	7.49	5.53	5.22	7.30
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	326	147	<2.0	<2.0	147
	Ammonia, Total (as N) (mg/L)	7.77 DLA	2.01	<0.0050	0.0216 RRV	2.00
	Chloride (Cl) (mg/L)	<10 DLA	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	<0.40 DLA	0.077	<0.020	<0.020	0.071
	Nitrate (as N) (mg/L)	<0.10 DLA	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.020 DLA	0.0017	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	11.8	2.90	<0.050	<0.050	2.67
	Sulfate (SO4) (mg/L)	1300	12.9	<0.50	<0.50	12.8
	Sulphide as S (mg/L)	<0.020	0.069	<0.020	<0.020	0.075
	Anion Sum (meq/L)	33.7	3.20	<0.10	<0.10	3.20
	Cation Sum (meq/L)	32.6	5.71	<0.10	<0.10	5.71
	Cation - Anion Balance (%)	-1.6	28.1	0.0	0.0	28.2
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	0.0097	<0.0050	<0.0050	<0.0050	<0.0050
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	67.0	33.2	<0.50	<0.50	30.9
	Total Organic Carbon (mg/L)	14.0	18.3	<0.50	<0.50	17.8
Total Metals	Aluminum (Al)-Total (mg/L)				<0.0030	
	Antimony (Sb)-Total (mg/L)				<0.00010	
	Arsenic (As)-Total (mg/L)				<0.00010	
	Barium (Ba)-Total (mg/L)				<0.000050	
	Beryllium (Be)-Total (mg/L)				<0.00010	
	Bismuth (Bi)-Total (mg/L)				<0.00050	
	Boron (B)-Total (mg/L)				<0.010	
	Cadmium (Cd)-Total (mg/L)				<0.000010	
	Calcium (Ca)-Total (mg/L)				<0.050	
	Chromium (Cr)-Total (mg/L)				<0.00010	
	Cobalt (Co)-Total (mg/L)				<0.00010	
	Copper (Cu)-Total (mg/L)				<0.00050	
	Iron (Fe)-Total (mg/L)				<0.010	
	Lead (Pb)-Total (mg/L)				<0.000050	
	Lithium (Li)-Total (mg/L)				<0.00050	

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-11 Water 29-JUN-14 12:35 GSI-DC-09-B	L1478849-12 Water 29-JUN-14 14:38 GSI-DC-10-B	L1478849-13 Water 29-JUN-14 07:40 MW09-07	L1478849-14 Water 29-JUN-14 13:18 MP09-12	L1478849-15 Water 29-JUN-14 16:15 GSI-DC-07-B
WATER						
Physical Tests	Conductivity (uS/cm)	1510	1040	2240	746	1020
	Hardness (as CaCO3) (mg/L)	816	513	1300	444	554
	pH (pH)	7.49	6.71	7.60	8.16	7.48
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	145	72.1	225	429	131
	Ammonia, Total (as N) (mg/L)	3.03	2.32	4.60	3.91	1.81
	Chloride (Cl) (mg/L)	<5.0 DLA	<5.0 DLA	<10 DLA	<0.50	<5.0 DLA
	Fluoride (F) (mg/L)	<0.20 DLA	<0.20 DLA	<0.40 DLA	0.356	<0.20 DLA
	Nitrate (as N) (mg/L)	<0.050 DLA	<0.050 DLA	<0.10 DLA	0.0218	<0.050 DLA
	Nitrite (as N) (mg/L)	<0.010 DLA	<0.010 DLA	<0.020 DLA	0.0017	<0.010 DLA
	Total Kjeldahl Nitrogen (mg/L)	4.47	3.63	6.55	4.60	2.27
	Sulfate (SO4) (mg/L)	820	519	1320	48.5	466
	Sulphide as S (mg/L)	0.024	<0.020	0.097	<0.020	<0.020
	Anion Sum (meq/L)	20.0	12.2	32.0	9.60	12.3
	Cation Sum (meq/L)	22.4	16.4	32.0	9.75	13.9
	Cation - Anion Balance (%)	5.7	14.4	0.0	0.8	6.1
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	0.0099	<0.0050	<0.0050	0.0367	<0.0050
	Thiocyanate (SCN) (mg/L)	0.52	0.70	<0.50	<0.50	<0.50
	Cyanide, Free (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	29.9	13.6	46.0	89.8	17.2
	Total Organic Carbon (mg/L)	29.5	29.6	20.3	13.8	13.0
Total Metals	Aluminum (Al)-Total (mg/L)					
	Antimony (Sb)-Total (mg/L)					
	Arsenic (As)-Total (mg/L)					
	Barium (Ba)-Total (mg/L)					
	Beryllium (Be)-Total (mg/L)					
	Bismuth (Bi)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					
	Lithium (Li)-Total (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-16 Water 29-JUN-14 14:40 GSI-DC-06-B	L1478849-17 Water 29-JUN-14 12:25 MP09-09	L1478849-18 Water 29-JUN-14 13:39 MP09-11	L1478849-19 Water 29-JUN-14 11:07 MW09-17	L1478849-20 Water 29-JUN-14 16:15 FB-4
WATER						
Physical Tests	Conductivity (uS/cm)	1260	489	888	2800	<2.0
	Hardness (as CaCO3) (mg/L)	587	197	485	2010	<0.50
	pH (pH)	8.20	8.74	8.14	7.94	5.42
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	204	80.2	581	451	<2.0
	Ammonia, Total (as N) (mg/L)	2.92	4.12	5.03	<0.0050	<0.0050
	Chloride (Cl) (mg/L)	<5.0 DLA	2.50	<5.0 DLA	<10 DLA	<0.50
	Fluoride (F) (mg/L)	<0.20 DLA	1.65	0.49	<0.40 DLA	<0.020
	Nitrate (as N) (mg/L)	0.277	0.0191	<0.050 DLA	0.11	<0.0050
	Nitrite (as N) (mg/L)	0.020	0.0063	<0.010 DLA	<0.020 DLA	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	6.67	5.38	9.0	0.092	<0.050
	Sulfate (SO4) (mg/L)	583	136	31.2	1590	<0.50
	Sulphide as S (mg/L)	<0.020	<0.10 DLM	0.030	<0.020	<0.020
	Anion Sum (meq/L)	16.2	4.59	12.3	42.0	<0.10
	Cation Sum (meq/L)	14.2	5.46	12.0	40.9	<0.10
	Cation - Anion Balance (%)	-6.8	8.7	-1.4	-1.4	0.0
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	0.0319	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	0.292	0.0323	<0.0050	<0.0050
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	0.62	<0.50	<0.50
	Cyanide, Free (mg/L)	<0.0050	0.0176	<0.0050	<0.0050	<0.0050
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	19.7	9.20	89.1	108	<0.50
	Total Organic Carbon (mg/L)	74.3	28.3	48.4	2.49	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)					
	Antimony (Sb)-Total (mg/L)					
	Arsenic (As)-Total (mg/L)					
	Barium (Ba)-Total (mg/L)					
	Beryllium (Be)-Total (mg/L)					
	Bismuth (Bi)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					
	Lithium (Li)-Total (mg/L)					

