



CERTIFICATE OF ANALYSIS

Date: July 4, 2006

ALS File No. X6417

Report On: 2006 May Polaris Garrow Lake
Seawater Analysis

Report To: **Azimuth Consulting Group Inc.**
218 - 2902 West Broadway
Vancouver, BC
V6K 2G8

Attention: **Ms. Cheryl Mackintosh**

Received: May 26, 2006

ALS ENVIRONMENTAL

per:

Heather A. Ross-Easton, B.Sc. - Account Manager
Andre Langlais, M.Sc. - Senior Account Manager

File No. X6417

REMARKS



The detection limits for some of the metals have been increased for several of the samples reported in the following data tables due to sample matrix interferences.

RESULTS OF ANALYSIS - Seawater

Sample ID	GLS-0m	GLS-1m	GLS-1.5m	GLS-2m	GLS-3m
Sample Date	06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID	1	2	3	4	5

Physical Tests

Conductivity	(uS/cm)	13900	13800	13800	13700	13700
Hardness	CaCO ₃	1860	1820	1790	1840	1820
pH		8.01	8.00	8.00	8.02	8.02
Salinity	o/oo	8.5	8.4	8.4	8.3	8.3
Total Suspended Solids		<3.0	<3.0	6.7	6.0	<3.0

Dissolved Anions

Alkalinity-Total	CaCO ₃	165	160	163	161	162
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Cyanides

Total Cyanide	CN	<0.0050	-	<0.0050	-	<0.0050
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Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Cadmium	T-Cd	0.000656	0.000628	0.000619	0.000569	0.000625
Calcium	T-Ca	166	164	161	166	164
Copper	T-Cu	0.00129	0.00120	0.00112	0.00105	0.00113
Iron	T-Fe	0.024	0.021	0.013	<0.010	<0.010
Lead	T-Pb	0.00173	0.00121	0.000918	0.000438	0.000247
Magnesium	T-Mg	351	342	337	346	343
Mercury	T-Hg	<0.000010	-	<0.000010	-	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.00443	0.00453	0.00441	0.00424	0.00479
Zinc	T-Zn	0.246	0.244	0.255	0.235	0.267

Inorganic Parameters

Sulphide	S	<0.020	<0.020	<0.020	<0.020	<0.020
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RESULTS OF ANALYSIS - Seawater

Sample ID	GLS-4m	GLS-5m	GLS-6m	GLS-7m	GLS-8m
Sample Date	06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID	6	7	8	9	10

Physical Tests

Conductivity	(uS/cm)	13700	13700	13600	13600	13600
Hardness	CaCO ₃	1800	1800	1800	1830	1830
pH		8.02	8.02	8.01	8.01	8.02
Salinity	o/oo	8.4	8.4	8.3	8.3	8.3
Total Suspended Solids		5.3	5.3	6.0	5.3	3.3

Dissolved Anions

Alkalinity-Total	CaCO ₃	159	160	175	161	161
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Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Cadmium	T-Cd	0.000510	0.000519	0.000588	0.000616	0.000582
Calcium	T-Ca	162	163	161	165	165
Copper	T-Cu	0.000889	0.000909	0.00110	0.00107	0.00103
Iron	T-Fe	0.016	<0.010	<0.010	<0.010	<0.010
Lead	T-Pb	0.000193	0.000196	0.000215	0.000230	0.000210
Magnesium	T-Mg	338	338	338	344	344
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.00364	0.00389	0.00427	0.00439	0.00417
Zinc	T-Zn	0.205	0.216	0.243	0.246	0.237

Inorganic Parameters

Sulphide	S	<0.020	<0.020	<0.020	<0.020	<0.020
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RESULTS OF ANALYSIS - Seawater

Sample ID	GLS-9m	GLS-10m	GLS-11m	GLS-12m	GLS-13m
Sample Date	06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID	11	12	13	14	15

