THE pebble PARTNERSHIP

Pre-Permitting Environmental / Socio-Economic Data Report Series

Report Series H- Macroinvertebrates and Periphyton

Report H-4
Metrics for Data Collected, Macroinvertebrates 2004-2007

Submitted to the Alaska Department of Natural Resources April 2009

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 Do not cite or quote.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.

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REPORT H-4.1
Macroinvertebrate Metrics for Data Collected Using the ASCI Method, Mine Study Area, June and August 2004

	Taxa Richness[a]		Percent EPT[b]		Percent Chironomidae		Percent Other Diptera		Percent Dominant Taxon		CTI[c]	
Site ID	**June**	**Aug**	**June**	**Aug**	**June**	**Aug**	**June**	**Aug**	**June**	**Aug**	**June**	**Aug**
CR199A	19	—	17	—	77	—	4	—	77	—	5.5	—
KC100A	18	17	2	2	89	86	3	2	89	86	5.9	5.9
NK100A	23	31	24	14	60	73	3	12	60	73	4.9	5.4
NK100B04	23	—	13	—	84	—	3	—	84	—	5.6	—
NK100C	29	27	8	24	60	22	3	5	60	22	6.2	5.7
NK119A	24	29	20	29	72	49	4	18	72	49	5.3	4.5
SK100A	23	28	24	27	63	47	6	10	63	47	4.9	4.6
SK100B	18	16	14	10	71	58	6	9	71	58	5.4	5.2
SK100C	11	—	3	—	64	—	32	—	64	—	6.0	—
SK100F	9	16	<1	37	2	22	98	4	98	23	6.0	5.3
SK100G	18	27	1	6	76	60	3	12	76	60	5.8	5.7
SK119A	21	18	28	7	66	32	2	44	66	32	5.3	5.2
UT100B	26	22	19	22	78	75	2	<1	78	75	5.2	4.9
UT100C	26	18	17	28	71	67	4	5	71	67	5.4	4.6
UT100D	25	26	4	16	88	65	2	13	88	65	5.8	5.2
UT100E	20	19	16	10	75	43	1	4	75	43	5.9	6.4
UT119A	16	20	55	16	29	66	<1	10	32	66	4.2	5.2
UT138A	—	18	—	47	—	37	—	11	—	37	—	3.8
Big Wiggly Lake	—	16	—	8	—	50	—	0	—	50	—	6.8
Frying Pan Lake	—	12	—	4	—	31	—	4	—	41	—	6.3

Notes:

a. Includes Chironomidae genera.

b. EPT = Ephemeroptera, Plecoptera, and Trichoptera.

c. CTI = Community Tolerance Index.

-- Samples were not collected.

REPORT H-4.2

Macroinvertebrate Metrics for Data Collected Using the Drift-net Method, Mine Study Area, June and August 2004

	Taxa Richness[a]		Percent EPT		Percent Chironomidae		Percent Other Diptera		Percent Dominant Taxon		CTI[c]	
Site ID	June	Aug	June	Aug	June	Aug	June	Aug	June	Aug	June	Aug
CR199A	22	—	34	—	11	—	4	—	45	—	3.9	—
KC100A	13	8	17	7	55	69	22	12	55	69	5.2	5.7
NK100A	9	7	4	36	92	45	4	0	92	45	5.9	4.5
NK100B04	9	—	4	—	82	—	<1	—	82	—	5.9	—
NK100C	21	3	16	91	64	0	13	0	64	82	5.6	1.6
NK119A	5	6	1	70	99	10	<1	3	99	57	6.0	4.5
SK100A	13	22	11	16	60	41	12	14	60	41	5.5	5.1
SK100B	11	16	2	4	96	80	2	2	96	80	5.9	5.8
SK100C	19	—	13	—	65	—	10	—	65	—	5.2	—
SK100F	9	8	0	1	24	3	72	1	72	74	6.1	9.3
SK100G	7	3	0	0	57	41	21	27	57	41	6.1	6.0
SK119A	11	16	48	19	48	62	0	6	48	62	5.0	4.9
UT100B	29	13	6	13	80	79	4	5	80	79	5.8	5.4
UT100C	16	15	8	25	79	73	5	2	79	73	5.9	4.7
UT100D	20	13	29	35	48	42	17	19	48	42	5.1	4.2
UT100E	16	20	49	3	32	87	17	5	46	87	4.9	5.9
UT119A	17	16	70	10	26	80	3	8	68	80	4.5	5.5
UT138A	—	7	—	22	—	19	—	9	—	50	—	3.9

Notes: a. Includes Chironomidae genera.

b. Insufficient flow data; nets washed out.

c. CTI = Community Tolerance Index.

