



Comstock Mine Environmental Monitoring Report First Quarterly 2003

Table of Contents

	<u>Page #</u>
1.0 Introduction	1
2.0 Water Monitoring.....	1
2.1 W1 – Comstock Creek Upstream.....	1
2.2 W2 – Main Adit Inlet.....	1
2.3 W3 – Main Adit Outlet.....	2
2.4 W4 – Base of Swansea Dump	2
3.0 Erosion Monitoring	3
3.1 E1 – East Wall of Allison’s Decline	3
3.2 E2 – Southwestern Batter of Central Dump	3
4.0 Summary.....	3
Appendix A – <i>Laboratory Analysis of Water Sampling</i>	
Appendix B – <i>Water Sampling Data Collection</i>	
Appendix C – <i>Laboratory pH Analysis - Graphed</i>	
Appendix D – <i>Weekly pH Analysis - Graphed</i>	

List of Figures

	<u>Page #</u>
Figure 1. Water sampling results for pH on 21/02/03.....	4
Figure 2. Water sampling results for TSS on 21/02/03	4
Figure 3. Water sampling results for metals on 21/02/03.....	5

1.0 Introduction

The following report has been completed in compliance with Section 3.7.4 *Monitoring Schedule* of the environmental Permit Conditions issued by the Department of Primary Industries, Water and Environment, Tasmania, under the Environmental Management and Pollution Control Act 1994 for the Zeehan Zinc mine, leased by Oceania Tasmania Pty Ltd. This report summarises the required monitoring for the time period of January 2002 to March 2002.

Since January 2002, Zeehan Zinc Pty Ltd has not continued any mineral extraction operations at the mine site. There have been limited activities at the site during this time period.

As of July 6, 2001, the Department of Primary Industry, Water and Environment have published new permit conditions for a level 2 mining activity by Oceania Tasmania Pty. Ltd. at the Comstock Mine.

2.0 Water Monitoring

As required by the Permit Conditions, water monitoring of sites W1, W2, W3, and W4 has been completed.

The following four sub-sections summarise and interpret the sampling and analysis findings.

2.1 W1 – Comstock Creek Upstream

Sampling location W1 is situated upstream of the mine site in Comstock Creek adjacent to historical workings

Samples were taken on February 21, 2003 and analysed at 'Allison Laboratories' on March 6, 2003 for all of the required parameters (Figures 1, 2 and 3). Laboratory results are located in Appendix A.

There have been no significant variances at this sampling location compared to the previous sampling activity.

2.2 W2 – Main Adit Inlet

Sampling location W2 is situated in the collection areas beside the main adit inlet at the base of Allison's decline. These areas contain a sediment screen to reduce sediment flow off site, and limestone to reduce the acidity of the run off.

Samples were taken on February 21, 2003 and analysed at 'Allison Laboratories' on March 6, 2003 for all of the required parameters (Figures 1, 2 and 3). Laboratory results are located in Appendix A.

This site is presumed to be of the worst quality of water simply because of its location. Exposed pyritic material and, until recently, an inappropriately drained dump surrounds this site.

In general, the metals content recorded at this site have increased compared to previous sampling activities. This increase could be correlated with three (3) issues present at the time of sampling: 1) rehabilitation work was proceeding on the Central Waste Rock Dump, 2) a lack of rain was recorded, and 3) sediment traps were emptied two days previous (stirring up the retained water).

2.3 W3 – Main Adit Outlet

Sampling location W3 is situated at the main adit outlet.

Samples were taken on February 21, 2003 and analysed at 'Allison Laboratories' on March 6, 2003 for all of the required parameters (Figures 1, 2 and 3). Laboratory results are located in Appendix A.

There have been no significant variances at this sampling location compared to the previous sampling activity.

2.4 W4 – Base of Swansea Dump

Sampling location W4 is situated in a small pool at the base of the Swansea Tramway Waste Rock Dump.

Samples were taken on February 21, 2003 and analysed at 'Allison Laboratories' on March 6, 2003 for all of the required parameters (Figures 1, 2 and 3). Laboratory results are located in Appendix A.

As described in the previous Quarter Annual Report, there was a lack of safe vehicle access to this retention dam for sediment extraction and limestone addition. The sampling results for this quarter indicate higher concentrations of metals at this location due to the upstream activities (development of an access road, wall and toe stabilisation, waste rock compaction, etc.).