Physical Tests

Conductivity	(uS/cm)	20500	64200	82800	83200	84200
Hardness	CaCO ₃	2960	10000	12400	12600	12600
pH		7.86	7.61	7.62	7.62	7.61
Salinity	o/oo	12.9	45.9	61.6	61.9	62.8
Total Suspended Solids		7.3	18.7	26.7	30.0	11.9

Dissolved Anions

Alkalinity-Total	CaCO ₃	165	138	452	454	456
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Cyanides

Total Cyanide	CN	-	0.0204	-	-	-
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Total Metals

Aluminum	T-Al	<0.20	0.26	<0.20	0.22	0.23
Arsenic	T-As	<0.00020	<0.00020	0.00027	0.00026	<0.00020
Cadmium	T-Cd	0.000979	0.00239	0.000045	0.000026	0.000028
Calcium	T-Ca	228	646	777	797	795
Copper	T-Cu	0.00117	0.00282	0.00146	0.00103	0.000773
Iron	T-Fe	<0.010	0.011	0.068	0.102	0.224
Lead	T-Pb	0.000244	0.00181	0.00113	0.000899	0.000904
Magnesium	T-Mg	580	2040	2530	2580	2590
Mercury	T-Hg	-	<0.000010	-	-	-
Molybdenum	T-Mo	<0.0050	<0.010	<0.010	<0.010	<0.010
Nickel	T-Ni	0.00450	0.00854	0.00811	0.00760	0.00622
Zinc	T-Zn	0.374	0.983	0.0981	0.0591	0.0320

Inorganic Parameters

Sulphide	S	<0.020	<0.020	<0.020	0.028	0.105
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RESULTS OF ANALYSIS - Seawater

Sample ID	GLS-14m	GLS-15m	GLS-16m	GLS-17m	GLS-18m
Sample Date	06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID	16	17	18	19	20

Physical Tests

Conductivity	(uS/cm)	83800	83800	84000	84400	83900
Hardness	CaCO ₃	12700	12500	12600	12500	12600
pH		7.55	7.59	7.61	7.61	7.61
Salinity	o/oo	64.4	64.4	62.6	62.9	62.6
Total Suspended Solids		20.7	26.7	30.0	28.0	35.1

Dissolved Anions

Alkalinity-Total	CaCO ₃	456	460	437	457	478
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Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	0.00029	0.00024	0.00027	0.00023
Cadmium	T-Cd	0.000031	0.000028	0.000026	0.000030	0.000021
Calcium	T-Ca	803	794	788	791	787
Copper	T-Cu	0.000794	0.000583	0.000513	0.000536	0.000474
Iron	T-Fe	0.205	0.203	0.191	0.219	0.222
Lead	T-Pb	0.000909	0.000882	0.000894	0.000871	0.000828
Magnesium	T-Mg	2590	2550	2580	2550	2570
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	<0.010	<0.010	<0.010	0.017	<0.010
Nickel	T-Ni	0.00622	0.00593	0.00628	0.00596	0.00518
Zinc	T-Zn	0.0309	0.0301	0.0320	0.0299	0.0262

Inorganic Parameters

Sulphide	S	0.118	0.131	0.138	0.103	0.115
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RESULTS OF ANALYSIS - Seawater

Sample ID	GLS-19m	GLS-20m	GLS-22m	GLC-0m	GLC-1m
Sample Date	06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID	21	22	23	24	25

Physical Tests

Conductivity	(uS/cm)	83900	83700	83700	13800	13800
Hardness	CaCO ₃	12000	12500	12500	1770	1840
pH		7.61	7.61	7.61	8.05	8.02
Salinity	o/oo	62.5	62.3	62.3	8.4	8.4
Total Suspended Solids		17.3	22.7	32.0	6.0	<3.0

Dissolved Anions

Alkalinity-Total	CaCO ₃	481	487	466	164	159
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Cyanides

