

# Comstock Mine Environmental Monitoring Report Fourth Quarterly 2003

MINERAL RESOURCES		
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## 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 09/12/2003 and analysed at 'Allison Laboratories' on 19/01/2004 for all of the required parameters (Figures 1, 2 and 3). Laboratory results are located in Appendix A.

This sampling activity has shown average results for this sampling location. There was no significant increases or decreases in pH, TSS or other physical properties.

### 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.

Unfortunately, this sampling location had no collected water to extract for the purposes of sampling during this quarterly sampling event. From the results of W1 and W3, there is no indication that these sites will have any significant increases or decreases in water quality.

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### **2.3 W3 – Main Adit Outlet**

Sampling location W3 is situated at the main adit outlet.

Samples were taken on 09/12/2003 and analysed at 'Allison Laboratories' on 19/01/2004 for all of the required parameters (Figures 1, 2 and 3). Laboratory results are located in Appendix A.

Results from this sampling event are comparable with past results, expect for the pH. The previous (and average) pH reading was 3.3, and on this sampling event increased to 4.6. This increase is similar to the increased pH of W1 (upstream Comstock Creek). Since complete creek diversion from adit entrances has yet to be successful, these results may be directly related to the areas of diversion that have been successful. Further sampling will reveal if this theory remains consistent.

### **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.

Unfortunately, this sampling location had no collected water to extract for the purposes of sampling during this quarterly sampling event. From the results of W1 and W3, there is no indication that these sites will have any significant increases or decreases in water quality.

## **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

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Rock Dump.

The Central Waste Rock Dump rehabilitation is almost complete. Full re-contouring and 95% of the 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 Third Quarter Annual Report 2003, the Comstock mine site has continued its rehabilitation and clay extraction exercises.

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 09/12/03.

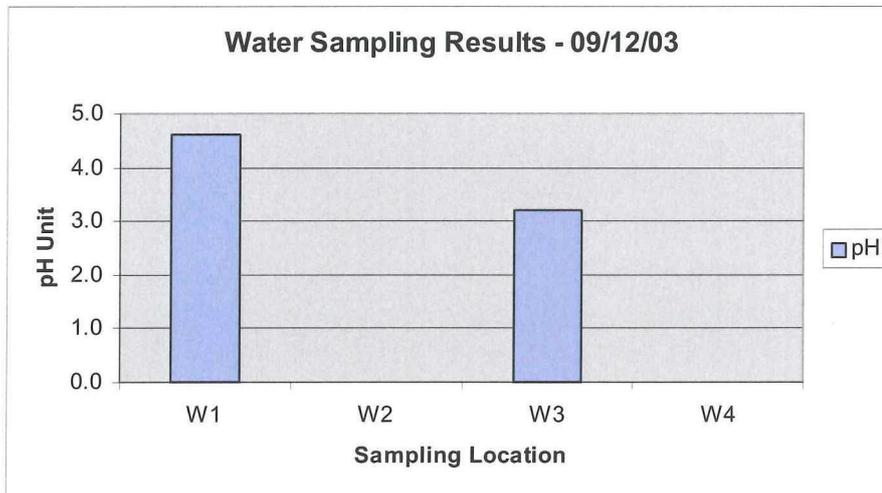


Figure 2. Water sampling results for TSS on 09/12/03.