As of today, the W4 sampling location has been moved to the bottom-centre of the Swansea Tramway Waste Rock Dump (STWRD), where a new retention dam has been constructed with improvements to the STWRD's drainage and retention dam access.

3.0 Erosion Monitoring

As required by the Permit Conditions, erosion monitoring of sites E1 and E2 has been completed. The following two sub-sections summarise the findings.

3.1 E1 – East Wall of Allison’s Decline

This site represents the east wall of Allison’s decline.

With the anticipation of continuing extraction of ore soon, these walls and batters have been and will continue being improved, and deemed a safe working environment by the mine manager.

Continued site inspections by the mining staff ensure that this will not become an issue in the future.

3.2 E2 – Southwestern Batter of Central Dump

This site represents the southwestern batter of the Central Mine Waste Rock Dump.

The Central Waste Rock Dump rehabilitation has commenced. Full re-contouring and partial clay capping has occurred. Within this procedure are practices that will ensure appropriate erosion control.

Continued site inspections by the mining staff ensure that this will not become an issue in the future.

4.0 Summary

Since the submission of the Fourth Quarter Annual Report 2002, the Comstock mine site has continued its rehabilitation and clay extraction exercises. Also, the STWRD has been re-contoured, benched, compacted and now has safe vehicle access to its retention dam.

With the assistance of the mine manager, regular inspections and sampling will continue and be maintained to meet government and in-house regulations.

Figure 1. Water sampling results for pH on 21/02/03.

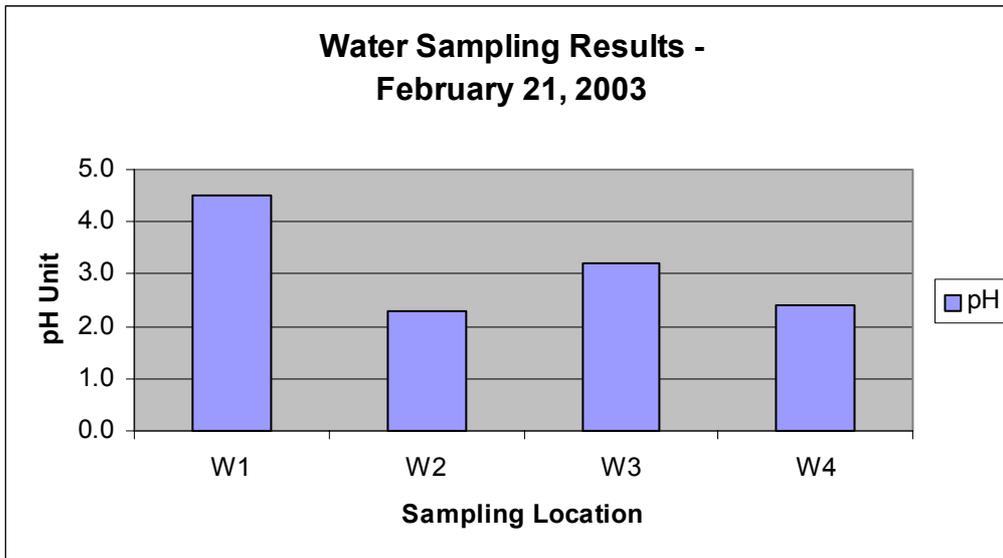


Figure 2. Water sampling results for TSS on 21/02/03.