Total Cyanide	CN	-	-	-	0.376	-
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Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	0.00025	<0.00020	<0.00020	<0.00020
Cadmium	T-Cd	0.000024	0.000028	0.000027	0.00100	0.000602
Calcium	T-Ca	771	787	790	157	164
Copper	T-Cu	0.000569	0.000478	0.000491	0.00191	0.00107
Iron	T-Fe	0.245	0.231	0.220	0.055	<0.010
Lead	T-Pb	0.000940	0.000884	0.000875	0.0155	0.00107
Magnesium	T-Mg	2450	2570	2570	334	348
Mercury	T-Hg	-	-	-	<0.000010	-
Molybdenum	T-Mo	<0.010	<0.010	<0.010	<0.0050	<0.0050
Nickel	T-Ni	0.00637	0.00585	0.00590	0.00417	0.00434
Zinc	T-Zn	0.0318	0.0285	0.0291	0.227	0.246

Inorganic Parameters

Sulphide	S	0.125	0.123	0.134	<0.020	<0.020
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RESULTS OF ANALYSIS - Seawater

Sample ID	GLC-1.5m	GLC-2m	GLC-3m	GLC-4m	GLC-5m
Sample Date	06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID	26	27	28	29	30

Physical Tests

Conductivity	(uS/cm)	13700	13700	13700	13600	13600
Hardness	CaCO ₃	1800	1800	1760	1830	1740
pH		8.01	8.01	7.99	8.02	8.02
Salinity	o/oo	8.4	8.4	8.6	8.3	8.3
Total Suspended Solids		5.3	6.0	7.3	4.7	3.3

Dissolved Anions

Alkalinity-Total	CaCO ₃	150	149	153	152	154
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Cyanides

Total Cyanide	CN	<0.0050	-	<0.0050	-	-
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Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	<0.00020	0.00025	<0.00020	<0.00020
Cadmium	T-Cd	0.000561	0.000575	0.000598	0.000589	0.000621
Calcium	T-Ca	162	161	156	162	155
Copper	T-Cu	0.00101	0.00101	0.00107	0.000957	0.00110
Iron	T-Fe	<0.010	<0.010	<0.010	<0.010	<0.010
Lead	T-Pb	0.000468	0.000240	0.000236	0.000256	0.000277
Magnesium	T-Mg	340	340	333	347	329
Mercury	T-Hg	<0.000010	-	<0.000010	-	-
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.00419	0.00428	0.00458	0.00427	0.00464
Zinc	T-Zn	0.231	0.235	0.241	0.237	0.250

Inorganic Parameters

Sulphide	S	<0.020	<0.020	<0.020	<0.020	<0.020
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RESULTS OF ANALYSIS - Seawater

Sample ID	GLC-6m	GLC-7m	GLC-8m	GLC-9m	GLC-10m
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Sample Date ALS ID	06-05-22 31	06-05-22 32	06-05-22 33	06-05-22 34	06-05-22 35
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Physical Tests

	(uS/cm)				
Conductivity	13600	13600	13600	20000	70600
Hardness	1800	1830	1810	2630	10900
pH	7.99	8.01	8.00	7.88	7.56
Salinity	8.3	8.3	8.3	12.6	51.2
Total Suspended Solids	3.3	5.3	5.3	5.3	3.3

Dissolved Anions

Alkalinity-Total	CaCO3				
	156	153	152	137	348

Cyanides

Total Cyanide	CN				
	-	-	-	-	<0.0050

Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	<0.00020	<0.00020	<0.00020
Cadmium	T-Cd	0.000514	0.000533	0.000534	0.000929
Calcium	T-Ca	160	161	159	207
Copper	T-Cu	0.000865	0.000909	0.000914	0.00107
Iron	T-Fe	<0.010	<0.010	<0.010	<0.010
Lead	T-Pb	0.000209	0.000252	0.000260	0.000239
Magnesium	T-Mg	340	348	342	514
Mercury	T-Hg	-	-	-	-
Molybdenum	T-Mo	0.0052	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.00374	0.00395	0.00406	0.00420
Zinc	T-Zn	0.211	0.218	0.233	0.359