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478849-21				
	Description	Water				
	Sampled Date	29-JUN-14				
	Sampled Time	17:30				
	Client ID	MP09-10				
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	683				
	Hardness (as CaCO3) (mg/L)	280				
	pH (pH)	9.07				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	108				
	Ammonia, Total (as N) (mg/L)	7.74				
	Chloride (Cl) (mg/L)	2.84				
	Fluoride (F) (mg/L)	1.63				
	Nitrate (as N) (mg/L)	0.0306				
	Nitrite (as N) (mg/L)	0.0023				
	Total Kjeldahl Nitrogen (mg/L)	33.7				
	Sulfate (SO4) (mg/L)	253				
	Sulphide as S (mg/L)	<0.020				
	Anion Sum (meq/L)	7.60				
	Cation Sum (meq/L)	7.66				
	Cation - Anion Balance (%)	0.3				
Cyanides	Cyanide, Weak Acid Diss (mg/L)	3.49				
	Cyanide, Total (mg/L)	49.9				
	Thiocyanate (SCN) (mg/L)	0.85				
	Cyanide, Free (mg/L)	3.22				
Organic / Inorganic Carbon	Total Inorganic Carbon (mg/L)	66.4				
	Total Organic Carbon (mg/L)	45.6				
Total Metals	Aluminum (Al)-Total (mg/L)					
	Antimony (Sb)-Total (mg/L)					
	Arsenic (As)-Total (mg/L)					
	Barium (Ba)-Total (mg/L)					
	Beryllium (Be)-Total (mg/L)					
	Bismuth (Bi)-Total (mg/L)					
	Boron (B)-Total (mg/L)					
	Cadmium (Cd)-Total (mg/L)					
	Calcium (Ca)-Total (mg/L)					
	Chromium (Cr)-Total (mg/L)					
	Cobalt (Co)-Total (mg/L)					
	Copper (Cu)-Total (mg/L)					
	Iron (Fe)-Total (mg/L)					
	Lead (Pb)-Total (mg/L)					
	Lithium (Li)-Total (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-1 Water 28-JUN-14 18:00 MW09-21	L1478849-2 Water 28-JUN-14 17:00 MP09-05	L1478849-3 Water 28-JUN-14 07:30 CH-P-13-03/50	L1478849-4 Water 28-JUN-14 11:40 MP09-04	L1478849-5 Water 28-JUN-14 10:20 MW09-24
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)					
	Manganese (Mn)-Total (mg/L)					
	Mercury (Hg)-Total (mg/L)					
	Molybdenum (Mo)-Total (mg/L)					
	Nickel (Ni)-Total (mg/L)					
	Phosphorus (P)-Total (mg/L)					
	Potassium (K)-Total (mg/L)					
	Selenium (Se)-Total (mg/L)					
	Silicon (Si)-Total (mg/L)					
	Silver (Ag)-Total (mg/L)					
	Sodium (Na)-Total (mg/L)					
	Strontium (Sr)-Total (mg/L)					
	Sulfur (S)-Total (mg/L)					
	Thallium (Tl)-Total (mg/L)					
	Tin (Sn)-Total (mg/L)					
	Titanium (Ti)-Total (mg/L)					
	Uranium (U)-Total (mg/L)					
	Vanadium (V)-Total (mg/L)					
	Zinc (Zn)-Total (mg/L)					
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0588	0.0224	0.0115	0.0017	0.0033
	Antimony (Sb)-Dissolved (mg/L)	0.00031	0.00040	0.00105	0.00185	0.00033
	Arsenic (As)-Dissolved (mg/L)	0.0576	0.0276	0.00422	0.00097	0.00319
	Barium (Ba)-Dissolved (mg/L)	0.147	0.0811	0.0447	0.0807	0.0607
	Beryllium (Be)-Dissolved (mg/L)	<0.00020 DLA	<0.00020 DLA	<0.00020 DLA	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010 DLA	<0.0010 DLA	<0.0010 DLA	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	0.110	0.122	0.040	0.017	0.014
	Cadmium (Cd)-Dissolved (mg/L)	0.000029	0.000961	0.000134	0.000090	0.000100
	Calcium (Ca)-Dissolved (mg/L)	474	449	268	260	241
	Chromium (Cr)-Dissolved (mg/L)	0.00087	0.00079	<0.00020 DLA	0.00027	0.00035
	Cobalt (Co)-Dissolved (mg/L)	0.0160	0.0157	0.0212	0.00022	0.00014
	Copper (Cu)-Dissolved (mg/L)	<0.00040 DLA	0.00378	0.00095	0.00267	0.00911
	Iron (Fe)-Dissolved (mg/L)	45.0	21.5	1.72	<0.010	0.014
	Lead (Pb)-Dissolved (mg/L)	<0.00010 DLA	<0.00010 DLA	0.00027	<0.000050	0.000974
	Lithium (Li)-Dissolved (mg/L)	<0.0010 DLA	<0.0010 DLA	0.0035	0.00079	0.00096
	Magnesium (Mg)-Dissolved (mg/L)	101	57.4	90.7	102	74.1