-- Samples were not collected.

REPORT H-4.3
Macroinvertebrate Metrics for Data Collected Using the ASCI Method, Mine Study Area, June 2005

Site ID	Taxa Richness[a]	Percent EPT	Percent Chironomidae	Percent Other Diptera	Percent Dominant Taxon	CTI[b]
NK100A	22	12	76	7	76	5.5
NK100C	20	26	47	25	47	4.9
SK100B	18	7	90	1	90	5.8
UT100B	17	15	39	46	45	5.7
UT100D	16	15	55	23	55	5.4
UT138A	17	10	72	14	72	5.7
Big Wiggly Lake	20	5	87	<1	87	6.0
Frying Pan Lake	13	0	16	<1	80	5.2

Note: a. Includes Chironomidae genera.
b. CTI = Community Tolerance Index

REPORT H-4.4
Macroinvertebrate Metrics[a] for Data Collected Using the Surber Method, Mine Study Area, June 2005

	Taxa Richness[b]		Percent EPT		Percent Chironomidae		Percent Other Diptera		Percent Dominant Taxon		CTI[c]	
Site ID	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation
NK100A	17	4.7	25	6.2	64	7.2	5	1.1	64	7.2	5.0	0.42
NK100C	24	4.2	29	16.3	36	15.5	20	16.8	45	6.0	5.4	0.62
SK100B	19	5.0	3	1.6	91	2.2	1	0.8	91	2.2	5.9	0.08
UT100B	18	10.6	24	10.7	64	9.4	12	12.4	64	9.4	5.2	0.51
UT100D	17	3.3	23	14.5	29	11.1	46	22.8	52	15.3	5.4	0.63
UT138A	15	4.2	31	11.8	61	7.5	3	3.0	61	7.5	5.1	0.30

Note: a. Mean values are averages for five samples per site.
b. Includes Chironomidae genera.
c. CTI = Community Tolerance Index

REPORT H-4.5
Macroinvertebrate Metrics for Data Collected Using the ASCI Method, Mine Study Area, June 2007

Site ID	Taxa Richness[a]	Percent EPT	Percent Chironomidae	Percent Diptera	Percent Dominant Taxon	CTI[c]
NK100A	26	23	54	18	54	5.2
NK100C	20	7	42	1	42	6.6
NK119A	28	21	69	2	69	5.5
SK100A	28	14	78	8	78	5.3
SK100B	19	5	77	3	77	5.9
SK100D	15	12	44	44	44	5.6
UT100B	26	35	47	17	47	4.5
UT100D	23	18	30	51	65	5.3
UT100C	17	7	91	2	91	5.7
UT119A	22	26	67	3	67	5.4

Note:

a. Mean values are averages for five samples per site.

b. Includes Chironomidae genera.

c. CTI = Community Tolerance Index

REPORT H-4.6
Macroinvertebrate Metrics[a] for Data Collected Using the Surber Method, Mine Study Area, June 2007

Site ID	Taxa Richness[b]		Percent EPT		Percent Chironomidae		Percent Diptera		Percent Dominant Taxon		CTI[c]	
	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation
NK100A	20	1.7	22	3.1	65	4.8	4.55	1.8	65	4.8	5.3	0.10
NK100C	30	1.1	11	1.6	70	4.8	5.84	3.8	70	4.8	5.9	0.10
NK119A	15	1.2	72	2.6	26	6.9	1.36	0.4	31	7.2	4.7	0.04
SK100A	18	1.8	18	4.2%	79	4.2	2.12	0.8	79	4.2	5.2	0.17
SK100B	25	0.8	2	0.3	84	3.6	0.51	0.2	84	3.6	6.0	0.08
SK100D	16	0.9	40	7.7	38	7.0	21.13	6.2	43	10.9	4.9	0.21
UT100B	17	0.5	24	6.9	74	7.2	1.37	0.6	74	7.2	5.3	0.20
UT100D	22	1.1	18	1.4	67	1.7	10.72	1.6	67	1.7	5.4	0.07
UT100C	15	1.2	18	6.9	76	6.4	5.09	1.5	76	6.4	5.2	0.33