Inorganic Parameters

Sulphide	S				
	<0.020	<0.020	<0.020	<0.020	<0.020

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RESULTS OF ANALYSIS - Seawater

Sample ID		GLC-11m	GLC-12m	GLC-13m	GLC-14m	GLC-15m
Sample Date		06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID		36	37	38	39	40
Physical Tests						
Conductivity	(uS/cm)	82700	83300	83900	84100	84200
Hardness	CaCO ₃	12300	12700	12200	12800	12400
pH		7.62	7.63	7.62	7.63	7.63
Salinity	o/oo	61.5	62.0	62.5	62.7	62.8
Total Suspended Solids		20.0	26.7	25.3	31.3	16.0
Dissolved Anions						
Alkalinity-Total	CaCO ₃	433	426	446	443	441
Total Metals						
Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	0.00042	0.00026	0.00024	<0.00020	<0.00020
Cadmium	T-Cd	0.000032	0.000021	0.000023	0.000025	<0.000020
Calcium	T-Ca	783	806	792	815	789
Copper	T-Cu	0.000747	0.000513	0.000602	0.000487	0.000444
Iron	T-Fe	0.046	0.076	0.142	0.176	0.167
Lead	T-Pb	0.000866	0.000686	0.000674	0.000586	0.000627
Magnesium	T-Mg	2500	2590	2480	2610	2540
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	<0.010	<0.010	<0.010	<0.010	<0.010
Nickel	T-Ni	0.00629	0.00520	0.00459	0.00488	0.00434
Zinc	T-Zn	0.0721	0.0383	0.0226	0.0240	0.0210
Inorganic Parameters						
Sulphide	S	<0.020	<0.020	0.088	0.115	0.117

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RESULTS OF ANALYSIS - Seawater

Sample ID	GLC-16m	GLC-17m	GLC-18m	GLC-19m	GLC-20m
Sample Date	06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID	41	42	43	44	45

Physical Tests

Conductivity	(uS/cm)	84200	84300	84100	83900	83800
Hardness	CaCO ₃	12400	12600	12400	12100	12100
pH		7.63	7.64	7.63	7.63	7.62
Salinity	o/oo	62.8	62.8	62.7	62.5	62.4
Total Suspended Solids		4.0	15.3	14.7	14.0	21.3

Dissolved Anions

Alkalinity-Total	CaCO ₃	432	441	442	448	449
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Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	<0.00020	0.00028	<0.00020	0.00028
Cadmium	T-Cd	0.000026	0.000024	0.000032	0.000029	0.000024
Calcium	T-Ca	773	782	799	775	795
Copper	T-Cu	0.000648	0.00110	0.000662	0.000678	0.000650
Iron	T-Fe	0.232	0.236	0.247	0.244	0.236
Lead	T-Pb	0.000959	0.00103	0.00102	0.00108	0.000980
Magnesium	T-Mg	2530	2580	2520	2470	2470
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	<0.010	<0.010	<0.010	<0.010	0.011
Nickel	T-Ni	0.00601	0.00584	0.00631	0.00641	0.00606
Zinc	T-Zn	0.0300	0.0294	0.0314	0.0351	0.0293

Inorganic Parameters

Sulphide	S	0.102	0.117	0.105	0.110	0.102
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RESULTS OF ANALYSIS - Seawater

Sample ID	GLC-22m	GLC-30m	GLC-40m	GLS-6Am	GLS-20Am
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Sample Date ALS ID	06-05-22 46	06-05-22 47	06-05-22 48	06-05-22 49	06-05-22 50
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Physical Tests

	(uS/cm)					
Conductivity	83800	14300	85200	13800	84400	
Hardness	CaCO ₃	12100	2030	12400	1850	12300
pH		7.62	8.01	7.55	8.04	7.63
Salinity	o/oo	62.4	8.8	63.6	8.4	63.0
Total Suspended Solids		3.3	111	15.2	<3.0	<3.0

