



Pre-Permitting Environmental / Socio-Economic Data Report Series

Report Series E- Trace Elements (Sediments & Soils)

Report E-6 Summary of Port Site Marine Sediment Inorganic Analytical Results, 2004 - 2005

*Submitted to the Alaska Department of Natural Resources September 2008
Collected for the Pebble Partnership by: Pentec Environmental*

Preliminary data. Do not cite or quote.

The Pebble Partnership is providing environmental and socio-economic baseline data collected to inform the development of the Pebble Project to state and federal agencies, project stakeholders and the general public prior to project permitting as part of its commitment to full and open disclosure.

A comprehensive Environmental Baseline Document (EBD) will subsequently be prepared and appended to future project permit applications. The EBD will also be made publicly available when complete.



Prepared for the Pebble Limited Partnership by:

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Pebble Project
Summary of Port Site Marine
Sediment Inorganic Analytical Results, 2004-2005

Sample Station Location ID	Date Sampled	Aluminum (mg/Kg)	Antimony (mg/Kg)	Arsenic (mg/Kg)	Barium (mg/Kg)	Beryllium (mg/Kg)	Bismuth (mg/Kg)	Boron (mg/Kg)	Cadmium (mg/Kg)	Calcium (mg/Kg)	Chromium (mg/Kg)	Cobalt (mg/Kg)	Copper (mg/Kg)	Iron (mg/Kg)
MBB	21/07/2005	17600	0.14	5.93	110	0.261	0.064	12.9	0.062	8150	14	9.3	25.6	27200
MBSA1	22/07/2005	18500	0.06	2.75	26.1	0.073	0.026	13.7	0.07	9780	10	13.6	36.6	29600
MOPP1	31/08/2004	12500	0.183	5.94	64	0.163	ND	10.5	ND	6240	14.5	6.99	12.4	23700
MPS11	28/08/2004	19100	0.167	9.29	111	0.339	0.125	13.1	0.0742	7560	28.5	11.1	33.5	32200
	29/08/2004	14600	0.129	8.48	76.5	0.189	0.072	16.4	0.0844	11600	21.2	9.59	22.4	28900
MPS12	28/08/2004	19400	0.183	9.99	119	0.339	0.0835	10.7	0.0805	8770	31.7	12.4	36.2	31700
MPS13	29/08/2004	15800	0.164	8.87	98.1	0.273	0.0793	12.4	0.0642	7920	26.6	10.6	29.4	27000
MPS14	29/08/2004	16000	0.162	8.74	106	0.276	0.0759	16.9	0.0649	8680	26.9	11	31.4	26400
MPS15	29/08/2004	16100	0.228	15.4	133	0.396	0.163	38.2	0.105	9360	36.1	13.9	46.7	26700
MPS1A	21/07/2005	12200	0.07	2.97	14.8	0.091	0.023	9.1	0.067	36700	19.3	7.9	18.8	16400
MPS1L	29/08/2004	12700	0.0436	3.57	21.9	0.136	ND	ND	0.0635	27200	23.5	8.38	18.2	17600
MPS1M	29/08/2004	11100	0.033	2.43	15.9	0.114	ND	ND	0.0726	27900	32.4	8.58	18.6	15700
MPS2	31/08/2004	13400	0.178	9.48	116	0.258	0.0982	16.4	0.0821	7590	30.4	11.5	33.5	22600
	19/07/2005	16700	0.14	10.4	109	0.293	0.146	17.1	0.072	7300	29.3	10.9	35.3	27600
MPS21	27/08/2004													
MPS22	27/08/2004													
	28/08/2004	16400	0.168	11.7	116	0.322	0.067	23.4	0.093	8860	27.6	10.9	30.5	28600
MPS23	28/08/2004	13100	0.15	9.7	103	0.272	ND	6.46	0.067	5920	26.4	10.3	28.5	22500
MPS24	28/08/2004	13100	0.143	9.66	77.9	0.234	ND	5.68	ND	7840	20.5	9.65	21.9	22100
MPS25	28/08/2004	20100	0.172	11.8	112	0.321	0.0731	9.02	0.0717	10100	28.3	12.6	31	34600
MPS2L	27/08/2004	18100	0.147	12.6	107	ND	0.135	8.74	ND	7140	31.3	11.4	31.8	29800
MPS2M	27/08/2004	15500	0.0981	6.64	44.8	0.188	0.0723	11.3	ND	20500	17.1	9.06	18.5	27500
MPS3	22/07/2005	20000	0.14	12.1	129	0.404	0.206	22.2	0.082	7940	33.6	12.6	45.6	31000
MPS3L	31/08/2004	17800	0.168	20.7	122	0.344	0.114	11.4	0.088	7000	34	12.1	40.8	32600
MPS3M	31/08/2004	17700	0.0856	6.53	57.9	0.216	ND	11.9	ND	7080	22.9	13.7	56.8	24700
MPS4	22/07/2005	14000	0.12	6.77	65.3	0.178	0.08	14.5	0.069	23800	21.1	10.1	26.3	22900

mg/Kg milligram per kilogram
µg/Kg microgram per kilogram
ND not detected above method reporting limit

