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Enquiries to: Huon Clark

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Re: Lethbridge South Water Sampling Results Jan 2011

Dear Peter,

In early January 2011, VDM Consulting EcOz (EcOz) conducted surface water sampling at the proposed Lethbridge South mineral sands mine. Results from this sampling event will be used as a baseline dataset for the project area's surface water quality. This dataset will be compared to results collected during post mining water quality monitoring as well as ANZECC surface water quality guidelines. This letter does not contain results interrogation and discussion, as these components will occur during the post mining phase (required for mine closure). Baseline ground water monitoring has already occurred within the project area and has been reported previously by EcOz (July 2010).

Method and Results

Water sampling was conducted by EcOz on the 3rd of January 2011 using Australian Standard sampling techniques. Three surface water sites were selected (LS 1, LS2 and LS3). Physical parameters including pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS) and Temperature were measured in the field (these results are presented in **Table 1**). The parameters analysed by the laboratory were:

- | | | |
|-------------|-------------|--------------|
| • Aluminium | • Mercury | • Calcium |
| • Arsenic | • Nickel | • Magnesium |
| • Cadmium | • Silver | • Sodium |
| • Chromium | • Thorium | • Potassium |
| • Copper | • Titanium | • Chlorine |
| • Iron | • Uranium | • Sulphate |
| • Lead | • Zinc | • Alkalinity |
| • Manganese | • Zirconium | |

The laboratory also measured pH, EC and Temperature as a comparison to the field tested parameters. However, the field results will be used during results interrogation as these parameters can change during transport of the sample water.

Site selection was based on an inspection of areas that held water in the wet season in the vicinity of the mining areas. At the time, surface water was wide spread within the project area. Access was difficult throughout the site and all sampling was conducted on foot. Therefore, these results will be use as representative surface water sites for the project area. Site locations are listed in **Table 1** and are plotted on the map in **Figure 1**. Site photos are provided in **Table 2**. In the dry season (July 2010), surface water bodies within the project area were reduced to small stagnant swamps and were highly impacted by water buffalo. Surface water was not sampled during the dry season.

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Table 1: Lethbridge South Surface Water Sites and physical characteristics taken on Jan 3, 2011.

Sample Site	Mineral Deposit	Easting	Northing	pH	EC (μ S)	TDS (ppm)	Temp ($^{\circ}$ C)
LS1	Lethbridge South	719669	8740214	6.38	0.89	0.44	30.5
LS2		719869	8740170	5.84	25	12	31.9
LS3		719453	8740517	4.99	34	17	30.2