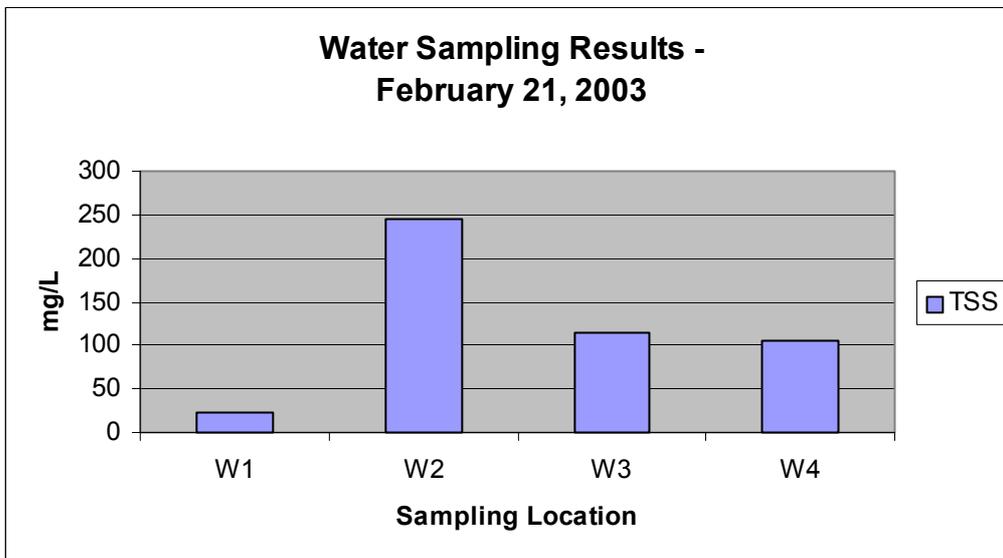
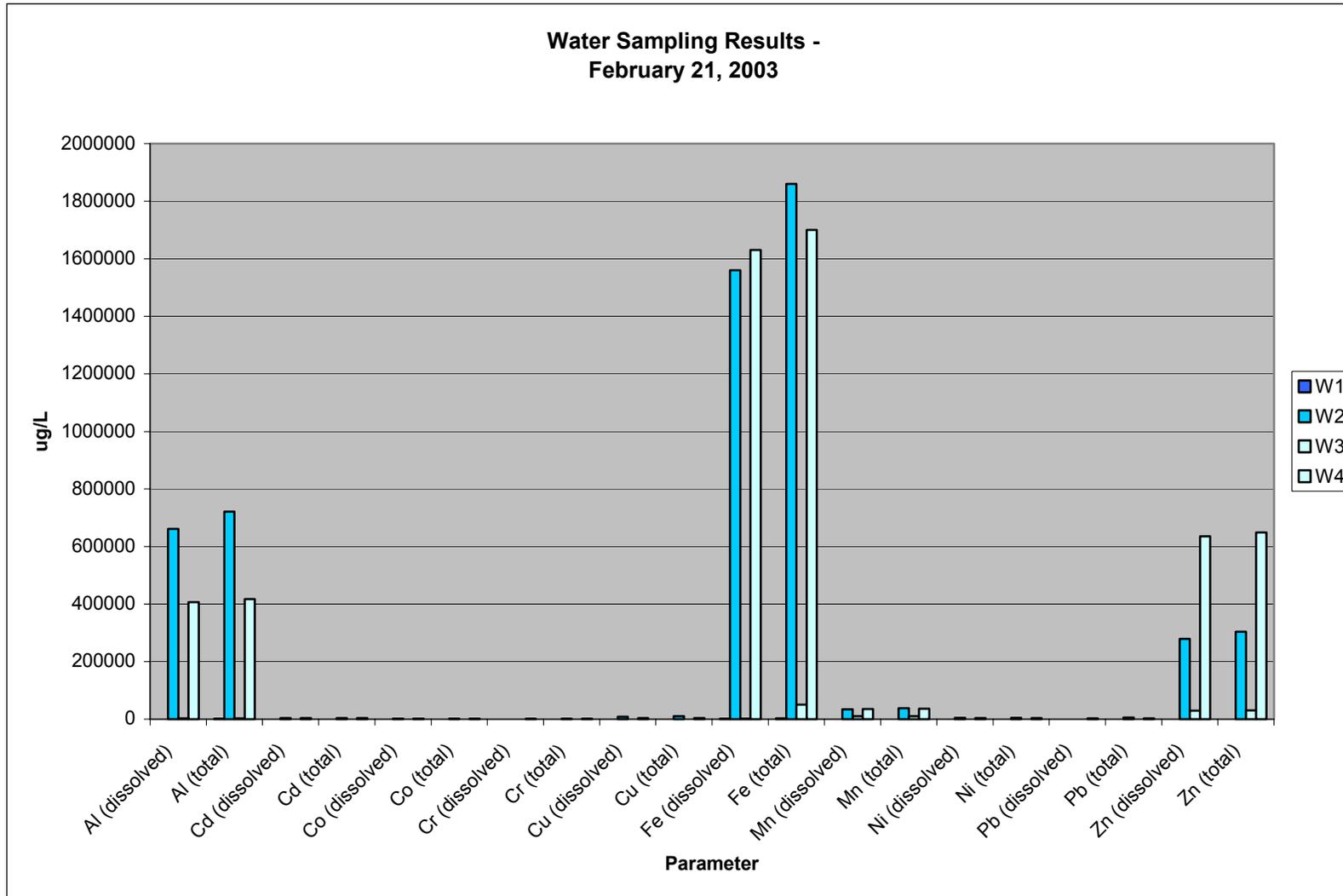


Figure 3. Water sampling results for metals on 21/02/03.



