

## Oonah Mine/Queen Hill Drainage Diversion Results of Water Samples taken December 2005

### Background

Water samples were taken in December 2005, following the first stage of remediation works undertaken by the Rehabilitation of Abandoned Mining Lands Trust Fund. The aim of this work is to improve water quality of flow from the Silver Lead Creek catchment into Zeehan Rivulet.

Results of chemical analysis are generally consistent with, and reinforce, previous findings that the most concentrated levels of metal contamination and acidity are in water flow from Queen number 4 shaft (site 1) and Bell's Adit (site 4). Although relatively moderate in most parameters measured for this report, Oonah Creek above the Oonah main shaft (site 3) recorded high levels of arsenic and lead. The source of this contamination should be investigated.

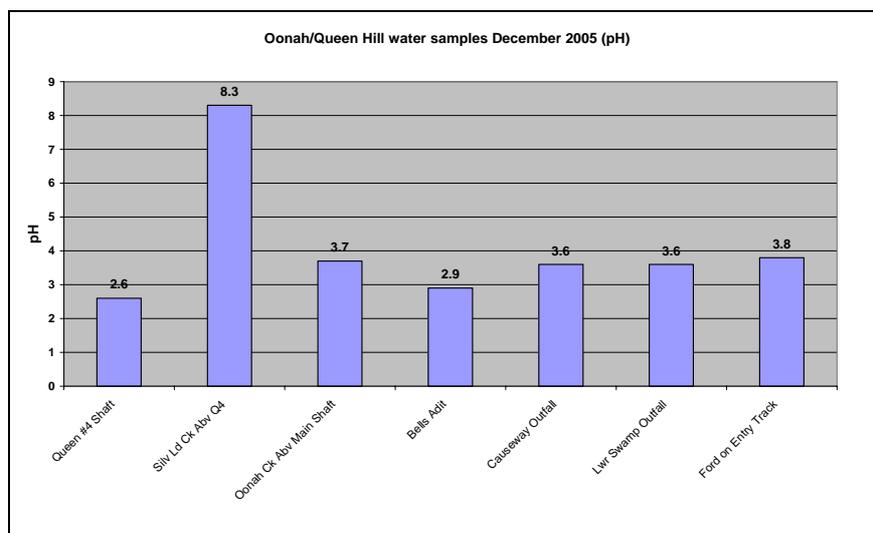
All seven samples returned results above ANZECC guidelines for protection of ecosystem values in at least three of the measured parameters. Samples reported on here were taken shortly after drainage diversion works and therefore, the reliability of results as an indicator of general water quality may have been affected due to physical disturbance of catchments. A more comprehensive program of sampling should be implemented to assess any impact of works on water quality and gain further information regarding sources of contamination and load fluxes.

### Results

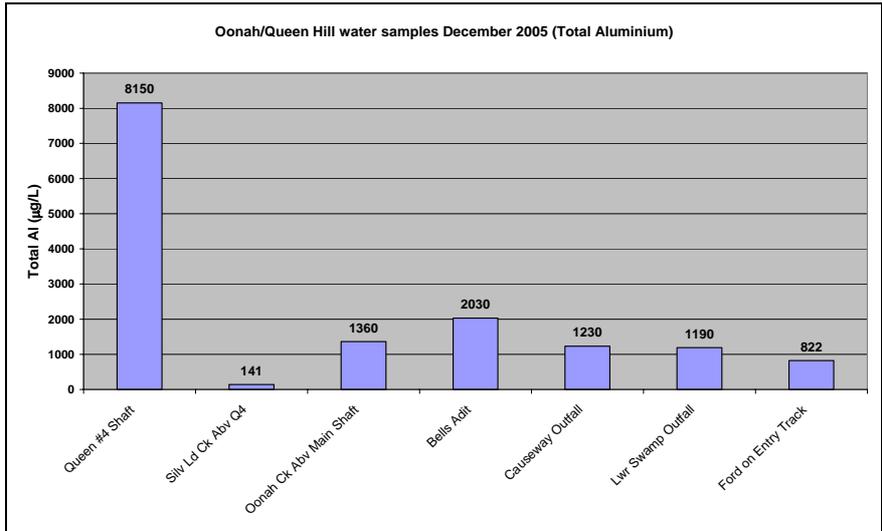
Water sample analyses show the highest levels of metal contamination and acidity in flow from underground workings; the Queen number 4 shaft (site 1) and Bell's Adit (site 4). These two sites recorded pH <3 and high levels of Al, Cd, Cr, Fe, Mn, Ni, Pb, Mg and Zn, relative to the other five sites sampled (Figure 1-7). A similar trend is evident in results from previous surveys, sampling a similar set of locations (Parr, 1997; Earth Systems, 1999). All seven sites reported on here exceed the limits for Al, Pb and Zn described in guidelines for the protection of freshwater ecosystem values (ANZECC, 2000).