Pebble Project
Summary of Port Site Marine
Sediment Inorganic Analytical Results, 2004-2005

Sample Station Location ID	Date Sampled	Lead (mg/Kg)	Magnesium (mg/Kg)	Manganese (mg/Kg)	Mercury (µg/Kg)	Molybdenum (mg/Kg)	Nickel (mg/Kg)	Potassium (mg/Kg)	Selenium (mg/Kg)	Silver (mg/Kg)	Sodium (mg/Kg)	Thallium (mg/Kg)	Tin (mg/Kg)
MBB	21/07/2005	3.93	6370	309	36	1.17	12.2	3280	0.3	0.056	6220	0.072	ND
MBSA1	22/07/2005	2.08	14900	714	22	0.431	7.68	1120	ND	0.058	2330	0.017	ND
MOPP1	31/08/2004	3.26	6190	325	34.4	ND	11.9	2060	0.356	0.0485	5580	0.0368	0.974
MPS11	28/08/2004	5.53	8230	435	55.1	0.977	24.1	2550	0.67	0.126	4710	0.164	1.08
	29/08/2004	4.34	8860	456	23.2	0.671	17.1	2700	0.557	0.101	20500	0.0617	1
MPS12	28/08/2004	6.09	10100	475	43.7	0.679	26.9	3370	0.864	0.121	6820	0.0947	1.19
MPS13	29/08/2004	5.17	8460	411	38.2	0.802	22.3	2660	0.866	0.11	7140	0.102	1.05
MPS14	29/08/2004	5.47	9430	411	41.3	0.775	23.5	3120	0.873	0.113	14000	0.0948	1.04
MPS15	29/08/2004	7.82	13100	600	64.5	1.2	31.2	3610	1.36	0.162	17800	0.196	1.23
MPS1A	21/07/2005	2.37	6940	345	15	0.131	13.2	796	ND	0.024	3290	0.017	ND
MPS1L	29/08/2004	2.51	7020	405	6.4	ND	13.7	869	ND	0.0508	3110	ND	0.983
MPS1M	29/08/2004	2.31	7430	376	4.4	ND	16.2	543	ND	0.0498	1810	ND	0.997
MPS2	31/08/2004	5.92	11100	445	49.6	0.805	25.6	2710	1.16	0.13	13000	0.136	1.12
	19/07/2005	7.21	9390	423	51	0.77	24.1	3090	0.6	0.09	6910	0.135	ND
MPS21	27/08/2004				45.8								
MPS22	27/08/2004				52.1								
	28/08/2004	5.37	10800	510	41.2	0.775	23.8	3730	1.6	0.136	24900	0.0793	1.04
MPS23	28/08/2004	4.95	7990	453	141	0.553	22.2	2260	0.638	0.115	3560	0.0833	0.985
MPS24	28/08/2004	4.26	7300	383	29.6	0.448	17.4	2130	0.549	0.0874	4790	0.0685	0.955
MPS25	28/08/2004	5.82	9070	480	41.3	0.606	23.5	3310	0.593	0.12	4650	0.0756	1.12
MPS2L	27/08/2004	6.13	9590	486	53.8	0.787	26.4	2980	0.4	0.098	6480	ND	1.16
MPS2M	27/08/2004	3.1	7580	504	20.3	0.728	13.4	1510	0.364	0.0896	4460	0.178	0.963
MPS3	22/07/2005	8.64	11000	483	60	1.06	31	3960	0.8	0.123	8080	0.166	ND
MPS3L	31/08/2004	6.53	11300	503	53.2	2.34	27.8	3580	0.8	0.153	12700	0.11	1.16
MPS3M	31/08/2004	2.57	12400	538	26.4	0.487	16.7	1570	0.483	0.102	2700	0.0394	0.986
MPS4	22/07/2005	4.18	8890	433	38	0.493	18.2	2480	0.4	0.075	6340	0.081	ND

mg/Kg milligram per kilogram
µg/Kg microgram per kilogram
ND not detected above method reporting limit