APPENDIX A

Laboratory Analysis of Water Samples

FRI 06:51 FAX 03 6226 7825 AST

003/003



Tasmania

ANALYTICAL SERVICES TASMANIA
Sandy Bay Laboratory

c/- Chemistry Department University of Tasmania

Sandy Bay Tasmania 7005



NATA Accreditation
Number: 5589

Report No: 19107

Report Date: 06-Mar-2003 15:28

Method	Analyte	Lab.No.:	Sample Id.:			
			41890	41891	41892	41893
		Units / Sampled On :	W1	W2	W3	W4
			21/02/03 08:00	21/02/03 08:00	21/02/03 08:00	21/02/03 08:00
1001-Water	pH		4.5	2.3	3.2	2.4
1002-Water	Conductivity	µS/cm	123	7470	973	6430
1004-Water	TDS	mg/L	453	11600	669	31700
1005-Water	TSS	mg/L	22	245	115	105
1101-Water	Alkalinity Total	mg CaCO3/L	<1	<1	<1	<1
1102-Water	Acidity	mg CaCO3/L	13	8360	165	7280
1301-Water	Al Dissolved	µg/L	433	661000	2510	407000
	Al Total	µg/L	627	721000	3220	417000
	As Dissolved	µg/L	<5	2960	7	3960
	As Total	µg/L	<5	5270	167	4300
	Cd Dissolved	µg/L	<1	3830	26	3350
	Cd Total	µg/L	<1	4040	28	3400
	Co Dissolved	µg/L	4	2310	62	1480
	Co Total	µg/L	4	2300	64	1520
	Cr Dissolved	µg/L	1	447	<1	583
	Cr Total	µg/L	1	498	1	574
	Cu Dissolved	µg/L	7	8860	3	3770
	Cu Total	µg/L	9	10400	3	3800
	Fe Dissolved	µg/L	961	1660000	1760	1630000
	Fe Total	µg/L	3050	1860000	50800	1700000
	Mn Dissolved	µg/L	273	34100	10500	35200
	Mn Total	µg/L	279	37900	10700	35900
	Ni Dissolved	µg/L	11	4920	122	3750
	Ni Total	µg/L	12	4910	126	3800
	Pb Dissolved	µg/L	78	121	50	3000
	Pb Total	µg/L	116	5800	87	3200
	Zn Dissolved	µg/L	342	279000	30000	636000
	Zn Total	µg/L	348	304000	30600	648000

APPENDIX B

Water Sampling Data Collection



Site	Date	TSS mg/L	Alkalinity (total) CaCO3 mg/L	Acidity CaCO3 mg/L	pH	Al (dissolved) ug/L	Al (total) ug/L	Cd (dissolved) ug/L	Cd (total) ug/L
S14	10/22/97						2560		39
S10	10/22/97						2800		42
S14	06/10/99	59	<1	61		1780	2190	19	19
S14	08/10/99	59	<1	49		1430	2110	19	20
S2	08/10/99	6	2	9	6.2	287	370	<1	1
S10	03/08/00	57	<1	98		441	1960	12	14
S1	06/27/00				4.6	0		0	
S2	06/27/00				6.2	340		0	
S10	06/27/00				5.0	1150		50	
S14	06/27/00				5.3	630		30	
S12	06/27/00				6.2	110		20	
S11	06/27/00				6.2	220		10	
S3	06/27/00				3.3	13060		160	
S1	09/22/00				5.5	0		40	
S2	09/22/00				6.4	580		30	
S10	09/22/00				6.0	10		20	
S14	09/22/00				5.8	0		20	
S12	09/22/00				6.1	160		10	
S11	09/22/00				6.4	90		10	
S3	09/22/00				no flow	no flow		no flow	
S1	01/15/01	2			4.7	234	452	<1	1
S10	01/15/01	107			3.1	7040	8230	254	254
S13	01/15/01	132			3.0	78700	86600	514	530
S10	02/04/01	86	<1		3.5	<20	1870	<1	18
S10	03/28/01	68	<1		3.4	8250	8430	191	190
S13	03/28/01	163	<1		2.6				
S1	05/18/01	4	<1	20	4.2		1020	<5	<5
S9	05/18/01	16	4	11	5.5		905	15	14
S6	05/18/01	15	<1	63	3.5		4040	<5	<5
S4	05/18/01	19	<1	2760	2.5		164000	2010	2060
S5	05/18/01	16	<1	209	3.0		13400	<5	6