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-6 Water 28-JUN-14 07:40 MW09-23	L1478849-7 Water 28-JUN-14 12:41 MW09-08	L1478849-8 Water 28-JUN-14 11:40 FB-3	L1478849-9 Water 28-JUN-14 12:00 TRAVEL BLANK	L1478849-10 Water 28-JUN-14 12:41 DUP-5
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)				<0.10	
	Manganese (Mn)-Total (mg/L)				<0.000050	
	Mercury (Hg)-Total (mg/L)				<0.000010	
	Molybdenum (Mo)-Total (mg/L)				<0.000050	
	Nickel (Ni)-Total (mg/L)				<0.00050	
	Phosphorus (P)-Total (mg/L)				<0.050	
	Potassium (K)-Total (mg/L)				<0.10	
	Selenium (Se)-Total (mg/L)				<0.00010	
	Silicon (Si)-Total (mg/L)				<0.050	
	Silver (Ag)-Total (mg/L)				<0.000010	
	Sodium (Na)-Total (mg/L)				<0.050	
	Strontium (Sr)-Total (mg/L)				<0.00020	
	Sulfur (S)-Total (mg/L)				<0.50	
	Thallium (Tl)-Total (mg/L)				<0.000010	
	Tin (Sn)-Total (mg/L)				<0.00010	
	Titanium (Ti)-Total (mg/L)				<0.010	
	Uranium (U)-Total (mg/L)				<0.000010	
	Vanadium (V)-Total (mg/L)				<0.0010	
	Zinc (Zn)-Total (mg/L)				<0.0030	
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD		FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD		FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0154	0.0686	<0.0010		0.0693
	Antimony (Sb)-Dissolved (mg/L)	0.00034	0.00024	<0.00010		0.00024
	Arsenic (As)-Dissolved (mg/L)	0.00119	0.198	<0.00010		0.197
	Barium (Ba)-Dissolved (mg/L)	0.0649	0.128	<0.000050		0.127
	Beryllium (Be)-Dissolved (mg/L)	<0.00020 DLA	<0.00010	<0.00010		<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010 DLA	<0.00050	<0.00050		<0.00050
	Boron (B)-Dissolved (mg/L)	0.180	<0.010	<0.010		<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000032	<0.000010	<0.000010		<0.000010
	Calcium (Ca)-Dissolved (mg/L)	355	41.6	<0.050		42.0
	Chromium (Cr)-Dissolved (mg/L)	0.00026	0.00093	<0.00010		0.00096
	Cobalt (Co)-Dissolved (mg/L)	0.0258	0.00124	<0.00010		0.00117
	Copper (Cu)-Dissolved (mg/L)	<0.00040 DLA	<0.00020	<0.00020		<0.00020
	Iron (Fe)-Dissolved (mg/L)	6.21	47.7	<0.010		47.6
	Lead (Pb)-Dissolved (mg/L)	<0.00010 DLA	0.000052	<0.000050		0.000059
	Lithium (Li)-Dissolved (mg/L)	<0.0010 DLA	<0.00050	<0.00050		<0.00050
	Magnesium (Mg)-Dissolved (mg/L)	113	8.43	<0.10		8.37