Dissolved Anions

	CaCO ₃				
Alkalinity-Total	448	154	438	153	448

Cyanides

	CN				
Total Cyanide	-	-	-	<0.0050	0.0201

Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	0.00023	<0.00020	<0.00020
Cadmium	T-Cd	0.000027	0.00223	0.000200	0.000579
Calcium	T-Ca	790	198	800	168
Copper	T-Cu	0.00132	0.00833	0.00180	0.00107
Iron	T-Fe	0.216	0.431	0.268	<0.010
Lead	T-Pb	0.00102	0.213	0.0351	0.000240
Magnesium	T-Mg	2470	374	2530	347
Mercury	T-Hg	-	-	-	<0.000010
Molybdenum	T-Mo	<0.010	<0.0050	<0.010	<0.0050
Nickel	T-Ni	0.00573	0.00536	0.000810	0.00419
Zinc	T-Zn	0.0301	0.561	0.0558	0.231

Inorganic Parameters

Sulphide	S	0.129	<0.020	3.00	<0.020

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RESULTS OF ANALYSIS - Seawater

Sample ID	GLC-0Am	GLC-9Am	GLC-20Am	GL-BLANK	Travel Blank 1
Sample Date	06-05-22	06-05-22	06-05-22	06-05-22	06-05-22
ALS ID	51	52	53	54	55

Physical Tests

Conductivity	(uS/cm)	13800	20400	83900	-	3.7
Hardness	CaCO ₃	1820	2630	12100	<0.54	<5.4
pH		8.02	7.88	7.62	-	5.87
Salinity	o/oo	8.4	12.9	62.5	-	<1.0
Total Suspended Solids		3.3	7.3	17.3	-	<3.0

Dissolved Anions

Alkalinity-Total	CaCO ₃	156	157	434	-	<2.0
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Cyanides

Total Cyanide	CN	<0.0050	<0.0050	0.0216	-	-
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Total Metals

Aluminum	T-Al	<0.20	<0.20	<0.20	0.0012	<0.0010
Arsenic	T-As	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Cadmium	T-Cd	0.00103	0.000920	0.000028	<0.000020	<0.000050
Calcium	T-Ca	165	211	785	<0.050	<0.50
Copper	T-Cu	0.00232	0.00123	0.000761	0.000076	<0.00010
Iron	T-Fe	0.072	<0.010	0.255	<0.010	<0.030
Lead	T-Pb	0.0157	0.000250	0.00104	0.000077	<0.000050
Magnesium	T-Mg	343	511	2460	<0.10	<1.0
Mercury	T-Hg	<0.000010	<0.000010	<0.000010	-	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.010	<0.000050	<0.000050
Nickel	T-Ni	0.00447	0.00423	0.00631	<0.000050	<0.00050
Zinc	T-Zn	0.239	0.339	0.0300	0.00137	<0.0010

Inorganic Parameters

Sulphide	S	<0.020	<0.020	0.114	-	<0.020
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Remarks regarding the analyses appear at the beginning of this report.
 Results are expressed as milligrams per litre except where noted.
 < = Less than the detection limit indicated.

File No. X6417

RESULTS OF ANALYSIS - Seawater



Sample ID	Travel Blank 2
Sample Date ALS ID	06-05-22 56

Physical Tests

Conductivity	(uS/cm)	<2.0
Hardness	CaCO ₃	<5.4
pH		5.84
Salinity	o/oo	<1.0
Total Suspended Solids		15.3

Dissolved Anions

Alkalinity-Total	CaCO ₃	<2.0
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Total Metals

Aluminum	T-Al	<0.0010
Arsenic	T-As	<0.00020
Cadmium	T-Cd	<0.000020
Calcium	T-Ca	<0.50
Copper	T-Cu	<0.000050
Iron	T-Fe	<0.010
Lead	T-Pb	<0.000050
Magnesium	T-Mg	<1.0
Mercury	T-Hg	<0.000010
Molybdenum	T-Mo	<0.000050
Nickel	T-Ni	<0.000050
Zinc	T-Zn	<0.00050