S2	05/18/01	<1	<1	22	4.1		1010	<5	<5
Site	Date	TSS mg/L	Alkalinity (total) CaCO3 mg/L	Acidity CaCO3 mg/L	pH	Al (dissolved) ug/L	Al (total) ug/L	Cd (dissolved) ug/L	Cd (total) ug/L
S10	05/18/01	64	<1	105	3.5		2260	106	129
S12	05/18/01	91	<1	135	3.2		11500	16	20
S13	05/18/01	17	<1	729	2.8		47500	46	62
S1	10/09/01	<1		9	4.3		420		<5
S4	10/09/01	4		1800	2.5		110000		2100
S10	10/09/01	50		740	3.0		2900		33
S13	10/09/01	75		1510	3.0		21000		260
S1	07/12/01	<1		8	4.3	340	430	10	10
S4	07/12/01	32		3500	2.4	180000	200000	4000	4200
S10	07/12/01	90		120	3.3	1800	2900	50	50
S13	07/12/01	110		590	2.8	19000	21000	260	280
S1	06/03/02	<1		18	4.7	290	250	30	30
S4	06/03/02	10		4100	2.5	240000	240000	4500	4300
S10	06/03/02	40		140	4.6	2900	510	60	60
S13	06/03/02	50		1000	2.9	39000	38000	680	640
S1	10/05/02	3		11	4.3	4600	510	10	10
S4	10/05/02	46		2700	2.6	140000	170000	2200	2400
S10	10/05/02	110		200	3.1	8600	8600	1360	130
S13	10/05/02	26		4000	2.5	230000	250000	4400	4600
S1	09/24/02	1	1	10	4.6	297	339	3	3
S4	09/24/02	87		570	2.8	25800	29000	365	398
S10	09/24/02	120		175	3.5	4630	5570	50	53
S13	09/24/02	241		1530	2.8	69600	71400	588	601
S1	16/12/02	1	1	9	4.6	349	366	2	2
S4	16/12/02	1	1	2260	2.4	95500	100000	1210	1240
S10	16/12/02	91	1	136	3.2	3470	3860	34	38
S13	16/12/02	3	1	3530	2.5	177000	183000	1420	1500
S1	21/02/03	22	1	13	4.5	433	627	1	1
S4	21/02/03	245	1	8360	2.3	661000	721000	3830	4040
S10	21/02/03	115	1	165	3.2	2510	3220	26	28



S13	21/02/03	105	1	7280	2.4	407000	417000	3350	3400
Site	Date	Co (dissolved) ug/L	Co (total) ug/L	Cr (dissolved) ug/L	Cr (total) ug/L	Cu (dissolved) ug/L	Cu (total) ug/L	Fe (dissolved) ug/L	Fe (total) ug/L
S14	10/22/97		66		7		<5		59100
S10	10/22/97		76		8		6		67700
S14	06/10/99	23	23	<1	<1	10	12	351	25100
S14	08/10/99	25	26	1	<1	14	13	678	30700
S2	08/10/99	<1	<1	1	<1	11	9	681	1300
S10	03/08/00	37	40	<1	<1	2	2	11700	43100
S1	06/27/00	10		0		30		470	
S2	06/27/00	30		20		40		600	
S10	06/27/00	40		50		50		19820	
S14	06/27/00	40		50		40		13410	
S12	06/27/00	60		30		40		7440	
S11	06/27/00	90		50		0		37640	
S3	06/27/00	350		20		70		2470	
S1	09/22/00	50		40		10		46040	
S2	09/22/00	60		40		0		48980	
S10	09/22/00	60		0		60		8980	
S14	09/22/00	50		0		40		9240	
S12	09/22/00	90		20		30		34460	
S11	09/22/00	30		0		40		1050	
S3	09/22/00	no flow		no flow		no flow		no flow	
S1	01/15/01	3	3	<1	1	4	6	636	2360
S10	01/15/01	112	114	1	3	125	128	1010	49000
S13	01/15/01	1730	1710	92	186	69	73	139000	390000
S10	02/04/01	<1	50	<1	<1	<1	3	<20	43700
S10	03/28/01	53	55	<1	2	56	56	2220	33600
S13	03/28/01								
S1	05/18/01	7	8	<1	<1	27	26	866	850
S9	05/18/01	4	5	<1	<1	22	23	2290	2430