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-11 Water 29-JUN-14 12:35 GSI-DC-09-B	L1478849-12 Water 29-JUN-14 14:38 GSI-DC-10-B	L1478849-13 Water 29-JUN-14 07:40 MW09-07	L1478849-14 Water 29-JUN-14 13:18 MP09-12	L1478849-15 Water 29-JUN-14 16:15 GSI-DC-07-B
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)					
	Manganese (Mn)-Total (mg/L)					
	Mercury (Hg)-Total (mg/L)					
	Molybdenum (Mo)-Total (mg/L)					
	Nickel (Ni)-Total (mg/L)					
	Phosphorus (P)-Total (mg/L)					
	Potassium (K)-Total (mg/L)					
	Selenium (Se)-Total (mg/L)					
	Silicon (Si)-Total (mg/L)					
	Silver (Ag)-Total (mg/L)					
	Sodium (Na)-Total (mg/L)					
	Strontium (Sr)-Total (mg/L)					
	Sulfur (S)-Total (mg/L)					
	Thallium (Tl)-Total (mg/L)					
	Tin (Sn)-Total (mg/L)					
	Titanium (Ti)-Total (mg/L)					
	Uranium (U)-Total (mg/L)					
	Vanadium (V)-Total (mg/L)					
	Zinc (Zn)-Total (mg/L)					
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0205	0.142	0.0306	0.0018	0.0087
	Antimony (Sb)-Dissolved (mg/L)	0.00033	0.00031	0.00850	0.0331	0.00020
	Arsenic (As)-Dissolved (mg/L)	0.0361	0.0931	0.564	5.41	0.167
	Barium (Ba)-Dissolved (mg/L)	0.0702	0.443	0.0270	0.0532	0.158
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00020 DLA	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.0010 DLA	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	0.015	<0.010	0.089	0.052	0.012
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000011	0.000049	0.000313	<0.000010
	Calcium (Ca)-Dissolved (mg/L)	199	147	396	103	153
	Chromium (Cr)-Dissolved (mg/L)	0.00049	0.00207	0.00040	0.00029	0.00035
	Cobalt (Co)-Dissolved (mg/L)	0.00340	0.0153	0.0243	0.00169	0.00298
	Copper (Cu)-Dissolved (mg/L)	0.00024	<0.00020	0.00224	0.00052	<0.00020
	Iron (Fe)-Dissolved (mg/L)	61.7	82.4	34.2	3.89	31.5
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000139	0.00024	0.00631	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.00059	0.00054	0.0082	0.00208	0.00167
	Magnesium (Mg)-Dissolved (mg/L)	77.7	35.5	76.6	45.6	41.5

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478849-16	L1478849-17	L1478849-18	L1478849-19	L1478849-20
	Description	Water	Water	Water	Water	Water
	Sampled Date	29-JUN-14	29-JUN-14	29-JUN-14	29-JUN-14	29-JUN-14
	Sampled Time	14:40	12:25	13:39	11:07	16:15
	Client ID	GSI-DC-06-B	MP09-09	MP09-11	MW09-17	FB-4
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)					
	Manganese (Mn)-Total (mg/L)					
	Mercury (Hg)-Total (mg/L)					
	Molybdenum (Mo)-Total (mg/L)					
	Nickel (Ni)-Total (mg/L)					
	Phosphorus (P)-Total (mg/L)					
	Potassium (K)-Total (mg/L)					
	Selenium (Se)-Total (mg/L)					
	Silicon (Si)-Total (mg/L)					
	Silver (Ag)-Total (mg/L)					
	Sodium (Na)-Total (mg/L)					
	Strontium (Sr)-Total (mg/L)					
	Sulfur (S)-Total (mg/L)					
	Thallium (Tl)-Total (mg/L)					
	Tin (Sn)-Total (mg/L)					
	Titanium (Ti)-Total (mg/L)					
	Uranium (U)-Total (mg/L)					
	Vanadium (V)-Total (mg/L)					
	Zinc (Zn)-Total (mg/L)					
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0507	0.0048	0.0050	<0.0020 DLA	<0.0010
	Antimony (Sb)-Dissolved (mg/L)	0.00034	0.0897	0.0195	0.00043	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.303	18.7	11.3	0.0207	<0.00010
	Barium (Ba)-Dissolved (mg/L)	0.220	0.00127	0.0884	0.00842	<0.000050
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00020 DLA	<0.00020 DLA	<0.00020 DLA	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.0010 DLA	<0.0010 DLA	<0.0010 DLA	<0.00050
	Boron (B)-Dissolved (mg/L)	0.014	0.299	0.037	0.096	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000102	<0.000020 DLA	<0.000020 DLA	<0.000010
	Calcium (Ca)-Dissolved (mg/L)	143	77.6	112	367	<0.050
	Chromium (Cr)-Dissolved (mg/L)	0.00472	<0.00020 DLA	0.00152	<0.00020 DLA	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00282	0.0402	0.00189	<0.00020 DLA	<0.00010
	Copper (Cu)-Dissolved (mg/L)	<0.00020	0.383	0.00049	0.00056	<0.00020
	Iron (Fe)-Dissolved (mg/L)	20.5	0.401	11.7	<0.010	<0.010
	Lead (Pb)-Dissolved (mg/L)	0.000055	0.00185	0.00144	<0.00010 DLA	<0.000050
	Lithium (Li)-Dissolved (mg/L)	<0.00050	<0.0010 DLA	0.0031	0.0201	<0.00050
	Magnesium (Mg)-Dissolved (mg/L)	55.5	0.81	49.8	266	<0.10