#### Attachments:

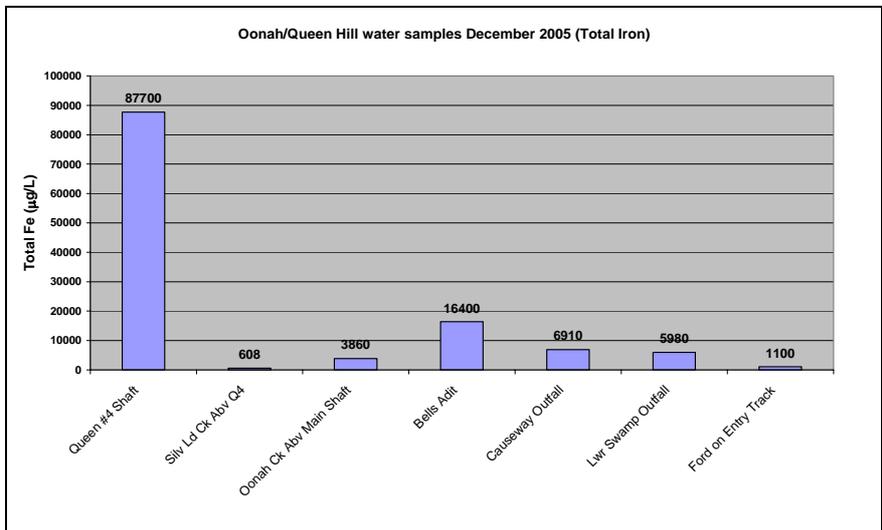
- Table 1 – sample site grid references.
- Site map showing water sample locations.
- Table of laboratory results from Analytical Services Tasmania.



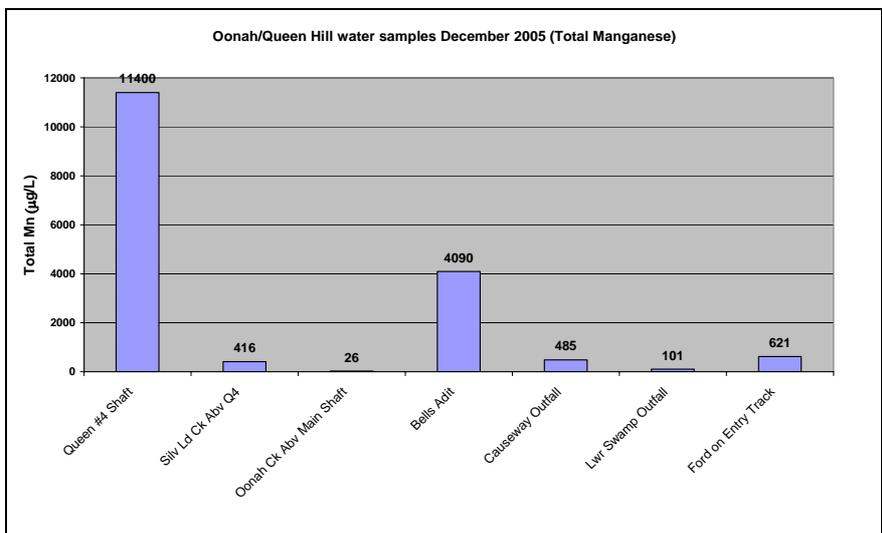
**Figure 1. Laboratory pH by site sample.**