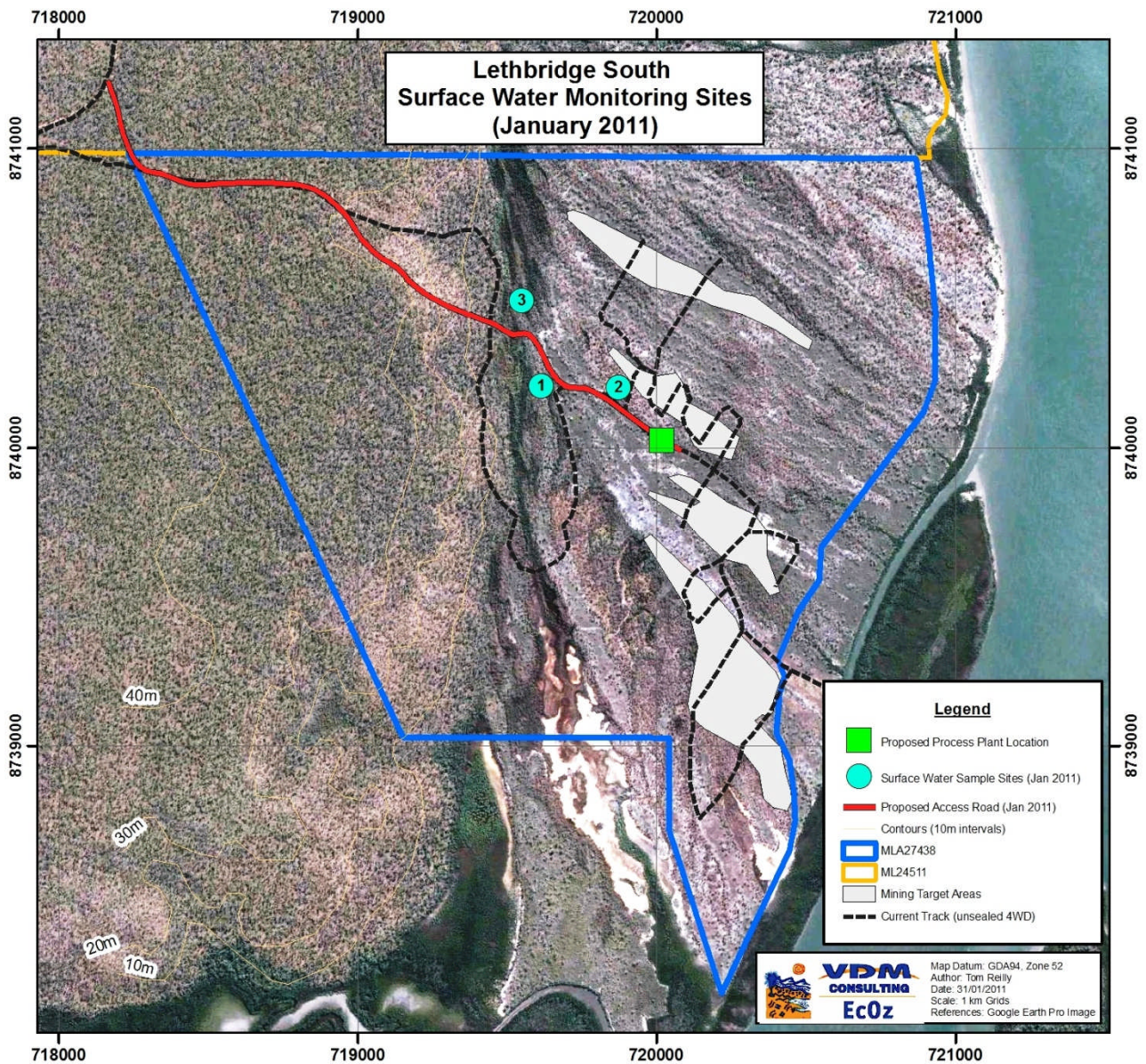


Figure 1: Surface Water Sampling Location Map, Lethbridge South Jan 2011

Table 2: Site Photos, Lethbridge South Surface Water Monitoring, Jan 2011

Site 1 Photos



Site 2 Photos



Site 3 Photos



Table 3: Lethbridge South Surface Water Sampling Results, Jan 2011

Lethbridge South Surface Water Sampling, Jan 2011				LS 1	LS 2	LS 3
ALS Ref Number: EB1100298				3/01/2011	3/01/2011	3/01/2011
Analyte	Units	LOR	Guideline Limit	3/01/2011	3/01/2011	3/01/2011
pH Value	pH Unit	0.01	-	6.98	6.1	5.58
Electrical Conductivity @ 25°C	µS/cm	1	-	113	29	35
Total Dissolved Solids @180°C	mg/L	5	-	127	72	30
Hydroxide Alkalinity as CaCO3	mg/L	1	-	<1	<1	<1
Carbonate Alkalinity as CaCO3	mg/L	1	-	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	mg/L	1	-	31	3	1
Total Alkalinity as CaCO3	mg/L	1	-	31	3	1
Sulfate as SO4 2- (Major Anion)	mg/L	1	-	7	1	<1
Chloride	mg/L	1	-	10	3	10
Calcium (Major Cation)	mg/L	1	-	15	3	<1
Magnesium (Major Cation)	mg/L	1	-	2	<1	<1
Sodium (Major Cation)	mg/L	1	-	5	2	5
Potassium (Major Cation)	mg/L	1	-	<1	<1	<1
EG020F: Dissolved Metals by ICP-MS						
Aluminium	mg/L	0.01	0.055	0.27	0.12	0.02
Arsenic	mg/L	0.001	-	0.005	<0.001	<0.001
Cadmium	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.001	-	0.001	<0.001	<0.001
Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001
Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001
Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001
Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005
Manganese	mg/L	0.001	1.9	0.014	0.025	0.001
Silver	mg/L	0.001	0.00005	<0.001	<0.001	<0.001
Thorium	mg/L	0.001	-	<0.001	<0.001	<0.001
Titanium	mg/L	0.01	-	<0.01	<0.01	<0.01
Uranium	mg/L	0.001	-	<0.001	<0.001	<0.001
Zirconium	mg/L	0.005	-	<0.005	<0.005	<0.005
Iron	mg/L	0.05	-	1.56	0.38	0.43
EG020T: Total Metals by ICP-MS						
Aluminium	mg/L	0.01	0.055	0.37	0.14	0.04
Arsenic	mg/L	0.001	-	0.005	0.001	<0.001
Cadmium	mg/L	0.0001	0.0002	<0.0001	<0.0001	0.0002
Chromium	mg/L	0.001	-	0.002	<0.001	<0.001
Copper	mg/L	0.001	0.0014	<0.001	<0.001	<0.001
Nickel	mg/L	0.001	0.011	<0.001	<0.001	<0.001
Lead	mg/L	0.001	0.0034	<0.001	<0.001	<0.001
Zinc	mg/L	0.005	0.008	<0.005	<0.005	<0.005
Manganese	mg/L	0.001	1.9	0.021	0.028	0.003
Silver	mg/L	0.001	5.00E-05	<0.001	<0.001	<0.001
Thorium	mg/L	0.001	-	<0.001	<0.001	<0.001
Titanium	mg/L	0.01	-	<0.01	<0.01	<0.01
Uranium	mg/L	0.001	-	<0.001	<0.001	<0.001
Zirconium	mg/L	0.005	-	<0.005	<0.005	<0.005
Iron	mg/L	0.05	-	2.28	0.5	1.06
Mercury	mg/L	0.0001	0.0006	<0.0001	<0.0001	<0.0001
Mercury	mg/L	0.0001	0.0006	<0.0001	<0.0001	<0.0001
EN05: Ionic Balance						
Total Anions	meq/L	0.01	-	1.03	0.18	0.3
Total Cations	meq/L	0.01	-	1.14	0.24	0.23
Guideline: ANZECC Protection of Aquatic Ecosystems (2000) (WATER) - Freshwater 95% protection level						

Analytical results for the three sites are provided in **Table 3**. Results were compared to the Australian and New Zealand Environment Conservation Council (ANZECC) guidelines for fresh water with a 95% protection level. There were a few breaches (Aluminium and Cadmium), which is one reason for collecting site specific water quality values to ensure that pre and post mining comparison are interrogated properly.

The Certificate of Analysis (COA) provided by ALS Laboratories and other quality control reports can be provided if you require this paperwork.

If you require any further information, please do not hesitate to contact us.

Yours faithfully



HUON CLARK
Environmental Scientist
EcOz Environmental Services