COMSTOCK MINE

Environmental Monitoring Report

Oceania Tasmania Pty Ltd



S6	05/18/01	11	11	3	3	123	122	3780	3810
S4	05/18/01	1230	1250	149	153	4650	4780	605000	622000
S5	05/18/01	42	42	2	3	55	70	18300	24400
S2	05/18/01	8	8	<1	<1	21	27	608	794
Site	Date	Co (dissolved) ug/L	Co (total) ug/L	Cr (dissolved) ug/L	Cr (total) ug/L	Cu (dissolved) ug/L	Cu (total) ug/L	Fe (dissolved) ug/L	Fe (total) ug/L
S10	05/18/01	32	39	<1	<1	7	7	31100	38300
S12	05/18/01	49	62	3	5	181	229	15900	20000
S13	05/18/01	446	579	33	43	264	341	77600	117000
S1	10/09/01		5		<1		10		670
S4	10/09/01		930		130		3000		500000
S10	10/09/01		63		<1		5		57000
S13	10/09/01		370		35		77		140000
S1	07/12/01	10	10	20	20	10	10	310	630
S4	07/12/01	1400	1500	200	200	4700	5000	770000	790000
S10	07/12/01	50	50	20	20	10	10	9300	54000
S13	07/12/01	340	350	20	200	75	77	100000	160000
S1	06/03/02	10	10	20	20	10	10	1200	1200
S4	06/03/02	1400	1400	210	200	5800	5600	950000	950000
S10	06/03/02	60	60	20	20	10	10	56000	43000
S13	06/03/02	410	400	120	100	300	300	250000	200000
S1	10/05/02	10	10	20	20	10	10	1100	1300
S4	10/05/02	1000	1000	140	150	3100	3300	720000	880000
S10	10/05/02	80	90	20	20	1400	1400	14000	70000
S13	10/05/02	1500	1500	290	380	1900	2000	1000000	1000000
S1	09/24/02	3	3	1	1	7	7	317	501
S4	09/24/02	158	174	24	28	592	655	80200	107000
S10	09/24/02	58	60	1	1	10	10	5100	54400
S13	09/24/02	473	476	86	90	287	295	290000	315000
S1	16/12/02	4	4	1	1	7	8	413	665
S4	16/12/02	514	529	93	96	2190	2270	408000	424000
S10	16/12/02	54	54	1	1	5	5	837	39800
S13	16/12/02	856	910	239	249	871	937	790000	791000



S1	21/02/03	4	4	1	1	7	9	961	3050
S4	21/02/03	2310	2300	447	498	8860	10400	1560000	1860000
S10	21/02/03	62	64	1	1	3	3	1760	50800
S13	21/02/03	1480	1520	563	574	3770	3800	1630000	1700000

Site	Date	Mn (dissolved) ug/L	Mn (total) ug/L	Ni (dissolved) ug/L	Ni (total) ug/L	Pb (dissolved) ug/L	Pb (total) ug/L	Zn (dissolved) ug/L	Zn (total) ug/L
S14	10/22/97		10800		147		380		33000
S10	10/22/97		12200		166		373		37700
S14	06/10/99	4290	4270	47	42	81	147	14700	14900
S14	08/10/99	4220	4230	51	51	80	155	14400	14900
S2	08/10/99	129	138	3	4	52	85	284	298
S10	03/08/00	8620	8770	73	75	<5	46	22500	23200
S1	06/27/00	40		40		80		230	
S2	06/27/00	70		50		140		170	
S10	06/27/00	2780		30		170		13590	
S14	06/27/00	1970		20		370		9710	
S12	06/27/00	6270		70		210		2880	
S11	06/27/00	5580		130		190		11670	
S3	06/27/00	820		380		5670		36000	
S1	09/22/00	7560		50		130		24600	
S2	09/22/00	7720		50		130		25760	
S10	09/22/00	6720		10		180		2840	
S14	09/22/00	6980		70		190		2730	
S12	09/22/00	5470		70		230		11870	
S11	09/22/00	120		0		210		650	
S3	09/22/00	no flow		no flow		no flow		no flow	
S1	01/15/01	285	281	9	11	64	142	345	366
S10	01/15/01	8680	8660	250	256	91	122	37200	37100
S13	01/15/01	13400	13000	5260	5150	3200	11600	258000	257000
S10	02/04/01	<5	8650	<1	95	<5	70	<1	20
S10	03/28/01	6340	6360	109	110	579	631	33700	33900