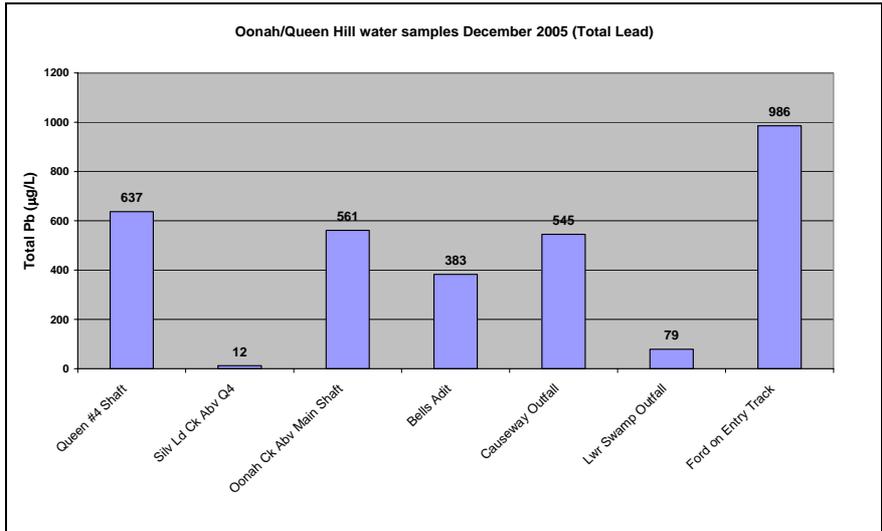
**Figure 2. Total aluminium by site sample.**



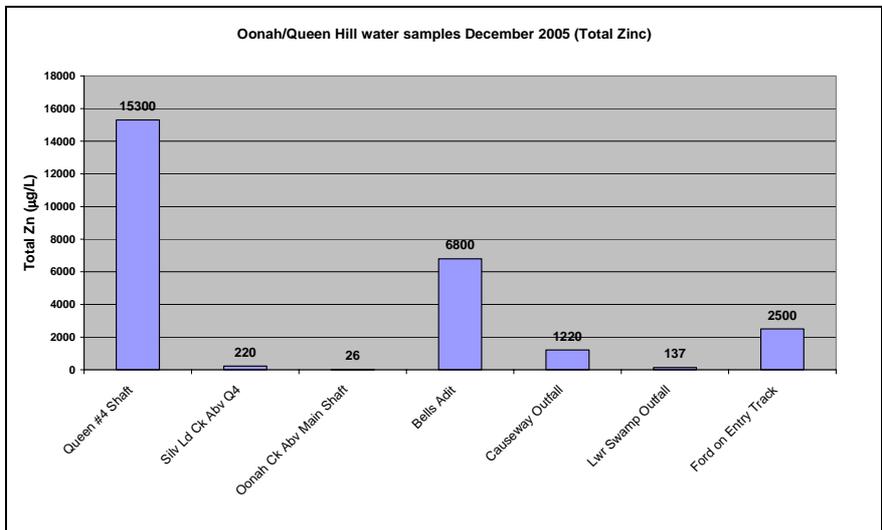
**Figure 3. Total iron by site sample.**