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478849-21				
	Description	Water				
	Sampled Date	29-JUN-14				
	Sampled Time	17:30				
	Client ID	MP09-10				
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)					
	Manganese (Mn)-Total (mg/L)					
	Mercury (Hg)-Total (mg/L)					
	Molybdenum (Mo)-Total (mg/L)					
	Nickel (Ni)-Total (mg/L)					
	Phosphorus (P)-Total (mg/L)					
	Potassium (K)-Total (mg/L)					
	Selenium (Se)-Total (mg/L)					
	Silicon (Si)-Total (mg/L)					
	Silver (Ag)-Total (mg/L)					
	Sodium (Na)-Total (mg/L)					
	Strontium (Sr)-Total (mg/L)					
	Sulfur (S)-Total (mg/L)					
	Thallium (Tl)-Total (mg/L)					
	Tin (Sn)-Total (mg/L)					
	Titanium (Ti)-Total (mg/L)					
	Uranium (U)-Total (mg/L)					
	Vanadium (V)-Total (mg/L)					
	Zinc (Zn)-Total (mg/L)					
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD				
	Dissolved Metals Filtration Location	FIELD				
	Aluminum (Al)-Dissolved (mg/L)	0.0088				
	Antimony (Sb)-Dissolved (mg/L)	0.0907				
	Arsenic (As)-Dissolved (mg/L)	9.72				
	Barium (Ba)-Dissolved (mg/L)	0.00083				
	Beryllium (Be)-Dissolved (mg/L)	<0.00020 DLA				
	Bismuth (Bi)-Dissolved (mg/L)	<0.0010 DLA				
	Boron (B)-Dissolved (mg/L)	0.342				
	Cadmium (Cd)-Dissolved (mg/L)	0.000658				
	Calcium (Ca)-Dissolved (mg/L)	111				
	Chromium (Cr)-Dissolved (mg/L)	<0.00020 DLA				
	Cobalt (Co)-Dissolved (mg/L)	0.0468				
	Copper (Cu)-Dissolved (mg/L)	0.0349				
	Iron (Fe)-Dissolved (mg/L)	0.229				
	Lead (Pb)-Dissolved (mg/L)	0.00280				
	Lithium (Li)-Dissolved (mg/L)	<0.0010 DLA				
	Magnesium (Mg)-Dissolved (mg/L)	0.88				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478849-1	L1478849-2	L1478849-3	L1478849-4	L1478849-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	28-JUN-14	28-JUN-14	28-JUN-14	28-JUN-14	28-JUN-14
	Sampled Time	18:00	17:00	07:30	11:40	10:20
	Client ID	MW09-21	MP09-05	CH-P-13-03/50	MP09-04	MW09-24
Grouping	**Analyte**					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	14.9	10.6	16.7	0.00340	0.00292
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00043	0.00053	0.00404	0.000162	0.000305
	Nickel (Ni)-Dissolved (mg/L)	0.0016	0.0036	0.0339	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	12.9	9.57	8.84	2.72	1.85
	Selenium (Se)-Dissolved (mg/L)	DLA <0.00020	DLA <0.00020	0.00089	0.00012	0.00020
	Silicon (Si)-Dissolved (mg/L)	4.91	5.68	7.15	6.69	5.48
	Silver (Ag)-Dissolved (mg/L)	DLA <0.000020	DLA <0.000020	DLA <0.000020	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	26.3	80.6	131	12.8	8.30
	Strontium (Sr)-Dissolved (mg/L)	1.29	1.13	0.777	0.927	0.632
	Sulfur (S)-Dissolved (mg/L)	433	398	316	265	199
	Thallium (Tl)-Dissolved (mg/L)	DLA <0.000020	0.000045	0.000029	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	DLA <0.00020	DLA <0.00020	0.00107	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	DLA <0.020	DLA <0.020	DLA <0.020	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00193	0.00205	0.00809	0.00247	0.00584
	Vanadium (V)-Dissolved (mg/L)	0.0039	DLA <0.0020	DLA <0.0020	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0025	0.0130	0.0317	0.0036	0.0021