Inorganic Parameters

Sulphide	S	<0.020
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Remarks regarding the analyses appear at the beginning of this report.
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**Appendix 1 - QUALITY CONTROL - Replicates**

Seawater		GLS-2m	GLS-2m	GLS-13m	GLS-13m
		06-05-22	QC # 503309	06-05-22	QC # 503310
<u>Physical Tests</u>					
Conductivity	(uS/cm)	13700	13700	-	-
Hardness	CaCO ₃	1840	1830	12600	12200
pH		8.02	8.02	7.61	7.61
Salinity	o/oo	8.3	8.3	62.8	62.9
Total Suspended Solids		6.0	7.3	-	-
<u>Dissolved Anions</u>					
Alkalinity-Total	CaCO ₃	161	167	456	451
<u>Total Metals</u>					
Aluminum	T-Al	<0.20	<0.20	0.23	0.22
Arsenic	T-As	<0.00020	<0.00020	<0.00020	<0.00020
Cadmium	T-Cd	0.000569	0.000612	0.000028	0.000028
Calcium	T-Ca	166	165	795	785
Copper	T-Cu	0.00105	0.00109	0.000773	0.000866
Iron	T-Fe	<0.010	<0.010	0.224	0.222
Lead	T-Pb	0.000438	0.000439	0.000904	0.000901
Magnesium	T-Mg	346	345	2590	2490
Molybdenum	T-Mo	<0.0050	<0.0050	<0.010	<0.010
Nickel	T-Ni	0.00424	0.00433	0.00622	0.00649
Zinc	T-Zn	0.235	0.247	0.0320	0.0326
<u>Inorganic Parameters</u>					
Sulphide	S	<0.020	<0.020	0.105	0.100

Remarks regarding the analyses appear at the beginning of this report.
 Results are expressed as milligrams per litre except where noted.
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**Appendix 1 - QUALITY CONTROL - Replicates**

Seawater		GLS-18m	GLS-18m	GLC-6m	GLC-6m
		06-05-22	QC # 503311	06-05-22	QC # 503312
<u>Physical Tests</u>					
Conductivity	(uS/cm)	-	-	13600	13600
Hardness	CaCO ₃	12600	12400	1800	1800
pH		7.61	7.61	7.99	8.01
Salinity	o/oo	62.6	62.5	8.3	8.3
Total Suspended Solids		-	-	3.3	4.0
<u>Dissolved Anions</u>					
Alkalinity-Total	CaCO ₃	478	454	156	151
<u>Total Metals</u>					
Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	0.00023	<0.00020	<0.00020	<0.00020
Cadmium	T-Cd	0.000021	0.000024	0.000514	0.000559
Calcium	T-Ca	787	805	160	159
Copper	T-Cu	0.000474	0.000466	0.000865	0.000960
Iron	T-Fe	0.222	0.235	<0.010	<0.010
Lead	T-Pb	0.000828	0.000899	0.000209	0.000226
Magnesium	T-Mg	2570	2530	340	342
Molybdenum	T-Mo	<0.010	<0.010	0.0052	<0.0050
Nickel	T-Ni	0.00518	0.00575	0.00374	0.00417
Zinc	T-Zn	0.0262	0.0293	0.211	0.233
<u>Inorganic Parameters</u>					
Sulphide	S	0.115	0.118	<0.020	<0.020

Remarks regarding the analyses appear at the beginning of this report.
 Results are expressed as milligrams per litre except where noted.
 < = Less than the detection limit indicated.