Pebble Project
Summary of Port Site Marine
Sediment Inorganic Analytical Results, 2004-2005

Sample Station Location ID	Date Sampled	Vanadium (mg/Kg)	Zinc (mg/Kg)	Chloride (mg/Kg)	Fluoride (mg/Kg)	Sulfate (mg/Kg)	Cyanide (mg/Kg)	Nitrogen, Ammonia (as N) (mg/Kg)	Nitrogen, Kjeldahl, Total (mg/Kg)
MBB	21/07/2005	90.8	47	4660	1.1	580	ND	13.5	247
MBSA1	22/07/2005	77.6	35.1	2380	ND	375	ND	1.3	94
MOPP1	31/08/2004	63.2	39.1	5480	ND	1180	0.078	23	315
MPS11	28/08/2004	66.7	71.5	9360	1.5	1820	0.15	50	837
	29/08/2004	67.4	60.2	6200	0.529	1370	0.087	53.6	658
MPS12	28/08/2004	75.1	79.9	9310	0.897	1050	0.14	56.2	794
MPS13	29/08/2004	64.6	66.5	6250	0.78	2600	0.1	48.4	640
MPS14	29/08/2004	65.7	68.9	9060	0.96	2150	0.12	81.6	418
MPS15	29/08/2004	79	90.1	11200	ND	2350	0.14	94.1	566
MPS1A	21/07/2005	41.8	31	2890	ND	461	0.11	0.5	71
MPS1L	29/08/2004	50.3	40.3	5150	1.2	996	0.041	34.3	302
MPS1M	29/08/2004	56.4	40.4	1830	0.688	372	0.057	15.5	142
MPS2	31/08/2004	70.2	75.6	33400	ND	10100	0.092	51.6	653
	19/07/2005	63.8	75.9	7580	ND	908	ND	17.8	528
MPS21	27/08/2004								
MPS22	27/08/2004								
	28/08/2004	65.9	68.8	23300	3.33	2540	0.1	101	1070
MPS23	28/08/2004	63	64.7	37800	1.55	3400	0.13	82.5	1050
MPS24	28/08/2004	60.4	55.9	6650	0.38	1260	0.11	53.1	690
MPS25	28/08/2004	81	74	5910	0.394	617	0.11	58.6	734
MPS2L	27/08/2004	69.9	75	1500	0.87	1840	0.07	71.2	803
MPS2M	27/08/2004	66.6	53.3	9370	0.499	1340	0.062	35.5	526
MPS3	22/07/2005	74.6	98.4	9530	ND	1060	ND	20.2	886
MPS3L	31/08/2004	71.2	83.9	12800	ND	2210	0.2	506	1690
MPS3M	31/08/2004	70.3	66.5	25100	ND	4170	0.092	48.9	680
MPS4	22/07/2005	57.2	48.7	6940	ND	735	ND	23	527

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Pebble Project
Summary of Port Site Marine
Sediment Inorganic Analytical Results, 2004-2005

Sample Station Location ID	Date Sampled	Aluminum (mg/Kg)	Antimony (mg/Kg)	Arsenic (mg/Kg)	Barium (mg/Kg)	Beryllium (mg/Kg)	Bismuth (mg/Kg)	Boron (mg/Kg)	Cadmium (mg/Kg)	Calcium (mg/Kg)	Chromium (mg/Kg)	Cobalt (mg/Kg)	Copper (mg/Kg)	Iron (mg/Kg)
MPS41	29/08/2004	18900	0.145	10.8	107	0.378	0.102	20	ND	8450	31.8	12.1	34.6	29300
	30/08/2004	14100	0.0823	9	69.3	0.201	ND	6.32	ND	12500	33	10.9	20.9	27400
MPS42	29/08/2004	20700	0.207	14.8	129	0.312	0.17	18.8	0.0635	8400	37.5	14.4	47.3	32800
MPS43	29/08/2004	20000	0.217	15.4	126	0.351	0.135	32.5	0.106	8430	35.9	14.4	47.7	33700
MPS44	30/08/2004	13200	0.106	7.89	73.4	ND	ND	8.96	ND	7360	22.4	9.03	17.9	22500
MPS45	30/08/2004	15600	0.138	11.3	87.4	ND	0.0981	11.5	ND	15100	26.8	11.2	28	24000
MPS4L	30/08/2004	15300	0.11	11.1	84	0.234	ND	10.6	ND	11000	28.2	10.2	25.8	25300
MPS4M	30/08/2004	14200	0.0808	6.66	68.2	0.168	ND	11.5	ND	18100	24.4	8.9	24.8	21600
MPSEM	31/08/2004	14900	0.136	9.33	103	0.269	0.0821	9.76	0.0638	5650	28.7	10	32.7	24400
MPSEU	22/07/2005	20600	0.19	12.9	133	0.383	0.231	19.9	0.081	6600	37.8	13.9	51.2	32900
MWGI	30/08/2004	12800	0.148	9.67	65.5	0.227	0.0764	9.55	0.0708	22800	20	10.2	24.7	21600