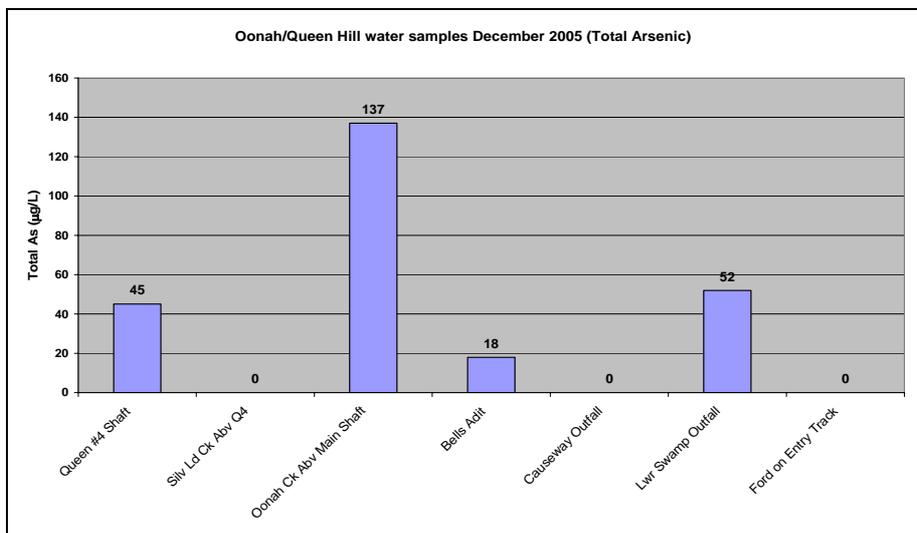
**Figure 4. Total manganese by site sample.**



**Figure 5. Total lead by site sample.**



**Figure 6. Total zinc by site sample.**



**Figure 7. Total arsenic by site sample.**

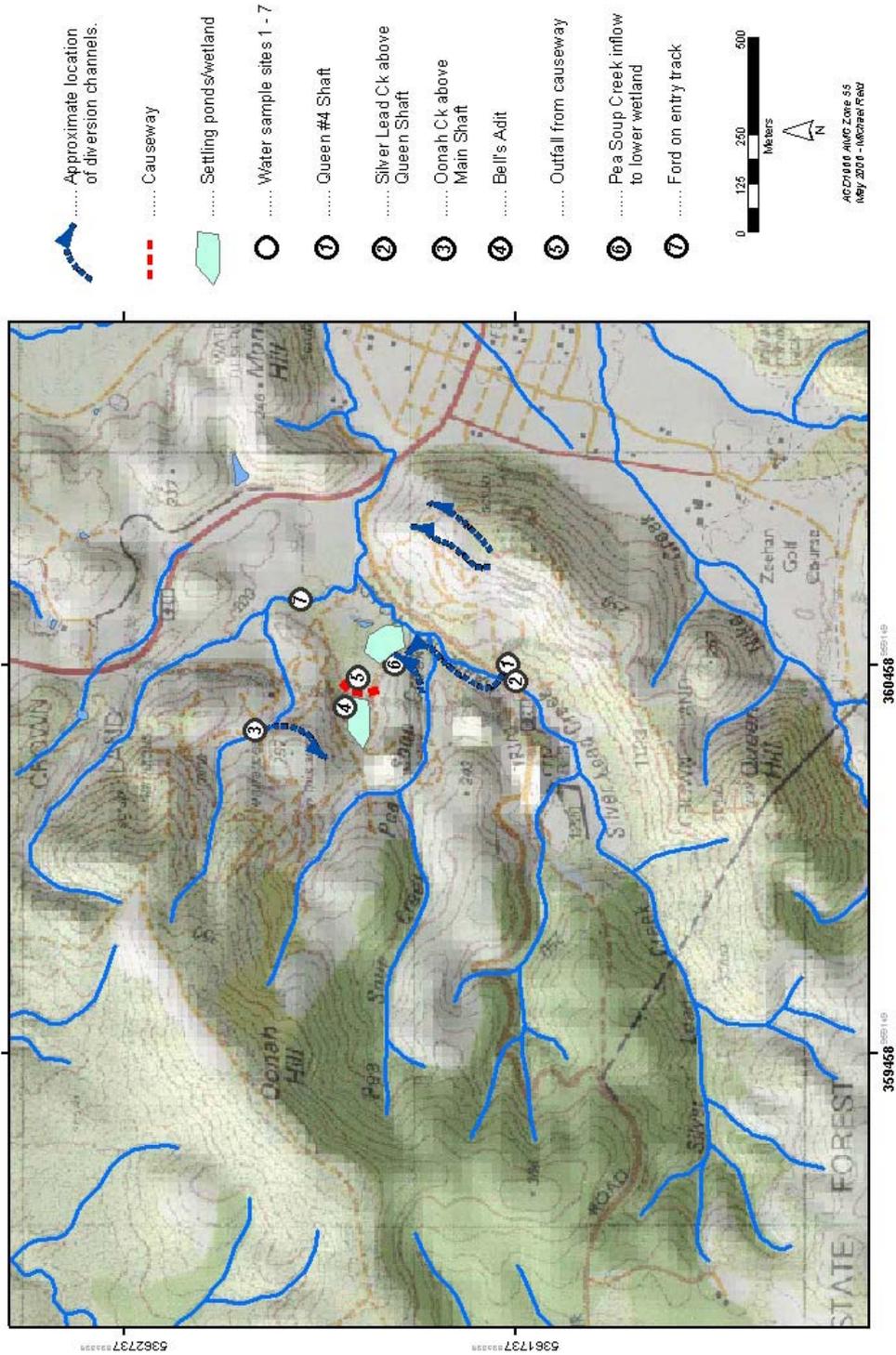
**Table 1.** Water sample sites numbered 1-7.