S13	03/28/01								
S1	05/18/01	336	335	15	15	593	591	3180	3130
S9	05/18/01	435	436	8	8	192	198	1180	1170
S6	05/18/01	269	269	20	22	488	488	6160	6130
S4	05/18/01	7620	7790	2630	2680	852	684	161000	161000
S5	05/18/01	443	687	55	71	1520	2020	6840	6930
S2	05/18/01	260	337	14	18	641	838	2520	3250
Site	Date	Mn (dissolved) ug/L	Mn (total) ug/L	Ni (dissolved) ug/L	Ni (total) ug/L	Pb (dissolved) ug/L	Pb (total) ug/L	Zn (dissolved) ug/L	Zn (total) ug/L
S10	05/18/01	5030	6080	62	75	231	287	13500	16500
S12	05/18/01	1370	1740	81	107	290	375	11900	15800
S13	05/18/01	4560	5770	991	1280	780	998	119000	160000
S1	10/09/01		210		20		240		1200
S4	10/09/01		5100		2100		670		120000
S10	10/09/01		8800		130		160		280000
S13	10/09/01		8100		800		390		850000
S1	07/12/01	190	190	20	20	170	220	910	920
S4	07/12/01	12000	13000	3000	3300	520	740	210000	220000
S10	07/12/01	9100	9300	110	110	120	250	26000	27000
S13	07/12/01	7500	8200	870	930	270	300	75000	83000
S1	06/03/02	1000	930	10	10	2300	1900	7200	6400
S4	06/03/02	38000	36000	3100	3000	450	450	450000	440000
S10	06/03/02	9200	8500	110	110	400	400	29000	28000
S13	06/03/02	6900	6600	1000	930	850	810	110000	110000
S1	10/05/02	110	110	20	20	150	190	750	750
S4	10/05/02	32000	39000	2200	2300	360	680	210000	250000
S10	10/05/02	8000	8000	170	180	180	230	28000	28000
S13	10/05/02	16000	16000	3100	3200	1000	1200	430000	430000
S1	09/24/02	128	139	13	14	127	140	628	674
S4	09/24/02	3650	4000	349	379	131	666	32200	35200
S10	09/24/02	9120	9300	127	129	243	300	33200	34000
S13	09/24/02	7980	8130	1120	1150	961	1100	147000	149000
S1	16/12/02	171	168	11	11	142	146	668	658



S4	16/12/02	16100	16800	1060	1090	181	187	138000	142000
S10	16/12/02	9190	9120	110	107	143	179	27300	27200
S13	16/12/02	16600	16900	2050	2150	664	705	318000	311000
S1	21/02/03	273	279	11	12	78	116	342	348
S4	21/02/03	34100	37900	4920	4910	121	5800	279000	304000
S10	21/02/03	10500	10700	122	126	50	87	30000	30600
S13	21/02/03	35200	35900	3750	3800	3000	3200	636000	649000

22/10/97, 10/06/99, 10/08/99, 08/03/00 (SEMF, Development Proposal and Environmental Management Plan, May 2000)

27/06/00, 22/09/00 (Meskanen, U., Acid Mine Drainage at the Comstock Ag-Pb-Zn Mine,... – Thesis, November 2000)

15/01/01 (Sarah Bunce – SEMF, March 21, 2001)

04/02/01 (Paul Heath – Oceania, March 21, 2001)

03/28/01 (Shane Bartel - Oceania Tasmania)

05/18/01 (Shane Bartel - Oceania Tasmania)

10/09/01 (Shane Bartel - Oceania Tasmania)

7/12/01 (Paul Heath - Oceania Tasmania)

6/03/02 (Shane Bartel - Oceania Tasmania)

10/05/02 (Shane Bartel - Oceania Tasmania)

24/09/02 (Paul Heath - Oceania Tasmania)

16/12/02 (Shane Bartel - Oceania Tasmania)

21/02/03 (Shane Bartel - Oceania Tasmania)

S1 - Comstock Creek - furthest upstream (was W1)

S2 - Comstock Creek - upstream beside old workings area

S3 - upper bench adit entrance

S4 - decline adit entrance (was W2)