Note:

a. Mean values are averages for five samples per site.

b. Includes Chironomidae genera.

c. CTI = Community Tolerance Index

REPORT H-4.7
Macroinvertebrate Metrics for Data Collected Using the ASCI Method, Transportation Corridor, August 2004

Site ID	Taxa Richness[a]	Percent EPT	Percent Chironomidae	Percent Other Diptera	Percent Dominant Taxon	Population per 0.1 Sq. Meter	CTI[b]
Bear Den Creek	26	23	64	6	10	7	4.8
Red Creek[b]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ursa 100B	26	55	35	6	13	20	3.8

Notes:

a. Includes Chironomidae genera.

b. CTI = Community Tolerance Index

N/A. Data not available - sample container broke during shipping.

REPORT H-4.8
Macroinvertebrate Metrics for Data Collected Using the Drift-net Method, Transportation Corridor, August 2004

Site ID	Taxa Richness[a]	Percent EPT	Percent Chironomidae	Percent Other Diptera	Percent Dominant Taxon	Density per Cubic Meter Stream Flow	CTI[b]
Bear Den Creek	2	50	50	0	50	0.01	3.5
Red Creek	10	11	42	5	29	0.06	6.2
Ursa 100B	15	29	24	36	33	0.29	5.0

Note:

a. Includes Chironomidae genera.

b. CTI = Community Tolerance Index

REPORT H-4.9
Macroinvertebrate Metrics for Data Collected Using the ASCI Method, Transportation Corridor, June 2005

Site ID	Taxa Richness[a]	Percent EPT	Percent Chironomidae	Percent Other Diptera	Percent Dominant Taxon	CTI[b]
Bear Den Creek	19	26	69	5	29	5.3
Red Creek	17	37	60	2	31	5.0
Ursa 100B	24	25	63	9	22	4.8

Note:

a. Includes Chironomidae genera

b. CTI = Community Tolerance Index

REPORT H-4.10
Macroinvertebrate Metrics[a] for Data Collected Using the Surber Method, Transportation Corridor, June 2005

	Taxa Richness[b]		Percent EPT		Percent Chironomidae		Percent Other Diptera		Percent Dominant Taxon		CTI[c]	
Site ID	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation	Mean Value	Standard Deviation
Bear Den Creek	16	7.1	61	4.9	11	10.3	17	15.8	28	3.4	3.9	0.60
Red Creek	8	2.6	42	17.6	31	15.1	2	2.3	35	13.2	4.9	0.51
Ursa 100B	9	3.1	64	17.1	23	18.1	11	4.4	31	5.7	3.2	0.65

Note:

a. Mean values are averages for five samples per site.

b. Includes Chironomidae genera.

c. CTI = Community Tolerance Index

REPORT H-4.11
Macroinvertebrate Metrics, Cook Inlet Drainages, 2004 and 2005

Site	Sample Type	Taxa Richness		Percent EPT		Percent Dominant Taxon		Community Tolerance Index	
		August 2004	June 2005	August 2004	June 2005	August 2004	June 2005	August 2004	June 2005
Y Valley Creek	ASCI	16	15	13	30	81	62	5.3	4.6
	Drift[a]	7	--	11	--	77	--	5.3	--
	Surber	--	5.4 ±1.7[b]	--	84 ±17.5[b]	--	40 ±11.8[b]	--	3.4 ±0.93[b]
Unnamed Creek[c]	ASCI	7	--	31	--	62	--	4.8	--
	Drift[a]	5	--	4	--	96	--	6.1	--

Notes:

a. Per 1 cubic meter stream flow.

b. Results are averages ±1 standard deviation derived from five samples.

c. Site removed from study in 2005 because of change in possible road alignment.

-- Samples were not collected.