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-6 Water 28-JUN-14 07:40 MW09-23	L1478849-7 Water 28-JUN-14 12:41 MW09-08	L1478849-8 Water 28-JUN-14 11:40 FB-3	L1478849-9 Water 28-JUN-14 12:00 TRAVEL BLANK	L1478849-10 Water 28-JUN-14 12:41 DUP-5
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	12.2	3.52	<0.000050		3.45
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00611	0.000071	<0.000050		0.000075
	Nickel (Ni)-Dissolved (mg/L)	0.0020	<0.00050	<0.00050		<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.050	0.104	<0.050		0.102
	Potassium (K)-Dissolved (mg/L)	15.7	1.45	<0.10		1.42
	Selenium (Se)-Dissolved (mg/L)	<0.00020 DLA	0.00011	<0.00010		0.00011
	Silicon (Si)-Dissolved (mg/L)	5.35	9.30	<0.050		9.28
	Silver (Ag)-Dissolved (mg/L)	<0.000020 DLA	<0.000010	<0.000010		<0.000010
	Sodium (Na)-Dissolved (mg/L)	89.7	1.44	<0.050		1.41
	Strontium (Sr)-Dissolved (mg/L)	0.873	0.182	<0.00020		0.184
	Sulfur (S)-Dissolved (mg/L)	405	3.99	<0.50		3.94
	Thallium (Tl)-Dissolved (mg/L)	<0.000020 DLA	<0.000010	<0.000010		<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00020 DLA	<0.00010	<0.00010		<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.020 DLA	<0.010	<0.010		<0.010
	Uranium (U)-Dissolved (mg/L)	0.00311	0.000077	<0.000010		0.000079
	Vanadium (V)-Dissolved (mg/L)	<0.0020 DLA	0.0030	<0.0010		0.0030
	Zinc (Zn)-Dissolved (mg/L)	0.0299	0.0017	<0.0010		0.0013

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-11 Water 29-JUN-14 12:35 GSI-DC-09-B	L1478849-12 Water 29-JUN-14 14:38 GSI-DC-10-B	L1478849-13 Water 29-JUN-14 07:40 MW09-07	L1478849-14 Water 29-JUN-14 13:18 MP09-12	L1478849-15 Water 29-JUN-14 16:15 GSI-DC-07-B
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	1.97	11.0	15.4	2.70	2.41
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.000346	0.000565	0.00343	0.00255	0.000363
	Nickel (Ni)-Dissolved (mg/L)	0.00176	0.00386	0.0231	0.00521	0.00103
	Phosphorus (P)-Dissolved (mg/L)	0.142	<0.050	<0.050	0.097	0.061
	Potassium (K)-Dissolved (mg/L)	3.90	2.54	22.1	5.23	3.25
	Selenium (Se)-Dissolved (mg/L)	0.00027	0.00023	<0.00020 DLA	<0.00010	<0.00010
	Silicon (Si)-Dissolved (mg/L)	6.51	8.18	10.1	9.61	6.95
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	0.000113	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	54.4	24.3	59.5	3.50	20.0
	Strontium (Sr)-Dissolved (mg/L)	0.633	0.555	0.915	0.468	0.474
	Sulfur (S)-Dissolved (mg/L)	246	162	396	16.3	148
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000016	<0.000020 DLA	0.000084	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00020 DLA	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.020 DLA	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000157	0.000294	0.00315	0.000713	0.000067
	Vanadium (V)-Dissolved (mg/L)	0.0017	0.0107	<0.0020 DLA	<0.0010	0.0013
	Zinc (Zn)-Dissolved (mg/L)	0.0024	0.0088	1.61	0.0403	0.0012