Grid references: AGD 1966 AMG Zone 55

<b>Site Number</b>	<b>Site Location</b>	<b>Easting</b>	<b>Northing</b>
<b>1</b>	Outfall from Queen #4 shaft.	360421	5361744
<b>2</b>	Silver Lead Creek 10 m above Queen #4 shaft.	360416	5361738
<b>3</b>	Oonah Creek above Oonah shaft.	360264	5362400
<b>4</b>	Flow from Bell's adit.	360335	5362173
<b>5</b>	Outfall pipe from new causeway.	360382	5362150
<b>6</b>	Outfall pipe from Sven's Swamp.	360490	5362024
<b>7</b>	Top side of ford on Oonah Mine access track (crossing tributary of Silver Lead Creek).	360619	5362267

*[M. Reid]*

Oonah/Queen Hill water sample locations December 2005



# ANALYTICAL SERVICES TASMANIA

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Method	Analyte	Lab.No.:	84659	84660	84661	84662	84663	84664	84665
		Sample Id.:	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7
		Units / Sampled On :	19/12/05	19/12/05	19/12/05	19/12/05	19/12/05	19/12/05	19/12/05
1001-Water	pH		2.6	8.3	3.7	2.9	3.6	3.6	3.8
1002-Water	Conductivity		1680	97	142	790	210	195	174
1101-Water	Alkalinity Total	µS/cm	1970	<2	7	<2	<2	<2	<2
1102-Water	Acidity	mg CaCO3/L	488	3	25	120	39	37	28
1103-Water	Sulphate	mg/L	654	11.4	16.9	217	44.8	32.4	36.8
1109-Water	Hardness	mg CaCO3/L	148	21.6	5.0	112	20.0	9.1	18.8
1301-Water	Al Total	µg/L	8150	141	1360	2030	1230	1190	822
	As Total	µg/L	45	<5	137	18	<5	52	<5
	Cd Total	µg/L	33	<1	<1	17	5	1	.9
	Co Total	µg/L	52	1	<1	50	11	4	13
	Cr Total	µg/L	6	<1	5	1	2	1	2
	Cu Total	µg/L	132	2	51	24	32	105	35
	Fe Total	µg/L	87700	608	3860	16400	6910	5980	1100
	Mn Total	µg/L	11400	416	26	4090	485	101	621
	Ni Total	µg/L	146	6	3	164	28	9	43
	Pb Total	µg/L	637	12	561	383	545	79	986
	Zn Total	µg/L	15300	220	26	6800	1220	137	2500
1302-Water	Ca Dissolved	mg/L	23.8	3.32	0.32	13.4	1.93	0.71	1.74
	Ca Total	mg/L	24.7	3.35	0.38	13.4	1.86	0.72	1.72
	K Total	mg/L	2.00	0.53	0.35	0.87	0.81	0.54	0.44
	Mg Dissolved	mg/L	21.5	3.23	1.01	19.2	3.68	1.79	3.52
	Mg Total	mg/L	22.1	3.14	1.31	18.9	3.43	1.82	3.51
	Na Total	mg/L	15.7	11.8	7.52	9.71	9.24	9.93	8.81