S5 - marsh area east of proposed processing mill location

S6 - collection pond beside proposed processing mill location

S7 - main drainage inlet before treatment pond #1

S8 - discharge from treatment pond #1

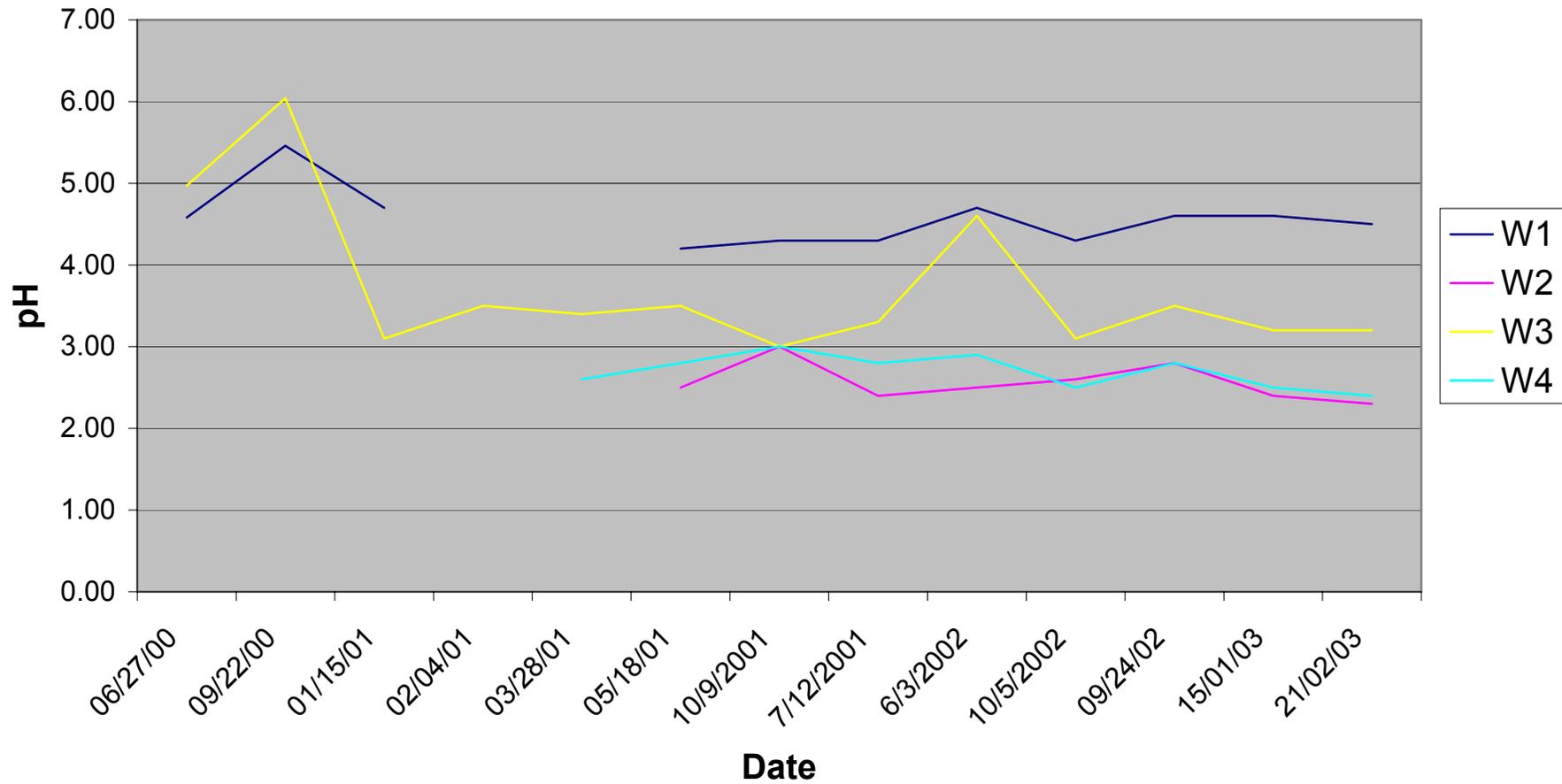
S9 - Comstock Creek - before mixing with adit drainage

- S10 - main adit drainage before mixing with Comstock Creek (*was W3*)**
- S11 - 2nd independent adit drainage south of Swansea dump after limestone buffer**
- S12 - 1st independent adit drainage south of Swansea dump after stormwater mixing**
- S13 - discharge from second collection dam west of Swansea dump (*was W4*)**
- S14 - Comstock Creek - downstream of mixing, before lease boundary**

APPENDIX C

Laboratory pH Analysis - Graphed

Laboratory pH Analysis



APPENDIX D

Weekly pH Analysis - Graphed