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1478849-16 Water 29-JUN-14 14:40 GSI-DC-06-B	L1478849-17 Water 29-JUN-14 12:25 MP09-09	L1478849-18 Water 29-JUN-14 13:39 MP09-11	L1478849-19 Water 29-JUN-14 11:07 MW09-17	L1478849-20 Water 29-JUN-14 16:15 FB-4
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	4.87	0.0591	4.15	0.0369	<0.000050
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	0.000036	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)	0.00960	0.0130	0.00818	<0.00010 DLA	<0.000050
	Nickel (Ni)-Dissolved (mg/L)	0.0194	0.0143	0.0093	<0.0010 DLA	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	0.159	0.179	0.083	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	3.53	8.18	8.22	7.58	<0.10
	Selenium (Se)-Dissolved (mg/L)	0.00051	0.00183	0.00032	<0.00020 DLA	<0.00010
	Silicon (Si)-Dissolved (mg/L)	10.1	8.71	10.8	5.00	<0.050
	Silver (Ag)-Dissolved (mg/L)	<0.000010	0.00189	<0.000020 DLA	<0.000020 DLA	<0.000010
	Sodium (Na)-Dissolved (mg/L)	19.7	22.7	21.0	11.7	<0.050
	Strontium (Sr)-Dissolved (mg/L)	0.726	0.146	0.596	1.10	<0.00020
	Sulfur (S)-Dissolved (mg/L)	1.61	132 DLA	11.9 DLA	482	<0.50
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000020 DLA	<0.000020 DLA	0.000103	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00020 DLA	<0.00020 DLA	<0.00020 DLA	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.020 DLA	<0.020 DLA	<0.020 DLA	<0.010
	Uranium (U)-Dissolved (mg/L)	0.000084	0.000542	0.000762	0.00794	<0.000010
	Vanadium (V)-Dissolved (mg/L)	0.0131	<0.0020 DLA	0.0056	<0.0020 DLA	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0063	0.0090	0.0206	<0.0020 DLA	<0.0010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1478849-21				
	Description	Water				
	Sampled Date	29-JUN-14				
	Sampled Time	17:30				
	Client ID	MP09-10				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Manganese (Mn)-Dissolved (mg/L)	0.0291				
	Mercury (Hg)-Dissolved (mg/L)	<0.000050 DLIV				
	Molybdenum (Mo)-Dissolved (mg/L)	0.0142				
	Nickel (Ni)-Dissolved (mg/L)	0.0146				
	Phosphorus (P)-Dissolved (mg/L)	0.199				
	Potassium (K)-Dissolved (mg/L)	10.5				
	Selenium (Se)-Dissolved (mg/L)	0.00150				
	Silicon (Si)-Dissolved (mg/L)	6.67				
	Silver (Ag)-Dissolved (mg/L)	0.00891				
	Sodium (Na)-Dissolved (mg/L)	28.1				
	Strontium (Sr)-Dissolved (mg/L)	0.180				
	Sulfur (S)-Dissolved (mg/L)	116				
	Thallium (Tl)-Dissolved (mg/L)	0.000046				
	Tin (Sn)-Dissolved (mg/L)	<0.00020 DLA				
	Titanium (Ti)-Dissolved (mg/L)	<0.020 DLA				
	Uranium (U)-Dissolved (mg/L)	0.000975				
	Vanadium (V)-Dissolved (mg/L)	<0.0020 DLA				
	Zinc (Zn)-Dissolved (mg/L)	0.0082				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Total Organic Carbon	MS-B	L1478849-10, -11, -12, -14, -15, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -8, -9
Matrix Spike	Total Organic Carbon	MS-B	L1478849-1, -13, -16, -7
Matrix Spike	Total Inorganic Carbon	MS-B	L1478849-1, -10, -11, -12, -13, -14, -15, -16, -17, -19, -2, -20, -21, -4, -5, -6, -8
Matrix Spike	Total Inorganic Carbon	MS-B	L1478849-1, -10, -11, -12, -13, -14, -15, -16, -17, -19, -2, -20, -21, -4, -5, -6, -8
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1478849-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1478849-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1478849-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1478849-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1478849-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -3, -4, -5, -6, -7, -8
Matrix Spike	Total Inorganic Carbon	MS-B	L1478849-18, -3, -7, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
CNP	Cyanide test sample appears to have been preserved, but pH was <10 at time of testing. Results may be biased low, particularly for Free CN species.
DLA	Detection Limit adjusted for required dilution
DLIV	Detection Limit Adjusted: Lower Initial Volume
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

ANIONS-CL-IC-WR	Water	Chloride by Ion Chromatography	EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

ANIONS-F-IC-WR	Water	Fluoride by Ion Chromatography	EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

ANIONS-NO2-IC-WR	Water	Nitrite Nitrogen by Ion Chromatography	EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-NO3-IC-WR	Water	Nitrate Nitrogen by Ion Chromatography	EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-SO4-IC-WR	Water	Sulphate by Ion Chromatography	EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

CARBONS-TIC-VA	Water	Total inorganic carbon by CO2 purge	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

Reference Information

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CN-FREE-CFA-VA Water Free Cyanide in water by CFA ASTM 7237

This analysis is carried out using procedures adapted from ASTM Method 7237 "Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection". Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.

CN-SCN-VA Water Thiocyanate by Colour APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN- M "Thiocyanate" Thiocyanate is determined by the ferric nitrate colourimetric method.

CN-T-CFA-VA Water Total Cyanide in water by CFA ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

CN-WAD-CFA-VA Water Weak Acid Diss. Cyanide in water by CFA APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-DIS-LOW-CVAFS-VA Water Dissolved Mercury in Water by CVAFS(Low) EPA SW-846 3005A & EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-LOW-CVAFS-VA Water Total Mercury in Water by CVAFS(Low) EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Reference Information

MET-TOT-LOW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

NH3-F-VA	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA	Water	Total Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S2-T-COL-VA	Water	Total Sulphide by Colorimetric	APHA 4500-S2 Sulphide

This analysis is carried out using procedures adapted from APHA Method 4500-S2 "Sulphide". Sulphide is determined using the methlyene blue colourimetric method.

TKN-F-VA	Water	TKN in Water by Fluorescence	APHA 4500-NORG D.