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		GLC-40m	GLC-40m	GLS-20Am	GLS-20Am
		06-05-22	QC # 503314	06-05-22	QC # 503313
<u>Physical Tests</u>					
Hardness	CaCO ₃	12400	12200	12300	12400
pH		7.55	7.55	7.63	7.64
Salinity	o/oo	63.6	63.0	63.0	63.6
<u>Dissolved Anions</u>					
Alkalinity-Total	CaCO ₃	438	454	448	449
<u>Total Metals</u>					
Aluminum	T-Al	<0.20	<0.20	<0.20	<0.20
Arsenic	T-As	<0.00020	<0.00020	<0.00020	0.00024
Cadmium	T-Cd	0.000200	0.000227	0.000024	0.000026
Calcium	T-Ca	800	788	798	825
Copper	T-Cu	0.00180	0.00168	0.000587	0.000537
Iron	T-Fe	0.268	0.316	0.243	0.217
Lead	T-Pb	0.0351	0.0490	0.000949	0.000903
Magnesium	T-Mg	2530	2480	2500	2500
Mercury	T-Hg	-	-	<0.000010	<0.000010
Molybdenum	T-Mo	<0.010	<0.010	<0.010	<0.010
Nickel	T-Ni	0.000810	0.00106	0.00590	0.00555
Zinc	T-Zn	0.0558	0.0680	0.0288	0.0282
<u>Inorganic Parameters</u>					
Sulphide	S	3.00	2.86	0.096	0.092

Remarks regarding the analyses appear at the beginning of this report.
 Results are expressed as milligrams per litre except where noted.
 < = Less than the detection limit indicated.

Appendix 2 - METHODOLOGY



Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

Conductivity in Water

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

Recommended Holding Time:

Sample: 28 days

Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

pH in Water

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.

Recommended Holding Time:

Sample: 2 hours

Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Methods for Chemical Analysis of Water and Wastes" (USEPA), "Manual for the Chemical Analysis of Water, Wastewaters, Sediments and Biological Tissues" (BCMOE), and/or "Standard Methods for the Examination of Water and Wastewater" (APHA). Further details are available on request.

Laboratory Location: ALS Environmental, Vancouver

Solids in Water

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total dissolved solids (TDS) and total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius, TSS is determined by drying the filter at 104 degrees celsius. Total solids are determined by evaporating a sample to dryness at 104 degrees celsius. Fixed and volatile solids are determined by igniting a dried sample residue at 550 degrees celsius.

Recommended Holding Time:

Sample: 7 days

Appendix 2 - METHODOLOGY - Continued



Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Alkalinity in Water by Colourimetry

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

Recommended Holding Time:

Sample: 14 days

Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Cyanide Species in Water

This analysis is carried out using procedures adapted from APHA Method 4500-CN "Cyanide". Total or strong acid dissociable (SAD) cyanide and weak acid dissociable (WAD) cyanide are determined by sample distillation and analysis using the chloramine-T colourimetric method. Cyanate is determined by the cyanate hydrolysis method using an ammonia selective electrode. Thiocyanate is determined by the ferric nitrate colourimetric method.

Recommended Holding Time:

Sample: 14 days

Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Metals in Seawater

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis of the seawater is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample: 6 months

Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Appendix 2 - METHODOLOGY - Continued



Trace Metals in Seawater by SPR-IDA Chelation

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995, and with procedures adapted from Cetac Technologies Incorporated. A suspended particulate resin (SPR), consisting of immobilized iminodiacetate (IDA) on a divinylbenzene polymer, is used to chelate and preconcentrate metals in seawater. Instrumental analysis is by inductively coupled plasma mass spectrometry (ICPMS) and/or routine atomic absorption spectrophotometry techniques (EPA 7000 series).

Recommended Holding Time:

Sample/Extract: 6 months

Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Water

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" 20th Edition 1998 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 hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample: 6 months

Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Mercury in Seawater

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedure involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

Recommended Holding Time:

File No. X6417

Appendix 2 - METHODOLOGY - Continued



Sample: 28 days
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Sulphide in Water

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

Recommended Holding Time:
Sample: 7 days
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with the written approval of ALS Environmental.

End of Report