mg/Kg milligram per kilogram

µg/Kg microgram per kilogram

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Pebble Project
Summary of Port Site Marine
Sediment Inorganic Analytical Results, 2004-2005

Sample Station Location ID	Date Sampled	Lead (mg/Kg)	Magnesium (mg/Kg)	Manganese (mg/Kg)	Mercury (µg/Kg)	Molybdenum (mg/Kg)	Nickel (mg/Kg)	Potassium (mg/Kg)	Selenium (mg/Kg)	Silver (mg/Kg)	Sodium (mg/Kg)	Thallium (mg/Kg)	Tin (mg/Kg)
MPS41	29/08/2004	6.5	10300	545	73.6	0.694	25.6	3270	0.574	0.101	10400	ND	1.12
	30/08/2004	4.12	9510	474	28.8	0.344	18.8	2410	0.354	0.055	8990	ND	0.982
MPS42	29/08/2004	8.55	11400	660	76.2	0.785	32.6	3800	0.667	0.146	8290	ND	1.31
MPS43	29/08/2004	7.83	13000	615	72.1	0.982	30.9	4530	1.3	0.182	26000	0.152	1.21
MPS44	30/08/2004	3.76	6980	428	30.4	0.47	17.6	2000	0.441	0.0435	8470	ND	0.991
MPS45	30/08/2004	5.38	8230	540	45.4	0.792	22.3	2640	0.473	0.0917	9160	ND	1.05
MPS4L	30/08/2004	4.54	9250	514	34.8	0.575	22.4	2600	0.596	0.0884	11000	ND	1.07
MPS4M	30/08/2004	3.5	7980	397	36.4	0.402	18.5	1950	0.428	0.0557	6730	ND	1.06
MPSEM	31/08/2004	5.16	8660	389	45.6	0.808	22.8	2630	0.435	0.126	5970	0.103	1.02
MPSEU	22/07/2005	10.4	11800	509	68	1.26	33.5	3950	0.8	0.138	7660	0.183	9.2
MWGI	30/08/2004	3.69	9180	438	33.9	0.778	16.4	2060	0.668	0.0977	13300	0.192	0.989

mg/Kg milligram per kilogram

µg/Kg microgram per kilogram

ND not detected above method reporting limit

Pebble Project
Summary of Port Site Marine
Sediment Inorganic Analytical Results, 2004-2005

Sample Station Location ID	Date Sampled	Vanadium (mg/Kg)	Zinc (mg/Kg)	Chloride (mg/Kg)	Fluoride (mg/Kg)	Sulfate (mg/Kg)	Cyanide (mg/Kg)	Nitrogen, Ammonia (as N) (mg/Kg)	Nitrogen, Kjeldahl, Total (mg/Kg)
MPS41	29/08/2004	69.6	76.7	15500	ND	1870	0.13	71.5	852
	30/08/2004	94.2	55.7	15000	34.7	4030	0.07	54.7	530
MPS42	29/08/2004	78.4	93.7	5860	2.91	1380	0.091	88.7	1120
MPS43	29/08/2004	76.7	89.4	18600	ND	4720	0.17	121	1700
MPS44	30/08/2004	62.3	52	14700	ND	3570	0.059	62.1	468
MPS45	30/08/2004	62.8	65.2	12800	ND	2580	0.066	84.5	814
MPS4L	30/08/2004	62.4	62.3	27000	ND	4020	0.079	96	1260
MPS4M	30/08/2004	56.7	53.7	28300	ND	3860	0.067	59.2	539
MPSEM	31/08/2004	61.1	67.7	6860	ND	1220	0.12	71.2	1030
MPSEU	22/07/2005	76.3	101	8660	ND	1010	0.07	14.1	819
MWGI	30/08/2004	58.3	55	27200	ND	6310	0.14	51.1	761

mg/Kg milligram per kilogram

µg/Kg microgram per kilogram

ND not detected above method reporting limit