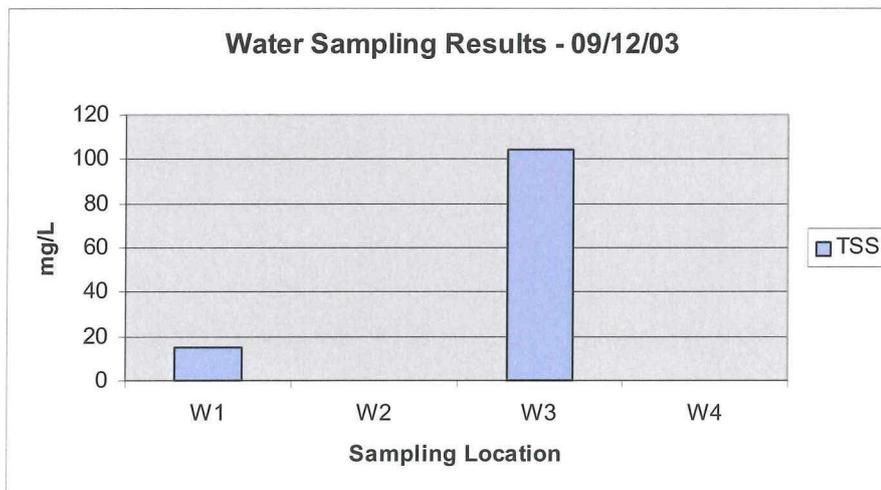
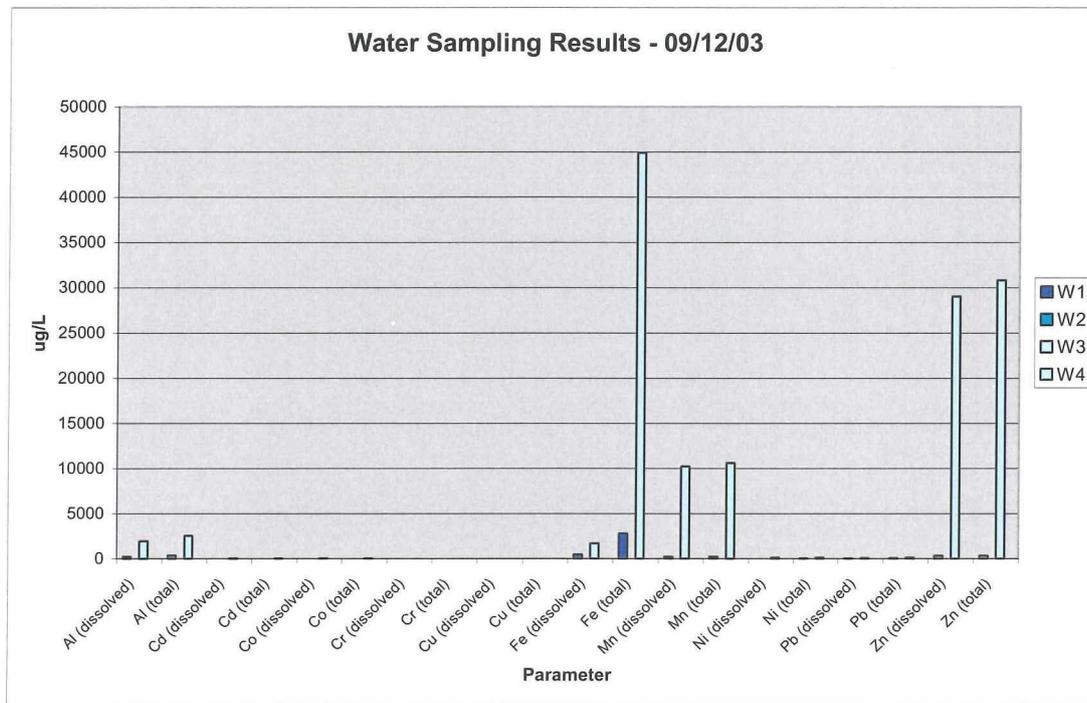


Figure 3. Water sampling results for metals on 09/12/03.



## **APPENDIX A**

*Laboratory Analysis of Water Samples*



**ANALYTICAL SERVICES TASMANIA**  
**Sandy Bay Laboratory**  
 c/- Chemistry Department University of Tasmania  
 Sandy Bay Tasmania 7005



Report No: 21263

Report Date: 19-Jan-2004 9:53

Method	Analyte	Units / Sampled On :	Lab.No.:	52699	52700
			Sample Id.:	w1	w3
			Units / Sampled On :	09/12/03 13:30	09/12/03 13:45
1001-Water	pH		4.6	3.2	
1002-Water	Conductivity	µS/cm	118	964	
1004-Water	TDS	mg/L	100	796	
1005-Water	TSS	mg/L	15	104	
1009-Water	Turbidity	NTU	3.1	250	
1101-Water	Alkalinity Total	mg CaCO3/L	<1	<1	
1102-Water	Acidity	mg CaCO3/L	12	144	
1301-Water	Al Dissolved	µg/L	215	1960	
	Al Total	µg/L	370	2530	
	As Dissolved	µg/L	<5	<5	
	As Total	µg/L	<5	190	
	Cd Dissolved	µg/L	1	25	
	Cd Total	µg/L	1	31	
	Co Dissolved	µg/L	4	56	
	Co Total	µg/L	4	59	
	Cr Dissolved	µg/L	<1	<1	
	Cr Total	µg/L	1	<1	
	Cu Dissolved	µg/L	5	4	
	Cu Total	µg/L	8	4	
	Fe Dissolved	µg/L	467	1670	
	Fe Total	µg/L	2790	44900	
	Mn Dissolved	µg/L	211	10200	
	Mn Total	µg/L	215	10600	
	Ni Dissolved	µg/L	10	113	
	Ni Total	µg/L	12	118	
	Pb Dissolved	µg/L	42	69	
	Pb Total	µg/L	80	109	
	Zn Dissolved	µg/L	334	29000	
	Zn Total	µg/L	339	30800	

**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
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



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
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
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



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
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

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
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
S1	17/07/03	89	89	9	8	114	119	555	559
S4	17/07/03	9970	10200	346	354	337	744	91100	93800
S10	17/07/03	8020	8010	111	111	562	617	33400	33600
S13	17/07/03	11000	11200	1940	1980	1060	1080	297000	302000
S1	24/10/03	133	142	10	12	109	125	620	651
S4	24/10/03	6340	6600	430	438	79	88	50900	51800
S10	24/10/03	9130	9650	113	117	205	288	30100	31200
S13	24/10/03	14800	14900	2050	2050	468	470	249000	249000
S1	09/12/03	211	215	10	12	42	80	334	339
S4	09/12/03								
S10	09/12/03	10200	10600	113	118	69	109	29000	30800
S13	09/12/03								

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)

17/07/03 (Shane Bartel - Oceania Tasmania)

24/10/03 (Simon Youd - Zeehan Zinc)

09/12/03 (Paul Heath - 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