This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1 2

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1478849-COFC

COC Number: 1 -

Report To	
Company:	Hemmera Environchem Inc.
Contact:	Natasha Sandys
Address:	230 - 2237 2nd Avenue, Whitehorse, YT
Phone:	867-456-4865

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ Yes ☐ No
☐ Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: nsandys@hemmera.com, rmartinka@hemmera.com
Email 2: chris@elr.ca

Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)

- R ☑ Regular (Standard TAT if received by 3 pm - business days)
- P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
- E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
- E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge

Specify Date Required for E2,E or P:

Invoice To	
Same as Report To	☑ Yes ☐ No
Copy of Invoice with Report	☐ Yes ☑ No
Company:	Hemmera Environchem Inc.
Contact:	Natasha Sandys

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☑ MAIL ☐ FAX
Email 1 or Fax: nsandys@hemmera.com
Email 2: chris@elr.ca

Project Information

ALS Quote #:	Q45291
Job #:	1343-005.03
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

Approver ID: | Cost Center:
GL Account: | Routing Code:
Activity Code:
Location:

ALS Lab Work Order # (lab use only):
ALS Contact:
Sampler: RM, AB, AN, MN

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

Columns: (1) Conductivity, pH, Hardness (as CaCO3); (2) Total Alkalinity (as CaCO3); (3) Ammonia N (total), Total Kjeldahl N (TKN); (4) Nitrate, Nitrite; (5) Cl, Fl, Sulfate (SO4); (6) Sulphide as S; (7) Anion Sum, Cation Sum, Cation/Anion Balan; (8) Cyanide - Weak Acid Diss.; (9) Cyanide, Total; (10) Cyanide, Free; (11) Thiocyanate; (12) Total Inorganic Carbon, Total Organic Carbo; (13) Dissolved Metals, including Mercury (F/P)

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	1	2	3	4	5	6	7	8	9	10	11	12	13	Number of Containers
	MW09-21	28-Jun-14	16:00	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MP09-05	28-Jun-14	17:00	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	CH-P-13-03/50	28-Jun-14	7:30	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MP09-04	28-Jun-14	11:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MW09-24	28-Jun-14	10:20	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MW09-23	28-Jun-14	7:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MW09-08	28-Jun-14	12:41	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	FB-3	28-Jun-14	11:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	Travel Blank			Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	DUP-5	28-Jun-14	12:41	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	GSI-DC-09-B	29-Jun-14	12:35	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	GSI-DC-10-B	29-Jun-14	14:38	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	9

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☑ No
Are samples for human drinking water use? ☐ Yes ☑ No

Special Instructions / Specify Criteria to add on report (client Use)

1) See attached parameter sheet for required metals 2) Please hold sulphide analysis until further notified. 3) Please run nitrate , nitrite analysis on sample MP09-10, but hold other analysis until otherwise notified.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐
Ice packs Yes ☐ No ☐ | Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C: 7.8, 5.7 | 3.4 | 4.4, 5.0
FINAL COOLER TEMPERATURES °C:

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: C. Jastrebski	Date: June 30/14	Time: 09:00	Received by: [signature]	Date: 30-JUN-14	Time: 9:15	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1478849-COFC

COC Number: 1 -

Page 2 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hemmera Environchem Inc.	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Natasha Sandys	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	230 - 2237 2nd Avenue Whitehorse, YT	☐ Criteria on Report - provide details below if box checked Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-456-4865	Email 1 or Fax	nsandys@hemmera.com, rmartinka@hemmera.com	Specify Date Required for E2,E or P:
		Email 2	chris@elr.ca	

Invoice To		Invoice Distribution		Analysis Request
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☑ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No	Email 1 or Fax	nsandys@hemmera.com	
Company:	Hemmera Environchem Inc.	Email 2	chris@elr.ca	
Contact:	Natasha Sandys			

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q45291	Approver ID:	Cost Center:
Job #:	1343-005.03	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: RM, AB, AN, MI

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Conductivity, pH, Hardness (as CaCO3)	Total Alkalinity (as CaCO3)	Ammonia N (total), Total Kjeldahl N (TKN)	Nitrate, Nitrite	Cl, Fl, Sulfate (S04)	Sulphide as S	Anion Sum, Cation Sum, Cation/Anion Balan	Cyanide - Weak Acid Diss.	Cyanide, Total	Cyanide, Free	Thiocyanate	Total Inorganic Carbon, Total Organic Carbo	Dissolved Metals, Including Mercury	F/P	Number of Containers
	MW09-07	29-Jun-14	7:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MP09-12	29-Jun-14	13:18	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	GSI-DC-07-B	29-Jun-14	16:15	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	GSI-DC-06-B	29-Jun-14	14:40	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MP09-09	29-Jun-14	12:25	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MP09-11	29-Jun-14	13:39	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MW09-17	29-Jun-14	11:07	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	FB-4	29-Jun-14	16:15	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
	MP09-10	29-Jun-14	17:30	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
				Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
				Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
				Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	1) See attached parameter sheet for required metals 2) Please hold sulphide analysis until further notified. 3) Please run nitrate , nitrite analysis on sample MP09-10, but hold other analysis until otherwise notified.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: C. Jastrebski	Date: Jun-30/14	Time: 09:00	Received by:	Date:	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY