COMBINED ANNUAL REPORT FOR ELs4662, 4870, 4871, 4872, 4873, and 4874 FOR THE PERIOD ENDING 30 SEPTEMBER 2012

Gippsland Mineral Sands Project
Eastern Gippsland Basin
Victoria

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FOR
ORESOME AUSTRALIA PTY LTD
ABN 75 071 762 484

TENEMENTS HELD
BY
Rio Tinto Exploration Pty Ltd
ABN 76 000 057 125

Date of Report: 18th October 2012

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Table 1: List of Supporting Digital Files

Keywords:
Bairnsdale, Gippsland Basin, Miocene, Pliocene, Pleistocene, Sand-Placer, Sandstone, Sand, conglomerate, Heavy Minerals, RC Air Core drilling, rutile, ilmenite, leucoxene, zircon, monazite, Boisdale Formation, Wurruk Sand Member, Lindenow Sand Member.

Mapsheets:
1:100,000 map Bairnsdale 8422
1:100,000 map Stratford 8322
1:250 000 Geological Map Series Bairnsdale SJ 55-7

1 SUMMARY and INTRODUCTION

Exploration Licence (EL) 4662 Stockdale was granted to Rio Tinto Exploration Pty Limited (RTX) on 31 October 2007 after the amalgamation of the former EL 4662 with ELs 4663, 4664 & 4665 which had been granted on 31 October 2002. Gaps that were recognised and applied for on 22nd March 2005 were granted as ELs 4870, 4871, 4872, 4873 and 4874, known respectively as Gippsland Gap 1 to 5. All are current or under renewal processes.

These six ELs comprise part of the Gippsland Mineral Sands Project and extend over an east west line of some 80km between Briagalong and Bruthen in the eastern Gippsland Basin of eastern Victoria. RTX holds a 100% interest in the title, but has entered in an agreement with Oresome Australia Pty Ltd a wholly owned subsidiary of Metallica Minerals Limited (ASX: MLM).

The ELs cover parts of the outcropping Miocene-Pliocene sand units of Seaspray and Sale Groups. These marine sands were identified as holding potential for concentrations of heavy minerals within shallow marine or shore face sand depositional settings. There is a question whether the sediments are from the Boisdale Formation Wurruk Sand Member or the Lindenow Sand Member. Samples will be sent for age dating that will delineate this question.

The programs of this reporting period were designed to follow up and be integrated with the previous drilling and testing by RIO. In this program air core drilling in the Glenaladale and Mossiface areas comprised of 43 holes for 2290 metres resulting in 776 assay samples and 747 bulk samples. Each of the exploration holes were duplicated for metallurgical bulk sampling. The drill program is detailed in the Appendix 2

Metallurgical scoping test work to develop a conceptual process flow diagram and discussed in detail within the RJ Robbins of Appendix 3 confirm that mineral sands products of acceptable quality can be produced.

The large difference in titanium product grades (48.4% - Glenaladale Main Ilmenite Product, 57.0% - Mossiface Ilmenite Product) suggests probable differences in ilmenite species are present. Preliminary observations also indicate material from Glenaladale Main to contain higher levels of chromium as compared to Mossiface as is evident in the elevated Cr2O3 levels in the titanium products produced. No amenable difference in grade and recovery exists between the zircon products produced from Glenaladale Main and Mossiface.

Overall un-optimised mineral test work recoveries for the valuable heavy minerals zircon, rutile and ilmenite are within the expected range whereas the recovery of the light heavy mineral leucoxene is low calculated at <10% and is believed to be associated with the high level of alteration and fine nature of the material.

The resources were calculated to JORC standards by AMC Consultants and these are reported in full in Appendices 4A and 4B, with an overview below in the Resource Estimates section of this report.

AMC reported a total Inferred Resource for Glenaladale of 1,710 million tonnes with a heavy mineral content of 2.7% and at Mossiface an Inferred Resource of 130 million tonnes at 1.9% heavy mineral content. The detailed reports on these are attached as Appendix 4A (Glenaladale) and Appendix 4B (Mossiface).

2 TENURE

The Exploration Licences that form the basis of this Report are held by Rio Tinto Exploration Pty Ltd as per Table 2 below.

EL	NAME	Sq Km	Grats	Expiry
EL4662	Stockdale	355.6	393	30 October 2012
EL4870	Gippsland Gap 1	0.2387	2	26 May 2013
EL4871	Gippsland Gap 2	1.552	4	27July 2012 under renewal
EL4872	Gippsland Gap 3	0.5929	2	26 May 2013
EL4873	Gippsland Gap 4	4.678	6	26 July 2012 under renewal
EL4874	Gippsland Gap 5	15.54	25	26 May 2015

Table 2: Contiguous ELs

Metallica Minerals Limited's (ASX: MLM) wholly-owned subsidiary, Oresome Australia Pty Ltd (Oresome), announced to the public on 26th August 2011 (see Appendix 1), that it had entered into a Right to Explore and Option to Purchase Agreement with Rio Tinto Exploration Pty Ltd pursuant to which Oresome has the exclusive right to explore certain exploration licences which comprise the Gippsland Heavy Mineral Sands (HMS) Project in Victoria's south east and option to purchase a 100% interest in the exploration licences at any time during the term of the Agreement. The work reported herein is as a result of that agreement.

The work conducted on these ELs is reported in this combined report as one Project.

3 GEOLOGY

3.1 Stratigraphy

This northern part of the Gippsland Basin, which is immediately adjacent to the Palaeozoic basement of the eastern Australian highlands, is known as the Lakes Entrance Platform (see Fig 1 of Hocking 1976 – attached as Fig 4).

Lindenow Sand Member

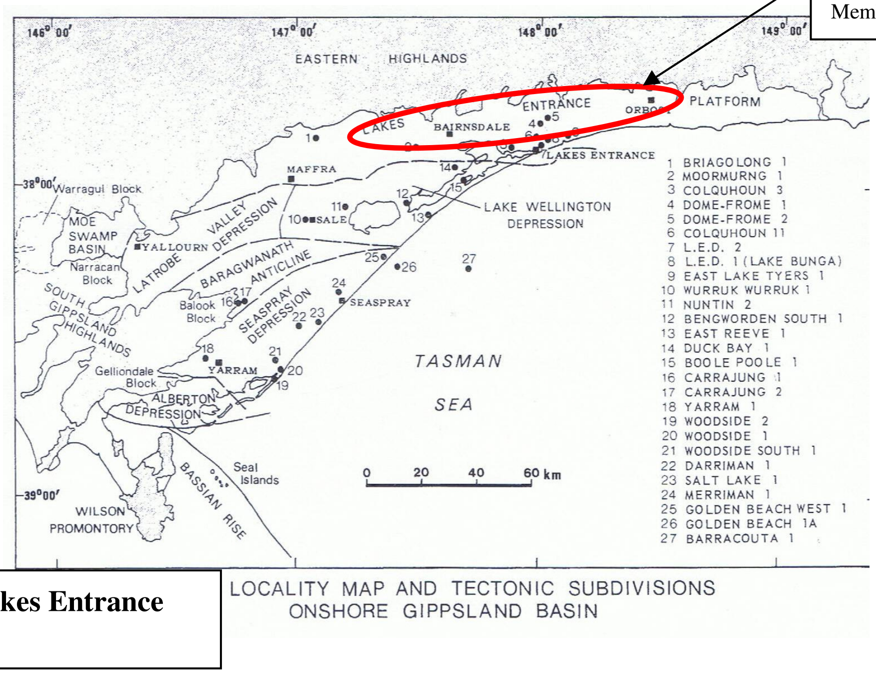

Figure 4: Lakes Entrance Platform

The basement of the area is the Early Cretaceous Strzelecki Group mudstones, sandstones and arkoses that were encountered in three holes (GS510, GS515 and GS516). At the bottom of GS510 the sandstone was overlain by a blue gray claystone grading up into a grey clay with rounded quartz pebbles. A similar clay with pebbles was seen at the bottom of GS515. In GS514 two "erratics" were encountered in the loose sands that were narrow banded with the appearance of ignimbrites.

The target sediments for the program were the fine sands commonly well sorted silty fine sands carrying varying heavy mineral content. These sands included clayey components with full variation from silty fine sands to clayey sands through sandy clays to clays. Colours varied extensively but are generally pale ("pastel"). When drilled these sands were rarely lithified or indurated but seen as loose sands with no drill fragments.

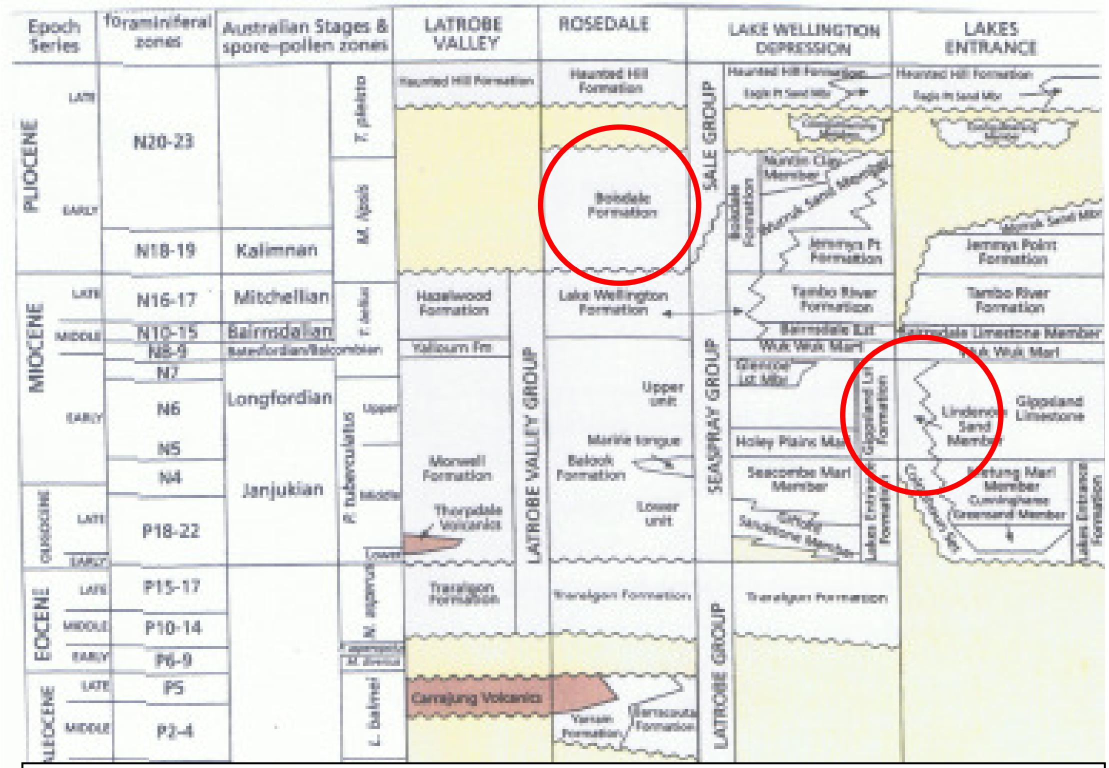

Figure 5: From Birch 2003 – showing Lindenow Sand Member and Boisdale Fm

Fig. 10.33: Stratigraphic correlation table — onshore Gippsland Basin. Reproduced from Gallagher & Holdgate (1996). Yellow indicates non-deposition/erosion.

Muggeridge and Clementson (2008) stated that these target sands were in the Boisdale Formation (Early to Mid Pliocene, in Table 2 below) which is part of the Sale Group that overlies the Seaspray Group. Hocking (1976) described the Boisdale Fm with its Wurruk Sand Member, and the Lindenow Sand Member in very similar lithological terms that fits the fine sands seen in these drilling programs.

Hocking (1976) described the Lindenow Sandstone Member (of the Seaspray Group) with its Glenaladale Sands that was originally described by Wilkins (1962 - in Hocking 1976). The Lindenow Sand Member (LSM) is the near shore equivalent of the Gippsland Limestone which belongs in the Seaspray Group with its lower boundary grading into the Colquhoun Sandstone Member. As such, Hocking (1976) refers to the LSM as Early to Middle Miocene. The town of Lindenow lies on the boundary of the target area.

The Wurruk Member of the Boisdale Formations was described by Hocking (1976), as extending from the Avon River east to Lakes Entrance, with a maximum thickness known of 143.3m in Wurruk Wurruk – 1 near Sale.

Hocking (1976) describes the thickness of the LSM as possibly in excess of 100m as indicated from the Dome-Frome 1 and Dome-Frome – 2 holes near Nowa Nowa, and the extent as from Glenaladale to just east of Orbost. This ties in with but extends beyond the tenements held.

Unconformably overlying these sands are the gravels and gravelly clays of the Pleistocene Haunted Hill Gravels (HHG – Photo 1 below). These gravels in the Glenaladale area vary from rounded cobbles of quartz and sandstone to gravelly and sandy red clays.

Photo 1: Haunted Hill Gravels on the Bairnsdale – Lindenow Road

The present surface is dominated by the flat lying Pleistocene HHG which Vandenberg and O'Shea (1981) described as undulating "Low Lying Hills" of the Gippsland Plains above the Munro Plain comprised of the alluvial and coastal plains. Those "Low Lying Hills" were further subdivided into the Nowa Nowa Hills, the Calulu Hills and the Stockdale Hills. It is these hills that are the targets for the heavy minerals of the fine sands.

Comparisons Boisdale Fm and Lindenow Sand Member						
					Distribution	Thickness
Pleistocene	Haunted Hill Gravels				West of Sale to Orbost?	Thin
Pliocene – Late						
Pliocene – Early		Boisdale Fm Wurruk Sand Member			Maffra – Lakes Entrance	>100m in bore hole
Miocene – L						
Miocene – M						
Miocene – Early			Lindenow Sand Member	Gippsland Limestone	Glenaladale - Orbost	>100m in bore hole
Oligocene – Late						

Table 3: Stratigraphic Comparisons

The Quaternary – Recent sediments are undifferentiated alluvial silts, sands and gravels of the river valleys and are essentially ignored as volumes are too insignificant for commercial or stratigraphic interest.

3.2 Mineralisation

During the logging of the drill samples, there was no attempt to distinguish mineralisation other than occasionally to estimate the "zircon" content of the total heavy minerals seen in the panning. The "zircon" was taken as all of the HM that was a clear or of a very pale colour compared to the black heavy minerals.

It was considered that panning was more difficult in the north east parts of the Glenaladale area possibly because the HM was finer. In the north east the grain sizes were more likely to be of the order of 80 – 100µ whereas in the other areas the HM appeared a little coarser – up to 120µ - as determined by hand held scale lupe.

In the Logging Codes (Appendix 4 in Appendix 2 of this report) there is reference to Ferruginous as a Lithological Qualifier either as WFE, MFE or SFE. In the logging, the ferruginous mineralisation was seen to be either globular or rounded being hematitic or probably goethite and usually 1-2% of the total with grain size of the order of 2-3 mm, a second variety (the "Angular") was also seen and this was usually what appeared to be thin possibly fracture or vein infill plates <1mm thick but with other dimensions of a maximum of 3 x 5mm and most likely of black goethite, hematite or maghemite, and more likely to be seen near the bottom of the profile. There was up to 20% (SFE) in GS506.

A "blue-grey" clay was seen in the bottom of GS510

4 WORK PROGRAMS IN CURRENT PERIOD

A summary of the programs conducted during the year is presented in Table 4 below

EL	Activities
4662	1. Negotiations with Landowners and TLOs 2. Continued community engagement 3. Drilling (43 air core holes for 2290 metres resulting in 776 assay samples and 747 bulk samples), 4. Metallurgical studies by RJ Robbins 5. Resource upgrades at Mossiface and Glenaladale by AMC 6. Commencement of feasibility evaluation 7. Continued environmental studies 8. Borehole drilled to test water source adjacent to potential mine
4870	1. Negotiations with Landowners and TLOs 2. Continued community engagement 3. Commencement of feasibility evaluation 4. Continued environmental studies
4871	1. Negotiations with Landowners and TLOs 2. Continued community engagement 3. Commencement of feasibility evaluation 4. Continued environmental studies
4872	1. Negotiations with Landowners and TLOs 2. Continued community engagement 3. Commencement of feasibility evaluation 4. Continued environmental studies
4873	1. Negotiations with Landowners and TLOs 2. Continued community engagement 3. Commencement of feasibility evaluation 4. Continued environmental studies
4874	1. Negotiations with Landowners and TLOs 2. Continued community engagement 3. Commencement of feasibility evaluation 4. Continued environmental studies

Table 4: Work Programs PE 30th September 2012

4.1 Drilling

Brett Duck of Bremar Minerals Pty Ltd was commissioned to supervise a drilling program carried out by Wallis Drilling of Perth on behalf of Oresome Australia Pty Ltd of Brisbane in the Bairnsdale area of eastern Victoria.

The drilling commenced on 20th December 2011 and finished on 3rd January 2012. A total of 2,290 metres was drilled in 43 holes at 20 locations. This program resulted in 776 assay samples and 747 bulk samples. See Figure 2 and 3 for location plans and Table 5 for a list of the co-ordinates.

The aim of the program was to integrate results with previous programs of Rio on the same tenements, to confirm the concepts and grades of the Rio work and to establish a JORC Resource leading to a bankable feasibility.

At each of the 20 locations where holes were drilled for assay samples, a duplicate (on in one case triplicate) holes were drilled so that a minimum of 3 tonnes from Glenaladale and 800 kg from Mossiface could be taken from the logged zone that was to considered visually of greater than 1% HM. The samples were sent to RJ Robbins for analysis (Appendix 3) and results to AMC Consultants for inclusion in resource estimates (Appendices 4a and 4b).

Area	Hole No	East	North
Glenaladale	**501**	529101	5816230
Glenaladale	**502**	526967	5817829
Glenaladale	**503**	526784	5818777
Glenaladale	**504**	529063	5818006
Glenaladale	**505**	529833	5817773
Glenaladale	**506**	530595	5817012
Glenaladale	**507**	531012	5816573
Glenaladale	**508**	531639	5816851
Glenaladale	**509**	529154	5818890
Glenaladale	**510**	528591	5818991
Glenaladale	**511**	527863	5819740
Glenaladale	**512**	527728	5818965
Glenaladale	**513**	527592	5818508
Glenaladale	**514**	527655	5817879
Glenaladale	**515**	529836	5818233
Glenaladale	**516**	529808	5818778
Glenaladale	**517**	528530	5816798
Glenaladale	**518**	531347	5816271
~~Glenaladale~~	~~**519**~~	~~Not Drilled~~	
~~Glenaladale~~	~~**520**~~	~~Not Drilled~~	
Mossiface	**521**	569770	5822698
Mossiface	**522**	570601	5821817

Table : 5 Collar Co-ordinates (GDA94)

4.2 Assay and Metallurgical Testing

Metallurgical scoping process flow diagram development test work was completed on a bulk sample from Glenaladale Main (Test Series 1) and Mossiface (Test Series 100). Head analyses of these two samples indicated the following heavy mineral and slimes content as per Table 6. below. The processes used in these studies are detailed attached in Appendix 6.

	Glenaladale Main	**Mossiface**
Slimes (-38μm)	26.7	18.2
HM (+2.85sg)	2.7	1.9

Table 6 Head Analyses

Mineralogical analyses of the heavy mineral for Glenaladale Main and Mossiface is included below as Table 7 with respect valuable mineral contents.

	Ilmenite	**Leucoxene**	**Rutile**	**Zircon**
Glenaladale Main	32	32	2.5	16
Mossiface	29	23.5	0.5	28

Table 7 Mineralogical Analyses of Heavy Mineral

The test work completed and discussed herein confirmed that mineral sands products of acceptable quality could be produced as per Table 1.2 (of Appendix 3) for Glenaladale Main, Table 1.3 (of Appendix 3) for Mossiface.

Primary Zircon product is of premium quality with the exception of the U+Th levels which exceed the required <500ppm level for premium grade. Although the U+Th levels exceed 500ppm it is Robmet's understanding that this material would still be marketed as premium grade.

Secondary Zircon product is of chemical/special grade quality containing <1.0% TiO2 and <1,000ppm U+Th.

Potential HiTi products were only produced from Glenaladale Main material as insufficient material from Mossiface was available. Robmet understand that HiTi products are of acceptable quality for use in applications such as welding rod manufacture, other than Titanium Dioxide production. Data from Glenaladale Main also suggest that a single HiTi 70 product as per product specification contained in Table 1.4 of Appendix 3 could be produced.

Further to the above further potential exist to produce a single Titanium Product containing >57% TiO2 but the production of such a product would be subject to further metallurgical testing and detailed market evaluations. Ilmenite products produced from the two samples contain different TiO2 levels with material from Glenaladale Main containing 48.4% TiO2 and material from Mossiface containing 57% TiO2, regardless of containing similar levels of ilmenite as per grain count, thereby indicating varying TiO2 levels for ilmenite. Confirmation of this would require further mineralogical and metallurgical evaluations. Cr2O3 levels for the Glenaladale Main material are high at 0.8% and would require further work to ascertain its solubility in sulphuric acid (solubility of <0.1% required for Titanium Dioxide production) and if it is liberated or part of the ilmenite grain. Product sizing data confirmed the relatively fine nature of the material and is enclosed as Appendix 7.2 in Appendix 3 of this report. Overall un-optimised mineral test work recoveries for the valuable heavy minerals zircon, rutile and ilmenite are within the expected range whereas the recovery of the light heavy mineral leucoxene is low calculated at <10% and is believed to be associated with the high level of alteration and fine nature of the material. Actual test work recoveries and projected mineral recoveries for Glenaladale Main and Mossiface is included as Table 1.5 and Table 1.6 of Appendix 3.

Overall projected recoveries for zircon are within expected range of 65-75%. Projected Ilmenite and rutile recoveries are within the expected range of 60-75% for ilmenite and 50-65% for rutile. Leucoxene recovery is low calculated at 6.7% and predicted at 9.9% and is associated with the loss to the wet concentration plant tailings and is as a direct result of alteration and fine grained nature. Further metallurgical work will be required to optimise these recoveries and evaluate the impact thereof of product production, particularly zircon and HiTi products.

4.3 Resource Estimates

AMC Consultants Pty Ltd (AMC) were contracted to prepare a resource block model and a Mineral Resource estimate in accordance with JORC for both the Glenaladale and Mossiface deposits. All of the drill holes by RIO and the holes detailed in this report were utilised as the basis of the resource estimates.

The Mineral Resource above a cut-off grade of 1% HM is shown in the table below.

Prospect	**Resource Area**	**Tonnes (m)**	**HM(%)**	**Slimes(%)**	**Contained HM (Mt)**
Glenaladale	VHM assemblage mineral resource	360	2.7	24.7	9.7
	Mineral Resource: no VHM assemblage estimate	1,350	2.1	24.3	29
	Total	1,710	2.2	24.4	38
Mossiface	High grade domain	57.9	2.7	16.2	1.5
	Low grade domain	72.1	1.3	17.6	0.9
		130	1.9	17.0	2.4

Table 8: **Inferred Mineral Resource above a Cut-off of 1% HM**

A portion of the Inferred Mineral Resource at Glenaladale, and the Inferred Mineral Resource at Mossiface have been further qualified by an estimation of the grades of mineral assemblage data for valuable heavy minerals (VHM) comprising zircon, rutile, other titanium minerals and monazite. The ilmenite. altered ilmenite and leucoxene have been combined into a variable called “other titanium Minerals” by summing their percentages within the HM fraction.

Due to a lack of VHM drillhole data, values of these minerals were obtained from the logarithmic trend line value for the total for Mossiface and from the mean statistical value for each domain for Glenaladale. The Inferred VHM assemblage Mineral Resource is shown in Table 9 below. The zircon, rutile, other titanium minerals and monazite grades are shown as a percentage of the HM.

Category	Tonnes (Mt)	HM (%)	Zircon (%HM)	Rutile (% HM)	Other Titanium (% HM)	Monazite (% HM)
Glenaladale Inferred	360	2.7	15	4	50	0.6
Mossiface Inferred	130	1.9	24.1	9.2	39.5	4.7

Table 9: **Inferred VHM Assemblage Mineral Resource Above a Cut-off of 1% HM**

4.4 Water Bore

One of the key issues (risks) associated with the project is the need for a sustainable water supply with Oresome having initially indicated a potential requirement of 6.2 gigalitres per annum.

A review of relevant publicly available geological and hydrogeological information undertaken by AECOM recommended additional preliminary field investigations to further assess the groundwater resource potential. AECOM (2012) developed a field investigation program targeting the Latrobe Coal Valley Measures/Balook Formation and Latrobe Group aquifers. This report summarises the field work program, provides interpretation of results obtained and recommendations for further work relating to identifying water sources for the project.

The investigation program was undertaken between 18 June and 24 August 2012 and comprised the drilling, construction, development and testing (physical and chemical) of a production bore at MW01. In-situ material, identified from exploratory drilling and a down-hole geophysical survey between 196 mbgl and 205 mbgl at MW01, was considered a potentially suitable groundwater-bearing formation, such that it might meet some of Oresome's water supply requirements. In order to assess the groundwater potential at this depth, a production bore was constructed and screened across this interval, and a pumping test undertaken.

The constant rate pumping test was conducted on MW01 for 22 hours at 0.5 L/sec. Constraints relating to water depth, bore width and size of necessary pumping equipment confined the test to this rate. Around 17 m of drawdown was experienced immediately after commencement of pumping, which may be attributed to initial well loss. Further drawdown within the 22 hour test was negligible. Within minutes of the cessation of pumping, the water level recovered close to its original standing water level, 86.7 mbgl. An assessment of the potential sustainable yield of the target aquifer was not possible based on the constant rate pumping test results. While the pumping test results were inconclusive, the targeted aquifer is considered unlikely to sustainably yield groundwater volumes of more than 5 L/sec based on: - the drilling results from this investigation which revealed a relatively thin sequence of material including around 10-15% of fines (silt) in the aquifer matrix - the preliminary groundwater resource availability assessment by AECOM (2012), which suggested groundwater yields of between of 1 L/sec and 5 L/sec were most likely.

Even if the targeted aquifer could sustainably produce 5 L/sec, a borefield comprising 40 bores would be required to meet Oresome's initially indicated supply requirements. As the capital and operational cost associated with such a borefield could outweigh the cost of other potential water source options or combinations of options, Oresome should continue to assess the likelihood and cost of other potential sources including (but not necessarily limited to):

1. other known groundwater systems located further to the south and west of Oresome's deposit.
2. potential new winterfill entitlements in the Mitchell River
3. supply from East Gippsland Water
4. transfer (purchase) of entitlements from existing licence holders.
5. treated waste water
6. discharge of mine water from the coal operators in the Latrobe Valley via The Saline Water Outfall Pipeline
7. Surface water flows in nearby tributaries that are not part of the Mitchell River catchment.

The above list of options should not be considered exhaustive and/or necessarily feasible. Considerations associated with required quality, reliability of supply, available volumes, cost feasibility and regulatory (and potentially community) acceptability will be important when considering water source options for this project. Combinations of sources should also be considered.

A risk-based evaluation and documentation of supply and infrastructure options to meet water consumption requirements is considered an important next step in working towards a resolution of water sourcing for this project.

The full report is attached as Appendix 5

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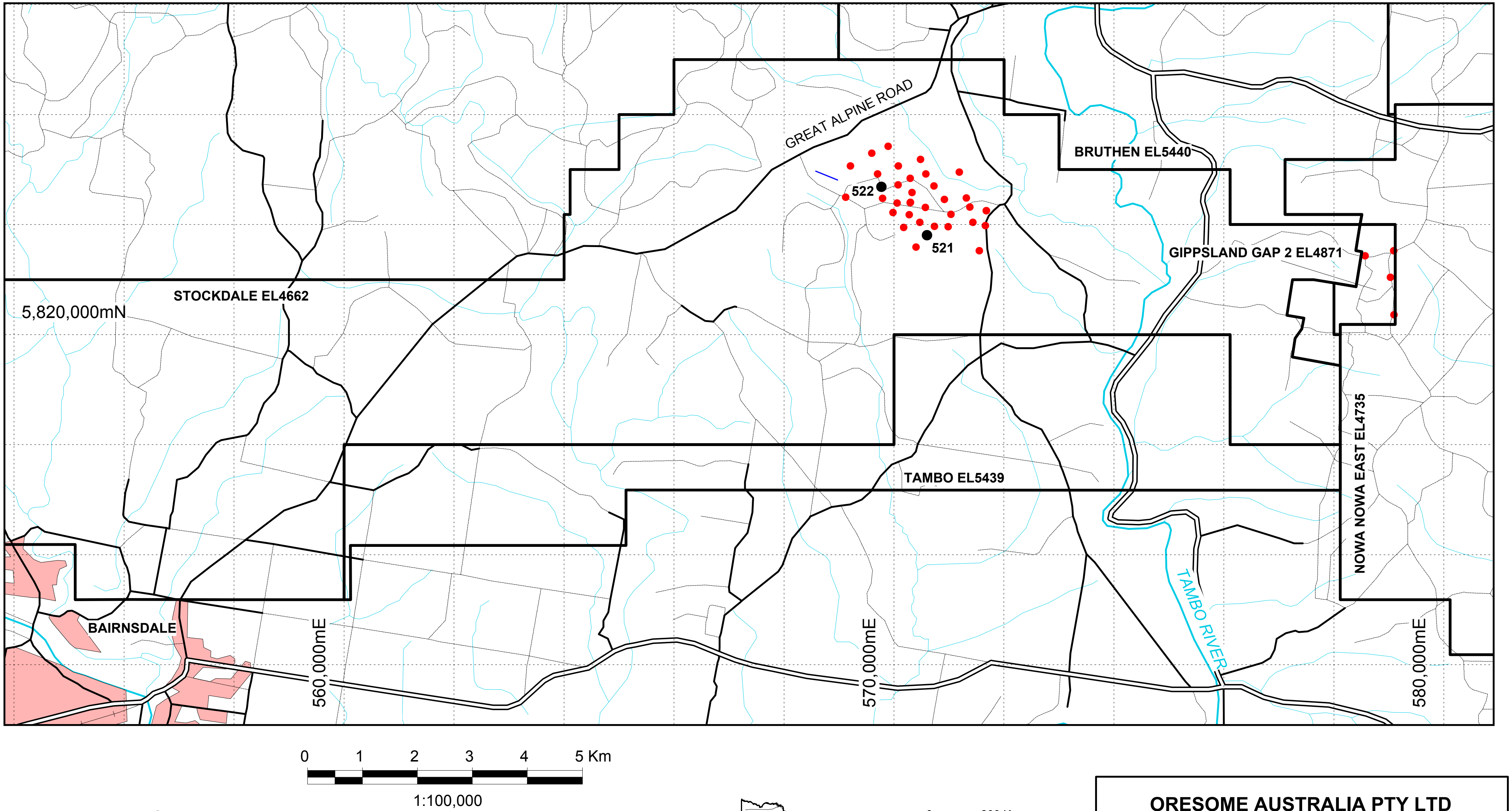
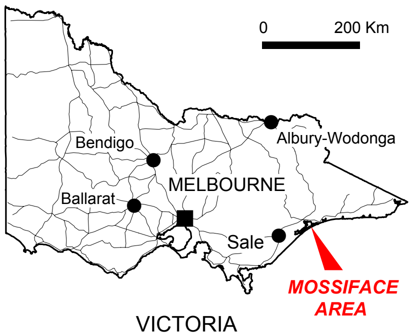


LEGEND

🔴 Previous drillhole (Rio Tinto)

● Current drillhole (Oresome Australia Pty ltd)
521



VICTORIA
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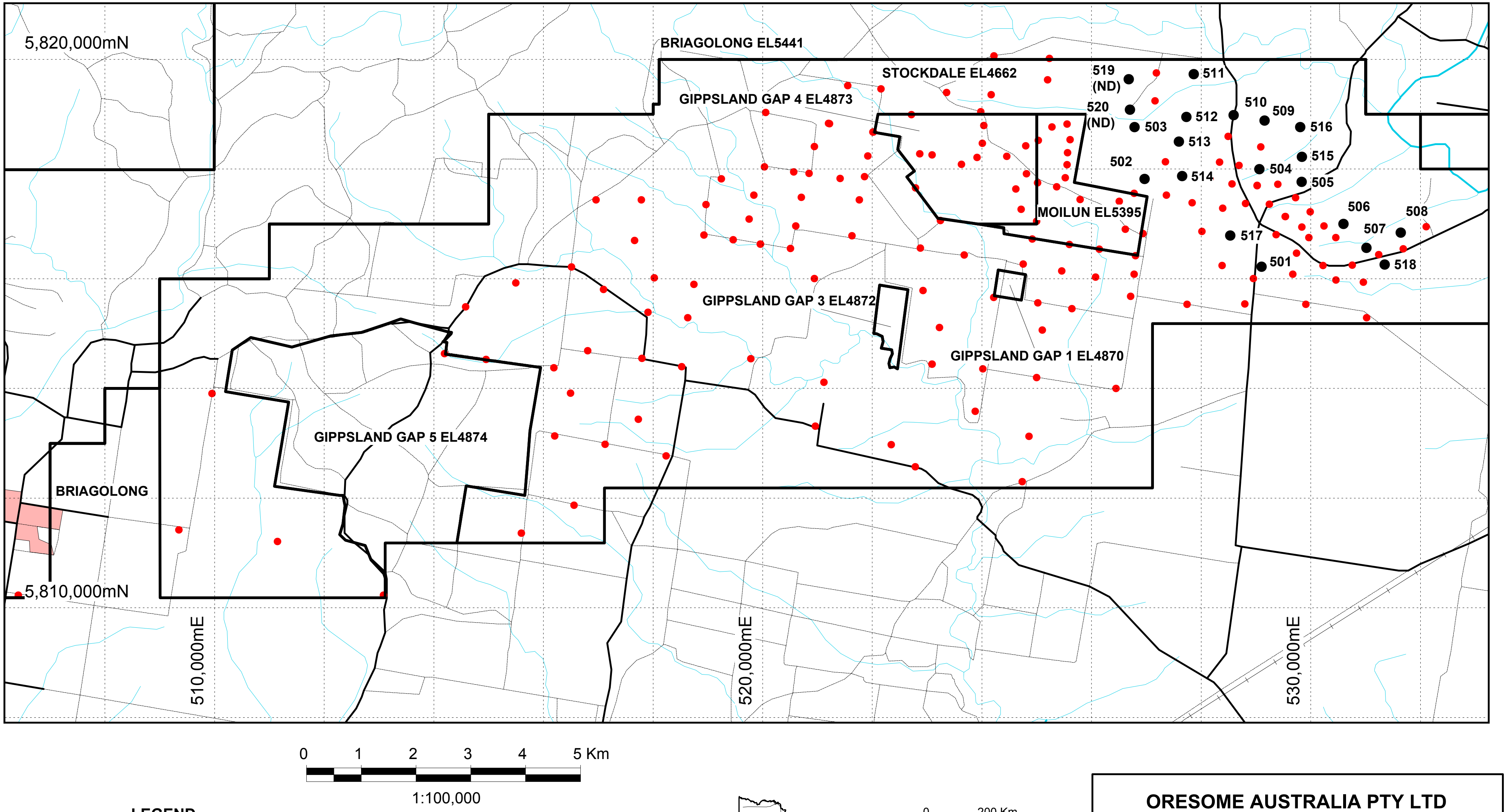
ORESOME AUSTRALIA PTY LTD

EL4662 **STOCKDALE**

GIPPSLAND MINERAL SANDS PROJECT
MOSSIFACE AREA

DRILLHOLE LOCATIONS

COMPILED BY	B. DUCK	OCT 12	SCALE 1: 100,000	**FIGURE 3**
DRAFTED BY	K.J.CORRIE	OCT 12	Proj.: MGA94 (Zone 55)	
REVISED			DWG No :	

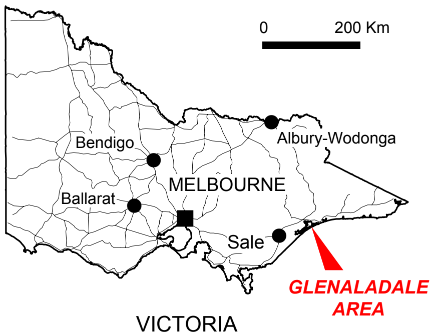


LEGEND

● Previous drillhole (Rio Tinto)

● 511 Current drillhole (Oresome Australia Pty ltd)

519 (ND) Not drilled



VICTORIA INDEX MAP

ORESOME AUSTRALIA PTY LTD

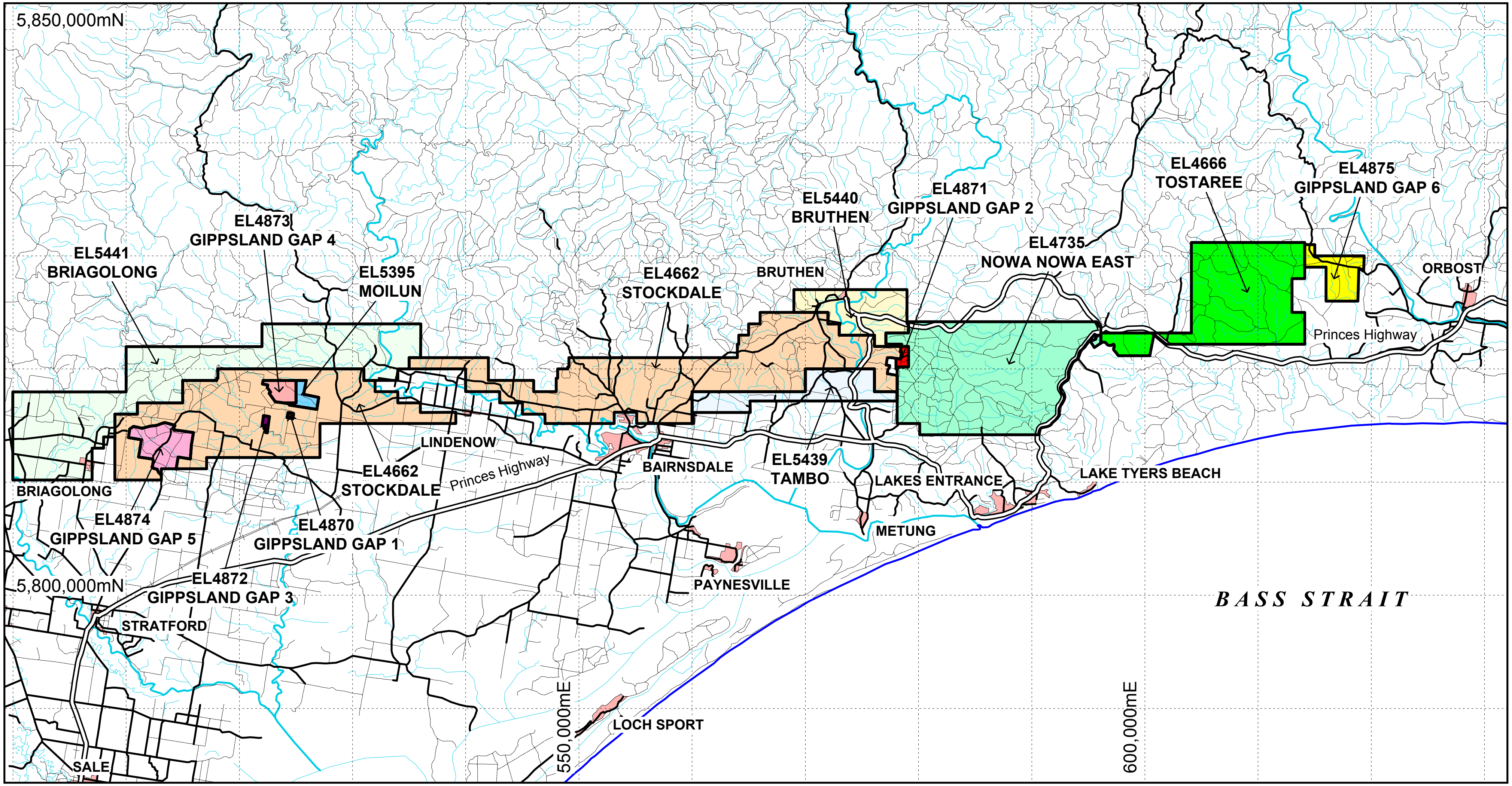
EL4662 **STOCKDALE**

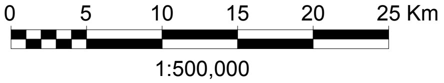
GIPPSLAND MINERAL SANDS PROJECT
GLENALADALE - STOCKDALE AREA

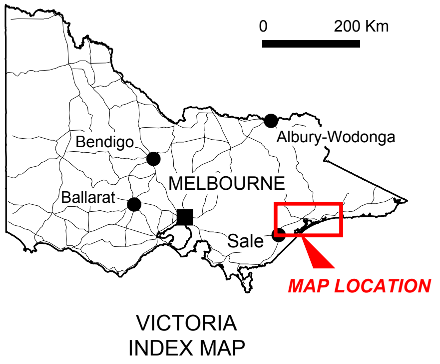
DRILLHOLE LOCATIONS

COMPILED BY	B. DUCK	OCT 12	SCALE 1: 100,000
DRAFTED BY	K.J.CORRIE	OCT 12	Proj.: MGA94 (Zone 55)
REVISED			DWG No :

FIGURE 2







ORESOME AUSTRALIA PTY LTD

GIPPSLAND MINERAL SANDS PROJECT

TENEMENT LOCATION AS AT SEPTEMBER 2012

COMPILED BY	B. DUCK	SEP 12	SCALE 1: 250,000	FIGURE 1
DRAFTED BY	K.J.CORRIE	SEP 12	Proj.: MGA94 (Zone 55)	
REVISED			DWG No :	

METALLICA MINERALS LIMITED
Subsidiary Companies ABN: 45 076 696 092
NORNICO Pty Ltd ACN 065 384 045 | Oresome Australia Pty Ltd ACN 071 762 484 | Greenvale Operations Pty Ltd ACN 139 136 708
Lucky Break Operations Pty Ltd ACN 126 272 580 | Scandium Pty Ltd ACN 138 608 894 | Phoenix Lime Pty Ltd ACN 096 355 761

ASX Release

26 August 2011

EXCLUSIVE RIGHT TO EXPLORE & OPTION TO ACQUIRE RIO TINTO'S GIPPSLAND ZIRCON-RUTILE HMS PROJECT

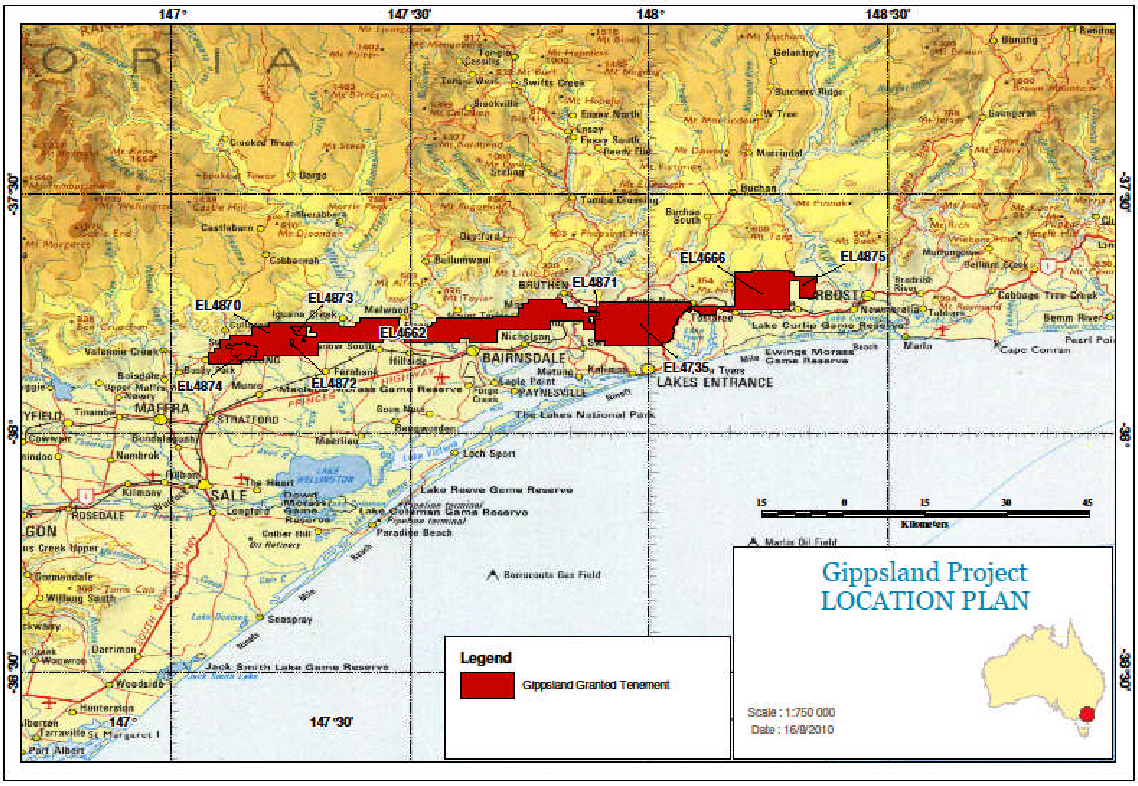
Metallica Minerals Limited's (**ASX: MLM**) wholly-owned subsidiary, Oresome Australia Pty Ltd (**Oresome**), advises that it has entered into a Right to Explore and Option to Purchase Agreement (the Agreement) with Rio Tinto Exploration Pty Ltd (Rio Tinto) pursuant to which Oresome will have the exclusive right to explore certain exploration licences which comprise the Gippsland Heavy Mineral Sands (HMS) Project in Victoria's south east and option to purchase a 100% interest in the exploration licences at any time during the term of the Agreement.

Key terms of the Agreement include:

- A exclusivity payment to Rio Tinto of A$40,000
- Oresome has the exclusive right to explore the exploration licences comprising the Gippsland HMS Project for 12 months (the Option Period).
- Oresome is committed to A$250,000 minimum expenditure during the Option Period.
- Oresome has the option to purchase a 100% interest in the exploration licences at anytime during the Option Period for a purchase price of A$8.0M.
- Rio Tinto retains a net smelter royalty of 2.5%.

The Gippsland HMS Project lies in south-east Victoria and consists of nine granted exploration licences covering a total area of approximately 620 km^2, all held 100% by RioTinto.

The tenements cover fossil strandlines of the Miocene-Pliocene shallow marine sand units of the Boisdale Formation which on lap the Palaeozoic basement at the southern margin of the eastern Australian Highlands.



HMS exploration to date has included surface sampling, significant drilling (12,697.5m of reverse circulation (RC) air core drilling for 232 holes) undertaken in 2004, 2005 and 2008 and 8 drill bulk samples at various locations in the project area. These samples were subjected to gravity separation and metallurgical test work at the Downer-EDI facility at Carrara on the Gold Coast, Queensland. An understanding of the characteristics of the zircon, rutile and ilmenite components of the Gippsland HMS deposits was developed from this work.

Two well defined areas of significant HMS concentration have been identified; these being the **Stockdale-Glenaladale area**, about 35km west of the town of Bairnsdale, and the **Mossiface area**, which lies 20km ENE of Bairnsdale.

Significant HMS deposits containing zircon and rutile (at a moderate strip ratio) have been identified by drilling in the two areas. Based on previous RC drilling (180 exploration drill holes), the expected average grade of these deposits is between 2.8 – 3.7% total heavy mineral (THM), of which a significant portion is zircon and rutile.

Oresome's Exploration Target* for the two defined areas are:

- Stockdale – Glenaladale area: 500 to 800Mt of mineralised sand with an average of 3-4% HMS, with the HMS containing approximately 14-18% Zircon, 5-7% Rutile and 35-55% Titanium Minerals
- Mossiface area (~55 km east): 25 to 35Mt of mineralised sand with an average of 2.5-3.0% HMS, with the HMS containing approximately 25-30% Zircon, 8-10% Rutile and 36-44% Titanium Minerals

Additional areas of untested potential exist on the recently granted exploration licences. No major environmental or community issues are currently evident.

For further information, please contact:

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Oresome Australia Pty Ltd (100% Metallica Minerals Ltd)

In line with its growth strategy, Oresome now has the opportunity to enlarge its portfolio of activity with HMS and become a significant player in the zircon-rutile HMS market sector. Oresome's General Manager, Stewart Hagan, said, "We are very pleased to now have formal and binding agreements in place to fully assess this opportunity. Review of the work carried out to date by Rio Tinto Exploration is very encouraging, and we believe this project can deliver substantial additional benefits to Metallica shareholders."

Oresome's Weipa & Cape York HMS Projects, which incorporates the Urquhart Point zircon-rutile deposit, together with the Gippsland HMS Project has the potential to set Oresome up as a long term supplier of zircon and rutile.

Metallica's Managing Director, Andrew Gillies, said, "Oresome Australia has been actively progressing its Urquhart Point zircon-rutile HMS Project towards feasibility and ultimate development for some time and has also been looking to considerably expand its' zircon-rutile portfolio. The Gippsland HMS project certainly fits this desire, and we will aggressively initiate infill exploration of the Rio drilling to establish a maiden HMS resource to JORC standards."

Execution of this acquisition remains subject to the completion of certain preliminary steps, in particular with respect to completion of due diligence and to the approval by the relevant regulatory authorities. Its completion could become effective by midyear 2012.

***Exploration Target**

The potential quantity and grade is conceptual in nature, that there has been insufficient exploration drilling and sampling density to define a Mineral Resource and that it is uncertain if further exploration will result in the determination of a Mineral Resource.

Competent Person

Technical information contained in this report has been compiled and/or supervised by Mr Andrew Gillies B.Sc (Geology) M.AusIMM (Managing Director of Metallica Minerals Limited) who is a competent person and member of the Australian Institute of Mining and Metallurgy (AusIMM). Mr Gillies has relevant experience to the mineralisation, exploration results and targets being reported on to qualify as a Competent Person as defined by the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Gillies consents to the inclusion of this information in the form and context in which it appears in this report.

REPORT ON AIR CORE DRILLING PROGRAM IN THE BAIRNSDALE AREA, VICTORIA

DEC 2011 TO JAN 2012

By

BH DUCK
(Geologist)

For

ORESOME AUSTRALIA PTY LTD

PO Box 6611,
Cairns
Qld., 4870
12 April 2012

Contents

APPENDICES et al

INTRODUCTION

This author was commissioned to supervise a drilling program carried out by Wallis Drilling of Perth on behalf of Oresome Australia Pty Ltd of Brisbane in the Bairnsdale area of eastern Victoria.

The drilling commenced on 20th December 2011 and finished on 3rd January 2012. A total of 2,290 metres was drilled in 43 holes at 20 locations.

The aim of the program was to integrate results with previous programs of Rio on the same tenements, to confirm the concepts and grades of the Rio work and to establish a JORC Resource leading to a bankable feasibility.

The work was being carried out as part of an agreement with Rio as released to the ASX on 26th August 2011 (attached as Appendix 1).

THE DRILLERS

The drill company was Wallis Drilling Pty Ltd of 54 Beaconsfield Ave, Midvale WA, 6056.

The rig was a Mantis 80 air core mounted on a 6x6 modified Toyota Landcruiser with a 4t Kanter as a support truck. The rig was operated by a driller and two offsiders, and the geologist (this author) was assisted by one offsider to carry out the bag labelling and sample stacking.

When the ground became too hard for the aircore (such as quartz pebbles) then a conventional hammer was used (3.5" diam).

Rods used were NQ with a patented tri tipped tungsten bit with a drill hole diameter of 84mm.

The drillers "plods" are attached as Appendix 2.

All operational personnel not employed by Wallis went through an induction conducted by the driller. All drillers and other operational personnel wore the appropriate PPE. Visitors were not permitted within 5 metres of the machinery.

Problems encountered during drilling included:

1. Cracked/split inner tubes caused loss of returns, thus cleaning and inner tube change needed.
2. "Sticky/moist" clayey horizons caused sticking and blocking of sample recovery or sample splitter
3. Intermittent water encountered, varying up to high water flow (measured at 4 litre per second in GS515)
4. Reaming of hole causes material stuck on annulus of hole to be returned after the sample has been taken. This lead to lower than anticipated weights of samples, and the reason why sample weights taken during drilling could not be used for SG estimation.

SAMPLING and FIELD PROTOCOLS

Hole Designation

At each location at least two holes were drilled – the first was for logging and assay and for planning of the sampling intervals in the second hole. The second hole was for bulk metallurgical sampling.

Sampling was by air lift through a jumbo hose to a rotary splitter taking 36% of the total material deposited into a calico bag when drilling the "assay" hole, whereas when the bulk metallurgical hole was drilled then 100% of the sample was taken into a polywoven sack. In the loose sands this bulk sample weighed approximately 9.5kg whereas for the heavy clays the weight was of the order of 15kg.

Photo 1: Rotary Splitter

The protocol was that the hole number was decided prior to drilling and the prefix GS was used with a three digit number (starting at GS501). For the metallurgical hole the suffix "A" was added in the Glenaladale area, whereas in the Mossiface area the suffix A, B and C were used.

The assay hole was drilled first, and then the subsequent holes were drilled by moving the rig back approx 1 metre.

Bulk Sampling

The aim was to recover in excess of 3 tonne of material from "ore zones" in the Glenaladale area, and 800 kg from the Mossiface area. One metallurgical hole was drilled at each location at Glenaladale (total est 3970 kg) and three were drilled at the two locations at Mossiface (est 860 kg) to achieve the required bulk samples. The samples were logged and panned as drilling proceeded and the "ore zone" was taken to be any two consecutive samples of over 1% heavy mineral by visual inspection.

Sample Collection and Despatch

A days drilling could produce in excess of 260 samples (assay and bulk) for over 2.6 tonnes, so a second 4WD was utilised in conjunction with an 8' x 6' trailer to remove the samples off site each day and deliver to the trucking agent. In Bairnsdale the trucking agent used was Dyers Trucking who also provided vegetable pallet/crates which made the despatch of samples far better that on normal flat pallets. It is recommended that prior to any future drilling program, the despatch processes be designed, the crates organised/purchased and the pickup vehicles/personnel be allocated. The samples were sent from Bairnsdale direct to RJ Robbins in Brisbane.

The sample interval selected was 1.5m which was the same as for the previous Rio drilling in the same areas. Each sample was logged by the author on site as drilling continued with each sample panned in a white plastic “gold” pan with visual estimates of the grade recorded for locating the ore zone for the bulk sampling and for later comparison with actual assay data. For the sake of designing the bulk sample locations any sample of estimated 1% or more heavy mineral (combined zircon and back minerals) was taken as “ore”.

Collar Locations

Initial target locations were defined by Oresome Australia personnel in collaboration with personnel from AMC who will be assessing the resources. Final locations were established on site considering proximity to dams, Telstra lines, fences and slope. The final location of the assay hole was picked up at the time of drilling by hand held Garmin 60CSX GPS using UTM co-ordinates in GDA94 and are detailed in Table 1 below.

Logging

The logging was done on site as drilled with all of the above mentioned data recorded on one sheet with a typed copy attached in the Appendices. (Appendix 3). The codes used were essentially the same as used by Rio in their programs to try and maintain some consistency for comparison of material types. These Codes are attached as Appendix 4. The samples were logged and panned as drilling proceeded and the “ore zone” was taken to be any two consecutive samples of over 1% heavy mineral by visual inspection. No attempt was made during logging to estimate the full extent of mineralogy other than to be able to differentiate between the black HM or the clear HM that was regarded as zircon. The HM estimates logged were “total” with intermittent estimates of “zircon” content.

It is suggested that for future programs instead of the colour codes used as in Appendix 4, then a system such as the Munsell Colour Code for Soils be used (see Fig 1). It is unknown if colour carries any significance in assisting the interpretation of the mineralogy or stratigraphy however, this would give greater accuracy and standardisation to the descriptions.

Figure 1: Munsell Colour Codes for Soils

Air Hammer

When the hammer was used – it was not a face sampling hammer so could only give samples from up the outside of the rods. Such samples were considered to be contaminated so were not taken and the use of the hammer restricted.

RLs

Collar RLs were taken from the 1:50,000 topo sheets and are considered to be accurate to 2m, however it is recommended that for resource assessment more detailed data be used. The collar relief varied over 58 metres as can be seen in Table 1 below.

				Co-ordinates As Drilled		RL	No of Holes
	Area	**Farmer**	**Hole No**	**East**	**North**		**Drilled**
1	Glenaladale	G Johnson	**501**	529101	5816230	119	2
2	Glenaladale	State F Jessica Cleaver	**502**	526967	5817829	101	2
3	Glenaladale	State F Jessica Cleaver	**503**	526784	5818777	76	2
4	Glenaladale	O Waller	**504**	529063	5818006	114	2
5	Glenaladale	O Waller	**505**	529833	5817773	111	2
6	Glenaladale	D Mc Mahon	**506**	530595	5817012	111	2
7	Glenaladale	D Mc Mahon	**507**	531012	5816573	101	2
8	Glenaladale	D Mc Mahon	**508**	531639	5816851	91	2
9	Glenaladale	E Waller	**509**	529154	5818890	109	2
10	Glenaladale	E Waller	**510**	528591	5818991	70	2
11	Glenaladale	E Coleman	**511**	527863	5819740	84	2
12	Glenaladale	E Coleman	**512**	527728	5818965	82	2
13	Glenaladale	E Coleman	**513**	527592	5818508	113	2
14	Glenaladale	E Coleman	**514**	527655	5817879	115	2
15	Glenaladale	O Waller	**515**	529836	5818233	73	2
16	Glenaladale	E Waller	**516**	529808	5818778	79	2
17	Glenaladale	J Lambert Blue Gum	**517**	528530	5816798	128	2
18	Glenaladale	F Waller	**518**	531347	5816271	105	2
~~19~~	~~Glenaladale~~	~~Peter & Lynda Clark~~	~~**519**~~	~~Not Drilled~~			0
~~20~~	~~Glenaladale~~	~~Peter & Lynda Clark~~	~~**520**~~	~~Not Drilled~~			0
21	Mossiface	Bob and Jan Reed (peter)	**521**	570601	5821817	47	4
22	Mossiface	Bob and Jan Reed (peter)	**522**	569770	5822698	70	3

Table 1: Drill data – Farmers, Co-ordinates and RLs.

Specific Gravity

Rio, in their programs assumed an SG of 1.7 for mineralised sand and 1.6 for overburden sand (page 24, Sec 8.4 of Bourque - Sep 2007), however for detailed feasibility resource estimation due consideration should be given to accurate testing of SGs in the project materials by targeted drilling.

During the Dec 2011 – Jan 2012 drilling program, attempts were made to assess density by:

1. Weighing the total sample that came from the hole, however material losses by sticking in the pipe string and operational difficulties during reaming together with the unreliability of hole diameter measurements – this method was discarded.
2. Sampling by drilling without air – ie by simply spinning in the bit which clearly compacted the sample so this was disregarded.

Results of the sample weights taken are detailed in Table 2 below.

Hole	Bulk Sample		Assay Sample			Hole	Bulk Sample		Assay Sample	
No	No	Kg	No	Kg		No	No	Kg	No	Kg
507	22	9.6				518	2	14		
507	23	9.1				518	3	15		
507	24	9.5				518	4	15		
507	26	10.65				518	5	14		
507	27	9.5				518	6	14		
507	28	9.5				518	11	6.5		
507	29	10				518	12	11		
507	30	10.3				518	13	8		
507	31	11				518	14	9		
517	7	12				518	15	9.5		
517	8	13				518	16	9		
517	9		9	4.5		518	17	8.5		
517	10		10	3.5		518	18	9		
517	12	10				518	19	9.5		
517	13	10.5				518	20	10.5		
517	14	9.0				518	23	9		
517	15	11.5				518	24	9		
517	16	9.5				518	25	9.5		
517	20		20	2.9		518	26	9		
517	21		21	3.6		518	27	8.5		
517	22		22	2.6		518	28	9.5		
517	23		23	2.6		518	29	9.5		
						518	30	9.5		
						518	31	9.5		
						518	32	9.5		
						518	33	9		
						518	34	8.7		
						518	35	9.5		
						518	36	14		
						518	37	9.5		
						518	38	13		
						518	39	10		
						518	40	11.5		

Table 2: Weights of selected samples – cannot be used for SGs

Water

Water was encountered at various levels in very low quantities in a number of holes and this is listed in the logs. This water is considered to have been present due to the high local rainfall prior to drilling.

In hole GS515 water was encountered at 53m depth and flow rate was measured at 4 litres per second however drillers estimated the flow rate would increase if the water were allowed to settle prior to pump testing (see the drill log GS515 in Appendix 3). A sample was retrieved for analysis, by settling the suspended sediment over a period of some 10 minutes and decanting the water. It is to be noted that the visual settling rate was quite high hence it is considered that all of the suspended matter in that sample was particulate and not clay as such. The assay results are summarised in Table 3 and detailed in Appendix 6

Item	Units	Value
pH	pH units	3.9
Electrical conductivity	µS/cm	2920
Total dissolved solids	mg/l	1890
Ca	mg/l	35
Mg	mg/l	80
Na	mg/l	392
K	mg/l	36

Table 3: GS515 Water assays

See Appendix 6 for assay details

Gas

During the drilling of GS521 and GS522 at Mossiface gas was encountered in both holes. The gas was under weak pressure and drilling was stopped immediately. In GS522 a Gas Alert Microclip instrument was obtained and used to measure CO, O_2, H_2S and LEL levels. Two tests were done after drilling 0.5m further and ensuring better seal to sample the gas.

On completion, each hole (including adjacent bulk sample holes) was cemented prior to backfill and closure.

Unit	Test 1	Test 2
CO	11 ppm	22.8ppm
LEL	51%	64%
H2S	0ppm	6ppm

Table 4: Gas Measurements GS522

Figure 2: Gas Alert used.

Rehabilitation

The "assay" hole was drilled first, and then the "bulk" hole(s) drilled after that. The bulk hole was drilled approximately 1m from the assay hole. Prior to commencement of drilling a block of surface soil was hand excavated and the sod set aside. Any spillage from the splitter fell on to a tarp to keep the sub surface materials off the grass, then on completion of both holes the remaining spillage was dumped back into the hole. A plastic "octopus" plug was pushed down the hole to approximately 1 to 1.5m below surface then the last of the backfill material placed on top.

Where gas was encountered in GS521 and GS522, each of the holes were sealed with a mix of concrete premix, extra cement and water, then backfilled as above.

On completion of backfilling the surface was raked over and photographed. Photos 2 and 3 below show GS504 before drilling and after drilling. Other photos are attached on a CD at the rear of the report.

Photo 2: **GS504 Before Drilling**

Photo 3: **GS504 After Drilling**

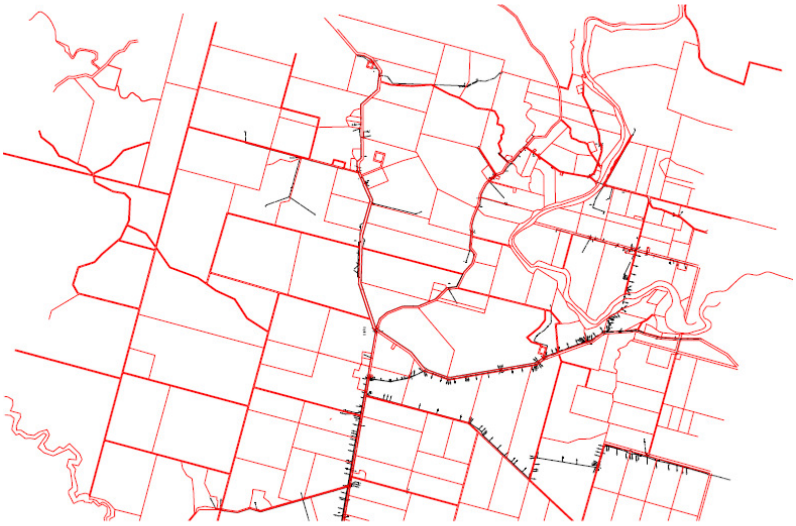
All gates were left as found at all times and all rubbish was removed. Most areas entered were grazing areas with cattle, sheep or no activity. One property was a blue gum plantation and two sites were in State Forest.

Weed Control

All vehicles were fitted with radiator screens to protect them from weed seed ingress. The order of drilling was planned around the reports that some properties were weed free and others may have the African Lovegrass, so these were left to last and the vehicles washed between properties and Mossiface.

Third Party Services

A search was conducted for any services that may be threatened by drilling, including telecommunications, water and gas lines (see Figure 3 below for the Telstra lines in the Glenaladale area).



On the basis of this, hole GS510 was relocated some 20 metres further east.

The Gippsland gas pipe at Mossiface was clearly marked and easily avoided.

Figure 3: **Telstra Lines in the Fingerboards – Glenaladale area.**

GEOLOGY

Stratigraphy

This northern part of the Gippsland Basin, which is immediately adjacent to the Palaeozoic basement of the eastern Australian highlands, is known as the Lakes Entrance Platform (see Fig 1 of Hocking 1976 – attached as Fig 4).

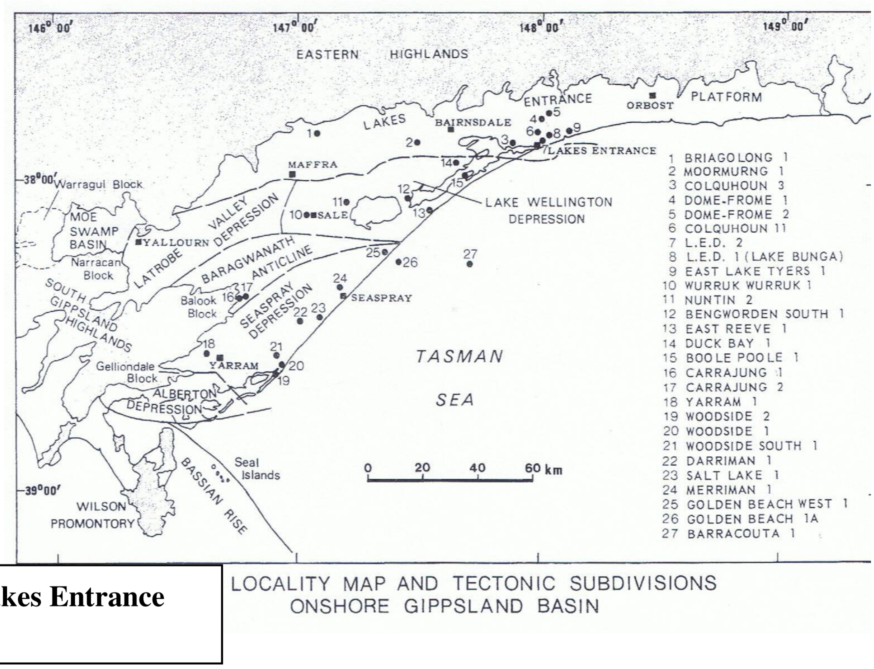


Figure 4: Lakes Entrance Platform

The basement of the area is the Early Cretaceous Strzelecki Group mudstones, sandstones and arkoses that were encountered in three holes GS510, GS515 and GS516. At the bottom of GS510 the sandstone was overlain by a blue gray claystone grading up into a grey clay with rounded quartz pebbles. A similar clay with pebbles was seen at the bottom of GS515. In GS514 two “erratics” were encountered in the loose sands that were narrow banded with the appearance of ignimbrites.

The target sediments for the program were the fine sands commonly well sorted silty fine sands carrying varying heavy mineral content. These sands included clayey components with full variation from silty fine sands to clayey sands through sandy clays to clays. Colours varied extensively (see above). When drilled these sands were rarely lithified or indurated but seen as loose sands with no drill fragments.

Muggeridge and Clementson (2008) stated that these target sands were in the Balook Formation which is part of the Seaspray Group. However, Goldie Divko et al (2009) did not include that formation in the Lakes Entrance Platform stratigraphy, and it was not included in Birch 2003.

Hocking (1976) described the Lindenow Sandstone Member (of the Seaspray Group) with its Glenaladale Sands that was originally described by Wilkins (1962 - in Hocking 1976). The Lindenow Sand Member (LSM) is the near shore equivalent of the Gippsland Limestone which belongs in the Seaspray Group with its lower boundary grading into the Colquhoun Sandstone Member. As such, Hocking (1976) refers to the LSM as Early to Middle Miocene

Hocking (1976) describes the thickness of the LSM as possibly in excess of 100m as indicated from the Dome-Frome 1 and Dome-Frome – 2 holes near Nowa Nowa, and the extent as from Glenaladale to just east of Orbost. This ties in with but extends beyond the tenements held by Rio.

Unconformably overlying these sands are the gravels and gravelly clays of the Pleistocene Haunted Hill Gravels (HHG). These gravels in the Glenaladale area vary from rounded cobbles of quartz and sandstone to gravelly and sandy red clays.

Photo 4: Haunted Hill Gravels on the Bairnsdale – Lindenow Road

The present surface is dominated by the flat lying Pleistocene HHG which Vandenberg and O'Shea (1981) described as undulating "Low Lying Hills" of the Gippsland Plains above the Munro Plain comprised of the alluvial and coastal plains. Those "Low Lying Hills" were further subdivided into the Nowa Nowa Hills, the Calulu Hills and the Stockdale Hills. It is these hills that are the targets for the heavy minerals of the fine sands.

The Quaternary – Recent sediments are undifferentiated alluvial silts, sands and gravels of the river valleys and are essentially ignored as volumes are too insignificant for commercial or stratigraphic interest.

Mineralisation

During the logging of the drill samples, there was no attempt to distinguish mineralisation other than occasionally to estimate the "zircon" content of the total heavy minerals seen in the panning. The "zircon" was taken as all of the HM that was a clear or of a very pale colour compared to the black heavy minerals.

It was considered that panning was more difficult in the north east parts of the Glenaladale area possibly because the HM was finer. In the north east the grain sizes were more likely to be of the order of 80 – 100µ whereas in the other areas the HM appeared a little coarser – up to 120µ - as determined by hand held scale lupe.

In the Logging Codes (Appendix 4) there is reference to Ferruginous as a Lithological Qualifier either as WFE, MFE or SFE. In the logging, the ferruginous mineralisation was seen to be either globular or rounded being hematitic or probably goethite and usually 1-2% of the total with grain size of the order of 2-3 mm, a second variety (the "Angular") was also seen and this was usually what appeared to be thin possibly fracture or vein infill plates <1mm thick but with other dimensions of a maximum of 3 x 5mm and most likely of black goethite, hematite or maghemite, and more likely to be seen near the bottom of the profile. There was up to 20% (SFE) in GS506.

Alteration

A “blue-grey” clay was seen in the bottom of GS510

OTHER OBSERVATIONS

During the logging visual estimates were made of grades of total heavy minerals (THM) which in the logs is shown as Est %THM. The process was to take a "handful" of the product from the bags then using a 230mm white plastic panning dish – it was reduced and a visual estimate of the THM content made. The THM included all heavy minerals and did not differentiate.

In the preparation of the Bulk samples for metallurgical testing by RJ Robbins these estimates were used as the foundation to composite the samples.

As assays for the various sample intervals came in – these were then compared with the visual estimates. The correlation factors are tabulated below with comments on the variations, and the graphical plots of the comparisons are shown in Appendix 5, and summarised in Table 5, below.

Hole No	Correlation Factor	Comments
GS501	0.85	Significantly overestimated 501-32,33,34
GS502	0.80	Inconsistent in 4 peaks, over on 2 and under on 2
GS503	0.92	Main errors – underestimated in clays
GS504	0.69	Predominantly underestimated with increasing grade with depth
GS505	0.37	Significantly underestimated most samples
GS506	0.80	Main variations are in underestimation in heavy clays towards end of hole
GS507	0.85	Estimate marginally lower, notably in clayey zones
GS508	0.74	Below assay from 12m, clay content notable from 507-25
GS509	0.68	Consistently below assay, worse with depth and increasing clay content
GS510	0.06	Very poor estimation, high clay content, partly indurated.
GS511	0.84	OK, but bottom not panned due to high clay content
GS512	0.76	Overestimated and underestimated – inconsistent
GS513	0.63	Generally overestimated, essentially no clay,
GS514	0.38	Badly underestimated – worse with depth and clay content
GS515	0.46	Consistently low with increasing clay
GS516	0.74	Underestimated but variable, basement from 30m
GS517	0.76	Underestimated in areas of clay
GS518	0.98	OK – incl clay zones
GS519	Not drilled	Not drilled
GS520	Not drilled	Not drilled
GS521	0.76	Variable – overest. in upper levels, below at depth
GS522	0.63	Initially underestimated, then overestimated – essentially no clay

Table 5: Correlation Factors for Visual Estimates

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METALLICA MINERALS LIMITED
Subsidiary Companies **ABN: 45 076 696 092**
NORNICO Pty Ltd ACN 065 384 045 | Oresome Australia Pty Ltd ACN 071 762 484 | Greenvale Operations Pty Ltd ACN 139 136 708
Lucky Break Operations Pty Ltd ACN 126 272 580 | Scandium Pty Ltd ACN 138 608 894 | Phoenix Lime Pty Ltd ACN 096 355 761

ASX Release

26 August 2011

EXCLUSIVE RIGHT TO EXPLORE & OPTION TO ACQUIRE RIO TINTO'S GIPPSLAND ZIRCON-RUTILE HMS PROJECT

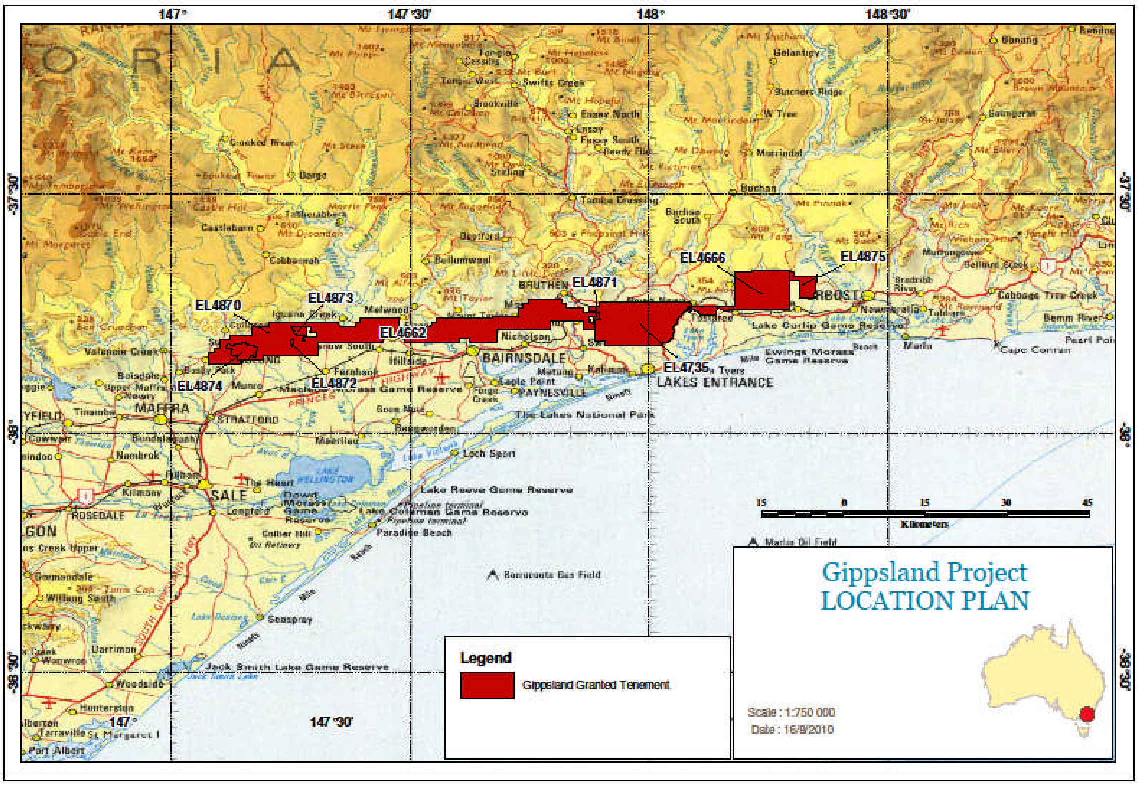
Metallica Minerals Limited's (**ASX: MLM**) wholly-owned subsidiary, Oresome Australia Pty Ltd (**Oresome**), advises that it has entered into a Right to Explore and Option to Purchase Agreement (the Agreement) with Rio Tinto Exploration Pty Ltd (Rio Tinto) pursuant to which Oresome will have the exclusive right to explore certain exploration licences which comprise the Gippsland Heavy Mineral Sands (HMS) Project in Victoria's south east and option to purchase a 100% interest in the exploration licences at any time during the term of the Agreement.

Key terms of the Agreement include:

- A exclusivity payment to Rio Tinto of A$40,000
- Oresome has the exclusive right to explore the exploration licences comprising the Gippsland HMS Project for 12 months (the Option Period).
- Oresome is committed to A$250,000 minimum expenditure during the Option Period.
- Oresome has the option to purchase a 100% interest in the exploration licences at anytime during the Option Period for a purchase price of A$8.0M.
- Rio Tinto retains a net smelter royalty of 2.5%.

The Gippsland HMS Project lies in south-east Victoria and consists of nine granted exploration licences covering a total area of approximately 620 km^2, all held 100% by RioTinto.

The tenements cover fossil strandlines of the Miocene-Pliocene shallow marine sand units of the Boisdale Formation which on lap the Palaeozoic basement at the southern margin of the eastern Australian Highlands.



HMS exploration to date has included surface sampling, significant drilling (12,697.5m of reverse circulation (RC) air core drilling for 232 holes) undertaken in 2004, 2005 and 2008 and 8 drill bulk samples at various locations in the project area. These samples were subjected to gravity separation and metallurgical test work at the Downer-EDI facility at Carrara on the Gold Coast, Queensland. An understanding of the characteristics of the zircon, rutile and ilmenite components of the Gippsland HMS deposits was developed from this work.

Two well defined areas of significant HMS concentration have been identified; these being the **Stockdale-Glenaladale area**, about 35km west of the town of Bairnsdale, and the **Mossiface area**, which lies 20km ENE of Bairnsdale.

Significant HMS deposits containing zircon and rutile (at a moderate strip ratio) have been identified by drilling in the two areas. Based on previous RC drilling (180 exploration drill holes), the expected average grade of these deposits is between 2.8 – 3.7% total heavy mineral (THM), of which a significant portion is zircon and rutile.

Oresome's Exploration Target* for the two defined areas are:

- Stockdale – Glenaladale area: 500 to 800Mt of mineralised sand with an average of 3-4% HMS, with the HMS containing approximately 14-18% Zircon, 5-7% Rutile and 35-55% Titanium Minerals
- Mossiface area (~55 km east): 25 to 35Mt of mineralised sand with an average of 2.5-3.0% HMS, with the HMS containing approximately 25-30% Zircon, 8-10% Rutile and 36-44% Titanium Minerals

Additional areas of untested potential exist on the recently granted exploration licences. No major environmental or community issues are currently evident.

For further information, please contact:

Mr Andrew Gillies
Managing Director
Metallica Minerals Limited
Phone: +61 (7) 3249 3000
Email: admin@metallicaminerals.com.au

Mr Stewart Hagan
General Manager
Oresome Australia Pty Ltd
Fax: +61 (7) 3249 3001

Oresome Australia Pty Ltd (100% Metallica Minerals Ltd)
In line with its growth strategy, Oresome now has the opportunity to enlarge its portfolio of activity with HMS and become a significant player in the zircon-rutile HMS market sector. Oresome's General Manager, Stewart Hagan, said, "We are very pleased to now have formal and binding agreements in place to fully assess this opportunity. Review of the work carried out to date by Rio Tinto Exploration is very encouraging, and we believe this project can deliver substantial additional benefits to Metallica shareholders."

Oresome's Weipa & Cape York HMS Projects, which incorporates the Urquhart Point zircon-rutile deposit, together with the Gippsland HMS Project has the potential to set Oresome up as a long term supplier of zircon and rutile.

Metallica's Managing Director, Andrew Gillies, said, "Oresome Australia has been actively progressing its Urquhart Point zircon-rutile HMS Project towards feasibility and ultimate development for some time and has also been looking to considerably expand its' zircon-rutile portfolio. The Gippsland HMS project certainly fits this desire, and we will aggressively initiate infill exploration of the Rio drilling to establish a maiden HMS resource to JORC standards."

Execution of this acquisition remains subject to the completion of certain preliminary steps, in particular with respect to completion of due diligence and to the approval by the relevant regulatory authorities. Its completion could become effective by midyear 2012.

***Exploration Target**
The potential quantity and grade is conceptual in nature, that there has been insufficient exploration drilling and sampling density to define a Mineral Resource and that it is uncertain if further exploration will result in the determination of a Mineral Resource.

Competent Person
Technical information contained in this report has been compiled and/or supervised by Mr Andrew Gillies B.Sc (Geology) M.AusIMM (Managing Director of Metallica Minerals Limited) who is a competent person and member of the Australian Institute of Mining and Metallurgy (AusIMM). Mr Gillies has relevant experience to the mineralisation, exploration results and targets being reported on to qualify as a Competent Person as defined by the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves. Mr Gillies consents to the inclusion of this information in the form and context in which it appears in this report.

WALLIS DRILLING

117991

DAILY DRILLING REPORT

Client: Metallica Minerals

Date: 19-12-11

Shift: MON.

Location: Bairnsdale

Job No: 2398.

Drill No. D8.

CREW		Hours
Driller	G. Cowling	11¼
Offsider	B. Bennett, R. Lewis	11¼
Offsider		
Offsider		

EQUIPMENT	Plant No.	Hourmeter Start	Hourmeter Finish	Hrs Wkd
RIG	D8	6381	6389	8.
CARRIER	F277			
SUPPORT	F264			

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES From	METRES To	METRES Drilled	METRES Core Recovered	U/S Bit Total m
1	90°	AC NQ					61		
2							54		
3							66		
4							60		
							241		

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

		6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1															1
Travel Camp / Site / Camp	2		XX										XX		1,	2
Service / Repairs/INDUCT	3			XXX										XX	1¼	3
Condition Hole	4															4
DRILLING Air Core	5			X	X	X	XX	XX	X	X	X	X	X		7½	5
DRILLING Reverse Circ Hammer	6															6
DRILLING Diamond	7															7
DRILLING Other	8															8
Reaming Casing	9															9
Casing In / Out	10															10
Trip to Change Technique	11															11
Trip Rods to Change Bit	12															12
Pull Rods E.O.H.	13															13
Survey / Logging	14															14
Stand By	15															15
Site Travel	16															16
Rig up / Rig down	17															17
BREAKS, THUNDER STORM.	18						XX								½	18
REHAB SITE.	19							XX					XX		1	19
REMARKS (PRINT)		6	7	8	9	10	11	12	1	2	3	4	5	6	11¼ TOTAL	

* 17-12-11 WEED WASH RIG + SUPPORT TRUCK.
4 Hrs.
18-12-11 MOBILISE SAN REMO TO BAIRNSDALE.
4½ Hrs.

19-12-11. LOTS OF ROCK. THUNDERSTORMS + LIGHTNING AROUND.

CASING LEFT IN HOLE

Type:

Metres:

CONSUMABLES

1x Blue bit NQ
1x Yellow bit NQ

DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING

Loads 1

Hours

Litres 500.

Kms

Client

Contractor

WALLIS
DRILLING

117992

DAILY DRILLING REPORT

Client: METALLICA MINERALS
Date: 20-12-11
Shift: TUE

Location: BAIRNSDALE
Job No: 2398.
Drill No. D8.

CREW		Hours
Driller	G. Cowling	11¾
Offsider	B. Bennett	11¾
Offsider	R. Lewis	11¾
Offsider		

EQUIPMENT	Plant No.	Hourmeter Start	Hourmeter Finish	Hrs Wkd
RIG	D8	6389	6396	7
CARRIER	F277			
SUPPORT.	F264			

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES From	METRES To	METRES Drilled	METRES Core Recovered	U/S Bit Total m
1	90°	AC NQ					60		
2							60		
3							45		
4							45		
5							42		
6							39		
							291		

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

			6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1																1
Travel Camp / Site / Camp	2			X	X										XX	1	2
Service / Repairs /F+W	3				XX			X						X	XX	1½	3
Condition Hole	4																4
DRILLING Air Core	5				X	XXXX	XXXX	X	XX	XXXX		XX	XXXX	XX		6	5
DRILLING Reverse Circ Hammer	6																6
DRILLING Diamond	7																7
DRILLING Other	8																8
Reaming Casing	9																9
Casing In / Out	10																10
Trip to Change Technique	11																11
Trip Rods to Change Bit	12																12
Pull Rods E.O.H.	13																13
Survey / Logging	14																14
Stand By	15			XX							XXXX					1½	15
Site Travel	16							X				X				½	16
Rig up / Rig down	17																17
BREAKS.	18								XX							½	18
REHAB SITE.	19							X		X				X		¾	19

REMARKS (PRINT)

TOTAL 11¾

CASING LEFT IN HOLE
Type:
Metres:

CONSUMABLES

☐ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING
Loads 1
Hours
Litres 400
Kms

Client

Contractor

WALLIS
DRILLING

117993

DAILY DRILLING REPORT

Client: METALLICA MINERALS
Date: 21-12-11
Shift: WED
Location: BAIRNSDALE
Job No: 2398
Drill No. D8

CREW		Hours
Driller	G. Cowling	9¼
Offsider	B. Bennett	9¼
Offsider	R. Lewis	9¼
Offsider		

EQUIPMENT	Plant No.	Hourmeter Start	Hourmeter Finish	Hrs Wkd
RIG	D8	6396	6400	4
CARRIER	F277			
SUPPORT	F264			

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES From	To	Drilled	Core Recovered	U/S Bit Total m
1	90°	AC NQ					69		
2							60		
							129		

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

		6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1															1
Travel Camp / Site / Camp	2			XXXX				XX				XX			2	2
Service / Repairs	3							XX				XX			1	3
Condition Hole	4															4
DRILLING Air Core	5								XX X	X	XX				3	5
DRILLING Reverse Circ Hammer	6															6
DRILLING Diamond	7															7
DRILLING Other	8															8
Reaming Casing	9															9
Casing In / Out	10															10
Trip to Change Technique	11															11
Trip Rods to Change Bit	12															12
Pull Rods E.O.H.	13															13
Survey / Logging	14															14
Stand By	15															15
Site Travel	16															16
Rig up / Rig down	17															17
WET WEATHER	18				XX X	X	XX								3	18
REHAB SITE	19											X			¼	19
REMARKS (PRINT)		6	7	8	9	10	11	12	1	2	3	4	5	6	9¼ TOTAL	

CASING LEFT IN HOLE
Type:
Metres:

CONSUMABLES

☐ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING
Loads 1
Hours
Litres 100
Kms

Client
Contractor

WALLIS DRILLING

117994

DAILY DRILLING REPORT

Client: METALLICA MINERALS

Date: 22-12-11 Shift: THU

Location: BAIRNSDALE

Job No: 2398. Drill No. D8

CREW	Hours
Driller G. Cowling	9½
Offsider B. Bennett	9½
Offsider R. Lewis	9½
Offsider	

EQUIPMENT	Plant No.	Hourmeter Start	Finish	Hrs Wkd
RIG	D8	6400	6408	8.
CARRIER				
SUPPORT				

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES From	To	Drilled	Core Recovered	U/S Bit Total m
1	90°	AC NQ					72		
2							84		
3							63		
4							60		
							279		

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

			6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1																1
Travel Camp / Site / Camp	2			xx									xx			1	2
Service / Repairs	3				xx								x			¾	3
Condition Hole	4																4
DRILLING Air Core	5				xx	X	X	xxx	x	X	X	X				6½	5
DRILLING Reverse Circ Hammer	6																6
DRILLING Diamond	7																7
DRILLING Other	8																8
Reaming Casing	9																9
Casing In / Out	10																10
Trip to Change Technique	11																11
Trip Rods to Change Bit	12																12
Pull Rods E.O.H.	13																13
Survey / Logging	14																14
Stand By	15																15
Site Travel	16																16
Rig up / Rig down	17																17
BREAKS	18								xx							½	18
REHAB SITE	19							x	x				x			¾	19

REMARKS (PRINT) 6 7 8 9 10 11 12 1 2 3 4 5 6

TOTAL 9½

FINISH DRILLING FOR THE XMAS BREAK.

WOO HOO.

CASING LEFT IN HOLE

Type: Metres:

CONSUMABLES

DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING

Loads.......... Hours..........

Litres.......... Kms..........

Client ....

Contractor ....

WALLIS DRILLING

123473

DAILY DRILLING REPORT

Client: Metallica Minerals

Date: 28.12.2011 Shift: day - wed

Location: Bairnsdale

Job No: 2398 Drill No. d8

CREW		Hours
Driller	P Montgomery	12
Offsider	B Bennett	12
Offsider	R Lewis	12
Offsider		

EQUIPMENT	Plant No.	Hourmeter Start	Finish	Hrs Wkd
Rig	d8	6415	6425	10
Carrier		27071	27130	59
Support	F264	109575		

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES From	To	Drilled	Core Recovered	U/S Bit Total m
GS502	90°	NQAC			0	60m	✓		
GS502.a					0	54m	✓		
503					0	42m	✓		Total
503.a					8	28½m	✓		
509					0	45m	✓		229.5m
						DAY TOTALS			

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

			6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1																1
Travel Camp / Site / Camp	2			xxx										x	xx	1½	2
Service / Repairs	3			x	①xx										x	1¼	3
Condition Hole	4																4
DRILLING Air Core	5				xx	xxx	xxxx		xx	xxx	xxx	x	xxxx	xxx		6¼	5
DRILLING Reverse Circ Hammer	6																6
DRILLING Diamond	7																7
DRILLING Other	8																8
Reaming Casing	9																9
Casing In / Out	10																10
Trip to Change Technique	11																11
Trip Rods to Change Bit	12																12
Pull Rods E.O.H.	13																13
Survey / Logging	14																14
Stand By	15																15
Site Travel	16							xxx				xxx				1½	16
Rig up / Rig down	17																17
Rehab site	18					x		x		x	x					1	18
Lunch	19								xx							½	19
REMARKS (PRINT)			6	7	8	9	10	11	12	1	2	3	4	5	6	12	

① inducted new ~~fe~~ fiddy Phil Traill, set up rig after break.

TOTAL

CASING LEFT IN HOLE

Type: Metres:

CONSUMABLES

✓ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING

Loads 1 Hours

Litres 400 Kms

Client

Contractor

WALLIS DRILLING

123474

DAILY DRILLING REPORT

Client: Metallica Minerals
Date: 29-12-2011
Shift: day-Thurs
Location: Bairnsdale
Job No: 2398
Drill No. d8

CREW	Hours
Driller P Montgomery	11½
Offsider B Bennett	11½
Offsider R Lewis	11½
Offsider	

EQUIPMENT	Plant No.	Hourmeter Start	Hourmeter Finish	Hourmeter Hrs Wkd
Rig	d8	6425	6434	9
Carrier		27130	27132	2
Support	F264		109722	

Hole No.	Angle	Type and Size	~~Bit No~~ hammer	Reamer and Casing Shoe No.	METRES From	METRES To	METRES Drilled	METRES Core Recovered	U/S Bit Total m
GS509	90°	NQAC			45m	64½m	19.5m	✓	Hammer
509.a			0-2½m	✓	2½m	51m	48½m	✓	2½m
516					0	31½m	✓		A core
									99.5m
									Total
						DAY TOTALS			102m

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

			6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1																1
Travel Camp / Site / Camp	2			XXX										XX		1¼	2
Service / Repairs	3			X										X	XX	1	3
Condition Hole	4																4
DRILLING Air Core	5				XXXX	XXXX	XXXX	XX	XX	XXXX	XXXX	X	XXXX	X		7½	5
DRILLING ~~Reverse Circ~~ Hammer	6							XX								½	6
DRILLING Diamond	7																7
DRILLING Other	8																8
Reaming Casing	9																9
Casing In / Out	10																10
Trip to Change Technique	11																11
Trip Rods to Change Bit	12																12
Pull Rods E.O.H.	13																13
Survey / Logging	14																14
Stand By	15																15
Site Travel	16											X				¼	16
Rig up / Rig down	17																17
Rehab Site	18											XX				½	18
Lunch	19								XX							½	19
REMARKS (PRINT)			6	7	8	9	10	11	12	1	2	3	4	5	6	11½ TOTAL	

REMARKS (PRINT)

- Had difficulties with GS509. four inner tubes had splits affecting drilling. Sorted I-tube prob. but still tricky ground to drill without injecting water.
- GS509a tricky ground (clay + powder sand, baking up)

CASING LEFT IN HOLE
Type:
Metres:

CONSUMABLES

✓ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING
Loads 1
Hours
Litres 400
Kms

Client

Contractor

WALLIS
DRILLING

123475

DAILY DRILLING REPORT

Client: Metallica Minerals
Date: 30.12.2011
Shift: day - Fri
Location: Bairnsdale
Job No: 2398
Drill No. d8

CREW		Hours
Driller	P. Montgomery	12
Offsider	B. Bennett	12
Offsider	R. Lewis	12
Offsider		

EQUIPMENT	Plant No.	Hourmeter		
		Start	Finish	Hrs Wkd
Rig	d8	6434	6444	10
Carrier		27132	27137	5
Support	F264	109722	109836	114

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES				U/S Bit Total m
					From	To	Drilled	Core Recovered	
GS 516	90°	NQAC			31½m	35m	- 3½		
516a					0	30m	✓		Total
510					0	33m	✓		
510a					0	27m	✓		
504					0	77m	✓		236½m
504a					0	66m	✓		
					DAY TOTALS				

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

			6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1																1
Travel Camp / Site / Camp	2			xxx											xxx	1½	2
Service / Repairs	3			x	x										x	¾	3
Condition Hole	4																4
DRILLING Air Core	5				xxx	xxx	xxx	xxxx	x	xxx	xxxx	xxxx	xxxx	xxxx		8¼ ~~7¾~~	5
DRILLING Reverse Circ Hammer	6																6
DRILLING Diamond	7																7
DRILLING Other	8																8
Reaming Casing	9																9
Casing In / Out	10																10
Trip to Change Technique	11																11
Trip Rods to Change Bit	12																12
Pull Rods E.O.H.	13																13
Survey / Logging	14																14
Stand By	15																15
Site Travel	16						x		x							½	16
Rig up / Rig down	17																17
Rehab	18					x			x							½	18
Lunch	19								x	x						½	19
REMARKS (PRINT)			6	7	8	9	10	11	12	1	2	3	4	5	6	12	
																TOTAL	

CASING LEFT IN HOLE

Type:
Metres:

CONSUMABLES

✓ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING

Loads 1
Hours
Litres 400
Kms

Client

Contractor

WALLIS
DRILLING

123476

DAILY DRILLING REPORT

Client: Metallica Minerals
Date: 31/12/2011
Shift: day - Sat
Location: Bairnsdale
Job No: 2398
Drill No. d8

CREW	Hours
Driller P-Montgomery	11½
Offsider B Bennett	11½
Offsider R. Lewis	11½
Offsider	

EQUIPMENT	Plant No.	Hourmeter Start	Finish	Hrs Wkd
Rig	d8	6444	6453	9
Carrier		27137	27142	5
support	F264	109836	109895	59

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES From	To	Drilled	Core Recovered	U/S Bit Total m
GS 505	90°	NQAC			0	78m	✓		
505a					0	69m	✓		Total 250 1/2m
GS 515					0	57m	✓		
515a					0	46½m	✓		
					DAY TOTALS				

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

			6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1																1
Travel Camp / Site / Camp	2			XXX										xxx		1½	2
Service / Repairs	3													XX	xx	1	3
Condition Hole	4																4
DRILLING Air Core	5				X	XXXX	XXXX	XXXX	XXXX	x	xx	XXXX	XXX			6¾	5
DRILLING Reverse Circ Hammer	6																6
DRILLING Diamond	7																7
DRILLING Other	8																8
Reaming Casing	9																9
Casing In / Out	10																10
Trip to Change Technique	11																11
Trip Rods to Change Bit	12																12
Pull Rods E.O.H.	13																13
Survey / Logging	14																14
Stand By	15																15
Site Travel	16				XX						XX					¾	16
Rig up / Rig down	17																17
Rehab	18			x	X					X	X					1	18
Lunch	19									XX						½	19
REMARKS (PRINT)			6	7	8	9	10	11	12	1	2	3	4	5	6	11½ TOTAL	

GS 505 + 505a hard ground from surface to 13-14m

good day

"Happy New Year" :)

CASING LEFT IN HOLE
Type:
Metres:

CONSUMABLES
1 Blue bit

☑ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING
Loads 1
Hours
Litres 400
Kms

Client

Contractor

WALLIS DRILLING

123478

DAILY DRILLING REPORT

Client: Metallica Minerals

Date: 1·1·2012

Shift: day - Sun

Location: Bairnsdale

Job No: 2398

Drill No. d8

CREW	Hours
Driller P.Montgomery	8 1/4
Offsider B Pennett	8 1/4
Offsider R. Lewis	8 1/4
Offsider	

EQUIPMENT	Plant No.	Hourmeter		
		Start	Finish	Hrs Wkd
Rig	d8	6453	6459	6
Carrier		27142	27143	1
Support	F264	[illegible]	109954	59

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES				U/S Bit Total m
					From	To	Drilled	Core Recovered	
GS506	90°	NQAC			0	60	✓		
506a					0	63	✓		Total
									123m
				DAY TOTALS					

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

		6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1															1
Travel Camp / Site / Camp	2				XXX							XX			1¼	2
Service / Repairs	3				X								XX		¾	3
Condition Hole	4															4
DRILLING Air Core	5						XXXXX	X	XXXX	XXXX	XXXX				4¾	5
DRILLING Reverse Circ Hammer	6															6
DRILLING Diamond	7															7
DRILLING Other	8															8
Reaming Casing	9															9
Casing In / Out	10															10
Trip to Change Technique	11															11
Trip Rods to Change Bit	12															12
Pull Rods E.O.H.	13															13
Survey / Logging	14															14
Stand By	15															15
Site Travel	16					XX									½	16
Rig up / Rig down	17															17
Rehab	18					X						X			½	18
lunch	19							XX							½	19
REMARKS (PRINT)		6	7	8	9	10	11	12	1	2	3	4	5	6	8¼ TOTAL	

hard ground 0-14 m

CASING LEFT IN HOLE

Type: Metres:

CONSUMABLES

1 Yellow bit

✓ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING

Loads 1 Hours

Litres 400 Kms

Client

Contractor

WALLIS
DRILLING

123479

DAILY DRILLING REPORT

Client: Metallica Minerals

Location: Bairnsdale

Date: 20.1.2012

Shift: day-Mon

Job No: 2398

Drill No. d8

CREW		Hours
Driller	P. Montgomery	12
Offsider	B. Bennett	12
Offsider	R. Lewis	12
Offsider		

EQUIPMENT	Plant No.	Hourmeter		
		Start	Finish	Hrs Wkd
Rig	d8	6459	6468	9
Carrier		27143	58	27201
Support	F264	109954	110069	115

Hole No.	Angle	Type and Size	~~Bit No.~~ Hamer	Reamer and Casing Shoe No.	METRES				U/S Bit Total m
					From	To	Drilled	Core Recovered	
GS308	90°	NQAC			0	72m	✓		
308a			0-5m		5m	54m	✓		Total
521					0	57 m	✓		
521a					0	48m	✓		231m
						DAY TOTALS			

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

			6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1																1
Travel Camp / Site / Camp	2			XXX											XXX	1½	2
Service / Repairs	3			X	X										X	¾	3
Condition Hole	4																4
DRILLING Air Core	5				XXX	XXXX	XX	X	XXXX			XX	XXXX	XXXX		6	5
DRILLING ~~Reverse Circ~~ Hammer	6						XX	XXX								1¼	6
DRILLING Diamond	7																7
DRILLING Other	8																8
Reaming Casing	9																9
Casing In / Out	10																10
Trip to Change Technique	11																11
Trip Rods to Change Bit	12																12
Pull Rods E.O.H.	13																13
Survey / Logging	14																14
Stand By	15																15
Site Travel	16									X	XXXX	XX				1¾	16
Rig up / Rig down	17																17
Rehab	18									X						¼	18
Weed n Seed	19									XX						½	19
REMARKS (PRINT)			6	7	8	9	10	11	12	1	2	3	4	5	6	12	

TOTAL

CASING LEFT IN HOLE

Type:

Metres:

CONSUMABLES

1x Yellow

☑ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING

Loads 1

Hours

Litres 400

Kms

Client

Contractor

WALLIS DRILLING

123480

DAILY DRILLING REPORT

Client: Metallica Minerals
Date: 3.1.2012
Shift: day-Tues
Location: Bairnsdale
Job No: 2398
Drill No. d8

CREW		Hours
Driller	P. Montgomery	11¼
Offsider	B. Bennett	11¼
Offsider	R. Lewis	11¼
Offsider		

EQUIPMENT	Plant No.	Hourmeter Start	Hourmeter Finish	Hrs Wkd
Rig	d8	6468	6476	8
Carrier		27201	27236	35
Support	F264	110069	110135	66

Hole No.	Angle	Type and Size	Bit No.	Reamer and Casing Shoe No.	METRES From	To	Drilled	Core Recovered	U/S Bit Total m
GS521.b	90°	NQAC			0	45m	✓		Total 195m
GS522					0	36m	✓		
522.a					0	33m	✓		
522.b					0	30m	✓		
521.c					0	51m	✓		
						DAY TOTALS			

NOTE: MARK WORK TIME - X - EACH DENOTES 15 MINUTES

			6	7	8	9	10	11	12	1	2	3	4	5	6	TOTAL	
Mobilisation / Demobilisation	1												XXXX			1	1
Travel Camp / Site / Camp	2			XXXX										XXXX		2	2
Service / Repairs	3				X										X	½	3
Condition Hole	4																4
DRILLING Air Core	5				XXX	XX X	XXX		XXX	XXX	XXX	XX				5	5
DRILLING Reverse Circ Hammer	6																6
DRILLING Diamond	7																7
DRILLING Other	8																8
Reaming Casing	9																9
Casing In / Out	10																10
Trip to Change Technique	11																11
Trip Rods to Change Bit	12																12
Pull Rods E.O.H.	13																13
Survey / Logging	14							①									14
Stand By	15							XXXXX	X							1½	15
Site Travel	16					X					X					½	16
Rig up / Rig down	17																17
Rehab	18									X		XX				¾	18
	19																19
REMARKS (PRINT)			6	7	8	9	10	11	12	1	2	3	4	5	6	11¼	

TOTAL

① - waiting on gas monitor, all holes GS521 + GS522 found a gas pocket!

CASING LEFT IN HOLE
Type:
Metres:

CONSUMABLES

✓ DAILY CHECKS - in accordance with Equipment and Vehicle Log Books have been carried out

WATER CARTING
Loads 1
Hours
Litres 400
Kms

Client
Contractor

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS501 Depth (m): 60 Date Drilled: 20.12.2011 East (GDA94): North (GDA94):

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 1 of 1 Bulk Hole Depth (m): 60.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	Comments
0.0	1.5	501-01	CLY	CLY	CLY				MO	GRY			NIL		Haunted Hill Gravels
1.5	3.0	501-02	SCL	SND	CLY				M	GRY			NIL		Haunted Hill Gravels
3.0	4.5	501-03	CLS	CLY	MS				M	GRY			TR		Haunted Hill Gravels
4.5	6.0	501-04	SCL	CLY	MS				M	GRY			NIL		Haunted Hill Gravels
6.0	7.5	501-05	SCL	CLY	MS				M	GRY			NIL		Haunted Hill Gravels
7.5	9.0	501-06	SCL	CLY	CLY				MO	GRY			NIL		Haunted Hill Gravels
9.0	10.5	501-07	CLY	CLY	CLY				L	GRY			NIL		Haunted Hill Gravels
10.5	12.0	501-08	CLY	CLY	CLY				L	GRY			NIL		Haunted Hill Gravels
12.0	13.5	501-09	CLY	CLY	CLY				MO	GRY	SLT	SLY	NIL		Haunted Hill Gravels
13.5	15.0	501-10	SCL	SDY	CLY				MO	GRY			NIL		Haunted Hill Gravels
15.0	16.5	501-11	SCL	SDY	FS	M			L	GRY			NIL		Haunted Hill Gravels
16.5	18.0	501-12	SND	SND	VCS	P	SA	VL	L	O	CON	GRA	NIL		Haunted Hill Gravels
18.0	19.5	501-13	CON	SND	GRA	P	SA-R	VL	L	BR			TR		Haunted Hill Gravels
19.5	21.0	501-14	GRA	SND	FS-GRA	W	SA-R	VL	L	GRY	CON	CLY	NIL		Haunted Hill Gravels
21.0	22.5	501-15	SND	SLY	FS	W		VL	L	GRY			1-2		Visual estimated "ore" zone
22.5	24.0	501-16	SND	SLY	FS	W		VL	L	GRY			1		Visual estimated "ore" zone
24.0	25.5	501-17	SND	SLY	FS	M		VL	L	GRY			1		Visual estimated "ore" zone
25.5	27.0	501-18	SND	SLY	FS	W		VL	L	GRY	SND	WFE	3		Visual estimated "ore" zone
27.0	28.5	501-19	SND	SND	FS	W		VL	L	GRY			6-8		Visual estimated "ore" zone
28.5	30.0	501-20	SND	SND	FS	W		VL	L	O			2		Visual estimated "ore" zone
30.0	31.5	501-21	SND	SND	FS	W		VL	MO	GRY,O			<1		Visual estimated "ore" zone
31.5	33.0	501-22	SND	SLY	FS	M		VL	L	GRY	SND	WFE	TR		Visual estimated "ore" zone
33.0	34.5	501-23	SND	SND	FS	W		VL	L	GRY			<1		Visual estimated "ore" zone
34.5	36.0	501-24	SND	SND	FS	W		VL	L	O			1		Visual estimated "ore" zone
36.0	37.5	501-25	SND	SND	FS	W		VL	L	GRY			3		Visual estimated "ore" zone
37.5	39.0	501-26	SND	SND	VFS	W		VL	L	O			10-12		Visual estimated "ore" zone
39.0	40.5	501-27	SND	SND	VFS	W		VL	L	GRY			15		Visual estimated "ore" zone
40.5	42.0	501-28	SND	SND	VFS	W		VL	L	GRY			2		Visual estimated "ore" zone
42.0	43.5	501-29	SND	SND	VFS	W		VL	L	GRY		WFE	3-4		Visual estimated "ore" zone
43.5	45.0	501-30	SND	SND	VFS	W		VL	L	K		WFE	4		Visual estimated "ore" zone
45.0	46.5	501-31	SND	SND	VFS	W		VL	L	GRY		WFE	3		Visual estimated "ore" zone
46.5	48.0	501-32	SND	SND	VFS	W		VL	L	O, GRY		WFE	4		Visual estimated "ore" zone
48.0	49.5	501-33	SND	SLT	VFS	M		VL	L	K			10		Visual estimated "ore" zone
49.5	51.0	501-34	SND	SLT	VFS	M		VL	L	K			4		Visual estimated "ore" zone
51.0	52.5	501-35	SND	SLT	VFS	M		VL	L	K			2		Visual estimated "ore" zone
52.5	54.0	501-36	SND	SLT	VFS	M		VL	L	O			2		Visual estimated "ore" zone
54.0	55.5	501-37	SCL	CLY	VFS	M		VL	L	GRY			TR		
55.5	57.0	501-38	SND	SLT	VFS	M		VL	L	GRY			<1		
57.0	58.5	501-39	CLS	SND	FS	M		VL	L	O			NIL		
58.5	60.0	501-40	SCL	CLY	CLY	M		L	M	O			NIL		

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS502 Depth (m): 60.0 Date Drilled: 28.Dec 2011 East (GDA94): 526967 North (GDA94): 5817829

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: 59.5 RL: Sheet 1 of Bulk Hole Depth (m): 54.0 Geo: B Duck

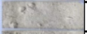
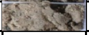
From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	Comments
0.0	1.5	502-01	CLY	SND	CLY	W			M	O			?		Haunted Hill Gravels
1.5	3.0	502-02	GRA	SND	PBL	P	R	VL	M	O	SND	SND	TR		Haunted Hill Gravels
3.0	4.5	502-03	SND	SLY	VFS	W		VL	Light	GRY			TR		Ore zone - no HM
4.5	6.0	502-04	SND	SLY	VFS	W		VL	Light	GRY			TR		Ore zone - no HM
6.0	7.5	502-05	SND	SLY	VFS	W		VL	P	B			TR		Ore zone - no HM
7.5	9.0	502-06	SND	CLY	VFS	M		L	M	B	CLY	CLY	TR		Ore zone - no HM
9.0	10.5	502-07	SND	SLY	VFS	W		L	P	GRY			TR		Ore zone - no HM
10.5	12.0	502-08	SND	SLY	VFS	W		VL	P	GRY			<1		Ore zone - no HM
12.0	13.5	502-09	SND	SLY	VFS	W		L	P	GRY			1		Visual estimated "ore" zone
13.5	15.0	502-10	SND	SLY	VFS	W		L	P	GRY			1-2		Visual estimated "ore" zone
15.0	16.5	502-11	SND	SLY	VFS	W		L	P	GRY			2-3		~20%zircon
16.5	18.0	502-12	SND	SLY	VFS	W		L	P	GRY			3		~20%zircon
18.0	19.5	502-13	SND	SLY	VFS	W		L	P	GRY			2-3		Visual estimated "ore" zone
19.5	21.0	502-14	SND	SLY	VFS	W		L	P	GRY			<1		Visual estimated "ore" zone
21.0	22.5	502-15	SND	SLY	VFS	W		L	P	BR			1-2		Visual estimated "ore" zone
22.5	24.0	502-16	SND	SLY	VFS	W		VL	P	BR			2		Visual estimated "ore" zone
24.0	25.5	502-17	SND	SLY	VFS	W		L	P	BR			<1		Visual estimated "ore" zone
25.5	27.0	502-18	SND	SLY	VFS	W		L	P	BR			TR		Visual estimated "ore" zone
27.0	28.5	502-19	SND	SLY	VFS	W		L	M	BR			TR		Visual estimated "ore" zone
28.5	30.0	502-20	SND	SLY	VFS	W		L	M	GRY			3		~15% zircon
30.0	31.5	502-21	SND	SLY	VFS	W		L	P	GRY			1		Visual estimated "ore" zone
31.5	33.0	502-22	SND	SLY	VFS	W		L	P	GRY			1-2		Visual estimated "ore" zone
33.0	34.5	502-23	SND	SLY	VFS	W		L	M	GRY			3-4		~20% zircon
34.5	36.0	502-24	SND	SLY	VFS	W		L	M	GRY			3-4		~20% zircon
36.0	37.5	502-25	SND	SLY	VFS	W		L	M	GRY			5		Visual estimated "ore" zone
37.5	39.0	502-26	SND	SLY	VFS	W		L	M	GRY			3-4		Visual estimated "ore" zone
39.0	40.5	502-27	SND	SLY	VFS	W		L	M	GRY			3		Visual estimated "ore" zone
40.5	42.0	502-28	SND	SLY	VFS	W		L	M	GRY			1		Visual estimated "ore" zone
42.0	43.5	502-29	SND	SLY	VFS	W		L	M	GRY			2		Visual estimated "ore" zone
43.5	45.0	502-30	SND	SLY	VFS	W		L	M	GRY			2-3		Visual estimated "ore" zone
45.0	46.5	502-31	SND	SLY	VFS	W		L	P	BR			1-2		Visual estimated "ore" zone
46.5	48.0	502-32	SND	SLY	VFS	W		L	P	GRY			1-2		Visual estimated "ore" zone
48.0	49.5	502-33	SND	SLY	VFS	W		L	P	BR			<1		Visual estimated "ore" zone
49.5	51.0	502-34	SND	SLY	VFS	W		L	M	GRY			<1		Visual estimated "ore" zone
51.0	52.5	502-35	SND	CLY	VFS	M		L	M	BR	SLY	SLY	<1		Visual estimated "ore" zone
52.5	54.0	502-36	SND	SLY	VFS	W		L	M	BR	CLY	CLY	1-2		Visual estimated "ore" zone
54.0	55.5	502-37	SND	CLY	VFS	M		L	M	BR	SLY	SLY	5		Sticky - water added
55.5	57.0	502-38	SND	CLY	VFS	M		L	M	BR	CLY	CLY	4		Sticky - water added
57.0	58.5	502-39	SCL	SND	VFS	M		L	M	BR	SLY	SLY	2-3		Visual estimated "ore" zone
58.5	60.0	502-40	CSL	SND	VFS	M		L	M	B	CLY	CLY	2		Visual estimated "ore" zone

GS503

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS503 Depth (m): 42.0 Date Drilled: 28 Dec 2011 East (GDA94): 526784 North (GDA94): 5818777

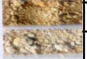
Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: 41.0 RL: Sheet 1 of 1. Bulk Hole Depth (m): 28.5 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
0.0	1.5	503-01	SCL	SND	FS	M		L	D	BR	SLY	SLY	<1		
1.5	3.0	503-02	SND	SND	VFS	M		VL	P	GRY	CLY	SLY	<1		
3.0	4.5	503-03	SND	SLY	VFS	M		C	P	GRY	SLY	SLY	2-3		Visual estimated "ore" zone
4.5	6.0	503-04	SND	SLY	VFS	M		L	P	BR	SLY	SLY	1		Visual estimated "ore" zone
6.0	7.5	503-05	SND	SLY	VFS	M		VL	P	GRY	SLY	SLY	2		Visual estimated "ore" zone
7.5	9.0	503-06	SND	SLY	VFS	M		VL	P	GRY	SLY	SLY	2		Visual estimated "ore" zone
9.0	10.5	503-07	SND	SLY	VFS	M		VL	P	GRY	SLY	SLY	4-5		Visual estimated "ore" zone
10.5	12.0	503-08	SND	SLY	VFS	M		VL	P	GRY	SLY	SLY	3-4		Visual estimated "ore" zone
12.0	13.5	503-09	SND	SLY	VFS	M		VL	P	BR	SLY	SLY	3-4		Visual estimated "ore" zone
13.5	15.0	503-10	SND	SLY	VFS	M		VL	P	BR	SLY	SLY	4		Visual estimated "ore" zone
15.0	16.5	503-11	SND	SLY	VFS	M		VL	P	BR	SLY	SLY	3		Visual estimated "ore" zone
16.5	18.0	503-12	SND	SLY	VFS	M		VL	P	BR	SLY	SLY	1-2		Visual estimated "ore" zone
18.0	19.5	503-13	CLS	SND	VFS	M		VL	L	BR	SLY		8		Visual estimated "ore" zone
19.5	21.0	503-14	SND	SND	VFS	W		VL	L	BR	SLY	CLY	<1		Visual estimated "ore" zone
21.0	22.5	503-15	SND	SND	VFS	W		VL	L	GRY	CLY	SLY	TR		Visual estimated "ore" zone
22.5	24.0	503-16	SND	SND	VFS	M		VL	P	BR	CLY	SLY	3-4		Visual estimated "ore" zone
24.0	25.5	503-17	SND	SND	VFS	M		VL	P	BR	CLY	SLY	TR		
25.5	27.0	503-18	SND	GRA	VFS	P	SR	VL	M	BR	GRA	SLY	TR		
27.0	28.5	503-19	SLC	SND	FS	P		L	M	BR	SND	SND	TR		
28.5	30.0	503-20	SND	SND	CSA	P	SR	L	M	BR	SND	SLY	<1		
30.0	31.5	503-21	SCL	SND	MS	P	SR	L	M	BR	SND	GRA	TR		
31.5	33.0	503-22	CLY	SND	CLY	P		L	M	O	SND	GRA	TR		
33.0	34.5	503-23	SCL	SND	MS	P		L	M	GRY	SND	CLY	TR		
34.5	36.0	503-24	SCL	SND	CSA	P		L	M	GRY	SND	CLY	TR		
36.0	37.5	503-25	SCL	SND	CSA	P		L	M	GRY	SND	CLY	TR		
37.5	39.0	503-26	SCL	SND	CSA	P		L	M	GRY	SND	CLY	TR		
39.0	40.5	503-27	CLS	SND	CSA	P		L	M	GRY	SND	CLY	TR		
40.5	42.0	503-28	SCL	SND	CSA	P		L	M	GRY	CLY	CLY	TR		
Notes:	Undisturbed sample at 0.3 - 0.6m, 161mm long x 46mm diam														
	Undisturbed sample at 19.0m = 177m long x 46mm diam														

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS504 Depth (m): 77.0 Date Drilled: 30 Dec 2011 East (GDA94): 529063 North (GDA94): 5818006

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: 114 Sheet 1 of 2 Bulk Hole Depth (m): 66.0 Geo: B Duck

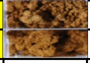
From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	504-01	GRA	SND	FS-GRA	P	SR	L	M	BR	CLY		TR		Haunted Hill Gravels
1.5	3.0	504-02	PEB	SND	FS-PBL	P	R	L	M	BR	SND		<1		Haunted Hill Gravels
3.0	4.5	504-03	GRA	SND	FS-GRA	P	SR	L	M	BR	SND		1		Visual estimated "ore" zone
4.5	6.0	504-04	SND	SLY	VFS	W		VL	M	BR			10-15		Visual estimated "ore" zone
6.0	7.5	504-05	SND	SLY	VFS	W		VL	MO-L	P			5		Visual estimated "ore" zone
7.5	9.0	504-06	SND	SLY	VFS	W		VL	P	BR	SLY	WFE	1		Visual estimated "ore" zone
9.0	10.5	504-07	SND	SLY	VFS	W		VL	P	BR	SLY		TR		
10.5	12.0	504-08	SND	SLY	VFS	W		VL	M	OR			<1		
12.0	13.5	504-09	SND	SLY	VFS	W		VL	P	BR	CLY	WFE	TR		
13.5	15.0	504-10	SND	SLY	VFS	W		VL	P	BR	SLY	WFE	<1		
15.0	16.5	504-11	SND	SLY	VFS	W		VL	P	BR			TR		
16.5	18.0	504-12	SND	SLY	VFS	W		VL	P	BR	SLY		<1		
18.0	19.5	504-13	SND	SLY	VFS	W		VL	L	GRY	SLY	WFE	<1		
19.5	21.0	504-14	SND	SLY	VFS	W		VL	L	GRY			TR		
21.0	22.5	504-15	SND	SLY	VFS	W		VL	P	BR	SLY	WFE	TR		
22.5	24.0	504-16	SND	SLY	VFS	W		VL	L	GRY	SLY		<1		
24.0	25.5	504-17	SND	SLY	VFS	W		VL	P	BR	SLY		TR		
25.5	27.0	504-18	SND	SLY	VFS	W		VL	L	GRY	SLY		TR		
27.0	28.5	504-19	SND	SLY	VFS	W		VL	L	BR	CLY	WFE	TR		
28.5	30.0	504-20	SND	SLY	VFS	W		VL	L	GRY	CLY	WFE	1		Visual estimated "ore" zone
30.0	31.5	504-21	SND	SLY	VFS	W		VL	L	BR	CLY		1		Visual estimated "ore" zone
31.5	33.0	504-22	SND	SLY	VFS	W		VL	MO-L	P-GRY	CLY		1		Visual estimated "ore" zone
33.0	34.5	504-23	SND	SLY	VFS	W		VL	L	R-GRY			2		HM <80 micron
34.5	36.0	504-24	SND	SLY	VFS	W		VL	L	GRY			1		Visual estimated "ore" zone
36.0	37.5	504-25	SND	SLY	VFS	W		VL	P	BR			1		Visual estimated "ore" zone
37.5	39.0	504-26	SND	SLY	VFS	W		VL	P	BR			1		Visual estimated "ore" zone
39.0	40.5	504-27	SND	SLY	VFS	W		VL	M	BR			2-3		Visual estimated "ore" zone
40.5	42.0	504-28	SND	SLY	VFS	W		VL	M	BR			TR		
42.0	43.5	504-29	SND	SLY	VFS	W		VL	M	BR			NIL		
43.5	45.0	504-30	SND	SLY	VFS	W		VL	M	BR			TR		
45.0	46.5	504-31	SND	SLY	VFS	W		VL	M	BR			TR		
46.5	48.0	504-32	SND	SLY	VFS	W		VL	M	BR			<1		
48.0	49.5	504-33	SND	SLY	VFS	W		VL	M	BR			1		Visual estimated "ore" zone
49.5	51.0	504-34	SND	SLY	VFS	W		VL	M	BR			<1		Visual estimated "ore" zone
51.0	52.5	504-35	SND	SLY	VFS	W		VL	M	BR			2-3		Visual estimated "ore" zone
52.5	54.0	504-36	SND	SLY	VFS	W		VL	M	BR			1-2		Visual estimated "ore" zone
54.0	55.5	504-37	SND	SLY	VFS	W		VL	M	BR			2		Visual estimated "ore" zone
55.5	57.0	504-38	SND	SLY	VFS	W		VL	M	BR	CLY		5-6		Visual estimated "ore" zone
57.0	58.5	504-39	SND	SLY	VFS	W		VL	M	BR	CLY	WFE	<1		
58.5	60.0	504-40	SND	SLY	VFS	W		VL	M	BR			TR		

GS504 (2)

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS504 Depth (m): 77.0 Date Drilled: 30 Dec 2011 East (GDA94): 529063 North (GDA94): 5818006

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: 114 Sheet 2 of 2 Bulk Hole Depth (m): 66.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
60.0	61.5	504-41	SND	SLY	FS-CSA	P		C	D	R-BR	SND	MFE	TR		
61.5	63.0	504-42	SND	SLY	VFS	W		L	D	O			1		Visual estimated "ore" zone
63.0	64.5	504-43	SND	SLY	VFS	W		L	M	BR	CLY		1		Visual estimated "ore" zone
64.5	66.0	504-44	SND	SLY	VFS	W		L	M	BR	CLY	WFE	1		Visual estimated "ore" zone
66.0	67.5	504-45	SND	SLY	VFS	W		L	M	BR	SLY	WFE	1-2		Visual estimated "ore" zone
67.5	69.0	504-46	SND	SLY	VFS	W		L	M	BR	SND	IND	1		5% INDURATED SST
69.0	70.5	504-47	SND	SLY	VFS	W		L	M	BR	CLY		1		Visual estimated "ore" zone
70.5	72.0	504-48	SCL	SLY	VFS	W		L	M	BR	CLY	WFE	TR		Visual estimated "ore" zone
72.0	73.5	504-49	SCL	SLY	VFS	W		L	M	BR	CLY		1		Visual estimated "ore" zone
73.5	75.0	504-50	CLY	SND	CLY	W		L	M	BR	SLY	WFE	3		Visual estimated "ore" zone
75.0	76.5	504-51	CLY	SND	CLY	W		L	M	BR	SLY	WFE	3		Visual estimated "ore" zone
76.5	77.0	504-52	CLY	SND	CLY	W		L	M	BR	SST	IND	3		

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS505 Depth (m): 78.0 Date Drilled: East (GDA94): 529833 North (GDA94): 5817773

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: 111 Sheet 1 of 2 Bulk Hole Depth (m): 69.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
0.0	1.5	505-01	CLY	SND	CLY			L	D	BR			?		Top soil
1.5	3.0	505-02	GRA	SND	MS-GRA	P	SA	L	M	O-BR			NIL		Haunted Hill Gravels
3.0	4.5	505-03	GRA	SND	MS-GRA	P	SA	L	M	O-BR	SLY		TR		Haunted Hill Gravels
4.5	6.0	505-04	GRA	SND	MS-GRA	P	SR	L	M	O-BR	SLY	CLY	NIL		Haunted Hill Gravels
6.0	7.5	505-05	GRA	CLY	CL-GRA	P	R	C	M	O-BR	SND	SLY	TR		Haunted Hill Gravels
7.5	9.0	505-06	GRA	SND	FS-GRA	P	R	C	M	O-BR	CLY		NIL		Haunted Hill Gravels
9.0	10.5	505-07	SCL	SND	FS-GRA	P	R	C	M	GRY-BR	CLY		NIL		Minor water
10.5	12.0	505-08	GRA	SND	CL-GRA	P	SR	C	M	O-BR	CLY		NIL		Haunted Hill Gravels
12.0	13.5	505-09	SCL	SND	FS-GRA	P	SA	C	M	O-BR	SLY		NIL		Haunted Hill Gravels
13.5	15.0	505-10	SCL	SND	CL-MS	P		L	M	O-BR	SLY		TR		Haunted Hill Gravels
15.0	16.5	505-11	SND	SLY	VFS	W		VL	P	GRY			<1		START OF FINE SANDS
16.5	18.0	505-12	SND	SLY	VFS	W		VL	P	BR			1		
18.0	19.5	505-13	SND	SLY	VFS	W		VL	P	BR			NIL		
19.5	21.0	505-14	SND	SLY	VFS	W		VL	Light	O-BR	CLY		NIL		
21.0	22.5	505-15	SND	SLY	VFS	W		VL	Light	O-BR	CLY		2		Vis est "ore" zone EST 20% Zir
22.5	24.0	505-16	SND	SLY	VFS	W		VL	P	BR	CLY	IND	1-2		Visual estimated "ore" zone
24.0	25.5	505-17	SND	SLY	VFS	W		VL	P	BR			NIL		
25.5	27.0	505-18	SCL	SND	VFS	M		L	P	BR	CLY		<1		
27.0	28.5	505-19	SND	SND	VFS	M		VL	P	GRY	SLY		<1		
28.5	30.0	505-20	SND	SND	VFS	M		VL	MO	GRY-BR	SLY		NIL		
30.0	31.5	505-21	SND	SLY	VFS	W		VL	P-MO	GRY-BR	SLY		<1		
31.5	33.0	505-22	SND	SLY	VFS	W		VL	P	GRY	SLY		TR		
33.0	34.5	505-23	SND	SLY	VFS	W		VL	P	GRY	CLY	WFE	<1		
34.5	36.0	505-24	SND	SLY	VFS	W		VL	P	BR	SLY		TR		
36.0	37.5	505-25	SCL	SND	CL-VFS	M		L	D	O-BR	SLY	WFE	TR		
37.5	39.0	505-26	CSL	SND	CL-VFS	M		L	Light	GRY-BR	SLY	IND	<1		<5% IND SST
39.0	40.5	505-27	SND	SLY	VFS	W		VL	Light	BR			1		Visual estimated "ore" zone
40.5	42.0	505-28	CLY	SLY	VFS	W		VL	M	BR			6-8		Visual estimated "ore" zone
42.0	43.5	505-29	SND	SLY	VFS	W		VL	M	KH			1		Visual estimated "ore" zone
43.5	45.0	505-30	CLY	SLY	VFS	W		VL	M	KH			2		Visual estimated "ore" zone
45.0	46.5	505-31	CLY	SLY	VFS	W		VL	D	O-BR			1-2		Visual estimated "ore" zone
46.5	48.0	505-32	SND	SLY	VFS	W		VL	M	O-BR	CLY	WFE	<1		Limonite on IND F SST
48.0	49.5	505-33	CLY	SLY	CL-VFS	M		VL	M	BR	SND	VFS	3		Visual estimated "ore" zone
49.5	51.0	505-34	CLY	VFS	CL-VFS	M		VL	M	BR	SND	VFS	1-2		Visual estimated "ore" zone
51.0	52.5	505-35	SND	SLY	VFS	W		VL	M	P			<1		Visual estimated "ore" zone
52.5	54.0	505-36	SCL	SND	CL-VFS	M		VL	M	P			1		Visual estimated "ore" zone
54.0	55.5	505-37	CLY	SND	CL-VFS	M		VL	M	P-BR			<1		Visual estimated "ore" zone
55.5	57.0	505-38	CLY	SND	CL-VFS	M		VL	M	BR	SLY		1		Visual estimated "ore" zone
57.0	58.5	505-39	SND	SLY	VFS	W		VL	M	BR	SLY		<1		Visual estimated "ore" zone
58.5	60.0	505-40	SND	SLY	VFS	W		VL	M	BR	SLY		1-2		Visual estimated "ore" zone

GS505 (2)

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS505 Depth (m): 78.0 Date Drilled: East (GDA94): 529833 North (GDA94): 5817773
Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: 111 Sheet 2 of 2 Bulk Hole Depth (m): 69.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
60.0	61.5	505-41	SND	SLY	VFS	W		VL	M	BR	SLY	IND	2		WFE on IND VFS - 1-2%
61.5	63.0	505-42	SND	SLY	VFS	W		VL	M	BR	SLY		1-2		Visual estimated "ore" zone
63.0	64.5	505-43	CLY	SLY	CLY	W		VL	M	BR	SND		1		Visual estimated "ore" zone
64.5	66.0	505-44	CLY	SLY	CLY	W		VL	M	KH	SND	VFS	2-3		Visual estimated "ore" zone
66.0	67.5	505-45	SND	SLY	VFS	W		VL	M	P-BR			1-2		Visual estimated "ore" zone
67.5	69.0	505-46	SND	SLY	VFS	W		VL	M	P-BR	SLY	IND/WFE	TR		hematite coated IND F SST
69.0	70.5	505-47	SND	SLY	VFS	W		VL	M	P-BR	SLY	WFE	<1		WFE 1%
70.5	72.0	505-48	SND	SLY	VFS	W		VL	M	BR	SLY	IND/WFE	<1		IND VFST + HEM coating
72.0	73.5	505-49	SND	SLY	VFS	W		VL	M	Y-BR	SLY	IND	<1		IND VFST + HEM coating
73.5	75.0	505-50	SND	SLY	VFS	W		VL	M	Y-BR	SLY	IND/WFE	1		IND VFST + HEM coating
75.0	76.5	505-51	CLY	SLY	CLY	W		VL	M	KH	SND	IND/WFE	<1		
76.5	78.0	505-52	CLY	SLY	CLY	W		VL	M	KH	SND		<1		
	NOTE:	In this North Eastern area of this drilling campaign, the HM appears finer and more difficult to pan													

GS506

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS506 Depth (m): 6 58.5 Date Drilled: 01 Jan 2012 East (GDA94): 530595 North (GDA94): 5817012
Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: 111 Sheet 1 of 2 Bulk Hole Depth (m): 63.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
0.0	1.5	506-01	CLY	BAN	CLY	W		L	D	GRY-BR	SND	FS	?		Haunted Hill Gravels
1.5	3.0	506-02	CLY	SND	CLY	M		L	MO	O-BR	SND	FS	NIL		Haunted Hill Gravels
3.0	4.5	506-03	CLS	GRA	FS-GRA	P		C	D	O-BR	SND	IND	NIL		Haunted Hill Gravels
4.5	6.0	506-04	GRA	GRA	PBL	P	A	L	M	O-BR			NIL		Haunted Hill Gravels
6.0	7.5	506-05	GRA	SND	PBL	P	A	C	M	KH	SLY		TR		Very slow drilling - gravel+pebs
7.5	9.0	506-06	GRA	SND	PBL	P	SA	L	M	KH	SLY		TR		Haunted Hill Gravels
9.0	10.5	506-07	GRA	CLY	PBL	P	SA	L	M	KH			TR		Haunted Hill Gravels
10.5	12.0	506-08	GRA	SND	PBL	P	SA	L	M	KH			TR		Haunted Hill Gravels
12.0	13.5	506-09	GRA	SND	GRA	P	SA	L	M	KH	SND	VFS	TR		Haunted Hill Gravels
13.5	15.0	506-10	SND	SLY	FS-GRA	M		VL	L	BR			TR		
15.0	16.5	506-11	SND	SND	FS-CSA	M	SA	VL	L	KH			1		Visual estimated "ore" zone
16.5	18.0	506-12	SND	SLY	VFS	W		VL	L	Y-BR			2		Visual estimated "ore" zone
18.0	19.5	506-13	SND	SLY	VFS	W		VL	P	BR			<1		Visual estimated "ore" zone
19.5	21.0	506-14	SND	SLY	VFS	W		VL	P	BR			<1		Visual estimated "ore" zone
21.0	22.5	506-15	SND	SLY	VFS	W		VL	P	BR			1		Visual estimated "ore" zone
22.5	24.0	506-16	SND	SLY	VFS	W		VL	P	BR			4		Visual estimated "ore" zone
24.0	25.5	506-17	SND	SLY	VFS	W		VL	P	BR			10-12		Visual estimated "ore" zone
25.5	27.0	506-18	SND	SLY	VFS	W		VL	P	BR			15		Visual estimated "ore" zone
27.0	28.5	506-19	SND	SLY	VFS	W		VL	P	BR			6-7		Visual estimated "ore" zone
28.5	30.0	506-20	SND	SLY	VFS	W		VL	L	GRY-BR			6		Visual estimated "ore" zone
30.0	31.5	506-21	SND	SLY	VFS	W		VL	P	BR			5		Visual estimated "ore" zone
31.5	33.0	506-22	SND	SLY	VFS	W		VL	P	BR			4		Visual estimated "ore" zone
33.0	34.5	506-23	SND	SLY	VFS	W		VL	M	O-BR			1		Visual estimated "ore" zone
34.5	36.0	506-24	SND	SLY	VFS	W		VL	M	O-BR			<1		Visual estimated "ore" zone
36.0	37.5	506-25	SND	SLY	VFS	W		VL	M	O-BR			1		Visual estimated "ore" zone
37.5	39.0	506-26	SND	SLY	VFS	W		VL	M	KH			<1		
39.0	40.5	506-27	SND	SLY	VFS	W		VL	M	KH			<1		
40.5	42.0	506-28	SND	SLY	VFS	W		VL	M	O-BR			<1		
42.0	43.5	506-29	CLY	SLY	CLY	W		VL	L	KH			2		Visual estimated "ore" zone
43.5	45.0	506-30	CLY	SLY	CLY	W		VL	L	KH	SND	WFE	2		minor VFS, nodular goethite
45.0	46.5	506-31	CLY	SLY	CLY	M		VL	L	KH	SND	FMS	2		Visual estimated "ore" zone
46.5	48.0	506-32	SND	SLY	VFS	W		VL	L	KH		WFE	2		Visual estimated "ore" zone
48.0	49.5	506-33	SND	SLY	VFS	M		VL	D-MO	R-BR-Y	CLY	BAN	<1		
49.5	51.0	506-34	SND	SLY	VFS	W		VL	MO-M	GRY-KH	CLY		TR		
51.0	52.5	506-35	SND	CLY	VFS	M		VL	P	GRY			TR		
52.5	54.0	506-36	SND	CLY	VFS	M		VL	P	GRY	SLY		TR		
54.0	55.5	506-37	SND	SFE	VFS-CSA	P		VL	M	O-BR	SND	IND	TR		10-20% SFE, 2% IND SST
55.5	57.0	506-38	CLY	SLY	CLY	M		VL	M	GRY			TR		
57.0	58.5	506-39	CLY	SLY	CLY	M		VL	P	BR	SND	IND	<1		
58.5	60.0	506-40	CLY	IND	CL-FS	M		C	L	BR			TR		BIT BLOCKED NOT SAMPLED??

GS506 (2)

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS506 Depth (m): 58.5 Date Drilled: 01 Jan 2012 East (GDA94): 530595 North (GDA94): 5817012

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: 111 Sheet 2 of 2 Bulk Hole Depth (m): 63.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos
60.0	61.5	506-41	CLY	IND	CL-VFS	M		C	M	BR	SST	IND	TR	
61.5	63.0	506-42	SND	CLY	VFS	M		L	M	O			<1	
	NOTE: Samples 40 - 42 taken from bulk hole 506A													

GS507

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS507 Depth (m): 63.0 Date Drilled: 22 Dec 2011 East (GDA94): North (GDA94):

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 1 of 2 Bulk Hole Depth (m): 60.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
0.0	1.5	507-01	CLY	GRA	CLY	P	SR	C	MO	GRY			?		
1.5	3.0	507-02	GRA	SND	VCS	P	SA	L	M	BR			NIL		
3.0	4.5	507-03	GRA	SND	GRA	P	SR	C	M	BR	CLY		NIL		
4.5	6.0	507-04	GRA	SND	GRA	P	SA	L	M	BR	CLY		NIL		
6.0	7.5	507-05	GRA	SND	GRA	P	SR	C	M	BR			NIL		
7.5	9.0	507-06	CON	GRA	PBL	P	R	C	M	BR			NIL		
9.0	10.5	507-07	SCL	SND	CSA	P	SA	C	M	BK			NIL		
10.5	12.0	507-08	SND	SND	FS	W		VL	P	BR			<1		
12.0	13.5	507-09	SND	SND	FS	W		VL	P	BR			<1		
13.5	15.0	507-10	SND	SND	FS	W		VL	P	BR			2		Visual estimated "ore" zone
15.0	16.5	507-11	SND	SND	FS	W		VL	P	BR			2-3		Visual estimated "ore" zone
16.5	18.0	507-12	SND	SND	FS	W		VL	P	BR			<1		Visual estimated "ore" zone
18.0	19.5	507-13	SND	SLY	VFS	W		VL	P	BR			TR		Visual estimated "ore" zone
19.5	21.0	507-14	SND	SLY	VFS	W		VL	P	BR			<1		Visual estimated "ore" zone
21.0	22.5	507-15	SND	SLY	VFS	W		VL	P	BR			2-3		Visual estimated "ore" zone
22.5	24.0	507-16	SND	SLY	VFS	W		VL	L	GRY			20		Visual estimated "ore" zone
24.0	25.5	507-17	SND	SLY	VFS	W		VL	L	GRY			5-6		Visual estimated "ore" zone
25.5	27.0	507-18	SND	SLY	VFS	W		VL	L	GRY			2-3		Visual estimated "ore" zone
27.0	28.5	507-19	SND	SLY	VFS	W		VL	MO	GRY			3		Visual estimated "ore" zone
28.5	30.0	507-20	SND	SLY	VFS	W		VL	P	GRY			2		Visual estimated "ore" zone
30.0	31.5	507-21	SND	SLY	VFS	W		VL	P	GRY			2-3		Visual estimated "ore" zone
31.5	33.0	507-22	SND	SLY	VFS	W		VL	P	BR			3-4		Visual estimated "ore" zone
33.0	34.5	507-23	SND	SLY	VFS	W		VL	P	BR			TR		Visual estimated "ore" zone
34.5	36.0	507-24	SND	SLY	VFS	W		VL	P	Y-BR			1		Visual estimated "ore" zone
36.0	37.5	507-25	SND	SLY	VFS	W		VL	P	Y-BR			<1		
37.5	39.0	507-26	SND	SLY	VFS	W		VL	P	Y-BR			TR		
39.0	40.5	507-27	SND	SLY	VFS	W		VL	P	Y-BR			TR		
40.5	42.0	507-28	SND	SLY	VFS	W		VL	D	O			1		
42.0	43.5	507-29	SND	SLY	VFS	W		VL	M	O	SND	WFE	1		Limonite in y-br nodules
43.5	45.0	507-30	SND	SLY	VFS	W		VL	M	O	SND	WFE	TR		
45.0	46.5	507-31	SCL	SND	CLY	W		VL	L	GRY	SND	WFE	TR		incr in cly content
46.5	48.0	507-32	SCL	SND	FS	W		VL	P	BR	SND	WFE	TR		
48.0	49.5	507-33	SCL	SND	FS	W		VL	M	O	SND	WFE	TR		Limonite 1-3mm
49.5	51.0	507-34	SCL	SND	FS	W		VL	D	O	SND	WFE	TR		
51.0	52.5	507-35	SND	CLS	FS	W		VL	D	O	SCL	WFE	<1		Angular br limonite (2%)
52.5	54.0	507-36	SCL	SND	FS	P		VL	M	O	SND	WFE	<1		angular hem/meghemite frags
54.0	55.5	507-37	SND	SLY	VFS	W		VL	P	GRY			TR		
55.5	57.0	507-38	CLY	CLY	FS	W		VL	P	BR			TR		
57.0	58.5	507-39	CLY	CLY	CLY	W		VL	P	BR			NIL		
58.5	60.0	507-40	CLY	CLY	CLY	W		VL	D	BLK			NIL		

GS507 (2)

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS507 Depth (m): 6 63 Date Drilled: 22 Dec 2011 East (GDA94): North (GDA94):

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 2 of 2 Bulk Hole Depth (m): 60.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
60.0	61.5	507-41	CLY	CLY	CLY			C	M	BLK			NIL		
61.5	63.0	507-42	SCL	CLY	CLY			C	M	BLK			NIL		

GS508

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS508 Depth (m): 72.0 Date Drilled: 2 Jan 2012 East (GDA94) 531639 North (GDA94): 5816851

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: Minor RL: 91 Sheet 1 of 2 Bulk Hole Depth (m): 54.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
0.0	1.5	508-01	GRA	SND	GRA	P	SA	L	M	KH	PBL		TR		Haunted Hill Gravels
1.5	3.0	508-02	GRA	SND	GRA	P	SR	L	M	O-BR	PBL		TR		40mm rounded pebbles
3.0	4.5	508-03	GRA	SND	GRA	P	SR	L	M	O-BR	PBL		TR		Haunted Hill Gravels to 4m
4.5	6.0	508-04	SND	SLY	VFS	W		VL	L	KH			TR		Sands start at 4m
6.0	7.5	508-05	SND	SLY	VFS	W		VL	L	KH			<1		Sands start at 4m
7.5	9.0	508-06	SND	SLY	VFS	W		VL	MO	KH-DK RED			4		Visual estimated "ore" zone
9.0	10.5	508-07	SND	SLY	VFS	W		VL	M	KH			1		Visual estimated "ore" zone
10.5	12.0	508-08	SND	SLY	VFS	W		VL	M	P			<1		Visual estimated "ore" zone
12.0	13.5	508-09	SND	SLY	VFS	W		VL	MO	P+KH			2		Visual estimated "ore" zone
13.5	15.0	508-10	SND	SLY	VFS	W		VL	L	KH			4		Visual estimated "ore" zone
15.0	16.5	508-11	SND	SLY	VFS	W		VL	M	GRY			20		Visual estimated "ore" zone
16.5	18.0	508-12	SND	SLY	VFS	W		VL	M	GRY			2		Visual estimated "ore" zone
18.0	19.5	508-13	SND	SLY	VFS	W		VL	M	GRY			5-6		Visual estimated "ore" zone
19.5	21.0	508-14	SND	SLY	VFS	W		VL	M	GRY			2		Visual estimated "ore" zone
21.0	22.5	508-15	SND	SCL	VFS	W		VL	M	O-BR	SCL	WFE	2		Water @21m on bit change
22.5	24.0	508-16	SND	SLY	VFS	W		VL	M	GRY	SCL	WFE	1		Visual estimated "ore" zone
24.0	25.5	508-17	SND	SLY	VFS	W		VL	M	KH	SCL		2		Visual estimated "ore" zone
25.5	27.0	508-18	SND	SLY	VFS	W		VL	L	GRY			1		Visual estimated "ore" zone
27.0	28.5	508-19	SND	SLY	VFS	W		VL	L	O-BR			1-2		Visual estimated "ore" zone
28.5	30.0	508-20	SND	SLY	VFS	W		VL	L	KH			1		Visual estimated "ore" zone
30.0	31.5	508-21	SCL	SLY	CL-VFS	W		VL	L	KH	CLY	WFE	2		Visual estimated "ore" zone
31.5	33.0	508-22	SND	SLY	VFS	W		VL	D	O-BR		WFE	1		Visual estimated "ore" zone
33.0	34.5	508-23	SND	SLY	VFS	W		VL	D	O-BR			<1		Visual estimated "ore" zone
34.5	36.0	508-24	SND	SLY	VFS	W		VL	MO	O-P			TR		Visual estimated "ore" zone
36.0	37.5	508-25	SCL	SLY	CL-VFS	W		VL	M	KH			1		Visual estimated "ore" zone
37.5	39.0	508-26	SCL	SLY	CL-VFS	W		VL	MO	KH-R			1		Visual estimated "ore" zone
39.0	40.5	508-27	SCL	SLY	CL-VFS	W		VL	M	KH			1		Visual estimated "ore" zone
40.5	42.0	508-28	SND	SLY	VFS	W		VL	L	KH	SND	WFE	TR		Rare IND SST
42.0	43.5	508-29	CLY	SND	CL-VFS	M		VL	L	KH			.1		Visual estimated "ore" zone
43.5	45.0	508-30	CLY	SND	CL-VFS	P		VL	M	O-BR	SND	WFE	<1		Rare IND SST
45.0	46.5	508-31	CLY	SND	CL-VFS	P		VL	M	O-BR			1		Visual estimated "ore" zone
46.5	48.0	508-32	CLY	SND	CL-VFS	P		VL	D	BR	SND	IND	<1		IND fine SST
48.0	49.5	508-33	CLS	SND	VFS	M		VL	M	KH			2		Minor water @ 49m
49.5	51.0	508-34	CLS	SND	VFS	M		VL	M	KH	SND	SFE	2		Visual estimated "ore" zone
51.0	52.5	508-35	CLY	SND	CL-MS	P		VL	M	KH	SND	SFE	1		Visual estimated "ore" zone
52.5	54.0	508-36	CLY	SND	CL-MS	P		VL	M	O-BR	SND	SFE	1		Visual estimated "ore" zone
54.0	55.5	508-37	SND	SLY	VFS	W		VL	D	O			TR		Visual estimated "ore" zone
55.5	57.0	508-38	CLS	SND	CL-CSA	P		VL	D	O-BR			1		Visual estimated "ore" zone
57.0	58.5	508-39	SND	SLY	VFS	W		VL	M	KH			TR		
58.5	60.0	508-40	SND	SLY	VFS	W		VL	D	O			<1		

GS508 (2)

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS508 Depth (m): 72.0 Date Drilled: 2 Jan 2012 East (GDA) 531639 North (GDA94): 5816851
Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: Minor RL: 91 Sheet 2 of 2 Bulk Hole Depth (m): 54.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
60.0	61.5	508-41	SND	WFE	VFS-CSA	P	A	L	D	O-BR			<1		
61.5	63.0	508-42	SND	SLY	VFS-CSA	W		VL	M	KH			<1		
63.0	64.5	508-43	CLY	SND	CL-MS	M		VL	M	BR	SND	SFE	<1		
64.5	66.0	508-44	SCL	SND	CL-MS	M		VL	M	BR			<1		
66.0	67.5	508-45	SCL	SND	CL-MS	M		VL	M	BR	SND	WFE	1		
67.5	69.0	508-46	CLY	SND	CL-MS	M		VL	M	O=BR	SND	WFE	TR		
69.0	70.5	508-47	CLS	SND	CL-MS	M		VL	M	O-BR	SND	WFE	1		
70.5	72.0	508-48	CLS	SND	CL-CSA	P		VL	D	KH	SND	WFE+IND	1		Rare IND FSST
	NOTE: Minor water at 21m and 49m - not seen as drilling continued.														

GS509

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS509 Depth (m): 64.5 Date Drilled: 29 Dec 2011 East (GDA94):529154 North (GDA94): 5818890

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: 91 Sheet 1 of 2 Bulk Hole Depth (m): 51.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
0.0	1.5	509-01	GRA	SND	GRA	P	SR	VL	P	BR			TR		Haunted Hill Gravels
1.5	3.0	509-02	GRA	SND	GRA	P	R	VL	M	BR			NIL		Haunted Hill Gravels
3.0	4.5	509-03	GRA	SND	PBL	P	R	VL	M	BR	CLY	CLY	NIL		Haunted Hill Gravels
4.5	6.0	509-04	SND	SND	F-CSA	P	ANG	VL	L	BR			TR		sands
6.0	7.5	509-05	SND	SND	F-CSA	P	ANG	VL	P	BR	CLY		<1		
7.5	9.0	509-06	SND	SLY	FS	M		VL	P	BR	SLY	SLY	TR		
9.0	10.5	509-07	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	TR		
10.5	12.0	509-08	SND	SLY	VFS	W		VL	P	BR	SLY		TR		
12.0	13.5	509-09	SND	SLY	VFS	W		VL	M	GRY	SLY		TR		
13.5	15.0	509-10	SND	SLY	VFS	W		VL	M	O	SLY		<1		
15.0	16.5	509-11	SND	SLY	VFS	W		VL	D	O	SLY		TR		
16.5	18.0	509-12	SND	SLY	VFS	W		VL	P	BR	SLY	WFE	<1		
18.0	19.5	509-13	CLY	CLY	CLY	W		L	M	BR	SLY		?		"Pottery clay"
19.5	21.0	509-14	SND	SLY	VFS	W		L	M	GRY	SLY		5-8		Visual estimated "ore" zone
21.0	22.5	509-15	SND	SLY	VFS	W		L	M	GRY	SLY		1		est 20% zircon
22.5	24.0	509-16	SND	SLY	VFS	W		L	P	BR	SLY		1-2		Visual estimated "ore" zone
24.0	25.5	509-17	SCL	SND	VFS	W		L	P	BR	SLY		<1		clay band
25.5	27.0	509-18	SND	SLY	VFS	W		L	P	BR	SLY		1-2		Visual estimated "ore" zone
27.0	28.5	509-19	SND	SLY	VFS	W		L	M	BR	SLY		TR		Visual estimated "ore" zone
28.5	30.0	509-20	SND	SLY	VFS	W		L	M	BR	SLY		3-4		Visual estimated "ore" zone
30.0	31.5	509-21	SCL	SND	CL-VFS	W		L	L	BR	SLY		1		clay band
31.5	33.0	509-22	SND	SLY	VFS	W		L	M	BR	SLY		1		Visual estimated "ore" zone
33.0	34.5	509-23	SND	SLY	VFS	W		L	M	BR	SLY	KG	1		Visual estimated "ore" zone
34.5	36.0	509-24	SND	SLY	VFS	W		L	D	BR	SLY	8.2	2		Visual estimated "ore" zone
36.0	37.5	509-25	SND	SLY	VFS	W		L	M	BR	SLY		1-2		Visual estimated "ore" zone
37.5	39.0	509-26	SND	SLY	VFS	W		L	L	BR	SLY		1		Visual estimated "ore" zone
39.0	40.5	509-27	SND	SLY	VFS	W		L	M	BR	SLY	8.7	<1		Visual estimated "ore" zone
40.5	42.0	509-28	SND	SLY	VFS	W		L	M	BR	SLY		1		Visual estimated "ore" zone
42.0	43.5	509-29	SND	SLY	VFS	W		L	M	BR	SLY		1		Visual estimated "ore" zone
43.5	45.0	509-30	SND	SLY	VFS	W		L	M	BR	SLY		<1		Visual estimated "ore" zone
45.0	46.5	509-31	SND	SLY	VFS	W		L	M	BR	SLY		1-2		Visual estimated "ore" zone
46.5	48.0	509-32	SCL	GRA	CLY-GRA	P	R	L	M	BR	SLY		<1		Visual estimated "ore" zone
48.0	49.5	509-33	SCL	GRA	CLY-CSA	P		L	M	BR	SLY		<1		Visual estimated "ore" zone
49.5	51.0	509-34	CLS	SND	CLY-CSA	P		L	M	BR	SLY		1		Visual estimated "ore" zone
51.0	52.5	509-35	SCL	SND	CLY-CSA	P	ANG	L	M	BR	SLY	WFE	2-3		Angular hem/WFE
52.5	54.0	509-36	CLS	SND	CLY-CSA	P		L	M	O	SLY	WFE	1-2		Rounded WFE
54.0	55.5	509-37	SND	SLY	VFS	W		L	M	O-BR	SLY		1-2		Visual estimated "ore" zone
55.5	57.0	509-38	SND	SLY	VFS	W		L	M	O-BR	SLY		1-2		Visual estimated "ore" zone
57.0	58.5	509-39	SND	SLY	VFS	W		L	M	O-BR	SLY		1		Visual estimated "ore" zone
58.5	60.0	509-40	SND	SLY	VFS	W		L	M	O-BR	SLY		<1		

GS509 (2)

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS509 Depth (m): 64.5 Date Drilled: 29 Dec 2011 East (GDA94): 529154 North (GDA94): 5818890

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: 91 Sheet 2 of 2 Bulk Hole Depth (m): 51.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
60.0	61.5	509- 41	SND	SLY	FS	W		L	M	BR	CLY	WFE	TR		Rounded WFE
61.5	63.0	509- 42	SND	SLY	FS-MF	P		C	D	BR	CLY	WFE	TR		Rounded WFE
63.0	64.5	509- 43	SCL	SLY	FS-CSA	P	A	L	D	BR	CLY	WFE	2		Angular WFE
NOTES:	1.Hammer used from 1.7 - 2.0m														
	2. Split inner tubes at 47m - sample lost														
	3. Thin layer of water at 1.5m - 2.0m in both holes - not seen after drilling on.														

GS510

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS510 Depth (m): 33.0 Date Drilled: 30 Dec 2011 East (GDA94): 528591 North (GDA94): 5818991

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: 32.0 RL: 70 Sheet 1 of 1 Bulk Hole Depth (m): 27.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Photos	
0.0	1.5	510-01	CLY	SND	CLY	W		L	D	BR			<1		very clayey - not HHG
1.5	3.0	510-02	SND	SLY	VFS	W		VL	L	BR			2-3		Visual estimated "ore" zone
3.0	4.5	510-03	SND	SLY	VFS	W		VL	L	BR	CLY		1		Visual estimated "ore" zone
4.5	6.0	510-04	SND	SLY	VFS	W		VL	L	BR			1		Visual estimated "ore" zone
6.0	7.5	510-05	SND	SLY	VFS	W		VL	L	BR			1		Visual estimated "ore" zone
7.5	9.0	510-06	SND	SLY	VFS	W		VL	M	BR			2-3		Visual estimated "ore" zone
9.0	10.5	510-07	SND	SLY	VFS	W		VL	M	KH	CLY		1		Visual estimated "ore" zone
10.5	12.0	510-08	SND	SLY	VFS	W		VL	M	KH			1		Visual estimated "ore" zone
12.0	13.5	510-09	SND	SLY	VFS	W		VL	M	KH			3		Visual estimated "ore" zone
13.5	15.0	510-10	SND	SLY	VFS	W		VL	M	KH			3		Visual estimated "ore" zone
15.0	16.5	510-11	SND	SLY	VFS	W		VL	M	KH			TR		Visual estimated "ore" zone
16.5	18.0	510-12	SND	SLY	VFS	W		VL	M	KH	CLY	WFE	TR		Visual estimated "ore" zone
18.0	19.5	510-13	SND	SLY	VFS	W		VL	M	KH	CLY		2		Visual estimated "ore" zone
19.5	21.0	510-14	SND	SLY	VFS	W		VL	M	KH	SLY	WFE	1		Angular WFE
21.0	22.5	510-15	SND	SLY	VFS	W		L	M	BR	SLY	WFE	<1		Rounded limonite
22.5	24.0	510-16	CLY	SLY	CLY	W		VL	M	BR	SLY		1		Visual estimated "ore" zone
24.0	25.5	510-17	CLY	SLY	CLY	W		L	M	KH	SLY	WFE	1		Visual estimated "ore" zone
25.5	27.0	510-18	SCL	IND	CLY-CSA	P		C	M	BR	SLY	WFE	<1		Partly indurated
27.0	28.5	510-19	SCL	SND	FS	M		L	P	GRY			TR		
28.5	30.0	510-20	CLS	IND	CLA-GRA	P	R	C	M	BR	CLY	IND	1		Indurated claystone
30.0	31.5	510-21	VOL	IND				HC	M	GRY	VOLC/CLY	IND	TR		Possible volcanic/claystone
31.5	33.0	510-22	SST	IND	FS-MS	M		HC	D	BR			NIL		SST same as in GS516

NOTES:

1. 32-33m, Purple - brown Sandstone same as in GS516, overlain by blue grey indurated Claystone - looks like a fine volcanic
2. This is overlain by grey clay with rounded pebbles to 30mm diam

GS511

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS511 Depth (m): 45.0 Date Drilled: 20 Dec 2011 East (GDA94): 527863 North (GDA94): 5819738
Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 1 of 1 Bulk Hole Depth (m): 45.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	511-01	SCL	SND	CLY				L	KH					
1.5	3.0	511-02	CLS	SND	FS	M		VL	L	KH			2		Visual estimated "ore" zone
3.0	4.5	511-03	SND	SND	FS	W		VL	L	GRY			1-2		Visual estimated "ore" zone
4.5	6.0	511-04	SND	SND	VFS	W		VL	L	K-GRY			1-2		Visual estimated "ore" zone
6.0	7.5	511-05	SND	SND	VFS	W		VL	L	KH			1-2		Visual estimated "ore" zone
7.5	9.0	511-06	SND	SND	VFS	W		VL	L	KH			2		Visual estimated "ore" zone
9.0	10.5	511-07	SND	SND	VFS	M		VL	L	GRY	SLT	SLY	1		Visual estimated "ore" zone
10.5	12.0	511-08	SND	SND	VFS	W		VL	M	O			3-4		Visual estimated "ore" zone
12.0	13.5	511-09	SND	SND	VFS	W		VL	M	O	SLT	WFE	5		Visual estimated "ore" zone
13.5	15.0	511-10	SND	SND	VFS	W		VL	M	GRY		SLY	NIL		
15.0	16.5	511-11	SND	SND	VFS	W		VL	M	GRY	SLT	SLY	TR		
16.5	18.0	511-12	SND	SND	VFS	W		VL	M	GRY	SLT	SLY	1		
18.0	19.5	511-13	SCL	SND	FS	M		VL	L	O	SND		<1		
19.5	21.0	511-14	CLY	CLY	CLY	W		VL	M	GRY		SLY			
21.0	22.5	511-15	CLY	SCL	CLY	M		VL	L	GRY	SND		TR		
22.5	24.0	511-16	SCL	SCL	CLY	W		VL	L	GRY					
24.0	25.5	511-17	SND	SND	MS	M		VL	L	GRY			TR		
25.5	27.0	511-18	GRA	SND	VCS-GRA	P	SA	VL	L	GRY	GRA		TR		
27.0	28.5	511-19	SCL	CLY	FS	M		VL	L	GRY	SND		TR		Panning ureliable due to clay
28.5	30.0	511-20	CLY	CLY	CLY	W		VL	L	GRY			NIL		Panning ureliable due to clay
30.0	31.5	511-21	SND	SND	MS	M		VL	L	BR	SLY	SLY	TR		Panning ureliable due to clay
31.5	33.0	511-22	SND	SND	CS	M		VL	L	BR	SND	FS	TR		Panning ureliable due to clay
33.0	34.5	511-23	CLY	SND	CLY	M		L	L	BR	SND	FS			Panning ureliable due to clay
34.5	36.0	511-24	SND	CLS	MS	M		VL	L	GRY	SND	CLY	TR		Panning ureliable due to clay
36.0	37.5	511-25	SCL	BAN	FS-CLY	M		L	MO	GRY	CLY	CLY			Panning ureliable due to clay
37.5	39.0	511-26	CLY	BAN	FS-CLY	M		L	MO	GRY	CLY				Panning ureliable due to clay
39.0	40.5	511-27	CLY	BAN	CLY	W		L	MO	BR					Panning ureliable due to clay
40.5	42.0	511-28	CLY	BAN	CLY	W		L	MO	BR					Panning ureliable due to clay
42.0	43.5	511-29	CLY	CLY	CLY	W		L	M	BR-GRY	CLY				Panning ureliable due to clay
43.5	45.0	511-30	SCL	CLY	FS-CLY	M		L	MO	P	CLY				Panning ureliable due to clay

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS512 Depth (m): 42.0 Date Drilled: 20 Dec 2011 East (GDA94): 527728 North (GDA94): 5818965

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: 39.0 RL: Sheet 1 of 1 Bulk Hole Depth (m): 39.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	512-01	SCL	CLY	CLY	M			L	GRA					
1.5	3.0	512-02	SND	SLY	VFS	W		VL	L	O	SLY	SLY	1-2		Visual estimated "ore" zone
3.0	4.5	512-03	CLS	CLY	F-MS	P	SA	VL	P	BR	GRA	GRA	1		Visual estimated "ore" zone
4.5	6.0	512-04	GRA	SND	FS-GRA	P	SR	VL	P	BR	GRA	GRA	2		Visual estimated "ore" zone
6.0	7.5	512-05	SND	SND	FS	W		VL	L	KH	SLY	SLY	2-3		Visual estimated "ore" zone
7.5	9.0	512-06	SND	SLY	FS	M		VL	L	O	SLY	WFE	TR		Visual estimated "ore" zone
9.0	10.5	512-07	SND	SND	FS	W		VL	L	GRY	SLY	WFE	10		Visual estimated "ore" zone
10.5	12.0	512-08	SND	SND	VFS	W		VL	L	GRY			10		Visual estimated "ore" zone
12.0	13.5	512-09	SND	SND	VFS	W		VL	L	GRY			2		Visual estimated "ore" zone
13.5	15.0	512-10	SND	SND	VFS	W		VL	P	BR	SLY	SLY	3		Visual estimated "ore" zone
15.0	16.5	512-11	SND	SND	VFS	W		VL	L	BR			6-8		Visual estimated "ore" zone
16.5	18.0	512-12	SND	SND	VFS	W		VL	L	O-BR	SLY	SLY	8-10		Visual estimated "ore" zone
18.0	19.5	512-13	SND	SND	VFS	W		VL	L	O-BR	SLY	WFE	2-3		Visual estimated "ore" zone
19.5	21.0	512-14	SND	SND	VFS	W		VL	MO	O-BR	SLY	WFE	2		Visual estimated "ore" zone
21.0	22.5	512-15	SND	SND	VFS	W		VL	D	BR			20		Visual estimated "ore" zone
22.5	24.0	512-16	SND	SLY	VFS	W		VL	M	KH-O	SLY	SLY	2		Visual estimated "ore" zone
24.0	25.5	512-17	CLS	SND	VFS	W		VL	D	O-BR	CLY		5		Visual estimated "ore" zone
25.5	27.0	512-18	SND	SLY	VFS	W		VL	D	BR	SLY		1-2		Visual estimated "ore" zone
27.0	28.5	512-19	SND	SLY	VFS	W		C	D	O-BR			1		Visual estimated "ore" zone
28.5	30.0	512-20	SND	CLY	VFS	P		L	M	GRY-BR	SLY	WFE	TR		Visual estimated "ore" zone
30.0	31.5	512-21	CLY	SLY	CLY	M		L	L	GRY	SLY		2-3		Visual estimated "ore" zone
31.5	33.0	512-22	CLY	SLY	CLY	M		L	M	GRY	SLY		1		Visual estimated "ore" zone
33.0	34.5	512-23	CLS	SLY	FS-MS	P		L	MO	O	SLY		TR		Visual estimated "ore" zone
34.5	36.0	512-24	SCL	SND	FS-CS	P		L	MO	GRY	SND		1-2		Visual estimated "ore" zone
36.0	37.5	512-25	SCL	SND	FS-CS	P		L	MO	O-BR	SND		1		Visual estimated "ore" zone
37.5	39.0	512-26	SND	SND	CSA	P		VL	L	GRY	GRA		NIL		
39.0	40.5	512-27	SND	SLY	F-MS	P		VL	MO	O	SLY	CLY	TR		
40.5	42.0	512-28	SND	SLY	F-MS	P		VL	M	Y-BR			<1		
		NOTE;	Bulk sample 512-26 not taken - too much water from driller input												

GS513

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS513 Depth (m): 69.0 Date Drilled: 21 Dec 2011 East (GDA94): 527592 North (GDA94): 5818508
Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 1 of 2 Bulk Hole Depth (m): 60.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	513-01	SOIL	CLY					MO	GREY	SND	MS			
1.5	3.0	513-02	GRA	IND	PBL	P	SA	C	L	BR	SND	FS-MS	NIL		Haunted Hill Gravels
3.0	4.5	513-03	GRA	IND	PBL	P	SR	C	L	R-BR	SND	IND	NIL		Haunted Hill Gravels
4.5	6.0	513-04	GRA	IND	GRA	P	SA	C	L	R-BR	CLY	CLY	NIL		Hard layer 1.5m - 9.0m
6.0	7.5	513-05	GRA	CLY	GRA	P	SR	C	D	R	SND	CLY	TR		Haunted Hill Gravels
7.5	9.0	513-06	GRA	CLY	GRA	P	SR	C	M	R	SND	CLY	TR		Haunted Hill Gravels
9.0	10.5	513-07	SND	SND	VFS	W		VL	P	GRY			TR		
10.5	12.0	513-08	SND	SND	VFS	W		VL	P	BR			<1		
12.0	13.5	513-09	SND	SLY	VFS	W		VL	P	Y-BR	SLY	SLY	TR		
13.5	15.0	513-10	SND	SLY	VFS	W		VL	P	BR	SLY	SL8Y	1		Visual estimated "ore" zone
15.0	16.5	513-11	SND	SLY	VFS	W		VL	P	BR	SLY	WFE	TR		Visual estimated "ore" zone
16.5	18.0	513-12	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	1		Visual estimated "ore" zone
18.0	19.5	513-13	SND	SLY	VFS	W		VL	MO	BR	SLY	WFE	<1		Visual estimated "ore" zone
19.5	21.0	513-14	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	1		Visual estimated "ore" zone
21.0	22.5	513-15	SND	SLY	VFS	W		VL	P	GRY-BR	SLY	SLY	4		Visual estimated "ore" zone
22.5	24.0	513-16	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	10-15		Visual estimated "ore" zone
24.0	25.5	513-17	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	10		Visual estimated "ore" zone
25.5	27.0	513-18	SND	SLY	VFS	W		VL	M	GRY	SLY	SLY	10		Visual estimated "ore" zone
27.0	28.5	513-19	SND	SLY	VFS	W		VL	M	GRY	SLY	SLY	3		Visual estimated "ore" zone
28.5	30.0	513-20	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	4		Visual estimated "ore" zone
30.0	31.5	513-21	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	6		Visual estimated "ore" zone
31.5	33.0	513-22	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	5		Visual estimated "ore" zone
33.0	34.5	513-23	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	<1		Visual estimated "ore" zone
34.5	36.0	513-24	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	4		Visual estimated "ore" zone
36.0	37.5	513-25	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	4		Visual estimated "ore" zone
37.5	39.0	513-26	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	2-3		Visual estimated "ore" zone
39.0	40.5	513-27	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	4		Visual estimated "ore" zone
40.5	42.0	513-28	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	1-2		Visual estimated "ore" zone
42.0	43.5	513-29	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	4-5		Visual estimated "ore" zone
43.5	45.0	513-30	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	5-6		Visual estimated "ore" zone
45.0	46.5	513-31	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	2-3		Visual estimated "ore" zone
46.5	48.0	513-32	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	4-5		Visual estimated "ore" zone
48.0	49.5	513-33	SND	SLY	VFS	W		VL	D	R	SLY	SLY	1-2		Visual estimated "ore" zone
49.5	51.0	513-34	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	20		Visual estimated "ore" zone
51.0	52.5	513-35	SND	SLY	VFS	W		VL	M	BR	SLY	SLY	6-8		Visual estimated "ore" zone
52.5	54.0	513-36	SND	SLY	VFS	W		VL	M	BR	SLY	SLY	2-3		Visual estimated "ore" zone
54.0	55.5	513-37	SND	SLY	VFS	W		VL	M	BR	SLY	SLY	4-5		Visual estimated "ore" zone
55.5	57.0	513-38	SND	SLY	VFS	W		VL	M	BR	SLY	SLY	2-3		Visual estimated "ore" zone
57.0	58.5	513-39	SND	SLY	VFS	W		VL	M	O-BR	SLY	SLY	12-15		Dark red colour indicating
58.5	60.0	513-40	SND	SND	VFS	M		VL	D	R	SLY	WFE	6		approaching clays??

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS513 Depth (m): 69.0 Date Drilled: 21 Dec 2011 East (GDA94): 527592 North (GDA94): 5818508

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 2 of 2 Bulk Hole Depth (m): 60.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
60.0	61.5	513-41	SND	SLY	FS-MS	M		VL	D	Y-BR	SND	MFE	2		Visual estimated "ore" zone
61.5	63.0	513-42	SND	SLY	FS-MS	M		VL	D	Y-BR	SND	WFE	20		Visual estimated "ore" zone
63.0	64.5	513-43	CLS	SND	MS	P		L	M	BR	SND	SLY	2		Visual estimated "ore" zone
64.5	66.0	513-44	CLY	CLY	CLY	W		L	M	BR	SLY	SLY	1		Visual estimated "ore" zone
66.0	67.5	513-45	SCL	CLY	CLY	M		L	MO	GRY	SND	FS			Too clayey to pan
67.5	69.0	513-46	SCL	CLY	CLY	M		L	MO	BR	SND	FS			Too clayey to pan

GS514

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS514 Depth (m): 84.0 Date Drilled: 22 Dec 2011 East (GDA94): North (GDA94):
Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 1 of 2 Bulk Hole Depth (m): 78.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	514-01	CLY	CLY	CLY			M	MO	BR-O					
1.5	3.0	514-02	GRA	CLY	PBL	P	SR	M	M	BR-O	CLY	CLY	TR		
3.0	4.5	514-03	GRA	SND	GRA	P	SA	L	M	R	SND	SND	TR		
4.5	6.0	514-04	SND	GRA	CSA	P	SA	L	D	R	GRA	SND	TR		
6.0	7.5	514-05	SND	GRA	CSA	P	SA	L	D	R	GRA		TR		
7.5	9.0	514-06	SND	SND	MS	P	SA	L	D	R			TR		
9.0	10.5	514-07	SND	SND	VFS	P	SA	L	D	R			TR		
10.5	12.0	514-08	SND	SND	VFS	W		VL	P	BR			<1		
12.0	13.5	514-09	SND	SND	VFS	W		VL	L	Y-BR	SLY	SLY	TR		
13.5	15.0	514-10	SND	SLY	VFS	W		VL	M	Y-BR	SLY	SLY	TR		
15.0	16.5	514-11	SND	SLY	VFS	W		VL	L	BR	SLY	SLY	TR		
16.5	18.0	514-12	SND	SLY	VFS	W		VL	L	BR	SLY	SLY	TR		
18.0	19.5	514-13	SND	SLY	VFS	W		VL	L	BR	SLY	SLY	<1		
19.5	21.0	514-14	SND	SLY	VFS	W		VL	L	BR	SLY	SLY	<1		
21.0	22.5	514-15	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	<1		
22.5	24.0	514-16	SND	SLY	VFS	W		VL	L	BR	SLY	SLY	<1		
24.0	25.5	514-17	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	1-2		Visual estimated "ore" zone
25.5	27.0	514-18	SND	SLY	VFS	W		VL	L	BR	SLY	SLY	1		Visual estimated "ore" zone
27.0	28.5	514-19	SND	SLY	VFS	W		VL	L	BR	SLY	SLY	<1		Visual estimated "ore" zone
28.5	30.0	514-20	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	<1		Visual estimated "ore" zone
30.0	31.5	514-21	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	TR		Visual estimated "ore" zone
31.5	33.0	514-22	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	1-2		Visual estimated "ore" zone
33.0	34.5	514-23	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	2-3		Visual estimated "ore" zone
34.5	36.0	514-24	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	2-3		Visual estimated "ore" zone
36.0	37.5	514-25	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	<1		Visual estimated "ore" zone
37.5	39.0	514-26	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	2-3		Visual estimated "ore" zone
39.0	40.5	514-27	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	<1		Visual estimated "ore" zone
40.5	42.0	514-28	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	<1		Visual estimated "ore" zone
42.0	43.5	514-29	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	<1		Visual estimated "ore" zone
43.5	45.0	514-30	SND	SLY	VFS	W		VL	L	GRY	SLY	SLY	3-5		Visual estimated "ore" zone
45.0	46.5	514-31	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	2-3		Visual estimated "ore" zone
46.5	48.0	514-32	SND	SLY	VFS	W		VL	P	BR	SLY	SLY	1-2		Visual estimated "ore" zone
48.0	49.5	514-33	SND	SLY	VFS	W		VL	M	BR	SLY	SLY	3		Visual estimated "ore" zone
49.5	51.0	514-34	SND	SLY	VFS	W		VL	M	BR	SLY	SLY	2-3		Visual estimated "ore" zone
51.0	52.5	514-35	SND	SLY	VFS	W		VL	D	BR	SLY	SLY	3-4		Visual estimated "ore" zone
52.5	54.0	514-36	SND	SLY	VFS	W		VL	D	R	SLY	SLY	3		Visual estimated "ore" zone
54.0	55.5	514-37	SND	SLY	VFS	W		VL	D	KH	SLY	SLY	1-2		Visual estimated "ore" zone
55.5	57.0	514-38	SND	SLY	VFS	W		VL	D	KH	SLY	SLY	<1		Visual estimated "ore" zone
57.0	58.5	514-39	SND	SLY	VFS	W		VL	D	KH	SLY	SLY	TR		Visual estimated "ore" zone
58.5	60.0	514-40	SND	SLY	VFS	W		VL	D	KH	SLY	SLY	3-4		Visual estimated "ore" zone

GS514 (2)

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS514 Depth (m): 84.0 Date Drilled: 22 Dec 2011 East (GDA94): North (GDA94):

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 2 of 2 Bulk Hole Depth (m): 78.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
60.0	61.5	514-41	SCL	SND	CL-CS	P	SA	C	D	O			<1		Visual estimated "ore" zone
61.5	63.0	514-42	SND	SLY	FS	M		C	D	O			2		Visual estimated "ore" zone
63.0	64.5	514-43	SND	SLY	FS	P	SA	C	M	BR	GRA	WFE	1-2		Angular Fe frags - marker?
64.5	66.0	514-44	SND	SLY	FS-CSA	P	SA-SR	C	M	BR	SND	WFE	1		Visual estimated "ore" zone
66.0	67.5	514-45	SCL	SND	CL-MS	P	SA	C	D	O	SND	WFE	TR		Visual estimated "ore" zone
67.5	69.0	514-46	SCL	SND	CLY-FS	P	SA	C	D	O	SND	WFE	<1		Visual estimated "ore" zone
69.0	70.5	514-47	SCL	SND	CL-CSA	P	SA	L	D	O	SND	WFE	<1		Visual estimated "ore" zone
70.5	72.0	514-48	SCL	SND	FS-CSA	P	SA	L	D	O	SND	WFE	5		Visual estimated "ore" zone
72.0	73.5	514-49	CLS	SND	FS-GRA	P	SA and SR	L	D	O	SND	WFE	4-5		Visual estimated "ore" zone
73.5	75.0	514-50	CLS	SND	FS-GRA	P	SA	L	D	O	SND	SLY	2-3		Visual estimated "ore" zone
75.0	76.5	514-51	CLS	SND	SLY	P	SA	L	D	O	SND	SLY	<1		Visual estimated "ore" zone
76.5	78.0	514-52	SCL	SND	CLY-FS	M		L	D	O	SLY	SLY	1		Visual estimated "ore" zone
78.0	79.5	514-53	SCL	SND	CLY-FS	M		L	D	O	SLY	SLY	1-2		Visual estimated "ore" zone
79.5	81.0	514-54					No sample								No sample
81.0	82.5	514-55	SCL	SND	FS	M		L	D	BLK	SLY	SLY	2		Visual estimated "ore" zone
82.5	84.0	514-56	CLY	CLY	CLY	W		L	D	KH	SLY	SLY	2		Visual estimated "ore" zone
	Note:	Two "erratics" of banded ignimbrite/rhyolite at 80.8m and 79.0m													

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS515 Depth (m): 57.0 Date Drilled: 31 Dec 2011 East (GDA94): 529836 North (GDA94): 5818233

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: 53.0 RL: 73m Sheet 1 of 1 Bulk Hole Depth (m): 57.0 Geo: B Duck

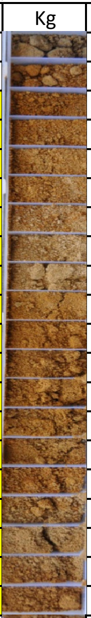
From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	515-01	CLY	SLY	CLY	W		L	D	BR-O					
1.5	3.0	515-02	SND	SLY	VFS	W		VL	L	BR	SLY	WFE	tr		
3.0	4.5	515-03	SND	SLY	VFS	W		VL	L	BR	SLY	WFE	<1		
4.5	6.0	515-04	SND	SLY	VFS	W		VL	L	BR	CLY	MFE	tr		
6.0	7.5	515-05	SND	SLY	VFS	W		VL	M	KH	SLY		1-2		Visual estimated "ore" zone
7.5	9.0	515-06	SND	SLY	VFS	W		VL	M	KH			1		Visual estimated "ore" zone
9.0	10.5	515-07	SND	CLY	VFS	W		VL	M	KH			<1		Visual estimated "ore" zone
10.5	12.0	515-08	SND	SLY	VFS	W		VL	M	KH			3		Visual estimated "ore" zone
12.0	13.5	515-09	SND	SLY	VFS	W		VL	M	KH			1		Visual estimated "ore" zone
13.5	15.0	515-10	SND	SLY	VFS	W		VL	M	KH			2		Visual estimated "ore" zone
15.0	16.5	515-11	SND	SLY	VFS	P		VL	M	KH			1-2		Visual estimated "ore" zone
16.5	18.0	515-12	SND	SLY	VFS	P		VL	M	O-BR	SND	IND	2-3		Visual estimated "ore" zone
18.0	19.5	515-13	SND	SLY	VFS-CSA	M		VL	M	O-BR	SND	IND	tr		Visual estimated "ore" zone
19.5	21.0	515-14	SND	SLY	VFS	M		VL	M	O-BR			1-2		Visual estimated "ore" zone
21.0	22.5	515-15	SND	SLY	VFS	M		VL	M	KH			1		Visual estimated "ore" zone
22.5	24.0	515-16	SND	SLY	VFS	M		VL	M	KH			4		Visual estimated "ore" zone
24.0	25.5	515-17	SND	SLY	VFS	M		VL	M	KH			1		Visual estimated "ore" zone
25.5	27.0	515-18	SND	SLY	VFS	M		VL	M	KH			tr		Visual estimated "ore" zone
27.0	28.5	515-19	SND	SLY	VFS	M		VL	M	KH			2		Visual estimated "ore" zone
28.5	30.0	515-20	SND	SLY	VFS	M		VL	M	BR			2		Visual estimated "ore" zone
30.0	31.5	515-21	SND	SND	FS-CSA	P		VL	M	BR	SND	IND	<1		5-8% IND SST w hem+goethite
31.5	33.0	515-22	SND	SLY	FS-CSA	P		VL	M	KH	SND	SLY	1		Visual estimated "ore" zone
33.0	34.5	515-23	SND	SND	CSA	P		VL	D	BR		IND/WFE	1		2% IND 10% WFE
34.5	36.0	515-24	SCL	SND	CLY-MS	P		VL	M	BR	SLY	WFE	2		Visual estimated "ore" zone
36.0	37.5	515-25	SCL	SND	CLY-MS	P		VL	M	KH	SCY	IND	1		Visual estimated "ore" zone
37.5	39.0	515-26	CLY	SLY	CLY-FS	M		VL	M	KH	SLY		<1		Visual estimated "ore" zone
39.0	40.5	515-27	SCL	SND	CLY-FS	M		VL	M	KH	SND	WFE	<1		Visual estimated "ore" zone
40.5	42.0	515-28	SCL	SND	CLY-FS	M		VL	M	KH	SND	WFE	1		Visual estimated "ore" zone
42.0	43.5	515-29	SCL	SND	CLY-FS	M		VL	M	KH	SND	WFE	1		Visual estimated "ore" zone
43.5	45.0	515-30	SCL	SND	CLY-FS	M		VL	D	GRY	SND		1		Marked colour change - darker
45.0	46.5	515-31	CLY	SND	CLY-FS	M		VL	D	GRY	SND		2		Visual estimated "ore" zone
46.5	48.0	515-32	CLY	SND	CLY-FS	M		VL	D	GRY	SND		<1		Visual estimated "ore" zone
48.0	49.5	515-33	CLY	SND	CL-PBL	P	R	VL	D	BLK	PBL	IND	1		Fresh SST
49.5	51.0	515-34	CLY	SND	CLY-CSA	P		VL	M	BLK	GRA		<1		Visual estimated "ore" zone
51.0	52.5	515-35	CLY	SND	CL-FS	P		VL	M	BLK	MST	IND	<1		Visual estimated "ore" zone
52.5	54.0	515-36	CLY	GRA	CLY-GRA	P		VL	M	BLK	GRA		1		Visual estimated "ore" zone
54.0	55.5	515-37	GRA	CLY	PBL	P		VL	M	BLK	SND		1		Visual estimated "ore" zone
55.5	57.0	515-38	GRA	CLY	PBL	P		VL	M	BLK	SND		1		Visual estimated "ore" zone
	NOTE:	Water encountered at 53.0m, tested at 54.0m, 81 seconds for 20 litres = 4 litre /sec													
		Dirty water recovered and settles out "very quickly", est recovery approx 5litre/sec for clean water													

GS516

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS516 Depth (m): 35.0 Date Drilled: 30 Dec 2011 East (GDA94): 529808 North (GDA94): 5818778

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 1 of 1 Bulk Hole Depth (m): 30.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	516-01	CLY	SND	CLY-GRA	P	SA	L	D	BR			<1		Includes angular slitstone frags
1.5	3.0	516-02	CLY	SND	CLY-FS	M		L	D	O	SLY	SLY	<1		
3.0	4.5	516-03	SND	SLY	FS	W		VL	D	BR	SLY		2-3		Visual estimated "ore" zone
4.5	6.0	516-04	SND	SLY	VFS	W		VL	D	O-BR	SLY		1		Visual estimated "ore" zone
6.0	7.5	516-05	SND	SLY	VFS	W		VL	D	O	SLY		1		Visual estimated "ore" zone
7.5	9.0	516-06	SND	SLY	VFS	W		VL	D	BR	SLY		1		Visual estimated "ore" zone
9.0	10.5	516-07	SND	SLY	VFS	P		VL	P	BR	SLY	WFE	<1		Visual estimated "ore" zone
10.5	12.0	516-08	SND	SLY	VFS	W		VL	M	BR	SLY		TR		Visual estimated "ore" zone
12.0	13.5	516-09	SND	SLY	VFS	W		VL	M	BR	SLY		<1		Visual estimated "ore" zone
13.5	15.0	516-10	SND	SLY	VFS	P		VL	M	BR	SLY	MFE	4-5		Visual estimated "ore" zone
15.0	16.5	516-11	SND	SLY	VFS	W		VL	M	O	SLY	WFE	1-2		Visual estimated "ore" zone
16.5	18.0	516-12	SND	SLY	VFS	W		VL	M	BR	SLY	WFE	1-2		Visual estimated "ore" zone
18.0	19.5	516-13	SND	SLY	VFS	W		VL	M	BR	SLY	WFE	1-2		WFE is <1mm
19.5	21.0	516-14	SND	SLY	VFS	W		VL	D	BR	SLY	WFE	5-8		Visual estimated "ore" zone
21.0	22.5	516-15	SND	SLY	VFS	W		VL	D	BR	SLY	WFE	2-3		Visual estimated "ore" zone
22.5	24.0	516-16	SND	SLY	VFS	W		VL	D	O-BR	SLY	WFE	1		Visual estimated "ore" zone
24.0	25.5	516-17	SND	SLY	VFS	W		VL	M	BR	SLY	WFE	2		Visual estimated "ore" zone
25.5	27.0	516-18	SND	SLY	VFS	W		VL	M	BR	SLY		1-2		Visual estimated "ore" zone
27.0	28.5	516-19	SND	SLY	VFS	W		VL	M	BR	CLY		2-3		Visual estimated "ore" zone
28.5	30.0	516-20	SND	SLY	VFS	W		VL	D	BR	CLY	WFE	1		Visual estimated "ore" zone
30.0	31.5	516-21	SST	IND	F-MS	W		HC	M	BR	CLY		<1		Strzelecki Grp basement
31.5	33.0	516-22	SST	IND	F-MS	W		HC	M	BR	CLY		<1		Strzelecki Grp basement
33.0	34.5	516-23	SST	IND	VF-MS	P		HC	D	BR	SLY		NIL		Vertical + horizontal joints
34.5	36.0	516-24	SST	IND	VF-MS	P		HC	M	BR	SLY		TR		Strzelecki Grp basement
		NOTES:	Indurated SST blocked bit at 30.0m												
			30-35m, Indurated f-m SST with Clay on sub vertical and horizontal joints, interbedded with dark brown Silitstone												

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS517 Depth (m): 61.5 Date Drilled: 19 Dec 2011 East (GDA94): 528530 North (GDA94): 5816798

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 1 of 1 Bulk Hole Depth (m): 54.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	517-01	CLY	DIS					MO	BR			NIL		
1.5	3.0	517-02	CLY						D	BR			NIL		
3.0	4.5	517-03	CLS	MW					M	O	SLT	SLY	NIL		
4.5	6.0	517-04	CLS	MW					M	O	SLT	SLY	NIL		
6.0	7.5	517-05	SCL	FRE					M	O	SLT	SLY	NIL		
7.5	9.0	517-06	SCL	CLY					M	O	SLT	SLY	NIL		
9.0	10.5	517-07	SCL	CLY					L	GRY	SLT	SLY	NIL		Bulk Sample
10.5	12.0	517-08	SCL	CLY					L	GRY	SLT	SLY	NIL		Bulk Sample
12.0	13.5	517-09	SCL	CLY					M	O	SLT	SLY	NIL		Assay sample
13.5	15.0	517-10	SCL	CLY					M	O	SLT	SLY	NIL		Assay sample
15.0	16.5	517-11	SCL	CLY					M	GRY	SLT	SLY	NIL		
16.5	18.0	517-12	SLT	CLY	CSI	W			L	GRY	SLT	SLY	NIL		Bulk Sample
18.0	19.5	517-13	SLT	CLY					L	GRY	SLT	SLY	NIL		Bulk Sample
19.5	21.0	517-14	SLT	CLY	CSI	W			L	O-GRY	SLT	SLY	NIL		Bulk Sample
21.0	22.5	517-15	SLT	CLY					L	GRY	SLT	SLY	NIL		Bulk Sample
22.5	24.0	517-16	GRA-CON	CLY	MS-PBL	P	R	L	L	GRY-O	SLT	SLY	NIL		Bulk Sample
24.0	25.5	517-17	SCL	CLY	CL-MS	P			M	O	SLT	SLY	NIL		
25.5	27.0	517-18	GRA-CON	CLY	CLY-PBL	P	R	L	M	O	SLT	SLY	NIL		
27.0	28.5	517-19	CLY	BAN	CLY	W					CON	PBL	NIL		
28.5	30.0	517-20	SND	SLY	FS	W		VL	M	P+O	SLT	SLY	1-2		Assay sample
30.0	31.5	517-21	SND	SLY	FS	W		VL	M	GRY-O	SLT	SLY	3-4		Assay sample
31.5	33.0	517-22	SND	SLY	FS			VL	P	GRY-O	SLT	SLY	10		Assay sample
33.0	34.5	517-23	SND	SLY	FS			VL	P	O	SLT	SLY	10		Assay sample
34.5	36.0	517-24	SND	SLY	FS			VL	L	O	SLT	SLY	8-10		Visual estimated "ore" zone
36.0	37.5	517-25	SND	SLY	FS			VL	M	O			3		Visual estimated "ore" zone
37.5	39.0	517-26	SND	SLY	FS	W		VL	M	O			4		Visual estimated "ore" zone
39.0	40.5	517-27	SND	SLY	FS	W		VL	M	O	SLT	SLY	<1		Visual estimated "ore" zone
40.5	42.0	517-28	SND	SLY	FS	M		VL	M	O	SLT	SLY	2		Visual estimated "ore" zone
42.0	43.5	517-29	SND	FER	FS-MS	P		L	M	GRY-O	LAT	FER	<1		Visual estimated "ore" zone
43.5	45.0	517-30	SND	CLY	FS	M		L	L	O	SLT	CLY	1		Visual estimated "ore" zone
45.0	46.5	517-31	SND	CLY	FS	P		L	M	O+GRY	CLY	MFE	<1		
46.5	48.0	517-32	SND	FER	FS	M		VL	M	O+GRY	CLY	CLY	<1		
48.0	49.5	517-33	SCL	CLY	FS	P		L	M	BR	CLY	CLY			
49.5	51.0	517-34	SCL	CLY	FS	P		L	M	O	CLY	WFE	<1		
51.0	52.5	517-35	SCL	CLY	FS	P		L	M		CLY	CLY			
52.5	54.0	517-36	SCL	CLY	FS	P		L	M		SLT	MIC	<1		
54.0	55.5	517-37	SCL	CLY	FS	P		L							
55.5	57.0	517-38	SCL	CLY	FS	P		L			SLT	SLY	NIL		
57.0	58.5	517-39	SCL	CLY	FS	P		L			SND	MFE	1		
58.5	60.0	517-40	SLT	SLY	FS	M		VL			SND	FS	NIL		
60.0	61.5	517-41	SIS	SLY	FS	M		VL			SND	FS	<1		

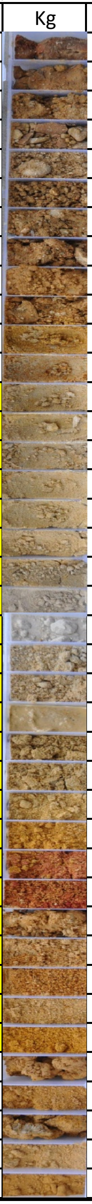
GS518

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS518 Depth (m): 66.0 Date Drilled: 19 Dec 2011 East (GDA94): 531347 North (GDA94): 5816271

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 1 of 2 Bulk Hole Depth (m): 60.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
0.0	1.5	518-01	CLY	CLY	CLY	W		L	MO	BR					
1.5	3.0	518-02	CLY	CLY	CLY	W		L	MO	BR					heavy clay
3.0	4.5	518-03	CON	CLY	GRA	P	SA	C	M	BR			TR		heavy clay
4.5	6.0	518-04	CON	CLY	PBL	P	SR	C	M	T	SND	IND			heavy clay
6.0	7.5	518-05	CON	CLY	GRA	P	SR	C	M	T	SND	SLY			heavy clay
7.5	9.0	518-06	CON	CLY	GRA	P	SR	C	M	T	SND	CLY			heavy clay
9.0	10.5	518-07	CON	CLY	GRA	P	SR	L	M	T	SND	CLY			
10.5	12.0	518-08	CON	CLY	GRA	P	SR	L	M	T	SND	CLY			
12.0	13.5	518-09	CON	CLY	PBL	P	SR	C	M	O	SND	CLY			
13.5	15.0	518-10	SND	CLY	CSA	P	SA	L	M	T	SND	CLY	TR		
15.0	16.5	518-11	SND	SLY	FS	W		VL	L	KH	SLT	CLY	1		
16.5	18.0	518-12	SND	SLY	FS	W		VL	L	KH	SLT	CLY	TR		
18.0	19.5	518-13	SND	SLY	FS	W		VL	L	KH	SLT	WFE	1		Visual estimated "ore" zone
19.5	21.0	518-14	SND	SLY	FS	W		VL	L	GRY	SLT	SLY	2-3		Visual estimated "ore" zone
21.0	22.5	518-15	SND	SLY	FS	W		VL	L	GRY			1		Visual estimated "ore" zone
22.5	24.0	518-16	SND	SLY	VFS	W		VL	L	GRY	SLT	SLY	TR		Visual estimated "ore" zone
24.0	25.5	518-17	SND	SLY	VFS	W		VL	L	GRY	SLT	WFE	2		Visual estimated "ore" zone
25.5	27.0	518-18	SND	SLY	VFS	W		VL	L	KH	SLT	WFE	1-2		Visual estimated "ore" zone
27.0	28.5	518-19	SND	SLY	VFS	W		VL	L	GRY	SLT		4		Visual estimated "ore" zone
28.5	30.0	518-20	SND	SLY	VFS	W		VL	L	GRY	SLT	WFE	30		Visual estimated "ore" zone
30.0	31.5	518-21	SND	SLY	VFS	W		VL	L	GRY	SLT	WFE	2		Visual estimated "ore" zone
31.5	33.0	518-22	SND	SLY	VFS	W		VL	L	KH	SLT	WFE	1		Visual estimated "ore" zone
33.0	34.5	518-23	SND	SLY	VFS	W		VL	L	KH	SLT	WFE	,1		Limonite nodules
34.5	36.0	518-24	SND	SLY	VFS	W		VL	L	KH	SLT	WFE	4		
36.0	37.5	518-25	SND	SLY	VFS	W		VL	L	KH	SLT	WFE	2-3		Visual estimated "ore" zone
37.5	39.0	518-26	SND	SLY	VFS	W		VL	L	KH	SLT	WFE	4		Visual estimated "ore" zone
39.0	40.5	518-27	SND	SLY	VFS	W		VL	L	KH	SLT	SLY	2-3		Visual estimated "ore" zone
40.5	42.0	518-28	SND	SLY	VFS	W		VL	L	KH	SLT		4		Visual estimated "ore" zone
42.0	43.5	518-29	SLT	VFS	SLT	W		VL	M	R			1		Visual estimated "ore" zone
43.5	45.0	518-30	SLT	VFS	SLT	W		VL	D	R			1-2		Visual estimated "ore" zone
45.0	46.5	518-31	SLT	VFS	SLT	W		VL	L	O	SND	CSA	1		Visual estimated "ore" zone
46.5	48.0	518-32	CLS	VFS	VFS	M		VL	L	R	CLY	CLY	TR		Visual estimated "ore" zone
48.0	49.5	518-33	SLT	CLY	CSI	M		VL	D	O	CLY	CLY	TR		Visual estimated "ore" zone
49.5	51.0	518-34	SLT	CLY	CSI	M		VL	M	KH	SLT	EWFE	1		Visual estimated "ore" zone
51.0	52.5	518-35	SLT	CLY	CSI	M		VL	M	O	SLT	WFE	1		Visual estimated "ore" zone
52.5	54.0	518-36	SLT	CLY	CSI	M		VL	M	GRY					
54.0	55.5	518-37	SLT	CLY	CSI	P		VL	M	O	SST	WFE	TR		
55.5	57.0	518-38	CLY	BAN	CLY	M		L	L	GRY	SLT	SLY			
57.0	58.5	518-39	SLT	CLY	CSI	M		VL	M	GRY	SLT	CLY	1		
58.5	60.0	518-40	CLY	CLY	CLY	M		L	L	GRY	SLT	SLY			



GS518(2)

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS518 Depth (m): 66.0 Date Drilled: 19 Dec 2011 East (GDA94): 531347 North (GDA94): 5816271

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: NIL RL: Sheet 2 of 2 Bulk Hole Depth (m): 60.0 Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	
60.0	61.5	518-41	SLTY	CLY	CSI	M		VL	M	O	CLY	CLY	<1		No photo
61.5	63.0	518-42	SLTY	CLY	CSI	M		VL	D	BR	CLY	WFE	2		No photo
63.0	64.5	518-43	CLY	SLY	CSI	M		L	MO	GRY					No photo
64.5	66.0	518-44	CLY	SLY	CSI	M		L	L	BLK	CLY	CLY			No photo
	NOTE:	The fine sands with the HM generally weighs approx 9.5 kg - the heavier weights are due to higher clay content													
		These weights are not regarded as accurate due to losses during reaming of the hole.													

GS521

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS521 Depth (m): 57.0 Date Drilled: 02 Jan12 East (GDA94): 569770 North (GDA94): 5822698

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: patchy RL: Sheet 1 of 1 Bulk Hole Depth: A=48m,B=45m Geo: B Duck

From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	Comments
0.0	1.5	521-01	SND	SLY	VFS	W		VL	D	O	SND	IND	TR		
1.5	3.0	521-02	SND	SLY	VFS	W		VL	D	O	SND	IND	TR		
3.0	4.5	521-03	SND	SLY	VFS	W		VL	D	O-BR			TR		
4.5	6.0	521-04	SND	SFE	VFS	W		VL	D	O-BR	SND	WFE+IND	TR		
6.0	7.5	521-05	SND	SLY	F-CSA	W	A	VL	M	O-BR	SND	IND	TR		
7.5	9.0	521-06	SND	SLY	VFS	W		VL	M	O-BR	SND	IND	TR		
9.0	10.5	521-07	SND	SLY	VFS	W		VL	M	O-BR			<1		
10.5	12.0	521-08	SND	SLY	VFS-MS	M		VL	M	O-BR	SND	IND	TR		
12.0	13.5	521-09	SND	SLY	VFS	W		VL	D	O			TR		
13.5	15.0	521-10	SND	SLY	VFS	W		VL	D	O			TR		
15.0	16.5	521-11	SND	SLY	VFS	W		VL	L	BR			3		Visual estimated "ore" zone
16.5	18.0	521-12	SND	SLY	VFS	W		VL	L	BR			2		Visual estimated "ore" zone
18.0	19.5	521-13	SND	SLY	VFS	W		VL	L	BR			1		Visual estimated "ore" zone
19.5	21.0	521-14	SND	SLY	VFS	W		VL	L	BR			4-5		Visual estimated "ore" zone
21.0	22.5	521-15	SND	SLY	VFS	W		VL	L	O-BR	SND	WFE+IND	1		Visual estimated "ore" zone
22.5	24.0	521-16	SND	SLY	VFS	W		VL	L	O-BR	SND	EWFE	<1		Visual estimated "ore" zone
24.0	25.5	521-17	SND	SLY	VFS	W		VL	L	GRY			1		Visual estimated "ore" zone
25.5	27.0	521-18	SND	SLY	VFS	W		VL	P	GRY			3		Visual estimated "ore" zone
27.0	28.5	521-19	SND	SLY	VFS	W		VL	MO	GRY-BR	SND	IND	2		Visual estimated "ore" zone
28.5	30.0	521-20	SND	SLY	VFS	W		VL	MO	R-BR	SND	IND	<1		Visual estimated "ore" zone
30.0	31.5	521-21	SND	SLY	VFS	W		VL	P	GRY	SND	IND	1-2		1%-2% IND
31.5	33.0	521-22	SND	SLY	VFS	W		VL	M	R-BR	GRA		1-2		Rare round quartz pebbles
33.0	34.5	521-23	SND	SLY	VFS	W		VL	P	BR			1		Visual estimated "ore" zone
34.5	36.0	521-24	SND	SLY	VFS	W		VL	P	GRY	SND	CSA	1-2		Visual estimated "ore" zone
36.0	37.5	521-25	CLS	SND	CL-VFS	W		VL	P	Y-BR			1-2		Visual estimated "ore" zone
37.5	39.0	521-26	SND	SND	VFS	W		VL	L	Y-BR			1-2		Visual estimated "ore" zone
39.0	40.5	521-27	SND	SLY	VFS	M		VL	M	Y-BR	SND	CRS	1-2		Rare coarse quartz sand
40.5	42.0	521-28	SND	SLY	VFS	M		VL	M	Y-BR	SND	CRS	2		Rare coarse quartz sand
42.0	43.5	521-29	SND	SLY	VFS	M		VL	M	Y-BR			<1		Visual estimated "ore" zone
43.5	45.0	521-30	SND	SLY	VFS	P		VL	M	Y-BR	SND	GRA	1-2		<5% white rounded quartz
45.0	46.5	521-31	SND	SLY	VFS	P		VL	M	Y-BR	SND	GRA	1		<5% white rounded quartz
46.5	48.0	521-32	SND	SND	VFS-CSA	P		VL	M	Y-BR			2		Visual estimated "ore" zone
48.0	49.5	521-33	SND	SND	FS-CSA	P		VL	M	Y-BR			1		Visual estimated "ore" zone
49.5	51.0	521-34	SND	SND	FS-CSA	P		VL	M	Y-BR	CLY		1		Visual estimated "ore" zone
51.0	52.5	521-35	SND	SND	FS-CSA	P		VL	M	Y-BR	CLY	GRA	1		Visual estimated "ore" zone
52.5	54.0	521-36	SND	SND	CSA	W		VL	P	GRY			TR		Visual estimated "ore" zone
54.0	55.5	521-37	SND	SND	CSA	M		VL	P	GRY	CLY	CAR	1		Visual estimated "ore" zone
55.5	57.0	521-38	MST/ORG	BAN	VFS			SOFT	VD	BLK	MST	CAR			Coal fragments
	NOTE:	Minor water at 9m and 55m+D45													
		Strong smell of gas at 57m, ceased drilling, pressurised. The 2 Bulk holes and the Assay hole were all cemented before backfill													

GS522

ORESOME AUSTRALIA PTY LTD

PROJECT: GIPPSLAND PROSPECT: GLENALADALE Hole No: GS522 Depth (m): 36.0 Date Drilled: 03 Jan 12 East (GDA94): 570601 North (GDA94): 5821817

Drilling Company: WALLIS DRILLING PTY LTD Rig: MANTIS 80 Hole Diam (mm): 84 Water: 35m RL: Sheet 1 of 1 Bulk Hole Depth (m): A=30m, B=30m Geo: B Duck

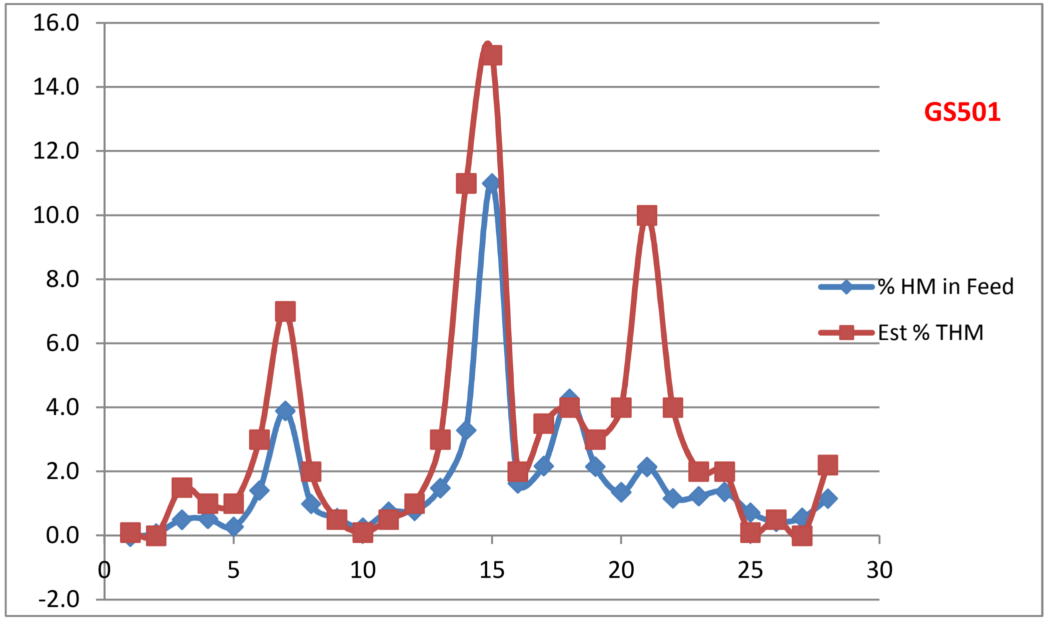
From(m)	To(m)	Sample	Lith 1	Lith1 Qual	Grainsize	Sorting	Rounding	Cement	Light	Colour	Lith2	Lith2 Qual	Est % THM	Kg	Comments
0.0	1.5	522-01	CLY	SND	CLY-FS	M		L	D	KH			1		
1.5	3.0	522-02	CLS	SND	CLY-CSA	P	SA	L	D	KH			<1		
3.0	4.5	522-03	SND	SLY	VFS	W		L	D	KH			.<1		
4.5	6.0	522-04	SND	SLY	VFS	W		L	M	GRY			1		
6.0	7.5	522-05	SND	SND	CSA	W	SA	L	M	GRY			TR		
7.5	9.0	522-06	SND	SLY	VFS	W		L	M	GRY			<1		
9.0	10.5	522-07	SND	SLY	VFS-MS	W		L	M	GRY			1-2		30% zircon
10.5	12.0	522-08	SND	SLY	VFS	W		L	M	GRY			1		Visual estimated "ore" zone
12.0	13.5	522-09	SND	SLY	VFS	W		L	L	GRY			<1		
13.5	15.0	522-10	SND	SLY	VFS	W		L	L	GRY			TR		
15.0	16.5	522-11	SND	SLY	VFS	W		L	L	GRY			TR		
16.5	18.0	522-12	SND	SND	VFS-CSA	P		L	M	GRY			TR		
18.0	19.5	522-13	SND	SLY	VFS	W		L	L	GRY			<1		
19.5	21.0	522-14	SND	SLY	VFS	W		L	D	GRY			<1		
21.0	22.5	522-15	SND	SLY	VFS	W		L	D	GRY			1		25-30% zircon
22.5	24.0	522-16	SND	SND	FS-MS	M		L	D	GRY			1		50/50 zircon blk HM
24.0	25.5	522-17	SND	SLY	VFS	W		L	M	GRY			2		50/50 zircon blk HM
25.5	27.0	522-18	SND	SLY	VFS	W		L	M	GRY			1-2		Visual estimated "ore" zone
27.0	28.5	522-19	SND	SLY	VFS	W		L	M	GRY			2-3		50/50 zircon blk HM
28.5	30.0	522-20	SND	SLY	VFS	W		L	M	GRY			2-3		40/60 zircon blk HM
30.0	31.5	522-21	SND	SLY	VFS	W		L	M	GRY			2-3		40/60 zircon blk HM
31.5	33.0	522-22	SND	SLY	VFS	W		L	M	GRY			3		Visual estimated "ore" zone
33.0	34.5	522-23	SND	SLY	VFS	W		L	M	GRY			3		Visual estimated "ore" zone
34.5	36.0	522-24	SND	SND	SLY-CSA	P		VL	M	GRY			3		water at 35m
		NOTE:	Gas at 35m, and used MicroClip XT, Gas Alert to measure presence (BLS Technologies)												
			Results:	CO	11 ppm	22.8ppm									
				LEL	51%	64%									
				H2S	0ppm	6ppm									

ORESOME AUSTRALIA - GIPPSLAND LOGGING CODES

LITHOLOGY		**LITHOLOGICAL QUALIFIER**		**GRAINSIZE**		mm	**COLOUR**	
SOI	Soil	ALL	Alluvial	CLY	Clay	<0.002	BK	Black
CLY	Clay	BAN	Banded	SLT	Silt	0.002-0.03	BR	Brown
MST	Mudstone	BRE	Brecciated	CSI	Coarse Silt	0.03-0.06	BU	Blue
SND	**Sand**	**CLN**	**Clean**	VFS	Very Fine Sand	0.06-0.12	GRY	Grey
SST	Sandstone	COR	Coral + Shells	FS	**Fine Sand**	**0.12-0.25**	GRN	Green
SCL	Sandy Clay	DIS	Disturbed	FMS	Fine Medium Sand		K	Khaki
CLS	Clayey Sand	SLK	Slickensided	MS	Medium Sand	0.25-0.5	O	Orange
SIS	Siltstone	**FER**	**Feruginous**	CSA	**Coarse Sand**	**0.5-1.0**	PU	Purple
SLT	**Silt**	FRA	Fractured	VCS	Very Coarse Sand	1.0-2.0	PI	Pink
LAT	Laterite	FRE	Fresh	GRA	**Granules**	**2.0-4.0**	R	Red
GRA	**Gravel**	IND	Indurated	PBL	Pebbles	4.0-16.0	T	Tan
CAL	Calcrete	MW	Mod Weathered	CBL	Cobbles	16.0-64.0	W	White
BAS	Basalt	SW	Str Weathered	CLD	Boulders	>64.0	Y	Yellow
BIO	Bioclastics	**WFE**	**Weak Ferrug**	**SORTING**			**LIGHTNESS**	
CON	**Conglomerate**	MFE	Moderate Ferug	P	Poor		P	Pale
FWD	Fossilised Wood	SFE	Strong Ferug	M	Moderate		L	Light
LST	Limestone	ALT	Altered	W	Well		M	Medium
ORG	Organics	CAR	Carbonaceous	**ROUNDING**			D	Dark
PEB	Pebbles	LAM	Laminated	VA	Very Angular		MO	Mottled
SAP	Saprolite	**CAL**	**Calcareous**	A	Angular		BA	Banded
SCH	Schist	GLA	Glaunitic	SA	Sub Angular		**MINERALS**	
SH	Shale	**CLY**	**Clayey**	SR	Sub Rounded		R	Rutile
SIL	Silcrete	SLY	Silty	R	Rounded		IL	Ilmenite
GRN	Granite	MIC	Micaceous	WR	Well Rounded		Z	Zircon
GNS	Gneiss	SDY	Sandy	**CEMENT**			MON	Monazite
CHT	Chert			VL	Very Loose			
SPO	Spongolite			L	Loose			
VOL	Volcanic			C	Cemented			
				HC	Highly Cemented			

Sample	% HM in Feed	Est % THM
501-13	0.0	0.1
501-14	0.1	0
501-15	0.5	1.5
501-16	0.5	1
501-17	0.3	1
501-18	1.4	3
501-19	3.9	7
501-20	1.0	2
501-21	0.6	0.5
501-22	0.3	0.1
501-23	0.7	0.5
501-24	0.8	1
501-25	1.5	3
501-26	3.3	11
501-27	11.0	15
501-28	1.6	2
501-29	2.2	3.5
501-30	4.3	4
501-31	2.2	3
501-32	1.4	4
501-33	2.1	10
501-34	1.2	4
501-35	1.2	2
501-36	1.4	2
501-37	0.7	0.1
501-38	0.4	0.5
501-39	0.6	0
501-40	1.2	2.2

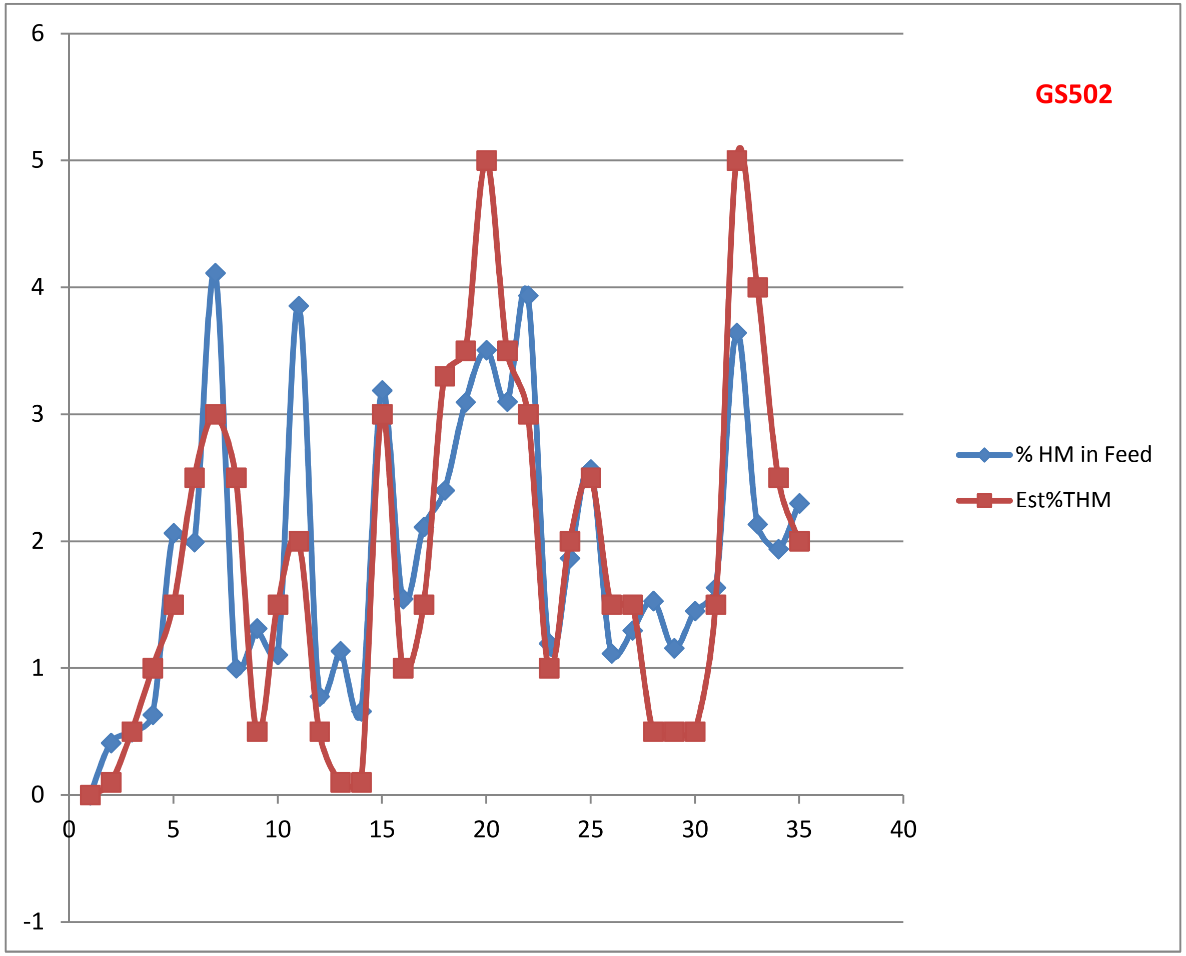
Correlation Factor
0.85



GS501: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
502-7	0.4	0.1
502-8	0.5	0.5
502-9	0.6	1
502-10	2.1	1.5
502-11	2.0	2.5
502-12	4.1	3
502-13	1.0	2.5
502-14	1.3	0.5
502-15	1.1	1.5
502-16	3.9	2
502-17	0.8	0.5
502-18	1.1	0.1
502-19	0.7	0.1
502-20	3.2	3
502-21	1.5	1
502-22	2.1	1.5
502-23	2.4	3.3
502-24	3.1	3.5
502-25	3.5	5
502-26	3.1	3.5
502-27	3.9	3
502-28	1.2	1
502-29	1.9	2
502-30	2.6	2.5
502-31	1.1	1.5
502-32	1.3	1.5
502-33	1.5	0.5
502-34	1.2	0.5
502-35	1.4	0.5
502-36	1.6	1.5
502-37	3.6	5
502-38	2.1	4
502-39	1.9	2.5
502-40	2.3	2

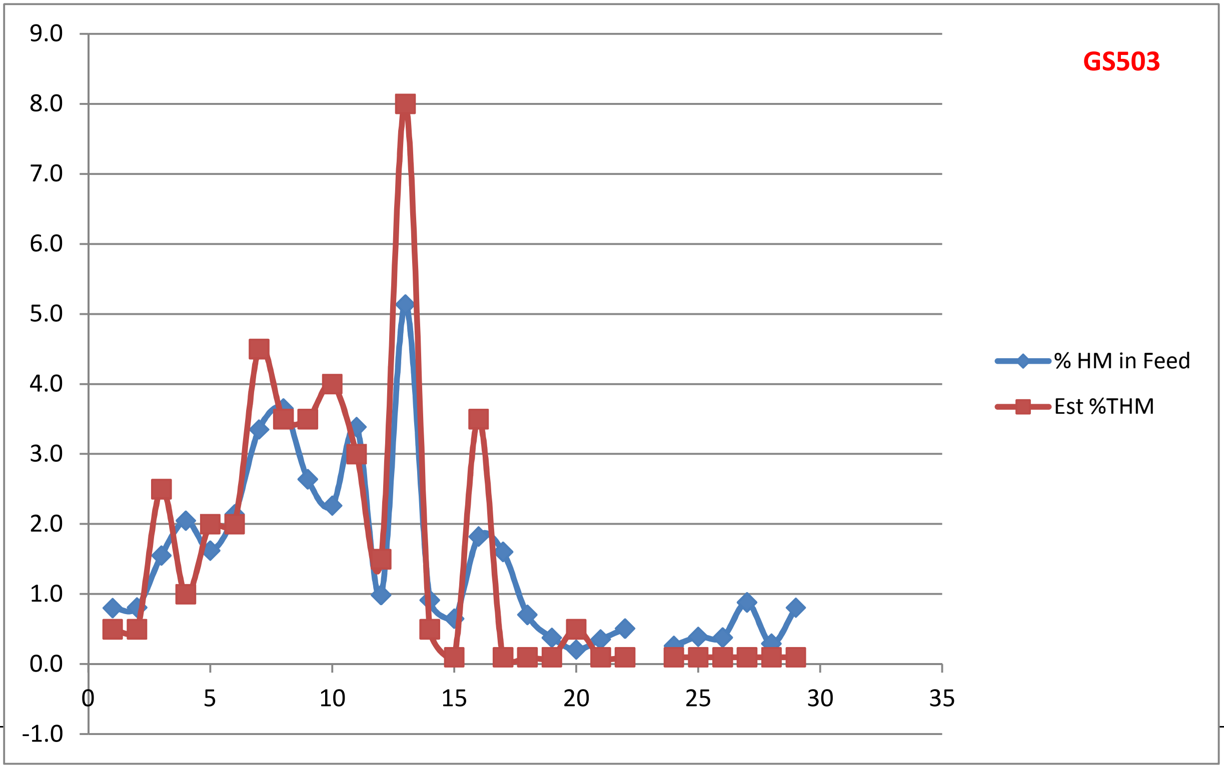
Correlation Factor 0.78516



GS502: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
503-1	0.8	0.5
503-2	0.8	0.5
503-3	1.6	2.5
503-4	2.0	1
503-5	1.6	2
503-6	2.1	2
503-7	3.4	4.5
503-8	3.7	3.5
503-9	2.6	3.5
503-10	2.3	4
503-11	3.4	3
503-12	1.0	1.5
503-13	5.1	8
503-14	0.9	0.5
503-15	0.7	0.1
503-16	1.8	3.5
503-17	1.6	0.1
503-18	0.7	0.1
503-19	0.4	0.1
503-20	0.2	0.5
503-21	0.4	0.1
503-22	0.5	0.1
503-23B	0.3	0.1
503-24	0.4	0.1
503-25	0.4	0.1
503-26	0.9	0.1
503-27	0.3	0.1
503-28	0.8	0.1

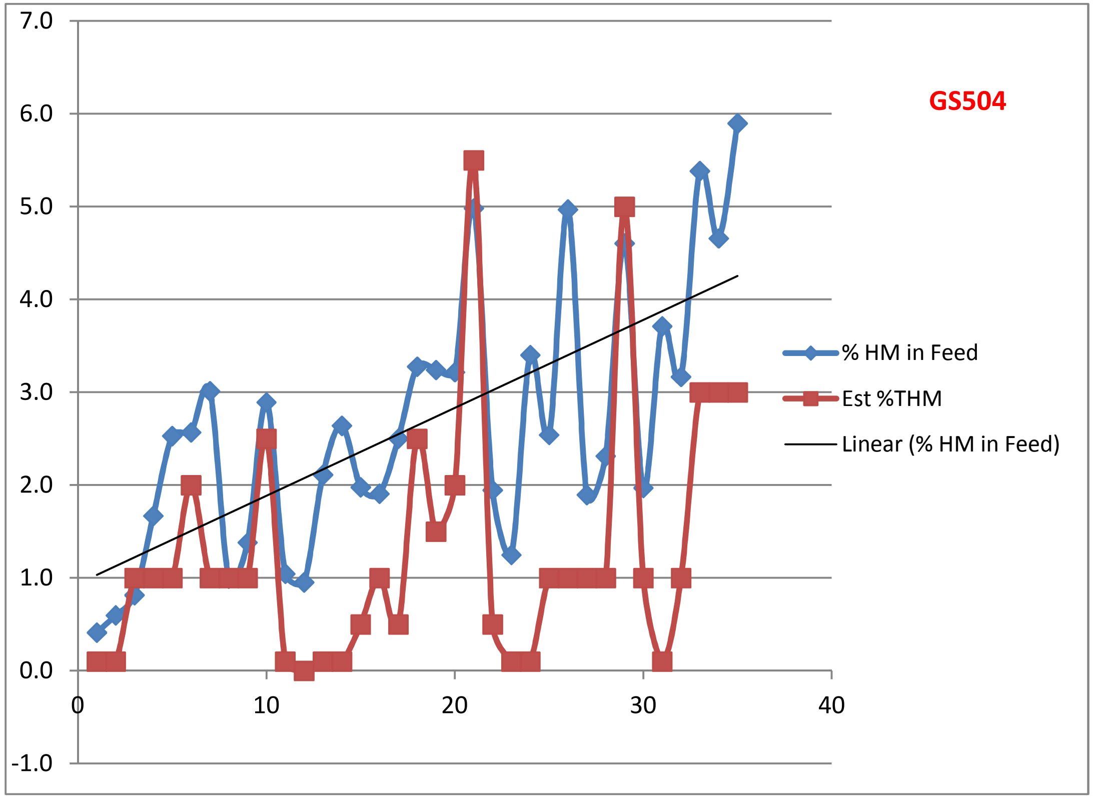
Correl 0.916718



GS503: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
504-18	0.4	0.1
504-19	0.6	0.1
504-20	0.8	1
504-21	1.7	1
504-22	2.5	1
504-23	2.6	2
504-24	3.0	1
504-25	1.0	1
504-26	1.4	1
504-27	2.9	2.5
504-28	1.0	0.1
504-29	1.0	0
504-30	2.1	0.1
504-31	2.6	0.1
504-32	2.0	0.5
504-33	1.9	1
504-34	2.5	0.5
504-35	3.3	2.5
504-36	3.2	1.5
504-37	3.2	2
504-38	5.0	5.5
504-39	1.9	0.5
504-40	1.2	0.1
504-41	3.4	0.1
504-42	2.5	1
504-43	5.0	1
504-44	1.9	1
504-45	2.3	1
504-46	4.6	5
504-47	2.0	1
504-48	3.7	0.1
504-49	3.2	1
504-50	5.4	3
504-51	4.7	3
504-52	5.9	3

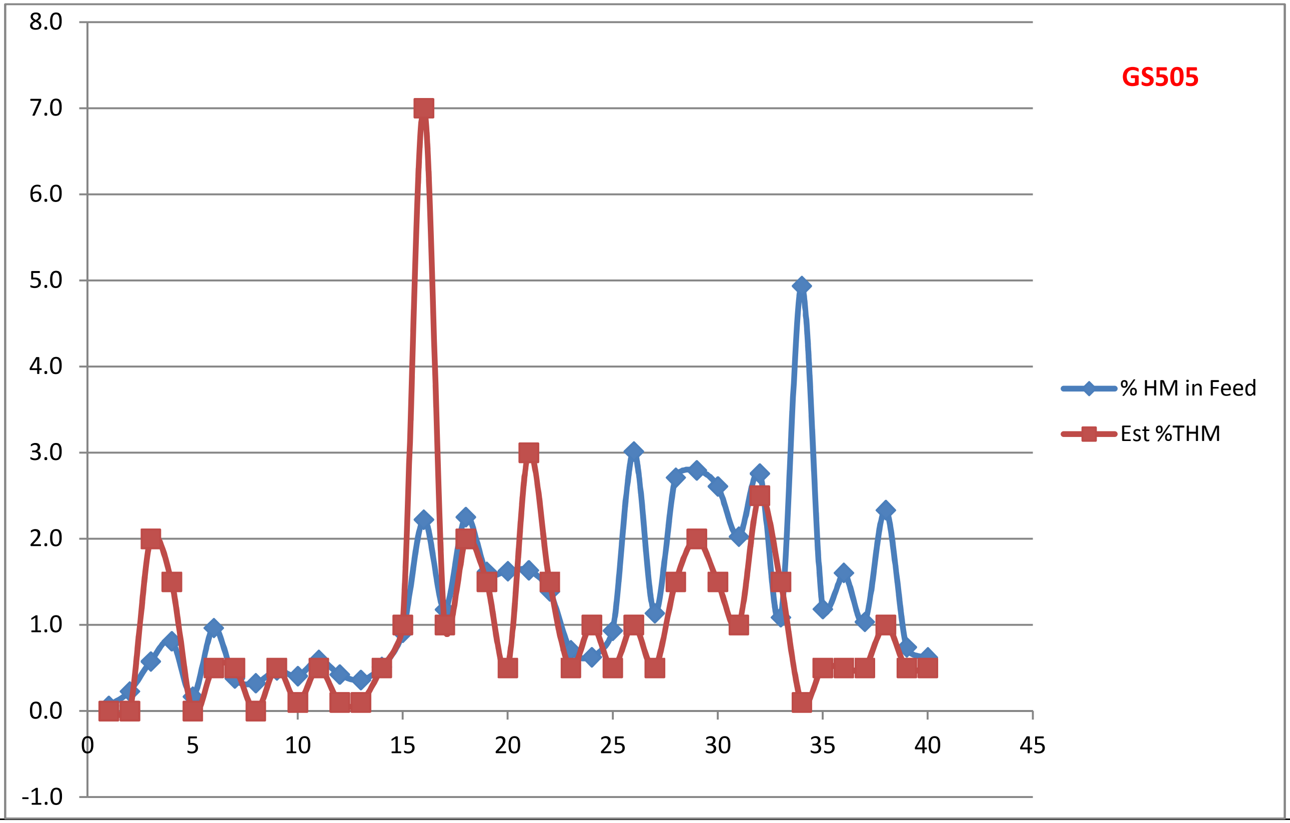
CORREL
0.692248



GS504: **Comparison of In-field panning vs assays by RJ Robbins**

Sample	% HM in Feed	Est % THM
505-13	0.1	0
505-14	0.2	0
505-15	0.6	2
505-16	0.8	1.5
505-17	0.2	0
505-18	1.0	0.5
505-19	0.4	0.5
505-20	0.3	0
505-21	0.5	0.5
505-22	0.4	0.1
505-23	0.6	0.5
505-24	0.4	0.1
505-25	0.4	0.1
505-26	0.5	0.5
505-27	0.9	1
505-28	2.2	7
505-29	1.2	1
505-30	2.3	2
505-31	1.6	1.5
505-32	1.6	0.5
505-33	1.6	3
505-34	1.4	1.5
505-35	0.7	0.5
505-36	0.6	1
505-37	0.9	0.5
505-38	3.0	1
505-39	1.1	0.5
505-40	2.7	1.5
505-41	2.8	2
505-42	2.6	1.5
505-43	2.0	1
505-44	2.8	2.5
505-45	1.1	1.5
505-46	4.9	0.1
505-47	1.2	0.5
505-48	1.6	0.5
505-49	1.0	0.5
505-50	2.3	1
505-51	0.7	0.5
505-52	0.6	0.5

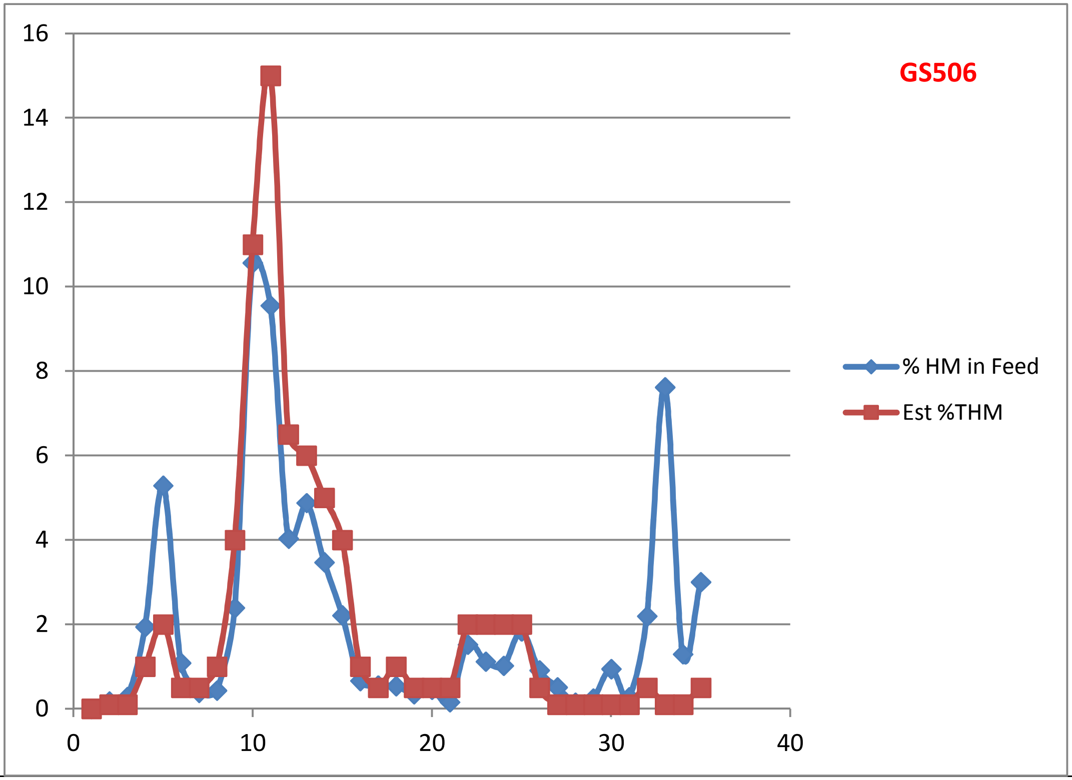
Correl 0.366234



GS505: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
506-9	0.2	0.1
506-10	0.3	0.1
506-11	1.9	1
506-12	5.3	2
506-13	1.1	0.5
506-14	0.4	0.5
506-15	0.4	1
506-16	2.4	4
506-17	10.6	11
506-18	9.6	15
506-19	4.0	6.5
506-20	4.9	6
506-21	3.5	5
506-22	2.2	4
506-23	0.7	1
506-24	0.6	0.5
506-25	0.5	1
506-26	0.3	0.5
506-27	0.5	0.5
506-28	0.2	0.5
506-29	1.5	2
506-30	1.1	2
506-31	1.0	2
506-32	1.8	2
506-33	0.9	0.5
506-34	0.5	0.1
506-35	0.1	0.1
506-36	0.2	0.1
506-37	0.9	0.1
506-38	0.3	0.1
506-39	2.2	0.5
506-40	7.6	0.1
506-41	1.3	0.1
506-42	3.0	0.5

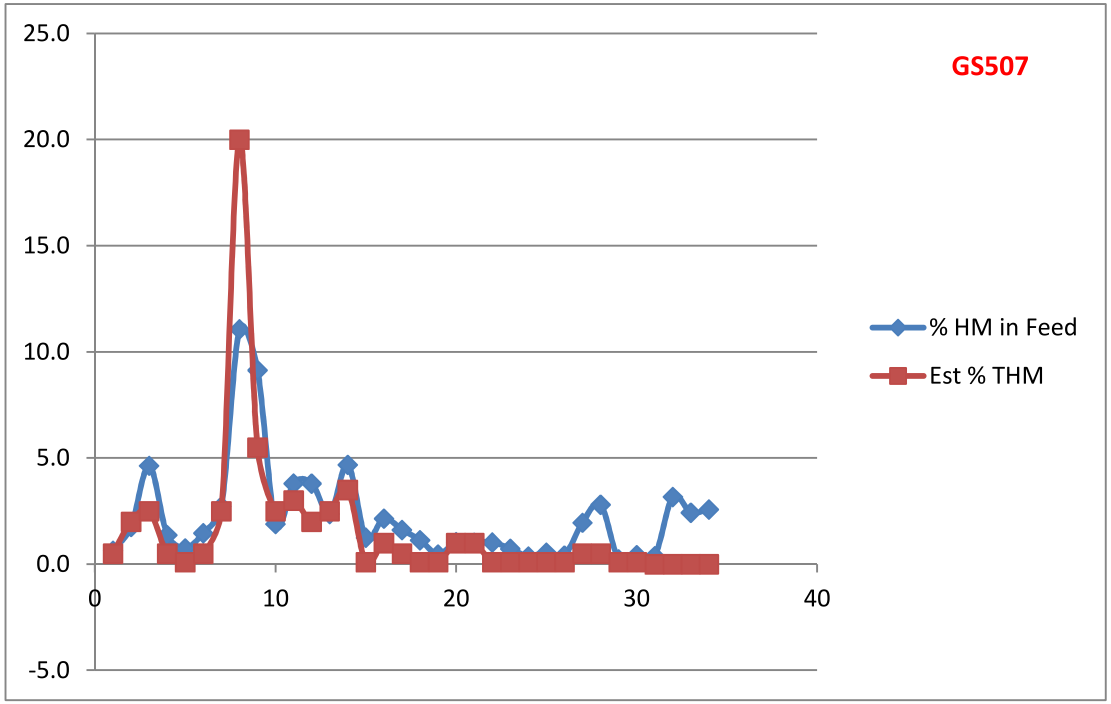
Correl 0.801998



GS506: **Comparison of In-field panning vs assays by RJ Robbins**

Sample	% HM in Feed	Est % THM
507-9	0.6	0.5
507-10	1.8	2
507-11	4.6	2.5
507-12	1.4	0.5
507-13	0.7	0.1
507-14	1.5	0.5
507-15	2.7	2.5
507-16	11.1	20
507-17	9.1	5.5
507-18	1.9	2.5
507-19	3.8	3
507-20	3.8	2
507-21	2.4	2.5
507-22	4.7	3.5
507-23	1.3	0.1
507-24	2.2	1
507-25	1.6	0.5
507-26	1.1	0.1
507-27	0.5	0.1
507-28	1.0	1
507-29	1.0	1
507-30	1.0	0.1
507-31	0.7	0.1
507-32	0.4	0.1
507-33	0.6	0.1
507-34	0.4	0.1
507-35	2.0	0.5
507-36	2.8	0.5
507-37	0.2	0.1
507-38	0.4	0.1
507-39	0.4	0
507-40	3.2	0
507-41	2.4	0
507-42	2.6	0

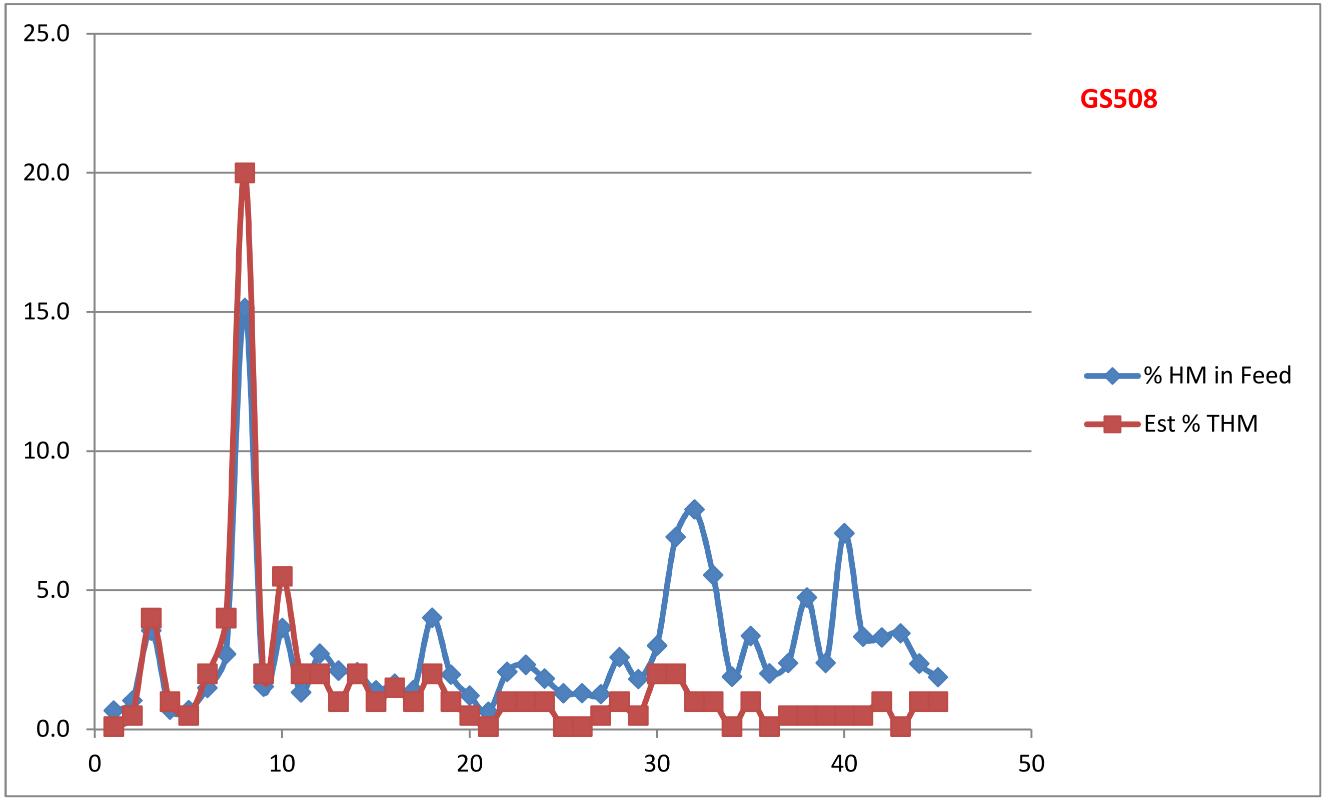
Correl
0.846746



GS507: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
508-4	0.7	0.1
508-5	1.0	0.5
508-6	3.6	4
508-7	0.7	1
508-8	0.7	0.5
508-9	1.5	2
508-10	2.7	4
508-11	15.1	20
508-12	1.5	2
508-13	3.6	5.5
508-14	1.3	2
508-15	2.7	2
508-16	2.1	1
508-17	2.1	2
508-18	1.4	1
508-19	1.6	1.5
508-20	1.4	1
508-21	4.0	2
508-22	2.0	1
508-23	1.2	0.5
508-24	0.6	0.1
508-25	2.1	1
508-26	2.3	1
508-27	1.8	1
508-28	1.3	0.1
508-29	1.3	0.1
508-30	1.3	0.5
508-31	2.6	1
508-32	1.8	0.5
508-33	3.0	2
508-34	6.9	2
508-35	7.9	1
508-36	5.5	1
508-37	1.9	0.1
508-38	3.4	1
508-39	2.0	0.1
508-40	2.4	0.5
508-41	4.7	0.5
508-42	2.4	0.5
508-43	7.0	0.5
508-44	3.3	0.5
508-45	3.3	1
508-46	3.5	0.1
508-47	2.4	1
508-48	1.9	1

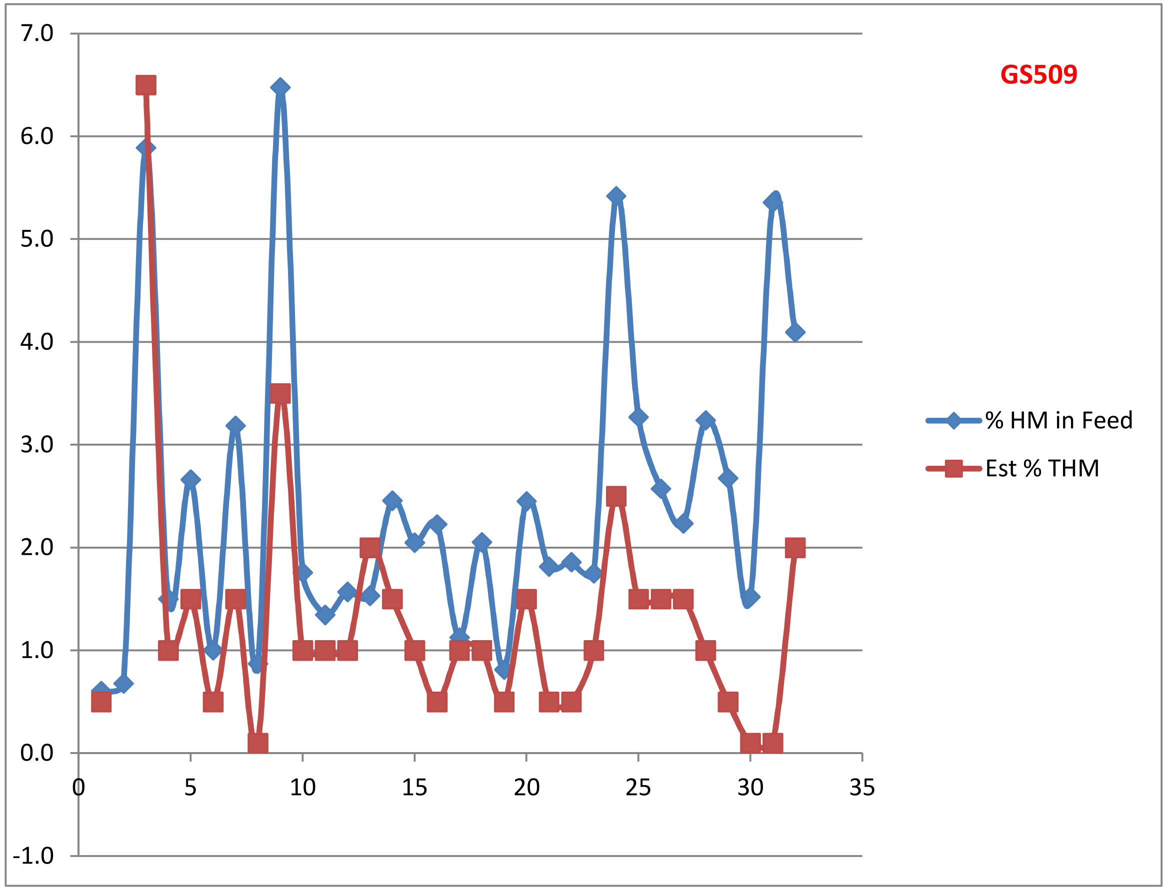
C orrel
0.744772



GS508: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
509-12	0.6	0.5
509-13	0.7	
509-14	5.9	6.5
509-15	1.5	1
509-16	2.7	1.5
509-17	1.0	0.5
509-18	3.2	1.5
509-19	0.9	0.1
509-20	6.5	3.5
509-21	1.8	1
509-22	1.3	1
509-23	1.6	1
509-24	1.5	2
509-25	2.5	1.5
509-26	2.0	1
509-27	2.2	0.5
509-28	1.1	1
509-29	2.1	1
509-30	0.8	0.5
509-31	2.5	1.5
509-32	1.8	0.5
509-33	1.9	0.5
509-34	1.8	1
509-35	5.4	2.5
509-36	3.3	1.5
509-37	2.6	1.5
509-38	2.2	1.5
509-39	3.2	1
509-40	2.7	0.5
509-41	1.5	0.1
509-42	5.4	0.1
509-43	4.1	2

Correl
0.675515

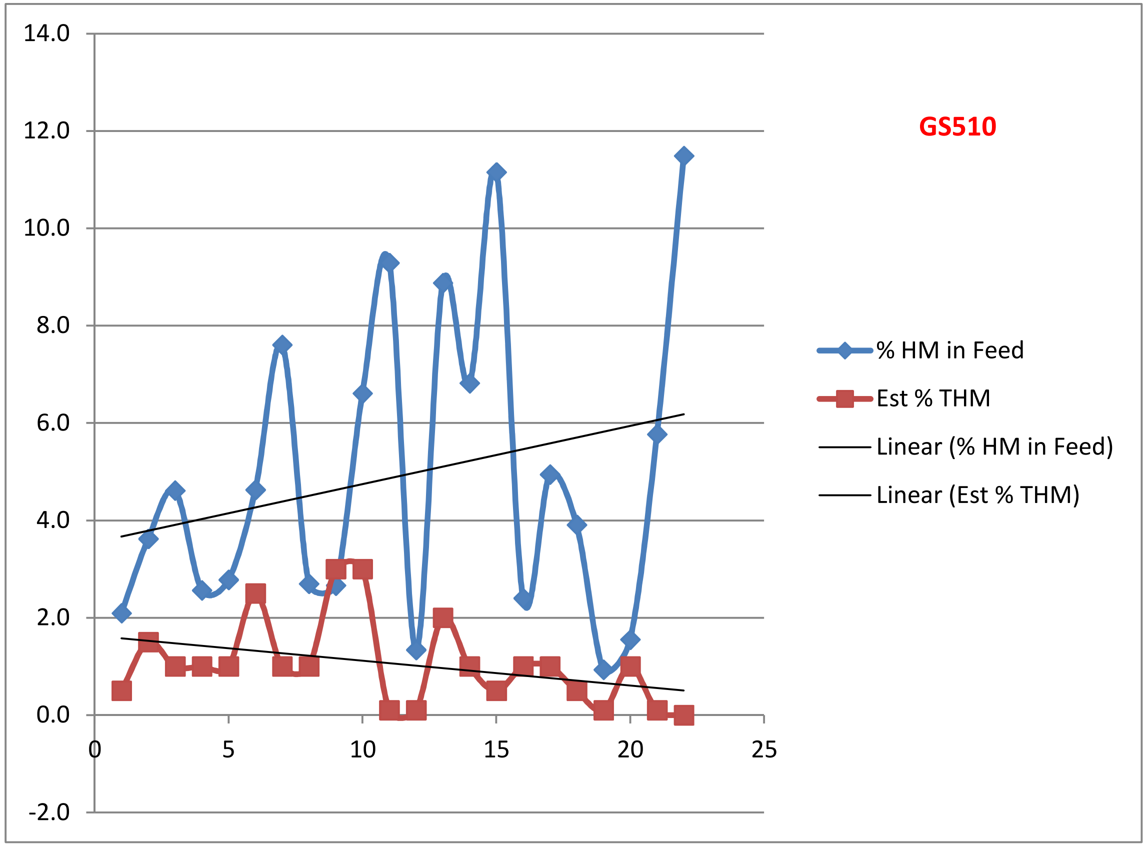


GS509: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
510-1	2.1	0.5
510-2	3.6	1.5
510-3	4.6	1
510-4	2.6	1
510-5	2.8	1
510-6	4.6	2.5
510-7	7.6	1
510-8	2.7	1
510-9	2.7	3
510-10	6.6	3
510-11	9.3	0.1
510-12	1.3	0.1
510-13	8.9	2
510-14	6.8	1
510-15	11.2	0.5
510-16	2.4	1
510-17	4.9	1
510-18	3.9	0.5
510-19	0.9	0.1
510-20	1.6	1
510-21	5.8	0.1
510-22	11.5	0

Correel

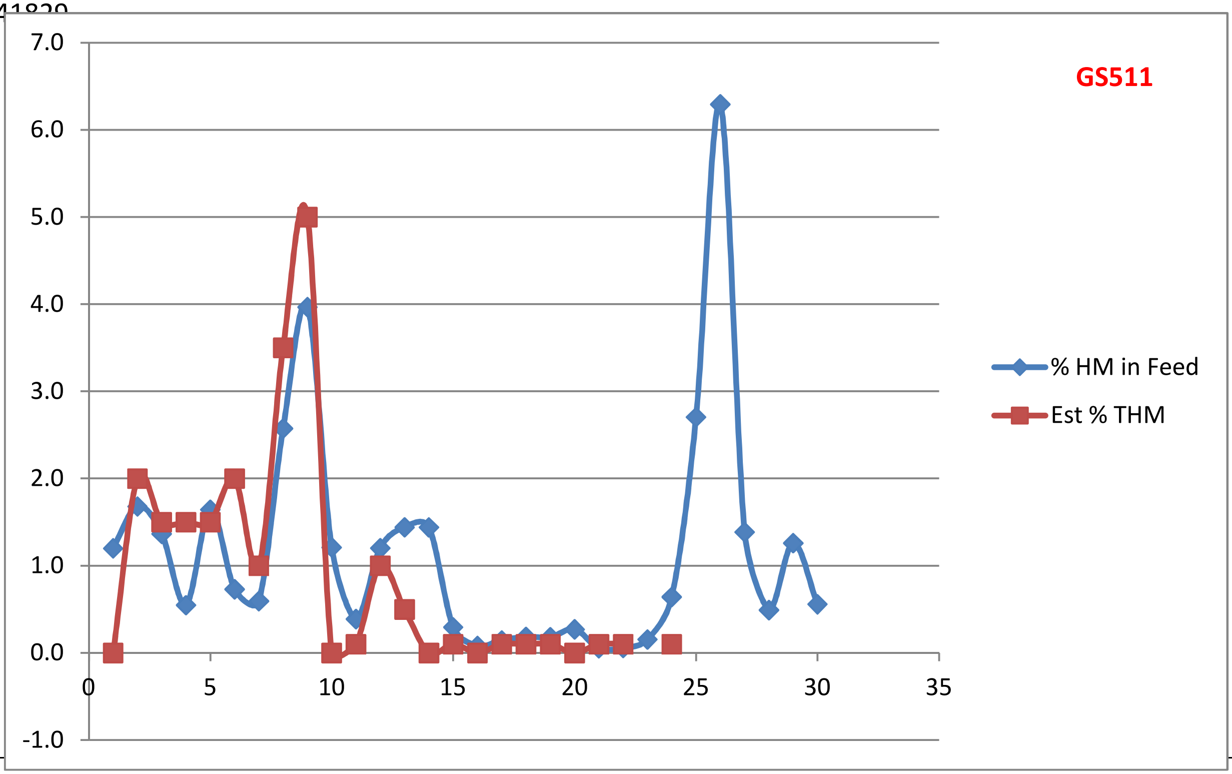
0.06693



GS510: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
511-1	1.2	0
511-2	1.7	2
511-3	1.4	1.5
511-4	0.5	1.5
511-5	1.6	1.5
511-6	0.7	2
511-7	0.6	1
511-8	2.6	3.5
511-9	4.0	5
511-10	1.2	0
511-11	0.4	0.1
511-12	1.2	1
511-13	1.4	0.5
511-14	1.4	0
511-15	0.3	0.1
511-16	0.1	0
511-17	0.1	0.1
511-18	0.2	0.1
511-19	0.2	0.1
511-20	0.3	0
511-21	0.1	0.1
511-22	0.1	0.1
511-23	0.2	
511-24	0.6	0.1
511-25	2.7	
511-26	6.3	
511-27	1.4	
511-28	0.5	
511-29	1.3	
511-30	0.6	

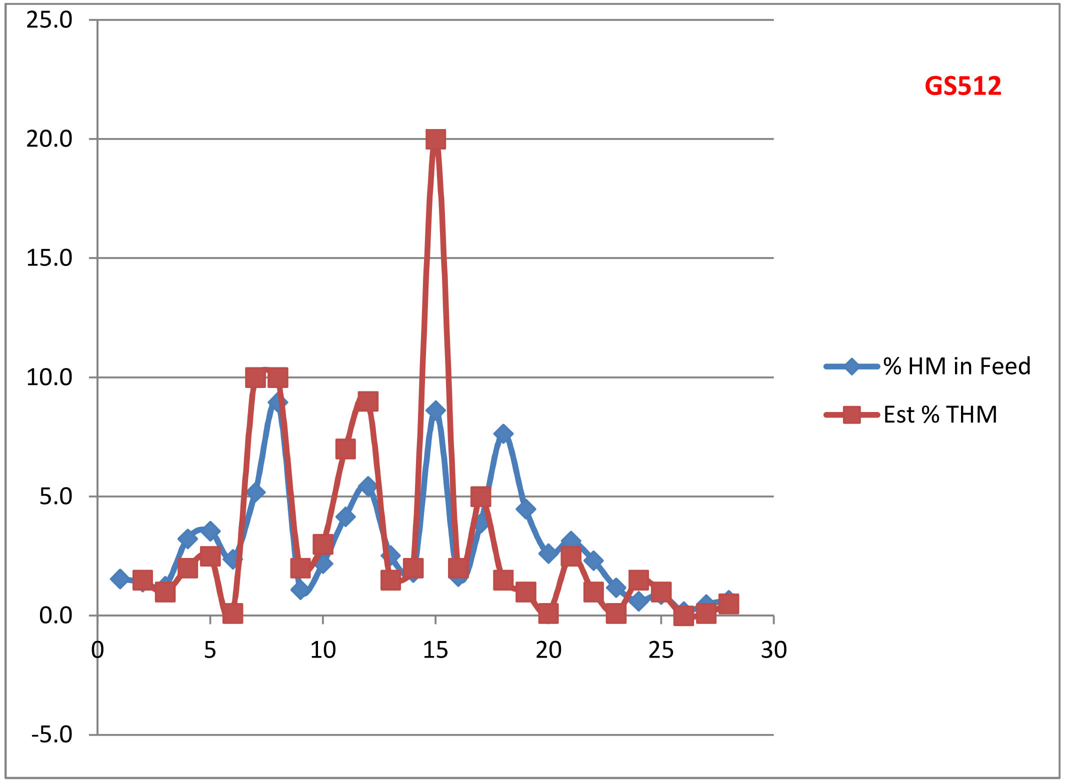
Correl
0.841829



GS511: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
512-1	1.5	
512-2	1.4	1.5
512-3	1.2	1
512-4	3.2	2
512-5	3.6	2.5
512-6	2.4	0.1
512-7	5.2	10
512-8	9.0	10
512-9	1.1	2
512-10	2.2	3
512-11	4.2	7
512-12	5.4	9
512-13	2.5	1.5
512-14	1.8	2
512-15	8.6	20
512-16	1.6	2
512-17	3.9	5
512-18	7.6	1.5
512-19	4.5	1
512-20	2.6	0.1
512-21	3.1	2.5
512-22	2.3	1
512-23	1.2	0.1
512-24	0.6	1.5
512-25	0.9	1
512-26	0.2	0
512-27	0.5	0.1
512-28	0.7	0.5

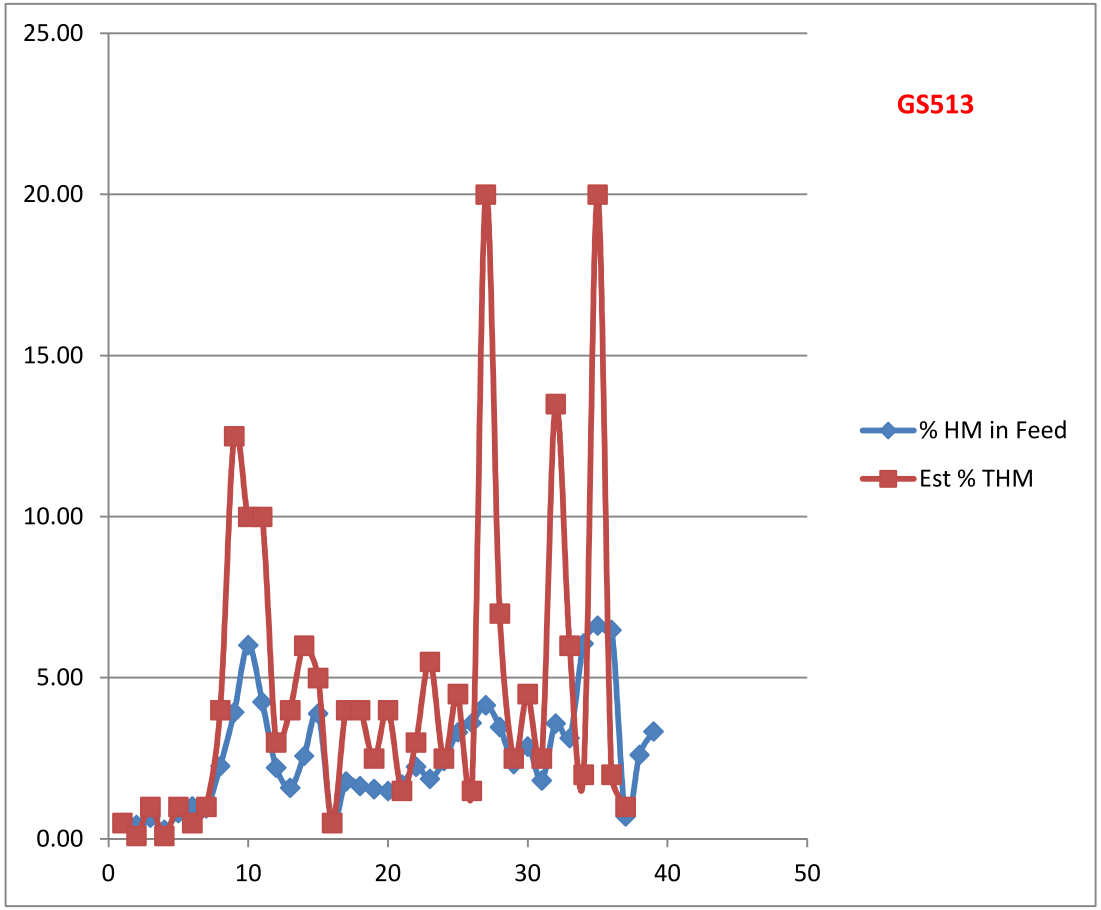
Correl
0.758669



GS512: **Comparison of In-field panning vs assays by RJ Robbins**

Sample	% HM in Feed	Est % THM
513-8	0.51	0.5
513-9	0.44	0.1
513-10	0.66	1
513-11	0.29	0.1
513-12	0.80	1
513-13	1.02	0.5
513-14	0.96	1
513-15	2.27	4
513-16	3.94	12.5
513-17	6.02	10
513-18	4.26	10
513-19	2.22	3
513-20	1.59	4
513-21	2.58	6
513-22	3.90	5
513-23	0.53	0.5
513-24	1.79	4
513-25	1.65	4
513-26	1.56	2.5
513-27	1.49	4
513-28	1.69	1.5
513-29	2.25	3
513-30	1.87	5.5
513-31	2.42	2.5
513-32	3.32	4.5
513-33	3.60	1.5
513-34	4.15	20
513-35	3.48	7
513-36	2.33	2.5
513-37	2.87	4.5
513-38	1.82	2.5
513-39	3.59	13.5
513-40	3.14	6
513-41	6.07	2
513-42	6.62	20
513-43	6.49	2
513-44	0.71	1
513-45	2.62	
513-46	3.34	

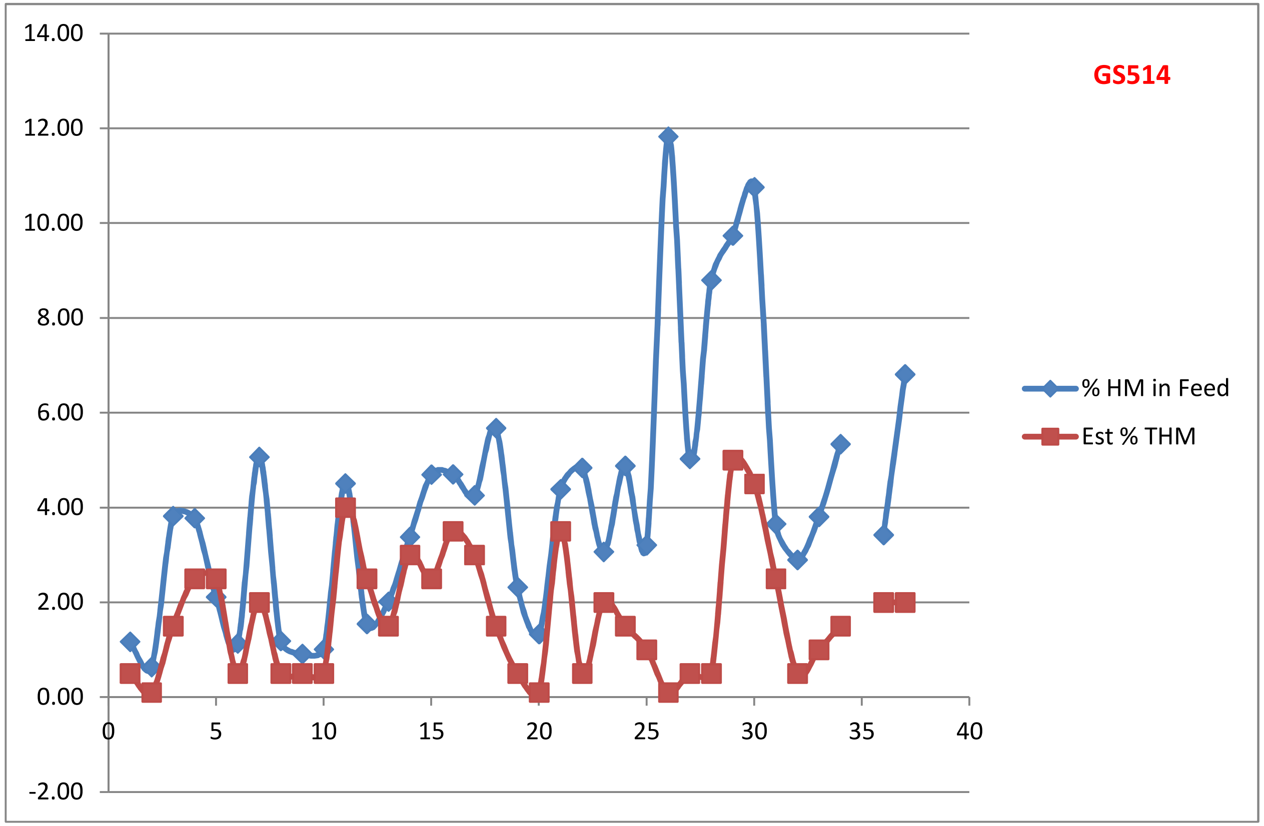
Correl
0.625544



GS513: **Comparison of In-field panning vs assays by RJ Robbins**

Sample	% HM in Feed	Est % THM
514-20	1.17	0.5
514-21	0.64	0.1
514-22	3.82	1.5
514-23	3.78	2.5
514-24	2.11	2.5
514-25	1.13	0.5
514-26	5.07	2
514-27	1.19	0.5
514-28	0.91	0.5
514-29	1.01	0.5
514-30	4.51	4
514-31	1.55	2.5
514-32	2.02	1.5
514-33	3.38	3
514-34	4.70	2.5
514-35	4.70	3.5
514-36	4.26	3
514-37	5.68	1.5
514-38	2.32	0.5
514-39	1.33	0.1
514-40	4.39	3.5
514-41	4.84	0.5
514-42	3.07	2
514-43	4.88	1.5
514-44	3.21	1
514-45	11.83	0.1
514-46	5.03	0.5
514-47	8.80	0.5
514-48	9.74	5
514-49	10.76	4.5
514-50	3.65	2.5
514-51	2.90	0.5
514-52	3.81	1
514-53	5.34	1.5

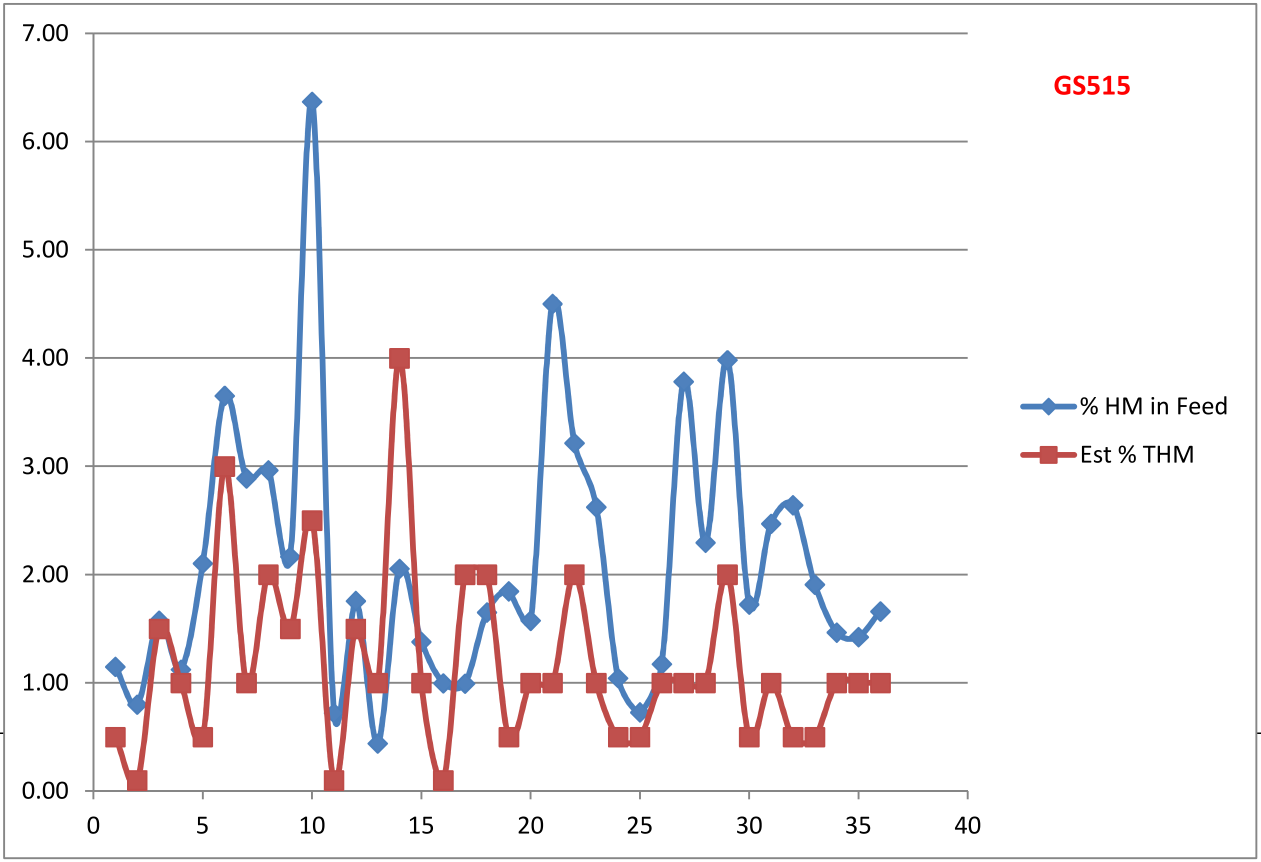
Correl 0.382062



GS514: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
515-3	1.15	0.5
515-4	0.80	0.1
515-5	1.58	1.5
515-6	1.12	1
515-7	2.10	0.5
515-8	3.65	3
515-9	2.89	1
515-10	2.96	2
515-11	2.17	1.5
515-12	6.37	2.5
515-13	0.72	0.1
515-14	1.76	1.5
515-15	0.44	1
515-16	2.06	4
515-17	1.38	1
515-18	1.00	0.1
515-19	0.99	2
515-20	1.65	2
515-21	1.85	0.5
515-22	1.58	1
515-23	4.50	1
515-24	3.22	2
515-25	2.62	1
515-26	1.04	0.5
515-27	0.73	0.5
515-28	1.18	1
515-29	3.78	1
515-30	2.30	1
515-31	3.98	2
515-32	1.73	0.5
515-33	2.47	1
515-34	2.64	0.5
515-35	1.91	0.5
515-36	1.47	1
515-37	1.42	1
515-38	1.66	1

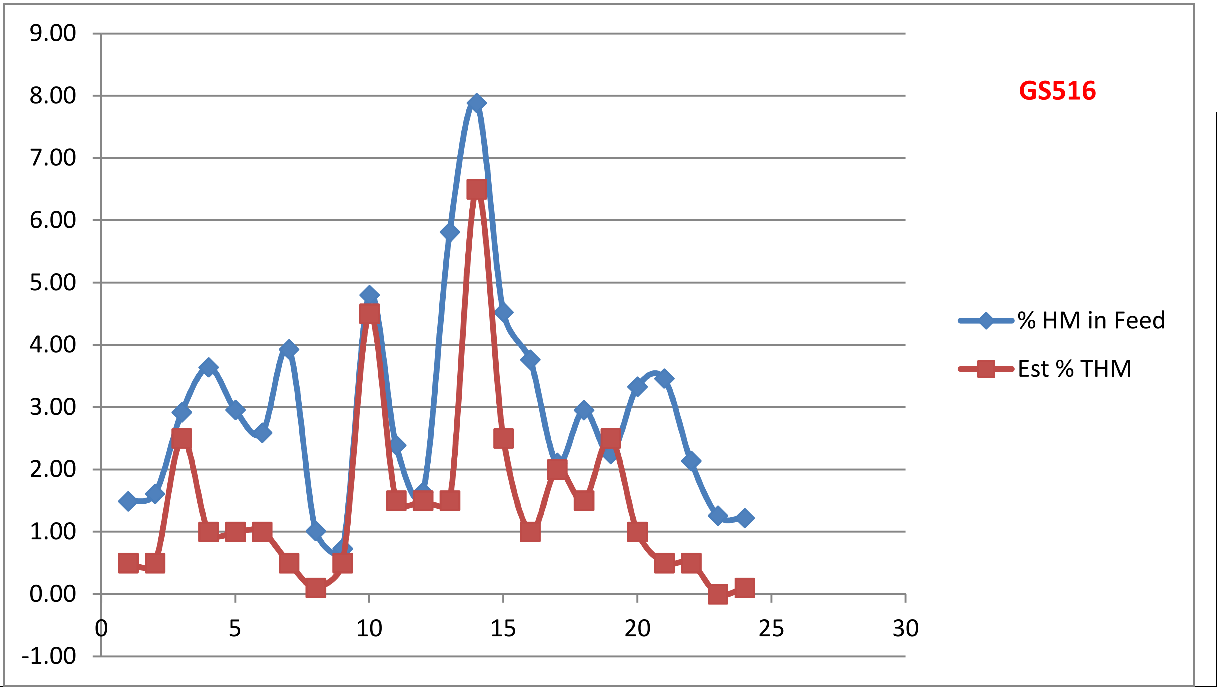
correel 0.462002



GS515: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
516-1	1.49	0.5
516-2	1.61	0.5
516-3	2.92	2.5
516-4	3.64	1
516-5	2.96	1
516-6	2.59	1
516-7	3.93	0.5
516-8	1.01	0.1
516-9	0.73	0.5
516-10	4.80	4.5
516-11	2.39	1.5
516-12	1.63	1.5
516-13	5.81	1.5
516-14	7.89	6.5
516-15	4.53	2.5
516-16	3.76	1
516-17	2.11	2
516-18	2.95	1.5
516-19	2.25	2.5
516-20	3.33	1
516-21	3.46	0.5
516-22	2.14	0.5
516-23	1.26	0
516-24	1.22	0.1

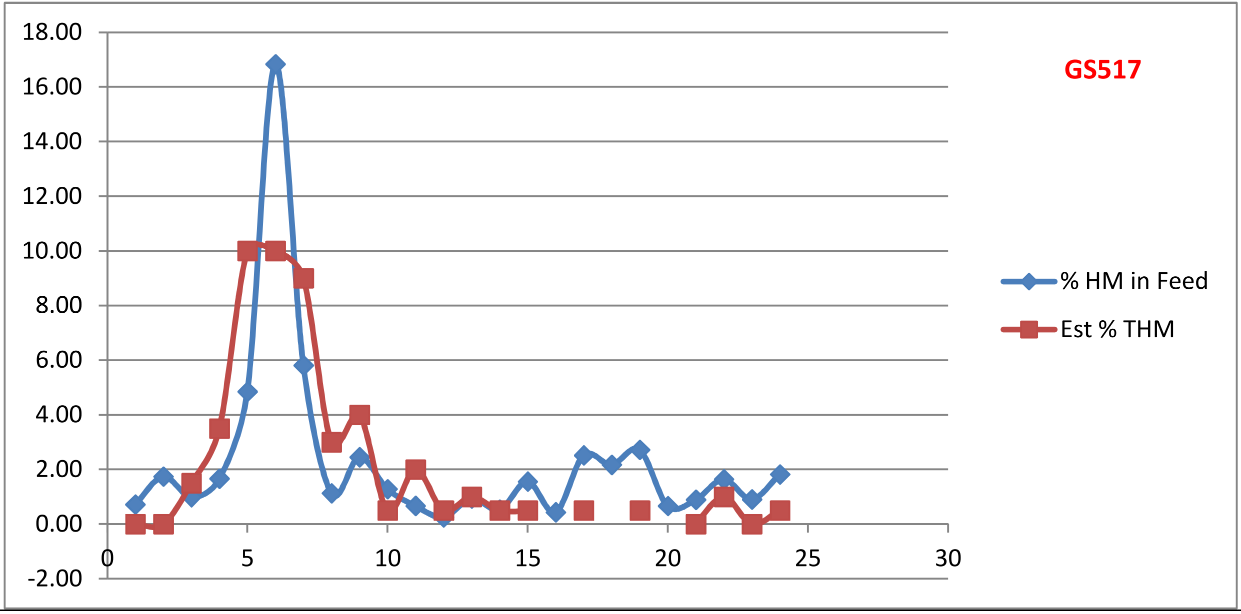
correel
0.738985



GS516: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
517-18	0.72	0
517-19	1.74	0
517-20	0.99	1.5
517-21	1.67	3.5
517-22	4.85	10
517-23	16.84	10
517-24	5.81	9
517-25	1.13	3
517-26	2.45	4
517-27	1.28	0.5
517-28	0.67	2
517-29	0.25	0.5
517-30	0.94	1
517-31	0.53	0.5
517-32	1.56	0.5
517-33	0.44	
517-34	2.52	0.5
517-35	2.17	
517-36	2.72	0.5
517-37	0.67	
517-38	0.89	0
517-39	1.64	1
517-40	0.91	0
517-41	1.82	0.5

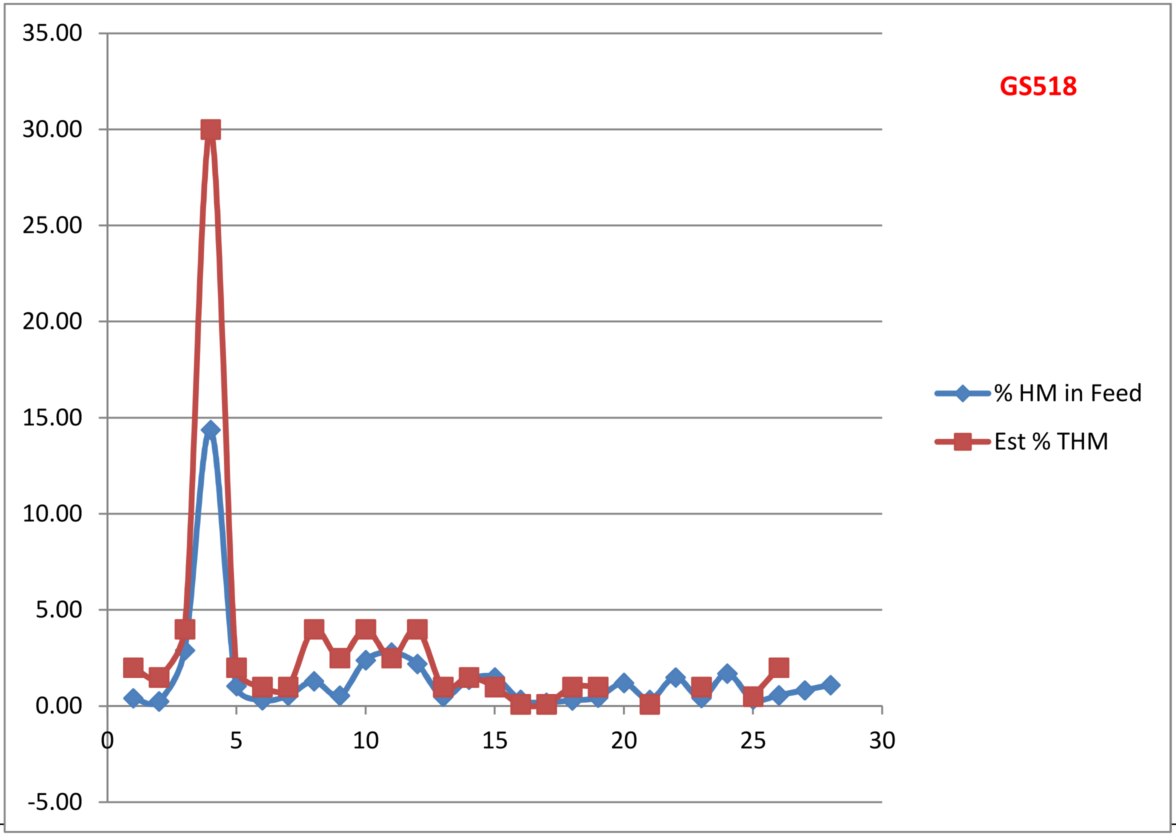
correl
0.763738



GS517: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
518-17	0.41	2
518-18	0.24	1.5
518-19	2.90	4
518-20	14.37	30
518-21	1.04	2
518-22	0.30	1
518-23	0.54	1
518-24	1.30	4
518-25	0.54	2.5
518-26	2.39	4
518-27	2.79	2.5
518-28	2.20	4
518-29	0.50	1
518-30	1.37	1.5
518-31	1.50	1
518-32	0.32	0.1
518-33	0.19	0.1
518-34	0.30	1
518-35	0.44	1
518-36	1.21	
518-37	0.33	0.1
518-38	1.49	
518-39	0.43	1
518-40	1.70	
518-41	0.34	0.5
518-42	0.57	2
518-43	0.82	
518-44	1.09	

correl
0.9821

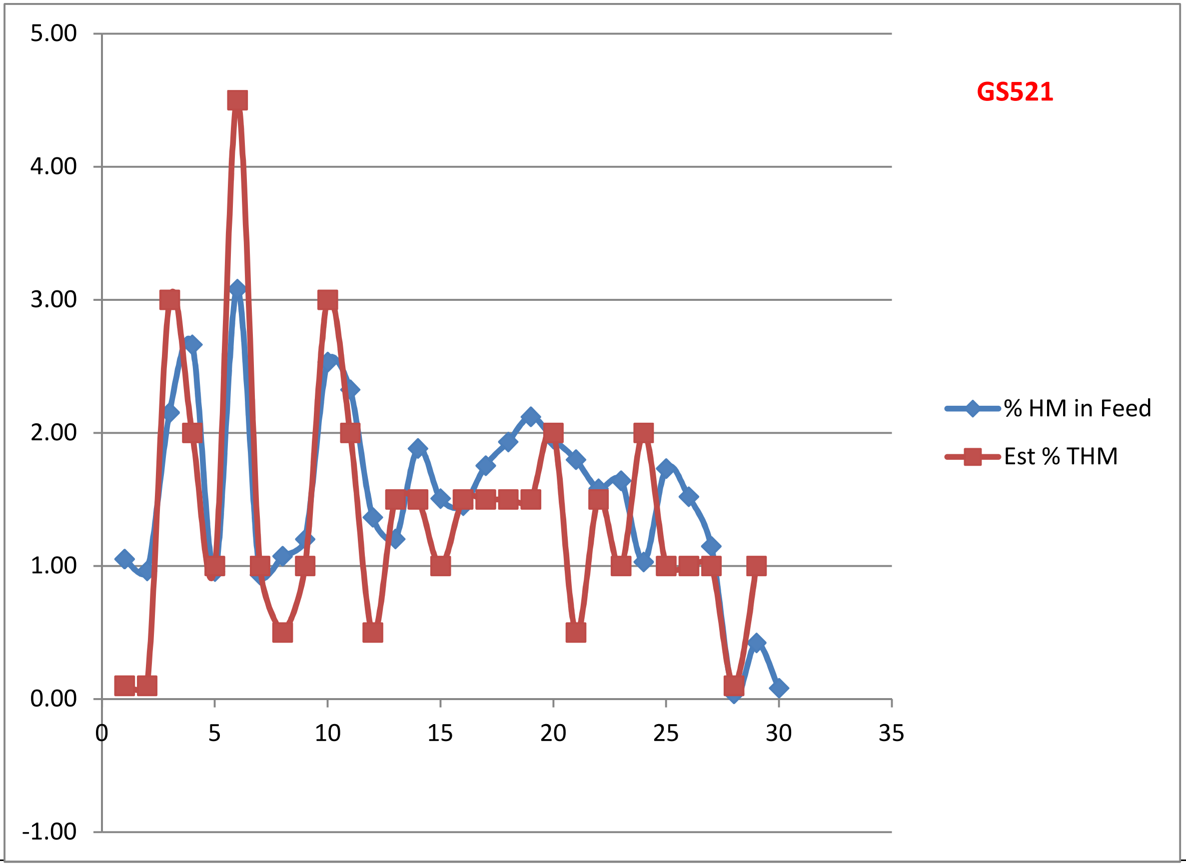


GS518: Comparison of In-field panning vs assays by RJ Robbins

Note: There are no drill holes numbered GS519, GS520

Sample	% HM in Feed	Est % THM
521-9	1.05	0.1
521-10	0.96	0.1
521-11	2.15	3
521-12	2.66	2
521-13	0.96	1
521-14	3.08	4.5
521-15	0.93	1
521-16	1.07	0.5
521-17	1.20	1
521-18	2.53	3
521-19	2.32	2
521-20	1.37	0.5
521-21	1.20	1.5
521-22	1.88	1.5
521-23	1.51	1
521-24	1.45	1.5
521-25	1.75	1.5
521-26	1.93	1.5
521-27	2.12	1.5
521-28	1.95	2
521-29	1.80	0.5
521-30	1.58	1.5
521-31	1.64	1
521-32	1.03	2
521-33	1.73	1
521-34	1.52	1
521-35	1.15	1
521-36	0.04	0.1
521-37	0.42	1
521-38	0.08	

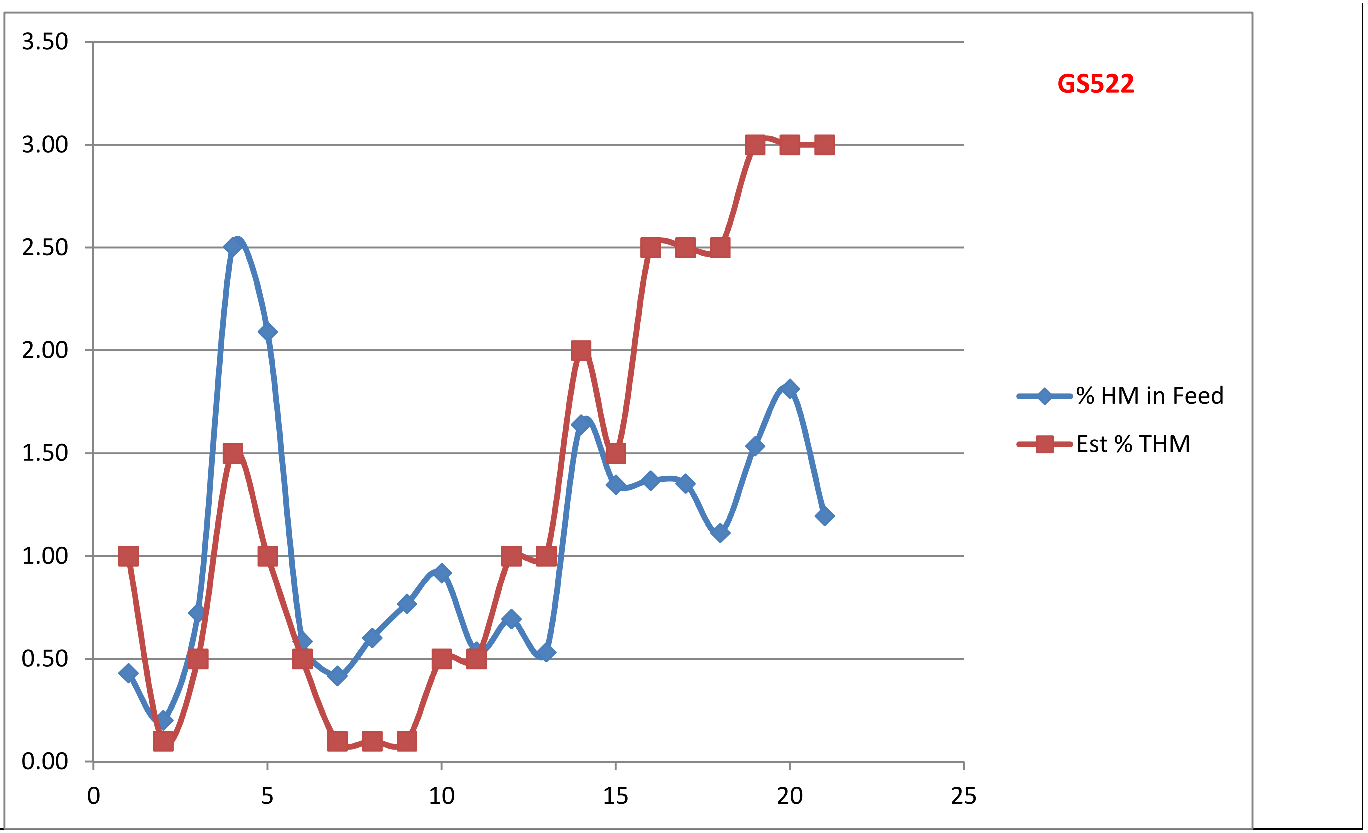
correl
0.761448



GS521: Comparison of In-field panning vs assays by RJ Robbins

Sample	% HM in Feed	Est % THM
522-1	0.66	1
522-2	0.50	0.5
522-3	0.52	.0.5
522-4	0.43	1
522-5	0.20	0.1
522-6	0.72	0.5
522-7	2.50	1.5
522-8	2.09	1
522-9	0.59	0.5
522-10	0.42	0.1
522-11	0.60	0.1
522-12	0.77	0.1
522-13	0.92	0.5
522-14	0.54	0.5
522-15	0.69	1
522-16	0.53	1
522-17	1.64	2
522-18	1.35	1.5
522-19	1.37	2.5
522-20	1.35	2.5
522-21	1.11	2.5
522-22	1.53	3
522-23	1.81	3
522-24	1.20	3

correel
0.626542



GS522: Comparison of In-field panning vs assays by RJ Robbins

CERTIFICATE OF ANALYSIS

Work Order : **EB1204766**
Client : **ROBBINS METALLURGICAL PTY LTD**
Contact : MS ELAINE S
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E-mail : elaines@rjrobbins.com.au
Telephone : +61 07 3376 9777
Facsimile : +61 07 3376 9699
Project : ----
Order number : 00000440
C-O-C number : ----
Sampler : ----
Site : ----

Quote number : ----

Page : 1 of 3
Laboratory : Environmental Division Brisbane
Contact : Customer Services
Address : 32 Shand Street Stafford QLD Australia 4053
E-mail : Brisbane.Enviro.Services@alsglobal.com
Telephone : +61 7 3243 7222
Facsimile : +61 7 3243 7218
QC Level : NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Date Samples Received : 20-FEB-2012
Issue Date : 28-FEB-2012

No. of samples received : 1
No. of samples analysed : 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: **WATER**			Client sample ID	**1 water sample**	----	----	----	----
			Client sampling date / time	17-FEB-2012 15:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EB1204766-001**	**----**	**----**	**----**	**----**
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**3.90**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**2920**	----	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	5	mg/L	**1890**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**35**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**80**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**392**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**36**	----	----	----	----

ROBBINS
METALLURGICAL

Metallurgical Scoping Test Work to Develop Conceptual Process Flow Diagram

Oresome Australia Pty Ltd
Gippsland Mineral Sands Project

Document No: 486-PM-REP-0000-8003 Rev B

Prepared by Robbins Metallurgical Pty Ltd

B	16/05/12	FINAL	AK	ND	MR
A	06/05/12	DRAFT FOR INTERNAL AND CLIENT REVIEW	AK	ND/SH	MR
Rev	Date	Description	Prepared	Checked	Approved

Mineral Processing Technologies and Services

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Robbins Metallurgical Pty Ltd has made every effort to ensure that the information presented and conclusions reached are realistic and not misleading. Robbins Metallurgical Pty Ltd makes no warranty as to the accuracy of the information contained in this report and will not accept responsibility or liability for any loss incurred by any person or organization relying on the information in this report.

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1.0 OVERALL SUMMARY

Metallurgical scoping process flow diagram development test work was completed on a bulk sample from Glenaladale Main (Test Series 1) and Mossiface (Test Series 100).

Head analyses of these two samples indicated the following heavy mineral and slimes content as per Table 1.0.

	Glenaladale Main	Mossiface
Slimes (-38µm)	26.7	18.2
HM (+2.85sg)	2.7	1.9

Table 1.0 Head Analyses

Mineralogical analyses of the heavy mineral for Glenaladale Main and Mossiface is included below as Table 1.1 with respect valuable mineral contents.

	Ilmenite	Leucoxene	Rutile	Zircon
Glenaladale Main	32	32	2.5	16
Mossiface	29	23.5	0.5	28

Table 1.1 Mineralogical Analyses of Heavy Mineral

The test work completed and discussed herein confirmed that mineral sands products of acceptable quality could be produced as per Table 1.2 for Glenaladale Main, Table 1.3 for Mossiface.

	TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	U XRF	Th XRF
Primary Zircon	0.14	0.05	32.7	0.1	65.5	391	222
Secondary Zircon	0.79	0.07	31.2	0.1	62.5	448	279

	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
HiTi 70	80.9	7.4	6.3	1.8	0.6	0.2	36	123
HiTi 80	83.7	7.0	1.9	1.1	3.6	0.1	16	74
Primary Ilmenite	48.4	46.4	0.8	0.8	0.8	0.1	0.0	36.8

Table 1.2 Glenaladale Main Produced Products

	TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	U XRF	Th XRF
Primary Zircon	0.10	0.03	33.80	0.31	63.00	415	217
Secondary Zircon	0.73	0.04	32.60	0.24	65.20	514	269

	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
HiTi 70	-	-	-	-	-	-	-	-
HiTi 80	-	-	-	-	-	-	-	-
Primary Ilmenite	57.0	36.8	0.8	0.5	0.6	0.1	27	102

Table 1.3 Mossiface Produced Products

Primary Zircon product is of premium quality with the exception of the U+Th levels which exceed the required <500ppm level for premium grade. Although the U+Th levels exceed 500ppm it is Robmet’s understanding that this material would still be marketed as premium grade.

Secondary Zircon product is of chemical/special grade quality containing <1.0% TiO_2 and <1,000ppm U+Th.

Potential HiTi products were only produced from Glenaladale Main material as insufficient material from Mossiface was available.

Robmet understand that HiTi products are of acceptable quality for use in applications such as welding rod manufacture, other than Titanium Dioxide production. Data from Glenaladale Main also suggest that a single HiTi 70 product as per product specification contained in Table 1.4 could be produced.

	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	%	%	%	%	%	%	ppm	ppm
HiTi 70	76.3	8.3	9.1	1.9	1.1	0.2	32	130

Table 1.4 Potential HiTi 70 Product

Further to the above further potential exist to produce a single Titanium Product containing >57% TiO_2 but the production of such a product would be subject to further metallurgical testing and detailed market evaluations.

Ilmenite products produced from the two samples contain different TiO_2 levels with material from Glenaladale Main containing 48.4% TiO_2 and material from Mossiface containing 57% TiO_2, regardless of containing similar levels of ilmenite as per grain count, thereby indicating varying TiO_2 levels for ilmenite. Confirmation of this would require further mineralogical and metallurgical evaluations. Cr_2O_3 levels for the Glenaladale Main material are high at 0.8% and would require further work to ascertain its solubility in sulphuric acid (solubility of <0.1% required for Titanium Dioxide production) and if it is liberated or part of the ilmenite grain.

Product sizing data confirmed the relatively fine nature of the material and is enclosed as appendix 7.2.

Overall un-optimised mineral test work recoveries for the valuable heavy minerals zircon, rutile and ilmenite are within the expected range whereas the recovery of the light heavy mineral leucoxene is low calculated at <10% and is believed to be associated with the high level of alteration and fine nature of the material. Actual test work recoveries and projected mineral recoveries for Glenaladale Main and Mossiface is included as Table 1.5 and Table 1.6.

	Zircon	
	Test Work	Projected
WCP - HMC	88.4	95.0
CUP - N/M	92.6	95.0
Rougher HTR N/M	96.0	95.0
Wet Zircon Conc	94.3	95.0
Dry Zircon (Primary Zircon)	57.6	65.0
Dry Zircon (Secondary Zircon)	19.5	25.0
Overall (Primary+Secondary Zircon)	**57.2**	**73.3**

	Titanium Minerals					
	Test Work			Projected		
	Ilmenite	Leucoxene	Rutile	Ilmenite	Leucoxene	Rutile
WCP - HMC	68.1	19.1	91.9	75.0	25.0	95.0
CUP - N/M	7.1	86.1	71.1	7.0	85.0	75.0
CUP - Mag	87.8	3.1	4.3	90.0	5.0	4.0
Ilmenite 1	90.0	0.0	0.0	90.0	0.0	0.0
Rougher HTR Cond	64.3	55.4	85.3	65.0	55.0	90.0
HiTi Concentrate 1	30.2	7.3	29.3	30.0	10.0	30.0
HiTi Concentrate 2	69.8	92.7	70.7	70.0	90.0	70.0
HiTi 70	38.0	43.8	75.6	40.0	45.0	80.0
HiTi 80	42.2	69.7	79.0	45.0	70.0	85.0
Overall (Ilmenite 1)	**53.8**	**0.0**	**0.0**	**60.8**	**0.0**	**0.0**
Overall (HiTi 70)	**0.8**	**3.7**	**29.8**	**1.0**	**4.7**	**35.9**
Overall (HiTi 80)	**0.4**	**0.5**	**12.9**	**0.5**	**0.8**	**16.4**

Table 1.5 Glenaladale Main Mineral Recoveries – Based on Mineralogical Analyses

	Zircon	
	Test Work	Projected
WCP - HMC	84.5	95.0
CUP - N/M	94.8	95.0
Rougher HTR N/M	90.4	95.0
Wet Zircon Conc	93.6	95.0
Dry Zircon (Primary Zircon)	60.2	65.0
Dry Zircon (Secondary Zircon)	14.8	25.0
Overall (Primary+Secondary Zircon)	**50.8**	**73.3**

	Titanium Minerals					
	Test Work			Projected		
	Ilmenite	Leucoxene	Rutile	Ilmenite	Leucoxene	Rutile
WCP - HMC	51.6	16.6	91.0	75.0	25.0	95.0
CUP - N/M	25.0	88.9	87.5	7.0	85.0	75.0
CUP - Mag	73.0	5.2	0.0	90.0	5.0	4.0
Ilmenite 1	82.5	37.0	0.0	90.0	0.0	0.0
Rougher HTR Cond	60.7	84.3	95.4	65.0	85.0	90.0
HiTi Concentrate 1	79.7	38.1	87.8	30.0	40.0	30.0
HiTi Concentrate 2	20.3	61.9	12.2	70.0	60.0	70.0
HiTi 70	*38.0*	*43.8*	*75.6*	40.0	45.0	80.0
HiTi 80	*42.2*	*69.7*	*79.0*	45.0	70.0	85.0
Overall (Ilmenite 1)	**31.1**	**0.3**	**0.0**	**60.8**	**0.0**	**0.0**
Overall (HiTi 70)	**0.6**	**3.4**	**7.0**	**1.0**	**4.9**	**35.9**
Overall (HiTi 80)	**2.6**	**3.3**	**52.6**	**0.5**	**5.1**	**16.4**

Table 1.6 Mossiface Mineral Recoveries – Based on Mineralogical Analyses

Overall projected recoveries for zircon are within expected range of 65-75%. Projected Ilmenite and rutile recoveries are within the expected range of 60-75% for ilmenite and 50-65% for rutile. Leucoxene recovery is low calculated at 6.7% and predicted at 9.9% and is associated with the loss to the wet concentration plant tailings and is as a direct result of alteration and fine grained nature. Further metallurgical work will be required to optimise these recoveries and evaluate the impact thereof of product production, particularly zircon and HiTi products.

2.0 INTRODUCTION

Robbins Metallurgical Pty Ltd “Robmet” was requested by Mr Stewart Hagan of Oresome Australia Pty Ltd to complete metallurgical process flow diagram development test work on two samples referred to as Glenaladale Main and Mossiface.

Each sample was prepared by compositing individual meter by meter drill samples for a selected ore zone based on a selected cut-off grade of 1.0% as advised by Oresome’s consulting geologist Mr Brett Duck.

Data from the metallurgical test program is discussed in detail herein.

3.0 TEST WORK PROCEDURES

3.1 Spiral Separator Test Work

Bulk mineral processing utilizing spiral separators were completed utilizing a MG 6.3 CPG – Mineral Technologies spiral separator operating at 2tph per start and 30% solids for the rougher/scavenger/middlings/cleaner duties and a NHM Multotec separator operating at 1.5tph per start and 30% solids for the re-cleaner and finisher duties.

3.2 Wet High Intensity Magnetic Separator Test Work

Wet High Intensity Magnetic Separator Test Work was completed utilizing a full scale 16-pole Heavy Mineral Development "HMD" unit operating at 40tph equivalent, 35% feed solids, 100% intensity and standard wash water conditions for the primary stage unit and 20tph, 35% feed solids, 100% intensity and standard wash water conditions for the secondary stage.

3.3 Wet Shaking Table Test Work

Wet shaking table test work was performed using a ¼ size Wilfley wet shaking table operating at conditions to simulate a full scale production unit.

3.4 Electrostatic Separator Test Work

Electrostatic Separator test work was performed using a bench scale Coronastat Evoiii separator operating at 220rpm, 26kilovolts, 4tph equivalent, 75-80°C feed temperature and configured as a middlings retreat unit.

3.5 Magnetic Separator Test Work

3.5.1 Rare Earth Roll Magnetic Separator Test Work

Rare Earth Roll Magnetic Separator "RERMS" test work was performed using a single stage bench scale Eriez RERMS, fitted with a 150mm roll and Kevlar belt operating at the required roll speed.

3.5.2 Induced Roll Magnetic Separator Test Work

Induced Roll Magnetic Separator test work was performed using a bench scale HMD Induced Roll Magnetic separator operating at 150rpm and a magnetic intensity equivalent to 7.5amp current input.

4.0 RESULTS AND DISCUSSION

4.1 Head Sample Analyses

A representative sample +/- 20kilograms was removed from Glenaladale Main bulk sample (Test Series 1) and Mossiface bulk sample (Test Series 100) for head characterization to determine oversize (+1.0mm), slimes (-38µm) and heavy mineral (mineral with a specific gravity >2.85sg). A sample of the heavy mineral was submitted for chemical analyses and mineralogical determination. Characterization data is included below as Table 4.0, Table 4.1 and Table 4.2.

	Glenaladale Main	Mossiface
O/S (+1.0mm)	0.8	1.7
Slimes (-38µm)	26.7	18.2
HM (+2.85sg)	2.7	1.9
Quartz (-2.85sg)	69.8	78.3

Table 4.1 Ore Characterization

	TiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
Heavy Mineral	%	%	%	%	ppm	ppm
Glenaladale Main	32.2	4.4	0.5	9.9	127	646
Mossiface	31.2	5.8	0.1	17.7	382	3040

Table 4.2 Heavy Mineral Chemical Analyses

	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
Heavy Mineral	%	%	%	%	%
Glenaladale Main	32.0	32.0	2.5	0.0	16.0
Mossiface	29.0	23.5	0.5	0.0	28.0

Table 4.3 Heavy Mineral Mineralogical Analyses

Data depicted above indicate Glenaladale Main to contain higher levels of heavy mineral, higher slimes and lower zircon concentration as compared to Mossiface. Of note is the high level of Thorium associated with Mossiface indicating a potentially higher concentration of monazite.

4.2 Feed Preparation Process Flow Development

As received samples was homogenised and processed over a vibrating screen fitted with a 1.0mm screen, oversize material reported to a collection hopper and undersize material was pumped through a Multotec hydro-cyclone for de-sliming with overflow reporting into a laboratory thickener and underflow into collection hoppers. For ease of reporting the feed preparation process flow development block diagram and balance have been included as part of the wet concentration process flow development.

Overflow material (slimes) was thickened using standard flocculants and no observable settling issues were noted. In order to better ascertain the overflow (slimes) behaviour a 10 kilogram sample from Glenaladale Main was submitted to BASF for full flocculent selection and settling rate tests.

BASF test work confirmed that Glenaladale slimes is readily flocculated using conventional medium anionic Magnaflow 5250 flocculent achieving at a optimised dose rate of 60g/tonne (dry slimes) achieving settling rates of 14m/hr. Test work completed by BASF is included in detail within the appendices.

4.3 Wet Concentration Process Flow Development

4.3.1 Spiral Separator Comparison

A 100kilogram sub-sample from the Glenaladale Main sample was removed and used to perform spiral comparison test work between a CPG – MG 6.3 spiral separator and a Multotec SC 20 HC spiral separator with both units operating at 1.8tph and 30% solids. Metallurgical test data is included within the appendices and release curve data below as Figure 4.0 based on heavy mineral and Figure 4.1 based on ZrO_2.

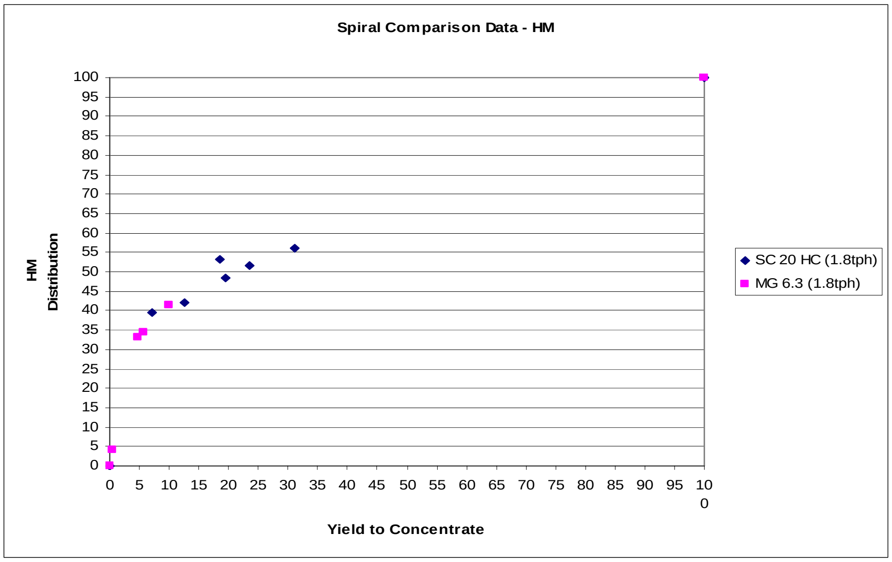

Figure 4.0 Spiral Separator Performance Evaluation – Heavy Mineral Data

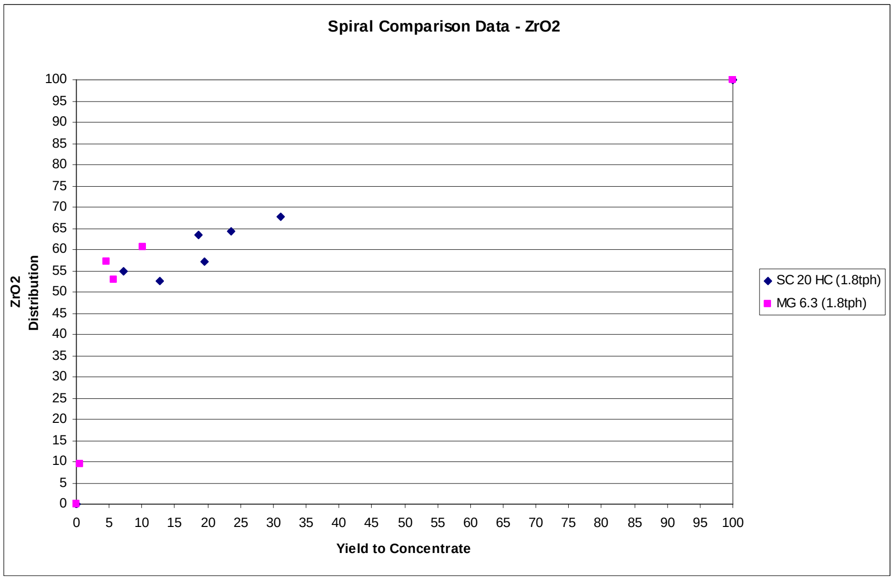

Figure 4.1 Spiral Separator Performance Evaluation – ZrO_2 Data

Data depicted above indicated that both spiral separators tested gave similar heavy mineral recovery performance, with the MG 6.3 spiral separator having a marginal improved ZrO_2 performance, compared to the SC 20 HC.

Given fine grained nature of the material the fine grained mineral spiral from Multotec the NHM was tested as a comparison to the MG 6.3. Heavy Mineral release curve data is included below as Figure 4.2.

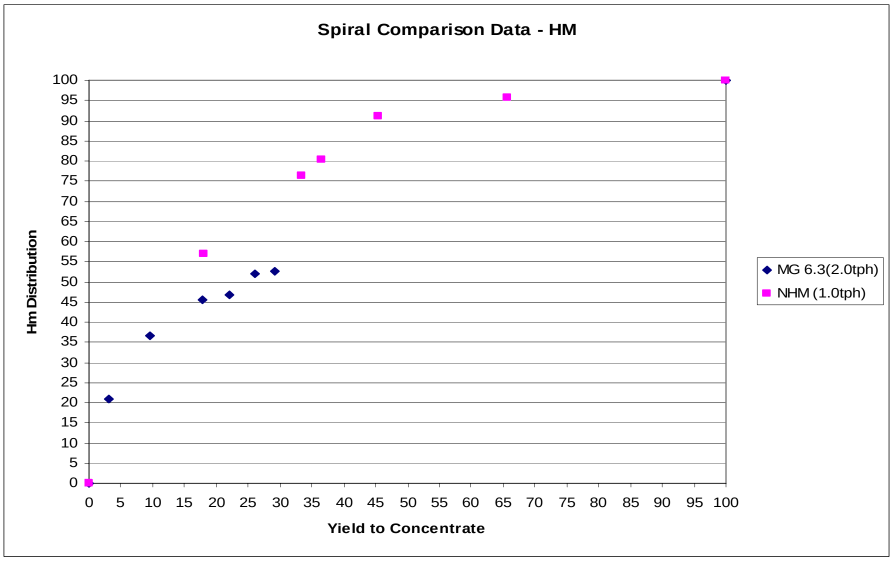

Figure 4.2 Spiral Separator Performance Evaluation – Heavy Mineral Data

Data depicted above indicate the NHM operating at 1.0tph to have a 10-15% higher heavy mineral distribution to concentrate as compared to the MG 6.3 when operating at 2.0tph. This although significant needs to be reviewed in the context of 1. reduction in feed rate on spiral separators within an acceptable operating range would results in improved performance and 2. given the potential throughput rate of 1,500-2,000tph operating at 1.0tph would result in a significant large wet concentrator.

Based on the above an given throughput constraints Robmet after consultation with Oresome elected to proceed with the MG 6.3 as the selected spiral separator for the scoping test work. Further metallurgical test work for the optimization and final spiral selection will be completed and reported at a later date and under a different report number.

4.3.2 Glenaladale Main

Screened, de-slimed material from Glenaladale Main was processed on a stage by stage basis through a seven stage spiral separator circuit producing a final heavy mineral concentrate containing 83.7% heavy mineral. A metallurgical block diagram is attached below as Figure 4.3.

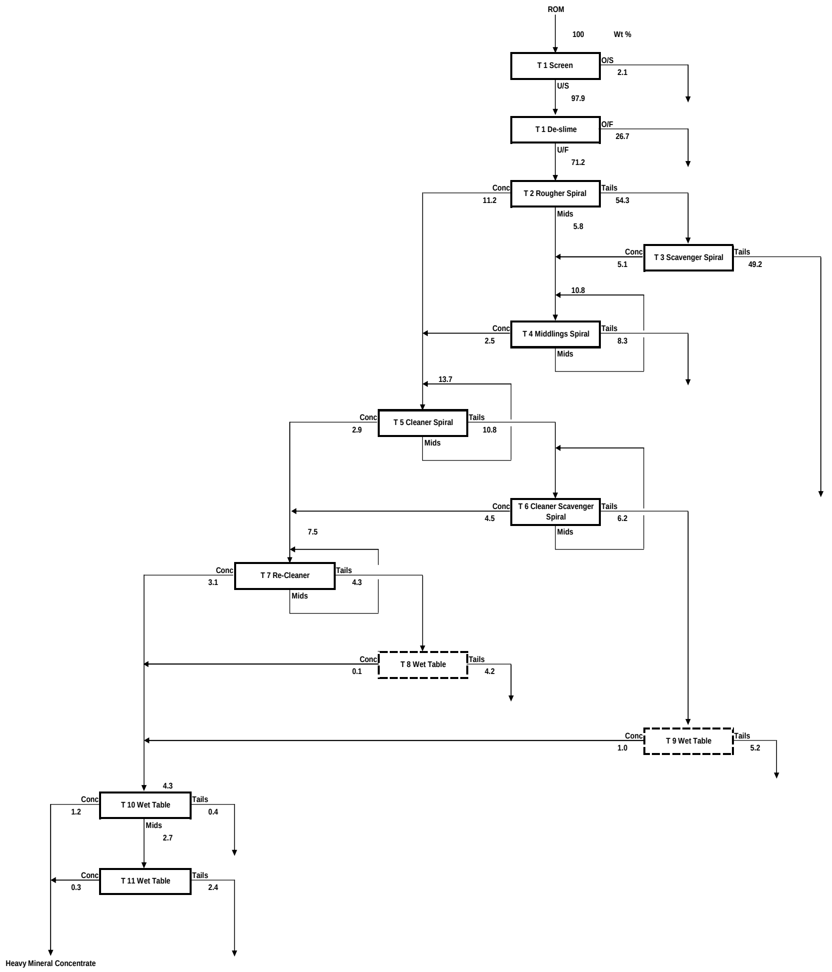

Figure 4.3 Wet Concentration Process Metallurgical Block Diagram – Glenaladale Main

All outflow streams from the test program were submitted for chemical and mineralogical analyses to complete a metallurgical balance with data included below as Table 4.4 and Table 4.5 (stage by stage data is included within the appendices).

		Assay			Distribution		
		HM	ZrO2	TiO2	HM	ZrO2	TiO2
	Wt %	%	%	%	%	%	%
T 1 O/S	2.1	0.0	0.0	0.0	0.0	0.0	0.0
T 1 Slimes	26.7	0.0	0.0	0.0	0.0	0.0	0.0
T 3 Tails	49.2	1.1	0.0	0.3	21.7	1.1	17.6
T 4 Tails	8.3	2.8	0.1	0.8	9.5	3.5	9.0
T 8 Tails	4.2	3.2	0.1	1.1	5.3	1.6	5.8
T 9 Tails	5.2	1.6	0.1	0.5	3.3	1.5	3.6
T 10 Tails	0.4	12.1	1.3	4.0	2.0	1.9	2.2
T 11 Tails	2.4	9.0	0.5	2.7	8.8	4.2	8.6
T 10 Conc	1.2	83.9	16.9	26.8	39.8	74.1	41.1
T 11 Conc	0.3	83.0	11.4	32.8	9.5	12.0	12.1
	100.0	2.5	0.27	0.8	100.0	100.0	100.0

HMC	1.5	83.7	15.8	28.0	49.3	86.1	53.2

Table 4.4 Wet Concentration Process Metallurgical Chemical Balance – Glenaladale Main

Chemical data indicate an overall heavy mineral recovery of 49.3%, ZrO_2 recovery of 86.1% and a TiO_2 recovery of 53.2%. Mineralogical recovery data (Table 4.5) indicate a zircon recovery of 88.4%, ilmenite recovery of 68.1%, leucoxene recovery of 19.1% and a rutile recovery of 91.9%.

		Mineralogy					Grain Count				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
Concentrate	1.5	38.3	10.5	3.8	0.0	25.8	68.1	19.1	91.9	-	88.4
Tails	98.5	0.3	0.7	0.01	0.0	0.05	31.9	80.9	8.1	-	11.6
	100.0	0.8	0.8	0.06	0.0	0.4	100.0	100.0	100.0	-	100.0

Table 4.5 Wet Concentration Process Metallurgical Mineralogical Balance – Glenaladale Main

Recoveries for zircon and rutile are high and within the typical range (85-95%) for un-optimised metallurgical test work. Ilmenite recoveries are lower than what would be typically expected but is believed to be associated with the altered nature (Geochempet observations) of the ilmenite. This recovery reduction due to alteration (Geochempet observations) is very prominent for the leucoxene material with the wet concentration process only having a leucoxene recovery of 19.1%. The overall recovery for the valuable heavy minerals zircon, rutile and ilmenite is believed to be acceptable.

4.3.3 Mossiface

As per Glenaladale Main, screened, de-slimed material from Mossiface was processed on a stage by stage basis through a five stage spiral separator circuit, with the final two spiral stages simulated utilizing a wet shaking table due to material constraints, producing a final heavy mineral concentrate containing 83.0% heavy mineral. A metallurgical block diagram is attached below as Figure 4.4.

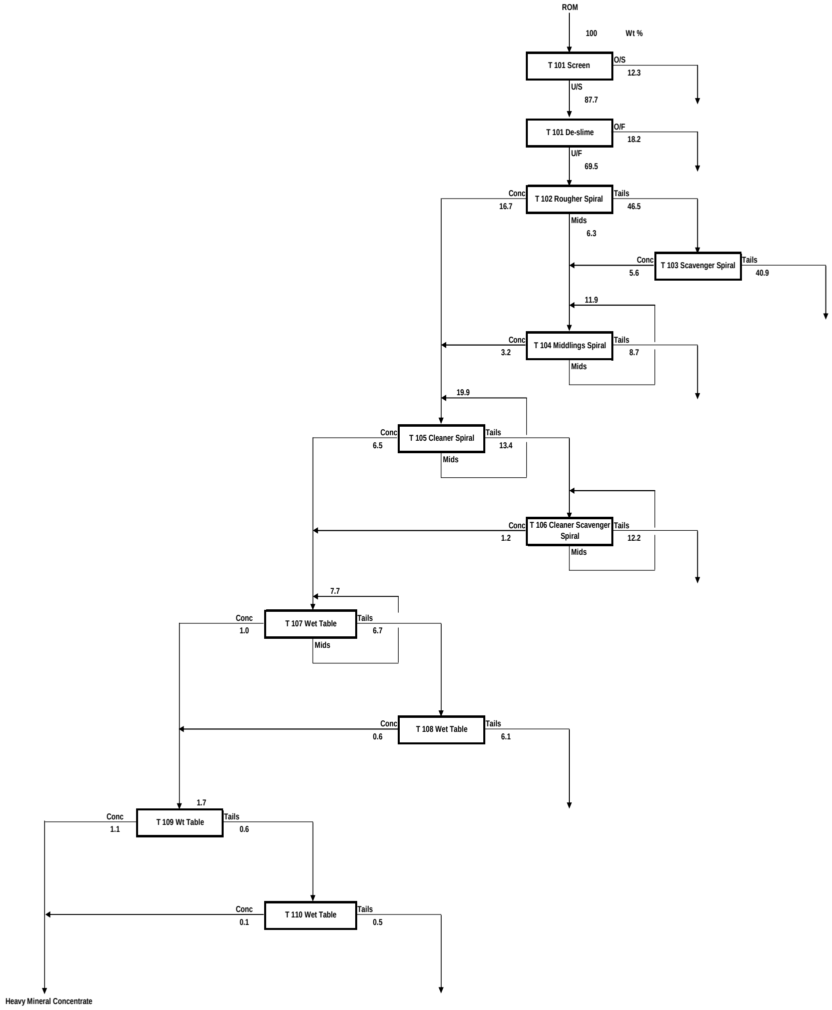

Figure 4.4 Wet Concentration Process Metallurgical Block Diagram – Mossiface

Outflow streams from the test program were submitted for chemical and mineralogical analyses to complete a metallurgical balance with data included below as Table 4.6 and Table 4.7 (stage by stage data is included within the appendices).

		Assay			Distribution		
		HM	ZrO2	TiO2	HM	ZrO2	TiO2
	Wt %	%	%	%	%	%	%
T 101 O/S	12.3	0.0	0.0	0.0	0.0	0.0	0.0
T 101 Slimes	18.2	0.0	0.0	0.0	0.0	0.0	0.0
T 103 Tails	40.9	0.9	0.0	0.3	20.7	0.5	20.5
T 104 Tails	8.7	1.8	0.2	0.6	8.5	5.3	9.7
T 106 Tails	12.2	0.8	0.1	0.3	5.1	3.1	6.1
T 108 Tails	6.1	2.9	0.3	1.2	9.5	5.2	13.5
T 110 Tails	0.5	7.2	1.0	2.9	1.9	1.5	2.5
T 109 Conc	1.1	83.2	23.3	21.6	49.6	78.3	42.6
T 110 Conc	0.1	80.5	18.7	26.6	4.7	6.2	5.1
	100.0	1.8	0.3	0.55	100.0	100.0	100.0
HMC	1.2	83.0	22.9	22.1	54.3	84.5	47.7

Table 4.6 Wet Concentration Process Metallurgical Chemical Balance – Mossiface

Chemical data indicate an overall heavy mineral recovery of 54.3%, ZrO_2 recovery of 84.5% and a TiO_2 recovery of 47.7%. Mineralogical recovery data (Table 4.7) indicate a zircon recovery of 84.5%, ilmenite recovery of 51.6%, leucoxene recovery of 16.6% and a rutile recovery of 91.0%.

		Mineralogy					Grain Count				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
Concentrate	1.2	22.4	5.8	1.7	0.0	34.7	51.6	16.6	91.0	-	84.5
Tails	98.8	0.3	0.4	0.0	0.0	0.1	48.4	83.4	9.0	-	15.5
	100.0	0.52	0.42	0.02	0.00	0.49	100.0	100.0	100.0	-	100.0

Table 4.7 Wet Concentration Process Metallurgical Mineralogical Balance – Mossiface

Recoveries for zircon and rutile are high and within the typical range (85-95%) for un-optimised metallurgical test work. As for Glenaladale Main Ilmenite recoveries are lower than what would be typically expected but is believed to be associated with the altered nature (Geochempet observations) of the ilmenite. This recovery reduction due to alteration (Geochempet observations) is very prominent for the leucoxene material with the wet concentration process only having a leucoxene recovery of 16.6%. The overall recovery for the valuable heavy minerals zircon, rutile and ilmenite is believed to be acceptable.

4.4 Concentrate Upgrade Process Flow Development

4.4.1 Glenaladale Main

Heavy Mineral Concentrate material produced from the wet concentration process development test work was processed through a simulated Concentrate Upgrade Process "CUP" to produce a magnetic and non-magnetic concentrate. A metallurgical block diagram is attached below as Figure 4.5.

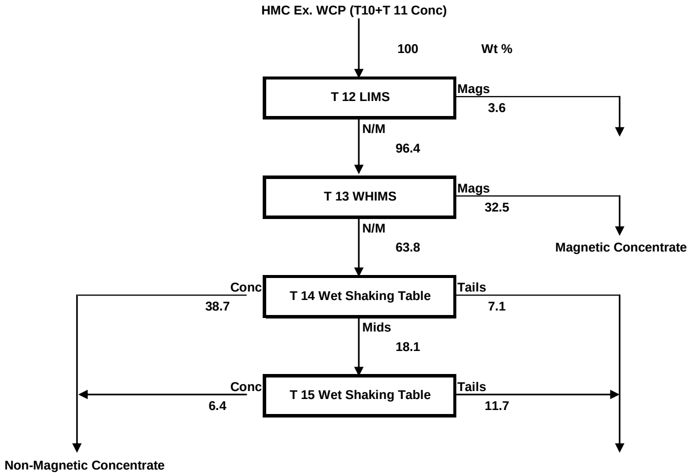

Figure 4.5 Concentrate Upgrade Process Metallurgical Block Diagram – Glenaladale Main

All outflow streams from the CUP development test program was submitted for chemical and mineralogical analyses so as to complete a metallurgical balance with data included below as Table 4.8 and 4.9.

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 12 Mags	3.6	48.2	45.2	1.9	0.7	0.5	0.9	0	92
T 13 Mags	32.5	46.0	44.5	1.9	1.3	1.3	1.0	42	188
T 14 Tails	7.1	4.4	2.4	86.8	2.2	0.0	1.1	13	60
T 15 Tails	11.7	20.4	7.6	47.9	5.4	0.2	11.4	113	673
T 14 Conc	38.7	23.8	4.5	27.0	2.3	0.5	34.0	337	2310
T 15 Conc	6.4	15.2	3.3	53.6	2.5	0.3	20.2	192	1110
	100.0	29.6	19.1	26.3	2.3	0.7	16.2	170	1112

Magnetic Concentrate	32.5	46.0	44.5	1.9	1.3	1.3	1.0	42	188
N/M Concentrate	45.1	27.9	6.3	43.2	3.8	0.5	35.0	346	2314

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 12 Mags	3.6	5.9	8.6	0.3	1.2	2.6	0.2	0.0	0.3
T 13 Mags	32.5	50.6	75.7	2.3	17.8	62.3	2.0	8.0	5.5
T 14 Tails	7.1	1.0	0.9	23.3	6.7	0.3	0.5	0.5	0.4
T 15 Tails	11.7	8.1	4.6	21.3	27.6	3.6	8.2	7.8	7.1
T 14 Conc	38.7	31.1	9.1	39.7	39.7	28.5	81.1	76.5	80.3
T 15 Conc	6.4	3.3	1.1	13.1	7.0	2.7	8.0	7.2	6.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Magnetic Concentrate	32.5	50.6	75.7	2.3	17.8	62.3	2.0	8.0	5.5
N/M Concentrate	45.1	34.4	10.2	52.8	46.7	31.2	89.1	83.7	86.7

Table 4.8 Concentrate Upgrade Process Metallurgical Chemical Balance – Glenaladale Main

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 12 Mags	3.6	94.0	0.0	0.0	0.0	0.0	8.9	0.0	0.0	-	0.0
T 13 Mags	32.5	93.0	1.0	0.5	0.0	1.5	78.9	3.1	4.3	-	1.9
T 14/15 Conc	45.1	6.0	20.0	6.0	0.0	53.0	7.1	86.1	71.1	-	92.6
T 14/15 Tails	18.7	10.5	6.0	5.0	0.0	7.5	5.1	10.7	24.6	-	5.4
HMC	100.0	38.3	10.5	3.8	0.0	25.8	100.0	100.0	100.0	-	100.0

Table 4.9 Concentrate Upgrade Process Mineralogical Balance – Glenaladale Main

Processing of the heavy mineral concentrate through the developed Concentrate Upgrade Process produced a magnetic concentrate containing 46% TiO_2 and a non-magnetic concentrate containing 35% ZrO_2 and 27.9% TiO_2. TiO_2 recovery to magnetic and non-magnetic fraction was calculated at 50.6% and 34.4% respectively, whilst ZrO_2 recovery to non-magnetic concentrate was calculated at 89.1%. Mineralogical data indicated individual titanium mineral recoveries to magnetic concentrate as 87.8% for ilmenite, 3.1% for leucoxene and 4.3% for rutile. Mineral recoveries to non-magnetic concentrate are calculated at 7.1% for ilmenite, 86.1% for leucoxene, 71.1% for rutile and 92.6% for zircon.

Un-optimised mineral recoveries to magnetic and non-magnetic fractions are believed to be acceptable and within the expected range.

4.4.2 Mossiface

Heavy Mineral Concentrate material produced from the wet concentration process development test work was processed through a simulated Concentrate Upgrade Process “CUP” to produce a magnetic and non-magnetic concentrate. A metallurgical block diagram is attached below as Figure 4.6.

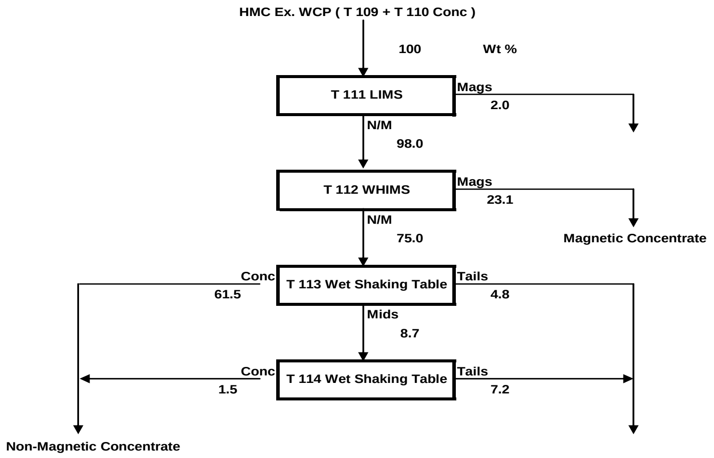

Figure 4.6 Concentrate Upgrade Process Metallurgical Block Diagram – Mossiface

All outflow streams from the CUP development test program was submitted for chemical and mineralogical analyses so as to complete a metallurgical balance with data included below as Table 4.10 and 4.11.

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 111 Mags	2.0	50.2	42.7	1.38	0.6	0.44	0.75	36	192
T 112 Mags	23.1	47.7	29.1	2.75	0.89	0.59	1.53	552	1870
T 113 Tails	4.8	2.3	0.6	93.0	1.4	0.01	1.0	19	114
T 114 Tails	7.2	18.5	2.6	47.5	6.0	0.03	16.9	205	2090
T 113 Conc	61.5	16.2	1.5	32.9	2.4	0.04	33.3	444	5900
T 114 Conc	1.5	12.7	1.2	48.9	2.0	0.03	26.7	293	3270
	100.0	23.6	8.7	29.5	2.2	0.17	22.5	421	4267

Magnetic Concentrate	23.1	47.7	29.1	2.8	0.9	0.6	1.5	552	1870
N/M Concentrate	63.0	18.2	1.8	38.7	3.1	0.0	35.1	464	6076

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 111 Mags	2.0	4.2	9.6	0.1	0.5	5.1	0.1	0.2	0.1
T 112 Mags	23.1	46.6	76.9	2.1	9.2	79.6	1.6	30.2	10.1
T 113 Tails	4.8	0.5	0.3	15.1	3.1	0.2	0.2	0.2	0.1
T 114 Tails	7.2	5.7	2.1	11.6	19.2	1.4	5.4	3.5	3.5
T 113 Conc	61.5	42.2	10.8	68.5	66.6	13.4	91.0	64.8	85.0
T 114 Conc	1.5	0.8	0.2	2.5	1.4	0.2	1.8	1.0	1.2
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Magnetic Concentrate	23.1	46.6	76.9	2.1	9.2	79.6	1.6	30.2	10.1
N/M Concentrate	63.0	43.0	11.0	71.0	68.0	13.7	92.7	65.9	86.2

Table 4.10 Concentrate Upgrade Process Metallurgical Chemical Balance – Mossiface

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 111 Mags	2.0	95.0	1.0	0.0	0.0	1.1	6.8	0.3	0.0	-	0.1
T 112 Mags	23.1	79.5	1.5	0.0	0.0	2.3	66.2	4.9	0.0	-	1.5
T 113/114 Conc	63.0	11.0	10.0	2.0	0.0	53.1	25.0	88.9	87.5	-	94.8
T 113/114 Tails	12.0	4.5	3.5	1.5	0.0	10.5	2.0	5.9	12.5	-	3.6
HMC	100.0	27.7	7.1	1.4	0.0	35.3	100.0	100.0	100.0	-	100.0

Table 4.11 Concentrate Upgrade Process Mineralogical Balance – Mossiface

Processing of the heavy mineral concentrate through the developed Concentrate Upgrade Process produced a magnetic concentrate containing 47.7% TiO_2 and a non-magnetic concentrate containing 35.1% ZrO_2 and 18.2% TiO_2. TiO_2 recovery to magnetic and non-magnetic fraction was calculated at 46.6% and 43% respectively, whilst ZrO_2 recovery to non-magnetic concentrate was calculated at 92.7%. Mineralogical data indicated individual titanium mineral recoveries to magnetic concentrate as 73% for ilmenite, 5.2% for leucoxene. Mineral recoveries to non-magnetic concentrate are calculated at 25% for ilmenite, 88.9% for leucoxene, 87.5% for rutile and 94.8% for zircon.

Un-optimised mineral recoveries to magnetic and non-magnetic fractions are believed to be acceptable and within the expected range.

4.5 Mineral Separation Process Flow Development

4.5.1 Non-Magnetic Rougher HTR Circuit – Glenaladale Main

Non-magnetic concentrate material produced from the concentrate upgrade process was processed through a seven stage electrostatic circuit producing a conductor and non-conductor concentrate. Non-conductor concentrate was processed over two stages of rare earth roll separators to produce a non-magnetic concentrate and magnetic rejects. A metallurgical block diagram is attached below as Figure 4.7.

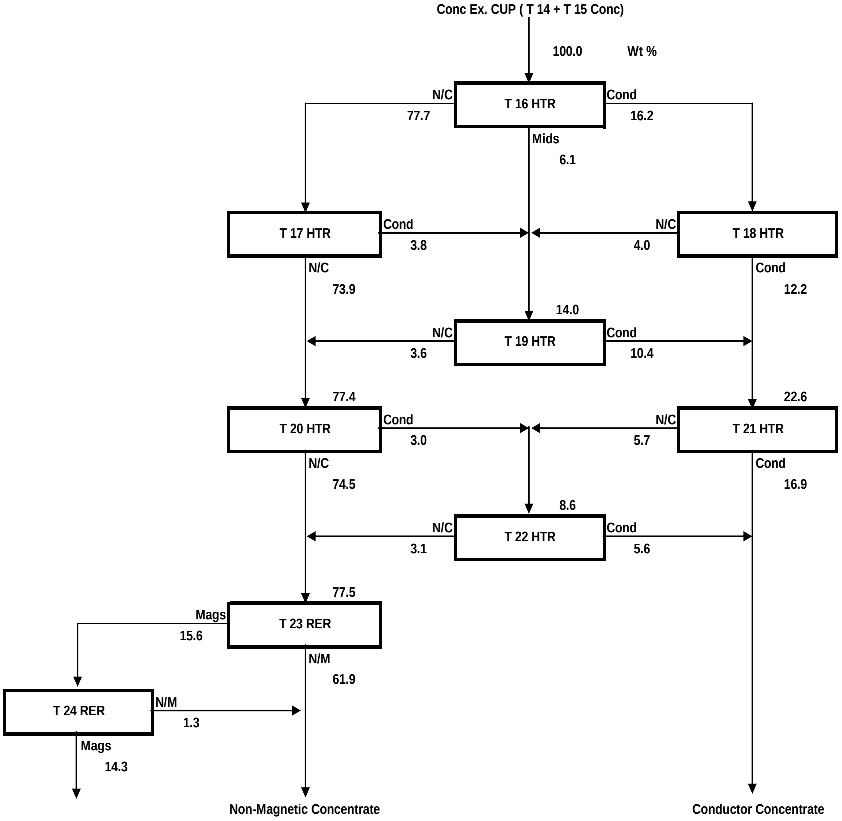

Figure 4.7 Non-Magnetic Rougher HTR Circuit Metallurgical Block Diagram – Glenaladale Main

Outflow streams were submitted for chemical and mineralogical analyses so as to complete a metallurgical balance with data included below as Table 4.12 and Table 4.13.

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 21+22 Cond	22.5	69.9	12.5	8.9	2.2	1.8	0.4	36	182
T 24 Mag	14.3	8.7	12.9	21.5	11.7	0.3	7.6	726	11300
T 23+24 N/M	63.3	9.5	0.4	39.2	0.9	0.0	48.1	416	491
Feed	100.0	22.9	4.9	29.9	2.7	0.5	31.6	375	1964

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 21+22 Cond	22.5	68.4	57.4	6.7	18.1	87.8	0.3	2.2	2.1
T 24 Mag	14.3	5.4	37.6	10.3	61.2	9.9	3.4	27.6	82.1
T 23+24 N/M	63.3	26.2	5.0	83.1	20.7	2.3	96.3	70.2	15.8
Feed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4.12 Rougher HTR Circuit Metallurgical Chemical Balance – Glenaladale Main

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T24 Mag	14.3	12.5	11.5	1.0	1.0	11.7	24.2	10.0	1.7	12.2	3.6
T 23/24 N/M	63.3	1.3	9.0	1.8	0.0	70.9	11.5	34.6	13.1	2.0	96.0
T 21/22 Cond	22.5	21.1	40.5	32.7	4.4	0.9	64.3	55.4	85.3	85.7	0.4
	100.0	7.4	16.4	8.6	1.2	46.7	100.0	100.0	100.0	100.0	100.0

Table 4.12 Rougher HTR Circuit Metallurgical Mineralogical Balance – Glenaladale Main

Overall ZrO_2 recovery to non-magnetic concentrate for the Rougher HTR Circuit is calculated at 96.3% and TiO_2 recovery to conductor concentrate is calculated at 68.4%. Mineralogical analyses of the non-magnetic concentrate indicate it to contain 9% leucoxene accounting for 34.6% of the leucoxene within the head sample, thereby indicating the bulk of the TiO_2 to be associated with leucoxene. Robmet believe that the leucoxene that report to this fraction to be highly altered containing elevated levels of silica, but would require further analyses to confirm this.

Mineralogical analyses indicate rutile/anatase recoveries of approximately 85% to conductor concentrate and a zircon recovery of 96% to non-magnetic concentrate. Recoveries of ilmenite and leucoxene are calculated at 64.3% and 55.4% respectively and although lower and as discussed previously are believed to be associated with highly altered material.

4.5.2 Non-Magnetic Rougher HTR Circuit – Mossiface

As per process flow for Glenaladale Main non-magnetic concentrate material produced from the concentrate upgrade process was processed through a seven stage electrostatic circuit producing a conductor and non-conductor concentrate. Non-conductor concentrate was processed over two stages of rare earth roll separators to produce a non-magnetic concentrate and magnetic rejects. A metallurgical block diagram is attached below as Figure 4.8.

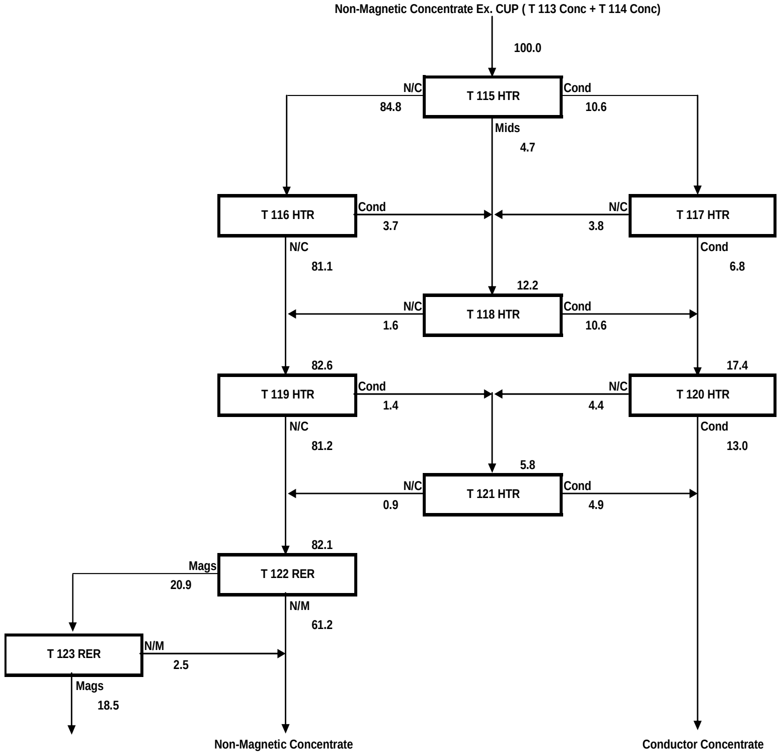

Figure 4.8 Non-Magnetic Rougher HTR Circuit Metallurgical Block Diagram – Mossiface

Outflow streams were submitted for chemical and mineralogical analyses so as to complete a metallurgical balance with data included below as Table 4.14 and Table 4.15.

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 120+121 Cond	17.9	76.5	4.9	11.5	1.4	0.2	1.2	49	157
T123 Mag	18.5	2.6	3.2	15.6	9.1	0.0	16.7	1290	27300
T 122+123 N/M	63.6	2.9	0.2	46.0	1.0	0.0	48.8	419	415
Feed	100.0	16.0	1.6	34.2	2.6	0.0	34.4	514	5332

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 120+121 Cond	17.9	85.4	55.5	6.0	9.8	74.4	0.6	1.7	0.5
T123 Mag	18.5	3.0	38.0	8.4	65.4	10.3	9.0	46.4	94.5
T 122+123 N/M	63.6	11.5	6.5	85.6	24.8	15.3	90.4	51.9	5.0
Feed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4.14 Rougher HTR Circuit Metallurgical Chemical Balance – Mossiface

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 120+121 Cond	17.9	17.2	38.5	32.7	0.0	1.8	60.7	84.3	95.4	-	0.6
T123 Mag	18.5	3.5	0.0	1.0	0.0	25.3	12.8	0.0	3.0	-	9.0
T 122+123 N/M	63.6	2.1	2.0	0.2	0.0	73.9	26.5	15.7	1.6	-	90.4
Feed	100.0	5.1	8.2	6.1	0.0	52.1	100.0	100.0	100.0	-	100.0

Table 4.15 Rougher HTR Circuit Metallurgical Mineralogical Balance – Glenaladale Main

Overall ZrO_2 recovery to non-magnetic concentrate for the Rougher HTR Circuit is calculated at 90.4% and TiO_2 recovery to conductor concentrate is calculated at 85.4%.

Mineralogical analyses indicate a rutile recovery of 95.4% to conductor concentrate and a zircon recovery of 90.4% to non-magnetic concentrate. Recoveries of ilmenite and leucoxene are calculated at 60.7% and 84.3% respectively.

Of note is the high level of U+Th for the feed material calculated at 5846ppm and is believed to be associated with high levels of monazite.

4.5.3 Non-Magnetic HiTi Circuit – Glenaladale Main

Conductor concentrate material produced from the rougher HTR circuit was processed over a two stage wet shaking table circuit, producing a concentrate and tailings. A metallurgical block diagram Figure 4.9, chemical balance Table 4.16 and mineralogical balance Table 4.17 is attached below.

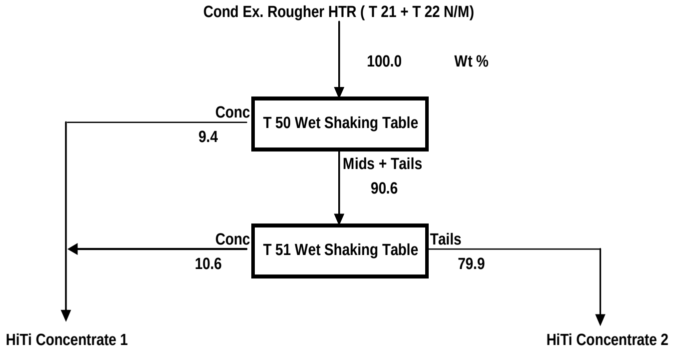

Figure 4.9 Non-Magnetic HiTi Circuit Metallurgical Block Diagram – Glenaladale Main

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 50 Conc	9.4	68.3	14.1	2.7	1.8	7.8	2.4	57	141
T 51 Conc	10.6	75.4	12.4	2.5	1.7	4.4	1.1	52	92
T 51 Tails	79.9	71.1	12.3	10.1	2.3	0.8	0.2	52	127
	100.0	71.3	12.5	8.6	2.2	1.8	0.5	52	125
HiTi Concentrate 1	20.1	72.1	13.2	2.6	1.7	6.0	1.7	54	115
HiTi Concentrate 2	79.9	71.1	12.3	10.1	2.3	0.8	0.2	52	127

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 50 Conc	9.4	9.0	10.7	2.9	7.6	39.9	46.0	10.2	10.7
T 51 Conc	10.6	11.2	10.6	3.1	8.3	25.4	23.0	10.5	7.8
T 51 Tails	79.9	79.7	78.8	94.0	84.1	34.7	31.0	79.2	81.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
HiTi Concentrate 1	20.1	20.3	21.2	6.0	15.9	65.3	69.0	20.8	18.5
HiTi Concentrate 2	79.9	79.7	78.8	94.0	84.1	34.7	31.0	79.2	81.5

Table 4.16 HiTi Circuit Metallurgical Chemical Balance – Glenaladale Main

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
Conc	20.1	31.8	14.7	47.7	1.7	4.1	30.2	7.3	29.3	7.6	94.7
Tails	79.9	18.5	47.0	28.9	5.1	0.1	69.8	92.7	70.7	92.4	5.3
Feed	100.0	21.1	40.5	32.7	4.4	0.9	100.0	100.0	100.0	100.0	100.0

Table 4.17 HiTi Circuit Metallurgical Mineralogical Balance – Glenaladale Main

Produced concentrate and tailings material was processed separately through electrostatic and magnetic separator stages so as to ascertain the possibility of producing a Rutile and Leucoxene product. A metallurgical block diagram Figure 4.10 for the processing of the concentrate and Tables 4.18, Table 4.19 for chemical and mineralogical balances are attached below.

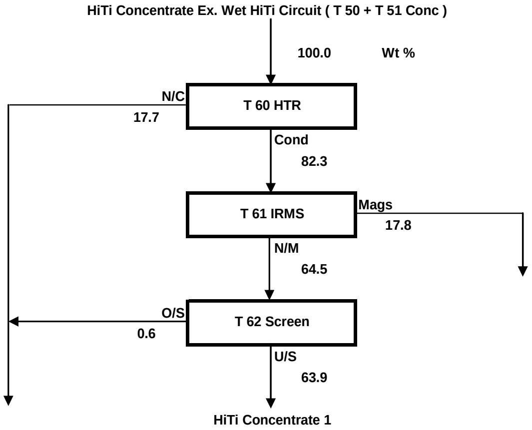

Figure 4.10 Non-Magnetic HiTi Circuit (Conc) Metallurgical Block Diagram – Glenaladale Main

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 60 N/C	17.7	71.4	7.0	6.1	1.4	3.4	0.4	34	163
T 61 Mags	17.8	29.8	40.3	1.3	4.3	16.9	0.2	21	141
T 62 O/S	0.6	60.8	15.5	1.8	2.8	10.1	0.2	36	123
T 62 U/S	63.9	83.7	7.0	1.9	1.1	3.6	0.1	16	74
	100.0	71.8	13.0	2.5	1.8	6.0	0.2	20	102

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 60 N/C	17.7	17.6	9.6	42.3	13.7	10.0	39.3	29.7	28.2
T 61 Mags	17.8	7.4	55.3	9.4	44.1	50.6	16.3	18.5	24.6
T 62 O/S	0.6								
T 62 U/S	63.9	74.5	34.4	47.8	41.2	38.3	43.8	50.6	46.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4.18 HiTi Circuit (Conc) Metallurgical Chemical Balance – Glenaladale Main

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 60 N/C	18.3	21.5	17.0	46.0	0.0	15.5	12.4	21.2	17.6	0.0	69.8
T 61 Mags	17.8	81.0	7.5	9.0	0.5	1.5	45.4	9.1	3.4	5.3	6.6
T 62 U/S	63.9	21.0	16.0	59.0	2.5	1.5	42.2	69.7	79.0	94.7	23.6
	100.0	31.8	14.7	47.7	1.7	4.1	100.0	100.0	100.0	100.0	100.0

Table 4.16 HiTi Circuit (Conc) Metallurgical Mineralogical Balance – Glenaladale Main

Processing of the HiTi concentrate material through an electrostatic and magnetic stage produced a final product containing 83.7% TiO_2, low levels of SiO_2, but high levels of Cr_2O_3. Overall TiO_2 recovery is calculated at 74.5%, whilst rutile recovery is calculated at 79% and leucoxene recovery 69.7%.

A metallurgical block diagram Figure 4.11 for the processing of the tails and Tables 4.20, Table 4.21 for chemical and mineralogical balances are attached below.

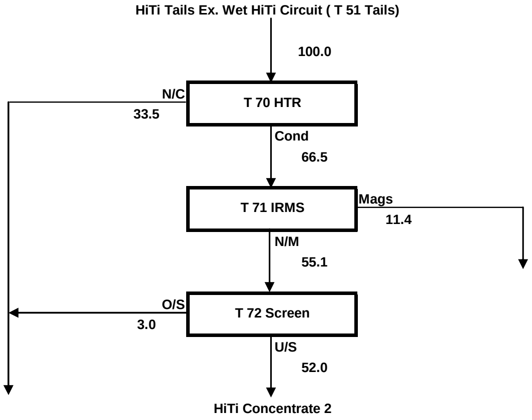

Figure 4.11 Non-Magnetic HiTi Circuit (Tails) Metallurgical Block Diagram – Glenaladale Main

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 70 N/C	33.5	66.1	10.3	17.3	2.3	0.3	0.4	34	163
T 71 Mags	11.4	47.3	35.5	4.2	3.9	3.2	0.2	21	141
T 62 O/S	3.0	34.9	33.7	17.8	3.7	0.9	0.1	16	74
T 62 U/S	52.0	80.9	7.4	6.3	1.8	0.6	0.2	36	123
	100.0	70.7	12.4	10.1	2.3	0.8	0.2	33.0	137.0

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 70 N/C	33.5	31.4	27.9	57.3	34.1	11.3	53.1	34.5	39.9
T 71 Mags	11.4	7.6	32.6	4.8	19.5	44.7	7.4	7.2	11.7
T 62 O/S	3.0	1.5	8.3	5.3	4.9	3.3	1.5	1.5	1.6
T 62 U/S	52.0	59.5	31.2	32.6	41.6	40.7	38.0	56.7	46.7
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4.20 HiTi Circuit (Tails) Metallurgical Chemical Balance – Glenaladale Main

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 70 N/C	36.6	6.5	67.5	18.0	7.5	0.0	12.9	52.6	22.8	53.4	0.0
T 71 Mags	11.4	79.5	15.0	4.0	0.5	0.5	49.1	3.6	1.6	1.1	100.0
T 62 U/S	52.0	13.5	39.5	42.0	4.5	0.0	38.0	43.8	75.6	45.5	0.0
	100.0	18.5	47.0	28.9	5.1	0.1	100.0	100.0	100.0	100.0	100.0

Table 4.21 HiTi Circuit (Tails) Metallurgical Mineralogical Balance – Glenaladale Main

Processing of the HiTi tails material through an electrostatic and magnetic stage produced a final product containing 80.9% TiO_2 and 6.3% of SiO_2 Overall TiO_2 recovery is calculated at 59.5%, whilst rutile recovery is calculated at 75.6% and leucoxene recovery 43.8%.

Data depicted above suggest that an option to produce a single HiTi 70 product exists and Robmet has calculated a potential product specification as per Table 4.22. Further metallurgical test work would be required to confirm that such a product at the required recoveries could be produced.

	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	%	%	%	%	%	%	ppm	ppm
HiTi 70	76.3	8.3	9.1	1.9	1.1	0.2	32	130

Table 4.22 Potential HiTi 70 product specification

4.5.4 Non-Magnetic HiTi Circuit – Mossiface

Conductor concentrate material produced from the rougher HTR circuit was processed over a two stage wet shaking table circuit, producing a concentrate and tailings. A metallurgical block diagram Figure 4.12, chemical balance Table 4.23 and mineralogical balance Table 4.24 is attached below.

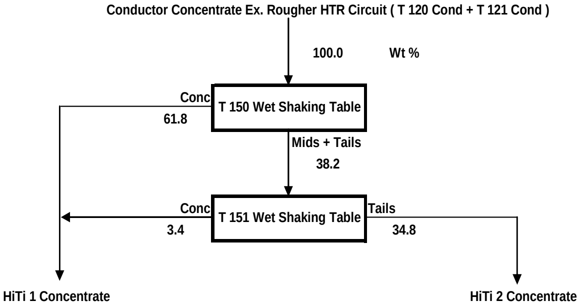

Figure 4.12 Non-Magnetic HiTi Circuit Metallurgical Block Diagram – Mossiface

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 150 Conc	61.8	83.4	2.8	4.7	0.5	0.5	5.6	106	359
T 151 Conc	3.4	87.8	3.0	3.7	0.6	0.3	2.7	70	183
T 151 Tails	34.8	76.1	5.5	13.7	1.7	0.1	0.3	55	112
	100.0	81.0	3.7	7.8	0.9	0.3	3.7	87.0	267.1

HiTi Concentrate 1	65.2	83.6	2.8	4.7	0.5	0.4	5.5	104	350
HiTi Concentrate 2	34.8	76.1	5.5	13.7	1.7	0.1	0.3	55	112

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 150 Conc	61.8	63.6	45.7	37.3	35.0	87.1	94.6	75.3	83.1
T 151 Conc	3.4	3.7	2.7	1.6	2.2	3.0	2.5	2.7	2.3
T 151 Tails	34.8	32.7	51.5	61.0	62.8	10.0	2.9	22.0	14.6
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

HiTi Concentrate 1	65.2	67.3	48.5	39.0	37.2	90.0	97.1	78.0	85.4
HiTi Concentrate 2	34.8	32.7	51.5	61.0	62.8	10.0	2.9	22.0	14.6

Table 4.23 HiTi Circuit Metallurgical Chemical Balance – Mossiface

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 150/151 Conc	65.2	21.0	22.5	44.0	0.0	10.5	79.7	38.1	87.8	-	88.7
T 151 Tails	34.8	10.0	68.5	11.5	0.0	2.5	20.3	61.9	12.2	-	11.3
	100.0	17.2	38.5	32.7	0.0	7.7	100.0	100.0	100.0	-	100.0

Table 4.24 HiTi Circuit Metallurgical Mineralogical Balance – Mossiface

Produced concentrate material contained 83.6% TiO_2 and 4.7% SiO_2. Due to sample constraint no further metallurgical test work was completed on the sample. Of note is that the concentrate contained 5.5% ZrO_2 + HfO_2 and it is believed that removal of this would reduce SiO_2 further. Further to this removal of the ilmenite and some of the leucoxene could produce a rutile product, but would be subject to further testing.

Tailings material contained 76.1% TiO_2 and 13.7% SiO_2 and should this be combine back with the concentrate and processed as per Glenaladale Main it is believed that a product containing >70% TiO_2 could be produced, but would be subject to further testing as material from current test program was insufficient to test.

Mineralogical analyses as per Glenaladale Main indicate concentrate to consist predominantly of rutile and ilmenite, whilst tailings consist predominantly of leucoxene, indicating that the titanium mineral could be separated utilizing gravity should it be required.

4.5.5 Non-Magnetic Wet Zircon Circuit – Glenaladale Main

Non-Conductor/Non-Magnetic concentrate material produced from the rougher HTR circuit was processed over a three stage wet shaking table circuit, producing a wet zircon concentrate and tailings. A metallurgical block diagram Figure 4.13, chemical balance Table 4.25 and mineralogical balance Table 4.26 is attached below.

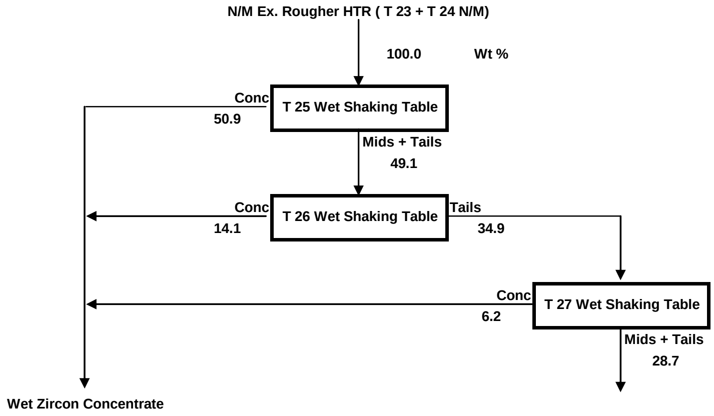

Figure 4.13 Non-Magnetic Wet Zircon Circuit Metallurgical Block Diagram – Glenaladale Main

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 25+T 26 Conc	65.1	3.4	0.16	31.5	0.2	0.0	61.8	438	645
T 27 Conc	6.2	6.1	0.19	30.3	0.3	0.0	60.3	465	610
T 27 Tails	28.7	24.3	0.85	59.1	2.7	0.0	11.3	134	221
	100.0	9.6	0.4	39.4	1.0	0.0	47.2	352	521
Zircon Conc	71.3	3.6	0.16	31.4	0.2	0.0	61.7	440	642

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 25+T 26 Conc	65.1	22.9	28.9	52.1	15.7	36.0	85.2	80.9	80.5
T 27 Conc	6.2	4.0	3.3	4.8	2.0	5.7	7.9	8.2	7.3
T 27 Tails	28.7	73.1	67.8	43.1	82.2	58.3	6.9	10.9	12.2
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Zircon Conc	71.3	26.9	32.2	56.9	17.8	41.7	93.1	89.1	87.8

Table 4.25 Non-Magnetic Wet Zircon Circuit Metallurgical Chemical Balance – Glenaladale Main

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
Conc	71.3	0.3	2.7	1.9	0.1	93.9	14.6	21.6	75.8	100.0	94.3
Tails	28.7	4.0	24.5	1.5	0.0	14.0	85.4	78.4	24.2	0.0	5.7
Feed	100.0	1.3	9.0	1.8	0.0	70.9	100.0	100.0	100.0	100.0	100.0

Table 4.26 Non-Magnetic Wet Zircon Circuit Metallurgical Mineralogical Balance – Glenaladale Main

Chemical analyses data depicted above indicate the wet zircon concentrate to contain 61.7% ZrO_2 + HfO_2 with an overall recovery of 93.1%. Mineralogical data indicate a zircon recovery of 94.3%, which is comparable with the chemical analyses recovery. Mineralogical data further indicate contaminants within the concentrate to be predominantly leucoxene and rutile.

4.5.6 Non-Magnetic Wet Zircon Circuit – Mossiface

As per Glenaladale Main sample non-conductor/non-magnetic concentrate material produced from the rougher HTR circuit was processed over a three stage wet shaking table circuit, producing a wet zircon concentrate and tailings. A metallurgical block diagram Figure 4.14, chemical balance Table 4.27 and mineralogical balance Table 4.28 is attached below.

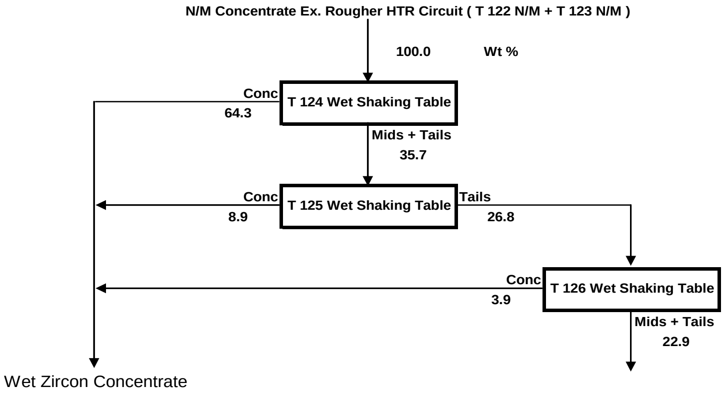

Figure 4.14 Non-Magnetic Wet Zircon Circuit Metallurgical Block Diagram – Mossiface

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T124+T125 Conc	73.2	1.7	0.1	33.0	0.4	0.0	62.0	452	607
T 126 Conc	3.9	5.8	0.2	31.6	0.8	0.0	58.1	446	557
T 126 Tails	22.9	5.8	0.27	85.3	3.0	0.01	5.3	49	69
	100.0	2.8	0.1	44.9	1.0	0.0	48.8	359	482

Zircon Conc	77.1	1.9	0.08	32.9	0.4	0.0	61.8	452	604

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T124+T125 Conc	73.2	44.2	46.2	53.8	29.9	45.8	92.9	92.1	92.2
T 126 Conc	3.9	8.0	4.9	2.7	3.1	6.5	4.6	4.8	4.5
T 126 Tails	22.9	47.8	48.9	43.5	67.1	47.8	2.5	3.1	3.3
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Zircon Conc	77.1	52.2	51.1	56.5	32.9	52.2	97.5	96.9	96.7

Table 4.27 Non-Magnetic Wet Zircon Circuit Metallurgical Chemical Balance – Mossiface

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T124+T125 Conc	73.2	1.0	1.0	0.0	0.0	96.0	34.7	36.3	0.0	-	93.6
T 126 Conc	3.9	3.0	3.5	1.0	0.0	92.0	5.5	6.7	25.3	-	4.8
T 126 Tails	22.9	5.5	5.0	0.5	0.0	5.5	59.8	56.9	74.7	-	1.7
	100.0	2.1	2.0	0.2	0.0	75.1	100.0	100.0	100.0	-	100.0

Table 4.28 Non-Magnetic Wet Zircon Circuit Metallurgical Mineralogical Balance – Mossiface

Chemical analyses data depicted above indicate the wet zircon concentrate to contain 61.8% ZrO_2 + HfO_2 with an overall recovery of 97.5%. Mineralogical data indicate a zircon recovery of 98.4%, which is comparable with the chemical analyses recovery. Mineralogical data further indicate contaminants within the concentrate to be predominantly leucoxene and ilmenite.

4.5.7 Non-Magnetic Dry Zircon Circuit – Glenaladale Main

Wet zircon concentrate material produced from the wet zircon circuit was processed over a four stage electrostatic and two stage magnetic separator circuit, producing a primary and secondary zircon product. A metallurgical block diagram, Figure 4.15, chemical balance Table 4.29 and mineralogical balance Table 4.30 is attached below.

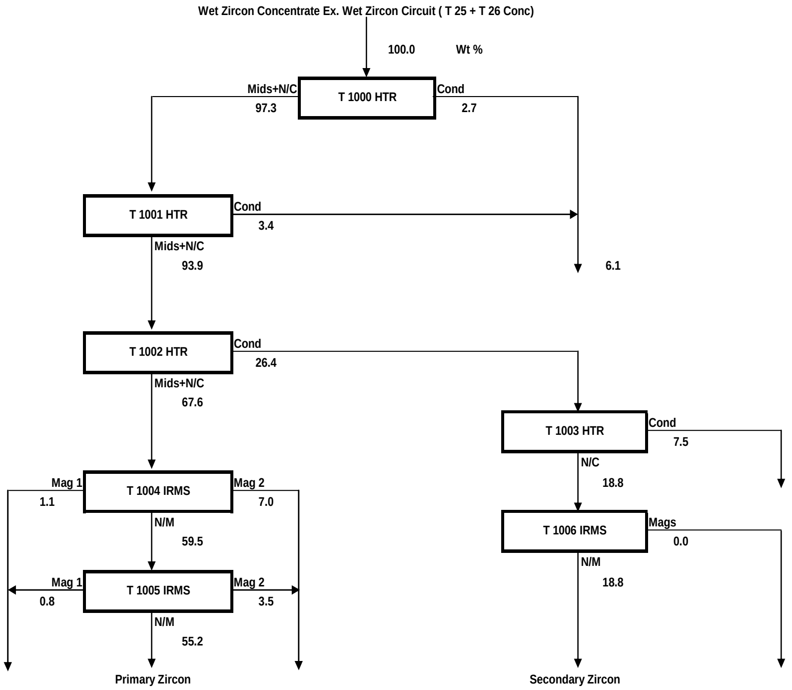

Figure 4.15 Non-Magnetic Dry Zircon Circuit Metallurgical Block Diagram – Glenaladale Main

		Assays						
		TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	ppm	ppm
T 1000 Cond	2.7	16.4	0.4	27.5	0.4	54.1	521	420
T 1001 Cond	3.4	11.2	0.3	29.1	0.3	57.9	524	412
T 1003 Cond	7.5	11.1	0.2	29.1	0.3	57.9	601	427
T 1004+1005 Mag 1	1.9	3.4	0.6	28.5	0.7	56.2	767	3960
T 1004+1005 Mag 2	10.5	4.1	0.2	30.7	0.3	60.6	706	540
T 1005 N/M (Primary Zircon)	55.2	0.14	0.05	32.7	0.1	65.5	391	222
T 1006 Mags	0.0	8.3	0.4	29.4	0.4	57.7	781	920
T 1006 N/M (Secondary Zircon)	18.8	0.79	0.07	31.2	0.1	62.5	448	279
	100.0	2.4	0.1	31.6	0.2	63.1	466	364

		Distribution						
		TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%
T 1000 Cond	2.7	18.5	9.2	2.3	5.8	2.3	3.0	3.1
T 1001 Cond	3.4	16.0	8.0	3.1	6.0	3.1	3.8	3.8
T 1003 Cond	7.5	35.2	15.7	6.9	14.4	6.9	9.7	8.8
T 1004+1005 Mag 1	1.9	2.7	9.9	1.7	7.7	1.7	3.1	20.5
T 1004+1005 Mag 2	10.5	18.1	20.1	10.2	19.4	10.1	16.0	15.6
T 1005 N/M (Primary Zircon)	55.2	3.3	25.0	57.1	34.0	57.2	46.3	33.6
T 1006 Mags	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T 1006 N/M (Secondary Zircon)	18.8	6.3	12.0	18.6	12.8	18.7	18.1	14.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4.29 Non-Magnetic Dry Zircon Circuit Metallurgical Chemical Balance – Glenaladale Main

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
Cond	13.6	0.5	12.5	13.0	0.0	74.0	24.7	62.3	93.4	0.0	10.7
T 1004+1005 Mag 1	1.9	1.0	1.0	1.0	0.0	94.5	6.9	0.7	1.0	0.0	1.9
T 1004+1005 Mag 2	10.5	0.0	6.0	1.0	0.5	92.0	0.0	23.2	5.6	100.0	10.3
T 1005 N/M (Primary Zircon)	55.2	0.0	0.0	0.0	0.0	98.0	0.0	0.0	0.0	0.0	57.6
T 1006 Mags	0.0	0.0	14.0	4.5	0.5	81.0	0.0	0.0	0.0	0.0	0.0
T 1006 N/M (Secondary Zircon)	18.8	1.0	2.0	0.0	0.0	97.0	68.4	13.8	0.0	0.0	19.5
	100.0	0.3	2.7	1.9	0.1	93.9	100.0	100.0	100.0	100.0	100.0

Table 4.30 Non-Magnetic Dry Zircon Circuit Metallurgical Mineralogical Balance – Glenaladale Main

Produced primary zircon product is of premium quality containing 0.14% TiO_2, 0.05% Fe_2O_3, 0.1% Al_2O_3 with the exception of U+Th calculated at 613ppm. ZrO_2 recovery to primary zircon is calculated at 57.2%.

Secondary zircon product contain <1.0% TiO_2 and <1000ppm U+Th with ZrO_2 recovery to this product calculated at 18.7%.

Overall ZrO_2 recovery to primary and secondary zircon product is calculated at 75.9% compared to 77.1% for mineralogical recovery of zircon. These recoveries are un-optimized and excludes semi-processed streams, such as T1004+T1005 Mags and conductors. With further processing recoveries could be increased to 85-90% but would be subject to further testing.

4.5.8 Non-Magnetic Dry Zircon Circuit – Mossiface

Wet zircon concentrate material produced from the Mossiface wet zircon circuit was processed over a four stage electrostatic and two stage magnetic separator circuit, producing a primary and secondary zircon product. A metallurgical block diagram, Figure 4.16, chemical balance Table 4.31 and mineralogical balance Table 4.32 is attached below.

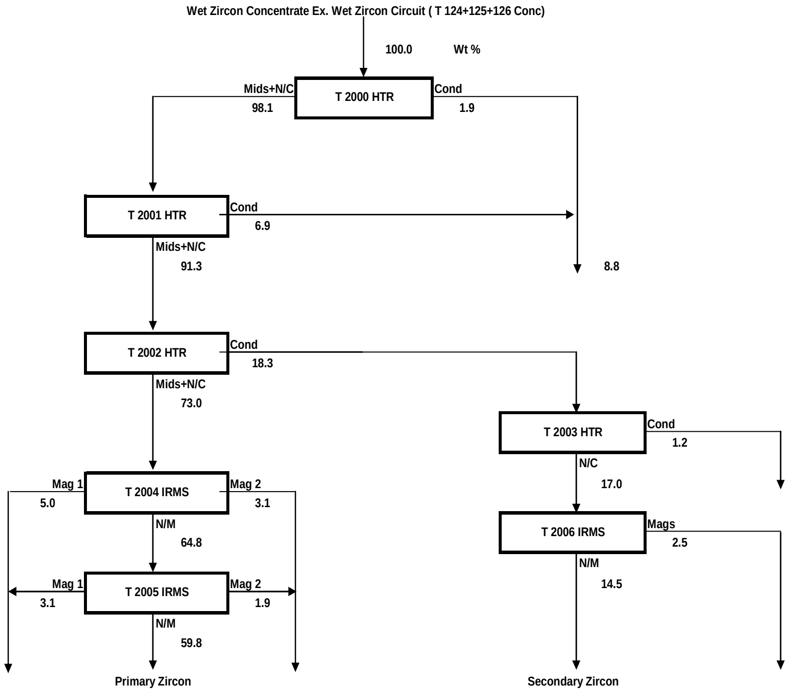

Figure 4.16 Non-Magnetic Dry Zircon Circuit Metallurgical Block Diagram – Mossiface

		Assays						
		TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	ppm	ppm
T 2000 Cond	1.9	11.7	0.3	29.0	0.3	56.5	579	381
T 2001 Cond	6.9	6.0	0.2	30.9	0.3	61.8	616	430
T 2003 Cond	1.2	14.2	0.3	28.5	0.5	54.9	583	400
T 2004+2005 Mag 1	8.2	2.7	0.2	30.7	0.9	60.5	811	1640
T 2004+2005 Mag 2	5.0	1.9	0.2	31.8	0.5	63.4	743	606
T 2005 N/M (Primary Zircon)	59.8	0.10	0.03	33.80	0.31	63.00	415	217
T 2006 Mags	2.5	7.3	0.3	29.7	0.5	58.4	848	1130
T 2006 N/M (Secondary Zircon)	14.5	0.73	0.04	32.60	0.24	65.20	514	269
	100.0	1.5	0.1	32.8	0.4	62.7	508	403

		Distribution						
		TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%
T 2000 Cond	1.9	14.9	7.3	1.7	1.8	1.7	2.1	1.8
T 2001 Cond	6.9	28.0	12.9	6.5	5.5	6.8	8.3	7.3
T 2003 Cond	1.2	11.8	4.1	1.1	1.6	1.1	1.4	1.2
T 2004+2005 Mag 1	8.2	15.0	24.5	7.6	19.6	7.9	13.0	33.2
T 2004+2005 Mag 2	5.0	6.5	11.9	4.9	7.2	5.1	7.3	7.5
T 2005 N/M (Primary Zircon)	59.8	4.1	22.5	61.6	51.1	60.1	48.9	32.2
T 2006 Mags	2.5	12.5	9.5	2.3	3.7	2.3	4.2	7.1
T 2006 N/M (Secondary Zircon)	14.5	7.2	7.3	14.4	9.6	15.1	14.7	9.7
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4.31 Non-Magnetic Dry Zircon Circuit Metallurgical Chemical Balance – Mossiface

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 2000 Cond	10.0	1.5	3.5	4.5	0.0	88.5	69.4	19.2	62.4	-	9.7
T 2004+2005 Mag 1	8.2	0.5	8.5	0.0	0.0	85.0	18.9	38.1	0.0	-	7.7
T 2004+2005 Mag 2	5.0	0.5	2.0	1.5	0.0	95.0	11.6	5.5	10.5	-	5.3
T 2005 N/M (Primary Zircon)	59.8	0.0	0.0	0.0	0.0	91.0	0.0	0.0	0.0	-	60.2
T 2006 Mags	2.5	0.0	12.5	2.0	0.0	84.0	0.0	17.3	7.0	-	2.3
T 2006 N/M (Secondary Zircon)	14.5	0.0	2.5	1.0	0.0	92.5	0.0	19.9	20.2	-	14.8
	100.0	0.2	1.8	0.7	0.0	90.5	100.0	100.0	100.0	-	100.0

Table 4.32 Non-Magnetic Dry Zircon Circuit Metallurgical Mineralogical Balance – Mossiface

Produced primary zircon product is of premium quality containing 0.10% TiO_2, 0.03% Fe_2O_3, 0.3% Al_2O_3 with the exception of U+Th calculated at 632ppm. ZrO_2 recovery to primary zircon is calculated at 60.1%.

Secondary zircon product contain <1.0% TiO_2 and <1000ppm U+Th with ZrO_2 recovery to this product calculated at 15.1%.

Overall ZrO_2 recovery to primary and secondary zircon product is calculated at 75.2% compared to 75% for mineralogical recovery of zircon. As per Glenaladale Main these recoveries are un-optimized and excludes semi-processed streams, such as T2004+T2005 Mags and conductors. With further processing recoveries could be increased to 85-90% but would be subject to further testing.

4.5.9 Magnetic Ilmenite Circuit – Glenaladale Main

Magnetic concentrate material produced from the concentrate upgrade circuit was processed over a two stage electrostatic circuit and magnetic separation stage producing a potential ilmenite product. A metallurgical block diagram Figure 4.17, chemical balance Table 4.33 and mineralogical balance Table 4.34 is attached below.

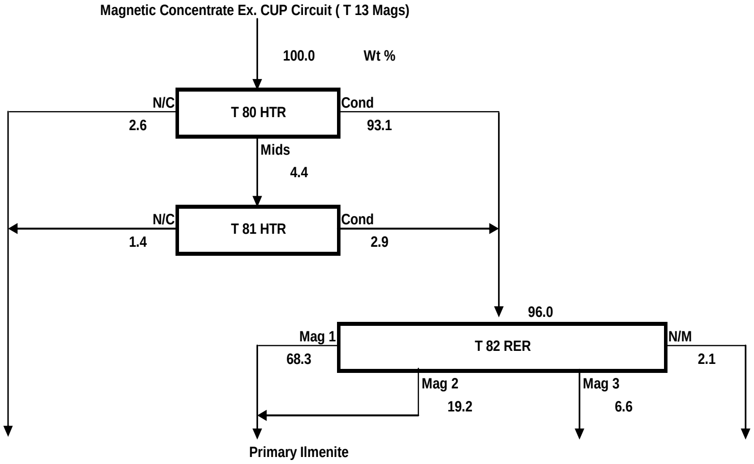

Figure 4.17 Magnetic Ilmenite Circuit Metallurgical Block Diagram – Glenaladale Main

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 80+81 N/C	4.0	7.9	17.8	21.8	5.4	1.1	17.3	1080	2530
T 82 Mag 1	68.3	48.6	46.9	0.8	0.7	0.5	0.1	0	34
T 82 Mag 2	19.2	47.5	44.8	1.1	1.4	1.9	0.2	0	47
T 82 Mag 3	6.6	42.2	42.8	1.9	3.0	4.9	0.2	35	65
T 82 N/M	2.1	38.9	32.2	6.2	4.0	6.6	5.2	97	361
	100.0	46.2	44.8	1.8	1.2	1.2	0.9	47	144
Ilmenite Product (Mag 1+2)	87.4	48.4	46.4	0.8	0.8	0.8	0.1	0	37

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 80+81 N/C	4.0	0.7	1.6	46.8	17.8	3.4	74.5	90.9	69.6
T 82 Mag 1	68.3	71.9	71.5	28.1	37.1	29.5	9.6	0.0	16.1
T 82 Mag 2	19.2	19.7	19.2	11.6	21.9	29.9	3.1	0.0	6.2
T 82 Mag 3	6.6	6.0	6.3	6.6	16.3	26.2	1.2	4.9	3.0
T 82 N/M	2.1	1.7	1.5	6.9	6.9	11.1	11.6	4.2	5.1
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Ilmenite Product (Mag 1+2)	87.4	91.6	90.7	39.7	59.0	59.3	12.7	0.0	22.3

Table 4.33 Magnetic Ilmenite Circuit Metallurgical Chemical Balance – Glenaladale Main

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 80+81 N/C	4.0	30.0	7.0	1.0	0.5	34.5	1.2	35.3	26.0	100.0	79.9
T 82 Mag 1	68.3	100.0	0.0	0.0	0.0	0.0	71.2	0.0	0.0	0.0	0.0
T 82 Mag 2+3	25.7	97.5	0.5	0.0	0.0	0.5	26.2	16.3	0.0	0.0	7.5
T 82 N/M	2.1	64.5	18.5	5.5	0.0	10.5	1.4	48.4	74.0	0.0	12.6
	100.0	95.8	0.8	0.2	0.0	1.7	100.0	100.0	100.0	100.0	100.0

Table 4.34 Magnetic Ilmenite Circuit Metallurgical Mineralogical Balance – Glenaladale Main

Produced ilmenite product contains low levels of SiO_2, Al_2O_3 and U+Th but elevated levels of Cr_2O_3. Further metallurgical test work to ascertain the form at which the Cr_2O_3 is present within the product and solubility of the Cr_2O_3 in sulphuric acid is recommended.

Overall TiO2 recovery to ilmenite product is calculated at 91.6% and individual ilmenite recovery is expected to be >90%. (Ilmenite recovery to Mag 1+2 can not be calculated as Mag 2+3 was combined for mineralogical analyses, given the high level of ilmenite, recovery for ilmenite is expected to be similar to individual TiO_2 recoveries).

4.5.10 Magnetic Ilmenite Circuit – Mossiface

Magnetic concentrate material produced from the Mossiface concentrate upgrade circuit was processed over a two stage electrostatic circuit and magnetic separation stage producing a potential ilmenite product. A metallurgical block diagram Figure 4.18, chemical balance Table 4.35 and mineralogical balance Table 4.36 is attached below.

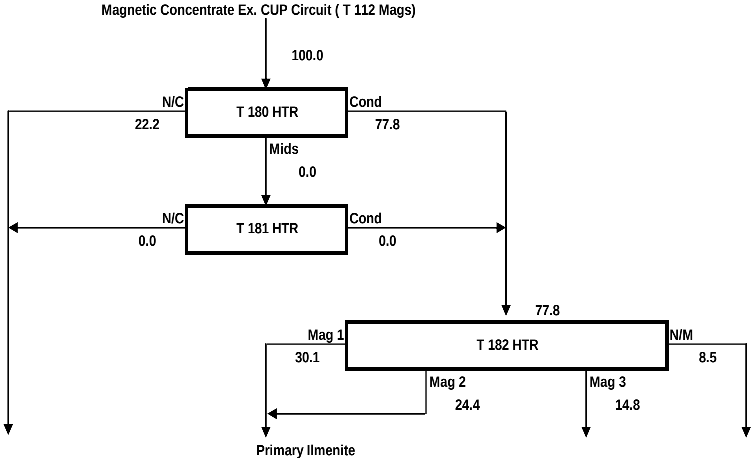

Figure 4.18 Magnetic Ilmenite Circuit Metallurgical Block Diagram –Mossiface

		Assay							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	ppm	ppm
T 80+81 N/C	22.2	10.8	7.2	9.6	2.1	0.2	6.2	2310	5550
T 82 Mag 1	30.1	55.3	40.3	0.6	0.4	0.3	0.1	17	79
T 82 Mag 2	24.4	57.5	35.7	0.8	0.5	0.6	0.1	35	103
T 82 Mag 3	14.8	59.6	31.6	1.1	0.8	1.1	0.1	35	146
T 82 N/M	8.5	61.6	26.8	2.1	1.1	1.5	0.7	67	261
	100.0	47.1	29.4	2.8	0.9	0.6	1.5	538	1326
Ilmenite Product (Mag 1+2+3)	69.3	57.0	36.8	0.8	0.5	0.6	0.1	27	102

		Distribution							
		TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
	Wt %	%	%	%	%	%	%	%	%
T 80+81 N/C	22.2	5.1	5.4	75.1	49.7	8.5	91.9	95.4	93.0
T 82 Mag 1	30.1	35.3	41.3	5.9	13.0	13.9	1.8	1.0	1.8
T 82 Mag 2	24.4	29.8	29.7	6.6	14.3	26.5	1.5	1.6	1.9
T 82 Mag 3	14.8	18.7	15.9	5.9	12.9	28.7	1.0	1.0	1.6
T 82 N/M	8.5	11.1	7.7	6.4	10.1	22.4	3.8	1.1	1.7
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Ilmenite Product (Mag 1+2+3)	69.3	83.9	86.8	18.5	40.2	69.1	4.3	3.5	5.3

Table 4.35 Magnetic Ilmenite Circuit Metallurgical Chemical Balance – Mossiface

		Grain Count					Distribution				
		Ilmenite	Leucoxene	Rutile	Anatase	Zircon	Ilmenite	Leucoxene	Rutile	Anatase	Zircon
	Wt %	%	%	%	%	%	%	%	%	%	%
T 180 N/C	22.2	32.0	3.0	0.5	0.0	43.0	8.6	33.4	46.7	-	98.3
T 181 Mag 1	30.1	99.5	0.5	0.0	0.0	0.0	36.1	7.5	0.0	-	0.0
T 181 Mag 2+3	39.2	98.0	1.5	0.0	0.0	0.0	46.4	29.5	0.0	-	0.0
T 181 N/M	8.5	87.0	7.0	1.5	0.0	2.0	8.9	29.6	53.3	-	1.7
	100.0	82.9	2.0	0.2	0.0	9.7	100.0	100.0	100.0	-	100.0

Table 4.36 Magnetic Ilmenite Circuit Metallurgical Mineralogical Balance – Mossiface

Produced ilmenite product contains low levels of SiO_2, Al_2O_3 and higher levels of TiO_2 as compared to Glenaladale Main, indicating the Mossiface material to be more altered than the Glenaladale Main as the product does not contain elevated levels of leucoxene or rutile/anatase.

Overall TiO_2 recovery to ilmenite product is calculated at 83.9% and individual ilmenite recovery is calculated at 82.5%. Further metallurgical work will need to be undertaken to confirm the different ilmenite species and the contribution to the different ilmenite product grades.

4.5.11 Summary – Glenaladale Main

Metallurgical test work completed utilizing material from Glenaladale Main produced typical mineral sands products. Chemical analyses for the produced products are attached below as Table 4.37.

	TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	U XRF	Th XRF
Primary Zircon	0.14	0.05	32.7	0.1	65.5	391	222
Secondary Zircon	0.79	0.07	31.2	0.1	62.5	448	279

	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
HiTi 70	80.9	7.4	6.3	1.8	0.6	0.2	36	123
HiTi 80	83.7	7.0	1.9	1.1	3.6	0.1	16	74
Primary Ilmenite	48.4	46.4	0.8	0.8	0.8	0.1	0.0	36.8

Table 4.37 Glenaladale Main Produced Products

Overall metallurgical test work recoveries are calculated at 57.2% for zircon, 53.8% for ilmenite, 42.7% for rutile and 4.2% for leucoxene. A mineral balance including predicted mineral recoveries is included below as Table 4.38.

	Zircon	
	Test Work	Projected
WCP - HMC	88.4	95.0
CUP - N/M	92.6	95.0
Rougher HTR N/M	96.0	95.0
Wet Zircon Conc	94.3	95.0
Primary Zircon	57.6	65.0
Secondary Zircon	19.5	25.0
Overall (Primary+Secondary Zircon)	**57.2**	**73.3**

	Titanium Minerals					
	Test Work			Projected		
	Ilmenite	Leucoxene	Rutile	Ilmenite	Leucoxene	Rutile
WCP - HMC	68.1	19.1	91.9	75.0	25.0	95.0
CUP - N/M	7.1	86.1	71.1	7.0	85.0	75.0
CUP - Mag	87.8	3.1	4.3	90.0	5.0	4.0
Ilmenite 1	90.0	0.0	0.0	90.0	0.0	0.0
Rougher HTR Cond	64.3	55.4	85.3	65.0	55.0	90.0
HiTi Concentrate 1	30.2	7.3	29.3	30.0	10.0	30.0
HiTi Concentrate 2	69.8	92.7	70.7	70.0	90.0	70.0
HiTi 70	38.0	43.8	75.6	40.0	45.0	80.0
HiTi 80	42.2	69.7	79.0	45.0	70.0	85.0
Overall (Ilmenite 1)	**53.8**	**0.0**	**0.0**	**60.8**	**0.0**	**0.0**
Overall (HiTi 70)	**0.8**	**3.7**	**29.8**	**1.0**	**4.7**	**35.9**
Overall (HiTi 80)	**0.4**	**0.5**	**12.9**	**0.5**	**0.8**	**16.4**

Table 4.38 Glenaladale Main Overall Mineral Recoveries

Overall predicted recoveries for zircon are within expected range of 65-75%. Predicted Ilmenite and rutile recoveries excluding the recovery to a potential secondary ilmenite are within the expected range of 60-75% for ilmenite and 50-65% for rutile. Leucoxene recovery is low calculated at 4.2% and predicted at 5.5% and is associated with the loss to the wet concentration plant tailings and is as a direct result of alteration and fine grained nature. Further metallurgical work will be required to optimise the recovery and evaluate the impact thereof of product production, particularly zircon and HiTi products.

4.5.12 Summary – Mossiface

Metallurgical test work completed utilizing material from Mossiface produced typical mineral sands products. Chemical analyses for the produced products are attached below as Table 4.39.

	TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	U XRF	Th XRF
Primary Zircon	0.10	0.03	33.80	0.31	63.00	415	217
Secondary Zircon	0.73	0.04	32.60	0.24	65.20	514	269

	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	ZrO2+HfO2	U XRF	Th XRF
HiTi 70	-	-	-	-	-	-	-	-
HiTi 80	-	-	-	-	-	-	-	-
Primary Ilmenite	57.0	36.8	0.8	0.5	0.6	0.1	27	102

Table 4.39 Mossiface Main Produced Products

Note: No HiTi products were produced due to limited sample quantity.

Overall metallurgical test work recoveries are calculated at 50.8% for zircon, 31.1% for ilmenite, 59.6% for rutile and 6.7% for leucoxene. A mineral balance including predicted mineral recoveries is included below as Table 4.40.

	Zircon	
	Test Work	Projected
WCP - HMC	84.5	95.0
CUP - N/M	94.8	95.0
Rougher HTR N/M	90.4	95.0
Wet Zircon Conc	93.6	95.0
Primary Zircon	60.2	65.0
Secondary Zircon	14.8	25.0
Overall (Primary+Secondary Zircon)	**50.8**	**73.3**

	Titanium Minerals					
	Test Work			Projected		
	Ilmenite	Leucoxene	Rutile	Ilmenite	Leucoxene	Rutile
WCP - HMC	51.6	16.6	91.0	75.0	25.0	95.0
CUP - N/M	25.0	88.9	87.5	7.0	85.0	75.0
CUP - Mag	73.0	5.2	0.0	90.0	5.0	4.0
Ilmenite 1	82.5	37.0	0.0	90.0	0.0	0.0
Rougher HTR Cond	60.7	84.3	95.4	65.0	85.0	90.0
HiTi Concentrate 1	79.7	38.1	87.8	30.0	40.0	30.0
HiTi Concentrate 2	20.3	61.9	12.2	70.0	60.0	70.0
HiTi 70	*38.0*	*43.8*	*75.6*	40.0	45.0	80.0
HiTi 80	*42.2*	*69.7*	*79.0*	45.0	70.0	85.0
Overall (Ilmenite 1)	**31.1**	**0.3**	**0.0**	**60.8**	**0.0**	**0.0**
Overall (HiTi 70)	**0.6**	**3.4**	**7.0**	**1.0**	**4.9**	**35.9**
Overall (HiTi 80)	**2.6**	**3.3**	**52.6**	**0.5**	**5.1**	**16.4**

Table 4.40 Mossiface Overall Mineral Recoveries

Overall predicted recoveries for zircon are within expected range of 65-75%. Predicted Ilmenite and rutile recoveries excluding the recovery to a potential secondary ilmenite are within the expected range of 60-75% for ilmenite and 50-65% for rutile. Leucoxene recovery is low calculated at 6.7% and predicted at 9.9% and is associated with the loss to the wet concentration plant tailings and is as a direct result of alteration and fine grained nature. Further metallurgical work will be required to optimise the recovery and evaluate the impact thereof of product production, particularly zircon and HiTi products.

5.0 CONCLUSION

Metallurgical scoping test work to develop a conceptual process flow diagram and discussed in detail within this report confirm that mineral sands products of acceptable quality can be produced.

The large difference in titanium product grades (48.4% - Glenaladale Main Ilmenite Product, 57.0% - Mossiface Ilmenite Product) suggests probable differences in ilmenite species are present.

Preliminary observations also indicate material from Glenaladale Main to contain higher levels of chromium as compared to Mossiface as is evident in the elevated Cr_2O_3 levels in the titanium products produced.

No amenable difference in grade and recovery exists between the zircon products produced from Glenaladale Main and Mossiface.

Overall un-optimised mineral test work recoveries for the valuable heavy minerals zircon, rutile and ilmenite are within the expected range whereas the recovery of the light heavy mineral leucoxene is low calculated at <10% and is believed to be associated with the high level of alteration and fine nature of the material.

6.0 RECOMMENDATION

Based on the metallurgical test work completed to date and general observations Robmet recommend that Oresome complete the following additional evaluations and metallurgical test work:

- Complete a detailed marked evaluation to ascertain marketability of produced products and potential prizing
- Submit an ilmenite sample from Glenaladale Main and Mossiface for QEMSCAN analyses to determine liberation of Cr_2O_3 and TiO_2 species present.
- Submit an ilmenite sample from Glenaladale Main for Sulphuric Acid Solubility test work so as to determine levels of soluble Cr_2O_3.
- Prepare a composite sample (from drill hole analyses samples held in store) for Glenaladale Main incorporating revised cut-off grade from Resource Modelling.

  Processing of this additional composite sample would confirm product qualities and allow more detailed assessment of mineral recoveries.

7.0 APPENDIX

7.1 Head Sample Analyses

Oresome Australia - Head Data

Sample 1 - Glenalandale Main

	Wt %
O/S (+1.0mm)	0.8
Slimes (-38µm)	26.7
HM (+2.85sg)	2.7
Quartz (-2.85sg)	69.8

	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2
	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
HM	32.2	24.0	22.4	4.4	0.5	1.1	0.4	9.9	0.6	127.0	646.0	0.2	0.1	0.1	0.1	0.3	0.4

Sample 100 - Mossiface

	Wt %
O/S (+1.0mm)	1.7
Slimes (-38µm)	18.2
HM (+2.85sg)	1.9
Quartz (-2.85sg)	78.3

	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2
	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
HM	31.2	11	21.9	5.82	0.145	0.84	0.52	17.7	2.21	382	3040	0.11	0.092	0.18	0.08	0.19	1.62

7.2 Slimes Settling Data

BASF
The Chemical Company

26th April 2012

Robbins Metallurgical
28 Staple Street
Seventeen Mile Rocks
QLD 4073

SUBJECT: Flocculant Settling Tests – Oresome Pty Ltd

SUMMARY

Ore sample 486 is readily flocculated using Magnafloc 5250 at an optimum dose rate of 60 grams/tonne dry solids. The resultant settling rate was ~ 14 m/hr with a wedge clarity of 23.

INTRODUCTION

BASF was sent a sample of 486 ore to assess the effectiveness of flocculation on the slimes component. The tests were carried out on 25-04-12.

SAMPLE PREPARATION

Ore sample 486 was slurried in a bucket using tap water and allowed to stand while the coarse component settled. The liquor containing suspended solids was decanted and used for settling tests. Initial sample solids in the decanted slurry was measured at 10.75 %w/w using a moisture balance. This was diluted to 2.3%w/w for the tests.

FLOCCULANTS TESTED

The flocculants tested covered the charge range:

Magnafloc 10	low anionic
Magnafloc 5250	medium anionic
Magnafloc 919	high anionic

PROCEDURE

Flocculants at 0.1% solution strength were dosed into 500 ml samples in 500 ml measuring cylinders. The flocculant was dosed in 2 stages; the dose being spilt 50:50. Settling of the mud-line was timed between the 450 and 350 graduations and converted to m/hr. Supernatant clarity was measured after 30 minutes using a clarity wedge (0 = opaque, 46 = clear).

RESULTS

Table 1 Initial Floc Screen

Flocculant	Dose (g/t)	Settling Rate (m/hr)	Clarity (wedge)
Magnafloc 10	102	68	8
Magnafloc 5250	102	3.2	37
Magnafloc 919	102	9.4	31

Table 2 Magnafloc 5250 Dose Response

Flocculant	Dose (g/t)	Settling Rate (m/hr)	Clarity (wedge)
Magnafloc 5250	39	6.8	17
Magnafloc 5250	60	14.6	23
Magnafloc 5250	81	24.4	34
Magnafloc 5250	102	60.3	37

DISCUSSION

The results from Table 1 showed that Magnafloc 5250 was clearly the best performing flocculant, producing the fastest settling rate and the clearest supernatant.

The results from Table 2 show settling rate and clarity at various dose rates using Magnafloc 5250. *In most mineral sand operations, the target settling rate is in the range of 10m/hr to 15 m/hr*. Based on this assumption, the optimum flocculant dose will be in the vicinity of 60 g/t. At this dose, the clarity is “fair” but can be improved with the further addition of flocculant.

CONCLUSIONS

Ore sample 486 is readily flocculated using Magnafloc 5250 at an optimum dose rate of 60 g/t.

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7.3 Product Sizing Data

Primary Zircon

TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	P2O5	U XRF	Th XRF	CaO	SO3	CeO2
%	%	%	%	%	%	ppm	ppm	%	%	%
0.14	0.05	32.7	0.10	65.5	0.2	391	222	0.03	0.02	0.008

	Wt %
+125	0.1
+106	0.3
+90	3.4
+75	13.5
+63	37.4
+53	28.9
+45	9.3
+38	6.6
0	0.6
Total	100.0

Secondary Zircon

TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO2	P2O5	U XRF	Th XRF	CaO	SO3	CeO2
%	%	%	%	%	%	ppm	ppm	%	%	%
0.79	0.07	31.2	0.11	62.5	0.2	448	279	0.04	0.01	0.004

	Wt %
+125	0.2
+106	0.4
+90	3.7
+75	14.5
+63	37.1
+53	28.4
+45	8.6
+38	6.6
0	0.7
Total	100.0

HiTi 80

TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2
%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
83.7	7.0	1.9	1.1	3.6	0.5	0.1	0.5	0.0	42	69	0.3	0.4	0.02	0.12	0.10	0.03

	Wt %
+125	0.1
+106	0.9
+90	6.1
+75	23.1
+63	45.6
+53	17.5
+45	4.3
+38	2.4
0	0.1
Total	100.0

HiTi 70

TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2
%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
74.9	12.5	6.0	2.2	1.1	0.6	0.4	0.2	0.1	33	126	0.2	0.3	0.1	0.1	0.2	0.0

	Wt %
+125	1.4
+106	4.1
+90	20.5
+75	37.5
+63	27.4
+53	7.1
+45	1.3
+38	0.8
0	0.0
Total	100.0

Primary Ilmenite

TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2
%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
48.6	46.9	0.8	0.7	0.5	1.7	1.1	0.1	0.04	0	34	0.2	0.08	0.03	0.02	0.02	0.00

	Wt %
+125	0.9
+106	1.0
+90	6.5
+75	23.0
+63	39.9
+53	18.7
+45	4.5
+38	4.9
0	0.7
Total	100.0

Secondary Ilmenite

TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2
%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%
57.0	36.8	0.8	0.5	0.6	0.9	2.3	0.1	0.07	27	102	0.2	0.12	0.06	0.04	0.00	0.01

	Wt %
+125	4.2
+106	5.1
+90	21.5
+75	36.3
+63	22.0
+53	7.2
+45	1.7
+38	1.8
0	0.2
Total	100.0

7.4 Chemical Analyses Data

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%
T.1 H/F Sir	32.2	24	22.4	4.4	0.545	1.1	0.37	9.85	0.617	127	646	0.15	0.08	0.09	0.11	0.34	0.384	1.69
T.1 H/F Sir	32.2	24	22.4	4.42	0.543	1.1	0.37	9.83	0.622	130	653	0.16	0.084	0.1	0.11	0.34	0.388	1.73
T.100 H/F	31.2	11	21.9	5.82	0.145	0.84	0.52	17.7	2.21	382	3040	0.11	0.092	0.18	0.08	0.19	1.62	1.52
T.100 H/F	31.2	11	21.9	5.83	0.148	0.84	0.53	17.7	2.22	383	3060	0.12	0.091	0.18	0.07	0.18	1.63	1.48
SARM 59 (										-10	-10							
STD 1.1	48.8	50.2	0.76	0.62	0.11	0.56	1.04	0.08	0.01	-10	-10	0.25	0.074	0.05	-0.01	0.03	0.008	
LOI std 1																		1.34
STD 1.2																		1.33
SARM59/S																		
STD 2.1	24.7	25.4	16.8	0.78	0.056	0.3	0.54	33	0.071	152	71	0.13	0.034	0.1	0.07	0.05	0.016	
LOI std 2																		5.67
STD 2.2																		5.71
UT-1 Ilm c																		
STD 3.1	0.27	24.2	40.5	13.9	0.031	0.99	0.15	-0.01	1.06	1130	948	0.07	0.098	2.29	0.14	7.91	0.13	
LOI std 1(2																		1.34
STD 3.2																		1.35

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2+HfO2, P2O5, U XRF, Th XRF
V2O5, Nb2O5, CaO, SO3, K2O, CeO2
have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius.
Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	ZrO2+HfO2	TiO2
UNITS	%	%
T1 Con	12.2	31.8
T2 Mid	6.54	33
T3 Tail	8.08	35.1
T4 Con	11.9	32.2
T5 Mid	7.71	32.8
T6 Tail	6.97	32.4
T7 Con	13.3	30
T8 Mid	6.02	34.3
T9 Tail	7.53	31.4
T10 Con	14.6	32
T11 Mid	9.24	35.3
T11 Mid Rp	9.28	35.4
T12 Tail	5.28	35.1
T13 Con	12.9	33.2
SARM 59 (		
STD 1.1	0.09	48.8
T14 Mid	6.93	35.4
T15 Tail	5.27	35.5
T16 Con	16.3	29
T17 Mid	12.1	36.2
T18 Tail	4.68	29.4
T19 Con	13.7	28.1
T20 Mid	8.69	28.4
T21 Tail	7.09	30.3
T22 Con	23	27.4
T23 Mid	17.8	33.3
T24 Tail	13.6	31.8
T24 Tail Rp	13.5	31.7
SARM59/S		
STD 2.1	32.8	24.5
UT-1 Ilm ca		
STD 3.1	0.01	0.28

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, ZrO2+HfO2

have been determined by X-Ray Fluorescence Spectrometry

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%
T.3 con Sir	35.3	25.2	16.7	3.28	0.704	1.13	0.46	13.3	0.709	146	846	0.16	0.084	0.13	0.07	0.22	0.486	0.84
T.3 tail Sinl	32.4	23.8	23.6	6.68	0.428	1.29	0.34	6.26	0.531	92	513	0.15	0.076	0.2	0.09	0.4	0.302	2.27
T.4 con Sir	34.8	23.9	16	2.92	0.745	1.07	0.5	16.2	0.862	178	1070	0.14	0.085	0.16	0.06	0.18	0.622	0.7
T.4 con Sir	34.8	23.9	16	2.92	0.743	1.07	0.51	16.3	0.862	179	1070	0.15	0.086	0.16	0.06	0.17	0.622	0.75
T.4 tail Sinl	34	24.6	20.8	5.28	0.542	1.28	0.38	8.19	0.54	118	544	0.15	0.078	0.18	0.08	0.34	0.322	1.66
T.103 con	28.7	10.6	19.9	3.27	0.199	0.63	0.55	24.1	3.03	455	4270	0.1	0.081	0.2	0.05	0.12	2.37	1.08
T.103 tail	30	16.4	28.3	6.74	0.189	0.94	0.41	8.71	1.1	183	1480	0.12	0.073	0.19	0.13	0.43	0.79	2.62
T.104 con	33	12.3	19.1	4.44	0.194	0.75	0.6	19.8	2.3	364	3210	0.11	0.093	0.2	0.06	0.14	1.74	1.17
T.104 con	33	12.3	19.1	4.45	0.194	0.75	0.6	19.9	2.31	363	3210	0.11	0.092	0.2	0.06	0.14	1.73	1.13
T.104 tail	34.5	13.6	25	6.62	0.181	0.95	0.49	11	1.31	211	1810	0.13	0.085	0.2	0.07	0.32	0.95	1.93
SARM 59 (										-10	-10							
STD 1.1	48.8	50.3	0.76	0.62	0.107	0.56	1.06	0.09	0.012	-10	-10	0.26	0.07	0.06	-0.01	0.03	0.006	
LOI std 1																		1.34
STD 1.2																		1.36
SARM59/S																		
STD 2.1	24.5	25.1	16.8	0.76	0.058	0.31	0.54	32.8	0.071	144	71	0.13	0.035	0.09	0.06	0.05	0.014	
LOI std 2																		5.67
STD 2.2																		5.71
UT-1 Ilm ca																		
STD 3.1	0.27	24.1	40.4	13.8	0.031	0.96	0.15	-0.01	1.06	1110	949	0.07	0.099	2.3	0.14	7.91	0.132	
LOI std 3																		10.3
STD 3.2																		10.3

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2+HfO2, P2O5, U XRF, Th XRF
V2O5, Nb2O5, CaO, SO3, K2O, CeO2
have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius.
Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	SnO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%	%
T.5 Con Sink	30.8	22.6	19.1	2.66	0.723	1.05	0.5	18	1.02	239	1140	0.14	0.085	0.14	0.09	0.18	0.716	0.01	0.86
T.5 Con Sink Rpt	30.8	22.7	19.1	2.67	0.724	1.03	0.5	18	1.02	236	1120	0.13	0.089	0.15	0.09	0.18	0.72	0.008	0.84
T.5 Tail Sink	35.6	24.1	19.1	4.67	0.584	1.31	0.41	10.2	0.58	136	540	0.16	0.092	0.15	0.06	0.27	0.354	0.002	1.08
T.6 Con Sink	34.9	24.1	17.7	3.35	0.661	1.17	0.46	13.6	0.713	170	720	0.16	0.092	0.14	0.07	0.2	0.458	-0.002	0.85
T.6 Tail Sink	34.6	24.6	23.1	5.38	0.452	1.27	0.35	5.55	0.449	111	323	0.16	0.089	0.17	0.08	0.39	0.204	0.006	1.75
T.105 Con Sink	24.9	9.75	18.7	2.62	0.189	0.54	0.57	28.5	3.85	618	4700	0.09	0.072	0.21	0.09	0.06	2.81	0.024	0.81
T.105 Tail Sink	33.6	12.2	22.9	6.57	0.185	0.99	0.51	13.8	1.64	305	1910	0.12	0.097	0.24	0.06	0.23	1.13	0.008	1.53
T.106 Con Sink	37.2	12.3	16.1	4.36	0.201	0.8	0.66	19.1	2.17	399	2570	0.13	0.1	0.2	0.04	0.09	1.51	0.01	0.9
T.106 Con Sink Rpt	37.2	12.4	16.1	4.35	0.199	0.82	0.66	19	2.18	400	2570	0.12	0.098	0.2	0.05	0.08	1.49	0.012	0.92
T.106 Tail Sink	35.9	12.3	24.6	6.38	0.17	1.16	0.49	10.8	1.29	248	1510	0.14	0.103	0.25	0.08	0.2	0.872	0.014	IS
SARM 59 (Ilm)										-10	-10								
STD 1.1	48.9	50.4	0.77	0.62	0.11	0.55	1.06	0.09	0.013	-10	-10	0.26	0.071	0.05	-0.01	0.03	0.006	0.002	
LOI std 1																			1.34
STD 1.2																			1.35
SARM59/SARM62 (50:50)																			
STD 2.1	24.4	25.1	16.8	0.77	0.058	0.32	0.54	32.8	0.073	153	71	0.13	0.037	0.09	0.07	0.05	0.016	0.004	
LOI std 2																			5.67
STD 2.2																			5.69
UT-1 Ilm cal std																			
STD 3.1	0.27	24.2	40.5	14	0.031	0.98	0.15	0.01	1.07	1120	949	0.07	0.1	2.3	0.14	7.93	0.126	0.002	
LOI std 3																			10.3
STD 3.2																			10.4
IGS-40	0.23	3.28	16.6	2.1	0.011	4.02	0.45	0.03	0.54	22	200	0.03	0.013	17	8.62	1.29	3.96	0.02	
STD 4.1	0.24	3.3	16.6	2.14	0.01	4.03	0.45	0.03	0.544	20	197	0.02	0.012	17.1	8.62	1.29	3.95	0.018	

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2+HfO2, P2O5, U XRF, Th XRF
V2O5, Nb2O5, CaO, SO3, K2O, CeO2, SnO2
have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius.
Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%
T.3A Con Sink	39	24.9	13.4	2.69	0.78	1.31	0.51	14.7	0.695	190	760	0.16	0.096	0.12	0.04	0.13	0.482	0.25
T.3A Tail Sink	28.8	27.6	26.9	5	0.365	1.1	0.31	4.23	0.469	71	260	0.17	0.063	0.19	0.13	0.47	0.166	3.23
T.3A Mid Sink	36.8	24	21.1	5.59	0.429	1.32	0.35	4.84	0.423	92	301	0.17	0.09	0.19	0.06	0.32	0.196	1.69
T.4A Con Sink	37.1	23.4	14.3	3.31	0.726	1.28	0.46	14.2	0.697	199	739	0.16	0.088	0.15	0.04	0.15	0.478	0.26
T.4A Tail Sink	30.7	26.6	25.1	5	0.393	1.1	0.34	5.06	0.451	94	293	0.16	0.071	0.19	0.12	0.4	0.182	2.52
T.4A Mid Sink	36.1	25.2	20.2	4.6	0.499	1.25	0.4	7.15	0.473	92	377	0.16	0.084	0.18	0.08	0.28	0.246	1.44
T.7 Con Sink	34.4	23.2	16.2	2.49	0.779	1.13	0.51	17.8	0.883	232	992	0.15	0.081	0.13	0.06	0.14	0.642	0.24
T.7 Tail Sink	41.1	24.4	18.1	5.79	0.443	1.46	0.41	4.3	0.371	71	250	0.17	0.091	0.23	0.07	0.28	0.162	1.43
T.7 Tail Sink Rpt	41.1	24.4	18.1	5.79	0.444	1.47	0.4	4.31	0.367	75	246	0.17	0.089	0.22	0.07	0.28	0.16	1.41
T.107 Con Sink	25.9	9.84	18.9	2.23	0.184	0.52	0.6	27.7	3.66	604	4480	0.09	0.073	0.2	0.08	0.06	2.74	0.6
T.107 Tail Sink	34.6	12.3	23	5.69	0.208	1.15	0.58	14.6	1.28	273	1380	0.12	0.09	0.3	0.08	0.16	0.796	IS
T.108 Con Sink	29.2	10.2	35.1	3.24	0.15	0.63	0.58	14	1.51	300	1670	0.1	0.079	0.15	0.05	0.08	0.986	0.67
T.108 Con Sink Rpt	29.3	10.2	35.1	3.23	0.15	0.64	0.59	14	1.53	297	1680	0.1	0.081	0.15	0.05	0.08	0.99	0.65
T.108 Tail Sink	43.3	13.3	20	5.57	0.138	0.9	0.73	9.66	0.883	207	900	0.14	0.113	0.22	0.08	0.15	0.486	1.4
SARM 59 (Ilm)										-10	-10							
STD 1.1	48.7	50.2	0.77	0.63	0.108	0.56	1.06	0.09	0.013	-10	-10	0.25	0.072	0.05	0.01	0.03	0.008	
LOI std 1																		1.34
STD 1.2																		1.32
SARM59/SARM62 (50:50)																		
STD 2.1	24.4	25.1	16.8	0.77	0.058	0.32	0.55	32.9	0.074	153	71	0.14	0.033	0.09	0.07	0.05	0.012	
LOI std 2																		5.67
STD 2.2																		5.69
UT-1 Ilm cal std																		
STD 3.1	0.28	24.3	40.5	13.9	0.032	0.98	0.15	0.01	1.07	1120	949	0.08	0.101	2.3	0.14	7.94	0.128	
LOI std 3																		10.3
STD 3.2																		10.3
SARM 59 (Ilm)(2)										-10	-10							
STD 4.1	48.9	50.2	0.77	0.6	0.107	0.56	1.06	0.09	0.013	-10	-10	0.25	0.072	0.05	-0.01	0.03	0.008	
LOI std 1(2)																		1.34
STD 4.2																		1.35

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2+HfO2, P2O5, U XRF, Th XRF
V2O5, Nb2O5, CaO, SO3, K2O, CeO2
have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius.
Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%
T.8 Con Sink	41.7	24.7	16.5	4.17	0.554	1.27	0.52	6.77	0.42	83	381	0.16	0.112	0.23	0.05	0.2	0.216	0.88
T.8 Con Sink Rpt	41.7	24.7	16.5	4.18	0.554	1.28	0.51	6.76	0.419	83	380	0.16	0.113	0.23	0.05	0.2	0.216	0.83
T.8 Tail Sink	33.6	25.7	23	5.79	0.357	1.22	0.38	3.23	0.357	58	241	0.15	0.096	0.26	0.14	0.33	0.122	2.66
T.9 Con Sink	30.9	19	32.6	3.25	0.507	0.98	0.36	8.22	0.421	101	477	0.12	0.078	0.12	0.03	0.2	0.272	0.46
T.9 Tail Sink	33.6	25	22.7	5.49	0.471	1.2	0.36	4.95	0.408	71	334	0.16	0.094	0.23	0.09	0.31	0.184	0
T.10 Con Sink	32	21.2	16.3	2.13	0.797	0.98	0.49	20.1	1.01	216	1390	0.13	0.082	0.13	0.04	0.11	0.78	0.08
T.10 Tail Sink	33.3	24.4	19.6	2.94	0.567	1.39	0.69	10.3	0.732	113	665	0.14	0.089	0.9	0.36	0.19	0.398	1.98
T.11 Con Sink	39.5	24.5	13.1	2.61	0.757	1.13	0.57	13.7	0.697	163	864	0.16	0.104	0.15	0.04	0.13	0.478	0.08
T.11 Tail Sink	30.2	29.7	22.2	4.41	0.419	1.02	0.51	5.17	0.422	66	347	0.13	0.074	0.19	0.24	0.31	0.192	2.77
T.109 Con Sink	26	9.89	17.4	2.07	0.191	0.47	0.59	28	3.62	517	5230	0.09	0.085	0.2	0.05	0.05	2.83	0.52
T.109 Tail Sink	37.1	12.6	16.4	3.58	0.188	0.65	0.72	17.5	1.98	321	2750	0.11	0.112	0.2	0.07	0.08	1.42	0.88
T.110 Con Sink	33	11.8	16.2	3.08	0.182	0.61	0.7	23.3	2.4	399	3310	0.1	0.098	0.19	0.04	0.07	1.73	0.61
T.110 Con Sink Rpt	33	11.7	16.2	3.08	0.183	0.61	0.7	23.4	2.39	399	3310	0.1	0.099	0.19	0.05	0.07	1.74	0.58
T.110 Tail Sink	40.5	13.3	17	4.96	0.145	0.75	0.73	14.4	1.29	239	1720	0.12	0.119	0.21	0.1	0.11	0.872	1.21
SARM 59 (Ilm)										-10	-10							
STD 1.1	48.7	50.2	0.75	0.61	0.106	0.58	1.06	0.09	0.013	-10	-10	0.25	0.074	0.05	-0.01	0.03	0.006	
LOI std 1																		1.34
STD 1.2																		1.34
SARM59/SARM62 (50:50)																		
STD 2.1	24.5	25.1	16.8	0.76	0.058	0.29	0.53	32.8	0.072	149	74	0.13	0.035	0.09	0.07	0.05	0.014	
LOI std 2																		5.67
STD 2.2																		5.71
UT-1 Ilm cal std																		
STD 3.1	0.26	24.2	40.5	13.8	0.032	0.96	0.15	0.01	1.07	1090	958	0.08	0.099	2.29	0.13	7.91	0.126	
LOI std 3																		10.3
STD 3.2																		10.3
SARM 61 (Rutile)										45	53							
STD 4.1	93.3	0.69	2.09	0.94	0.108	0.06	0.02	1.36	0.029	39	58	0.45	0.315	0.09	0.02	0.09	0.01	
LOI std 1(2)																		1.34
STD 4.2																		1.33

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2+HfO2, P2O5, U XRF, Th XRF
V2O5, Nb2O5, CaO, SO3, K2O, CeO2
have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius.
Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%
RC TAIL 1 Sink	34	27.3	22.4	5.82	0.392	1.17	0.47	4.17	0.397	55	262	0.15	0.09	0.28	0.15	0.33	0.154	2.52
RC TAIL 2 Sink	35	26.3	21.5	4.06	0.517	1.07	0.54	7.61	0.485	99	446	0.15	0.079	0.22	0.12	0.24	0.244	1.66
RC TAIL 3 Sink	35	27.4	21.7	5.45	0.409	1.16	0.44	4.53	0.388	54	292	0.16	0.08	0.26	0.14	0.31	0.158	2.23
RC MID 1 Sink	34.6	26.6	19.3	3.27	0.635	1.06	0.55	10.8	0.571	135	590	0.15	0.084	0.17	0.12	0.21	0.342	1.2
RC MID 1 Sink Rpt	34.6	26.6	19.3	3.26	0.634	1.06	0.54	10.8	0.572	135	590	0.16	0.005	0.17	0.11	0.21	0.342	1.17
SARM 59 (Ilm)										-10	-10							
STD 1.1	48.7	50.3	0.75	0.62	0.107	0.56	1.06	0.08	0.012	-10	-10	0.26	0.072	0.06	-0.01	0.02	0.006	
LOI std 1																		1.34
STD 1.2																		1.37
RC MID 2 Sink	28.1	21.1	30.9	2.12	0.625	0.83	0.48	14	0.645	157	775	0.12	0.071	0.12	0.07	0.18	0.436	0.01
RC MID 3 Sink	31.6	24.3	19.3	2.59	0.722	0.94	0.53	16.6	0.882	174	1130	0.14	0.087	0.17	0.1	0.16	0.634	0.85
RC CON 1 Sink	30.5	23.5	18.1	2.17	0.794	0.89	0.56	19.9	1.06	210	1390	0.14	0.084	0.14	0.1	0.13	0.8	0.62
RC CON 2 Sink	29	22.6	16.5	1.65	0.874	0.87	0.56	24.2	1.31	269	1780	0.13	0.077	0.13	0.1	0.1	1.04	0.31
RC CON 3 Sink	20	15.4	47.9	1.96	0.463	0.61	0.37	10.8	0.603	115	770	0.09	0.053	0.11	0.07	0.21	0.432	0.62
RC CON 3 Sink Rpt	19.9	15.4	47.9	1.96	0.462	0.62	0.36	10.9	0.602	114	770	0.08	0.053	0.1	0.07	0.21	0.432	0.65
SARM59/SARM62 (50:50)																		
STD 2.1	24.6	25	16.7	0.82	0.057	0.31	0.55	32.8	0.074	148	71	0.13	0.035	0.09	0.06	0.04	0.014	
LOI std 2																		5.67
STD 2.2																		5.7
UT-1 Ilm cal std																		
STD 3.1	0.26	24.1	40.4	13.9	0.032	0.96	0.15	-0.01	1.07	1110	954	0.07	0.099	2.29	0.14	7.9	0.13	
LOI std 3																		10.3
STD 3.2																		10.4
SARM 61 (Rutile)										45	53							
STD 4.1	93.3	0.71	2.08	0.94	0.113	0.06	0.03	1.4	0.028	41	52	0.42	0.315	0.1	0.02	0.07	0.01	
LOI std 1(2)																		1.34
STD 4.2																		1.31

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2+HfO2, P2O5, U XRF, Th XRF
V2O5, Nb2O5, CaO, SO3, K2O, CeO2
have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius.
Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2+HfO	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%
T12Mag	48.2	45.2	1.92	0.73	0.498	1.56	1.1	0.92	0.095	-10	92	0.23	0.068	0.05	0.02	0.04	0.046	-1.3
T13Mag	46	44.5	1.85	1.25	1.344	1.65	1.05	1	0.354	42	188	0.22	0.075	0.07	0.02	0.04	0.094	-1.23
SARM 59 (Ilm)										-10	-10							
STD 1.1	48.8	50.2	0.75	0.62	0.109	0.56	1.06	0.09	0.012	-10	-10	0.25	0.073	0.05	-0.01	0.03	0.006	
LOI std 1																		1.34
STD 1.2																		1.33
T14Tails	15.2	3.3	53.6	2.49	0.294	0.39	0.07	20.2	0.785	192	1110	0.05	0.057	0.12	0.05	0.23	0.628	0.71
T15Tails	4.38	2.41	86.8	2.16	0.032	0.23	0.03	1.13	0.086	13	60	0.02	0.01	0.07	0.03	0.28	0.042	0.65
T14Conc	23.8	4.51	27	2.34	0.518	0.45	0.1	34	1.55	337	2310	0.07	0.076	0.17	0.07	0.15	1.33	0.75
T14Conc Rpt	23.8	4.5	27	2.35	0.517	0.44	0.09	33.9	1.55	336	2300	0.07	0.077	0.17	0.07	0.15	1.33	0.79
T15Conc	20.4	7.55	47.9	5.38	0.218	0.8	0.1	11.4	0.583	113	673	0.07	0.064	0.28	0.06	0.29	0.388	1.7
T111Mag	50.2	42.7	1.38	0.6	0.442	0.8	2.01	0.75	0.204	36	192	0.26	0.09	0.1	0.04	0.02	0.07	-0.76
T112Mag	47.7	29.1	2.75	0.89	0.586	0.77	1.82	1.53	3.8	552	1870	0.16	0.112	0.12	0.02	0.02	0.836	0.56
T113Tails	12.7	1.15	48.9	2.02	0.028	0.27	0.06	26.7	1.81	293	3270	0.03	0.045	0.15	0.05	0.08	1.76	0.47
T114Tails	2.32	0.61	93	1.44	0.006	0.15	0.03	0.99	0.071	19	114	-0.01	0.006	0.04	0.03	0.08	0.064	0.19
T113Conc	16.2	1.54	32.9	2.42	0.037	0.33	0.08	33.3	3.18	444	5900	0.04	0.057	0.21	0.08	0.07	3.23	0.44
T114Conc	18.5	2.58	47.5	5.95	0.034	0.74	0.09	16.9	1.17	205	2090	0.05	0.057	0.21	0.08	0.11	1.12	0.79
T114Conc Rpt	18.5	2.59	47.5	5.94	0.034	0.74	0.09	16.8	1.17	205	2080	0.05	0.056	0.21	0.08	0.11	1.12	0.79
SARM59/SARM62 (50:50)																		
STD 2.1	24.4	25	16.6	0.76	0.058	0.3	0.54	32.8	0.072	148	70	0.13	0.035	0.09	0.06	0.05	0.014	
LOI std 2																		5.67
STD 2.2																		5.68
UT-1 Ilm cal std																		
STD 3.1	0.25	24.2	40.4	13.8	0.033	0.96	0.15	0.02	1.07	1110	958	0.07	0.099	2.3	0.14	7.91	0.13	
LOI std 3																		10.3
STD 3.2																		10.3

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2+HfO2, P2O5, U XRF, Th XRF
V2O5, Nb2O5, CaO, SO3, K2O, CeO2
have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius.
Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2	ZrO2+HfO2	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%
T21+22 Cond	69.9	12.5	8.87	2.2	1.841	0.62	0.28	0.44		0.141	36	182	0.21	0.267	0.08	0.103	0.24	0.05	1.23
T23+24 N/M	9.49	0.39	39.2	0.89	0.017	0.05	0.01		48.1	0.401	413	488	0.03	0.029	0.08	0.004	0.12	0.162	0.54
T23+24 N/M Rpt	9.51	0.39	39.2	0.87	0.018	0.06	0.01		48.2	0.399	416	491	0.03	0.031	0.09	0.004	0.13	0.158	0.54
T24 Mag	8.67	12.9	21.5	11.7	0.327	2.29	0.1		7.58	8.61	726	11300	0.08	0.037	0.74	0.036	0.19	7.33	2.5
T120+121 Cond	76.5	4.88	11.5	1.41	0.156	0.11	0.25		1.2	0.119	49	157	0.17	0.287	0.08	0.235	0.15	0.048	1.12
T122+123 N/M	2.9	0.16	46	1	0.009	0.03	0.01		48.8	0.35	419	415	0.02	0.011	0.07	-0.001	0.04	0.124	0.32
T123 Mag	2.63	3.24	15.6	9.11	0.021	1.78	0.08		8.45	16.7	1290	27300	0.05	0.035	0.85	0.006	0.05	15.4	1
T123 Mag Rpt	2.63	3.22	15.6	9.07	0.019	1.78	0.08		8.47	16.8	1280	27200	0.05	0.034	0.84	0.006	0.05	15.4	1.02
SARM 59 (Ilm)											-10	-10							
STD 1.1	48.8	50.2	0.77	0.6	0.108	0.55	1.06	0.08	0.08	0.012	-10	-10	0.24	0.072	0.06	0.006	0.03	0.004	
LOI std 1																			1.34
STD 1.2																			1.36
SARM59/SARM62 (50:50)																			
STD 2.1	24.5	25.6	16.8	0.77	0.06	0.29	0.55	32.1	32.8	0.073	147	70	0.12	0.036	0.09	0.064	0.05	0.014	
LOI std 2																			5.67
STD 2.2																			5.67
UT-1 Ilm cal std																			
STD 3.1	0.27	24.5	40.5	13.9	0.032	0.98	0.16	0.01	0.01	1.08	1120	949	0.07	0.099	2.3	0.13	7.93	0.13	
LOI std 3																			10.3
STD 3.2																			10.2
SARM 62 (Zircon)											292	142							
STD 4.1	0.13	0.08	32.8	0.86	0.003	0.03	-0.01	64.3	65.6	0.124	296	140	0.01	0.003	0.11	0.012	0.05	0.024	
IGS-40	0.23	3.28	16.6	2.1	0.011	4.02	0.45		0.03	0.54	22	200	0.03	0.013	17	8.62	1.29	3.96	
STD 5.1	0.24	3.32	16.5	2.14	0.011	4.01	0.46	-0.01	0.02	0.545	20	194	0.02	0.014	16.9	8.62	1.27	3.95	
IGS-41	0.04	0.42	1.3	0.08	0.024	0.27	0.14		0.04	1.24		1020	0.04	0.008	4.51	1.22	0.04	32.2	
STD 6.1	0.03	0.44	1.31	0.08	0.026	0.28	0.13	-0.01	0.03	1.24	16	1000	0.03	0.006	4.47	1.2	0.03	32.2	
OKA-2																			
STD 7.1	0.37	5.87	14.8	0.8	-0.001	1.28	0.54	0.14	0.17	12.8	217	28900	0.1	0.098	25.2	0.132	0.5	14.5	

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2, ZrO2+HfO2, P2O5, U XRF
Th XRF, V2O5, Nb2O5, CaO, SO3, K2O, CeO2
have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius.
Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	TiO2	Fe2O3	SiO2	Al2O3	Cr2O3	MgO	MnO	ZrO2	ZrO2+HfO	P2O5	U XRF	Th XRF	V2O5	Nb2O5	CaO	SO3	K2O	CeO2	LOI1000
UNITS	%	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%	%	%	%	%	%
T80+81 N/C	7.93	17.8	21.8	5.36	1.056	1.18	1.68		17.3	6.7	1080	2530	0.07	0.038	0.61	0.09	0.08	1.6	1.83
T82 Mag 1	48.6	46.9	0.76	0.65	0.531	1.74	1.05	0.13		0.039	-10	34	0.23	0.078	0.03	0.02	0.02	0.004	-1.75
T82 Mag 2	47.5	44.8	1.12	1.37	1.916	1.76	1.13	0.15		0.08	-10	47	0.21	0.081	0.05	0.04	0.03	0.008	-0.85
T82 Mag 3	42.2	42.8	1.87	2.98	4.909	1.98	1.11	0.17		0.179	35	65	0.21	0.084	0.07	0.04	0.05	0.022	0.6
T82 Mag 3 Rpt	42.3	42.8	1.84	2.98	4.924	2	1.12	0.18		0.181	33	71	0.21	0.082	0.07	0.04	0.05	0.024	0.63
T82 N/M	38.9	32.2	6.22	4.04	6.621	1.97	0.78		5.19	0.442	97	361	0.19	0.116	0.1	0.09	0.11	0.208	1.5
T181 N/C	MISSING																		
T181 Mag 1	55.3	40.3	0.56	0.4	0.262	1.04	2.14	0.09		0.045	17	79	0.23	0.093	0.05	0.04	-0.01	0.008	-0.53
T181 Mag 2	57.5	35.7	0.77	0.54	0.613	0.81	2.31	0.09		0.078	35	103	0.19	0.131	0.06	0.03	-0.01	0.016	0.41
T181 Mag 3	59.6	31.6	1.14	0.81	1.097	0.62	2.38	0.1		0.125	35	146	0.17	0.16	0.08	0.04	0.02	0.024	1.42
T181 N/M	61.6	26.8	2.13	1.1	1.501	0.47	2.2	0.67		0.236	67	261	0.16	0.18	0.11	0.06	0.04	0.1	2.22
T181 N/M Rpt	61.6	26.8	2.11	1.1	1.489	0.48	2.2	0.65		0.236	67	254	0.15	0.178	0.13	0.05	0.03	0.096	2.27
T180 N/C	10.8	7.2	9.58	2.07	0.217	0.69	0.59		6.18	17.8	2310	5550	0.05	0.064	0.31	0.03	0.02	3.38	0.62
SARM 59 (Ilm)											-10	-10							
STD 1.1	48.7	50.3	0.76	0.62	0.109	0.56	1.07	0.08	0.08	0.014	-10	-10	0.25	0.074	0.05	-0.01	0.02	0.006	
LOI std 1																			1.34
STD 1.2																			1.31
SARM59/SARM62 (50:50)																			
STD 2.1	24.4	25.1	16.8	0.78	0.057	0.3	0.55	32.1	32.8	0.075	149	70	0.12	0.035	0.09	0.06	0.05	0.014	
LOI std 2																			5.67
STD 2.2																			5.66
UT-1 Ilm cal std																			
STD 3.1	0.27	24.1	40.5	14.1	0.032	0.99	0.14	0.01	0.01	1.08	1130	940	0.07	0.098	2.3	0.15	7.93	0.126	
LOI std 3																			10.3
STD 3.2																			10.3
SARM 61 (Rutile)											45	53							
STD 4.1	93.4	0.71	2.07	0.94	0.113	0.05	-0.01	1.35	1.39	0.027	46	57	0.43	0.313	0.09	0.02	0.08	0.01	
LOI std 1(2)																			1.34
STD 4.2																			1.34

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Tungsten Carbide bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, Cr2O3, MgO, MnO, ZrO2, ZrO2+HfO2, P2O5, U XRF Th XRF, V2O5, Nb2O5, CaO, SO3, K2O, CeO2 have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius. Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

Sample	TiO2	Fe2O3	SiO2	Al2O3	ZrO2+HfO	P2O5	U XRF	Th XRF	CaO	SO3	CeO2	LOI1000
UNITS	%	%	%	%	%	%	ppm	ppm	%	%	%	%
T1000 Cond	16.4	0.38	27.5	0.35	54.1	0.322	521	420	0.07	0.03	0.048	0.57
T1001 Cond	11.2	0.26	29.1	0.29	57.9	0.337	524	412	0.07	0.02	0.052	0.47
T1003 Cond	11.1	0.23	29.1	0.31	57.9	0.367	601	427	0.08	0.01	0.036	0.62
T1003 Cond Rpt	11.1	0.23	29.1	0.31	57.7	0.365	609	434	0.09	-0.01	0.038	0.66
T1004+T1005 Mag 1	3.44	0.58	28.5	0.66	56.2	2.88	767	3960	0.19	0.04	2.71	0.77
T1004+T1005 Mag 2	4.08	0.21	30.7	0.3	60.6	0.477	706	540	0.11	0.01	0.064	0.71
T1005 N/M	0.14	0.05	32.7	0.1	65.5	0.188	391	222	0.03	0.02	0.008	0.21
SARM 62 (Zircon)							292	142				
STD 1.1	0.14	0.07	32.5	0.88	65.3	0.125	299	141	0.12	0.01	0.018	
LOI std 1												1.34
STD 1.2												1.36
T1006 Mag	8.27	0.35	29.4	0.4	57.7	0.768	781	920	0.14	0.02	0.296	0.84
T1006 N/M	0.79	0.07	31.2	0.11	62.5	0.215	448	279	0.04	0.01	0.004	0.24
T2000 Cond	11.7	0.31	29	0.34	56.5	0.386	579	381	0.09	0.02	0.048	0.56
T2001 Cond	5.99	0.15	30.9	0.29	61.8	0.415	616	430	0.09	0.02	0.046	0.59
T2003 Cond	14.2	0.27	28.5	0.47	54.9	0.398	583	400	0.1	0.02	0.042	0.61
T2004+2005 Mag 1	2.7	0.24	30.7	0.87	60.5	1.23	811	1640	0.19	0.02	0.764	0.86
T2004+T2005 Mag 2	1.9	0.19	31.8	0.52	63.4	0.562	743	606	0.13	0.02	0.094	0.72
T2005 N/M	0.1	0.03	33.8	0.31	63	0.226	415	217	0.03	0.02	0.002	0.24
T2006 Mag	7.26	0.3	29.7	0.53	58.4	0.92	848	1130	0.18	0.02	0.394	0.98
T2006 N/M	0.73	0.04	32.6	0.24	65.2	0.288	514	269	0.05	0.01	0.014	0.34
T2006 N/M Rpt	0.74	0.05	32.7	0.22	65.3	0.291	514	264	0.05	0.02	0.018	0.31
ASCRM-008	0.1	0.06	32.7	0.1	66.8	0.09	239	123	0.01	0.02	0.004	
STD 2.1	0.09	0.06	32.7	0.1	67	0.086	232	128	-0.01	0.02	0.004	
LOI std 2												5.67
STD 2.2												5.65
UT-1 Ilm cal std												
STD 3.1	0.26	24.1	40.6	14.1	0.02	1.08	1130	949	2.29	0.15	0.128	
LOI std 3												10.3
STD 3.2												10.3

Sample Preparation

The samples have been sorted and dried. The whole sample has been pulverised in a vibrating pulveriser equipped with a Zirconia bowl. A barren flush has been pulverised between each sample.

Analytical Methods

The samples have been cast using a 12:22 flux to form a glass bead which has been analysed by XRF.

TiO2, Fe2O3, SiO2, Al2O3, ZrO2+HfO2, P2O5, U XRF, Th XRF, CaO, SO3, CeO2 have been determined by X-Ray Fluorescence Spectrometry

Loss on Ignition has been determined between 105 and 1000 degrees celsius. Results are reported on a dry sample basis.

LOI1000
has been determined Gravimetrically

7.5 Mineralogical Analyses Data

Geochempet Services

ABN 980 6945 3445

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MINERALOGICAL REPORT ON TWENTY-FOUR HEAVY MINERAL SAMPLES
JOB No 486 SERIES 1

prepared for

ROBBINS METALLURGICAL PTY LTD

Order Number:	48602
Invoice Number:	
Client Ref:	Arno Kruger

Issued by

H M Spring

H. M. Spring B.Sc.
12 April 2012

GEOCHEMPET SERVICES, MALENY

MINERALOGICAL REPORT
ON TWENTY - FOUR HEAVY MINERAL CONCENTRATES

WORK REQUESTED

Mineralogical analysis of 24 heavy mineral fractions from 1 Series

METHODS AND COMMENTS

The samples fraction was repeatedly coned to improve homogeneity prior to subsampling for grain counting using transmitted polarized light microscopy in oil immersion mounts.

Identifications have been made on optical appearance in transmitted light, supplemented only where necessary by additional observations in obliquely reflected light.

It is noted that that the method used does not permit practical distinction between ilmenite and magnetite: for the purposes of this report all shiny black, opaque oxide grains have been listed as "apparently ilmenite", but it is accepted that some such grains may be magnetite.

It is noted that there can be difficulties for individual grains in distinguishing between leucoxene, rutile and anatase: the distinction is plain for well crystallized individual grains, but more difficult for finely polycrystalline aggregates of grains which may grade between leucoxene which is regarded as cryptocrystalline rutile or anatase developed by degradation of former ilmenite (or perhaps in a few cases by modification of former single grains of rutile) and which can recrystallized into optically discernible aggregates of small crystals of either rutile or anatase. Accordingly immature leucoxene consists of TiO_2 with variable amounts of residual iron oxides; anatase and rutile both consist of essentially pure TiO_2.

Other accessory minerals such as hematite, secondary iron, clinozoisite, calcite, feldspar, quartz etc have been grouped together under others.

RESULTS

The results of counting 200 grains per sample in random linear traverses are recorded in Tables 1 through 4.

Table 1. Composition of the Six Heavy Mineral Concentrates

1 Series	**T1 HMC**	**T1 H/F**	**T12 MAG**	**T13 MAG**	**T14/15 CONC**	**T14/15 TAILS**
Opaque Oxide (apparently ilmenite)	44.0	32.0	94.0	93.0	6.0	10.5
Leucoxene	12.5	32.0		1.0	20.0	6.0
Rutile	2.0	2.5		0.5	6.0	5.0
Anatase					2.5	
Zircon	35.5	16.0	5.5	3.5	42.5	20.5
Monazite						
Aluminosilicates (apparently sillimanite)	2.0	6.5		0.5	10.5	27.0
Tourmaline	3.5	4.5	0.5	1.0	6.5	2.5
Others	0.5	6.5		0.5	6.0	28.5

Table 2. Composition of the Six Heavy Mineral Concentrates

1 Series	**T24 MAG**	**T27 TAILS**	**T60 N/C**	**T61 MAG**	**T62 N/M U/S**	**T70 N/C**
Opaque Oxide (apparently ilmenite)	12.5	4.0	21.5	81.0	21.0	6.5
Leucoxene	11.5	24.5	17.0	7.5	16.0	67.5
Rutile	1.0	1.5	46.0	9.0	59.0	18.0
Anatase	1.0			0.5	2.5	7.5
Zircon	28.5	14.0	15.5	1.5	1.5	
Monazite						
Aluminosilicates (apparently sillimanite)	3.0	29.5				0.5
Tourmaline	37.0	0.5				
Others	5.5	26.0		0.5		

Table 3. Composition of the Six Heavy Mineral Concentrates

1 Series	**T71 MAG**	**T72 N/M U/S**	**T80/81 N/C**	**T82 N/M**	**T82 MAG 1**	**T82 MAG 2+3**
Opaque Oxide (apparently ilmenite)	79.5	13.5	30.0	64.5	100.00	97.5
Leucoxene	15.0	39.5	7.0	18.5		0.5
Rutile	4.0	42.0	1.0	5.5		
Anatase	0.5	4.5	0.5			0.5
Zircon	0.5		34.5	10.5		0.5
Monazite						
Aluminosilicates (apparently sillimanite)		0.5	10.5	1.0		0.5
Tourmaline			4.5			0.5
Others	0.5		12.0			

Table 4. Composition of the Six Heavy Mineral Concentrates

1 Series	**T1000 COND**	**T1004/1005 MAG 1**	**T1004/1005 MAG 2**	**T1005 N/M**	**T1006 N/M**	**T1006 MAG**
Opaque Oxide (apparently ilmenite)	0.5	1.0				
Leucoxene	12.5	1.0	6.0		1.0	14.0
Rutile	13.0	1.0	1.0		2.0	4.5
Anatase			0.5			0.5
Zircon	74.0	94.5	92.0	98.0	97.0	81.0
Monazite						
Aluminosilicates (apparently sillimanite)		1.0	0.5	2.0		
Tourmaline		1.5				
Others						

Tabulated values are in **grain percent**, based on identifying and counting 200 grains per fraction in random linear traverses

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MINERALOGICAL REPORT ON TWENTY-TWO HEAVY MINERAL SAMPLES
JOB No 486 SERIES 100

prepared for

ROBBINS METALLURGICAL PTY LTD

Order Number: 48602

Invoice Number: 00004247

Client Ref: Arno Kruger

Issued by H M Spring

H. M. Spring B.Sc.
11 April 2012

GEOCHEMPET SERVICES, MALENY

MINERALOGICAL REPORT ON TWENTY - TWO HEAVY MINERAL CONCENTRATES

WORK REQUESTED

Mineralogical analysis of 22 heavy mineral fractions from 100 Series

METHODS AND COMMENTS

The samples fraction was repeatedly coned to improve homogeneity prior to subsampling for grain counting using transmitted polarized light microscopy in oil immersion mounts.

Identifications have been made on optical appearance in transmitted light, supplemented only where necessary by additional observations in obliquely reflected light.

It is noted that that the method used does not permit practical distinction between ilmenite and magnetite: for the purposes of this report all shiny black, opaque oxide grains have been listed as “apparently ilmenite”, but it is accepted that some such grains may be magnetite.

The leucoxene appears to be generally iron rich; and it is possible that some for the grains identifies as leucoxene are in fact secondary iron grains.

Other accessory minerals such as hematite, clinozoisite, calcite, feldspar, quartz etc have been grouped together under others.

RESULTS

The results of counting 200 grains per sample in random linear traverses are recorded in Tables 1 through 4.

Table 1. Composition of the Six Heavy Mineral Concentrates

100 Series	T100 HMC	T100 H/F	T111 MAG	T112 MAG	T113/114 CONC	T113/114 TAILS
Opaque Oxide (apparently ilmenite)	27.0	29.0	95.0	79.5	11.0	4.5
Leucoxene	7.0	23.5	1.0	1.5	10.0	3.5
Rutile	2.0	0.5			2.0	1.5
Anatase						
Zircon	56.5	28.0	2.0	14.0	46.0	8.0
Monazite						
Aluminosilicates (apparently sillimanite)	4.5	9.0	2.0	4.5	23.0	72.5
Tourmaline	2.5	9.5		0.5	8.0	3.0
Others	0.5	0.5				7.0

Table 2. Composition of the Six Heavy Mineral Concentrates

100 Series	T123 MAG	T124/125 CON	T126 CON	126 TAILS	T150/151 CONC	T151 TAILS
Opaque Oxide (apparently ilmenite)	3.5	1.0	3.0	5.5	21.0	10.0
Leucoxene		1.0	3.5	5.0	22.5	68.5
Rutile	1.0		1.0	0.5	44.0	11.5
Anatase						
Zircon	54.0	96.0	92.0	5.5	10.5	2.5
Monazite					0.5	
Aluminosilicates (apparently sillimanite)	2.0	1.5	0.5	69.0	0.5	1.5
Tourmaline	38.0	0.5		3.0		
Others	1.5			11.5	1.0	6.0

Table 3. Composition of the Five Heavy Mineral Concentrates

100 Series	T180 N/C	T181 N/M	T181 MAG1	T181 MAG 2+4	T2000 COND
Opaque Oxide (apparently ilmenite)	32.0	87.0	99.5	98.0	1.5
Leucoxene	3.0	7.0	0.5	1.5	3.5
Rutile	0.5	1.5			4.5
Anatase					
Zircon	43.0	2.0			88.5
Monazite					
Aluminosilicates (apparently sillimanite)	9.5	0.5		0.5	1.5
Tourmaline	5.5	0.5			
Others	6.5	1.5			0.5

Table 4. Composition of the Five Heavy Mineral Concentrates

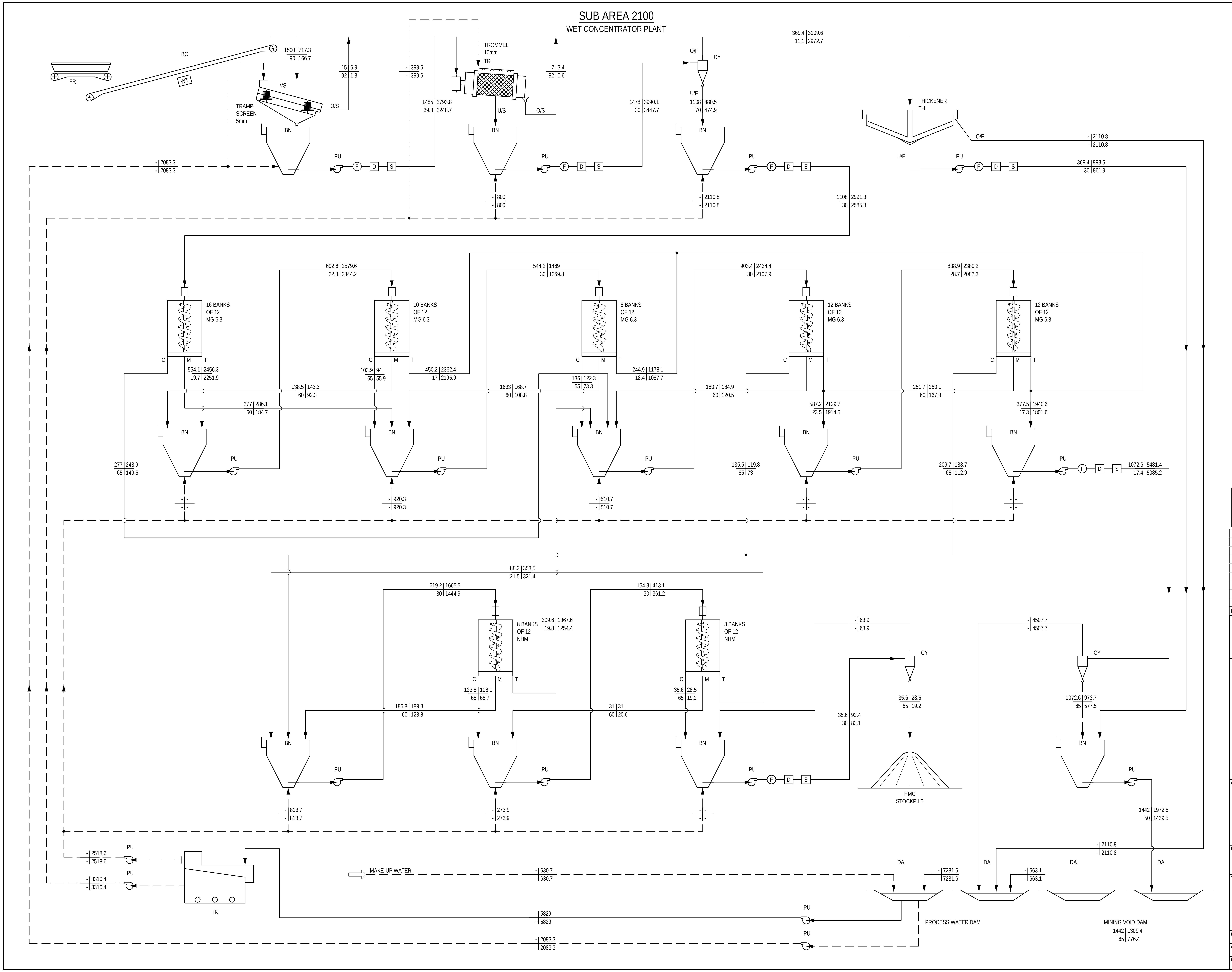
100 Series	T2004+2005 MAG1	T2004-2005 MAG2	T2005 N/M	T2006 MAG	T2006 N/M
Opaque Oxide (apparently ilmenite)	0.5	0.5			
Leucoxene	8.5	2.0		12.5	2.5
Rutile		1.5		2.0	1.0
Anatase					
Zircon	85.0	95.0	91.0	84.0	92.5
Monazite					
Aluminosilicates (apparently sillimanite)	2.5	0.5	7.0	0.5	3.0
Tourmaline	2.0			0.5	
Others	1.5	0.5	2.0	0.5	1.0

Tabulated values are in **grain percent**, based on identifying and counting 200 grains per fraction in random linear traverses

7.6 Conceptual Process Flow Diagrams

ORIGINAL SHEET SIZE = A1

SUB AREA 2100
WET CONCENTRATOR PLANT



LEGEND

TPH - SOLIDS | m³/ HOUR - SLURRY
% - SOLIDS | m³/ HOUR - WATER

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	— — —	WATER PIPEWORK
FM	F	FLOW METER
DM	D	DENSITY METER
SA	S	SAMPLER
WS	WS	BELT WEIGHER
	⋈	VALVE (REFER TO P&ID FOR DETAILS)
	O/F	OVERFLOW
	O/S	OVERSIZE

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CLIENT
ORESOME
AUSTRALIA PTY LTD

PROJECT
Oresome Australia. Pty. Ltd.
Gippsland Mineral Sands Project - Scoping Study
Victoria Australia

TITLE
FEED PREPARATION PLANT
WET CONCENTRATOR PLANT
AREA 2000
SUB AREA 2100
PROCESS FLOW DIAGRAM

DRAWN AB
DATE 23/04/2012
JOB No. 581
Dimensions MILLIMETRES
SCALE NTS
CLIENT DRG No.
RJR DRG No. 486-G-PF-2000-0001
REV A

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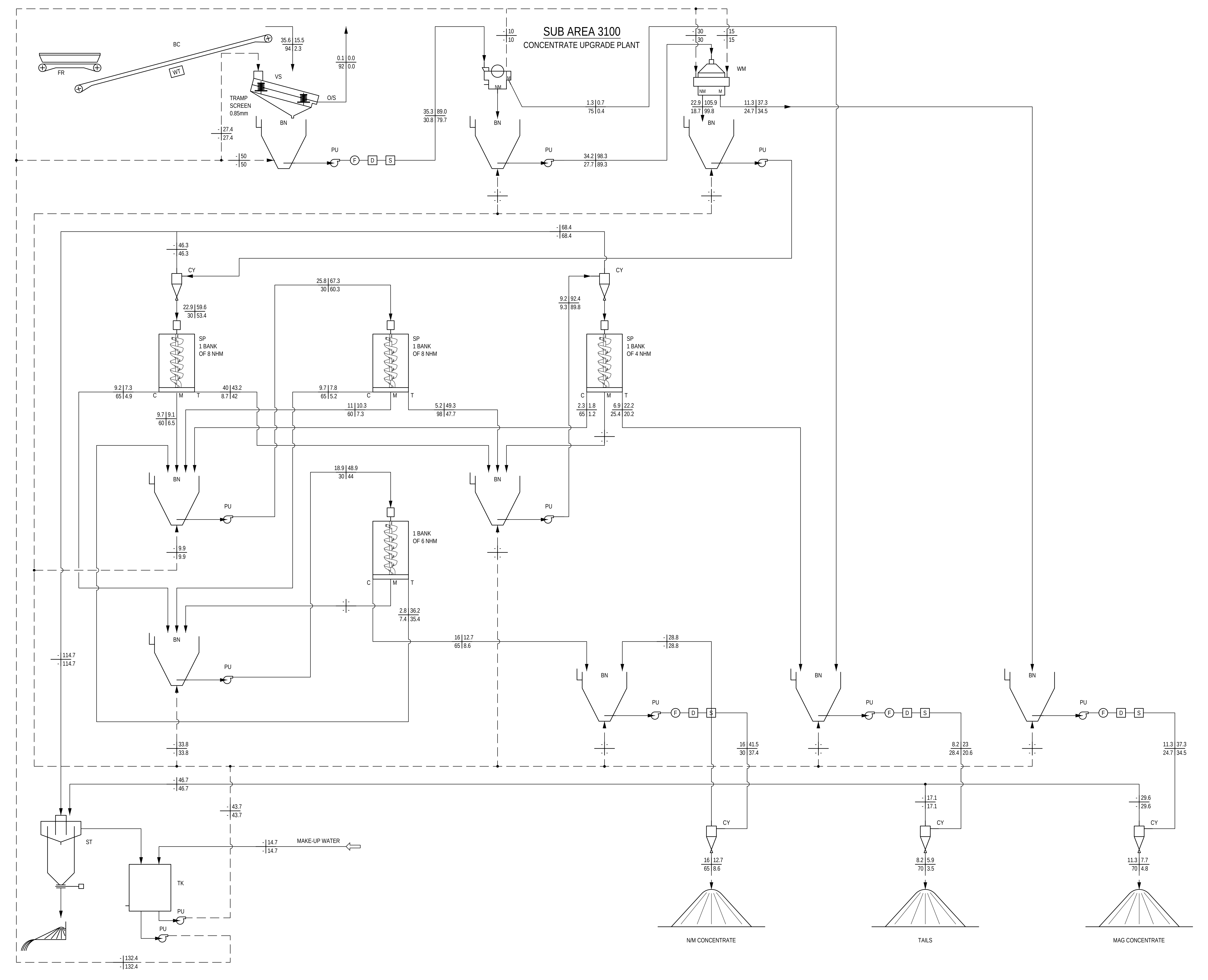

LEGEND

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% - SOLIDS | m³/ HOUR - WATER

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	— — —	WATER PIPEWORK
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DM	D	DENSITY METER
SA	S	SAMPLER
WS	WS	BELT WEIGHER
	⋈	VALVE (REFER TO P&ID FOR DETAILS)
	O/F	OVERFLOW
	O/S	OVERSIZE

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TITLE
FEED PREPARATION PLANT
CONCENTRATE UPGRADE PLANT
AREA 3000
SUB AREA 3100
PROCESS FLOW DIAGRAM

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AB	23/04/2012	581	SCALE NTS

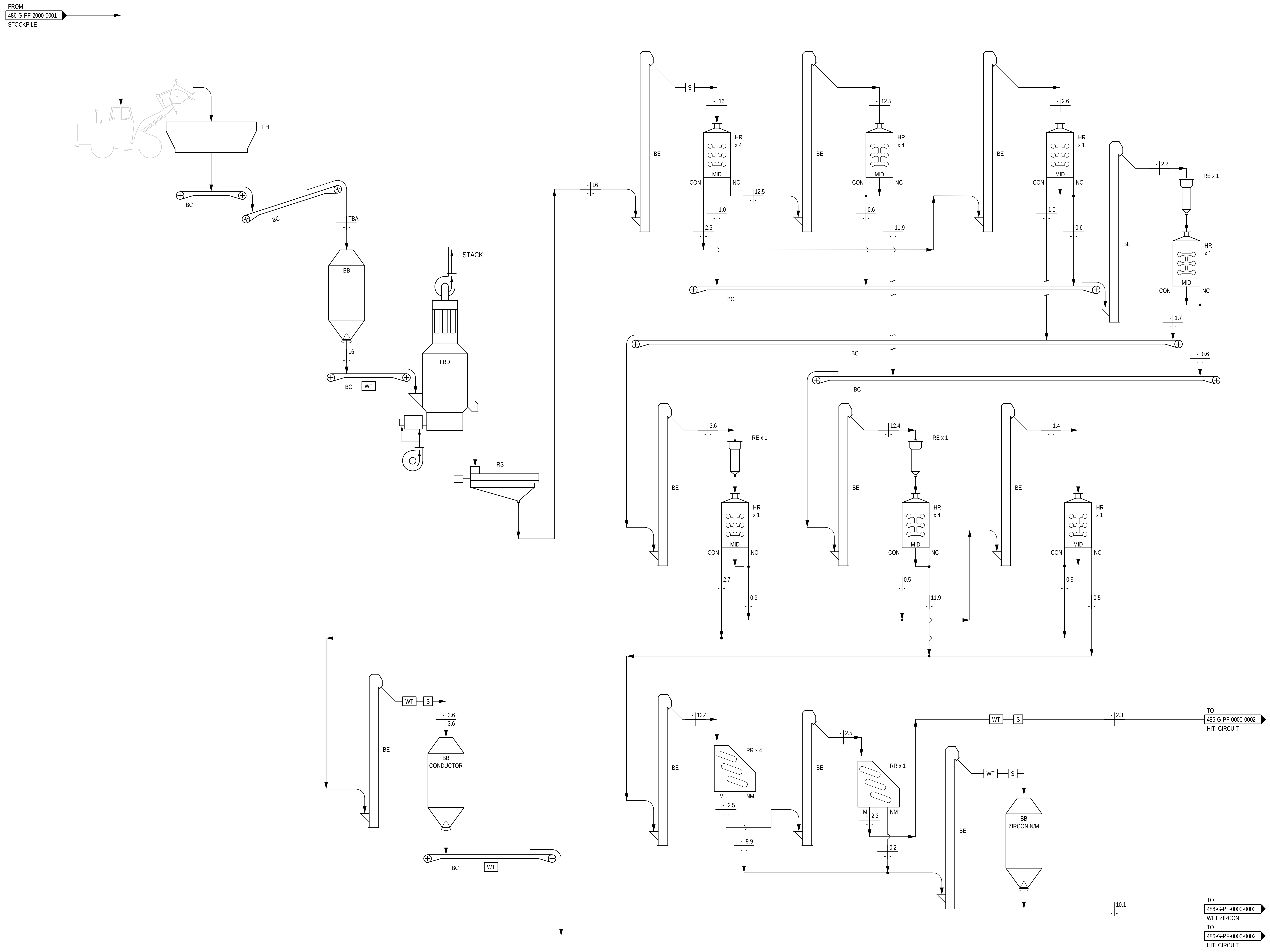
CLIENT DRG No.

RJR DRG No. 486-G-PF-3000-0001
REV A

ORIGINAL SHEET SIZE = A1

SUB AREA 4100

ROUGHER HTR CIRCUIT



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% - SOLIDS | m³/ HOUR - WATER

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DM	D	DENSITY METER
SA	S	SAMPLER
WS	WS	BELT WEIGHER
	⋈	VALVE (REFER TO P&ID FOR DETAILS)
	O/F	OVERFLOW
	O/S	OVERSIZE

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Victoria Australia

TITLE
FEED PREPARATION PLANT
ROUGHER HTR CIRCUIT
AREA 4000
SUB AREA 4100
PROCESS FLOW DIAGRAM

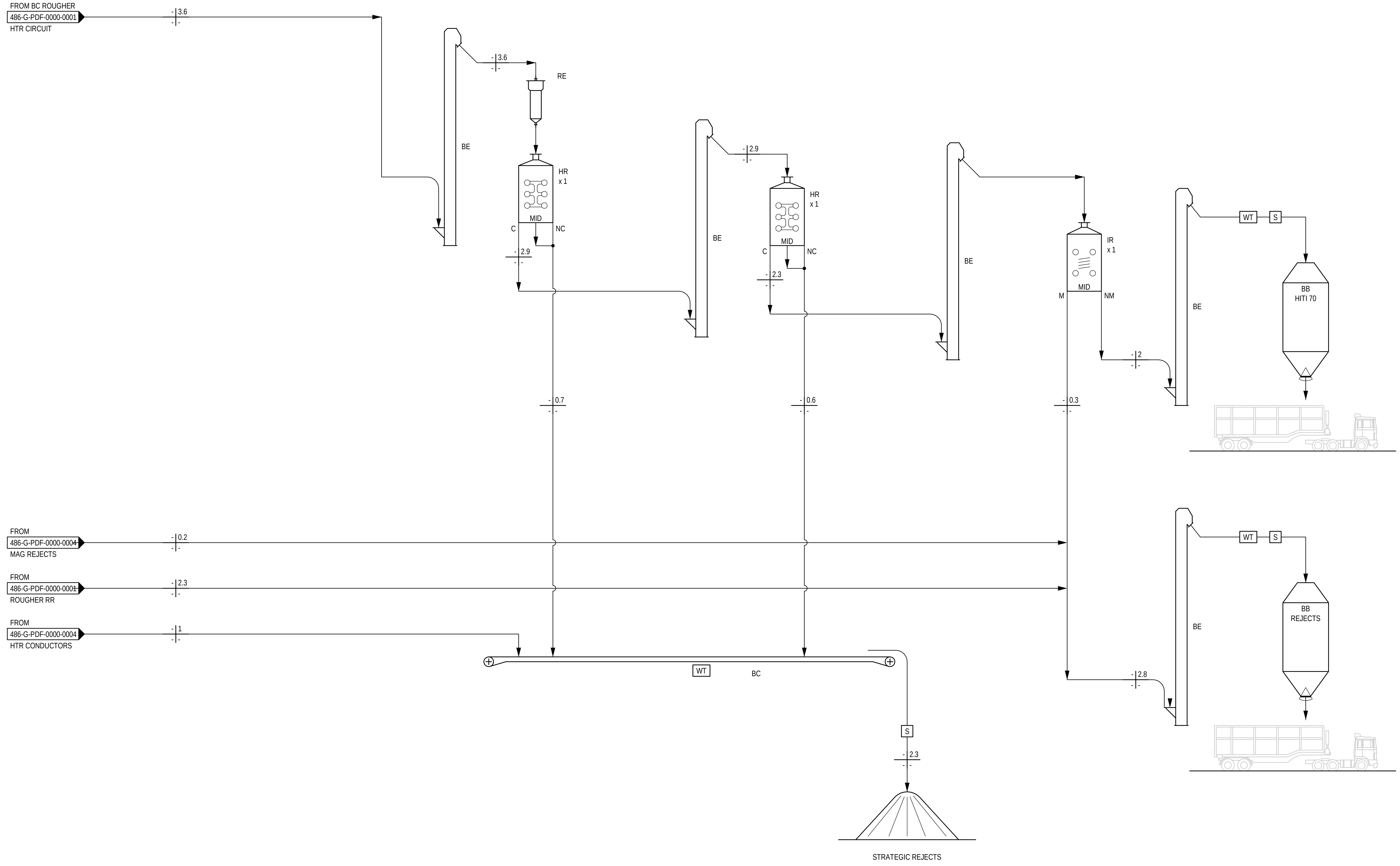
DRAWN	DATE	JOB No.	Dimensions - MILLIMETRES
AB	23/04/2012	486	SCALE NTS

CLIENT DRG No.

RJR DRG No. 486-G-PF-4000-0001 REV A

ORIGINAL SHEET SIZE = A1

SUB AREA 4200
HITI CIRCUIT



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% - SOLIDS | m³/ HOUR - WATER

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DM	D	DENSITY METER
SA	S	SAMPLER
WS	WS	BELT WEIGHER
	⋈	VALVE (REFER TO P&ID FOR DETAILS)
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	O/S	OVERSIZE

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TITLE
FEED PREPARATION PLANT
HITI CIRCUIT
AREA 4000
SUB AREA 4200
PROCESS FLOW DIAGRAM

DRAWN AB
DATE 23/04/2012
JOB No. 486
Dimensions - MILLIMETRES
SCALE NTS
CLIENT DRG No.
RJR DRG No. 486-G-PF-4000-0002
REV A

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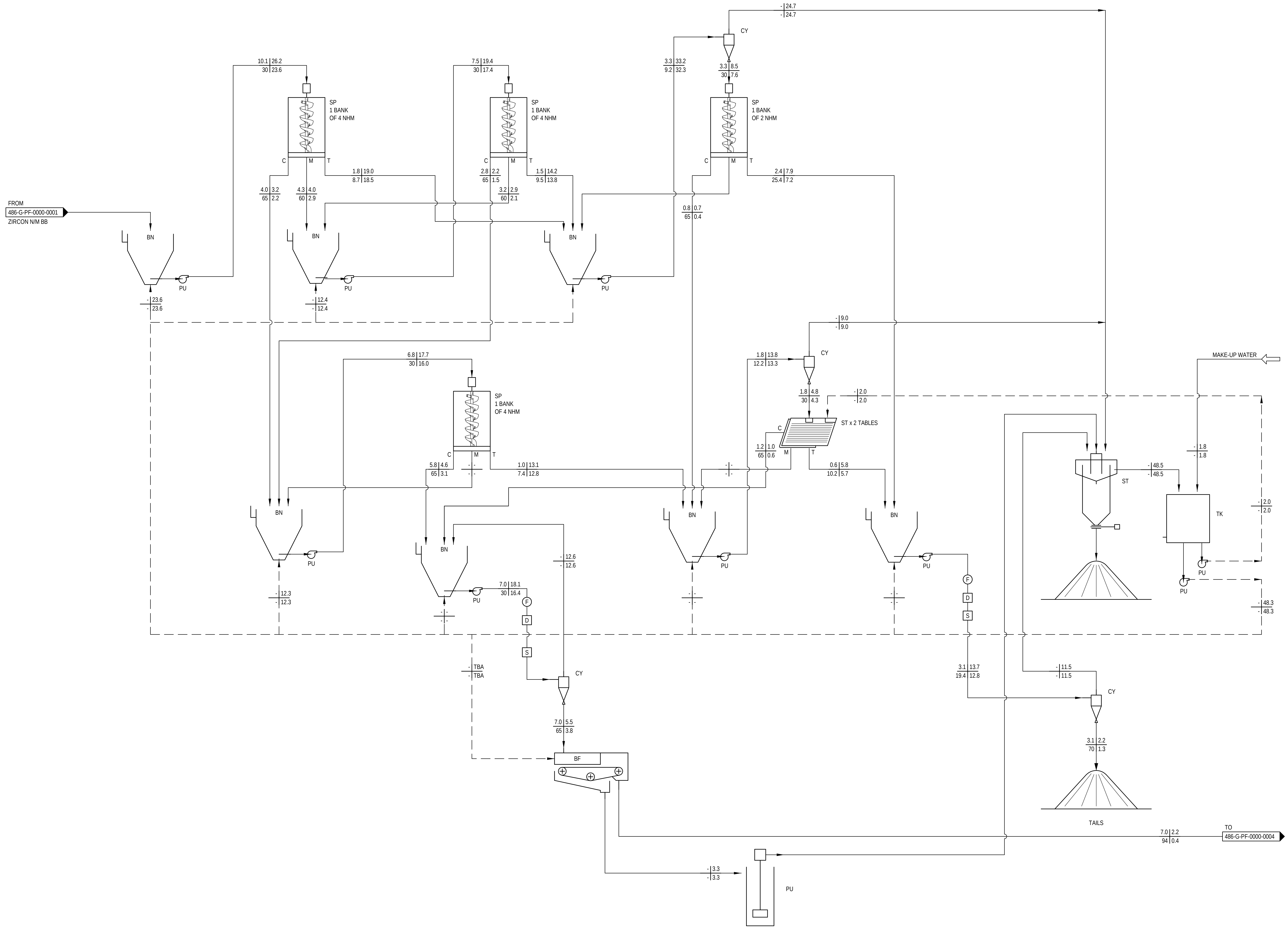
SUB AREA 4300
WET ZIRCON CIRCUIT



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% - SOLIDS | m³/ HOUR - WATER

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DM	D	DENSITY METER
SA	S	SAMPLER
WS	WS	BELT WEIGHER
	⋈	VALVE (REFER TO P&ID FOR DETAILS)
	O/F	OVERFLOW
	O/S	OVERSIZE

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Gippsland Mineral Sands Project - Scoping Study
Victoria Australia

TITLE
MINERAL SEPARATION PLANT
WET ZIRCON CIRCUITS
AREA 4000
SUB AREAS 4300
PROCESS FLOW DIAGRAM

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CLIENT DRG No.

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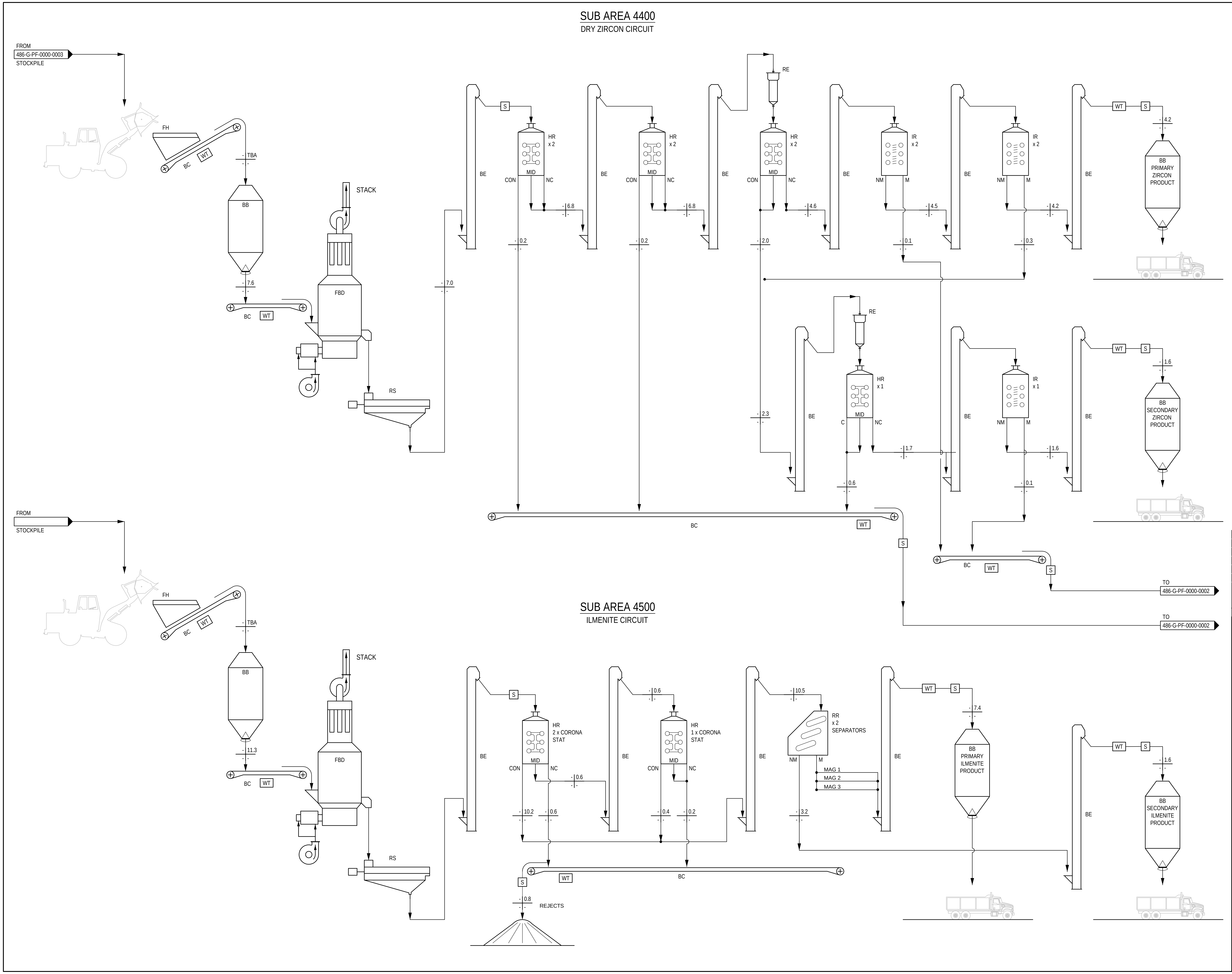

LEGEND

TPH - SOLIDS | m³/ HOUR - SLURRY
% - SOLIDS | m³/ HOUR - WATER

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	— — —	WATER PIPEWORK
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DM	D	DENSITY METER
SA	S	SAMPLER
WS	WS	BELT WEIGHER
	⋈	VALVE (REFER TO P&ID FOR DETAILS)
	O/F	OVERFLOW
	O/S	OVERSIZE

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AUSTRALIA PTY LTD

PROJECT
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Gippsland Mineral Sands Project - Scoping Study
Victoria Australia

TITLE
MINERAL SEPARATION PLANT
ILMENITE & DRY ZIRCON CIRCUITS
AREA 4000
SUB AREAS 4400 & 4500
PROCESS FLOW DIAGRAM

DRAWN	DATE	JOB No.	Dimensions - MILLIMETRES SCALE NTS
AB	23/04/2012	486	

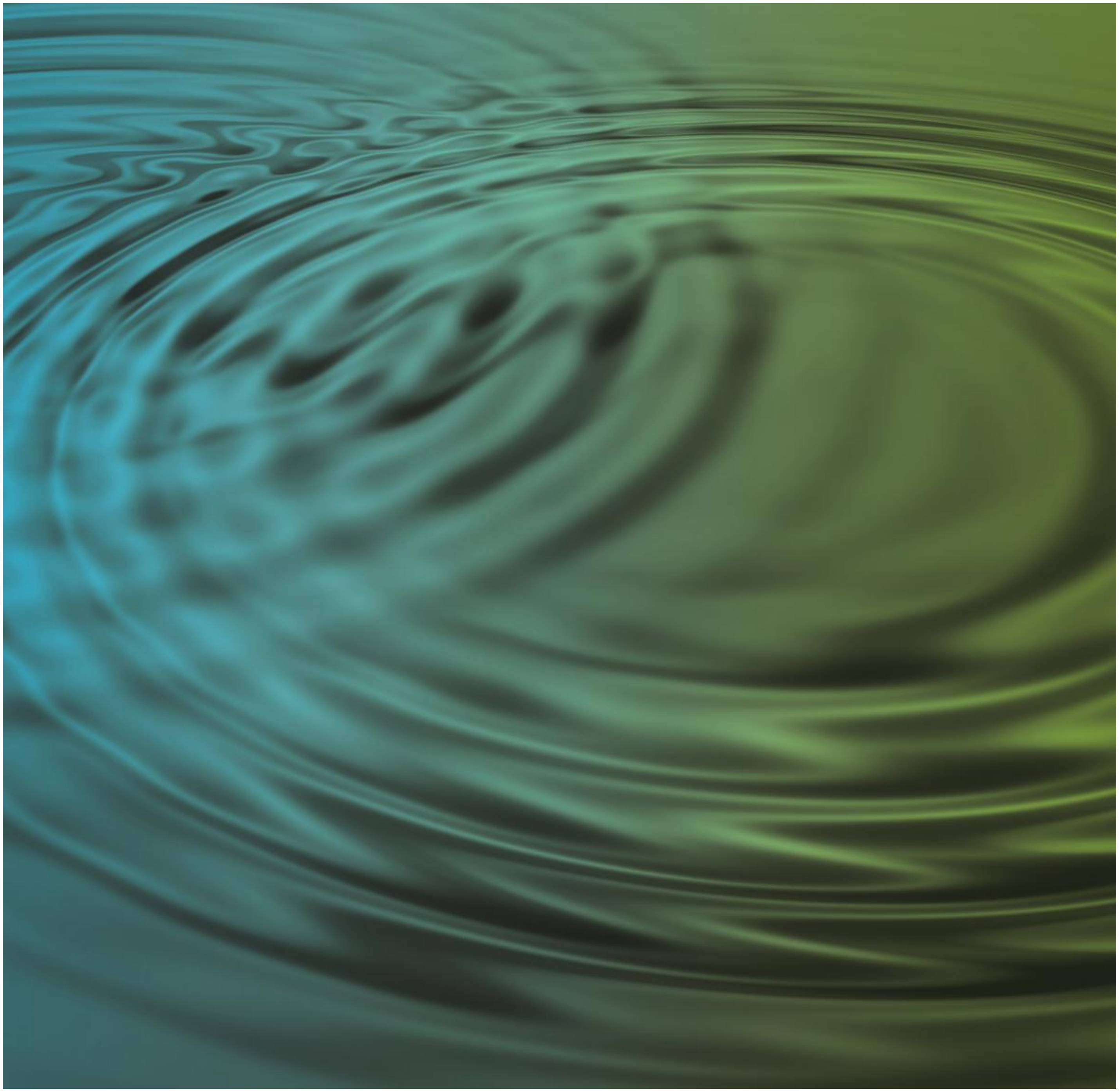
CLIENT DRG No.

RJR DRG No. 486-G-PF-4000-0004 REV A

Glenaladale Mineral Sands Project
Oresome Australia Pty Ltd
12 September 2012

DRAFT

Stage 2 - Groundwater Resource Availability Field Investigation



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Stage 2 - Groundwater Resource Availability Field Investigation

Prepared for

Oresome Australia Pty Ltd

Prepared by

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ABN 20 093 846 925

12 September 2012

60266544

AECOM in Australia and New Zealand is certified to the latest version of ISO9001 and ISO14001.

DRAFT

Quality Information

Document	Stage 2 - Groundwater Resource Availability Field Investigation
Ref	60266544
Date	12 September 2012
Prepared by	Scott Jenke
Reviewed by	David Western

Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
1	12-Sept-2012	Draft for Client Comment	Steven Gray Project Manager	

DRAFT

Table of Contents

DRAFT

Executive Summary

Oresome Australia Pty Ltd (Oresome) is assessing the feasibility of developing a mineral sands deposit located in the Glenaladale area. One of the key issues (risks) associated with the project is the need for a sustainable water supply with Oresome having initially indicated a potential requirement of 6.2 gigalitres per annum.

A review of relevant publicly available geological and hydrogeological information undertaken by AECOM recommended additional preliminary field investigations to further assess the groundwater resource potential.

AECOM (2012) developed a field investigation program targeting the Latrobe Coal Valley Measures/Balook Formation and Latrobe Group aquifers. This report summarises the field work program, provides interpretation of results obtained and recommendations for further work relating to identifying water sources for the project.

The investigation program was undertaken between 18 June and 24 August 2012 and comprised the drilling, construction, development and testing (physical and chemical) of a production bore at MW01.

In-situ material, identified from exploratory drilling and a down-hole geophysical survey between 196 mbgl and 205 mbgl at MW01, was considered a potentially suitable groundwater-bearing formation, such that it might meet some of Oresome's water supply requirements. In order to assess the groundwater potential at this depth, a production bore was constructed and screened across this interval, and a pumping test undertaken.

The constant rate pumping test was conducted on MW01 for 22 hours at 0.5 L/sec. Constraints relating to water depth, bore width and size of necessary pumping equipment confined the test to this rate. Around 17 m of drawdown was experienced immediately after commencement of pumping, which may be attributed to initial well loss. Further drawdown within the 22 hour test was negligible. Within minutes of the cessation of pumping, the water level recovered close to its original standing water level, 86.7 mbgl.

An assessment of the potential sustainable yield of the target aquifer was not possible based on the constant rate pumping test results. While the pumping test results were inconclusive, the targeted aquifer is considered unlikely to sustainably yield groundwater volumes of more than 5 L/sec based on:

- the drilling results from this investigation which revealed a relatively thin sequence of material including around 10-15% of fines (silt) in the aquifer matrix
- the preliminary groundwater resource availability assessment by AECOM (2012), which suggested groundwater yields of between of 1 L/sec and 5 L/sec were most likely.

Even if the targeted aquifer could sustainably produce 5 L/sec, a borefield comprising 40 bores would be required to meet Oresome's initially indicated supply requirements. As the capital and operational cost associated with such a borefield could outweigh the cost of other potential water source options or combinations of options, Oresome should continue to assess the likelihood and cost of other potential sources including (but not necessarily limited to):

1) other known groundwater systems located further to the south and west of Oresome's deposit.
2) potential new winterfill entitlements in the Mitchell River
3) supply from East Gippsland Water
4) transfer (purchase) of entitlements from existing licence holders.
5) treated waste water
6) discharge of mine water from the coal operators in the Latrobe Valley via The Saline Water Outfall Pipeline
7) Surface water flows in nearby tributaries that are not part of the Mitchell River catchment.

The above list of options should not be considered exhaustive and/or necessarily feasible. Considerations associated with required quality, reliability of supply, available volumes, cost feasibility and regulatory (and potentially community) acceptability will be important when considering water source options for this project. Combinations of sources should also be considered.

A risk-based evaluation and documentation of supply and infrastructure options to meet water consumption requirements is considered an important next step in working towards a resolution of water sourcing for this project.

DRAFT

1.0 Introduction

Oresome Australia Pty Ltd (Oresome) is assessing the feasibility of developing a mineral sands deposit located in the Glenaladale area, herein referred to as the study area, in East Gippsland, Victoria. One of the key issues (risks) associated with the project is the need for a sustainable water supply.

Oresome prepared and provided an initial water balance model which indicates a requirement of up to 6.2 gigalitres (GL) per annum.

Following consultation with Oresome and a review of relevant publicly available geological and hydrogeological information, AECOM (2012) recommended additional preliminary field investigations to further assess the groundwater resource potential. Oresome engaged AECOM to assist with the field investigations.

This report details the results and conclusions from the field investigations and provides recommendations to further assess the groundwater source option as well as other potential sources of water.

1.1 Preliminary Groundwater Resource Availability Assessment

AECOM (2012) based on SRW (2008 and 2010) considered the following aquifer systems to be within or close to the study area (from shallowest to deepest):

- Quaternary alluvial (Mitchell River valley sediments).
- The Haunted Hills Formation (Quaternary aged sediments).
- The Boisdale Formation (upper Tertiary aged sediments).
- The Latrobe Valley Coal Measures and Balook Formation (middle Tertiary aged sediments).
- The Latrobe Group (lower Tertiary aged sediments).

Based on the preliminary assessment, the Latrobe Coal Valley Measures/Balook Formation aquifers and underlying Latrobe Group aquifer are considered the best (most prospective) groundwater source option(s) as:

- there is a relatively greater likelihood of intersecting these aquifer systems compared to the Boisdale Formation aquifer
- they are likely to be relatively thicker and potentially yield greater volumes of water than the Boisdale Formation aquifer
- they occur at greater depths than the Boisdale Formation aquifer and there is a relatively greater likelihood and degree of confinement (isolation) from aquifers that are used by local irrigators and/or hydraulically connected to the Mitchell River
- the expected TDS of the groundwater in the Latrobe Group aquifer is similar to the groundwater TDS in the Boisdale Formation aquifer. The expected groundwater TDS in the Latrobe Coal Valley Measures/Balook Formation aquifers is marginally poorer than for the Boisdale.

Groundwater was also considered likely to be present within structural features (e.g faults, fractures and bedding planes) of basement rocks beneath the Latrobe Group. However, given the relatively greater depths and the lower likelihood of yielding greater volumes of water in the basement rocks compared with the overlying sediments, further investigation of the basement rocks was not considered warranted.

AECOM (2012) developed a field investigation program targeting the Latrobe Coal Valley Measures/Balook Formation and Latrobe Group aquifers which comprised drilling, bore installation, test pumping, monitoring, sampling and field analysis of groundwater samples.

Within the study area two proposed bore locations, as shown on Figure 1 (Appendix A), were selected based on a combination of considerations including:

- proximity to the possible processing site;
- land tenure (i.e within Oresome’s exploration licence tenements);
- access including approval from the landowners; and
- relatively greater likelihood of intersecting the targeted aquifer systems (i.e in a southerly and westerly location in the study area).

2.0 Field Investigation Program

2.1 Overview

The Stage 2 field investigation program was undertaken between 18 June and 24 August 2012 and comprised the drilling, construction, development and testing (physical and chemical) of a production bore at MW01 (refer Figure 1, Appendix A), the most south-western location within the Oresome tenement and considered the most prospective of the two proposed locations. More detailed discussion of the field investigation program is provided in the following sub-sections.

A Licence to Construct Works (Appendix B) was obtained from Southern Rural Water before mobilising to site.

Drilltech Pty Ltd (Drilltech) was engaged by Oresome to undertake the drilling, construction and development of MW01 with AECOM engaged to provide hydro-geological advice in the field. GHD Pty Ltd was subsequently engaged by Drilltech to undertake a down-hole geophysical survey of MW01. These works were undertaken between 18 June and 13 July 2012.

Subsequently Agmek Ballarat was also engaged by Oresome to undertake test pumping under the direction and supervision of AECOM. This work was undertaken on 23 and 24 August 2012.

Groundwater samples collected at the end of bore development and test pumping of MW01 were sent to ALS Laboratory Group under AECOMs Chain-of-Custody (CoC) procedures for laboratory testing.

2.2 Drilling, Construction and Development

A six inch (6”) diameter exploratory hole was initially drilled to a total depth of 214 metres below ground level (mbgl) using the mud-rotary drilling technique. Drill-hole cuttings were collected at 1m intervals, lithologically logged by an experienced Engineering Geologist and stored in re-sealable plastic bags for future reference. These have since been provided to R.J. Robbins and Associates for further analysis, at Oresome’s request.

Following discussions between Oresome and Drilltech, the exploratory hole was enlarged to eight inch (8”) to the total depth of 214 mbgl.

At the completion of the enlarged drill-hole, a down-hole gamma and density geophysical survey was undertaken. Based on the geophysical survey, drill-hole cutting logs and consultation between Oresome, Drilltech and AECOM, a target screen interval was identified between 196 mbgl and 205 mbgl. The lithological log of drill-hole cuttings is provided in Appendix C. A copy of the geophysical survey is provided in Appendix D.

Drilltech proposed a nominal bore construction methodology and design based on the drill-hole cutting samples and geophysical survey, which included a screen aperture of 1 mm. The nominal methodology and design was reviewed by AECOM, Oresome and the Southern Rural Water drilling inspector and agreed to following minor alterations to the proposed construction sequencing and methodology. The proposed bore construction diagram is shown on Figure 2 (Appendix A).

During construction, the bore-casing was temporarily suspended at around 189 mbgl, possibly due to swelling clays. However, the bore-casing was pushed through the constriction at 189 mbgl and proceeded to the drilled depth without further issue.

A filter pack was slowly placed into the borehole annulus. Based on the volume of material required to reach the top of the filter pack design level, it is possible the filter pack did not extend beyond the constriction at around 189m. Based on advice from Drilltech, it is understood that the stainless steel screen is appropriately sized for the in-situ material present at the target interval to act as a suitable filter pack.

The bore construction was completed by grouting from the top of the filter pack back to ground surface with a water:cement:bentonite mix, using two grout slugs tremmied from 170 mbgl and 90 mbgl. The as-constructed bore is shown on Figure 3 (Appendix A).

The constructed bore was allowed to cure and settle for 2 days before development commenced. The bore was developed by initially injecting clean water with a chemical agent to break-down the drilling fluid and then surging and airlifting to remove drilling mud and to facilitate hydraulic connection with the target aquifer. Measurements of airlift yields, water levels and water quality as electrical conductivity (EC), total dissolved solids (TDS) and pH were recorded during development.

2.3 Pumping Test

A constant rate pumping test was conducted on MW01 for 22 hours at 0.5 L/sec. This was followed by a short recovery test until the water level in MW01 had returned close to its original standing water level. It should be noted that the pump in MW01 could not be set at a depth of greater than 110 mbgl (i.e around 20 m below the standing water level) due to the internal diameter of the bore-casing at this depth (refer Figure 3, Appendix A). Hence, it is possible that a higher discharge rate may have been possible if the pump was set deeper and there was more drawdown available above the pump inlet.

Water levels in MW01 were recorded at 30 second intervals using a data-logger. A flow meter was used to monitor and maintain a steady pumping rate during the test. Field measurements of pH, EC and temperature were typically taken at no more than 30 minute intervals over the first 5 hours of pumping and then at the end of the constant rate test. The raw data are provided in Appendix E.

A step test to assess the efficiency of MW01 was also originally planned, but could not be completed due to:

- the pump running dry at rates of more than 0.5 L/sec; and
- the pump being unable to discharge water to the surface at rates of less than 0.5 L/sec.

2.4 Groundwater Quality Testing

Groundwater samples were collected at the end of bore development and the pumping test and sent to ALS Laboratory Group under AECOMs CoC procedures for laboratory testing. The sample collected at the end of bore development was tested to assess the suitability of groundwater as a process water supply and analytes assessed were as directed by R.J. Robbins and Associates.

The sample collected from the end of the pumping test was tested to characterise the hydrogeochemical signature of groundwater.

A copy of the groundwater quality laboratory test result certificates (including quality assurance and quality control documentation) and chain of custody are included in Appendix F

DRAFT

3.0 Field Investigation Results

3.1 Drilling and Development

3.1.1 Lithology

A summary of the lithologies intersected in MW01 is summarised in Table 1.

Table 1 MW01 - Subsurface Profile

Depth Below Ground Level (m)		Horizon Description
From	To	
0	48	Predominately mottled, orange / brown CLAYS with varying percentages of fine sand (est. content 5-20%) and lignite (<5%). A single thin (4m thick) horizon of fine to medium grained quartzose gravel was intercepted from 12m bgl
>48	163	Predominately high plasticity dark grey Sandy CLAYS with varying percentages of fine to medium sand (est. content 10-30%) and fine subangular gravels throughout
>163	170	Grey to off white subangular and subrounded, fine to medium sized GRAVEL with estimated 20% clay and 10% fine grained sand content (Not carbonaceous)
>170	180	Light grey, high plasticity CLAY with estimated 10% fine sand content
>180	188	Variable horizon consisting of thin layers of dark grey to off-white fine to medium SAND with estimated 10% clay content alternating with less frequent thin layers of dark grey GRAVELS with estimated 30% low plasticity clay content. Material non carbonaceous
>188	196	Light grey high plasticity CLAYS with variable fine to medium grained sand content (10 – 20%)
>196	205	Dark grey medium to coarse SANDS and fine to medium GRAVELS throughout, minor (10-15%) fines (silt)
>205	214	Light grey / light blue (becoming red at base of interval) high plasticity CLAY

3.1.2 Water Intersections

Water was first intersected during drilling at around 23 mbgl and remained at this level until drilling had advanced to 163 mbgl. While further water intersections occurred at depth, these most likely represent the water level in two or more water-bearing zones and are not discussed further.

3.1.3 Airlift Yields

The discharge measured during airlifting from depths of between 80 mbgl to 180 mbgl was generally between 1 L/sec and1.25 L/sec, although there was a noticeable decline to less than 0.5 L/sec in the discharge when bore development occurred at or close to the bottom of the bore.

Following bore development, the standing water level was recorded at 86.7 mbgl.

3.1.4 Groundwater Quality Field Measurements

Results of field testing of discharge water revealed:

- EC between 1845 µS/cm and 2187 µS/cm
- TDS between 1190 mg/L and 1376 mg/L.
- pH between 6.4 and 6.9.
- Temperature between 19.6°C and 22.5°C.

Results of field testing of discharge water during test pumping revealed:

- EC between 1086 µS/cm and 1153 µS/cm
- pH between 6.4 and 7.0.
- Temperature between 22.7°C and 24.0°C.

3.2 Pumping Test

A semi-log plot of drawdown versus time is shown on Figure 4 (Appendix A). The plot shows that around 17 m of drawdown was experienced immediately after commencement of pumping, which may be attributed to initial well loss, i.e turbulent flow that occurs either in the bore (and which maybe an indication of the bore efficiency) and/or in the aquifer. Following this initial well loss, the rate of drawdown stabilises for the remainder of the test. Within minutes of the cessation of pumping, the water level recovered close to its original standing water level.

As there was no drawdown following the initial well loss, it is not possible to analyse the data for estimates of aquifer transmissivity. Further, aquifer storativity can only be estimated based on water level measurements in a nearby observation bore during a constant-rate pumping test.

3.3 Groundwater Quality

Results from laboratory analyses of the groundwater samples collected at the end of development and the pumping test are summarised in Tables 2 and 3.

Table 2: Summary of Groundwater Quality Results at end of Development

Analyte	Units	Limits of Reporting	Test Result
Electrical conductivity (@ 25^{o}C)	µS/cm	1	990
Total Dissolved Solids (@ 180^{o}C)	mg/L	10	596
Total Hardness as CaCO3	mg/L	1	132
Iron	mg/L	0.05	3.48
Ferrous Iron	mg/L	0.05	3.19
Ferric Iron	mg/L	0.05	0.29
Dissolved Organic Carbon	mg/L	1	5
Density (@15^{o}C)	g/mL	n/a	0.9997
Specific Gravity (@15^{o}C)	-	n/a	1.0004
Viscosity (at Ambient Temp)	cSt	n/a	0.912

D R A F T

Table 3: Summary of Groundwater Quality Results at end of Pumping Test

Analyte	Units	Limits of Reporting	Test Result
pH	unit	0.01	6.31
Electrical conductivity (@ 25°C)	µS/cm	1	1090
Total Dissolved Solids (@ 180°C)	mg/L	10	660
Hydroxide Alkalinity as CaCO3	mg/L	1	<1
Carbonate Alkalinity as CaCO3	mg/L	1	<1
Bicarbonate Alkalinity as CaCO3	mg/L	1	68
Total Alkalinity as CaCO3	mg/L	1	68
Sulphate as SO4	mg/L	1	68
Chloride	mg/L	1	295
Calcium	mg/L	1	29
Magnesium	mg/L	1	17
Sodium	mg/L	1	155
Potassium	mg/L	1	12

It is noted that the laboratory EC and TDS test results were lower than those recorded in the field during well development (although comparable) and similar to those recorded in the field during test pumping. While the reason for this difference is not known, greater confidence is placed in the laboratory results which have similar EC and TDS results for both groundwater samples and which are determined under controlled conditions.

The Piper diagram presented on Figure 5 (Appendix A) indicates that the groundwater is sodium-chloride type.

4.0 Conclusions and Recommendations

In-situ material, identified from exploratory drilling and a down-hole geophysical survey between 196 mbgl and 205 mbgl at the most south-western proposed location (MW01), was considered a potentially suitable groundwater-bearing formation, such that it might meet some of Oresome's water supply requirements. In order to assess the groundwater potential at this depth, a production bore was constructed and screened across this interval, and a pumping test undertaken.

While the stratigraphic unit of the screened interval at MW01 is not clear, based on a previous review of limited geological and hydrogeological information within the vicinity of MW01 (AECOM 2012) and results of exploratory drilling during this investigation, the material is considered to represent either the middle or lower Tertiary aged sediments. Quaternary aged sediments of the Haunted Hills Formation are considered to overly these Tertiary sediments higher-up in the borehole sequence. Further work would be required to confirm the stratigraphy at MW01, e.g comparing the geophysical survey from this investigation with a similar geophysical trace from a borehole with known stratigraphy. However, this is not considered warranted as the potential for interference with the aquifer(s) screened by local irrigation bores is considered low given the relatively greater depth to the screened interval at MW01 and that the local irrigation bores source groundwater from shallow groundwater system(s), most likely confined to the lateral extents of the Mitchell River floodplain.

An assessment of the potential sustainable yield of the target aquifer was not possible based on the constant rate pumping test results. While the pumping test results were inconclusive, the targeted aquifer is unlikely to sustainably yield groundwater volumes of more than 5 L/sec based on:

- the drilling results from this investigation which revealed a relatively thin (7 m) sequence of material including around 10-15% of fines (silt) in the aquifer matrix.
- The preliminary groundwater resource availability assessment by AECOM (2012), which suggested groundwater yields of between of 1 L/sec and 5 L/sec were most likely.

Even if the targeted aquifer could sustainably produce 5 L/sec, a borefield comprising 40 bores would be required to meet Oresome's initially indicated supply requirements. As the capital and operational cost associated with such a borefield could outweigh the cost of other potential water source options or combinations of options, Oresome should continue to assess the likelihood and cost of other potential sources including:

8) Known groundwater systems, based on regional information presented in SRW (2010), located further to the south and west of Oresome's deposit. This would initially involve a more comprehensive search and review of information on the groundwater systems in these areas compared to the original preliminary groundwater resource availability assessment, which was more focused within in the immediate vicinity of Oresome's deposit.

9) A proposal in the draft Gippsland Region Sustainable Water Strategy (GRSWS) (DSE, 2010) to increase the temporary cap on new winterfill entitlements in the Mitchell River to a total of 6 GL. The intent of this proposal is to provide opportunities for consumptive water users to invest in infrastructure to store water over the wetter months, i.e winterfill entitlements would only be accessible between July and October.

    According to DSE (2010), where future water demands exceed this cap, a change would only be reconsidered where there is shown, based on a precautionary approach, to be a low risk to the reliability of existing consumptive users and the environment, which includes irrigators in the Lindenow Valley, East Gippsland Water's town water supplies and environmental flows into the Gippsland Lakes Ramsar-listed wetlands.

    Access to the proposed 6 GL of winterfill entitlement would be administered by Southern Rural Water (SRW). While the process for this is not yet clear, SRW would be obliged to ensure that it is equitable and transparent for all consumptive users.

    However, it is likely that such a process would register significant interest in the proposed additional water entitlement. The Lindenow irrigators have long campaigned for access to more water from the Mitchell River, including the possible construction of a dam on the river. Although a dam on the Mitchell River is unlikely, the Government is continuing to explore opportunities to create more winter storage for the irrigation district including potential dam sites on nearby tributaries, and investigation of Aquifer Storage and Recovery (ASR).

    In order to secure supply from the Mitchell River, Oresome would need to:

- engage in a transparent and competitive process (possibly through a publicly advertised Expression of Interest or similar) for allocation of the proposed additional winterfill entitlement; and
- construct off-stream infrastructure to transfer and store water between July and October.

10) Exploring the potential for East Gippsland Water (EGW) to supply water it extracts from the Mitchell River at Glenaladale. As EGW's entitlements (including winterfill) exceed the annual demand of the system in the medium term, EGW may be in a position to supply water during the winterfill months, assuming Oresome has adequate storage capacity. It should be noted that EGW has recently expanded its raw water storage capacity to improve security of supply for its largest water supply system.
11) Seeking to transfer (purchase) entitlements from existing licence holders.
12) Treated wastewater, although it is understood that, based on discussions with Oresome and R.J. Robbins and Associates during the risk assessment workshop in May 2012, the volumes of wastewater treated at the Bairnsdale Wastewater Treatment Plant (WWTP) would be insufficient to fully meet Oresome's demands.
13) Discharge of mine water from the coal operators in the Latrobe Valley via The Saline Water Outfall Pipeline (SWOP).
14) Surface water flows in nearby tributaries that are not part of the Mitchell River catchment.

The above list of options should not be considered exhaustive and/or necessarily feasible. Considerations associated with required quality, reliability of supply, available volumes, cost feasibility and regulatory (and potentially community) acceptability will be important when considering water source options for this project. Combinations of sources should also be considered.

A risk-based evaluation and documentation of supply and infrastructure options to meet water consumption requirements is considered an important next step in working towards a resolution of water sourcing for this project.

5.0 References

AECOM Australia Pty Ltd (2012). *Preliminary Groundwater Resource Availability Assessment*, dated 5 June 2012. Prepared for Oresome Australia Pty Ltd.

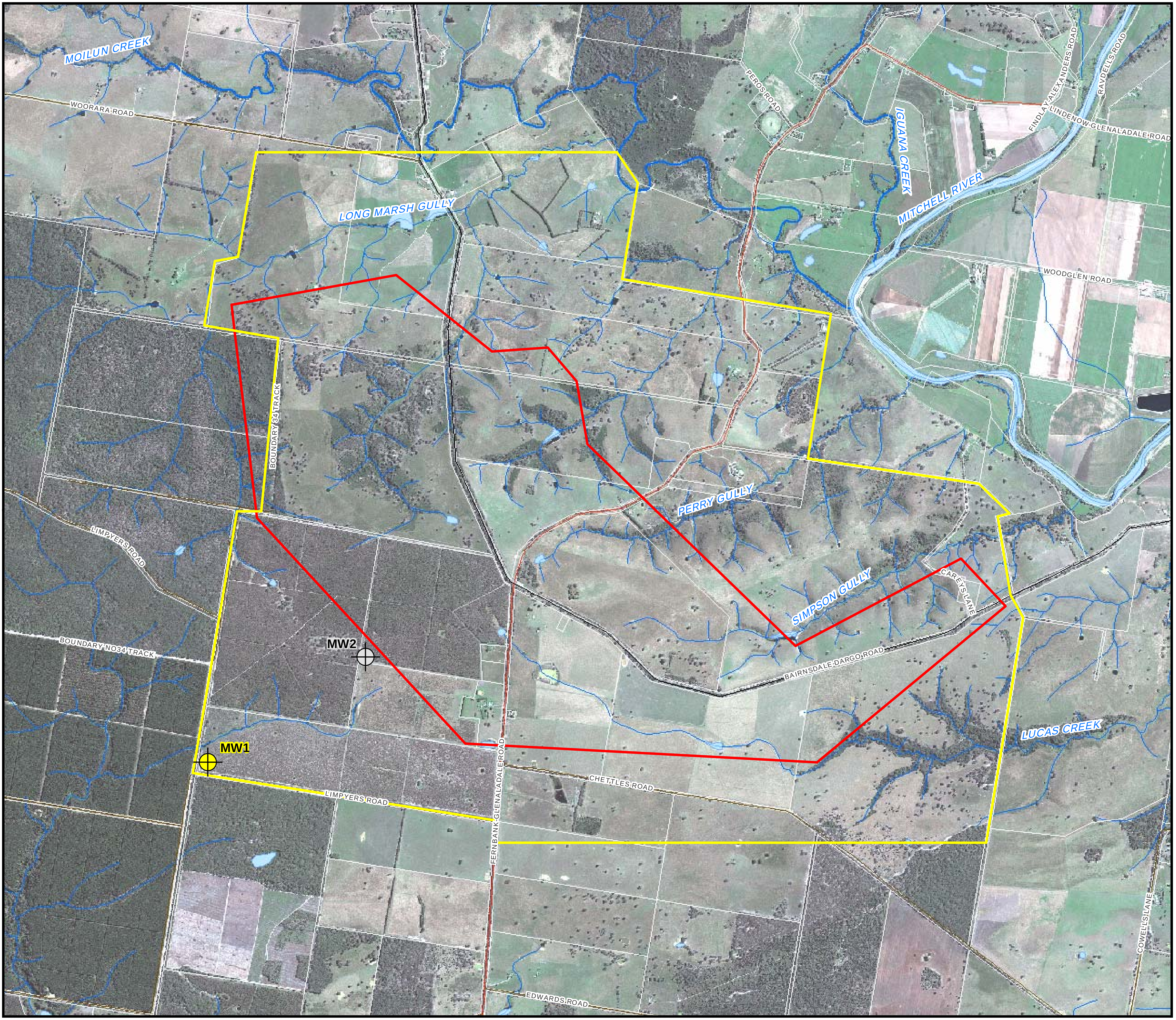
Department of Sustainability and Environment (DSE) (2010). *Draft Gippsland Region Sustainable Water Strategy* (GRSWS)

Southern Rural Water (SRW) (2008). *Groundwater Resource Assessment of Deeper Aquifers in the Lindenow region, East Gippsland*. Prepared by SKM for Southern Rural Water, August 2008.

Southern Rural Water (SRW) (2010). *Hydrogeological Mapping of Southern Victoria*. Prepared by SKM and GHD for Southern Rural Water, April 2010 (SRW, 2010).

Appendix A

Figures



AECOM

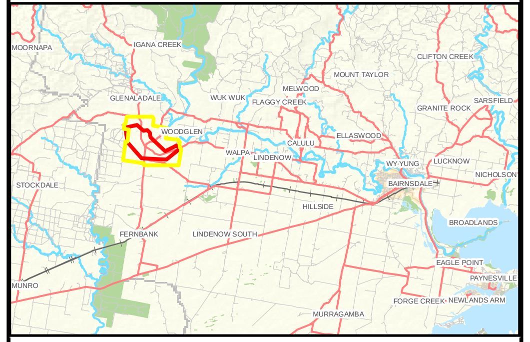
www.aecom.com

DATUM GDA 1994, PROJECTION MGA ZONE 55

1:25,000 (when printed at A3)

Legend

🟥	Project Area
🟨	Potential Mining Lease Boundary
—	Arterial Road
—	Connector Roads
—	Local Roads
—	watercourse_river
—	watercourse_stream
🟦	Waterbody
⊕	MW1 (Constructed)
⊕	MW2 (Proposed, not constructed)



Data sources:

Imagery: Oresome Australia Pty Ltd & Geoimage Pty Ltd 06 March 2012

VicMap data:
Background Mapping Data Copyright The State of Victoria 2009. The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information

SITE OVERVIEW

Oresome Australia Pty Ltd

Stage 2 - Groundwater Resource Borehole Location Plan

PROJECT ID	60266544
CREATED BY	DJB
LAST MODIFIED	DJB 01 Aug 2012

Figure

F1

Drilltech Proposed Well Installation Sketch - Provided 05 July 2012

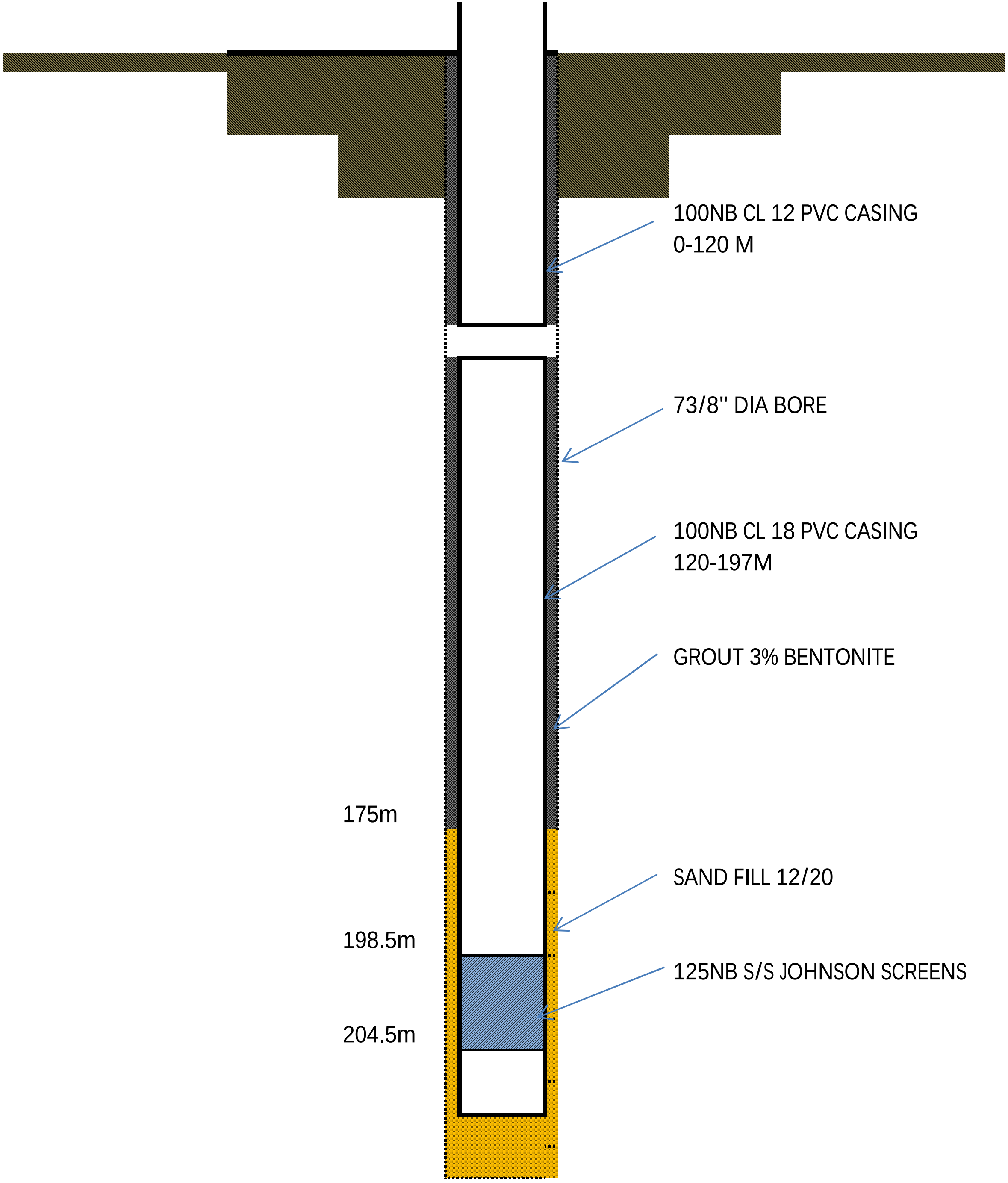
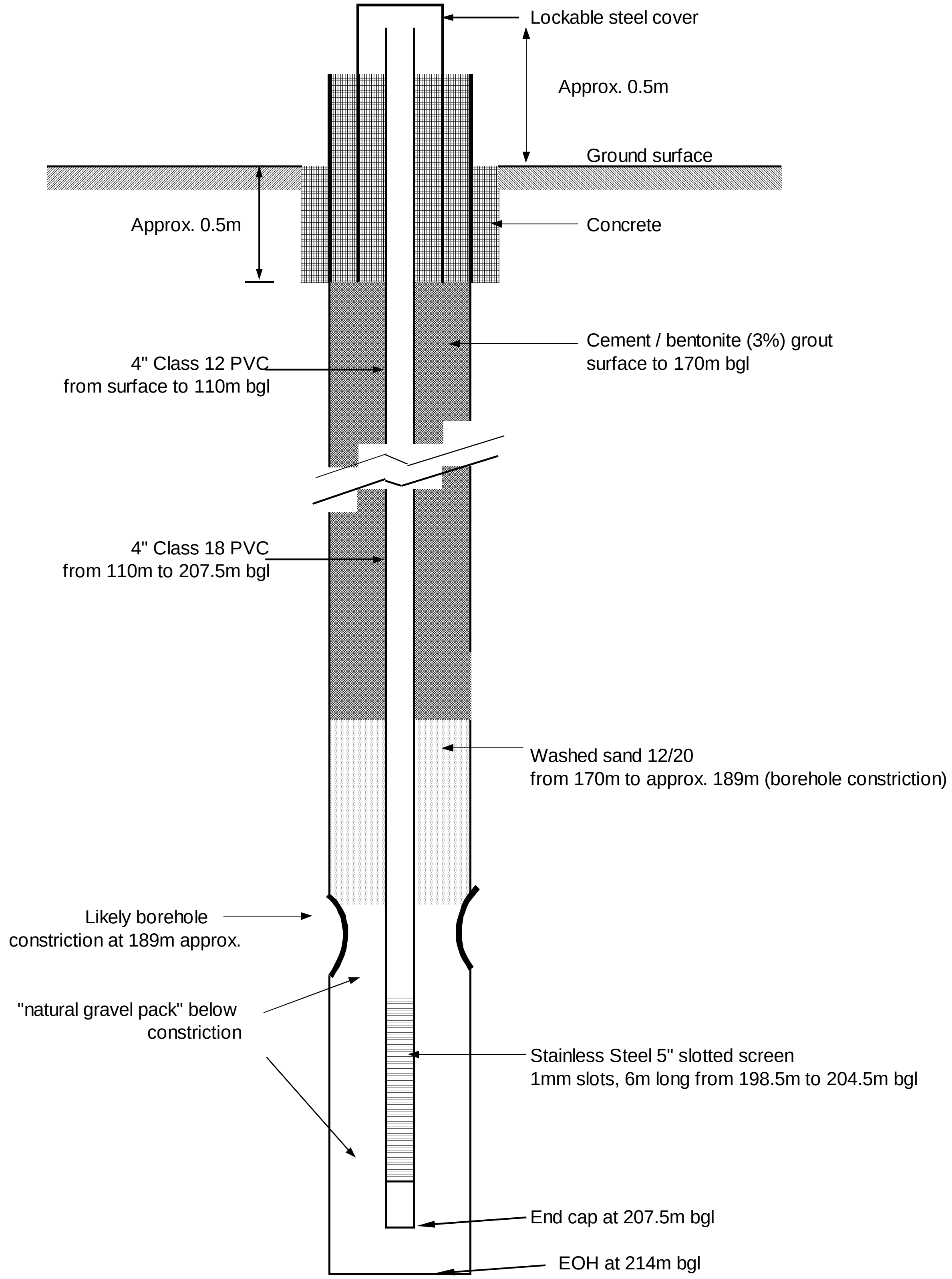


FIGURE 2

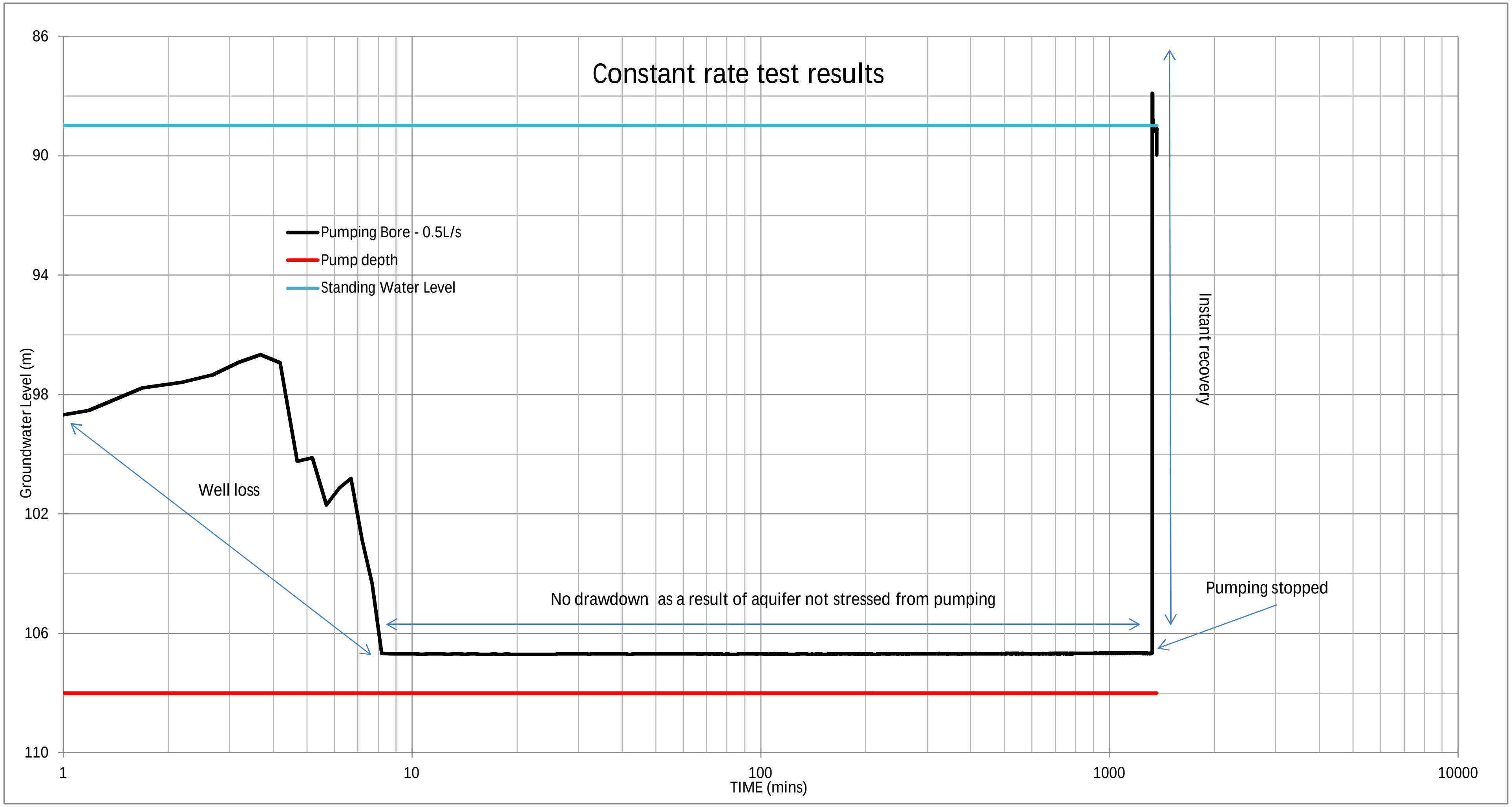
Figure 3

MWO1 SCHEMATIC OF WELL INSTALLATION



NOTE

DRILLHOLE CONSTRICTION AT APPROXIMATELY 189M. FILTER SAND BELIEVED TO BRIDGE AT THIS DEPTH AND "NATURAL GRAVEL PACK" BELOW



A		11-Sep-12
REV	DESCRIPTION	DATE

CLIENT: Oresome Australia P/L

PROJECT: Stage 2 - Groundwater Resource Availability Field Investigation

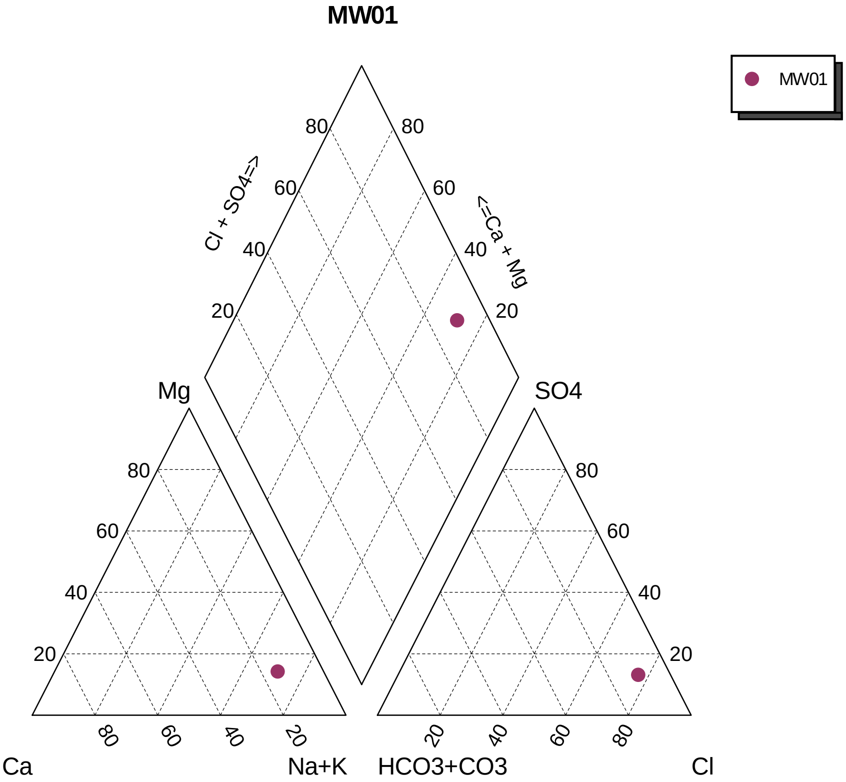
REVISION: A
SCALE: NTS
DRAWING NO:
FILE NO:
DATE:

DESIGNED: DW
DRAWN: DW
CHECKED:
APPROVED:
STATUS:

TITLE:
CONSTANT RATE TEST :
DRAWDOWN IN PUMPING BORE

FIGURE: **4**

A4


MW01
MW01
80
60
40
20
80
60
40
20
Cl + SO4=>
<=Ca + Mg
Mg
SO4
80
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80
60
40
20
80
60
40
20
20
40
60
80
Ca
Na+K
HCO3+CO3
Cl

Appendix B

Southern Rural Water - Licence to Construct Works

Works Licence ID:

WLE055146

Printed on: 08 Jun 2012 8:49:06 am

COPY OF RECORD IN THE VICTORIAN WATER REGISTER

LICENCE TO CONSTRUCT WORKS

under Section 67 of the Water Act 1989

The information in this copy of record is as recorded at the time of printing. Current information should be obtained by a search of the register. The State of Victoria does not warrant the accuracy or completeness of this information and accepts no responsibility for any subsequent release, publication or reproduction of this information.

This licence does not remove the need to apply for any authorisation or permission necessary under any other Act of Parliament with respect to anything authorised by the works licence.

Water used under this licence is not fit for any use that may involve human consumption, directly or indirectly, without first being properly treated.

This licence is not to be interpreted as an endorsement of the design and/or construction of any works (including dams). The Authority does not accept any responsibility or liability for any suits or actions arising from injury, loss, damage or death to person or property which may arise from the maintenance, existence or use of the works.

Each person named as a licence holder is responsible for ensuring all the conditions of this licence are complied with.

This licence authorises its holders to construct the described works, subject to the conditions.

Licence Holder(s)

ORESOME AUSTRALIA PTY LTD of PO BOX 122 BRISBANE QLD 4001

Licence Contact Details

ORESOME AUSTRALIA PTY LTD
PO BOX 122
BRISBANE QLD 4001

Licence Details

Expiry date	07 Jun 2013
Status	Active
Authority	Southern Rural Water
Name of waterway or aquifer	UNC-Unincorporated
Water system	Unincorporated (GMU)

Summary of Licensed Works

The details in this section are a summary only. They are subject to the conditions specified in this licence.

Works ID	*Works type*	*Use of water*
WRK069859	Bore	Observation or investigation
WRK069860	Bore	Observation or investigation

Description of Licensed Works

WORKS ID WRK069859

Works type	Bore
Works subtype	Drilled bore
Maximum depth	200.000 metres

Extraction Details

Use of water	Observation or investigation

Works location

Easting	*Northing*	*Zone MGA*
Nil		

Land description

Volume 10328 Folio 459
Lot 3 of Plan PS343168V

Property address

FERNBANK GLENALADALE ROAD, FERNBANK, VIC 3864

Description of Licensed Works

WORKS ID WRK069860

Works type	Bore
Works subtype	Drilled bore
Maximum depth	200.000 metres

Extraction Details

Use of water	Observation or investigation

Works location

Easting	*Northing*	*Zone MGA*
Nil		

Land description

Volume 10328 Folio 458
Lot 2 of Plan PS343168V

Property address

LIMPYERS ROAD, FERNBANK, VIC 3864

Related Instruments

Related entitlements	Nil
Related water-use entities	Nil

Application History

Reference	*Type*	*Status*	*Lodged date*	*Approved date*	*Recorded date*
WLI014625	Issue	Approved	07 Jun 2012	08 Jun 2012	

Conditions

Licence WLE055146 is subject to the following conditions:

Siting and construction

1 The bore must be constructed on the land described in the licence, at coordinates E: 526762.0, N: 5815690.0, Zone: 55.

2 The bore(s) must be drilled at the location specified in the application approved by the Authority, but if after drilling a bore is considered unsatisfactory, a replacement bore may be drilled at an alternative site no greater than 20 metres from the authorised site and no closer to neighbouring bores or nearby waterways, or as authorised by the Authority before the commencement of drilling.

Preventing pollution

3 All earthworks must be carried out, and all drilling fluids and waters produced during construction and development must be disposed of, in ways that avoid contaminating native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

4 Construction must stop immediately if the Authority reasonably believes that fuel, lubricant, drilling fluid, soil or water produced during construction and development is at risk of being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

5 The licence holder must construct and maintain bund walls, in accordance with the timeframe, specifications, guidelines or standards prescribed by the Authority, to prevent fuel, lubricant, drilling fluid, soil or water produced during construction and development from being spilled into native vegetation, waterways, aquifers, the riparian environment, the riverine environment or other people's property.

Construction standards

6 The bore(s) must be constructed, and where relevant decommissioned, in accordance with the ARMCANZ (2nd Edition September 2003) guidelines relating to monitoring bores.

Drilling licence and supervision requirements

7 The bore(s) must be constructed by, or under the direct supervision of, a driller licensed under the Water Act 1989 and endorsed as a Class 1, 2, or 3 driller, with appropriate endorsements.

8 The licence holder must ensure that the licensed driller notifies the Authority's Drilling Inspector at least one day prior to work commencing on any grouting operations and must not proceed with the work unless authorised by the Drilling Inspector.

Bore completion report

9 The licence holder must ensure that the licensed driller sends a Bore Completion Report to the Authority within twenty-eight working days of the bore(s) being completed.

10 The works referred to in the licence must not be made operational until the Authority acknowledges receipt of an acceptable Bore Completion Report.

11 The works referred to in the licence must not be made operational until the licence holder sends a water sample to the laboratory nominated by the Authority.

Protecting water resources

12 No more than 2 bore(s) may be brought to final development under this licence.

13 At the completion of drilling, and before the drilling rig leaves the site, all but 2 bore(s) must be decommissioned so as to eliminate physical hazards, conserve aquifer yield, prevent groundwater contamination and prevent the intermingling of desirable and undesirable waters.

Protecting water quality

14 The bore(s) must be constructed so as to prevent aquifer contamination caused by vertical flow outside the casing.

15 If two or more aquifers are encountered, the bore(s) must be constructed to ensure that an

impervious seal is made and maintained between each aquifer to prevent aquifer connection through vertical flow outside the casing; under no circumstances are two or more aquifers to be screened within the one bore or in any other manner to allow connection between them.

16 Boreheads must be constructed, to ensure that no flood water, surface runoff or potential subsurface contaminated soakage can enter the bore or bore annulus.

17 Drilling must not exceed the maximum depth unless the Authority approves, in advance, drilling beyond this depth.

Protecting other water users

18 The diameter of the bore-casing must not exceed 200 millimetres.

19 The licence holder must, at the licence-holder’s expense, if required by the Authority, conduct a pumping test and obtain a hydrogeological report, to the Authority's specification, on the potential for bore operation to interfere with any bore, aquifer, groundwater dependent ecosystem or waterway.

Fees and charges

20 The licence holder must, when requested by the Authority, pay all fees, costs and other charges under the Water Act 1989 in respect of this licence.

END OF COPY OF RECORD

Appendix C

Lithological Log

60266544 - Glenaladale Aquifer Assessment

Drilled	Depth				
	From	Top	Primary Materal	Colour and plasticity	Secondary Material
20/06/2012	0	1	sandy CLAY	LP, grey - brown	fine sandy (40%)
	1	2	CLAY	HP, orange - brown	trace fine sand (10%)
	2	3	CLAY	HP, lt grey	trace fine sand (<5%)
	3	4	CLAY	HP, mottled orange - grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	4	5	CLAY	HP, dk orange	(10% sand)
	5	6	CLAY	HP, mottled lt grey - red	trace fine sand (<5%)
	6	7	CLAY	HP, orange - red	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	7	8	sandy CLAY	HP, ly greyish red	sand with trace fine grv. (25% sand, 5%grv)
	8	9	CLAY	HP, mottled lt grey - orange	trace fine sand (10%)
	9	10	CLAY	HP, mottled lt grey - orange	trace fine sand (10%)
	10	11	CLAY	HP, mottled lt grey - orange	trace fine sand (10%)
	11	12	gravelly CLAY	L-MP, lt grey/brown	(10% sand, 15%grv)
	12	13	GRAVEL	lt grey-white, quartz, fine to med gravel	
	13	14	GRAVEL	lt grey-white, quartz, fine to med g	
	14	15	GRAVEL	lt grey-white, quartz, fine to med g	
	15	16	GRAVEL		Sample not obtained due to drilling of casing
	16	17	sandy CLAY	HP, mottled lt grey - orange	trace fine - medium sand sized lignite flecks (20% sand)
	17	18	sandy CLAY	HP, mottled lt grey - orange	trace fine - medium sand sized lignite flecks (20% sand)
	18	19	sandy CLAY	HP, mottled lt grey - orange	trace fine - medium sand sized lignite flecks (20% sand)
	19	20	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)

Drilled Depth				
From	Top	Primary Materal	Colour and plasticity	Secondary Material
20	21	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
21	22	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
22	23	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
23	24	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
24	25	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
25	26	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
26	27	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
27	28	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
28	29	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
29	30	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)

Drilled	Depth From	Top	Primary Materal	Colour and plasticity	Secondary Material
21/06/2012	30	31	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
	31	32	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <5% lignite)
	32	33	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand)
	33	34	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand)
	34	35	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand)
	35	36	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand)
	36	37	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand)
	37	38	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand)
	38	39	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand)
	39	40	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <10% gravel)
	40	41	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <10% gravel)
	41	42	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <10% gravel)
	42	43	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <10% gravel)

Drilled Depth From	Top	Primary Materal	Colour and plasticity	Secondary Material
43	44	CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (10% sand, <10% gravel)
44	45	sandy CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (20% sand, <10% gravel)
45	46	sandy CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (20% sand, <10% gravel)
46	47	sandy CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (20% sand, <10% gravel)
47	48	sandy CLAY	HP, mottled lt grey - orange	trace fine sand and lignite fragments (20% sand, <10% gravel)
48	49	CLAY	HP, lt-dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
49	50	CLAY	HP, lt-dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
50	51	CLAY	HP, lt-dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
51	52	CLAY	HP, dk grey	trace fine sand (10%)
52	53	CLAY	HP, dk grey	trace fine sand (10%)
53	54	CLAY	HP, dk grey	trace fine sand (10%)
54	55	CLAY	HP, dk grey	trace fine sand (10%)
55	56	CLAY	HP, dk grey	trace fine sand (10%)
56	57	CLAY	HP, dk grey	trace fine sand (10%)
57	58	CLAY	HP, dk grey	trace fine sand (10%)
58	59	CLAY	HP, dk grey	trace fine sand (10%)

Drilled	Depth From	Top	Primary Materal	Colour and plasticity	Secondary Material
22/06/2012	59	60	CLAY	HP, dk grey	trace fine sand (10%)
	60	61	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	61	62	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	62	63	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	63	64	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	64	65	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	65	66	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	66	67	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	67	68	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	68	69	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	69	70	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	70	71	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	71	72	sandy CLAY	HP, dk grey	trace fine gravel (5% grv, 20% sand)
	72	73	sandy CLAY	HP, dk grey	trace fine gravel and lignite flecks (5% grv, 20% sand, <5% lignite)
	73	74	CLAY	HP, lt-dk grey	trace fine sand (10%)
	74	75	CLAY	HP, lt-dk grey	trace fine sand (10%)

Drilled	Depth			
From	Top	Primary Materal	Colour and plasticity	Secondary Material
75	76	CLAY	HP, lt-dk grey	trace fine sand (10%)
76	77	CLAY	HP, lt-dk grey	trace fine sand (10%)
77	78	sandy CLAY	HP, dk grey	fine sand (20%)
78	79	sandy CLAY	HP, dk grey	fine sand (20%)
79	80	sandy CLAY	HP, dk grey	fine sand (20%)
80	81	sandy CLAY	HP, dk grey	fine sand (20%)
81	82	sandy CLAY	HP, dk grey	fine sand (20%)
82	83	sandy CLAY	HP, dk grey	fine sand (20%)
83	84	sandy CLAY	HP, dk grey	fine sand (20%)
84	85	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
85	86	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
86	87	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
87	88	sandy CLAY	HP, lt-dk grey	fine sand (20%) with trace fine subangular gravel (<5%)
88	89	sandy CLAY	HP, lt-dk grey	fine sand (20%) with trace fine subangular gravel (<5%)
89	90	CLAY	HP, dk grey	trace fine sand and lignite fragments (10% sand, <5% lignite)
90	91	CLAY	HP, dk grey	trace fine sand and lignite fragments (10% sand, <5% lignite)
91	92	CLAY	HP, dk grey	trace fine sand and lignite fragments (10% sand, <5% lignite)

Drilled Depth From	Top	Primary Materal	Colour and plasticity	Secondary Material
92	93	CLAY	HP, dk grey	trace fine sand and lignite fragments (10% sand, <5% lignite)
93	94	CLAY	HP, dk grey	trace fine gravel and lignite flecks (5% grv, 20% sand, <5% lignite)
94	95	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (<5%)
95	96	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (<5%)
96	97	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (<5%)
97	98	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (<5%)
98	99	GRAVELLY SAND	Dk gray, black, off white, medium	gravel (30%)
99	100	GRAVELLY SAND	Dk gray, black, off white, medium	gravel (30%)
100	101	sandy CLAY	HP, dk grey	fine to medium sand with trace fine gravel (30% sand / 10% grv)
101	102	sandy CLAY	HP, dk grey	fine to medium sand with trace fine gravel (30% sand / 10% grv)
102	103	sandy CLAY	HP, dk grey	fine to medium sand with trace fine gravel (30% sand / 10% grv)
103	104	sandy CLAY	HP, dk grey	fine to medium sand with trace fine gravel (30% sand / 10% grv)
104	105	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)

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Drilled	Depth				
	From	Top	Primary Materal	Colour and plasticity	Secondary Material
26/06/2012	105	106	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	106	107	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	107	108	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	108	109	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	109	110	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
	110	111	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	111	112	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	112	113	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	113	114	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	114	115	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)

Drilled Depth From	Top	Primary Materal	Colour and plasticity	Secondary Material
115	116	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
116	117	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
117	118	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
118	119	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
119	120	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
120	121	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
121	122	sandy CLAY	HP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
122	123	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
123	124	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
124	125	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)

Drilled Depth From	Top	Primary Materal	Colour and plasticity	Secondary Material
125	126	CLAY	HP, dk grey	trace fine sand and fine gravel fragments (10% sand, <5% grv)
126	127	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (10%)
127	128	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (10%)
128	129	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (10%)
129	130	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (10%)
130	131	sandy CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (10%)
131	132	sandy, gravelly CLAY	MP, dk grey	fine to medium sand with fine gravel (25% sand / 15% grv)
132	133	sandy, gravelly CLAY	MP, dk grey	fine to medium sand with fine gravel (25% sand / 15% grv)
133	134	CLAY	HP, dk grey	trace medium-coarse sand and trace fine gravel (10% sand 10% grv)
134	135	CLAY	HP, dk grey	trace medium-coarse sand and trace fine gravel (10% sand 10% grv)
135	136	CLAY	HP, dk grey	trace medium-coarse sand and trace fine gravel (10% sand 10% grv)
136	137	CLAY	HP, dk grey	trace fine sand (10%)
137	138	CLAY	HP, dk grey	trace fine sand (10%)
138	139	CLAY	HP, dk grey	trace fine sand (10%)
139	140	CLAY	HP, dk grey	trace fine sand (10%)
140	141	sandy CLAY	HP, dk grey	fine to medium sand with fine gravel (20% sand / 10% grv)

Drilled	Depth				
	From	Top	Primary Materal	Colour and plasticity	Secondary Material
2012	141	142	sandy CLAY	HP, dk grey	fine to medium sand with fine gravel (20% sand / 10% grv)
	142	143	sandy CLAY	HP, dk grey	fine to medium sand with fine gravel (20% sand / 10% grv)
	143	144	CLAY	HP, dk grey	trace fine sand (10%)
	144	145	CLAY	HP, dk grey	trace fine sand (10%)
	145	146	CLAY	HP, dk grey	trace fine sand (10%)
	146	147	silty CLAY	HP, dk grey	trace fine sand and fine gravel fragments (25% silt, 10% sand, <5% grv)
	147	148	silty CLAY	HP, dk grey	trace fine sand and fine gravel fragments (25% silt, 10% sand, <5% grv)
	148	149	sandy CLAY	MP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	149	150	sandy CLAY	MP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	150	151	sandy CLAY	MP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	151	152	sandy CLAY	MP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	152	153	sandy CLAY	MP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	153	154	sandy CLAY	MP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)

Drilled	Depth From	Top	Primary Materal	Colour and plasticity	Secondary Material
27/06/	154	155	sandy CLAY	MP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	155	156	sandy CLAY	MP, dk grey	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
	156	157	sandy CLAY	HP, dk grey	fine to medium sand (20%) with trace fine subangular gravel (<5%)
	157	158	sandy CLAY	HP, dk grey	fine to medium sand (20%) with trace fine subangular gravel (<5%)
	158	159	sandy CLAY	HP, dk grey	fine to medium sand (20%) with trace fine subangular gravel (<5%)
	159	160	sandy CLAY	HP, dk grey	fine to medium sand (20%) with trace fine subangular gravel (<5%)
	160	161	sandy CLAY	HP, dk grey	fine to medium sand (20%) with trace fine subangular gravel (<5%)
	161	162	sandy CLAY	HP, dk grey	fine to medium sand (20%) with trace fine subangular gravel (<5%)
	162	163	gravelly CLAY	HP, dk grey	fine sand (20%) with trace fine subangular gravel (10%)
	163	164	clayey GRAVEL	Dk grey - off white	clay and trace coarse sand (clay 20%, sand 10%)
	164	165	clayey GRAVEL	Dk grey - off white	clay and trace coarse sand (clay 20%, sand 10%)
	165	166	clayey GRAVEL	Dk grey - off white	clay and trace coarse sand (clay 20%, sand 10%)

Drilled Depth				
From	Top	Primary Materal	Colour and plasticity	Secondary Material
166	167	clayey GRAVEL	Dk grey - off white	clay and trace coarse sand (clay 20%, sand 10%)
167	168	gravelly SAND	Dk grey - off white	fine gravel (20%)
168	169	gravelly SAND	Dk grey - off white	fine gravel (20%)
169	170	clayey SAND	Dk grey - off white	clay and trace coarse sand (clay 30%, sand 10%)
170	171	sandy CLAY	LP, dk grey,	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
171	172	sandy CLAY	LP, dk grey,	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
172	173	sandy CLAY	LP, dk grey,	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
173	174	sandy CLAY	LP, dk grey,	medium - coarse sand with trace fine gravel (30% sand / 10% grv)
174	175	CLAY	HP, lt grey	trace fine sand (10%)
175	176	CLAY	HP, lt grey	trace fine sand (10%)
176	177	CLAY	HP, lt grey	trace fine sand (10%)
177	178	CLAY	HP, lt grey	trace fine sand (10%)
178	179	CLAY	HP, lt grey	trace fine sand (10%)
179	180	CLAY	HP, lt grey	trace fine sand (10%)
180	181	gravelly CLAY	LP, dk grey,	gravel (30%)
181	182	gravelly CLAY	LP, dk grey,	gravel (30%)
182	183	gravelly CLAY	LP, dk grey,	gravel (30%)
183	184	SAND	Dk grey - off white	trace clay (10%) and trace fine gravel (10%)
184	185	SAND	Dk grey - off white	trace clay (10%)
185	186	clayey SAND	Dk grey - off white	clay (20%)

Drilled	Depth				
	From	Top	Primary Materal	Colour and plasticity	Secondary Material
28/06/20	186	187	sandy CLAY	LP, dk grey,	medium - coarse sand (30% sand)
	187	188	sandy CLAY	LP, dk grey,	medium - coarse sand (30% sand)
	188	189	sandy CLAY	LP, dk grey,	medium - coarse sand (30% sand)
	189	190	CLAY	HP, lt grey	trace fine sand (10%)
	190	191	CLAY	HP, lt grey	trace fine sand (10%)
	191	192	CLAY	HP, lt grey	trace fine sand (10%)
	192	193	sandy CLAY	HP, lt grey	fine to medium sand (20%), fines (estimate mostly silt) around 10-15%
	193	194	sandy CLAY	HP, lt grey	fine to medium sand (20%), fines (estimate mostly silt) around 10-15%
	194	195	sandy CLAY	HP, lt grey	fine to medium sand (20%), fines (estimate mostly silt) around 10-15%
	195	196	CLAY	HP, lt grey	trace medium-coarse sand (10% sand), fines (estimate mostly silt) around 10-15%
	196	197	GRAVELLY SAND	Dk gray, black, off white, medium	gravel (30%), fines (estimate mostly silt) around 10-15%
29/06/2012	197	198	sandy GRAVEL	Dk grey - off white	medium - coarse sand (40% sand),, fines (estimate mostly silt) around 10-15%
	198	199	sandy GRAVEL	Dk grey - off white	medium - coarse sand (40% sand), fines (estimate mostly silt) around 10-15%
	199	200	sandy GRAVEL	Dk grey - off white	medium - coarse sand (40% sand), fines (estimate mostly silt) around 10-15%

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Drilled	Depth				
	From	Top	Primary Materal	Colour and plasticity	Secondary Material
	200	201	sandy GRAVEL	Dk grey - off white	medium - coarse sand (40% sand), fines (estimate mostly silt) around 10-15%
	201	202	sandy GRAVEL	Dk grey - off white	medium - coarse sand (40% sand), fines (estimate mostly silt) around 10-15%
	202	203	sandy GRAVEL	Dk grey - off white	medium - coarse sand (40% sand), fines (estimate mostly silt) around 10-15%
	203	204	gravelly SAND	Dk gray, black, off white, medium	gravel (30%), fines (estimate mostly silt) around 10-15%
	204	205	clayey SAND	Dk grey - off white	medium - coarse sand (30% sand), fines (estimate mostly silt) around 10-15%
	205	206	sandy CLAY	HP, lt grey	fine to medium sand (20%)
	206	207	CLAY	HP, lt grey - lt blue	
	207	208	CLAY	HP, lt grey - lt blue	
2/07/2012	208	209	CLAY	HP, lt grey - lt blue	
	209	210	CLAY	HP, lt grey - lt blue	
	210	211	CLAY	HP, lt grey - lt blue	
	211	212	CLAY	HP, lt grey - lt blue	
	212	213	CLAY	HP, lt grey - lt blue - with red	
	213	214	CLAY	HP, lt grey - lt blue - with red	
	End Of Hole				

Appendix D

Geophysical Survey

Scale

1:200

Well name

WLE055146

Surveys

Gamma, SSD, LSD

Well name **WLE055146** **Surveys** Gamma, SSD, LSD

Location

Bore Hole 2 Limpyreis Road

Field

Fernbank

Company

Drilltec

Drilling Company/Operator

Drillltec

Logging Operator

Peter Olver

Start date

4/07/2012 2:16:55 PM

Finish date

5/07/2012 3:39:57 PM

Drill date

04/07/12

Drillers depth

214.000000

Inclination

0.000000

Heading

0.000000

Elevation

0.000000

Co-ord system

X

Y

Latitude

Longitude

Run

Dual Density Gamma Caliper-A605-S605--14-16-55-04-07-2012

Project name

WLE055146

Perm datum

Fuild

Type	*Start depth(m)*	*End depth(m)*	*Density(gm/cc)*
Drill mud	0.00	214.00	0.00

Casing

Type	*ID(mm)*	*OD(mm)*	*Start depth(m)*	*End depth(m)*	*Density(gm/cc)*
Steel	200.00	212.00	0.00	18.00	0.00

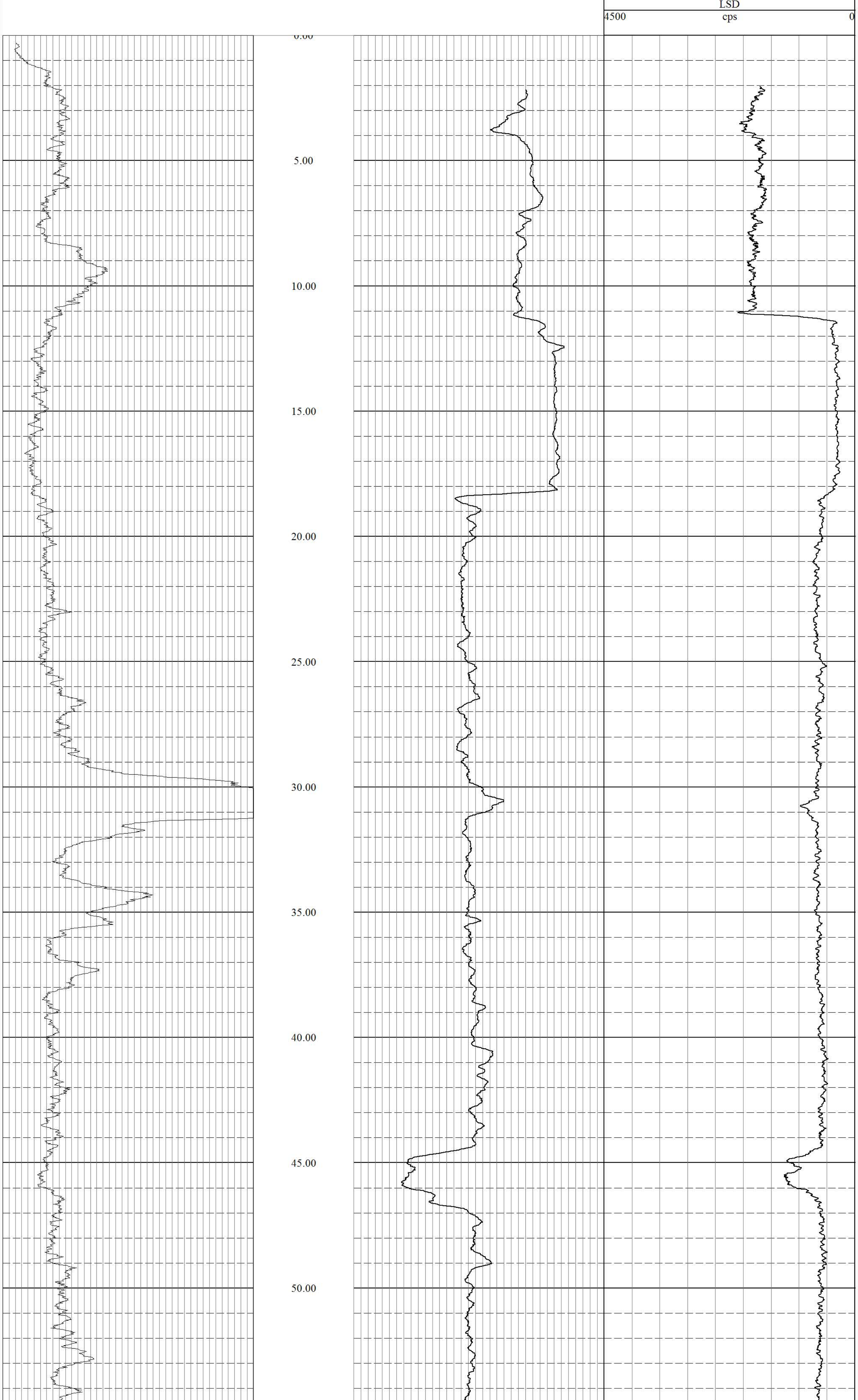
Bit sizes

Diameter(mm)	*Start depth(m)*	*End depth(m)*
190.00	0.00	214.00

Winches

Model	*Serial*	*Length (m)*	*Conductors*	*Factor(cm/p)*
W600-4	000		4	0.250000

Gamma		SSD
0 cps 400	1m:200m	7000 cps 0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cps
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25.00
30.00
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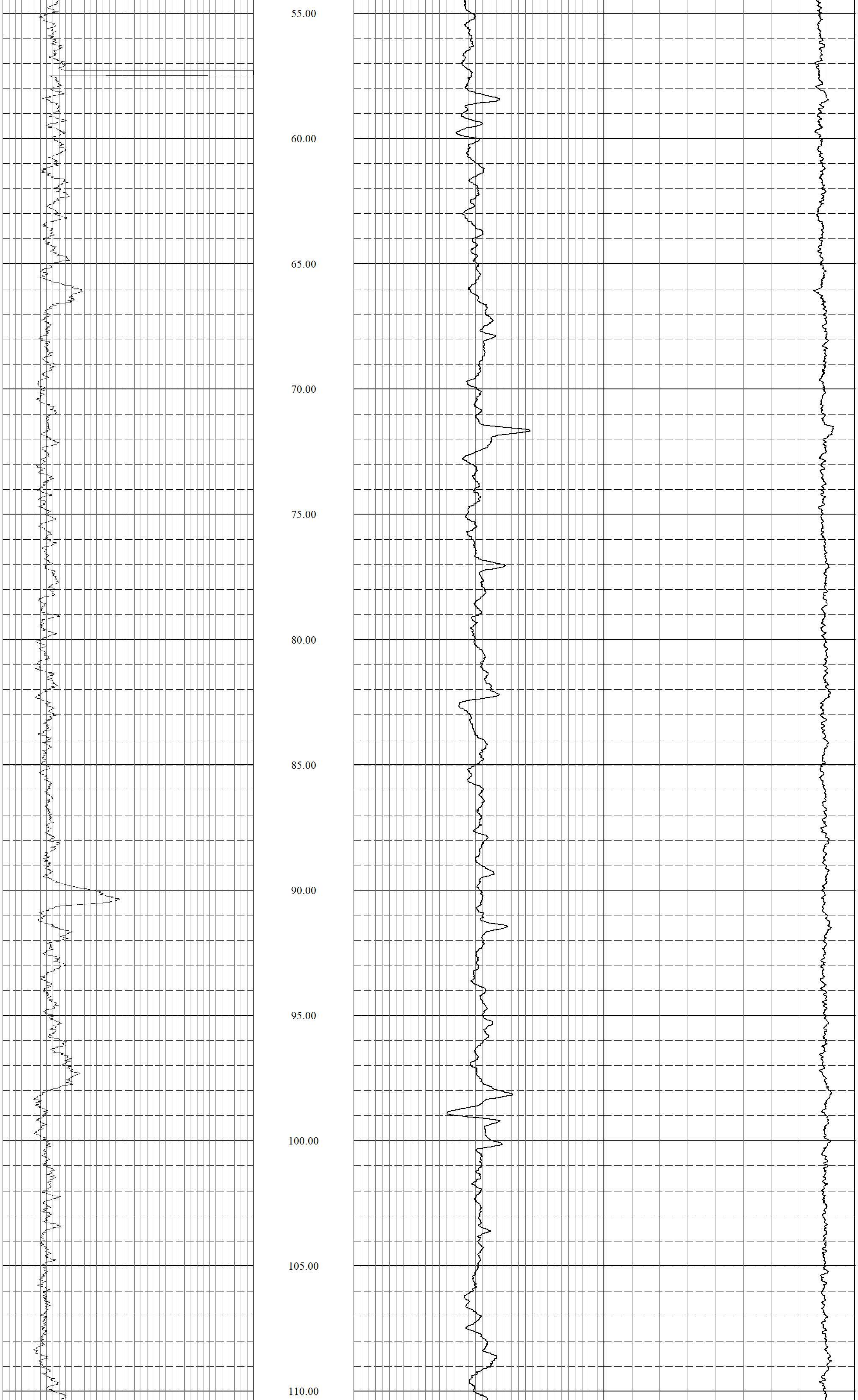
50.00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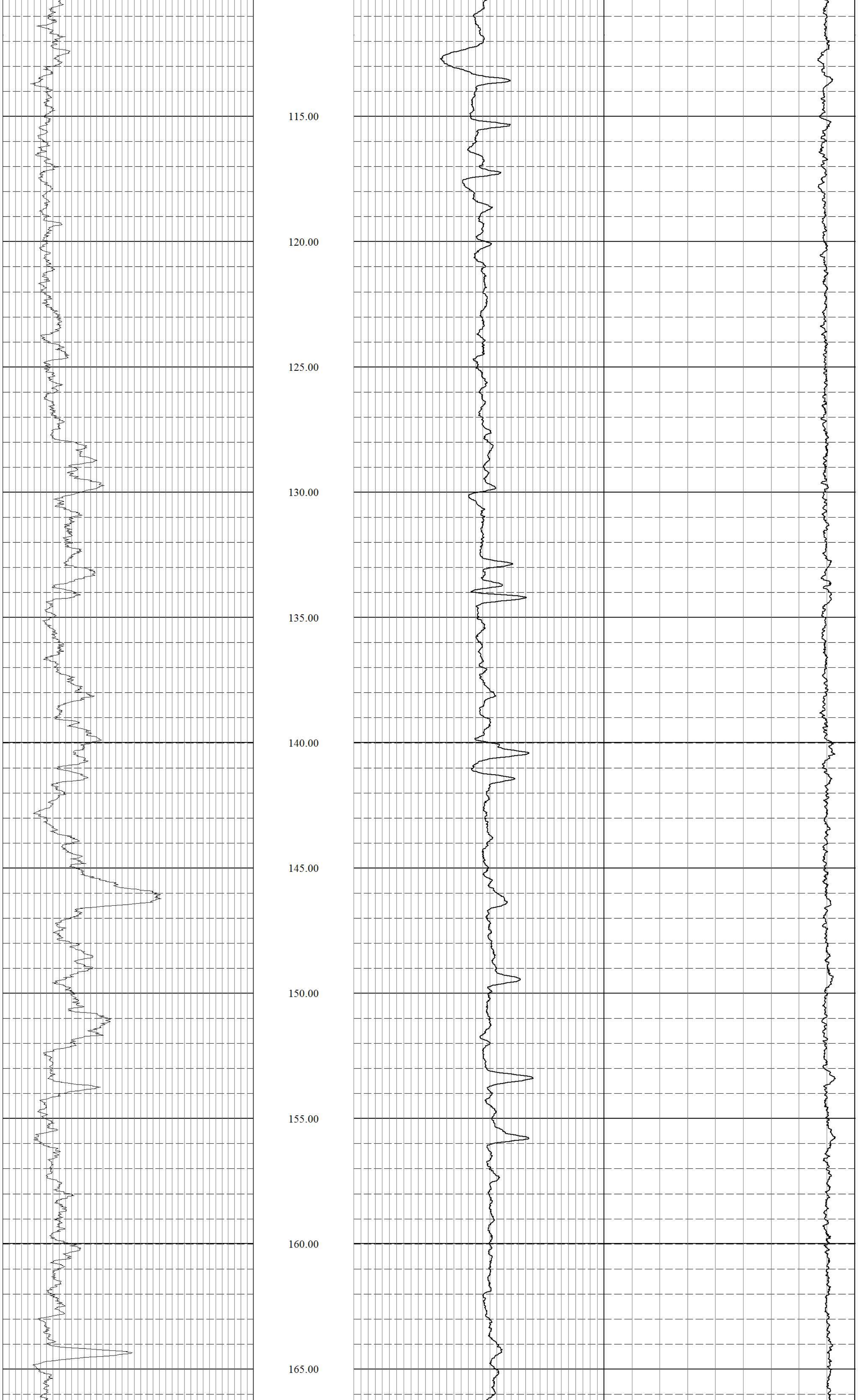
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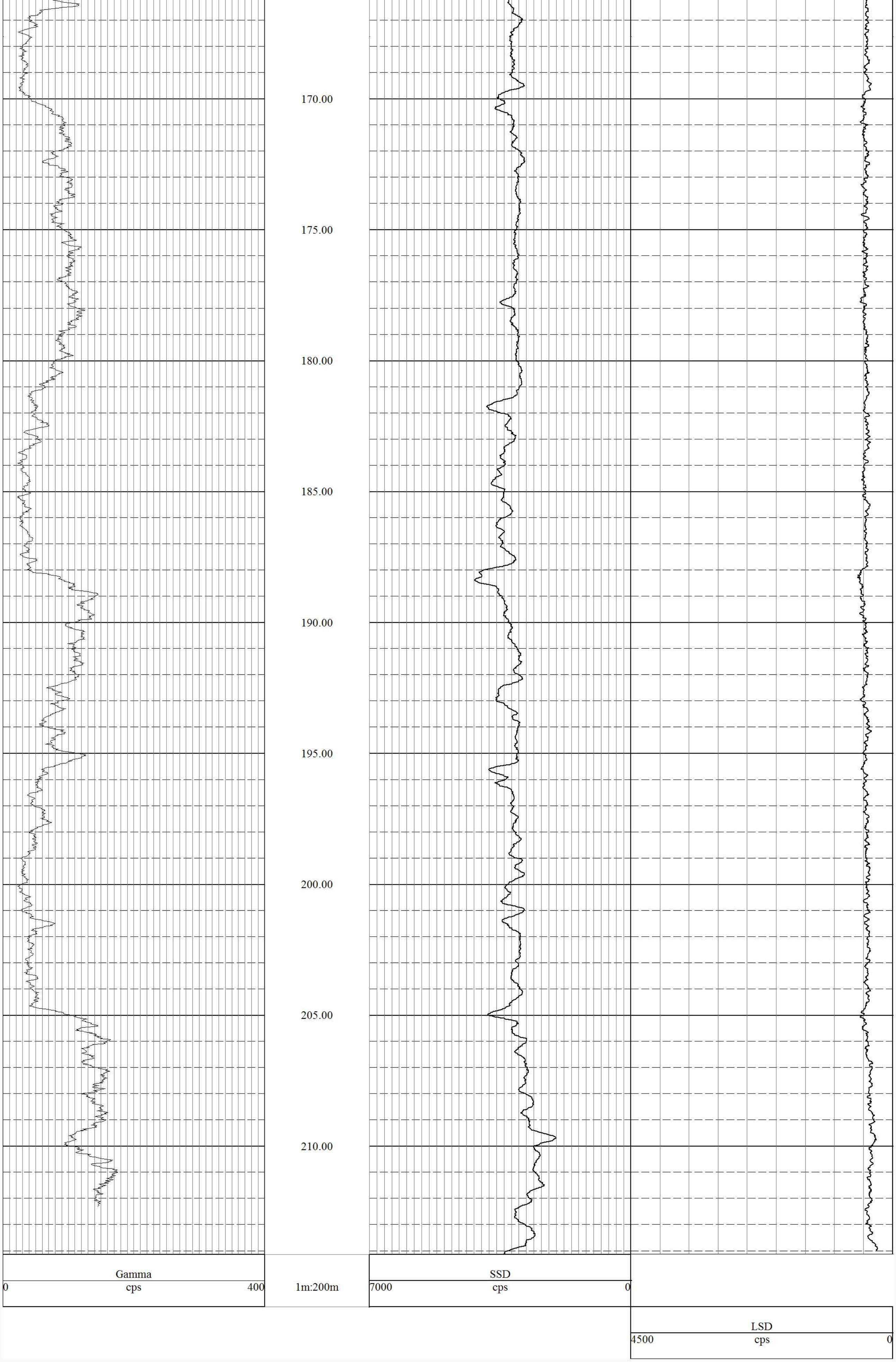
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185.00
190.00
195.00
200.00
205.00
210.00
Gamma
0
cps
400
1m:200m
SSD
7000
cps
0
LSD
4500
cps
0

Appendix E

Constant Rate Test Raw Data

Date	Time	Level above pump	Elapsed time (mins)	Water Level (m)	Drawdown (m)	pH (units)	EC (mS/cm)	Temperature (ºC)	Notes
23/08/2012	12:00:00		0	88.9905	0				pumping commenced
23/08/2012	12:00:11	14.8468	0.183333334	93.1532	4.1627				
23/08/2012	12:00:41	8.9906	0.683333336	99.0094	10.0189				
23/08/2012	12:01:11	9.4647	1.183333338	98.5353	9.5448				
23/08/2012	12:01:41	10.2217	1.683333329	97.7783	8.7878				
23/08/2012	12:02:11	10.4061	2.18333333	97.5939	8.6034				
23/08/2012	12:02:41	10.6631	2.683333332	97.3369	8.3464				
23/08/2012	12:03:11	11.0812	3.183333334	96.9188	7.9283				
23/08/2012	12:03:41	11.3299	3.683333335	96.6701	7.6796				
23/08/2012	12:04:11	11.0704	4.183333337	96.9296	7.9391				
23/08/2012	12:04:41	7.7595	4.683333338	100.2405	11.25				
23/08/2012	12:05:11	7.8918	5.18333333	100.1082	11.1177				
23/08/2012	12:05:41	6.2963	5.683333331	101.7037	12.7132				
23/08/2012	12:06:11	6.8786	6.183333333	101.1214	12.1309				
23/08/2012	12:06:41	7.1932	6.683333335	100.8068	11.8163				
23/08/2012	12:07:11	5.1308	7.183333336	102.8692	13.8787				
23/08/2012	12:07:41	3.6793	7.683333338	104.3207	15.3302				
23/08/2012	12:08:11	1.3301	8.183333329	106.6699	17.6794				
23/08/2012	12:08:41	1.3231	8.683333331	106.6769	17.6864				
23/08/2012	12:09:11	1.3143	9.183333332	106.6857	17.6952				
23/08/2012	12:09:41	1.3201	9.683333334	106.6799	17.6894				
23/08/2012	12:10:11	1.3152	10.18333334	106.6848	17.6943				
23/08/2012	12:10:41	1.3061	10.68333334	106.6939	17.7034				
23/08/2012	12:11:11	1.3079	11.18333333	106.6921	17.7016				
23/08/2012	12:11:41	1.3086	11.68333333	106.6914	17.7009				
23/08/2012	12:12:11	1.3119	12.18333333	106.6881	17.6976				
23/08/2012	12:12:41	1.2999	12.68333333	106.7001	17.7096				
23/08/2012	12:13:11	1.311	13.18333333	106.689	17.6985				
23/08/2012	12:13:41	1.3085	13.68333334	106.6915	17.701				
23/08/2012	12:14:11	1.3069	14.18333334	106.6931	17.7026				
23/08/2012	12:14:41	1.3076	14.68333333	106.6924	17.7019				
23/08/2012	12:15:11	1.3099	15.18333333	106.6901	17.6996				
23/08/2012	12:15:41	1.292	15.68333333	106.708	17.7175				
23/08/2012	12:16:11	1.306	16.18333333	106.694	17.7035				
23/08/2012	12:16:41	1.3002	16.68333334	106.6998	17.7093				
23/08/2012	12:17:11	1.308	17.18333334	106.692	17.7015				
23/08/2012	12:17:41	1.3055	17.68333333	106.6945	17.704				
23/08/2012	12:18:11	1.3043	18.18333333	106.6957	17.7052				
23/08/2012	12:18:41	1.3079	18.68333333	106.6921	17.7016				
23/08/2012	12:19:11	1.3043	19.18333333	106.6957	17.7052				
23/08/2012	12:19:41	1.3063	19.68333333	106.6937	17.7032				
23/08/2012	12:20:11	1.3026	20.18333334	106.6974	17.7069				
23/08/2012	12:20:41	1.305	20.68333334	106.695	17.7045				
23/08/2012	12:21:11	1.3008	21.18333333	106.6992	17.7087				
23/08/2012	12:21:41	1.2995	21.68333333	106.7005	17.71				
23/08/2012	12:22:11	1.3054	22.18333333	106.6946	17.7041				
23/08/2012	12:22:41	1.3036	22.68333333	106.6964	17.7059				
23/08/2012	12:23:11	1.3026	23.18333334	106.6974	17.7069				
23/08/2012	12:23:41	1.3021	23.68333334	106.6979	17.7074				
23/08/2012	12:24:11	1.2984	24.18333333	106.7016	17.7111				
23/08/2012	12:24:41	1.3034	24.68333333	106.6966	17.7061				
23/08/2012	12:25:11	1.3015	25.18333333	106.6985	17.708				
23/08/2012	12:25:41	1.3007	25.68333333	106.6993	17.7088				
23/08/2012	12:26:11	1.3143	26.18333334	106.6857	17.6952				
23/08/2012	12:26:41	1.316	26.68333334	106.684	17.6935				
23/08/2012	12:27:11	1.311	27.18333334	106.689	17.6985				
23/08/2012	12:27:41	1.311	27.68333333	106.689	17.6985				
23/08/2012	12:28:11	1.312	28.18333333	106.688	17.6975				
23/08/2012	12:28:41	1.3082	28.68333333	106.6918	17.7013				
23/08/2012	12:29:11	1.3123	29.18333333	106.6877	17.6972				
23/08/2012	12:29:41	1.3133	29.68333334	106.6867	17.6962				
23/08/2012	12:30:11	1.3116	30.18333334	106.6884	17.6979				
23/08/2012	12:30:41	1.3105	30.68333333	106.6895	17.699				
23/08/2012	12:31:11	1.3122	31.18333333	106.6878	17.6973				
23/08/2012	12:31:41	1.3128	31.68333333	106.6872	17.6967				
23/08/2012	12:32:11	1.3059	32.18333333	106.6941	17.7036				
23/08/2012	12:32:41	1.3148	32.68333334	106.6852	17.6947				
23/08/2012	12:33:11	1.312	33.18333334	106.688	17.6975				
23/08/2012	12:33:41	1.3126	33.68333333	106.6874	17.6969				
23/08/2012	12:34:11	1.3077	34.18333333	106.6923	17.7018				
23/08/2012	12:34:41	1.3083	34.68333333	106.6917	17.7012				
23/08/2012	12:35:11	1.3091	35.18333333	106.6909	17.7004				
23/08/2012	12:35:41	1.3114	35.68333333	106.6886	17.6981				
23/08/2012	12:36:11	1.3151	36.18333334	106.6849	17.6944				
23/08/2012	12:36:41	1.3129	36.68333334	106.6871	17.6966				
23/08/2012	12:37:11	1.3139	37.18333333	106.6861	17.6956				
23/08/2012	12:37:41	1.3134	37.68333333	106.6866	17.6961				
23/08/2012	12:38:11	1.3127	38.18333333	106.6873	17.6968				
23/08/2012	12:38:41	1.3106	38.68333333	106.6894	17.6989				
23/08/2012	12:39:11	1.3116	39.18333334	106.6884	17.6979				
23/08/2012	12:39:41	1.3121	39.68333334	106.6879	17.6974				
23/08/2012	12:40:11	1.3116	40.18333333	106.6884	17.6979				
23/08/2012	12:40:41	1.308	40.68333333	106.692	17.7015				
23/08/2012	12:41:11	1.3101	41.18333333	106.6899	17.6994				
23/08/2012	12:41:41	1.3028	41.68333333	106.6972	17.7067				
23/08/2012	12:42:11	1.3055	42.18333333	106.6945	17.704				
23/08/2012	12:42:41	1.3061	42.68333334	106.6939	17.7034				
23/08/2012	12:43:11	1.3084	43.18333334	106.6916	17.7011				
23/08/2012	12:43:41	1.3091	43.68333333	106.6909	17.7004				
23/08/2012	12:44:11	1.31	44.18333333	106.69	17.6995				
23/08/2012	12:44:41	1.3071	44.68333333	106.6929	17.7024				
23/08/2012	12:45:11	1.3109	45.18333333	106.6891	17.6986	6.8	1153	23.4	Very dirty discharge water - possibly drilling mud
23/08/2012	12:45:41	1.309	45.68333334	106.691	17.7005				
23/08/2012	12:46:11	1.3141	46.18333334	106.6859	17.6954				
23/08/2012	12:46:41	1.3106	46.68333333	106.6894	17.6989				
23/08/2012	12:47:11	1.314	47.18333333	106.686	17.6955				
23/08/2012	12:47:41	1.3142	47.68333333	106.6858	17.6953				
23/08/2012	12:48:11	1.3118	48.18333333	106.6882	17.6977				
23/08/2012	12:48:41	1.3154	48.68333334	106.6846	17.6941				
23/08/2012	12:49:11	1.3131	49.18333334	106.6869	17.6964				
23/08/2012	12:49:41	1.3154	49.68333334	106.6846	17.6941				
23/08/2012	12:50:11	1.3093	50.18333333	106.6907	17.7002				
23/08/2012	12:50:41	1.3106	50.68333333	106.6894	17.6989				
23/08/2012	12:51:11	1.3155	51.18333333	106.6845	17.694				
23/08/2012	12:51:41	1.32	51.68333333	106.68	17.6895				
23/08/2012	12:52:11	1.3112	52.18333334	106.6888	17.6983				
23/08/2012	12:52:41	1.3175	52.68333334	106.6825	17.692				
23/08/2012	12:53:11	1.315	53.18333333	106.685	17.6945				
23/08/2012	12:53:41	1.312	53.68333333	106.688	17.6975				
23/08/2012	12:54:11	1.3133	54.18333333	106.6867	17.6962				
23/08/2012	12:54:41	1.3155	54.68333333	106.6845	17.694				
23/08/2012	12:55:11	1.3159	55.18333334	106.6841	17.6936				
23/08/2012	12:55:41	1.3156	55.68333334	106.6844	17.6939				
23/08/2012	12:56:11	1.3138	56.18333333	106.6862	17.6957				
23/08/2012	12:56:41	1.3134	56.68333333	106.6866	17.6961				

23/08/2012	12:57:11	1.3113	57.18333333	106.6887	17.6982				
23/08/2012	12:57:41	1.3174	57.68333333	106.6826	17.6921				
23/08/2012	12:58:11	1.3125	58.18333333	106.6875	17.697				
23/08/2012	12:58:41	1.3149	58.68333334	106.6851	17.6946				
23/08/2012	12:59:11	1.3099	59.18333334	106.6901	17.6996				
23/08/2012	12:59:41	1.3114	59.68333333	106.6886	17.6981				
23/08/2012	13:00:11	1.308	60.18333333	106.692	17.7015				
23/08/2012	13:00:41	1.3132	60.68333333	106.6868	17.6963				
23/08/2012	13:01:11	1.3113	61.18333333	106.6887	17.6982				
23/08/2012	13:01:41	1.3107	61.68333334	106.6893	17.6988				
23/08/2012	13:02:11	1.3124	62.18333334	106.6876	17.6971				
23/08/2012	13:02:41	1.3092	62.68333333	106.6908	17.7003				
23/08/2012	13:03:11	1.3101	63.18333333	106.6899	17.6994				
23/08/2012	13:03:41	1.3108	63.68333333	106.6892	17.6987				
23/08/2012	13:04:11	1.3104	64.18333333	106.6896	17.6991				
23/08/2012	13:04:41	1.3132	64.68333333	106.6868	17.6963				
23/08/2012	13:05:11	1.3165	65.18333334	106.6835	17.693				
23/08/2012	13:05:41	1.3079	65.68333334	106.6921	17.7016				
23/08/2012	13:06:11	1.305	66.18333333	106.695	17.7045				
23/08/2012	13:06:41	1.3076	66.68333333	106.6924	17.7019				
23/08/2012	13:07:11	1.3101	67.18333333	106.6899	17.6994				
23/08/2012	13:07:41	1.3022	67.68333333	106.6978	17.7073				
23/08/2012	13:08:11	1.3097	68.18333334	106.6903	17.6998				
23/08/2012	13:08:41	1.3108	68.68333334	106.6892	17.6987				
23/08/2012	13:09:11	1.3118	69.18333333	106.6882	17.6977				
23/08/2012	13:09:41	1.3082	69.68333333	106.6918	17.7013				
23/08/2012	13:10:11	1.3093	70.18333333	106.6907	17.7002				
23/08/2012	13:10:41	1.3077	70.68333333	106.6923	17.7018				
23/08/2012	13:11:11	1.3064	71.18333334	106.6936	17.7031				
23/08/2012	13:11:41	1.3077	71.68333334	106.6923	17.7018				
23/08/2012	13:12:11	1.3073	72.18333334	106.6927	17.7022				
23/08/2012	13:12:41	1.3085	72.68333333	106.6915	17.701				
23/08/2012	13:13:11	1.3098	73.18333333	106.6902	17.6997				
23/08/2012	13:13:41	1.3059	73.68333333	106.6941	17.7036				
23/08/2012	13:14:11	1.3062	74.18333333	106.6938	17.7033				
23/08/2012	13:14:41	1.3071	74.68333334	106.6929	17.7024				
23/08/2012	13:15:11	1.3085	75.18333334	106.6915	17.701				
23/08/2012	13:15:41	1.3047	75.68333333	106.6953	17.7048				
23/08/2012	13:16:11	1.3116	76.18333333	106.6884	17.6979				
23/08/2012	13:16:41	1.3127	76.68333333	106.6873	17.6968				
23/08/2012	13:17:11	1.3092	77.18333333	106.6908	17.7003				
23/08/2012	13:17:41	1.3064	77.68333334	106.6936	17.7031				
23/08/2012	13:18:11	1.3034	78.18333334	106.6966	17.7061				
23/08/2012	13:18:41	1.3011	78.68333333	106.6989	17.7084				
23/08/2012	13:19:11	1.3028	79.18333333	106.6972	17.7067				
23/08/2012	13:19:41	1.3079	79.68333333	106.6921	17.7016				
23/08/2012	13:20:11	1.3072	80.18333333	106.6928	17.7023				
23/08/2012	13:20:41	1.3071	80.68333333	106.6929	17.7024				
23/08/2012	13:21:11	1.3036	81.18333334	106.6964	17.7059				
23/08/2012	13:21:41	1.3042	81.68333334	106.6958	17.7053				
23/08/2012	13:22:11	1.3064	82.18333333	106.6936	17.7031				
23/08/2012	13:22:41	1.3027	82.68333333	106.6973	17.7068				
23/08/2012	13:23:11	1.3005	83.18333333	106.6995	17.709				
23/08/2012	13:23:41	1.3036	83.68333333	106.6964	17.7059				
23/08/2012	13:24:11	1.302	84.18333334	106.698	17.7075				
23/08/2012	13:24:41	1.3054	84.68333334	106.6946	17.7041				
23/08/2012	13:25:11	1.3052	85.18333333	106.6948	17.7043				
23/08/2012	13:25:41	1.3036	85.68333333	106.6964	17.7059				
23/08/2012	13:26:11	1.3087	86.18333333	106.6913	17.7008				
23/08/2012	13:26:41	1.3146	86.68333333	106.6854	17.6949				
23/08/2012	13:27:11	1.3097	87.18333333	106.6903	17.6998				
23/08/2012	13:27:41	1.311	87.68333334	106.689	17.6985				
23/08/2012	13:28:11	1.3113	88.18333334	106.6887	17.6982				
23/08/2012	13:28:41	1.3089	88.68333333	106.6911	17.7006				
23/08/2012	13:29:11	1.3133	89.18333333	106.6867	17.6962				
23/08/2012	13:29:41	1.3115	89.68333333	106.6885	17.698				
23/08/2012	13:30:11	1.3117	90.18333333	106.6883	17.6978	7.02	1122	23.7	Cleaner than discharge at 12.45pm
23/08/2012	13:30:41	1.3109	90.68333334	106.6891	17.6986				
23/08/2012	13:31:11	1.3132	91.18333334	106.6868	17.6963				
23/08/2012	13:31:41	1.3148	91.68333333	106.6852	17.6947				
23/08/2012	13:32:11	1.3107	92.18333333	106.6893	17.6988				
23/08/2012	13:32:41	1.3188	92.68333333	106.6812	17.6907				
23/08/2012	13:33:11	1.3186	93.18333333	106.6814	17.6909				
23/08/2012	13:33:41	1.3152	93.68333334	106.6848	17.6943				
23/08/2012	13:34:11	1.3117	94.18333334	106.6883	17.6978				
23/08/2012	13:34:41	1.3186	94.68333333	106.6814	17.6909				
23/08/2012	13:35:11	1.3154	95.18333333	106.6846	17.6941				
23/08/2012	13:35:41	1.3152	95.68333333	106.6848	17.6943				
23/08/2012	13:36:11	1.3118	96.18333333	106.6882	17.6977				
23/08/2012	13:36:41	1.3078	96.68333333	106.6922	17.7017				
23/08/2012	13:37:11	1.3033	97.18333334	106.6967	17.7062				
23/08/2012	13:37:41	1.3076	97.68333334	106.6924	17.7019				
23/08/2012	13:38:11	1.3072	98.18333333	106.6928	17.7023				
23/08/2012	13:38:41	1.3091	98.68333333	106.6909	17.7004				
23/08/2012	13:39:11	1.3107	99.18333333	106.6893	17.6988				
23/08/2012	13:39:41	1.3119	99.68333333	106.6881	17.6976				
23/08/2012	13:40:11	1.3094	100.1833333	106.6906	17.7001				
23/08/2012	13:40:41	1.3112	100.6833333	106.6888	17.6983				
23/08/2012	13:41:11	1.3085	101.1833333	106.6915	17.701				
23/08/2012	13:41:41	1.3117	101.6833333	106.6883	17.6978				
23/08/2012	13:42:11	1.3056	102.1833333	106.6944	17.7039				
23/08/2012	13:42:41	1.3042	102.6833333	106.6958	17.7053				
23/08/2012	13:43:11	1.3101	103.1833333	106.6899	17.6994				
23/08/2012	13:43:41	1.3042	103.6833333	106.6958	17.7053				
23/08/2012	13:44:11	1.3084	104.1833333	106.6916	17.7011				
23/08/2012	13:44:41	1.3067	104.6833333	106.6933	17.7028				
23/08/2012	13:45:11	1.3059	105.1833333	106.6941	17.7036	6.39	1116	23.6	Cleaner than discharge at 12.45pm
23/08/2012	13:45:41	1.3031	105.6833333	106.6969	17.7064				
23/08/2012	13:46:11	1.3072	106.1833333	106.6928	17.7023				
23/08/2012	13:46:41	1.3065	106.6833333	106.6935	17.703				
23/08/2012	13:47:11	1.3047	107.1833333	106.6953	17.7048				
23/08/2012	13:47:41	1.3104	107.6833333	106.6896	17.6991				
23/08/2012	13:48:11	1.3062	108.1833333	106.6938	17.7033				
23/08/2012	13:48:41	1.3041	108.6833333	106.6959	17.7054				
23/08/2012	13:49:11	1.3085	109.1833333	106.6915	17.701				
23/08/2012	13:49:41	1.3062	109.6833333	106.6938	17.7033				
23/08/2012	13:50:11	1.3106	110.1833333	106.6894	17.6989				
23/08/2012	13:50:41	1.304	110.6833333	106.696	17.7055				
23/08/2012	13:51:11	1.3037	111.1833333	106.6963	17.7058				
23/08/2012	13:51:41	1.3028	111.6833333	106.6972	17.7067				
23/08/2012	13:52:11	1.3086	112.1833333	106.6914	17.7009				
23/08/2012	13:52:41	1.306	112.6833333	106.694	17.7035				
23/08/2012	13:53:11	1.3061	113.1833333	106.6939	17.7034				
23/08/2012	13:53:41	1.3033	113.6833333	106.6967	17.7062				
23/08/2012	13:54:11	1.3101	114.1833333	106.6899	17.6994				
23/08/2012	13:54:41	1.309	114.6833333	106.691	17.7005				
23/08/2012	13:55:11	1.3064	115.1833333	106.6936	17.7031				

23/08/2012	13:55:41	1.3052	115.6833333	106.6948	17.7043				
23/08/2012	13:56:11	1.303	116.1833333	106.697	17.7065				
23/08/2012	13:56:41	1.3088	116.6833333	106.6912	17.7007				
23/08/2012	13:57:11	1.31	117.1833333	106.69	17.6995				
23/08/2012	13:57:41	1.3083	117.6833333	106.6917	17.7012				
23/08/2012	13:58:11	1.3067	118.1833333	106.6933	17.7028				
23/08/2012	13:58:41	1.3036	118.6833333	106.6964	17.7059				
23/08/2012	13:59:11	1.3092	119.1833333	106.6908	17.7003				
23/08/2012	13:59:41	1.3052	119.6833333	106.6948	17.7043				
23/08/2012	14:00:11	1.3058	120.1833333	106.6942	17.7037	6.6	1122	23.8	Clean discharge water
23/08/2012	14:00:41	1.3066	120.6833333	106.6934	17.7029				
23/08/2012	14:01:11	1.3002	121.1833333	106.6998	17.7093				
23/08/2012	14:01:41	1.3054	121.6833333	106.6946	17.7041				
23/08/2012	14:02:11	1.3032	122.1833333	106.6968	17.7063				
23/08/2012	14:02:41	1.3031	122.6833333	106.6969	17.7064				
23/08/2012	14:03:11	1.3022	123.1833333	106.6978	17.7073				
23/08/2012	14:03:41	1.3059	123.6833333	106.6941	17.7036				
23/08/2012	14:04:11	1.2999	124.1833333	106.7001	17.7096				
23/08/2012	14:04:41	1.3005	124.6833333	106.6995	17.709				
23/08/2012	14:05:11	1.2985	125.1833333	106.7015	17.711				
23/08/2012	14:05:41	1.3008	125.6833333	106.6992	17.7087				
23/08/2012	14:06:11	1.3068	126.1833333	106.6932	17.7027				
23/08/2012	14:06:41	1.3082	126.6833333	106.6918	17.7013				
23/08/2012	14:07:11	1.3124	127.1833333	106.6876	17.6971				
23/08/2012	14:07:41	1.3064	127.6833333	106.6936	17.7031				
23/08/2012	14:08:11	1.3087	128.1833333	106.6913	17.7008				
23/08/2012	14:08:41	1.3064	128.6833333	106.6936	17.7031				
23/08/2012	14:09:11	1.3102	129.1833333	106.6898	17.6993				
23/08/2012	14:09:41	1.3102	129.6833333	106.6898	17.6993				
23/08/2012	14:10:11	1.3117	130.1833333	106.6883	17.6978				
23/08/2012	14:10:41	1.3092	130.6833333	106.6908	17.7003				
23/08/2012	14:11:11	1.313	131.1833333	106.687	17.6965				
23/08/2012	14:11:41	1.3082	131.6833333	106.6918	17.7013				
23/08/2012	14:12:11	1.3098	132.1833333	106.6902	17.6997				
23/08/2012	14:12:41	1.3124	132.6833333	106.6876	17.6971				
23/08/2012	14:13:11	1.3076	133.1833333	106.6924	17.7019				
23/08/2012	14:13:41	1.3128	133.6833333	106.6872	17.6967				
23/08/2012	14:14:11	1.314	134.1833333	106.686	17.6955				
23/08/2012	14:14:41	1.315	134.6833333	106.685	17.6945				
23/08/2012	14:15:11	1.3101	135.1833333	106.6899	17.6994				
23/08/2012	14:15:41	1.3104	135.6833333	106.6896	17.6991				
23/08/2012	14:16:11	1.3066	136.1833333	106.6934	17.7029				
23/08/2012	14:16:41	1.3021	136.6833333	106.6979	17.7074				
23/08/2012	14:17:11	1.3064	137.1833333	106.6936	17.7031				
23/08/2012	14:17:41	1.3009	137.6833333	106.6991	17.7086				
23/08/2012	14:18:11	1.305	138.1833333	106.695	17.7045				
23/08/2012	14:18:41	1.3035	138.6833333	106.6965	17.706				
23/08/2012	14:19:11	1.3039	139.1833333	106.6961	17.7056				
23/08/2012	14:19:41	1.3055	139.6833333	106.6945	17.704				
23/08/2012	14:20:11	1.3081	140.1833333	106.6919	17.7014				
23/08/2012	14:20:41	1.3067	140.6833333	106.6933	17.7028				
23/08/2012	14:21:11	1.3063	141.1833333	106.6937	17.7032				
23/08/2012	14:21:41	1.3055	141.6833333	106.6945	17.704				
23/08/2012	14:22:11	1.3038	142.1833333	106.6962	17.7057				
23/08/2012	14:22:41	1.3028	142.6833333	106.6972	17.7067				
23/08/2012	14:23:11	1.305	143.1833333	106.695	17.7045				
23/08/2012	14:23:41	1.3063	143.6833333	106.6937	17.7032				
23/08/2012	14:24:11	1.3071	144.1833333	106.6929	17.7024				
23/08/2012	14:24:41	1.3001	144.6833333	106.6999	17.7094				
23/08/2012	14:25:11	1.3065	145.1833333	106.6935	17.703				
23/08/2012	14:25:41	1.3049	145.6833333	106.6951	17.7046				
23/08/2012	14:26:11	1.3077	146.1833333	106.6923	17.7018				
23/08/2012	14:26:41	1.3066	146.6833333	106.6934	17.7029				
23/08/2012	14:27:11	1.3084	147.1833333	106.6916	17.7011				
23/08/2012	14:27:41	1.3079	147.6833333	106.6921	17.7016				
23/08/2012	14:28:11	1.3042	148.1833333	106.6958	17.7053				
23/08/2012	14:28:41	1.3056	148.6833333	106.6944	17.7039				
23/08/2012	14:29:11	1.3076	149.1833333	106.6924	17.7019				
23/08/2012	14:29:41	1.3048	149.6833333	106.6952	17.7047				
23/08/2012	14:30:11	1.3057	150.1833333	106.6943	17.7038	6.5	1115	23.2	Clean discharge water
23/08/2012	14:30:41	1.3038	150.6833333	106.6962	17.7057				
23/08/2012	14:31:11	1.3049	151.1833333	106.6951	17.7046				
23/08/2012	14:31:41	1.3023	151.6833333	106.6977	17.7072				
23/08/2012	14:32:11	1.3017	152.1833333	106.6983	17.7078				
23/08/2012	14:32:41	1.2995	152.6833333	106.7005	17.71				
23/08/2012	14:33:11	1.3032	153.1833333	106.6968	17.7063				
23/08/2012	14:33:41	1.2999	153.6833333	106.7001	17.7096				
23/08/2012	14:34:11	1.2991	154.1833333	106.7009	17.7104				
23/08/2012	14:34:41	1.302	154.6833333	106.698	17.7075				
23/08/2012	14:35:11	1.3003	155.1833333	106.6997	17.7092				
23/08/2012	14:35:41	1.2987	155.6833333	106.7013	17.7108				
23/08/2012	14:36:11	1.3093	156.1833333	106.6907	17.7002				
23/08/2012	14:36:41	1.3106	156.6833333	106.6894	17.6989				
23/08/2012	14:37:11	1.3076	157.1833333	106.6924	17.7019				
23/08/2012	14:37:41	1.3089	157.6833333	106.6911	17.7006				
23/08/2012	14:38:11	1.3108	158.1833333	106.6892	17.6987				
23/08/2012	14:38:41	1.2951	158.6833333	106.7049	17.7144				
23/08/2012	14:39:11	1.3074	159.1833333	106.6926	17.7021				
23/08/2012	14:39:41	1.3073	159.6833333	106.6927	17.7022				
23/08/2012	14:40:11	1.3068	160.1833333	106.6932	17.7027				
23/08/2012	14:40:41	1.3081	160.6833333	106.6919	17.7014				
23/08/2012	14:41:11	1.3064	161.1833333	106.6936	17.7031				
23/08/2012	14:41:41	1.3067	161.6833333	106.6933	17.7028				
23/08/2012	14:42:11	1.307	162.1833333	106.693	17.7025				
23/08/2012	14:42:41	1.3095	162.6833333	106.6905	17.7				
23/08/2012	14:43:11	1.3056	163.1833333	106.6944	17.7039				
23/08/2012	14:43:41	1.3107	163.6833333	106.6893	17.6988				
23/08/2012	14:44:11	1.3112	164.1833333	106.6888	17.6983				
23/08/2012	14:44:41	1.3061	164.6833333	106.6939	17.7034				
23/08/2012	14:45:11	1.3111	165.1833333	106.6889	17.6984				
23/08/2012	14:45:41	1.3111	165.6833333	106.6889	17.6984				
23/08/2012	14:46:11	1.3095	166.1833333	106.6905	17.7				
23/08/2012	14:46:41	1.3089	166.6833333	106.6911	17.7006				
23/08/2012	14:47:11	1.3144	167.1833333	106.6856	17.6951				
23/08/2012	14:47:41	1.3096	167.6833333	106.6904	17.6999				
23/08/2012	14:48:11	1.3116	168.1833333	106.6884	17.6979				
23/08/2012	14:48:41	1.3093	168.6833333	106.6907	17.7002				
23/08/2012	14:49:11	1.3097	169.1833333	106.6903	17.6998				
23/08/2012	14:49:41	1.3065	169.6833333	106.6935	17.703				
23/08/2012	14:50:11	1.3139	170.1833333	106.6861	17.6956				
23/08/2012	14:50:41	1.3117	170.6833333	106.6883	17.6978				
23/08/2012	14:51:11	1.3084	171.1833333	106.6916	17.7011				
23/08/2012	14:51:41	1.3086	171.6833333	106.6914	17.7009				
23/08/2012	14:52:11	1.3112	172.1833333	106.6888	17.6983				
23/08/2012	14:52:41	1.3118	172.6833333	106.6882	17.6977				
23/08/2012	14:53:11	1.3099	173.1833333	106.6901	17.6996				
23/08/2012	14:53:41	1.3096	173.6833333	106.6904	17.6999				

23/08/2012	14:54:11	1.3098	174.1833333	106.6902	17.6997				
23/08/2012	14:54:41	1.3099	174.6833333	106.6901	17.6996				
23/08/2012	14:55:11	1.3129	175.1833333	106.6871	17.6966				
23/08/2012	14:55:41	1.3127	175.6833333	106.6873	17.6968				
23/08/2012	14:56:11	1.308	176.1833333	106.692	17.7015				
23/08/2012	14:56:41	1.3097	176.6833333	106.6903	17.6998				
23/08/2012	14:57:11	1.3109	177.1833333	106.6891	17.6986				
23/08/2012	14:57:41	1.3127	177.6833333	106.6873	17.6968				
23/08/2012	14:58:11	1.3088	178.1833333	106.6912	17.7007				
23/08/2012	14:58:41	1.3106	178.6833333	106.6894	17.6989				
23/08/2012	14:59:11	1.3067	179.1833333	106.6933	17.7028				
23/08/2012	14:59:41	1.3085	179.6833333	106.6915	17.701				
23/08/2012	15:00:11	1.3094	180.1833333	106.6906	17.7001	6.78	1109	23.8	Clean discharge water
23/08/2012	15:00:41	1.3083	180.6833333	106.6917	17.7012				
23/08/2012	15:01:11	1.31	181.1833333	106.69	17.6995				
23/08/2012	15:01:41	1.3096	181.6833333	106.6904	17.6999				
23/08/2012	15:02:11	1.3097	182.1833333	106.6903	17.6998				
23/08/2012	15:02:41	1.3098	182.6833333	106.6902	17.6997				
23/08/2012	15:03:11	1.3163	183.1833333	106.6837	17.6932				
23/08/2012	15:03:41	1.313	183.6833333	106.687	17.6965				
23/08/2012	15:04:11	1.3106	184.1833333	106.6894	17.6989				
23/08/2012	15:04:41	1.3123	184.6833333	106.6877	17.6972				
23/08/2012	15:05:11	1.3081	185.1833333	106.6919	17.7014				
23/08/2012	15:05:41	1.3088	185.6833333	106.6912	17.7007				
23/08/2012	15:06:11	1.3017	186.1833333	106.6983	17.7078				
23/08/2012	15:06:41	1.3086	186.6833333	106.6914	17.7009				
23/08/2012	15:07:11	1.3085	187.1833333	106.6915	17.701				
23/08/2012	15:07:41	1.3085	187.6833333	106.6915	17.701				
23/08/2012	15:08:11	1.3086	188.1833333	106.6914	17.7009				
23/08/2012	15:08:41	1.3061	188.6833333	106.6939	17.7034				
23/08/2012	15:09:11	1.3086	189.1833333	106.6914	17.7009				
23/08/2012	15:09:41	1.3106	189.6833333	106.6894	17.6989				
23/08/2012	15:10:11	1.3043	190.1833333	106.6957	17.7052				
23/08/2012	15:10:41	1.3141	190.6833333	106.6859	17.6954				
23/08/2012	15:11:11	1.3119	191.1833333	106.6881	17.6976				
23/08/2012	15:11:41	1.3066	191.6833333	106.6934	17.7029				
23/08/2012	15:12:11	1.3065	192.1833333	106.6935	17.703				
23/08/2012	15:12:41	1.3083	192.6833333	106.6917	17.7012				
23/08/2012	15:13:11	1.308	193.1833333	106.692	17.7015				
23/08/2012	15:13:41	1.3025	193.6833333	106.6975	17.707				
23/08/2012	15:14:11	1.3098	194.1833333	106.6902	17.6997				
23/08/2012	15:14:41	1.3073	194.6833333	106.6927	17.7022				
23/08/2012	15:15:11	1.3069	195.1833333	106.6931	17.7026				
23/08/2012	15:15:41	1.3062	195.6833333	106.6938	17.7033				
23/08/2012	15:16:11	1.3076	196.1833333	106.6924	17.7019				
23/08/2012	15:16:41	1.3091	196.6833333	106.6909	17.7004				
23/08/2012	15:17:11	1.3083	197.1833333	106.6917	17.7012				
23/08/2012	15:17:41	1.3081	197.6833333	106.6919	17.7014				
23/08/2012	15:18:11	1.3097	198.1833333	106.6903	17.6998				
23/08/2012	15:18:41	1.3076	198.6833333	106.6924	17.7019				
23/08/2012	15:19:11	1.3063	199.1833333	106.6937	17.7032				
23/08/2012	15:19:41	1.3047	199.6833333	106.6953	17.7048				
23/08/2012	15:20:11	1.3129	200.1833333	106.6871	17.6966				
23/08/2012	15:20:41	1.3069	200.6833333	106.6931	17.7026				
23/08/2012	15:21:11	1.3105	201.1833333	106.6895	17.699				
23/08/2012	15:21:41	1.3104	201.6833333	106.6896	17.6991				
23/08/2012	15:22:11	1.3088	202.1833333	106.6912	17.7007				
23/08/2012	15:22:41	1.3066	202.6833333	106.6934	17.7029				
23/08/2012	15:23:11	1.3144	203.1833333	106.6856	17.6951				
23/08/2012	15:23:41	1.3085	203.6833333	106.6915	17.701				
23/08/2012	15:24:11	1.3077	204.1833333	106.6923	17.7018				
23/08/2012	15:24:41	1.3104	204.6833333	106.6896	17.6991				
23/08/2012	15:25:11	1.3091	205.1833333	106.6909	17.7004				
23/08/2012	15:25:41	1.314	205.6833333	106.686	17.6955				
23/08/2012	15:26:11	1.3097	206.1833333	106.6903	17.6998				
23/08/2012	15:26:41	1.3118	206.6833333	106.6882	17.6977				
23/08/2012	15:27:11	1.3049	207.1833333	106.6951	17.7046				
23/08/2012	15:27:41	1.3102	207.6833333	106.6898	17.6993				
23/08/2012	15:28:11	1.3044	208.1833333	106.6956	17.7051				
23/08/2012	15:28:41	1.3083	208.6833333	106.6917	17.7012				
23/08/2012	15:29:11	1.3074	209.1833333	106.6926	17.7021				
23/08/2012	15:29:41	1.2997	209.6833333	106.7003	17.7098				
23/08/2012	15:30:11	1.3047	210.1833333	106.6953	17.7048	6.7	1124	24	Murky discharge water
23/08/2012	15:30:41	1.3052	210.6833333	106.6948	17.7043				
23/08/2012	15:31:11	1.3012	211.1833333	106.6988	17.7083				
23/08/2012	15:31:41	1.3028	211.6833333	106.6972	17.7067				
23/08/2012	15:32:11	1.3005	212.1833333	106.6995	17.709				
23/08/2012	15:32:41	1.3	212.6833333	106.7	17.7095				
23/08/2012	15:33:11	1.3015	213.1833333	106.6985	17.708				
23/08/2012	15:33:41	1.2975	213.6833333	106.7025	17.712				
23/08/2012	15:34:11	1.2964	214.1833333	106.7036	17.7131				
23/08/2012	15:34:41	1.2973	214.6833333	106.7027	17.7122				
23/08/2012	15:35:11	1.2978	215.1833333	106.7022	17.7117				
23/08/2012	15:35:41	1.2996	215.6833333	106.7004	17.7099				
23/08/2012	15:36:11	1.3124	216.1833333	106.6876	17.6971				
23/08/2012	15:36:41	1.3078	216.6833333	106.6922	17.7017				
23/08/2012	15:37:11	1.3123	217.1833333	106.6877	17.6972				
23/08/2012	15:37:41	1.3125	217.6833333	106.6875	17.697				
23/08/2012	15:38:11	1.3088	218.1833333	106.6912	17.7007				
23/08/2012	15:38:41	1.3119	218.6833333	106.6881	17.6976				
23/08/2012	15:39:11	1.3059	219.1833333	106.6941	17.7036				
23/08/2012	15:39:41	1.3073	219.6833333	106.6927	17.7022				
23/08/2012	15:40:11	1.3088	220.1833333	106.6912	17.7007				
23/08/2012	15:40:41	1.3141	220.6833333	106.6859	17.6954				
23/08/2012	15:41:11	1.3094	221.1833333	106.6906	17.7001				
23/08/2012	15:41:41	1.3109	221.6833333	106.6891	17.6986				
23/08/2012	15:42:11	1.3162	222.1833333	106.6838	17.6933				
23/08/2012	15:42:41	1.3116	222.6833333	106.6884	17.6979				
23/08/2012	15:43:11	1.3138	223.1833333	106.6862	17.6957				
23/08/2012	15:43:41	1.3168	223.6833333	106.6832	17.6927				
23/08/2012	15:44:11	1.3156	224.1833333	106.6844	17.6939				
23/08/2012	15:44:41	1.3177	224.6833333	106.6823	17.6918				
23/08/2012	15:45:11	1.3188	225.1833333	106.6812	17.6907				
23/08/2012	15:45:41	1.3186	225.6833333	106.6814	17.6909				
23/08/2012	15:46:11	1.3075	226.1833333	106.6925	17.702				
23/08/2012	15:46:41	1.313	226.6833333	106.687	17.6965				
23/08/2012	15:47:11	1.3142	227.1833333	106.6858	17.6953				
23/08/2012	15:47:41	1.3105	227.6833333	106.6895	17.699				
23/08/2012	15:48:11	1.3133	228.1833333	106.6867	17.6962				
23/08/2012	15:48:41	1.3146	228.6833333	106.6854	17.6949				
23/08/2012	15:49:11	1.3078	229.1833333	106.6922	17.7017				
23/08/2012	15:49:41	1.3057	229.6833333	106.6943	17.7038				
23/08/2012	15:50:11	1.3078	230.1833333	106.6922	17.7017				
23/08/2012	15:50:41	1.3058	230.6833333	106.6942	17.7037				
23/08/2012	15:51:11	1.3094	231.1833333	106.6906	17.7001				
23/08/2012	15:51:41	1.307	231.6833333	106.693	17.7025				
23/08/2012	15:52:11	1.3101	232.1833333	106.6899	17.6994				

23/08/2012	15:52:41	1.3121	232.6833333	106.6879	17.6974				
23/08/2012	15:53:11	1.3084	233.1833333	106.6916	17.7011				
23/08/2012	15:53:41	1.3045	233.6833333	106.6955	17.705				
23/08/2012	15:54:11	1.3118	234.1833333	106.6882	17.6977				
23/08/2012	15:54:41	1.3123	234.6833333	106.6877	17.6972				
23/08/2012	15:55:11	1.3095	235.1833333	106.6905	17.7				
23/08/2012	15:55:41	1.3073	235.6833333	106.6927	17.7022				
23/08/2012	15:56:11	1.3111	236.1833333	106.6889	17.6984				
23/08/2012	15:56:41	1.3089	236.6833333	106.6911	17.7006				
23/08/2012	15:57:11	1.31	237.1833333	106.69	17.6995				
23/08/2012	15:57:41	1.3094	237.6833333	106.6906	17.7001				
23/08/2012	15:58:11	1.3119	238.1833333	106.6881	17.6976				
23/08/2012	15:58:41	1.3114	238.6833333	106.6886	17.6981				
23/08/2012	15:59:11	1.3101	239.1833333	106.6899	17.6994				
23/08/2012	15:59:41	1.312	239.6833333	106.688	17.6975				
23/08/2012	16:00:11	1.3106	240.1833333	106.6894	17.6989	6.91	1100	24	Clear discharge water
23/08/2012	16:00:41	1.311	240.6833333	106.689	17.6985				
23/08/2012	16:01:11	1.3133	241.1833333	106.6867	17.6962				
23/08/2012	16:01:41	1.309	241.6833333	106.691	17.7005				
23/08/2012	16:02:11	1.3079	242.1833333	106.6921	17.7016				
23/08/2012	16:02:41	1.3113	242.6833333	106.6887	17.6982				
23/08/2012	16:03:11	1.3098	243.1833333	106.6902	17.6997				
23/08/2012	16:03:41	1.3107	243.6833333	106.6893	17.6988				
23/08/2012	16:04:11	1.3149	244.1833333	106.6851	17.6946				
23/08/2012	16:04:41	1.3085	244.6833333	106.6915	17.701				
23/08/2012	16:05:11	1.3091	245.1833333	106.6909	17.7004				
23/08/2012	16:05:41	1.3107	245.6833333	106.6893	17.6988				
23/08/2012	16:06:11	1.3071	246.1833333	106.6929	17.7024				
23/08/2012	16:06:41	1.3127	246.6833333	106.6873	17.6968				
23/08/2012	16:07:11	1.3053	247.1833333	106.6947	17.7042				
23/08/2012	16:07:41	1.3096	247.6833333	106.6904	17.6999				
23/08/2012	16:08:11	1.3128	248.1833333	106.6872	17.6967				
23/08/2012	16:08:41	1.3079	248.6833333	106.6921	17.7016				
23/08/2012	16:09:11	1.3094	249.1833333	106.6906	17.7001				
23/08/2012	16:09:41	1.3103	249.6833333	106.6897	17.6992				
23/08/2012	16:10:11	1.3099	250.1833333	106.6901	17.6996				
23/08/2012	16:10:41	1.3108	250.6833333	106.6892	17.6987				
23/08/2012	16:11:11	1.3088	251.1833333	106.6912	17.7007				
23/08/2012	16:11:41	1.3086	251.6833333	106.6914	17.7009				
23/08/2012	16:12:11	1.3095	252.1833333	106.6905	17.7				
23/08/2012	16:12:41	1.3135	252.6833333	106.6865	17.696				
23/08/2012	16:13:11	1.3098	253.1833333	106.6902	17.6997				
23/08/2012	16:13:41	1.311	253.6833333	106.689	17.6985				
23/08/2012	16:14:11	1.3155	254.1833333	106.6845	17.694				
23/08/2012	16:14:41	1.3145	254.6833333	106.6855	17.695				
23/08/2012	16:15:11	1.3063	255.1833333	106.6937	17.7032				
23/08/2012	16:15:41	1.3174	255.6833333	106.6826	17.6921				
23/08/2012	16:16:11	1.31	256.1833333	106.69	17.6995				
23/08/2012	16:16:41	1.3119	256.6833333	106.6881	17.6976				
23/08/2012	16:17:11	1.3145	257.1833333	106.6855	17.695				
23/08/2012	16:17:41	1.3137	257.6833333	106.6863	17.6958				
23/08/2012	16:18:11	1.3115	258.1833333	106.6885	17.698				
23/08/2012	16:18:41	1.309	258.6833333	106.691	17.7005				
23/08/2012	16:19:11	1.3135	259.1833333	106.6865	17.696				
23/08/2012	16:19:41	1.3093	259.6833333	106.6907	17.7002				
23/08/2012	16:20:11	1.3076	260.1833333	106.6924	17.7019				
23/08/2012	16:20:41	1.3079	260.6833333	106.6921	17.7016				
23/08/2012	16:21:11	1.306	261.1833333	106.694	17.7035				
23/08/2012	16:21:41	1.3071	261.6833333	106.6929	17.7024				
23/08/2012	16:22:11	1.3083	262.1833333	106.6917	17.7012				
23/08/2012	16:22:41	1.3085	262.6833333	106.6915	17.701				
23/08/2012	16:23:11	1.3073	263.1833333	106.6927	17.7022				
23/08/2012	16:23:41	1.3096	263.6833333	106.6904	17.6999				
23/08/2012	16:24:11	1.3069	264.1833333	106.6931	17.7026				
23/08/2012	16:24:41	1.3098	264.6833333	106.6902	17.6997				
23/08/2012	16:25:11	1.3056	265.1833333	106.6944	17.7039				
23/08/2012	16:25:41	1.3068	265.6833333	106.6932	17.7027				
23/08/2012	16:26:11	1.3132	266.1833333	106.6868	17.6963				
23/08/2012	16:26:41	1.3123	266.6833333	106.6877	17.6972				
23/08/2012	16:27:11	1.3107	267.1833333	106.6893	17.6988				
23/08/2012	16:27:41	1.3124	267.6833333	106.6876	17.6971				
23/08/2012	16:28:11	1.3144	268.1833333	106.6856	17.6951				
23/08/2012	16:28:41	1.3098	268.6833333	106.6902	17.6997				
23/08/2012	16:29:11	1.3097	269.1833333	106.6903	17.6998				
23/08/2012	16:29:41	1.3102	269.6833333	106.6898	17.6993				
23/08/2012	16:30:11	1.3155	270.1833333	106.6845	17.694	6.85	1102	23.7	Clear discharge water
23/08/2012	16:30:41	1.3134	270.6833333	106.6866	17.6961				
23/08/2012	16:31:11	1.3108	271.1833333	106.6892	17.6987				
23/08/2012	16:31:41	1.3147	271.6833333	106.6853	17.6948				
23/08/2012	16:32:11	1.3117	272.1833333	106.6883	17.6978				
23/08/2012	16:32:41	1.3177	272.6833333	106.6823	17.6918				
23/08/2012	16:33:11	1.3115	273.1833333	106.6885	17.698				
23/08/2012	16:33:41	1.3164	273.6833333	106.6836	17.6931				
23/08/2012	16:34:11	1.3134	274.1833333	106.6866	17.6961				
23/08/2012	16:34:41	1.3109	274.6833333	106.6891	17.6986				
23/08/2012	16:35:11	1.3115	275.1833333	106.6885	17.698				
23/08/2012	16:35:41	1.3132	275.6833333	106.6868	17.6963				
23/08/2012	16:36:11	1.3156	276.1833333	106.6844	17.6939				
23/08/2012	16:36:41	1.3088	276.6833333	106.6912	17.7007				
23/08/2012	16:37:11	1.3152	277.1833333	106.6848	17.6943				
23/08/2012	16:37:41	1.3145	277.6833333	106.6855	17.695				
23/08/2012	16:38:11	1.3131	278.1833333	106.6869	17.6964				
23/08/2012	16:38:41	1.3154	278.6833333	106.6846	17.6941				
23/08/2012	16:39:11	1.3135	279.1833333	106.6865	17.696				
23/08/2012	16:39:41	1.3307	279.6833333	106.6693	17.6788				
23/08/2012	16:40:11	1.3133	280.1833333	106.6867	17.6962				
23/08/2012	16:40:41	1.3148	280.6833333	106.6852	17.6947				
23/08/2012	16:41:11	1.3199	281.1833333	106.6801	17.6896				
23/08/2012	16:41:41	1.3159	281.6833333	106.6841	17.6936				
23/08/2012	16:42:11	1.3175	282.1833333	106.6825	17.692				
23/08/2012	16:42:41	1.3186	282.6833333	106.6814	17.6909				
23/08/2012	16:43:11	1.3136	283.1833333	106.6864	17.6959				
23/08/2012	16:43:41	1.3175	283.6833333	106.6825	17.692				
23/08/2012	16:44:11	1.315	284.1833333	106.685	17.6945				
23/08/2012	16:44:41	1.3151	284.6833333	106.6849	17.6944				
23/08/2012	16:45:11	1.3187	285.1833333	106.6813	17.6908				
23/08/2012	16:45:41	1.3174	285.6833333	106.6826	17.6921				
23/08/2012	16:46:11	1.3133	286.1833333	106.6867	17.6962				
23/08/2012	16:46:41	1.3127	286.6833333	106.6873	17.6968				
23/08/2012	16:47:11	1.3109	287.1833333	106.6891	17.6986				
23/08/2012	16:47:41	1.3138	287.6833333	106.6862	17.6957				
23/08/2012	16:48:11	1.3142	288.1833333	106.6858	17.6953				
23/08/2012	16:48:41	1.3141	288.6833333	106.6859	17.6954				
23/08/2012	16:49:11	1.3157	289.1833333	106.6843	17.6938				
23/08/2012	16:49:41	1.3164	289.6833333	106.6836	17.6931				
23/08/2012	16:50:11	1.318	290.1833333	106.682	17.6915				
23/08/2012	16:50:41	1.3149	290.6833333	106.6851	17.6946				

23/08/2012	16:51:11	1.3138	291.1833333	106.6862	17.6957				
23/08/2012	16:51:41	1.3193	291.6833333	106.6807	17.6902				
23/08/2012	16:52:11	1.3229	292.1833333	106.6771	17.6866				
23/08/2012	16:52:41	1.3176	292.6833333	106.6824	17.6919				
23/08/2012	16:53:11	1.3183	293.1833333	106.6817	17.6912				
23/08/2012	16:53:41	1.3179	293.6833333	106.6821	17.6916				
23/08/2012	16:54:11	1.3202	294.1833333	106.6798	17.6893				
23/08/2012	16:54:41	1.317	294.6833333	106.683	17.6925				
23/08/2012	16:55:11	1.3199	295.1833333	106.6801	17.6896				
23/08/2012	16:55:41	1.323	295.6833333	106.677	17.6865				
23/08/2012	16:56:11	1.3139	296.1833333	106.6861	17.6956				
23/08/2012	16:56:41	1.3156	296.6833333	106.6844	17.6939				
23/08/2012	16:57:11	1.3169	297.1833333	106.6831	17.6926				
23/08/2012	16:57:41	1.3157	297.6833333	106.6843	17.6938				
23/08/2012	16:58:11	1.3152	298.1833333	106.6848	17.6943				
23/08/2012	16:58:41	1.3216	298.6833333	106.6784	17.6879				
23/08/2012	16:59:11	1.3159	299.1833333	106.6841	17.6936				
23/08/2012	16:59:41	1.3149	299.6833333	106.6851	17.6946				
23/08/2012	17:00:11	1.3175	300.1833333	106.6825	17.692	6.99	1095	23.7	Clear discharge water
23/08/2012	17:00:41	1.3145	300.6833333	106.6855	17.695				
23/08/2012	17:01:11	1.3121	301.1833333	106.6879	17.6974				
23/08/2012	17:01:41	1.3167	301.6833333	106.6833	17.6928				
23/08/2012	17:02:11	1.3149	302.1833333	106.6851	17.6946				
23/08/2012	17:02:41	1.3203	302.6833333	106.6797	17.6892				
23/08/2012	17:03:11	1.3138	303.1833333	106.6862	17.6957				
23/08/2012	17:03:41	1.3128	303.6833333	106.6872	17.6967				
23/08/2012	17:04:11	1.3146	304.1833333	106.6854	17.6949				
23/08/2012	17:04:41	1.3185	304.6833333	106.6815	17.691				
23/08/2012	17:05:11	1.3191	305.1833333	106.6809	17.6904				
23/08/2012	17:05:41	1.3164	305.6833333	106.6836	17.6931				
23/08/2012	17:06:11	1.3112	306.1833333	106.6888	17.6983				
23/08/2012	17:06:41	1.3103	306.6833333	106.6897	17.6992				
23/08/2012	17:07:11	1.3096	307.1833333	106.6904	17.6999				
23/08/2012	17:07:41	1.3131	307.6833333	106.6869	17.6964				
23/08/2012	17:08:11	1.3097	308.1833333	106.6903	17.6998				
23/08/2012	17:08:41	1.3121	308.6833333	106.6879	17.6974				
23/08/2012	17:09:11	1.3134	309.1833333	106.6866	17.6961				
23/08/2012	17:09:41	1.3078	309.6833333	106.6922	17.7017				
23/08/2012	17:10:11	1.312	310.1833333	106.688	17.6975				
23/08/2012	17:10:41	1.3113	310.6833333	106.6887	17.6982				
23/08/2012	17:11:11	1.309	311.1833333	106.691	17.7005				
23/08/2012	17:11:41	1.3119	311.6833333	106.6881	17.6976				
23/08/2012	17:12:11	1.3111	312.1833333	106.6889	17.6984				
23/08/2012	17:12:41	1.3137	312.6833333	106.6863	17.6958				
23/08/2012	17:13:11	1.3102	313.1833333	106.6898	17.6993				
23/08/2012	17:13:41	1.3119	313.6833333	106.6881	17.6976				
23/08/2012	17:14:11	1.3149	314.1833333	106.6851	17.6946				
23/08/2012	17:14:41	1.3109	314.6833333	106.6891	17.6986				
23/08/2012	17:15:11	1.311	315.1833333	106.689	17.6985				
23/08/2012	17:15:41	1.3078	315.6833333	106.6922	17.7017				
23/08/2012	17:16:11	1.3163	316.1833333	106.6837	17.6932				
23/08/2012	17:16:41	1.3131	316.6833333	106.6869	17.6964				
23/08/2012	17:17:11	1.3157	317.1833333	106.6843	17.6938				
23/08/2012	17:17:41	1.3108	317.6833333	106.6892	17.6987				
23/08/2012	17:18:11	1.3103	318.1833333	106.6897	17.6992				
23/08/2012	17:18:41	1.3158	318.6833333	106.6842	17.6937				
23/08/2012	17:19:11	1.3143	319.1833333	106.6857	17.6952				
23/08/2012	17:19:41	1.3172	319.6833333	106.6828	17.6923				
23/08/2012	17:20:11	1.3154	320.1833333	106.6846	17.6941				
23/08/2012	17:20:41	1.319	320.6833333	106.681	17.6905				
23/08/2012	17:21:11	1.315	321.1833333	106.685	17.6945				
23/08/2012	17:21:41	1.3165	321.6833333	106.6835	17.693				
23/08/2012	17:22:11	1.3141	322.1833333	106.6859	17.6954				
23/08/2012	17:22:41	1.3177	322.6833333	106.6823	17.6918				
23/08/2012	17:23:11	1.3205	323.1833333	106.6795	17.689				
23/08/2012	17:23:41	1.315	323.6833333	106.685	17.6945				
23/08/2012	17:24:11	1.3204	324.1833333	106.6796	17.6891				
23/08/2012	17:24:41	1.3245	324.6833333	106.6755	17.685				
23/08/2012	17:25:11	1.3225	325.1833333	106.6775	17.687				
23/08/2012	17:25:41	1.3206	325.6833333	106.6794	17.6889				
23/08/2012	17:26:11	1.3105	326.1833333	106.6895	17.699				
23/08/2012	17:26:41	1.3147	326.6833333	106.6853	17.6948				
23/08/2012	17:27:11	1.3154	327.1833333	106.6846	17.6941				
23/08/2012	17:27:41	1.3125	327.6833333	106.6875	17.697				
23/08/2012	17:28:11	1.3123	328.1833333	106.6877	17.6972				
23/08/2012	17:28:41	1.3159	328.6833333	106.6841	17.6936				
23/08/2012	17:29:11	1.3145	329.1833333	106.6855	17.695				
23/08/2012	17:29:41	1.3179	329.6833333	106.6821	17.6916				
23/08/2012	17:30:11	1.3133	330.1833333	106.6867	17.6962				
23/08/2012	17:30:41	1.3155	330.6833333	106.6845	17.694				
23/08/2012	17:31:11	1.3179	331.1833333	106.6821	17.6916				
23/08/2012	17:31:41	1.3177	331.6833333	106.6823	17.6918				
23/08/2012	17:32:11	1.3165	332.1833333	106.6835	17.693				
23/08/2012	17:32:41	1.3129	332.6833333	106.6871	17.6966				
23/08/2012	17:33:11	1.3177	333.1833333	106.6823	17.6918				
23/08/2012	17:33:41	1.3153	333.6833333	106.6847	17.6942				
23/08/2012	17:34:11	1.316	334.1833333	106.684	17.6935				
23/08/2012	17:34:41	1.3153	334.6833333	106.6847	17.6942				
23/08/2012	17:35:11	1.3147	335.1833333	106.6853	17.6948				
23/08/2012	17:35:41	1.3192	335.6833333	106.6808	17.6903				
23/08/2012	17:36:11	1.3158	336.1833333	106.6842	17.6937				
23/08/2012	17:36:41	1.3128	336.6833333	106.6872	17.6967				
23/08/2012	17:37:11	1.3171	337.1833333	106.6829	17.6924				
23/08/2012	17:37:41	1.3155	337.6833333	106.6845	17.694				
23/08/2012	17:38:11	1.3139	338.1833333	106.6861	17.6956				
23/08/2012	17:38:41	1.3189	338.6833333	106.6811	17.6906				
23/08/2012	17:39:11	1.3149	339.1833333	106.6851	17.6946				
23/08/2012	17:39:41	1.3148	339.6833333	106.6852	17.6947				
23/08/2012	17:40:11	1.3155	340.1833333	106.6845	17.694				
23/08/2012	17:40:41	1.3145	340.6833333	106.6855	17.695				
23/08/2012	17:41:11	1.312	341.1833333	106.688	17.6975				
23/08/2012	17:41:41	1.3146	341.6833333	106.6854	17.6949				
23/08/2012	17:42:11	1.3135	342.1833333	106.6865	17.696				
23/08/2012	17:42:41	1.3115	342.6833333	106.6885	17.698				
23/08/2012	17:43:11	1.3107	343.1833333	106.6893	17.6988				
23/08/2012	17:43:41	1.3064	343.6833333	106.6936	17.7031				
23/08/2012	17:44:11	1.3168	344.1833333	106.6832	17.6927				
23/08/2012	17:44:41	1.3124	344.6833333	106.6876	17.6971				
23/08/2012	17:45:11	1.309	345.1833333	106.691	17.7005				
23/08/2012	17:45:41	1.3135	345.6833333	106.6865	17.696				
23/08/2012	17:46:11	1.31	346.1833333	106.69	17.6995				
23/08/2012	17:46:41	1.3122	346.6833333	106.6878	17.6973				
23/08/2012	17:47:11	1.3153	347.1833333	106.6847	17.6942				
23/08/2012	17:47:41	1.3157	347.6833333	106.6843	17.6938				
23/08/2012	17:48:11	1.3163	348.1833333	106.6837	17.6932				
23/08/2012	17:48:41	1.3151	348.6833333	106.6849	17.6944				
23/08/2012	17:49:11	1.3101	349.1833333	106.6899	17.6994				

23/08/2012	17:49:41	1.3165	349.6833333	106.6835	17.693
23/08/2012	17:50:11	1.3152	350.1833333	106.6848	17.6943
23/08/2012	17:50:41	1.3168	350.6833333	106.6832	17.6927
23/08/2012	17:51:11	1.3129	351.1833333	106.6871	17.6966
23/08/2012	17:51:41	1.3205	351.6833333	106.6795	17.689
23/08/2012	17:52:11	1.319	352.1833333	106.681	17.6905
23/08/2012	17:52:41	1.3151	352.6833333	106.6849	17.6944
23/08/2012	17:53:11	1.3166	353.1833333	106.6834	17.6929
23/08/2012	17:53:41	1.3153	353.6833333	106.6847	17.6942
23/08/2012	17:54:11	1.32	354.1833333	106.68	17.6895
23/08/2012	17:54:41	1.3135	354.6833333	106.6865	17.696
23/08/2012	17:55:11	1.3176	355.1833333	106.6824	17.6919
23/08/2012	17:55:41	1.3127	355.6833333	106.6873	17.6968
23/08/2012	17:56:11	1.3139	356.1833333	106.6861	17.6956
23/08/2012	17:56:41	1.3142	356.6833333	106.6858	17.6953
23/08/2012	17:57:11	1.3132	357.1833333	106.6868	17.6963
23/08/2012	17:57:41	1.3145	357.6833333	106.6855	17.695
23/08/2012	17:58:11	1.3133	358.1833333	106.6867	17.6962
23/08/2012	17:58:41	1.3109	358.6833333	106.6891	17.6986
23/08/2012	17:59:11	1.3168	359.1833333	106.6832	17.6927
23/08/2012	17:59:41	1.3169	359.6833333	106.6831	17.6926
23/08/2012	18:00:11	1.3129	360.1833333	106.6871	17.6966
23/08/2012	18:00:41	1.3119	360.6833333	106.6881	17.6976
23/08/2012	18:01:11	1.3111	361.1833333	106.6889	17.6984
23/08/2012	18:01:41	1.3138	361.6833333	106.6862	17.6957
23/08/2012	18:02:11	1.3125	362.1833333	106.6875	17.697
23/08/2012	18:02:41	1.3088	362.6833333	106.6912	17.7007
23/08/2012	18:03:11	1.3115	363.1833333	106.6885	17.698
23/08/2012	18:03:41	1.3148	363.6833333	106.6852	17.6947
23/08/2012	18:04:11	1.3171	364.1833333	106.6829	17.6924
23/08/2012	18:04:41	1.3167	364.6833333	106.6833	17.6928
23/08/2012	18:05:11	1.3144	365.1833333	106.6856	17.6951
23/08/2012	18:05:41	1.3125	365.6833333	106.6875	17.697
23/08/2012	18:06:11	1.3134	366.1833333	106.6866	17.6961
23/08/2012	18:06:41	1.3127	366.6833333	106.6873	17.6968
23/08/2012	18:07:11	1.3148	367.1833333	106.6852	17.6947
23/08/2012	18:07:41	1.3118	367.6833333	106.6882	17.6977
23/08/2012	18:08:11	1.3067	368.1833333	106.6933	17.7028
23/08/2012	18:08:41	1.3144	368.6833333	106.6856	17.6951
23/08/2012	18:09:11	1.3126	369.1833333	106.6874	17.6969
23/08/2012	18:09:41	1.3102	369.6833333	106.6898	17.6993
23/08/2012	18:10:11	1.3097	370.1833333	106.6903	17.6998
23/08/2012	18:10:41	1.3095	370.6833333	106.6905	17.7
23/08/2012	18:11:11	1.3108	371.1833333	106.6892	17.6987
23/08/2012	18:11:41	1.3073	371.6833333	106.6927	17.7022
23/08/2012	18:12:11	1.3087	372.1833333	106.6913	17.7008
23/08/2012	18:12:41	1.31	372.6833333	106.69	17.6995
23/08/2012	18:13:11	1.3078	373.1833333	106.6922	17.7017
23/08/2012	18:13:41	1.3087	373.6833333	106.6913	17.7008
23/08/2012	18:14:11	1.306	374.1833333	106.694	17.7035
23/08/2012	18:14:41	1.3083	374.6833333	106.6917	17.7012
23/08/2012	18:15:11	1.3053	375.1833333	106.6947	17.7042
23/08/2012	18:15:41	1.3096	375.6833333	106.6904	17.6999
23/08/2012	18:16:11	1.315	376.1833333	106.685	17.6945
23/08/2012	18:16:41	1.3147	376.6833333	106.6853	17.6948
23/08/2012	18:17:11	1.3175	377.1833333	106.6825	17.692
23/08/2012	18:17:41	1.3142	377.6833333	106.6858	17.6953
23/08/2012	18:18:11	1.3132	378.1833333	106.6868	17.6963
23/08/2012	18:18:41	1.3119	378.6833333	106.6881	17.6976
23/08/2012	18:19:11	1.3141	379.1833333	106.6859	17.6954
23/08/2012	18:19:41	1.3168	379.6833333	106.6832	17.6927
23/08/2012	18:20:11	1.3151	380.1833333	106.6849	17.6944
23/08/2012	18:20:41	1.3099	380.6833333	106.6901	17.6996
23/08/2012	18:21:11	1.3136	381.1833333	106.6864	17.6959
23/08/2012	18:21:41	1.3121	381.6833333	106.6879	17.6974
23/08/2012	18:22:11	1.3101	382.1833333	106.6899	17.6994
23/08/2012	18:22:41	1.3155	382.6833333	106.6845	17.694
23/08/2012	18:23:11	1.3141	383.1833333	106.6859	17.6954
23/08/2012	18:23:41	1.3127	383.6833333	106.6873	17.6968
23/08/2012	18:24:11	1.3133	384.1833333	106.6867	17.6962
23/08/2012	18:24:41	1.3169	384.6833333	106.6831	17.6926
23/08/2012	18:25:11	1.3108	385.1833333	106.6892	17.6987
23/08/2012	18:25:41	1.3133	385.6833333	106.6867	17.6962
23/08/2012	18:26:11	1.3162	386.1833333	106.6838	17.6933
23/08/2012	18:26:41	1.3154	386.6833333	106.6846	17.6941
23/08/2012	18:27:11	1.3143	387.1833333	106.6857	17.6952
23/08/2012	18:27:41	1.316	387.6833333	106.684	17.6935
23/08/2012	18:28:11	1.3139	388.1833333	106.6861	17.6956
23/08/2012	18:28:41	1.3172	388.6833333	106.6828	17.6923
23/08/2012	18:29:11	1.3153	389.1833333	106.6847	17.6942
23/08/2012	18:29:41	1.314	389.6833333	106.686	17.6955
23/08/2012	18:30:11	1.3112	390.1833333	106.6888	17.6983
23/08/2012	18:30:41	1.3128	390.6833333	106.6872	17.6967
23/08/2012	18:31:11	1.3123	391.1833333	106.6877	17.6972
23/08/2012	18:31:41	1.3125	391.6833333	106.6875	17.697
23/08/2012	18:32:11	1.315	392.1833333	106.685	17.6945
23/08/2012	18:32:41	1.3128	392.6833333	106.6872	17.6967
23/08/2012	18:33:11	1.315	393.1833333	106.685	17.6945
23/08/2012	18:33:41	1.3194	393.6833333	106.6806	17.6901
23/08/2012	18:34:11	1.315	394.1833333	106.685	17.6945
23/08/2012	18:34:41	1.3158	394.6833333	106.6842	17.6937
23/08/2012	18:35:11	1.3163	395.1833333	106.6837	17.6932
23/08/2012	18:35:41	1.3171	395.6833333	106.6829	17.6924
23/08/2012	18:36:11	1.3139	396.1833333	106.6861	17.6956
23/08/2012	18:36:41	1.3128	396.6833333	106.6872	17.6967
23/08/2012	18:37:11	1.3161	397.1833333	106.6839	17.6934
23/08/2012	18:37:41	1.3138	397.6833333	106.6862	17.6957
23/08/2012	18:38:11	1.3178	398.1833333	106.6822	17.6917
23/08/2012	18:38:41	1.3194	398.6833333	106.6806	17.6901
23/08/2012	18:39:11	1.3171	399.1833333	106.6829	17.6924
23/08/2012	18:39:41	1.3158	399.6833333	106.6842	17.6937
23/08/2012	18:40:11	1.3166	400.1833333	106.6834	17.6929
23/08/2012	18:40:41	1.3174	400.6833333	106.6826	17.6921
23/08/2012	18:41:11	1.3172	401.1833333	106.6828	17.6923
23/08/2012	18:41:41	1.3165	401.6833333	106.6835	17.693
23/08/2012	18:42:11	1.3189	402.1833333	106.6811	17.6906
23/08/2012	18:42:41	1.3136	402.6833333	106.6864	17.6959
23/08/2012	18:43:11	1.3177	403.1833333	106.6823	17.6918
23/08/2012	18:43:41	1.319	403.6833333	106.681	17.6905
23/08/2012	18:44:11	1.3144	404.1833333	106.6856	17.6951
23/08/2012	18:44:41	1.3164	404.6833333	106.6836	17.6931
23/08/2012	18:45:11	1.3154	405.1833333	106.6846	17.6941
23/08/2012	18:45:41	1.3202	405.6833333	106.6798	17.6893
23/08/2012	18:46:11	1.3168	406.1833333	106.6832	17.6927
23/08/2012	18:46:41	1.3173	406.6833333	106.6827	17.6922
23/08/2012	18:47:11	1.3184	407.1833333	106.6816	17.6911
23/08/2012	18:47:41	1.3182	407.6833333	106.6818	17.6913

23/08/2012	18:48:11	1.3202	408.1833333	106.6798	17.6893
23/08/2012	18:48:41	1.3173	408.6833333	106.6827	17.6922
23/08/2012	18:49:11	1.3136	409.1833333	106.6864	17.6959
23/08/2012	18:49:41	1.3141	409.6833333	106.6859	17.6954
23/08/2012	18:50:11	1.3172	410.1833333	106.6828	17.6923
23/08/2012	18:50:41	1.3194	410.6833333	106.6806	17.6901
23/08/2012	18:51:11	1.3196	411.1833333	106.6804	17.6899
23/08/2012	18:51:41	1.3183	411.6833333	106.6817	17.6912
23/08/2012	18:52:11	1.3192	412.1833333	106.6808	17.6903
23/08/2012	18:52:41	1.3192	412.6833333	106.6808	17.6903
23/08/2012	18:53:11	1.3214	413.1833333	106.6786	17.6881
23/08/2012	18:53:41	1.3203	413.6833333	106.6797	17.6892
23/08/2012	18:54:11	1.3219	414.1833333	106.6781	17.6876
23/08/2012	18:54:41	1.317	414.6833333	106.683	17.6925
23/08/2012	18:55:11	1.3189	415.1833333	106.6811	17.6906
23/08/2012	18:55:41	1.3262	415.6833333	106.6738	17.6833
23/08/2012	18:56:11	1.3149	416.1833333	106.6851	17.6946
23/08/2012	18:56:41	1.3147	416.6833333	106.6853	17.6948
23/08/2012	18:57:11	1.3168	417.1833333	106.6832	17.6927
23/08/2012	18:57:41	1.3171	417.6833333	106.6829	17.6924
23/08/2012	18:58:11	1.3175	418.1833333	106.6825	17.692
23/08/2012	18:58:41	1.3156	418.6833333	106.6844	17.6939
23/08/2012	18:59:11	1.3167	419.1833333	106.6833	17.6928
23/08/2012	18:59:41	1.3202	419.6833333	106.6798	17.6893
23/08/2012	19:00:11	1.3162	420.1833333	106.6838	17.6933
23/08/2012	19:00:41	1.3179	420.6833333	106.6821	17.6916
23/08/2012	19:01:11	1.318	421.1833333	106.682	17.6915
23/08/2012	19:01:41	1.3192	421.6833333	106.6808	17.6903
23/08/2012	19:02:11	1.3188	422.1833333	106.6812	17.6907
23/08/2012	19:02:41	1.3171	422.6833333	106.6829	17.6924
23/08/2012	19:03:11	1.3157	423.1833333	106.6843	17.6938
23/08/2012	19:03:41	1.3183	423.6833333	106.6817	17.6912
23/08/2012	19:04:11	1.3198	424.1833333	106.6802	17.6897
23/08/2012	19:04:41	1.3201	424.6833333	106.6799	17.6894
23/08/2012	19:05:11	1.3211	425.1833333	106.6789	17.6884
23/08/2012	19:05:41	1.3204	425.6833333	106.6796	17.6891
23/08/2012	19:06:11	1.3185	426.1833333	106.6815	17.691
23/08/2012	19:06:41	1.3154	426.6833333	106.6846	17.6941
23/08/2012	19:07:11	1.3163	427.1833333	106.6837	17.6932
23/08/2012	19:07:41	1.3149	427.6833333	106.6851	17.6946
23/08/2012	19:08:11	1.315	428.1833333	106.685	17.6945
23/08/2012	19:08:41	1.3164	428.6833333	106.6836	17.6931
23/08/2012	19:09:11	1.3144	429.1833333	106.6856	17.6951
23/08/2012	19:09:41	1.3146	429.6833333	106.6854	17.6949
23/08/2012	19:10:11	1.3123	430.1833333	106.6877	17.6972
23/08/2012	19:10:41	1.3131	430.6833333	106.6869	17.6964
23/08/2012	19:11:11	1.3177	431.1833333	106.6823	17.6918
23/08/2012	19:11:41	1.3152	431.6833333	106.6848	17.6943
23/08/2012	19:12:11	1.3172	432.1833333	106.6828	17.6923
23/08/2012	19:12:41	1.3183	432.6833333	106.6817	17.6912
23/08/2012	19:13:11	1.319	433.1833333	106.681	17.6905
23/08/2012	19:13:41	1.3161	433.6833333	106.6839	17.6934
23/08/2012	19:14:11	1.313	434.1833333	106.687	17.6965
23/08/2012	19:14:41	1.3133	434.6833333	106.6867	17.6962
23/08/2012	19:15:11	1.3165	435.1833333	106.6835	17.693
23/08/2012	19:15:41	1.3112	435.6833333	106.6888	17.6983
23/08/2012	19:16:11	1.3173	436.1833333	106.6827	17.6922
23/08/2012	19:16:41	1.3153	436.6833333	106.6847	17.6942
23/08/2012	19:17:11	1.3169	437.1833333	106.6831	17.6926
23/08/2012	19:17:41	1.3142	437.6833333	106.6858	17.6953
23/08/2012	19:18:11	1.3162	438.1833333	106.6838	17.6933
23/08/2012	19:18:41	1.3147	438.6833333	106.6853	17.6948
23/08/2012	19:19:11	1.3182	439.1833333	106.6818	17.6913
23/08/2012	19:19:41	1.3136	439.6833333	106.6864	17.6959
23/08/2012	19:20:11	1.3147	440.1833333	106.6853	17.6948
23/08/2012	19:20:41	1.3148	440.6833333	106.6852	17.6947
23/08/2012	19:21:11	1.3131	441.1833333	106.6869	17.6964
23/08/2012	19:21:41	1.3151	441.6833333	106.6849	17.6944
23/08/2012	19:22:11	1.313	442.1833333	106.687	17.6965
23/08/2012	19:22:41	1.3103	442.6833333	106.6897	17.6992
23/08/2012	19:23:11	1.3151	443.1833333	106.6849	17.6944
23/08/2012	19:23:41	1.3099	443.6833333	106.6901	17.6996
23/08/2012	19:24:11	1.3161	444.1833333	106.6839	17.6934
23/08/2012	19:24:41	1.315	444.6833333	106.685	17.6945
23/08/2012	19:25:11	1.3193	445.1833333	106.6807	17.6902
23/08/2012	19:25:41	1.316	445.6833333	106.684	17.6935
23/08/2012	19:26:11	1.3173	446.1833333	106.6827	17.6922
23/08/2012	19:26:41	1.3153	446.6833333	106.6847	17.6942
23/08/2012	19:27:11	1.3175	447.1833333	106.6825	17.692
23/08/2012	19:27:41	1.3197	447.6833333	106.6803	17.6898
23/08/2012	19:28:11	1.3128	448.1833333	106.6872	17.6967
23/08/2012	19:28:41	1.3171	448.6833333	106.6829	17.6924
23/08/2012	19:29:11	1.3162	449.1833333	106.6838	17.6933
23/08/2012	19:29:41	1.3174	449.6833333	106.6826	17.6921
23/08/2012	19:30:11	1.3145	450.1833333	106.6855	17.695
23/08/2012	19:30:41	1.3158	450.6833333	106.6842	17.6937
23/08/2012	19:31:11	1.3145	451.1833333	106.6855	17.695
23/08/2012	19:31:41	1.3115	451.6833333	106.6885	17.698
23/08/2012	19:32:11	1.3083	452.1833333	106.6917	17.7012
23/08/2012	19:32:41	1.3153	452.6833333	106.6847	17.6942
23/08/2012	19:33:11	1.3199	453.1833333	106.6801	17.6896
23/08/2012	19:33:41	1.3139	453.6833333	106.6861	17.6956
23/08/2012	19:34:11	1.3148	454.1833333	106.6852	17.6947
23/08/2012	19:34:41	1.3136	454.6833333	106.6864	17.6959
23/08/2012	19:35:11	1.3174	455.1833333	106.6826	17.6921
23/08/2012	19:35:41	1.3193	455.6833333	106.6807	17.6902
23/08/2012	19:36:11	1.3194	456.1833333	106.6806	17.6901
23/08/2012	19:36:41	1.3174	456.6833333	106.6826	17.6921
23/08/2012	19:37:11	1.3155	457.1833333	106.6845	17.694
23/08/2012	19:37:41	1.3203	457.6833333	106.6797	17.6892
23/08/2012	19:38:11	1.3199	458.1833333	106.6801	17.6896
23/08/2012	19:38:41	1.3204	458.6833333	106.6796	17.6891
23/08/2012	19:39:11	1.3201	459.1833333	106.6799	17.6894
23/08/2012	19:39:41	1.3169	459.6833333	106.6831	17.6926
23/08/2012	19:40:11	1.3189	460.1833333	106.6811	17.6906
23/08/2012	19:40:41	1.3185	460.6833333	106.6815	17.691
23/08/2012	19:41:11	1.3206	461.1833333	106.6794	17.6889
23/08/2012	19:41:41	1.3189	461.6833333	106.6811	17.6906
23/08/2012	19:42:11	1.3176	462.1833333	106.6824	17.6919
23/08/2012	19:42:41	1.3211	462.6833333	106.6789	17.6884
23/08/2012	19:43:11	1.32	463.1833333	106.68	17.6895
23/08/2012	19:43:41	1.3173	463.6833333	106.6827	17.6922
23/08/2012	19:44:11	1.319	464.1833333	106.681	17.6905
23/08/2012	19:44:41	1.3228	464.6833333	106.6772	17.6867
23/08/2012	19:45:11	1.3238	465.1833333	106.6762	17.6857
23/08/2012	19:45:41	1.3233	465.6833333	106.6767	17.6862
23/08/2012	19:46:11	1.3141	466.1833333	106.6859	17.6954

23/08/2012	19:46:41	1.3148	466.6833333	106.6852	17.6947
23/08/2012	19:47:11	1.3143	467.1833333	106.6857	17.6952
23/08/2012	19:47:41	1.3155	467.6833333	106.6845	17.694
23/08/2012	19:48:11	1.3148	468.1833333	106.6852	17.6947
23/08/2012	19:48:41	1.3088	468.6833333	106.6912	17.7007
23/08/2012	19:49:11	1.3168	469.1833333	106.6832	17.6927
23/08/2012	19:49:41	1.3121	469.6833333	106.6879	17.6974
23/08/2012	19:50:11	1.3158	470.1833333	106.6842	17.6937
23/08/2012	19:50:41	1.3159	470.6833333	106.6841	17.6936
23/08/2012	19:51:11	1.3188	471.1833333	106.6812	17.6907
23/08/2012	19:51:41	1.3177	471.6833333	106.6823	17.6918
23/08/2012	19:52:11	1.3165	472.1833333	106.6835	17.693
23/08/2012	19:52:41	1.313	472.6833333	106.687	17.6965
23/08/2012	19:53:11	1.3163	473.1833333	106.6837	17.6932
23/08/2012	19:53:41	1.3169	473.6833333	106.6831	17.6926
23/08/2012	19:54:11	1.3139	474.1833333	106.6861	17.6956
23/08/2012	19:54:41	1.3129	474.6833333	106.6871	17.6966
23/08/2012	19:55:11	1.3142	475.1833333	106.6858	17.6953
23/08/2012	19:55:41	1.316	475.6833333	106.684	17.6935
23/08/2012	19:56:11	1.3166	476.1833333	106.6834	17.6929
23/08/2012	19:56:41	1.3128	476.6833333	106.6872	17.6967
23/08/2012	19:57:11	1.3174	477.1833333	106.6826	17.6921
23/08/2012	19:57:41	1.3201	477.6833333	106.6799	17.6894
23/08/2012	19:58:11	1.3166	478.1833333	106.6834	17.6929
23/08/2012	19:58:41	1.3147	478.6833333	106.6853	17.6948
23/08/2012	19:59:11	1.3191	479.1833333	106.6809	17.6904
23/08/2012	19:59:41	1.3184	479.6833333	106.6816	17.6911
23/08/2012	20:00:11	1.3158	480.1833333	106.6842	17.6937
23/08/2012	20:00:41	1.316	480.6833333	106.684	17.6935
23/08/2012	20:01:11	1.3164	481.1833333	106.6836	17.6931
23/08/2012	20:01:41	1.3162	481.6833333	106.6838	17.6933
23/08/2012	20:02:11	1.3154	482.1833333	106.6846	17.6941
23/08/2012	20:02:41	1.3178	482.6833333	106.6822	17.6917
23/08/2012	20:03:11	1.3138	483.1833333	106.6862	17.6957
23/08/2012	20:03:41	1.3152	483.6833333	106.6848	17.6943
23/08/2012	20:04:11	1.3156	484.1833333	106.6844	17.6939
23/08/2012	20:04:41	1.312	484.6833333	106.688	17.6975
23/08/2012	20:05:11	1.3129	485.1833333	106.6871	17.6966
23/08/2012	20:05:41	1.3165	485.6833333	106.6835	17.693
23/08/2012	20:06:11	1.3179	486.1833333	106.6821	17.6916
23/08/2012	20:06:41	1.3185	486.6833333	106.6815	17.691
23/08/2012	20:07:11	1.3183	487.1833333	106.6817	17.6912
23/08/2012	20:07:41	1.3177	487.6833333	106.6823	17.6918
23/08/2012	20:08:11	1.3159	488.1833333	106.6841	17.6936
23/08/2012	20:08:41	1.3179	488.6833333	106.6821	17.6916
23/08/2012	20:09:11	1.3182	489.1833333	106.6818	17.6913
23/08/2012	20:09:41	1.3154	489.6833333	106.6846	17.6941
23/08/2012	20:10:11	1.3196	490.1833333	106.6804	17.6899
23/08/2012	20:10:41	1.3215	490.6833333	106.6785	17.688
23/08/2012	20:11:11	1.3194	491.1833333	106.6806	17.6901
23/08/2012	20:11:41	1.3241	491.6833333	106.6759	17.6854
23/08/2012	20:12:11	1.3189	492.1833333	106.6811	17.6906
23/08/2012	20:12:41	1.3236	492.6833333	106.6764	17.6859
23/08/2012	20:13:11	1.323	493.1833333	106.677	17.6865
23/08/2012	20:13:41	1.321	493.6833333	106.679	17.6885
23/08/2012	20:14:11	1.3212	494.1833333	106.6788	17.6883
23/08/2012	20:14:41	1.3235	494.6833333	106.6765	17.686
23/08/2012	20:15:11	1.3218	495.1833333	106.6782	17.6877
23/08/2012	20:15:41	1.323	495.6833333	106.677	17.6865
23/08/2012	20:16:11	1.3189	496.1833333	106.6811	17.6906
23/08/2012	20:16:41	1.3197	496.6833333	106.6803	17.6898
23/08/2012	20:17:11	1.3181	497.1833333	106.6819	17.6914
23/08/2012	20:17:41	1.3171	497.6833333	106.6829	17.6924
23/08/2012	20:18:11	1.3176	498.1833333	106.6824	17.6919
23/08/2012	20:18:41	1.3218	498.6833333	106.6782	17.6877
23/08/2012	20:19:11	1.3214	499.1833333	106.6786	17.6881
23/08/2012	20:19:41	1.3213	499.6833333	106.6787	17.6882
23/08/2012	20:20:11	1.3193	500.1833333	106.6807	17.6902
23/08/2012	20:20:41	1.3191	500.6833333	106.6809	17.6904
23/08/2012	20:21:11	1.3199	501.1833333	106.6801	17.6896
23/08/2012	20:21:41	1.318	501.6833333	106.682	17.6915
23/08/2012	20:22:11	1.3189	502.1833333	106.6811	17.6906
23/08/2012	20:22:41	1.325	502.6833333	106.675	17.6845
23/08/2012	20:23:11	1.3247	503.1833333	106.6753	17.6848
23/08/2012	20:23:41	1.3214	503.6833333	106.6786	17.6881
23/08/2012	20:24:11	1.3272	504.1833333	106.6728	17.6823
23/08/2012	20:24:41	1.3221	504.6833333	106.6779	17.6874
23/08/2012	20:25:11	1.3233	505.1833333	106.6767	17.6862
23/08/2012	20:25:41	1.3228	505.6833333	106.6772	17.6867
23/08/2012	20:26:11	1.3238	506.1833333	106.6762	17.6857
23/08/2012	20:26:41	1.3189	506.6833333	106.6811	17.6906
23/08/2012	20:27:11	1.3278	507.1833333	106.6722	17.6817
23/08/2012	20:27:41	1.3268	507.6833333	106.6732	17.6827
23/08/2012	20:28:11	1.3191	508.1833333	106.6809	17.6904
23/08/2012	20:28:41	1.3235	508.6833333	106.6765	17.686
23/08/2012	20:29:11	1.3213	509.1833333	106.6787	17.6882
23/08/2012	20:29:41	1.3254	509.6833333	106.6746	17.6841
23/08/2012	20:30:11	1.3241	510.1833333	106.6759	17.6854
23/08/2012	20:30:41	1.3263	510.6833333	106.6737	17.6832
23/08/2012	20:31:11	1.327	511.1833333	106.673	17.6825
23/08/2012	20:31:41	1.3286	511.6833333	106.6714	17.6809
23/08/2012	20:32:11	1.3306	512.1833333	106.6694	17.6789
23/08/2012	20:32:41	1.3292	512.6833333	106.6708	17.6803
23/08/2012	20:33:11	1.331	513.1833333	106.669	17.6785
23/08/2012	20:33:41	1.3337	513.6833333	106.6663	17.6758
23/08/2012	20:34:11	1.3283	514.1833333	106.6717	17.6812
23/08/2012	20:34:41	1.3319	514.6833333	106.6681	17.6776
23/08/2012	20:35:11	1.3291	515.1833333	106.6709	17.6804
23/08/2012	20:35:41	1.327	515.6833333	106.673	17.6825
23/08/2012	20:36:11	1.3182	516.1833333	106.6818	17.6913
23/08/2012	20:36:41	1.3194	516.6833333	106.6806	17.6901
23/08/2012	20:37:11	1.321	517.1833333	106.679	17.6885
23/08/2012	20:37:41	1.3178	517.6833333	106.6822	17.6917
23/08/2012	20:38:11	1.3164	518.1833333	106.6836	17.6931
23/08/2012	20:38:41	1.3214	518.6833333	106.6786	17.6881
23/08/2012	20:39:11	1.3191	519.1833333	106.6809	17.6904
23/08/2012	20:39:41	1.3282	519.6833333	106.6718	17.6813
23/08/2012	20:40:11	1.3172	520.1833333	106.6828	17.6923
23/08/2012	20:40:41	1.3195	520.6833333	106.6805	17.69
23/08/2012	20:41:11	1.3218	521.1833333	106.6782	17.6877
23/08/2012	20:41:41	1.3196	521.6833333	106.6804	17.6899
23/08/2012	20:42:11	1.3226	522.1833333	106.6774	17.6869
23/08/2012	20:42:41	1.3228	522.6833333	106.6772	17.6867
23/08/2012	20:43:11	1.3201	523.1833333	106.6799	17.6894
23/08/2012	20:43:41	1.3191	523.6833333	106.6809	17.6904
23/08/2012	20:44:11	1.3228	524.1833333	106.6772	17.6867
23/08/2012	20:44:41	1.317	524.6833333	106.683	17.6925

23/08/2012	20:45:11	1.3234	525.1833333	106.6766	17.6861
23/08/2012	20:45:41	1.326	525.6833333	106.674	17.6835
23/08/2012	20:46:11	1.3231	526.1833333	106.6769	17.6864
23/08/2012	20:46:41	1.3196	526.6833333	106.6804	17.6899
23/08/2012	20:47:11	1.3235	527.1833333	106.6765	17.686
23/08/2012	20:47:41	1.3232	527.6833333	106.6768	17.6863
23/08/2012	20:48:11	1.3306	528.1833333	106.6694	17.6789
23/08/2012	20:48:41	1.321	528.6833333	106.679	17.6885
23/08/2012	20:49:11	1.3244	529.1833333	106.6756	17.6851
23/08/2012	20:49:41	1.3254	529.6833333	106.6746	17.6841
23/08/2012	20:50:11	1.3263	530.1833333	106.6737	17.6832
23/08/2012	20:50:41	1.3247	530.6833333	106.6753	17.6848
23/08/2012	20:51:11	1.3258	531.1833333	106.6742	17.6837
23/08/2012	20:51:41	1.3265	531.6833333	106.6735	17.683
23/08/2012	20:52:11	1.3245	532.1833333	106.6755	17.685
23/08/2012	20:52:41	1.3259	532.6833333	106.6741	17.6836
23/08/2012	20:53:11	1.3286	533.1833333	106.6714	17.6809
23/08/2012	20:53:41	1.3287	533.6833333	106.6713	17.6808
23/08/2012	20:54:11	1.326	534.1833333	106.674	17.6835
23/08/2012	20:54:41	1.3304	534.6833333	106.6696	17.6791
23/08/2012	20:55:11	1.3296	535.1833333	106.6704	17.6799
23/08/2012	20:55:41	1.3305	535.6833333	106.6695	17.679
23/08/2012	20:56:11	1.3205	536.1833333	106.6795	17.689
23/08/2012	20:56:41	1.3198	536.6833333	106.6802	17.6897
23/08/2012	20:57:11	1.3234	537.1833333	106.6766	17.6861
23/08/2012	20:57:41	1.3262	537.6833333	106.6738	17.6833
23/08/2012	20:58:11	1.3189	538.1833333	106.6811	17.6906
23/08/2012	20:58:41	1.3244	538.6833333	106.6756	17.6851
23/08/2012	20:59:11	1.3223	539.1833333	106.6777	17.6872
23/08/2012	20:59:41	1.3237	539.6833333	106.6763	17.6858
23/08/2012	21:00:11	1.3271	540.1833333	106.6729	17.6824
23/08/2012	21:00:41	1.3297	540.6833333	106.6703	17.6798
23/08/2012	21:01:11	1.3232	541.1833333	106.6768	17.6863
23/08/2012	21:01:41	1.3283	541.6833333	106.6717	17.6812
23/08/2012	21:02:11	1.3256	542.1833333	106.6744	17.6839
23/08/2012	21:02:41	1.3254	542.6833333	106.6746	17.6841
23/08/2012	21:03:11	1.3288	543.1833333	106.6712	17.6807
23/08/2012	21:03:41	1.3237	543.6833333	106.6763	17.6858
23/08/2012	21:04:11	1.3274	544.1833333	106.6726	17.6821
23/08/2012	21:04:41	1.331	544.6833333	106.669	17.6785
23/08/2012	21:05:11	1.328	545.1833333	106.672	17.6815
23/08/2012	21:05:41	1.3331	545.6833333	106.6669	17.6764
23/08/2012	21:06:11	1.3196	546.1833333	106.6804	17.6899
23/08/2012	21:06:41	1.3263	546.6833333	106.6737	17.6832
23/08/2012	21:07:11	1.3232	547.1833333	106.6768	17.6863
23/08/2012	21:07:41	1.3203	547.6833333	106.6797	17.6892
23/08/2012	21:08:11	1.3212	548.1833333	106.6788	17.6883
23/08/2012	21:08:41	1.3266	548.6833333	106.6734	17.6829
23/08/2012	21:09:11	1.3212	549.1833333	106.6788	17.6883
23/08/2012	21:09:41	1.3217	549.6833333	106.6783	17.6878
23/08/2012	21:10:11	1.3216	550.1833333	106.6784	17.6879
23/08/2012	21:10:41	1.3213	550.6833333	106.6787	17.6882
23/08/2012	21:11:11	1.3186	551.1833333	106.6814	17.6909
23/08/2012	21:11:41	1.3226	551.6833333	106.6774	17.6869
23/08/2012	21:12:11	1.3211	552.1833333	106.6789	17.6884
23/08/2012	21:12:41	1.3182	552.6833333	106.6818	17.6913
23/08/2012	21:13:11	1.3189	553.1833333	106.6811	17.6906
23/08/2012	21:13:41	1.3161	553.6833333	106.6839	17.6934
23/08/2012	21:14:11	1.3171	554.1833333	106.6829	17.6924
23/08/2012	21:14:41	1.3186	554.6833333	106.6814	17.6909
23/08/2012	21:15:11	1.3235	555.1833333	106.6765	17.686
23/08/2012	21:15:41	1.3204	555.6833333	106.6796	17.6891
23/08/2012	21:16:11	1.3184	556.1833333	106.6816	17.6911
23/08/2012	21:16:41	1.3203	556.6833333	106.6797	17.6892
23/08/2012	21:17:11	1.3193	557.1833333	106.6807	17.6902
23/08/2012	21:17:41	1.3181	557.6833333	106.6819	17.6914
23/08/2012	21:18:11	1.3194	558.1833333	106.6806	17.6901
23/08/2012	21:18:41	1.3198	558.6833333	106.6802	17.6897
23/08/2012	21:19:11	1.3199	559.1833333	106.6801	17.6896
23/08/2012	21:19:41	1.3243	559.6833333	106.6757	17.6852
23/08/2012	21:20:11	1.3178	560.1833333	106.6822	17.6917
23/08/2012	21:20:41	1.3178	560.6833333	106.6822	17.6917
23/08/2012	21:21:11	1.3192	561.1833333	106.6808	17.6903
23/08/2012	21:21:41	1.3201	561.6833333	106.6799	17.6894
23/08/2012	21:22:11	1.3197	562.1833333	106.6803	17.6898
23/08/2012	21:22:41	1.3214	562.6833333	106.6786	17.6881
23/08/2012	21:23:11	1.321	563.1833333	106.679	17.6885
23/08/2012	21:23:41	1.3224	563.6833333	106.6776	17.6871
23/08/2012	21:24:11	1.3236	564.1833333	106.6764	17.6859
23/08/2012	21:24:41	1.3208	564.6833333	106.6792	17.6887
23/08/2012	21:25:11	1.3267	565.1833333	106.6733	17.6828
23/08/2012	21:25:41	1.3221	565.6833333	106.6779	17.6874
23/08/2012	21:26:11	1.3243	566.1833333	106.6757	17.6852
23/08/2012	21:26:41	1.3195	566.6833333	106.6805	17.69
23/08/2012	21:27:11	1.32	567.1833333	106.68	17.6895
23/08/2012	21:27:41	1.3183	567.6833333	106.6817	17.6912
23/08/2012	21:28:11	1.3181	568.1833333	106.6819	17.6914
23/08/2012	21:28:41	1.3209	568.6833333	106.6791	17.6886
23/08/2012	21:29:11	1.3168	569.1833333	106.6832	17.6927
23/08/2012	21:29:41	1.3157	569.6833333	106.6843	17.6938
23/08/2012	21:30:11	1.318	570.1833333	106.682	17.6915
23/08/2012	21:30:41	1.3168	570.6833333	106.6832	17.6927
23/08/2012	21:31:11	1.321	571.1833333	106.679	17.6885
23/08/2012	21:31:41	1.3186	571.6833333	106.6814	17.6909
23/08/2012	21:32:11	1.3207	572.1833333	106.6793	17.6888
23/08/2012	21:32:41	1.3142	572.6833333	106.6858	17.6953
23/08/2012	21:33:11	1.3178	573.1833333	106.6822	17.6917
23/08/2012	21:33:41	1.3192	573.6833333	106.6808	17.6903
23/08/2012	21:34:11	1.3191	574.1833333	106.6809	17.6904
23/08/2012	21:34:41	1.3192	574.6833333	106.6808	17.6903
23/08/2012	21:35:11	1.3166	575.1833333	106.6834	17.6929
23/08/2012	21:35:41	1.3165	575.6833333	106.6835	17.693
23/08/2012	21:36:11	1.3187	576.1833333	106.6813	17.6908
23/08/2012	21:36:41	1.3182	576.6833333	106.6818	17.6913
23/08/2012	21:37:11	1.3191	577.1833333	106.6809	17.6904
23/08/2012	21:37:41	1.3185	577.6833333	106.6815	17.691
23/08/2012	21:38:11	1.3179	578.1833333	106.6821	17.6916
23/08/2012	21:38:41	1.3184	578.6833333	106.6816	17.6911
23/08/2012	21:39:11	1.3186	579.1833333	106.6814	17.6909
23/08/2012	21:39:41	1.321	579.6833333	106.679	17.6885
23/08/2012	21:40:11	1.3197	580.1833333	106.6803	17.6898
23/08/2012	21:40:41	1.3151	580.6833333	106.6849	17.6944
23/08/2012	21:41:11	1.3165	581.1833333	106.6835	17.693
23/08/2012	21:41:41	1.3198	581.6833333	106.6802	17.6897
23/08/2012	21:42:11	1.3158	582.1833333	106.6842	17.6937
23/08/2012	21:42:41	1.3165	582.6833333	106.6835	17.693
23/08/2012	21:43:11	1.312	583.1833333	106.688	17.6975

23/08/2012	21:43:41	1.3093	583.6833333	106.6907	17.7002
23/08/2012	21:44:11	1.3107	584.1833333	106.6893	17.6988
23/08/2012	21:44:41	1.3167	584.6833333	106.6833	17.6928
23/08/2012	21:45:11	1.31	585.1833333	106.69	17.6995
23/08/2012	21:45:41	1.3078	585.6833333	106.6922	17.7017
23/08/2012	21:46:11	1.3163	586.1833333	106.6837	17.6932
23/08/2012	21:46:41	1.3152	586.6833333	106.6848	17.6943
23/08/2012	21:47:11	1.3138	587.1833333	106.6862	17.6957
23/08/2012	21:47:41	1.3134	587.6833333	106.6866	17.6961
23/08/2012	21:48:11	1.3176	588.1833333	106.6824	17.6919
23/08/2012	21:48:41	1.3146	588.6833333	106.6854	17.6949
23/08/2012	21:49:11	1.3116	589.1833333	106.6884	17.6979
23/08/2012	21:49:41	1.3096	589.6833333	106.6904	17.6999
23/08/2012	21:50:11	1.3146	590.1833333	106.6854	17.6949
23/08/2012	21:50:41	1.3128	590.6833333	106.6872	17.6967
23/08/2012	21:51:11	1.3121	591.1833333	106.6879	17.6974
23/08/2012	21:51:41	1.3131	591.6833333	106.6869	17.6964
23/08/2012	21:52:11	1.3152	592.1833333	106.6848	17.6943
23/08/2012	21:52:41	1.3105	592.6833333	106.6895	17.699
23/08/2012	21:53:11	1.3111	593.1833333	106.6889	17.6984
23/08/2012	21:53:41	1.3112	593.6833333	106.6888	17.6983
23/08/2012	21:54:11	1.3105	594.1833333	106.6895	17.699
23/08/2012	21:54:41	1.3092	594.6833333	106.6908	17.7003
23/08/2012	21:55:11	1.308	595.1833333	106.692	17.7015
23/08/2012	21:55:41	1.3062	595.6833333	106.6938	17.7033
23/08/2012	21:56:11	1.316	596.1833333	106.684	17.6935
23/08/2012	21:56:41	1.3117	596.6833333	106.6883	17.6978
23/08/2012	21:57:11	1.313	597.1833333	106.687	17.6965
23/08/2012	21:57:41	1.3155	597.6833333	106.6845	17.694
23/08/2012	21:58:11	1.3152	598.1833333	106.6848	17.6943
23/08/2012	21:58:41	1.3141	598.6833333	106.6859	17.6954
23/08/2012	21:59:11	1.3136	599.1833333	106.6864	17.6959
23/08/2012	21:59:41	1.3137	599.6833333	106.6863	17.6958
23/08/2012	22:00:11	1.3101	600.1833333	106.6899	17.6994
23/08/2012	22:00:41	1.3114	600.6833333	106.6886	17.6981
23/08/2012	22:01:11	1.3117	601.1833333	106.6883	17.6978
23/08/2012	22:01:41	1.3161	601.6833333	106.6839	17.6934
23/08/2012	22:02:11	1.3137	602.1833333	106.6863	17.6958
23/08/2012	22:02:41	1.3156	602.6833333	106.6844	17.6939
23/08/2012	22:03:11	1.3124	603.1833333	106.6876	17.6971
23/08/2012	22:03:41	1.3144	603.6833333	106.6856	17.6951
23/08/2012	22:04:11	1.3145	604.1833333	106.6855	17.695
23/08/2012	22:04:41	1.3114	604.6833333	106.6886	17.6981
23/08/2012	22:05:11	1.3108	605.1833333	106.6892	17.6987
23/08/2012	22:05:41	1.3119	605.6833333	106.6881	17.6976
23/08/2012	22:06:11	1.3222	606.1833333	106.6778	17.6873
23/08/2012	22:06:41	1.3127	606.6833333	106.6873	17.6968
23/08/2012	22:07:11	1.3142	607.1833333	106.6858	17.6953
23/08/2012	22:07:41	1.3152	607.6833333	106.6848	17.6943
23/08/2012	22:08:11	1.3157	608.1833333	106.6843	17.6938
23/08/2012	22:08:41	1.3172	608.6833333	106.6828	17.6923
23/08/2012	22:09:11	1.32	609.1833333	106.68	17.6895
23/08/2012	22:09:41	1.3186	609.6833333	106.6814	17.6909
23/08/2012	22:10:11	1.3156	610.1833333	106.6844	17.6939
23/08/2012	22:10:41	1.3143	610.6833333	106.6857	17.6952
23/08/2012	22:11:11	1.3149	611.1833333	106.6851	17.6946
23/08/2012	22:11:41	1.3163	611.6833333	106.6837	17.6932
23/08/2012	22:12:11	1.3134	612.1833333	106.6866	17.6961
23/08/2012	22:12:41	1.314	612.6833333	106.686	17.6955
23/08/2012	22:13:11	1.315	613.1833333	106.685	17.6945
23/08/2012	22:13:41	1.3155	613.6833333	106.6845	17.694
23/08/2012	22:14:11	1.3152	614.1833333	106.6848	17.6943
23/08/2012	22:14:41	1.3148	614.6833333	106.6852	17.6947
23/08/2012	22:15:11	1.3149	615.1833333	106.6851	17.6946
23/08/2012	22:15:41	1.3141	615.6833333	106.6859	17.6954
23/08/2012	22:16:11	1.3164	616.1833333	106.6836	17.6931
23/08/2012	22:16:41	1.3125	616.6833333	106.6875	17.697
23/08/2012	22:17:11	1.3151	617.1833333	106.6849	17.6944
23/08/2012	22:17:41	1.3189	617.6833333	106.6811	17.6906
23/08/2012	22:18:11	1.3127	618.1833333	106.6873	17.6968
23/08/2012	22:18:41	1.3157	618.6833333	106.6843	17.6938
23/08/2012	22:19:11	1.3141	619.1833333	106.6859	17.6954
23/08/2012	22:19:41	1.3139	619.6833333	106.6861	17.6956
23/08/2012	22:20:11	1.3149	620.1833333	106.6851	17.6946
23/08/2012	22:20:41	1.3167	620.6833333	106.6833	17.6928
23/08/2012	22:21:11	1.3168	621.1833333	106.6832	17.6927
23/08/2012	22:21:41	1.3134	621.6833333	106.6866	17.6961
23/08/2012	22:22:11	1.3181	622.1833333	106.6819	17.6914
23/08/2012	22:22:41	1.3148	622.6833333	106.6852	17.6947
23/08/2012	22:23:11	1.3161	623.1833333	106.6839	17.6934
23/08/2012	22:23:41	1.3167	623.6833333	106.6833	17.6928
23/08/2012	22:24:11	1.3161	624.1833333	106.6839	17.6934
23/08/2012	22:24:41	1.3142	624.6833333	106.6858	17.6953
23/08/2012	22:25:11	1.3149	625.1833333	106.6851	17.6946
23/08/2012	22:25:41	1.3132	625.6833333	106.6868	17.6963
23/08/2012	22:26:11	1.3134	626.1833333	106.6866	17.6961
23/08/2012	22:26:41	1.3157	626.6833333	106.6843	17.6938
23/08/2012	22:27:11	1.3159	627.1833333	106.6841	17.6936
23/08/2012	22:27:41	1.3172	627.6833333	106.6828	17.6923
23/08/2012	22:28:11	1.315	628.1833333	106.685	17.6945
23/08/2012	22:28:41	1.3189	628.6833333	106.6811	17.6906
23/08/2012	22:29:11	1.2959	629.1833333	106.7041	17.7136
23/08/2012	22:29:41	1.3153	629.6833333	106.6847	17.6942
23/08/2012	22:30:11	1.3166	630.1833333	106.6834	17.6929
23/08/2012	22:30:41	1.3149	630.6833333	106.6851	17.6946
23/08/2012	22:31:11	1.3179	631.1833333	106.6821	17.6916
23/08/2012	22:31:41	1.3161	631.6833333	106.6839	17.6934
23/08/2012	22:32:11	1.3164	632.1833333	106.6836	17.6931
23/08/2012	22:32:41	1.3163	632.6833333	106.6837	17.6932
23/08/2012	22:33:11	1.3137	633.1833333	106.6863	17.6958
23/08/2012	22:33:41	1.3158	633.6833333	106.6842	17.6937
23/08/2012	22:34:11	1.3167	634.1833333	106.6833	17.6928
23/08/2012	22:34:41	1.3199	634.6833333	106.6801	17.6896
23/08/2012	22:35:11	1.3148	635.1833333	106.6852	17.6947
23/08/2012	22:35:41	1.3213	635.6833333	106.6787	17.6882
23/08/2012	22:36:11	1.3133	636.1833333	106.6867	17.6962
23/08/2012	22:36:41	1.3182	636.6833333	106.6818	17.6913
23/08/2012	22:37:11	1.3168	637.1833333	106.6832	17.6927
23/08/2012	22:37:41	1.3168	637.6833333	106.6832	17.6927
23/08/2012	22:38:11	1.3167	638.1833333	106.6833	17.6928
23/08/2012	22:38:41	1.3164	638.6833333	106.6836	17.6931
23/08/2012	22:39:11	1.3166	639.1833333	106.6834	17.6929
23/08/2012	22:39:41	1.32	639.6833333	106.68	17.6895
23/08/2012	22:40:11	1.3161	640.1833333	106.6839	17.6934
23/08/2012	22:40:41	1.3177	640.6833333	106.6823	17.6918
23/08/2012	22:41:11	1.3167	641.1833333	106.6833	17.6928
23/08/2012	22:41:41	1.3155	641.6833333	106.6845	17.694

23/08/2012	22:42:11	1.3161	642.1833333	106.6839	17.6934
23/08/2012	22:42:41	1.3191	642.6833333	106.6809	17.6904
23/08/2012	22:43:11	1.3229	643.1833333	106.6771	17.6866
23/08/2012	22:43:41	1.32	643.6833333	106.68	17.6895
23/08/2012	22:44:11	1.32	644.1833333	106.68	17.6895
23/08/2012	22:44:41	1.3189	644.6833333	106.6811	17.6906
23/08/2012	22:45:11	1.3288	645.1833333	106.6712	17.6807
23/08/2012	22:45:41	1.3188	645.6833333	106.6812	17.6907
23/08/2012	22:46:11	1.3221	646.1833333	106.6779	17.6874
23/08/2012	22:46:41	1.318	646.6833333	106.682	17.6915
23/08/2012	22:47:11	1.3189	647.1833333	106.6811	17.6906
23/08/2012	22:47:41	1.3165	647.6833333	106.6835	17.693
23/08/2012	22:48:11	1.3194	648.1833333	106.6806	17.6901
23/08/2012	22:48:41	1.3152	648.6833333	106.6848	17.6943
23/08/2012	22:49:11	1.3172	649.1833333	106.6828	17.6923
23/08/2012	22:49:41	1.3156	649.6833333	106.6844	17.6939
23/08/2012	22:50:11	1.3147	650.1833333	106.6853	17.6948
23/08/2012	22:50:41	1.3166	650.6833333	106.6834	17.6929
23/08/2012	22:51:11	1.3178	651.1833333	106.6822	17.6917
23/08/2012	22:51:41	1.3143	651.6833333	106.6857	17.6952
23/08/2012	22:52:11	1.3146	652.1833333	106.6854	17.6949
23/08/2012	22:52:41	1.3169	652.6833333	106.6831	17.6926
23/08/2012	22:53:11	1.3134	653.1833333	106.6866	17.6961
23/08/2012	22:53:41	1.3166	653.6833333	106.6834	17.6929
23/08/2012	22:54:11	1.3169	654.1833333	106.6831	17.6926
23/08/2012	22:54:41	1.3151	654.6833333	106.6849	17.6944
23/08/2012	22:55:11	1.316	655.1833333	106.684	17.6935
23/08/2012	22:55:41	1.3184	655.6833333	106.6816	17.6911
23/08/2012	22:56:11	1.3163	656.1833333	106.6837	17.6932
23/08/2012	22:56:41	1.3194	656.6833333	106.6806	17.6901
23/08/2012	22:57:11	1.3191	657.1833333	106.6809	17.6904
23/08/2012	22:57:41	1.3207	657.6833333	106.6793	17.6888
23/08/2012	22:58:11	1.3198	658.1833333	106.6802	17.6897
23/08/2012	22:58:41	1.3194	658.6833333	106.6806	17.6901
23/08/2012	22:59:11	1.3195	659.1833333	106.6805	17.69
23/08/2012	22:59:41	1.3147	659.6833333	106.6853	17.6948
23/08/2012	23:00:11	1.3203	660.1833333	106.6797	17.6892
23/08/2012	23:00:41	1.319	660.6833333	106.681	17.6905
23/08/2012	23:01:11	1.3196	661.1833333	106.6804	17.6899
23/08/2012	23:01:41	1.3189	661.6833333	106.6811	17.6906
23/08/2012	23:02:11	1.3223	662.1833333	106.6777	17.6872
23/08/2012	23:02:41	1.3188	662.6833333	106.6812	17.6907
23/08/2012	23:03:11	1.3165	663.1833333	106.6835	17.693
23/08/2012	23:03:41	1.3185	663.6833333	106.6815	17.691
23/08/2012	23:04:11	1.3176	664.1833333	106.6824	17.6919
23/08/2012	23:04:41	1.3174	664.6833333	106.6826	17.6921
23/08/2012	23:05:11	1.3205	665.1833333	106.6795	17.689
23/08/2012	23:05:41	1.3204	665.6833333	106.6796	17.6891
23/08/2012	23:06:11	1.3189	666.1833333	106.6811	17.6906
23/08/2012	23:06:41	1.3183	666.6833333	106.6817	17.6912
23/08/2012	23:07:11	1.3203	667.1833333	106.6797	17.6892
23/08/2012	23:07:41	1.3192	667.6833333	106.6808	17.6903
23/08/2012	23:08:11	1.3193	668.1833333	106.6807	17.6902
23/08/2012	23:08:41	1.3171	668.6833333	106.6829	17.6924
23/08/2012	23:09:11	1.3192	669.1833333	106.6808	17.6903
23/08/2012	23:09:41	1.3171	669.6833333	106.6829	17.6924
23/08/2012	23:10:11	1.3183	670.1833333	106.6817	17.6912
23/08/2012	23:10:41	1.3194	670.6833333	106.6806	17.6901
23/08/2012	23:11:11	1.3203	671.1833333	106.6797	17.6892
23/08/2012	23:11:41	1.3257	671.6833333	106.6743	17.6838
23/08/2012	23:12:11	1.3171	672.1833333	106.6829	17.6924
23/08/2012	23:12:41	1.3185	672.6833333	106.6815	17.691
23/08/2012	23:13:11	1.3183	673.1833333	106.6817	17.6912
23/08/2012	23:13:41	1.3203	673.6833333	106.6797	17.6892
23/08/2012	23:14:11	1.3176	674.1833333	106.6824	17.6919
23/08/2012	23:14:41	1.3215	674.6833333	106.6785	17.688
23/08/2012	23:15:11	1.3156	675.1833333	106.6844	17.6939
23/08/2012	23:15:41	1.318	675.6833333	106.682	17.6915
23/08/2012	23:16:11	1.3207	676.1833333	106.6793	17.6888
23/08/2012	23:16:41	1.3232	676.6833333	106.6768	17.6863
23/08/2012	23:17:11	1.3231	677.1833333	106.6769	17.6864
23/08/2012	23:17:41	1.3231	677.6833333	106.6769	17.6864
23/08/2012	23:18:11	1.3244	678.1833333	106.6756	17.6851
23/08/2012	23:18:41	1.322	678.6833333	106.678	17.6875
23/08/2012	23:19:11	1.3261	679.1833333	106.6739	17.6834
23/08/2012	23:19:41	1.3181	679.6833333	106.6819	17.6914
23/08/2012	23:20:11	1.3182	680.1833333	106.6818	17.6913
23/08/2012	23:20:41	1.323	680.6833333	106.677	17.6865
23/08/2012	23:21:11	1.3255	681.1833333	106.6745	17.684
23/08/2012	23:21:41	1.3216	681.6833333	106.6784	17.6879
23/08/2012	23:22:11	1.3205	682.1833333	106.6795	17.689
23/08/2012	23:22:41	1.3197	682.6833333	106.6803	17.6898
23/08/2012	23:23:11	1.3223	683.1833333	106.6777	17.6872
23/08/2012	23:23:41	1.3189	683.6833333	106.6811	17.6906
23/08/2012	23:24:11	1.3212	684.1833333	106.6788	17.6883
23/08/2012	23:24:41	1.3198	684.6833333	106.6802	17.6897
23/08/2012	23:25:11	1.3201	685.1833333	106.6799	17.6894
23/08/2012	23:25:41	1.3232	685.6833333	106.6768	17.6863
23/08/2012	23:26:11	1.322	686.1833333	106.678	17.6875
23/08/2012	23:26:41	1.3212	686.6833333	106.6788	17.6883
23/08/2012	23:27:11	1.3237	687.1833333	106.6763	17.6858
23/08/2012	23:27:41	1.3213	687.6833333	106.6787	17.6882
23/08/2012	23:28:11	1.3232	688.1833333	106.6768	17.6863
23/08/2012	23:28:41	1.3211	688.6833333	106.6789	17.6884
23/08/2012	23:29:11	1.3202	689.1833333	106.6798	17.6893
23/08/2012	23:29:41	1.323	689.6833333	106.677	17.6865
23/08/2012	23:30:11	1.3226	690.1833333	106.6774	17.6869
23/08/2012	23:30:41	1.3278	690.6833333	106.6722	17.6817
23/08/2012	23:31:11	1.3215	691.1833333	106.6785	17.688
23/08/2012	23:31:41	1.3193	691.6833333	106.6807	17.6902
23/08/2012	23:32:11	1.3218	692.1833333	106.6782	17.6877
23/08/2012	23:32:41	1.3229	692.6833333	106.6771	17.6866
23/08/2012	23:33:11	1.3229	693.1833333	106.6771	17.6866
23/08/2012	23:33:41	1.3245	693.6833333	106.6755	17.685
23/08/2012	23:34:11	1.3234	694.1833333	106.6766	17.6861
23/08/2012	23:34:41	1.3218	694.6833333	106.6782	17.6877
23/08/2012	23:35:11	1.3242	695.1833333	106.6758	17.6853
23/08/2012	23:35:41	1.3244	695.6833333	106.6756	17.6851
23/08/2012	23:36:11	1.3236	696.1833333	106.6764	17.6859
23/08/2012	23:36:41	1.3225	696.6833333	106.6775	17.687
23/08/2012	23:37:11	1.324	697.1833333	106.676	17.6855
23/08/2012	23:37:41	1.3243	697.6833333	106.6757	17.6852
23/08/2012	23:38:11	1.3275	698.1833333	106.6725	17.682
23/08/2012	23:38:41	1.324	698.6833333	106.676	17.6855
23/08/2012	23:39:11	1.3227	699.1833333	106.6773	17.6868
23/08/2012	23:39:41	1.3281	699.6833333	106.6719	17.6814
23/08/2012	23:40:11	1.33	700.1833333	106.67	17.6795

23/08/2012	23:40:41	1.3267	700.6833333	106.6733	17.6828
23/08/2012	23:41:11	1.3248	701.1833333	106.6752	17.6847
23/08/2012	23:41:41	1.326	701.6833333	106.674	17.6835
23/08/2012	23:42:11	1.3323	702.1833333	106.6677	17.6772
23/08/2012	23:42:41	1.3282	702.6833333	106.6718	17.6813
23/08/2012	23:43:11	1.3257	703.1833333	106.6743	17.6838
23/08/2012	23:43:41	1.331	703.6833333	106.669	17.6785
23/08/2012	23:44:11	1.325	704.1833333	106.675	17.6845
23/08/2012	23:44:41	1.3288	704.6833333	106.6712	17.6807
23/08/2012	23:45:11	1.3229	705.1833333	106.6771	17.6866
23/08/2012	23:45:41	1.3291	705.6833333	106.6709	17.6804
23/08/2012	23:46:11	1.3235	706.1833333	106.6765	17.686
23/08/2012	23:46:41	1.3246	706.6833333	106.6754	17.6849
23/08/2012	23:47:11	1.3255	707.1833333	106.6745	17.684
23/08/2012	23:47:41	1.3234	707.6833333	106.6766	17.6861
23/08/2012	23:48:11	1.3247	708.1833333	106.6753	17.6848
23/08/2012	23:48:41	1.3213	708.6833333	106.6787	17.6882
23/08/2012	23:49:11	1.3241	709.1833333	106.6759	17.6854
23/08/2012	23:49:41	1.3216	709.6833333	106.6784	17.6879
23/08/2012	23:50:11	1.3241	710.1833333	106.6759	17.6854
23/08/2012	23:50:41	1.3193	710.6833333	106.6807	17.6902
23/08/2012	23:51:11	1.3182	711.1833333	106.6818	17.6913
23/08/2012	23:51:41	1.327	711.6833333	106.673	17.6825
23/08/2012	23:52:11	1.3192	712.1833333	106.6808	17.6903
23/08/2012	23:52:41	1.3208	712.6833333	106.6792	17.6887
23/08/2012	23:53:11	1.3193	713.1833333	106.6807	17.6902
23/08/2012	23:53:41	1.3244	713.6833333	106.6756	17.6851
23/08/2012	23:54:11	1.3183	714.1833333	106.6817	17.6912
23/08/2012	23:54:41	1.3241	714.6833333	106.6759	17.6854
23/08/2012	23:55:11	1.3169	715.1833333	106.6831	17.6926
23/08/2012	23:55:41	1.318	715.6833333	106.682	17.6915
23/08/2012	23:56:11	1.3275	716.1833333	106.6725	17.682
23/08/2012	23:56:41	1.3273	716.6833333	106.6727	17.6822
23/08/2012	23:57:11	1.325	717.1833333	106.675	17.6845
23/08/2012	23:57:41	1.3217	717.6833333	106.6783	17.6878
23/08/2012	23:58:11	1.3245	718.1833333	106.6755	17.685
23/08/2012	23:58:41	1.325	718.6833333	106.675	17.6845
23/08/2012	23:59:11	1.3231	719.1833333	106.6769	17.6864
23/08/2012	23:59:41	1.3252	719.6833333	106.6748	17.6843
24/08/2012	0:00:11	1.3228	720.1833333	106.6772	17.6867
24/08/2012	0:00:41	1.3238	720.6833333	106.6762	17.6857
24/08/2012	0:01:11	1.325	721.1833333	106.675	17.6845
24/08/2012	0:01:41	1.3258	721.6833333	106.6742	17.6837
24/08/2012	0:02:11	1.3237	722.1833333	106.6763	17.6858
24/08/2012	0:02:41	1.3247	722.6833333	106.6753	17.6848
24/08/2012	0:03:11	1.3251	723.1833333	106.6749	17.6844
24/08/2012	0:03:41	1.3223	723.6833333	106.6777	17.6872
24/08/2012	0:04:11	1.3222	724.1833333	106.6778	17.6873
24/08/2012	0:04:41	1.3227	724.6833333	106.6773	17.6868
24/08/2012	0:05:11	1.3259	725.1833333	106.6741	17.6836
24/08/2012	0:05:41	1.3215	725.6833333	106.6785	17.688
24/08/2012	0:06:11	1.3242	726.1833333	106.6758	17.6853
24/08/2012	0:06:41	1.3268	726.6833333	106.6732	17.6827
24/08/2012	0:07:11	1.325	727.1833333	106.675	17.6845
24/08/2012	0:07:41	1.3255	727.6833333	106.6745	17.684
24/08/2012	0:08:11	1.3268	728.1833333	106.6732	17.6827
24/08/2012	0:08:41	1.3257	728.6833333	106.6743	17.6838
24/08/2012	0:09:11	1.326	729.1833333	106.674	17.6835
24/08/2012	0:09:41	1.3289	729.6833333	106.6711	17.6806
24/08/2012	0:10:11	1.3259	730.1833333	106.6741	17.6836
24/08/2012	0:10:41	1.3257	730.6833333	106.6743	17.6838
24/08/2012	0:11:11	1.326	731.1833333	106.674	17.6835
24/08/2012	0:11:41	1.3264	731.6833333	106.6736	17.6831
24/08/2012	0:12:11	1.3284	732.1833333	106.6716	17.6811
24/08/2012	0:12:41	1.3262	732.6833333	106.6738	17.6833
24/08/2012	0:13:11	1.3277	733.1833333	106.6723	17.6818
24/08/2012	0:13:41	1.3263	733.6833333	106.6737	17.6832
24/08/2012	0:14:11	1.3258	734.1833333	106.6742	17.6837
24/08/2012	0:14:41	1.3288	734.6833333	106.6712	17.6807
24/08/2012	0:15:11	1.3267	735.1833333	106.6733	17.6828
24/08/2012	0:15:41	1.3276	735.6833333	106.6724	17.6819
24/08/2012	0:16:11	1.3226	736.1833333	106.6774	17.6869
24/08/2012	0:16:41	1.3198	736.6833333	106.6802	17.6897
24/08/2012	0:17:11	1.3232	737.1833333	106.6768	17.6863
24/08/2012	0:17:41	1.3259	737.6833333	106.6741	17.6836
24/08/2012	0:18:11	1.3242	738.1833333	106.6758	17.6853
24/08/2012	0:18:41	1.3256	738.6833333	106.6744	17.6839
24/08/2012	0:19:11	1.3237	739.1833333	106.6763	17.6858
24/08/2012	0:19:41	1.323	739.6833333	106.677	17.6865
24/08/2012	0:20:11	1.3262	740.1833333	106.6738	17.6833
24/08/2012	0:20:41	1.3263	740.6833333	106.6737	17.6832
24/08/2012	0:21:11	1.3254	741.1833333	106.6746	17.6841
24/08/2012	0:21:41	1.3246	741.6833333	106.6754	17.6849
24/08/2012	0:22:11	1.3271	742.1833333	106.6729	17.6824
24/08/2012	0:22:41	1.325	742.6833333	106.675	17.6845
24/08/2012	0:23:11	1.3242	743.1833333	106.6758	17.6853
24/08/2012	0:23:41	1.3256	743.6833333	106.6744	17.6839
24/08/2012	0:24:11	1.3264	744.1833333	106.6736	17.6831
24/08/2012	0:24:41	1.3283	744.6833333	106.6717	17.6812
24/08/2012	0:25:11	1.3286	745.1833333	106.6714	17.6809
24/08/2012	0:25:41	1.3283	745.6833333	106.6717	17.6812
24/08/2012	0:26:11	1.3235	746.1833333	106.6765	17.686
24/08/2012	0:26:41	1.3262	746.6833333	106.6738	17.6833
24/08/2012	0:27:11	1.3239	747.1833333	106.6761	17.6856
24/08/2012	0:27:41	1.3267	747.6833333	106.6733	17.6828
24/08/2012	0:28:11	1.3216	748.1833333	106.6784	17.6879
24/08/2012	0:28:41	1.3246	748.6833333	106.6754	17.6849
24/08/2012	0:29:11	1.3147	749.1833333	106.6853	17.6948
24/08/2012	0:29:41	1.3243	749.6833333	106.6757	17.6852
24/08/2012	0:30:11	1.3262	750.1833333	106.6738	17.6833
24/08/2012	0:30:41	1.3272	750.6833333	106.6728	17.6823
24/08/2012	0:31:11	1.3231	751.1833333	106.6769	17.6864
24/08/2012	0:31:41	1.3245	751.6833333	106.6755	17.685
24/08/2012	0:32:11	1.3211	752.1833333	106.6789	17.6884
24/08/2012	0:32:41	1.3288	752.6833333	106.6712	17.6807
24/08/2012	0:33:11	1.3255	753.1833333	106.6745	17.684
24/08/2012	0:33:41	1.3301	753.6833333	106.6699	17.6794
24/08/2012	0:34:11	1.3255	754.1833333	106.6745	17.684
24/08/2012	0:34:41	1.324	754.6833333	106.676	17.6855
24/08/2012	0:35:11	1.3278	755.1833333	106.6722	17.6817
24/08/2012	0:35:41	1.3299	755.6833333	106.6701	17.6796
24/08/2012	0:36:11	1.3252	756.1833333	106.6748	17.6843
24/08/2012	0:36:41	1.3228	756.6833333	106.6772	17.6867
24/08/2012	0:37:11	1.3247	757.1833333	106.6753	17.6848
24/08/2012	0:37:41	1.3264	757.6833333	106.6736	17.6831
24/08/2012	0:38:11	1.3233	758.1833333	106.6767	17.6862
24/08/2012	0:38:41	1.3256	758.6833333	106.6744	17.6839

24/08/2012	0:39:11	1.3255	759.1833333	106.6745	17.684
24/08/2012	0:39:41	1.3249	759.6833333	106.6751	17.6846
24/08/2012	0:40:11	1.3243	760.1833333	106.6757	17.6852
24/08/2012	0:40:41	1.3252	760.6833333	106.6748	17.6843
24/08/2012	0:41:11	1.3208	761.1833333	106.6792	17.6887
24/08/2012	0:41:41	1.321	761.6833333	106.679	17.6885
24/08/2012	0:42:11	1.3235	762.1833333	106.6765	17.686
24/08/2012	0:42:41	1.3214	762.6833333	106.6786	17.6881
24/08/2012	0:43:11	1.3224	763.1833333	106.6776	17.6871
24/08/2012	0:43:41	1.3218	763.6833333	106.6782	17.6877
24/08/2012	0:44:11	1.3211	764.1833333	106.6789	17.6884
24/08/2012	0:44:41	1.3219	764.6833333	106.6781	17.6876
24/08/2012	0:45:11	1.3214	765.1833333	106.6786	17.6881
24/08/2012	0:45:41	1.3195	765.6833333	106.6805	17.69
24/08/2012	0:46:11	1.3237	766.1833333	106.6763	17.6858
24/08/2012	0:46:41	1.3249	766.6833333	106.6751	17.6846
24/08/2012	0:47:11	1.3311	767.1833333	106.6689	17.6784
24/08/2012	0:47:41	1.3272	767.6833333	106.6728	17.6823
24/08/2012	0:48:11	1.3237	768.1833333	106.6763	17.6858
24/08/2012	0:48:41	1.3243	768.6833333	106.6757	17.6852
24/08/2012	0:49:11	1.3243	769.1833333	106.6757	17.6852
24/08/2012	0:49:41	1.3223	769.6833333	106.6777	17.6872
24/08/2012	0:50:11	1.3278	770.1833333	106.6722	17.6817
24/08/2012	0:50:41	1.3229	770.6833333	106.6771	17.6866
24/08/2012	0:51:11	1.3222	771.1833333	106.6778	17.6873
24/08/2012	0:51:41	1.325	771.6833333	106.675	17.6845
24/08/2012	0:52:11	1.322	772.1833333	106.678	17.6875
24/08/2012	0:52:41	1.3231	772.6833333	106.6769	17.6864
24/08/2012	0:53:11	1.327	773.1833333	106.673	17.6825
24/08/2012	0:53:41	1.3243	773.6833333	106.6757	17.6852
24/08/2012	0:54:11	1.323	774.1833333	106.677	17.6865
24/08/2012	0:54:41	1.3243	774.6833333	106.6757	17.6852
24/08/2012	0:55:11	1.3244	775.1833333	106.6756	17.6851
24/08/2012	0:55:41	1.3256	775.6833333	106.6744	17.6839
24/08/2012	0:56:11	1.3273	776.1833333	106.6727	17.6822
24/08/2012	0:56:41	1.3235	776.6833333	106.6765	17.686
24/08/2012	0:57:11	1.3265	777.1833333	106.6735	17.683
24/08/2012	0:57:41	1.3221	777.6833333	106.6779	17.6874
24/08/2012	0:58:11	1.3223	778.1833333	106.6777	17.6872
24/08/2012	0:58:41	1.327	778.6833333	106.673	17.6825
24/08/2012	0:59:11	1.3275	779.1833333	106.6725	17.682
24/08/2012	0:59:41	1.3225	779.6833333	106.6775	17.687
24/08/2012	1:00:11	1.3301	780.1833333	106.6699	17.6794
24/08/2012	1:00:41	1.3276	780.6833333	106.6724	17.6819
24/08/2012	1:01:11	1.3262	781.1833333	106.6738	17.6833
24/08/2012	1:01:41	1.3246	781.6833333	106.6754	17.6849
24/08/2012	1:02:11	1.322	782.1833333	106.678	17.6875
24/08/2012	1:02:41	1.3273	782.6833333	106.6727	17.6822
24/08/2012	1:03:11	1.3277	783.1833333	106.6723	17.6818
24/08/2012	1:03:41	1.3256	783.6833333	106.6744	17.6839
24/08/2012	1:04:11	1.3277	784.1833333	106.6723	17.6818
24/08/2012	1:04:41	1.3225	784.6833333	106.6775	17.687
24/08/2012	1:05:11	1.3297	785.1833333	106.6703	17.6798
24/08/2012	1:05:41	1.3283	785.6833333	106.6717	17.6812
24/08/2012	1:06:11	1.3235	786.1833333	106.6765	17.686
24/08/2012	1:06:41	1.3222	786.6833333	106.6778	17.6873
24/08/2012	1:07:11	1.3251	787.1833333	106.6749	17.6844
24/08/2012	1:07:41	1.3258	787.6833333	106.6742	17.6837
24/08/2012	1:08:11	1.3265	788.1833333	106.6735	17.683
24/08/2012	1:08:41	1.326	788.6833333	106.674	17.6835
24/08/2012	1:09:11	1.3287	789.1833333	106.6713	17.6808
24/08/2012	1:09:41	1.3275	789.6833333	106.6725	17.682
24/08/2012	1:10:11	1.3281	790.1833333	106.6719	17.6814
24/08/2012	1:10:41	1.3299	790.6833333	106.6701	17.6796
24/08/2012	1:11:11	1.3309	791.1833333	106.6691	17.6786
24/08/2012	1:11:41	1.3312	791.6833333	106.6688	17.6783
24/08/2012	1:12:11	1.3304	792.1833333	106.6696	17.6791
24/08/2012	1:12:41	1.3314	792.6833333	106.6686	17.6781
24/08/2012	1:13:11	1.331	793.1833333	106.669	17.6785
24/08/2012	1:13:41	1.3321	793.6833333	106.6679	17.6774
24/08/2012	1:14:11	1.3314	794.1833333	106.6686	17.6781
24/08/2012	1:14:41	1.3301	794.6833333	106.6699	17.6794
24/08/2012	1:15:11	1.33	795.1833333	106.67	17.6795
24/08/2012	1:15:41	1.3327	795.6833333	106.6673	17.6768
24/08/2012	1:16:11	1.3367	796.1833333	106.6633	17.6728
24/08/2012	1:16:41	1.3354	796.6833333	106.6646	17.6741
24/08/2012	1:17:11	1.3297	797.1833333	106.6703	17.6798
24/08/2012	1:17:41	1.333	797.6833333	106.667	17.6765
24/08/2012	1:18:11	1.3308	798.1833333	106.6692	17.6787
24/08/2012	1:18:41	1.3333	798.6833333	106.6667	17.6762
24/08/2012	1:19:11	1.3337	799.1833333	106.6663	17.6758
24/08/2012	1:19:41	1.332	799.6833333	106.668	17.6775
24/08/2012	1:20:11	1.3299	800.1833333	106.6701	17.6796
24/08/2012	1:20:41	1.3314	800.6833333	106.6686	17.6781
24/08/2012	1:21:11	1.334	801.1833333	106.666	17.6755
24/08/2012	1:21:41	1.3357	801.6833333	106.6643	17.6738
24/08/2012	1:22:11	1.3338	802.1833333	106.6662	17.6757
24/08/2012	1:22:41	1.3311	802.6833333	106.6689	17.6784
24/08/2012	1:23:11	1.3312	803.1833333	106.6688	17.6783
24/08/2012	1:23:41	1.3302	803.6833333	106.6698	17.6793
24/08/2012	1:24:11	1.3312	804.1833333	106.6688	17.6783
24/08/2012	1:24:41	1.3349	804.6833333	106.6651	17.6746
24/08/2012	1:25:11	1.3311	805.1833333	106.6689	17.6784
24/08/2012	1:25:41	1.332	805.6833333	106.668	17.6775
24/08/2012	1:26:11	1.3283	806.1833333	106.6717	17.6812
24/08/2012	1:26:41	1.3316	806.6833333	106.6684	17.6779
24/08/2012	1:27:11	1.3343	807.1833333	106.6657	17.6752
24/08/2012	1:27:41	1.3319	807.6833333	106.6681	17.6776
24/08/2012	1:28:11	1.3301	808.1833333	106.6699	17.6794
24/08/2012	1:28:41	1.3319	808.6833333	106.6681	17.6776
24/08/2012	1:29:11	1.331	809.1833333	106.669	17.6785
24/08/2012	1:29:41	1.3316	809.6833333	106.6684	17.6779
24/08/2012	1:30:11	1.3305	810.1833333	106.6695	17.679
24/08/2012	1:30:41	1.3315	810.6833333	106.6685	17.678
24/08/2012	1:31:11	1.329	811.1833333	106.671	17.6805
24/08/2012	1:31:41	1.3309	811.6833333	106.6691	17.6786
24/08/2012	1:32:11	1.3299	812.1833333	106.6701	17.6796
24/08/2012	1:32:41	1.3302	812.6833333	106.6698	17.6793
24/08/2012	1:33:11	1.3325	813.1833333	106.6675	17.677
24/08/2012	1:33:41	1.3304	813.6833333	106.6696	17.6791
24/08/2012	1:34:11	1.3279	814.1833333	106.6721	17.6816
24/08/2012	1:34:41	1.3299	814.6833333	106.6701	17.6796
24/08/2012	1:35:11	1.332	815.1833333	106.668	17.6775
24/08/2012	1:35:41	1.3336	815.6833333	106.6664	17.6759
24/08/2012	1:36:11	1.3292	816.1833333	106.6708	17.6803
24/08/2012	1:36:41	1.3327	816.6833333	106.6673	17.6768
24/08/2012	1:37:11	1.329	817.1833333	106.671	17.6805

24/08/2012	1:37:41	1.3319	817.6833333	106.6681	17.6776
24/08/2012	1:38:11	1.3299	818.1833333	106.6701	17.6796
24/08/2012	1:38:41	1.3323	818.6833333	106.6677	17.6772
24/08/2012	1:39:11	1.3313	819.1833333	106.6687	17.6782
24/08/2012	1:39:41	1.3295	819.6833333	106.6705	17.68
24/08/2012	1:40:11	1.3314	820.1833333	106.6686	17.6781
24/08/2012	1:40:41	1.3351	820.6833333	106.6649	17.6744
24/08/2012	1:41:11	1.3287	821.1833333	106.6713	17.6808
24/08/2012	1:41:41	1.3291	821.6833333	106.6709	17.6804
24/08/2012	1:42:11	1.3319	822.1833333	106.6681	17.6776
24/08/2012	1:42:41	1.3324	822.6833333	106.6676	17.6771
24/08/2012	1:43:11	1.3256	823.1833333	106.6744	17.6839
24/08/2012	1:43:41	1.3341	823.6833333	106.6659	17.6754
24/08/2012	1:44:11	1.3271	824.1833333	106.6729	17.6824
24/08/2012	1:44:41	1.3303	824.6833333	106.6697	17.6792
24/08/2012	1:45:11	1.3291	825.1833333	106.6709	17.6804
24/08/2012	1:45:41	1.3296	825.6833333	106.6704	17.6799
24/08/2012	1:46:11	1.3333	826.1833333	106.6667	17.6762
24/08/2012	1:46:41	1.33	826.6833333	106.67	17.6795
24/08/2012	1:47:11	1.3296	827.1833333	106.6704	17.6799
24/08/2012	1:47:41	1.3325	827.6833333	106.6675	17.677
24/08/2012	1:48:11	1.3302	828.1833333	106.6698	17.6793
24/08/2012	1:48:41	1.3263	828.6833333	106.6737	17.6832
24/08/2012	1:49:11	1.326	829.1833333	106.674	17.6835
24/08/2012	1:49:41	1.3296	829.6833333	106.6704	17.6799
24/08/2012	1:50:11	1.3305	830.1833333	106.6695	17.679
24/08/2012	1:50:41	1.3337	830.6833333	106.6663	17.6758
24/08/2012	1:51:11	1.3266	831.1833333	106.6734	17.6829
24/08/2012	1:51:41	1.3336	831.6833333	106.6664	17.6759
24/08/2012	1:52:11	1.3305	832.1833333	106.6695	17.679
24/08/2012	1:52:41	1.3287	832.6833333	106.6713	17.6808
24/08/2012	1:53:11	1.3272	833.1833333	106.6728	17.6823
24/08/2012	1:53:41	1.3325	833.6833333	106.6675	17.677
24/08/2012	1:54:11	1.3288	834.1833333	106.6712	17.6807
24/08/2012	1:54:41	1.3295	834.6833333	106.6705	17.68
24/08/2012	1:55:11	1.3286	835.1833333	106.6714	17.6809
24/08/2012	1:55:41	1.3289	835.6833333	106.6711	17.6806
24/08/2012	1:56:11	1.329	836.1833333	106.671	17.6805
24/08/2012	1:56:41	1.3317	836.6833333	106.6683	17.6778
24/08/2012	1:57:11	1.3318	837.1833333	106.6682	17.6777
24/08/2012	1:57:41	1.3331	837.6833333	106.6669	17.6764
24/08/2012	1:58:11	1.3308	838.1833333	106.6692	17.6787
24/08/2012	1:58:41	1.3355	838.6833333	106.6645	17.674
24/08/2012	1:59:11	1.329	839.1833333	106.671	17.6805
24/08/2012	1:59:41	1.3314	839.6833333	106.6686	17.6781
24/08/2012	2:00:11	1.3349	840.1833333	106.6651	17.6746
24/08/2012	2:00:41	1.3314	840.6833333	106.6686	17.6781
24/08/2012	2:01:11	1.3367	841.1833333	106.6633	17.6728
24/08/2012	2:01:41	1.3303	841.6833333	106.6697	17.6792
24/08/2012	2:02:11	1.3346	842.1833333	106.6654	17.6749
24/08/2012	2:02:41	1.3339	842.6833333	106.6661	17.6756
24/08/2012	2:03:11	1.337	843.1833333	106.663	17.6725
24/08/2012	2:03:41	1.3358	843.6833333	106.6642	17.6737
24/08/2012	2:04:11	1.3301	844.1833333	106.6699	17.6794
24/08/2012	2:04:41	1.335	844.6833333	106.665	17.6745
24/08/2012	2:05:11	1.3328	845.1833333	106.6672	17.6767
24/08/2012	2:05:41	1.3307	845.6833333	106.6693	17.6788
24/08/2012	2:06:11	1.3347	846.1833333	106.6653	17.6748
24/08/2012	2:06:41	1.3325	846.6833333	106.6675	17.677
24/08/2012	2:07:11	1.3369	847.1833333	106.6631	17.6726
24/08/2012	2:07:41	1.3312	847.6833333	106.6688	17.6783
24/08/2012	2:08:11	1.3316	848.1833333	106.6684	17.6779
24/08/2012	2:08:41	1.3348	848.6833333	106.6652	17.6747
24/08/2012	2:09:11	1.3315	849.1833333	106.6685	17.678
24/08/2012	2:09:41	1.331	849.6833333	106.669	17.6785
24/08/2012	2:10:11	1.3329	850.1833333	106.6671	17.6766
24/08/2012	2:10:41	1.3321	850.6833333	106.6679	17.6774
24/08/2012	2:11:11	1.3332	851.1833333	106.6668	17.6763
24/08/2012	2:11:41	1.3322	851.6833333	106.6678	17.6773
24/08/2012	2:12:11	1.3339	852.1833333	106.6661	17.6756
24/08/2012	2:12:41	1.3344	852.6833333	106.6656	17.6751
24/08/2012	2:13:11	1.3341	853.1833333	106.6659	17.6754
24/08/2012	2:13:41	1.3322	853.6833333	106.6678	17.6773
24/08/2012	2:14:11	1.3314	854.1833333	106.6686	17.6781
24/08/2012	2:14:41	1.3385	854.6833333	106.6615	17.671
24/08/2012	2:15:11	1.3365	855.1833333	106.6635	17.673
24/08/2012	2:15:41	1.3324	855.6833333	106.6676	17.6771
24/08/2012	2:16:11	1.3352	856.1833333	106.6648	17.6743
24/08/2012	2:16:41	1.3379	856.6833333	106.6621	17.6716
24/08/2012	2:17:11	1.3322	857.1833333	106.6678	17.6773
24/08/2012	2:17:41	1.3349	857.6833333	106.6651	17.6746
24/08/2012	2:18:11	1.3347	858.1833333	106.6653	17.6748
24/08/2012	2:18:41	1.3277	858.6833333	106.6723	17.6818
24/08/2012	2:19:11	1.335	859.1833333	106.665	17.6745
24/08/2012	2:19:41	1.3352	859.6833333	106.6648	17.6743
24/08/2012	2:20:11	1.3307	860.1833333	106.6693	17.6788
24/08/2012	2:20:41	1.3281	860.6833333	106.6719	17.6814
24/08/2012	2:21:11	1.33	861.1833333	106.67	17.6795
24/08/2012	2:21:41	1.3335	861.6833333	106.6665	17.676
24/08/2012	2:22:11	1.3348	862.1833333	106.6652	17.6747
24/08/2012	2:22:41	1.3304	862.6833333	106.6696	17.6791
24/08/2012	2:23:11	1.3317	863.1833333	106.6683	17.6778
24/08/2012	2:23:41	1.336	863.6833333	106.664	17.6735
24/08/2012	2:24:11	1.3376	864.1833333	106.6624	17.6719
24/08/2012	2:24:41	1.3362	864.6833333	106.6638	17.6733
24/08/2012	2:25:11	1.3353	865.1833333	106.6647	17.6742
24/08/2012	2:25:41	1.3367	865.6833333	106.6633	17.6728
24/08/2012	2:26:11	1.3346	866.1833333	106.6654	17.6749
24/08/2012	2:26:41	1.3338	866.6833333	106.6662	17.6757
24/08/2012	2:27:11	1.3314	867.1833333	106.6686	17.6781
24/08/2012	2:27:41	1.3322	867.6833333	106.6678	17.6773
24/08/2012	2:28:11	1.3315	868.1833333	106.6685	17.678
24/08/2012	2:28:41	1.3377	868.6833333	106.6623	17.6718
24/08/2012	2:29:11	1.3261	869.1833333	106.6739	17.6834
24/08/2012	2:29:41	1.3341	869.6833333	106.6659	17.6754
24/08/2012	2:30:11	1.3308	870.1833333	106.6692	17.6787
24/08/2012	2:30:41	1.3306	870.6833333	106.6694	17.6789
24/08/2012	2:31:11	1.3308	871.1833333	106.6692	17.6787
24/08/2012	2:31:41	1.3309	871.6833333	106.6691	17.6786
24/08/2012	2:32:11	1.3332	872.1833333	106.6668	17.6763
24/08/2012	2:32:41	1.3289	872.6833333	106.6711	17.6806
24/08/2012	2:33:11	1.3301	873.1833333	106.6699	17.6794
24/08/2012	2:33:41	1.3329	873.6833333	106.6671	17.6766
24/08/2012	2:34:11	1.3305	874.1833333	106.6695	17.679
24/08/2012	2:34:41	1.334	874.6833333	106.666	17.6755
24/08/2012	2:35:11	1.3336	875.1833333	106.6664	17.6759
24/08/2012	2:35:41	1.3347	875.6833333	106.6653	17.6748

24/08/2012	2:36:11	1.3369	876.1833333	106.6631	17.6726
24/08/2012	2:36:41	1.3316	876.6833333	106.6684	17.6779
24/08/2012	2:37:11	1.3337	877.1833333	106.6663	17.6758
24/08/2012	2:37:41	1.3351	877.6833333	106.6649	17.6744
24/08/2012	2:38:11	1.3348	878.1833333	106.6652	17.6747
24/08/2012	2:38:41	1.3303	878.6833333	106.6697	17.6792
24/08/2012	2:39:11	1.3337	879.1833333	106.6663	17.6758
24/08/2012	2:39:41	1.3327	879.6833333	106.6673	17.6768
24/08/2012	2:40:11	1.3333	880.1833333	106.6667	17.6762
24/08/2012	2:40:41	1.3314	880.6833333	106.6686	17.6781
24/08/2012	2:41:11	1.3316	881.1833333	106.6684	17.6779
24/08/2012	2:41:41	1.3329	881.6833333	106.6671	17.6766
24/08/2012	2:42:11	1.3328	882.1833333	106.6672	17.6767
24/08/2012	2:42:41	1.3362	882.6833333	106.6638	17.6733
24/08/2012	2:43:11	1.3334	883.1833333	106.6666	17.6761
24/08/2012	2:43:41	1.332	883.6833333	106.668	17.6775
24/08/2012	2:44:11	1.3309	884.1833333	106.6691	17.6786
24/08/2012	2:44:41	1.3348	884.6833333	106.6652	17.6747
24/08/2012	2:45:11	1.3329	885.1833333	106.6671	17.6766
24/08/2012	2:45:41	1.3319	885.6833333	106.6681	17.6776
24/08/2012	2:46:11	1.331	886.1833333	106.669	17.6785
24/08/2012	2:46:41	1.3312	886.6833333	106.6688	17.6783
24/08/2012	2:47:11	1.3353	887.1833333	106.6647	17.6742
24/08/2012	2:47:41	1.3319	887.6833333	106.6681	17.6776
24/08/2012	2:48:11	1.3325	888.1833333	106.6675	17.677
24/08/2012	2:48:41	1.3328	888.6833333	106.6672	17.6767
24/08/2012	2:49:11	1.3341	889.1833333	106.6659	17.6754
24/08/2012	2:49:41	1.3357	889.6833333	106.6643	17.6738
24/08/2012	2:50:11	1.3328	890.1833333	106.6672	17.6767
24/08/2012	2:50:41	1.3358	890.6833333	106.6642	17.6737
24/08/2012	2:51:11	1.3367	891.1833333	106.6633	17.6728
24/08/2012	2:51:41	1.3334	891.6833333	106.6666	17.6761
24/08/2012	2:52:11	1.3361	892.1833333	106.6639	17.6734
24/08/2012	2:52:41	1.3361	892.6833333	106.6639	17.6734
24/08/2012	2:53:11	1.331	893.1833333	106.669	17.6785
24/08/2012	2:53:41	1.3329	893.6833333	106.6671	17.6766
24/08/2012	2:54:11	1.3319	894.1833333	106.6681	17.6776
24/08/2012	2:54:41	1.3358	894.6833333	106.6642	17.6737
24/08/2012	2:55:11	1.3358	895.1833333	106.6642	17.6737
24/08/2012	2:55:41	1.3336	895.6833333	106.6664	17.6759
24/08/2012	2:56:11	1.3345	896.1833333	106.6655	17.675
24/08/2012	2:56:41	1.3306	896.6833333	106.6694	17.6789
24/08/2012	2:57:11	1.3329	897.1833333	106.6671	17.6766
24/08/2012	2:57:41	1.3324	897.6833333	106.6676	17.6771
24/08/2012	2:58:11	1.3345	898.1833333	106.6655	17.675
24/08/2012	2:58:41	1.3342	898.6833333	106.6658	17.6753
24/08/2012	2:59:11	1.3356	899.1833333	106.6644	17.6739
24/08/2012	2:59:41	1.3361	899.6833333	106.6639	17.6734
24/08/2012	3:00:11	1.3329	900.1833333	106.6671	17.6766
24/08/2012	3:00:41	1.3371	900.6833333	106.6629	17.6724
24/08/2012	3:01:11	1.3349	901.1833333	106.6651	17.6746
24/08/2012	3:01:41	1.3379	901.6833333	106.6621	17.6716
24/08/2012	3:02:11	1.3342	902.1833333	106.6658	17.6753
24/08/2012	3:02:41	1.3327	902.6833333	106.6673	17.6768
24/08/2012	3:03:11	1.3359	903.1833333	106.6641	17.6736
24/08/2012	3:03:41	1.3352	903.6833333	106.6648	17.6743
24/08/2012	3:04:11	1.3341	904.1833333	106.6659	17.6754
24/08/2012	3:04:41	1.3376	904.6833333	106.6624	17.6719
24/08/2012	3:05:11	1.3369	905.1833333	106.6631	17.6726
24/08/2012	3:05:41	1.3359	905.6833333	106.6641	17.6736
24/08/2012	3:06:11	1.3371	906.1833333	106.6629	17.6724
24/08/2012	3:06:41	1.3373	906.6833333	106.6627	17.6722
24/08/2012	3:07:11	1.336	907.1833333	106.664	17.6735
24/08/2012	3:07:41	1.3409	907.6833333	106.6591	17.6686
24/08/2012	3:08:11	1.3393	908.1833333	106.6607	17.6702
24/08/2012	3:08:41	1.3322	908.6833333	106.6678	17.6773
24/08/2012	3:09:11	1.3389	909.1833333	106.6611	17.6706
24/08/2012	3:09:41	1.3377	909.6833333	106.6623	17.6718
24/08/2012	3:10:11	1.3396	910.1833333	106.6604	17.6699
24/08/2012	3:10:41	1.3365	910.6833333	106.6635	17.673
24/08/2012	3:11:11	1.3409	911.1833333	106.6591	17.6686
24/08/2012	3:11:41	1.3366	911.6833333	106.6634	17.6729
24/08/2012	3:12:11	1.3414	912.1833333	106.6586	17.6681
24/08/2012	3:12:41	1.3381	912.6833333	106.6619	17.6714
24/08/2012	3:13:11	1.3351	913.1833333	106.6649	17.6744
24/08/2012	3:13:41	1.3413	913.6833333	106.6587	17.6682
24/08/2012	3:14:11	1.3403	914.1833333	106.6597	17.6692
24/08/2012	3:14:41	1.3422	914.6833333	106.6578	17.6673
24/08/2012	3:15:11	1.3437	915.1833333	106.6563	17.6658
24/08/2012	3:15:41	1.3395	915.6833333	106.6605	17.67
24/08/2012	3:16:11	1.3364	916.1833333	106.6636	17.6731
24/08/2012	3:16:41	1.3351	916.6833333	106.6649	17.6744
24/08/2012	3:17:11	1.3392	917.1833333	106.6608	17.6703
24/08/2012	3:17:41	1.3365	917.6833333	106.6635	17.673
24/08/2012	3:18:11	1.3367	918.1833333	106.6633	17.6728
24/08/2012	3:18:41	1.3361	918.6833333	106.6639	17.6734
24/08/2012	3:19:11	1.3367	919.1833333	106.6633	17.6728
24/08/2012	3:19:41	1.3326	919.6833333	106.6674	17.6769
24/08/2012	3:20:11	1.3378	920.1833333	106.6622	17.6717
24/08/2012	3:20:41	1.3357	920.6833333	106.6643	17.6738
24/08/2012	3:21:11	1.3387	921.1833333	106.6613	17.6708
24/08/2012	3:21:41	1.3354	921.6833333	106.6646	17.6741
24/08/2012	3:22:11	1.336	922.1833333	106.664	17.6735
24/08/2012	3:22:41	1.3354	922.6833333	106.6646	17.6741
24/08/2012	3:23:11	1.3379	923.1833333	106.6621	17.6716
24/08/2012	3:23:41	1.3332	923.6833333	106.6668	17.6763
24/08/2012	3:24:11	1.3344	924.1833333	106.6656	17.6751
24/08/2012	3:24:41	1.3331	924.6833333	106.6669	17.6764
24/08/2012	3:25:11	1.3371	925.1833333	106.6629	17.6724
24/08/2012	3:25:41	1.3349	925.6833333	106.6651	17.6746
24/08/2012	3:26:11	1.3367	926.1833333	106.6633	17.6728
24/08/2012	3:26:41	1.3367	926.6833333	106.6633	17.6728
24/08/2012	3:27:11	1.3351	927.1833333	106.6649	17.6744
24/08/2012	3:27:41	1.3355	927.6833333	106.6645	17.674
24/08/2012	3:28:11	1.334	928.1833333	106.666	17.6755
24/08/2012	3:28:41	1.3368	928.6833333	106.6632	17.6727
24/08/2012	3:29:11	1.3384	929.1833333	106.6616	17.6711
24/08/2012	3:29:41	1.3329	929.6833333	106.6671	17.6766
24/08/2012	3:30:11	1.3321	930.1833333	106.6679	17.6774
24/08/2012	3:30:41	1.3346	930.6833333	106.6654	17.6749
24/08/2012	3:31:11	1.3349	931.1833333	106.6651	17.6746
24/08/2012	3:31:41	1.3365	931.6833333	106.6635	17.673
24/08/2012	3:32:11	1.3358	932.1833333	106.6642	17.6737
24/08/2012	3:32:41	1.3344	932.6833333	106.6656	17.6751
24/08/2012	3:33:11	1.3323	933.1833333	106.6677	17.6772
24/08/2012	3:33:41	1.3338	933.6833333	106.6662	17.6757
24/08/2012	3:34:11	1.3385	934.1833333	106.6615	17.671

24/08/2012	3:34:41	1.3374	934.6833333	106.6626	17.6721
24/08/2012	3:35:11	1.3391	935.1833333	106.6609	17.6704
24/08/2012	3:35:41	1.3344	935.6833333	106.6656	17.6751
24/08/2012	3:36:11	1.3371	936.1833333	106.6629	17.6724
24/08/2012	3:36:41	1.338	936.6833333	106.662	17.6715
24/08/2012	3:37:11	1.3379	937.1833333	106.6621	17.6716
24/08/2012	3:37:41	1.3368	937.6833333	106.6632	17.6727
24/08/2012	3:38:11	1.3385	938.1833333	106.6615	17.671
24/08/2012	3:38:41	1.3415	938.6833333	106.6585	17.668
24/08/2012	3:39:11	1.3347	939.1833333	106.6653	17.6748
24/08/2012	3:39:41	1.3332	939.6833333	106.6668	17.6763
24/08/2012	3:40:11	1.3401	940.1833333	106.6599	17.6694
24/08/2012	3:40:41	1.3409	940.6833333	106.6591	17.6686
24/08/2012	3:41:11	1.3402	941.1833333	106.6598	17.6693
24/08/2012	3:41:41	1.3379	941.6833333	106.6621	17.6716
24/08/2012	3:42:11	1.3361	942.1833333	106.6639	17.6734
24/08/2012	3:42:41	1.3402	942.6833333	106.6598	17.6693
24/08/2012	3:43:11	1.334	943.1833333	106.666	17.6755
24/08/2012	3:43:41	1.3361	943.6833333	106.6639	17.6734
24/08/2012	3:44:11	1.3404	944.1833333	106.6596	17.6691
24/08/2012	3:44:41	1.3403	944.6833333	106.6597	17.6692
24/08/2012	3:45:11	1.3402	945.1833333	106.6598	17.6693
24/08/2012	3:45:41	1.3337	945.6833333	106.6663	17.6758
24/08/2012	3:46:11	1.3372	946.1833333	106.6628	17.6723
24/08/2012	3:46:41	1.34	946.6833333	106.66	17.6695
24/08/2012	3:47:11	1.3358	947.1833333	106.6642	17.6737
24/08/2012	3:47:41	1.3362	947.6833333	106.6638	17.6733
24/08/2012	3:48:11	1.3344	948.1833333	106.6656	17.6751
24/08/2012	3:48:41	1.3369	948.6833333	106.6631	17.6726
24/08/2012	3:49:11	1.3373	949.1833333	106.6627	17.6722
24/08/2012	3:49:41	1.3404	949.6833333	106.6596	17.6691
24/08/2012	3:50:11	1.3384	950.1833333	106.6616	17.6711
24/08/2012	3:50:41	1.3427	950.6833333	106.6573	17.6668
24/08/2012	3:51:11	1.3392	951.1833333	106.6608	17.6703
24/08/2012	3:51:41	1.3409	951.6833333	106.6591	17.6686
24/08/2012	3:52:11	1.3407	952.1833333	106.6593	17.6688
24/08/2012	3:52:41	1.3382	952.6833333	106.6618	17.6713
24/08/2012	3:53:11	1.3363	953.1833333	106.6637	17.6732
24/08/2012	3:53:41	1.3388	953.6833333	106.6612	17.6707
24/08/2012	3:54:11	1.3378	954.1833333	106.6622	17.6717
24/08/2012	3:54:41	1.3414	954.6833333	106.6586	17.6681
24/08/2012	3:55:11	1.3398	955.1833333	106.6602	17.6697
24/08/2012	3:55:41	1.3395	955.6833333	106.6605	17.67
24/08/2012	3:56:11	1.3378	956.1833333	106.6622	17.6717
24/08/2012	3:56:41	1.3387	956.6833333	106.6613	17.6708
24/08/2012	3:57:11	1.3403	957.1833333	106.6597	17.6692
24/08/2012	3:57:41	1.3365	957.6833333	106.6635	17.673
24/08/2012	3:58:11	1.3372	958.1833333	106.6628	17.6723
24/08/2012	3:58:41	1.3386	958.6833333	106.6614	17.6709
24/08/2012	3:59:11	1.3425	959.1833333	106.6575	17.667
24/08/2012	3:59:41	1.3381	959.6833333	106.6619	17.6714
24/08/2012	4:00:11	1.3393	960.1833333	106.6607	17.6702
24/08/2012	4:00:41	1.3448	960.6833333	106.6552	17.6647
24/08/2012	4:01:11	1.3394	961.1833333	106.6606	17.6701
24/08/2012	4:01:41	1.3423	961.6833333	106.6577	17.6672
24/08/2012	4:02:11	1.3382	962.1833333	106.6618	17.6713
24/08/2012	4:02:41	1.3366	962.6833333	106.6634	17.6729
24/08/2012	4:03:11	1.3351	963.1833333	106.6649	17.6744
24/08/2012	4:03:41	1.3386	963.6833333	106.6614	17.6709
24/08/2012	4:04:11	1.3409	964.1833333	106.6591	17.6686
24/08/2012	4:04:41	1.343	964.6833333	106.657	17.6665
24/08/2012	4:05:11	1.3418	965.1833333	106.6582	17.6677
24/08/2012	4:05:41	1.3392	965.6833333	106.6608	17.6703
24/08/2012	4:06:11	1.3414	966.1833333	106.6586	17.6681
24/08/2012	4:06:41	1.3396	966.6833333	106.6604	17.6699
24/08/2012	4:07:11	1.3399	967.1833333	106.6601	17.6696
24/08/2012	4:07:41	1.3358	967.6833333	106.6642	17.6737
24/08/2012	4:08:11	1.3377	968.1833333	106.6623	17.6718
24/08/2012	4:08:41	1.3389	968.6833333	106.6611	17.6706
24/08/2012	4:09:11	1.3371	969.1833333	106.6629	17.6724
24/08/2012	4:09:41	1.3409	969.6833333	106.6591	17.6686
24/08/2012	4:10:11	1.3404	970.1833333	106.6596	17.6691
24/08/2012	4:10:41	1.338	970.6833333	106.662	17.6715
24/08/2012	4:11:11	1.34	971.1833333	106.66	17.6695
24/08/2012	4:11:41	1.3397	971.6833333	106.6603	17.6698
24/08/2012	4:12:11	1.3377	972.1833333	106.6623	17.6718
24/08/2012	4:12:41	1.3373	972.6833333	106.6627	17.6722
24/08/2012	4:13:11	1.3386	973.1833333	106.6614	17.6709
24/08/2012	4:13:41	1.3415	973.6833333	106.6585	17.668
24/08/2012	4:14:11	1.3397	974.1833333	106.6603	17.6698
24/08/2012	4:14:41	1.3413	974.6833333	106.6587	17.6682
24/08/2012	4:15:11	1.338	975.1833333	106.662	17.6715
24/08/2012	4:15:41	1.3375	975.6833333	106.6625	17.672
24/08/2012	4:16:11	1.338	976.1833333	106.662	17.6715
24/08/2012	4:16:41	1.3368	976.6833333	106.6632	17.6727
24/08/2012	4:17:11	1.3363	977.1833333	106.6637	17.6732
24/08/2012	4:17:41	1.3418	977.6833333	106.6582	17.6677
24/08/2012	4:18:11	1.3394	978.1833333	106.6606	17.6701
24/08/2012	4:18:41	1.3444	978.6833333	106.6556	17.6651
24/08/2012	4:19:11	1.3406	979.1833333	106.6594	17.6689
24/08/2012	4:19:41	1.3425	979.6833333	106.6575	17.667
24/08/2012	4:20:11	1.3381	980.1833333	106.6619	17.6714
24/08/2012	4:20:41	1.3391	980.6833333	106.6609	17.6704
24/08/2012	4:21:11	1.3438	981.1833333	106.6562	17.6657
24/08/2012	4:21:41	1.3398	981.6833333	106.6602	17.6697
24/08/2012	4:22:11	1.338	982.1833333	106.662	17.6715
24/08/2012	4:22:41	1.3453	982.6833333	106.6547	17.6642
24/08/2012	4:23:11	1.3406	983.1833333	106.6594	17.6689
24/08/2012	4:23:41	1.345	983.6833333	106.655	17.6645
24/08/2012	4:24:11	1.345	984.1833333	106.655	17.6645
24/08/2012	4:24:41	1.3397	984.6833333	106.6603	17.6698
24/08/2012	4:25:11	1.3469	985.1833333	106.6531	17.6626
24/08/2012	4:25:41	1.3431	985.6833333	106.6569	17.6664
24/08/2012	4:26:11	1.34	986.1833333	106.66	17.6695
24/08/2012	4:26:41	1.3418	986.6833333	106.6582	17.6677
24/08/2012	4:27:11	1.3422	987.1833333	106.6578	17.6673
24/08/2012	4:27:41	1.3394	987.6833333	106.6606	17.6701
24/08/2012	4:28:11	1.3382	988.1833333	106.6618	17.6713
24/08/2012	4:28:41	1.3397	988.6833333	106.6603	17.6698
24/08/2012	4:29:11	1.3398	989.1833333	106.6602	17.6697
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24/08/2012	4:30:11	1.3355	990.1833333	106.6645	17.674
24/08/2012	4:30:41	1.3394	990.6833333	106.6606	17.6701
24/08/2012	4:31:11	1.3328	991.1833333	106.6672	17.6767
24/08/2012	4:31:41	1.3357	991.6833333	106.6643	17.6738
24/08/2012	4:32:11	1.3357	992.1833333	106.6643	17.6738
24/08/2012	4:32:41	1.3349	992.6833333	106.6651	17.6746

24/08/2012	4:33:11	1.3356	993.1833333	106.6644	17.6739
24/08/2012	4:33:41	1.3391	993.6833333	106.6609	17.6704
24/08/2012	4:34:11	1.3381	994.1833333	106.6619	17.6714
24/08/2012	4:34:41	1.3365	994.6833333	106.6635	17.673
24/08/2012	4:35:11	1.3352	995.1833333	106.6648	17.6743
24/08/2012	4:35:41	1.3393	995.6833333	106.6607	17.6702
24/08/2012	4:36:11	1.3361	996.1833333	106.6639	17.6734
24/08/2012	4:36:41	1.3445	996.6833333	106.6555	17.665
24/08/2012	4:37:11	1.3429	997.1833333	106.6571	17.6666
24/08/2012	4:37:41	1.3384	997.6833333	106.6616	17.6711
24/08/2012	4:38:11	1.3348	998.1833333	106.6652	17.6747
24/08/2012	4:38:41	1.3403	998.6833333	106.6597	17.6692
24/08/2012	4:39:11	1.3403	999.1833333	106.6597	17.6692
24/08/2012	4:39:41	1.3394	999.6833333	106.6606	17.6701
24/08/2012	4:40:11	1.3352	1000.183333	106.6648	17.6743
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24/08/2012	4:41:11	1.3368	1001.183333	106.6632	17.6727
24/08/2012	4:41:41	1.3376	1001.683333	106.6624	17.6719
24/08/2012	4:42:11	1.3416	1002.183333	106.6584	17.6679
24/08/2012	4:42:41	1.3399	1002.683333	106.6601	17.6696
24/08/2012	4:43:11	1.3375	1003.183333	106.6625	17.672
24/08/2012	4:43:41	1.3393	1003.683333	106.6607	17.6702
24/08/2012	4:44:11	1.3397	1004.183333	106.6603	17.6698
24/08/2012	4:44:41	1.3406	1004.683333	106.6594	17.6689
24/08/2012	4:45:11	1.3375	1005.183333	106.6625	17.672
24/08/2012	4:45:41	1.3333	1005.683333	106.6667	17.6762
24/08/2012	4:46:11	1.3388	1006.183333	106.6612	17.6707
24/08/2012	4:46:41	1.336	1006.683333	106.664	17.6735
24/08/2012	4:47:11	1.3425	1007.183333	106.6575	17.667
24/08/2012	4:47:41	1.3435	1007.683333	106.6565	17.666
24/08/2012	4:48:11	1.3365	1008.183333	106.6635	17.673
24/08/2012	4:48:41	1.3418	1008.683333	106.6582	17.6677
24/08/2012	4:49:11	1.3389	1009.183333	106.6611	17.6706
24/08/2012	4:49:41	1.3376	1009.683333	106.6624	17.6719
24/08/2012	4:50:11	1.3407	1010.183333	106.6593	17.6688
24/08/2012	4:50:41	1.343	1010.683333	106.657	17.6665
24/08/2012	4:51:11	1.3382	1011.183333	106.6618	17.6713
24/08/2012	4:51:41	1.3353	1011.683333	106.6647	17.6742
24/08/2012	4:52:11	1.3403	1012.183333	106.6597	17.6692
24/08/2012	4:52:41	1.3363	1012.683333	106.6637	17.6732
24/08/2012	4:53:11	1.3353	1013.183333	106.6647	17.6742
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24/08/2012	4:54:11	1.3401	1014.183333	106.6599	17.6694
24/08/2012	4:54:41	1.345	1014.683333	106.655	17.6645
24/08/2012	4:55:11	1.339	1015.183333	106.661	17.6705
24/08/2012	4:55:41	1.3387	1015.683333	106.6613	17.6708
24/08/2012	4:56:11	1.3406	1016.183333	106.6594	17.6689
24/08/2012	4:56:41	1.3376	1016.683333	106.6624	17.6719
24/08/2012	4:57:11	1.3364	1017.183333	106.6636	17.6731
24/08/2012	4:57:41	1.341	1017.683333	106.659	17.6685
24/08/2012	4:58:11	1.3333	1018.183333	106.6667	17.6762
24/08/2012	4:58:41	1.3394	1018.683333	106.6606	17.6701
24/08/2012	4:59:11	1.3416	1019.183333	106.6584	17.6679
24/08/2012	4:59:41	1.3412	1019.683333	106.6588	17.6683
24/08/2012	5:00:11	1.3422	1020.183333	106.6578	17.6673
24/08/2012	5:00:41	1.3425	1020.683333	106.6575	17.667
24/08/2012	5:01:11	1.3398	1021.183333	106.6602	17.6697
24/08/2012	5:01:41	1.3449	1021.683333	106.6551	17.6646
24/08/2012	5:02:11	1.3409	1022.183333	106.6591	17.6686
24/08/2012	5:02:41	1.3374	1022.683333	106.6626	17.6721
24/08/2012	5:03:11	1.3385	1023.183333	106.6615	17.671
24/08/2012	5:03:41	1.3404	1023.683333	106.6596	17.6691
24/08/2012	5:04:11	1.3392	1024.183333	106.6608	17.6703
24/08/2012	5:04:41	1.3411	1024.683333	106.6589	17.6684
24/08/2012	5:05:11	1.3375	1025.183333	106.6625	17.672
24/08/2012	5:05:41	1.3375	1025.683333	106.6625	17.672
24/08/2012	5:06:11	1.3425	1026.183333	106.6575	17.667
24/08/2012	5:06:41	1.3395	1026.683333	106.6605	17.67
24/08/2012	5:07:11	1.342	1027.183333	106.658	17.6675
24/08/2012	5:07:41	1.3414	1027.683333	106.6586	17.6681
24/08/2012	5:08:11	1.3375	1028.183333	106.6625	17.672
24/08/2012	5:08:41	1.3384	1028.683333	106.6616	17.6711
24/08/2012	5:09:11	1.3385	1029.183333	106.6615	17.671
24/08/2012	5:09:41	1.3409	1029.683333	106.6591	17.6686
24/08/2012	5:10:11	1.3426	1030.183333	106.6574	17.6669
24/08/2012	5:10:41	1.3442	1030.683333	106.6558	17.6653
24/08/2012	5:11:11	1.3389	1031.183333	106.6611	17.6706
24/08/2012	5:11:41	1.3403	1031.683333	106.6597	17.6692
24/08/2012	5:12:11	1.3443	1032.183333	106.6557	17.6652
24/08/2012	5:12:41	1.342	1032.683333	106.658	17.6675
24/08/2012	5:13:11	1.3416	1033.183333	106.6584	17.6679
24/08/2012	5:13:41	1.3413	1033.683333	106.6587	17.6682
24/08/2012	5:14:11	1.3427	1034.183333	106.6573	17.6668
24/08/2012	5:14:41	1.3436	1034.683333	106.6564	17.6659
24/08/2012	5:15:11	1.3444	1035.183333	106.6556	17.6651
24/08/2012	5:15:41	1.3424	1035.683333	106.6576	17.6671
24/08/2012	5:16:11	1.3405	1036.183333	106.6595	17.669
24/08/2012	5:16:41	1.3437	1036.683333	106.6563	17.6658
24/08/2012	5:17:11	1.3397	1037.183333	106.6603	17.6698
24/08/2012	5:17:41	1.341	1037.683333	106.659	17.6685
24/08/2012	5:18:11	1.3564	1038.183333	106.6436	17.6531
24/08/2012	5:18:41	1.3451	1038.683333	106.6549	17.6644
24/08/2012	5:19:11	1.3378	1039.183333	106.6622	17.6717
24/08/2012	5:19:41	1.3394	1039.683333	106.6606	17.6701
24/08/2012	5:20:11	1.339	1040.183333	106.661	17.6705
24/08/2012	5:20:41	1.3439	1040.683333	106.6561	17.6656
24/08/2012	5:21:11	1.3432	1041.183333	106.6568	17.6663
24/08/2012	5:21:41	1.3408	1041.683333	106.6592	17.6687
24/08/2012	5:22:11	1.3398	1042.183333	106.6602	17.6697
24/08/2012	5:22:41	1.3431	1042.683333	106.6569	17.6664
24/08/2012	5:23:11	1.3408	1043.183333	106.6592	17.6687
24/08/2012	5:23:41	1.3414	1043.683333	106.6586	17.6681
24/08/2012	5:24:11	1.3423	1044.183333	106.6577	17.6672
24/08/2012	5:24:41	1.3407	1044.683333	106.6593	17.6688
24/08/2012	5:25:11	1.3414	1045.183333	106.6586	17.6681
24/08/2012	5:25:41	1.3399	1045.683333	106.6601	17.6696
24/08/2012	5:26:11	1.342	1046.183333	106.658	17.6675
24/08/2012	5:26:41	1.3379	1046.683333	106.6621	17.6716
24/08/2012	5:27:11	1.3433	1047.183333	106.6567	17.6662
24/08/2012	5:27:41	1.3395	1047.683333	106.6605	17.67
24/08/2012	5:28:11	1.3419	1048.183333	106.6581	17.6676
24/08/2012	5:28:41	1.3415	1048.683333	106.6585	17.668
24/08/2012	5:29:11	1.3395	1049.183333	106.6605	17.67
24/08/2012	5:29:41	1.3413	1049.683333	106.6587	17.6682
24/08/2012	5:30:11	1.3434	1050.183333	106.6566	17.6661
24/08/2012	5:30:41	1.3438	1050.683333	106.6562	17.6657
24/08/2012	5:31:11	1.3398	1051.183333	106.6602	17.6697

24/08/2012	5:31:41	1.3433	1051.683333	106.6567	17.6662
24/08/2012	5:32:11	1.3415	1052.183333	106.6585	17.668
24/08/2012	5:32:41	1.345	1052.683333	106.655	17.6645
24/08/2012	5:33:11	1.3421	1053.183333	106.6579	17.6674
24/08/2012	5:33:41	1.3432	1053.683333	106.6568	17.6663
24/08/2012	5:34:11	1.3395	1054.183333	106.6605	17.67
24/08/2012	5:34:41	1.3425	1054.683333	106.6575	17.667
24/08/2012	5:35:11	1.3424	1055.183333	106.6576	17.6671
24/08/2012	5:35:41	1.3454	1055.683333	106.6546	17.6641
24/08/2012	5:36:11	1.3418	1056.183333	106.6582	17.6677
24/08/2012	5:36:41	1.3449	1056.683333	106.6551	17.6646
24/08/2012	5:37:11	1.3441	1057.183333	106.6559	17.6654
24/08/2012	5:37:41	1.3416	1057.683333	106.6584	17.6679
24/08/2012	5:38:11	1.3412	1058.183333	106.6588	17.6683
24/08/2012	5:38:41	1.3428	1058.683333	106.6572	17.6667
24/08/2012	5:39:11	1.3437	1059.183333	106.6563	17.6658
24/08/2012	5:39:41	1.3465	1059.683333	106.6535	17.663
24/08/2012	5:40:11	1.3398	1060.183333	106.6602	17.6697
24/08/2012	5:40:41	1.3408	1060.683333	106.6592	17.6687
24/08/2012	5:41:11	1.3388	1061.183333	106.6612	17.6707
24/08/2012	5:41:41	1.3402	1061.683333	106.6598	17.6693
24/08/2012	5:42:11	1.3456	1062.183333	106.6544	17.6639
24/08/2012	5:42:41	1.3427	1062.683333	106.6573	17.6668
24/08/2012	5:43:11	1.3435	1063.183333	106.6565	17.666
24/08/2012	5:43:41	1.3416	1063.683333	106.6584	17.6679
24/08/2012	5:44:11	1.344	1064.183333	106.656	17.6655
24/08/2012	5:44:41	1.3413	1064.683333	106.6587	17.6682
24/08/2012	5:45:11	1.3388	1065.183333	106.6612	17.6707
24/08/2012	5:45:41	1.3434	1065.683333	106.6566	17.6661
24/08/2012	5:46:11	1.3423	1066.183333	106.6577	17.6672
24/08/2012	5:46:41	1.343	1066.683333	106.657	17.6665
24/08/2012	5:47:11	1.343	1067.183333	106.657	17.6665
24/08/2012	5:47:41	1.3418	1067.683333	106.6582	17.6677
24/08/2012	5:48:11	1.3397	1068.183333	106.6603	17.6698
24/08/2012	5:48:41	1.3396	1068.683333	106.6604	17.6699
24/08/2012	5:49:11	1.3425	1069.183333	106.6575	17.667
24/08/2012	5:49:41	1.3404	1069.683333	106.6596	17.6691
24/08/2012	5:50:11	1.337	1070.183333	106.663	17.6725
24/08/2012	5:50:41	1.3404	1070.683333	106.6596	17.6691
24/08/2012	5:51:11	1.3368	1071.183333	106.6632	17.6727
24/08/2012	5:51:41	1.3419	1071.683333	106.6581	17.6676
24/08/2012	5:52:11	1.344	1072.183333	106.656	17.6655
24/08/2012	5:52:41	1.343	1072.683333	106.657	17.6665
24/08/2012	5:53:11	1.3404	1073.183333	106.6596	17.6691
24/08/2012	5:53:41	1.3452	1073.683333	106.6548	17.6643
24/08/2012	5:54:11	1.342	1074.183333	106.658	17.6675
24/08/2012	5:54:41	1.3382	1074.683333	106.6618	17.6713
24/08/2012	5:55:11	1.3422	1075.183333	106.6578	17.6673
24/08/2012	5:55:41	1.3435	1075.683333	106.6565	17.666
24/08/2012	5:56:11	1.3393	1076.183333	106.6607	17.6702
24/08/2012	5:56:41	1.3438	1076.683333	106.6562	17.6657
24/08/2012	5:57:11	1.3435	1077.183333	106.6565	17.666
24/08/2012	5:57:41	1.3436	1077.683333	106.6564	17.6659
24/08/2012	5:58:11	1.3417	1078.183333	106.6583	17.6678
24/08/2012	5:58:41	1.3442	1078.683333	106.6558	17.6653
24/08/2012	5:59:11	1.3423	1079.183333	106.6577	17.6672
24/08/2012	5:59:41	1.3412	1079.683333	106.6588	17.6683
24/08/2012	6:00:11	1.3399	1080.183333	106.6601	17.6696
24/08/2012	6:00:41	1.3444	1080.683333	106.6556	17.6651
24/08/2012	6:01:11	1.3439	1081.183333	106.6561	17.6656
24/08/2012	6:01:41	1.3466	1081.683333	106.6534	17.6629
24/08/2012	6:02:11	1.3423	1082.183333	106.6577	17.6672
24/08/2012	6:02:41	1.3422	1082.683333	106.6578	17.6673
24/08/2012	6:03:11	1.3422	1083.183333	106.6578	17.6673
24/08/2012	6:03:41	1.3457	1083.683333	106.6543	17.6638
24/08/2012	6:04:11	1.3422	1084.183333	106.6578	17.6673
24/08/2012	6:04:41	1.3442	1084.683333	106.6558	17.6653
24/08/2012	6:05:11	1.345	1085.183333	106.655	17.6645
24/08/2012	6:05:41	1.3404	1085.683333	106.6596	17.6691
24/08/2012	6:06:11	1.3393	1086.183333	106.6607	17.6702
24/08/2012	6:06:41	1.3417	1086.683333	106.6583	17.6678
24/08/2012	6:07:11	1.3419	1087.183333	106.6581	17.6676
24/08/2012	6:07:41	1.345	1087.683333	106.655	17.6645
24/08/2012	6:08:11	1.3417	1088.183333	106.6583	17.6678
24/08/2012	6:08:41	1.3427	1088.683333	106.6573	17.6668
24/08/2012	6:09:11	1.3432	1089.183333	106.6568	17.6663
24/08/2012	6:09:41	1.3437	1089.683333	106.6563	17.6658
24/08/2012	6:10:11	1.3416	1090.183333	106.6584	17.6679
24/08/2012	6:10:41	1.3435	1090.683333	106.6565	17.666
24/08/2012	6:11:11	1.3422	1091.183333	106.6578	17.6673
24/08/2012	6:11:41	1.344	1091.683333	106.656	17.6655
24/08/2012	6:12:11	1.3405	1092.183333	106.6595	17.669
24/08/2012	6:12:41	1.3413	1092.683333	106.6587	17.6682
24/08/2012	6:13:11	1.3414	1093.183333	106.6586	17.6681
24/08/2012	6:13:41	1.3401	1093.683333	106.6599	17.6694
24/08/2012	6:14:11	1.3424	1094.183333	106.6576	17.6671
24/08/2012	6:14:41	1.3378	1094.683333	106.6622	17.6717
24/08/2012	6:15:11	1.3453	1095.183333	106.6547	17.6642
24/08/2012	6:15:41	1.3435	1095.683333	106.6565	17.666
24/08/2012	6:16:11	1.3404	1096.183333	106.6596	17.6691
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24/08/2012	6:17:11	1.3406	1097.183333	106.6594	17.6689
24/08/2012	6:17:41	1.3398	1097.683333	106.6602	17.6697
24/08/2012	6:18:11	1.3376	1098.183333	106.6624	17.6719
24/08/2012	6:18:41	1.3432	1098.683333	106.6568	17.6663
24/08/2012	6:19:11	1.3442	1099.183333	106.6558	17.6653
24/08/2012	6:19:41	1.3421	1099.683333	106.6579	17.6674
24/08/2012	6:20:11	1.3392	1100.183333	106.6608	17.6703
24/08/2012	6:20:41	1.3441	1100.683333	106.6559	17.6654
24/08/2012	6:21:11	1.3413	1101.183333	106.6587	17.6682
24/08/2012	6:21:41	1.3437	1101.683333	106.6563	17.6658
24/08/2012	6:22:11	1.3406	1102.183333	106.6594	17.6689
24/08/2012	6:22:41	1.3419	1102.683333	106.6581	17.6676
24/08/2012	6:23:11	1.3436	1103.183333	106.6564	17.6659
24/08/2012	6:23:41	1.3447	1103.683333	106.6553	17.6648
24/08/2012	6:24:11	1.3401	1104.183333	106.6599	17.6694
24/08/2012	6:24:41	1.3442	1104.683333	106.6558	17.6653
24/08/2012	6:25:11	1.342	1105.183333	106.658	17.6675
24/08/2012	6:25:41	1.3429	1105.683333	106.6571	17.6666
24/08/2012	6:26:11	1.3438	1106.183333	106.6562	17.6657
24/08/2012	6:26:41	1.3417	1106.683333	106.6583	17.6678
24/08/2012	6:27:11	1.3447	1107.183333	106.6553	17.6648
24/08/2012	6:27:41	1.3417	1107.683333	106.6583	17.6678
24/08/2012	6:28:11	1.337	1108.183333	106.663	17.6725
24/08/2012	6:28:41	1.3438	1108.683333	106.6562	17.6657
24/08/2012	6:29:11	1.3388	1109.183333	106.6612	17.6707
24/08/2012	6:29:41	1.3419	1109.683333	106.6581	17.6676

24/08/2012	6:30:11	1.3445	1110.183333	106.6555	17.665
24/08/2012	6:30:41	1.3408	1110.683333	106.6592	17.6687
24/08/2012	6:31:11	1.3462	1111.183333	106.6538	17.6633
24/08/2012	6:31:41	1.3421	1111.683333	106.6579	17.6674
24/08/2012	6:32:11	1.3441	1112.183333	106.6559	17.6654
24/08/2012	6:32:41	1.3407	1112.683333	106.6593	17.6688
24/08/2012	6:33:11	1.3423	1113.183333	106.6577	17.6672
24/08/2012	6:33:41	1.3441	1113.683333	106.6559	17.6654
24/08/2012	6:34:11	1.344	1114.183333	106.656	17.6655
24/08/2012	6:34:41	1.3444	1114.683333	106.6556	17.6651
24/08/2012	6:35:11	1.3455	1115.183333	106.6545	17.664
24/08/2012	6:35:41	1.342	1115.683333	106.658	17.6675
24/08/2012	6:36:11	1.3405	1116.183333	106.6595	17.669
24/08/2012	6:36:41	1.3439	1116.683333	106.6561	17.6656
24/08/2012	6:37:11	1.3493	1117.183333	106.6507	17.6602
24/08/2012	6:37:41	1.3433	1117.683333	106.6567	17.6662
24/08/2012	6:38:11	1.3451	1118.183333	106.6549	17.6644
24/08/2012	6:38:41	1.3469	1118.683333	106.6531	17.6626
24/08/2012	6:39:11	1.3448	1119.183333	106.6552	17.6647
24/08/2012	6:39:41	1.3445	1119.683333	106.6555	17.665
24/08/2012	6:40:11	1.3478	1120.183333	106.6522	17.6617
24/08/2012	6:40:41	1.3468	1120.683333	106.6532	17.6627
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24/08/2012	6:41:41	1.344	1121.683333	106.656	17.6655
24/08/2012	6:42:11	1.3477	1122.183333	106.6523	17.6618
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24/08/2012	6:43:11	1.3436	1123.183333	106.6564	17.6659
24/08/2012	6:43:41	1.3479	1123.683333	106.6521	17.6616
24/08/2012	6:44:11	1.3476	1124.183333	106.6524	17.6619
24/08/2012	6:44:41	1.3502	1124.683333	106.6498	17.6593
24/08/2012	6:45:11	1.3467	1125.183333	106.6533	17.6628
24/08/2012	6:45:41	1.3464	1125.683333	106.6536	17.6631
24/08/2012	6:46:11	1.3453	1126.183333	106.6547	17.6642
24/08/2012	6:46:41	1.3446	1126.683333	106.6554	17.6649
24/08/2012	6:47:11	1.3465	1127.183333	106.6535	17.663
24/08/2012	6:47:41	1.3478	1127.683333	106.6522	17.6617
24/08/2012	6:48:11	1.3467	1128.183333	106.6533	17.6628
24/08/2012	6:48:41	1.3462	1128.683333	106.6538	17.6633
24/08/2012	6:49:11	1.3463	1129.183333	106.6537	17.6632
24/08/2012	6:49:41	1.3508	1129.683333	106.6492	17.6587
24/08/2012	6:50:11	1.3505	1130.183333	106.6495	17.659
24/08/2012	6:50:41	1.3473	1130.683333	106.6527	17.6622
24/08/2012	6:51:11	1.3484	1131.183333	106.6516	17.6611
24/08/2012	6:51:41	1.3477	1131.683333	106.6523	17.6618
24/08/2012	6:52:11	1.3517	1132.183333	106.6483	17.6578
24/08/2012	6:52:41	1.3458	1132.683333	106.6542	17.6637
24/08/2012	6:53:11	1.3441	1133.183333	106.6559	17.6654
24/08/2012	6:53:41	1.3479	1133.683333	106.6521	17.6616
24/08/2012	6:54:11	1.3476	1134.183333	106.6524	17.6619
24/08/2012	6:54:41	1.3486	1134.683333	106.6514	17.6609
24/08/2012	6:55:11	1.3467	1135.183333	106.6533	17.6628
24/08/2012	6:55:41	1.3432	1135.683333	106.6568	17.6663
24/08/2012	6:56:11	1.3425	1136.183333	106.6575	17.667
24/08/2012	6:56:41	1.3444	1136.683333	106.6556	17.6651
24/08/2012	6:57:11	1.3435	1137.183333	106.6565	17.666
24/08/2012	6:57:41	1.3434	1137.683333	106.6566	17.6661
24/08/2012	6:58:11	1.3429	1138.183333	106.6571	17.6666
24/08/2012	6:58:41	1.3458	1138.683333	106.6542	17.6637
24/08/2012	6:59:11	1.3426	1139.183333	106.6574	17.6669
24/08/2012	6:59:41	1.3493	1139.683333	106.6507	17.6602
24/08/2012	7:00:11	1.3452	1140.183333	106.6548	17.6643
24/08/2012	7:00:41	1.3423	1140.683333	106.6577	17.6672
24/08/2012	7:01:11	1.3501	1141.183333	106.6499	17.6594
24/08/2012	7:01:41	1.3468	1141.683333	106.6532	17.6627
24/08/2012	7:02:11	1.3468	1142.183333	106.6532	17.6627
24/08/2012	7:02:41	1.345	1142.683333	106.655	17.6645
24/08/2012	7:03:11	1.3473	1143.183333	106.6527	17.6622
24/08/2012	7:03:41	1.3485	1143.683333	106.6515	17.661
24/08/2012	7:04:11	1.3453	1144.183333	106.6547	17.6642
24/08/2012	7:04:41	1.3467	1144.683333	106.6533	17.6628
24/08/2012	7:05:11	1.3437	1145.183333	106.6563	17.6658
24/08/2012	7:05:41	1.3453	1145.683333	106.6547	17.6642
24/08/2012	7:06:11	1.3441	1146.183333	106.6559	17.6654
24/08/2012	7:06:41	1.3449	1146.683333	106.6551	17.6646
24/08/2012	7:07:11	1.3439	1147.183333	106.6561	17.6656
24/08/2012	7:07:41	1.3429	1147.683333	106.6571	17.6666
24/08/2012	7:08:11	1.3405	1148.183333	106.6595	17.669
24/08/2012	7:08:41	1.3436	1148.683333	106.6564	17.6659
24/08/2012	7:09:11	1.3467	1149.183333	106.6533	17.6628
24/08/2012	7:09:41	1.347	1149.683333	106.653	17.6625
24/08/2012	7:10:11	1.3457	1150.183333	106.6543	17.6638
24/08/2012	7:10:41	1.3423	1150.683333	106.6577	17.6672
24/08/2012	7:11:11	1.3476	1151.183333	106.6524	17.6619
24/08/2012	7:11:41	1.3462	1151.683333	106.6538	17.6633
24/08/2012	7:12:11	1.3445	1152.183333	106.6555	17.665
24/08/2012	7:12:41	1.345	1152.683333	106.655	17.6645
24/08/2012	7:13:11	1.3467	1153.183333	106.6533	17.6628
24/08/2012	7:13:41	1.3439	1153.683333	106.6561	17.6656
24/08/2012	7:14:11	1.3431	1154.183333	106.6569	17.6664
24/08/2012	7:14:41	1.3471	1154.683333	106.6529	17.6624
24/08/2012	7:15:11	1.3465	1155.183333	106.6535	17.663
24/08/2012	7:15:41	1.345	1155.683333	106.655	17.6645
24/08/2012	7:16:11	1.3462	1156.183333	106.6538	17.6633
24/08/2012	7:16:41	1.3482	1156.683333	106.6518	17.6613
24/08/2012	7:17:11	1.3448	1157.183333	106.6552	17.6647
24/08/2012	7:17:41	1.3474	1157.683333	106.6526	17.6621
24/08/2012	7:18:11	1.3457	1158.183333	106.6543	17.6638
24/08/2012	7:18:41	1.3468	1158.683333	106.6532	17.6627
24/08/2012	7:19:11	1.3473	1159.183333	106.6527	17.6622
24/08/2012	7:19:41	1.3486	1159.683333	106.6514	17.6609
24/08/2012	7:20:11	1.3472	1160.183333	106.6528	17.6623
24/08/2012	7:20:41	1.3478	1160.683333	106.6522	17.6617
24/08/2012	7:21:11	1.3464	1161.183333	106.6536	17.6631
24/08/2012	7:21:41	1.348	1161.683333	106.652	17.6615
24/08/2012	7:22:11	1.3454	1162.183333	106.6546	17.6641
24/08/2012	7:22:41	1.3492	1162.683333	106.6508	17.6603
24/08/2012	7:23:11	1.348	1163.183333	106.652	17.6615
24/08/2012	7:23:41	1.3462	1163.683333	106.6538	17.6633
24/08/2012	7:24:11	1.3482	1164.183333	106.6518	17.6613
24/08/2012	7:24:41	1.3442	1164.683333	106.6558	17.6653
24/08/2012	7:25:11	1.3501	1165.183333	106.6499	17.6594
24/08/2012	7:25:41	1.3482	1165.683333	106.6518	17.6613
24/08/2012	7:26:11	1.3447	1166.183333	106.6553	17.6648
24/08/2012	7:26:41	1.345	1166.683333	106.655	17.6645
24/08/2012	7:27:11	1.3481	1167.183333	106.6519	17.6614
24/08/2012	7:27:41	1.3487	1167.683333	106.6513	17.6608
24/08/2012	7:28:11	1.3449	1168.183333	106.6551	17.6646

24/08/2012	7:28:41	1.3464	1168.683333	106.6536	17.6631
24/08/2012	7:29:11	1.3446	1169.183333	106.6554	17.6649
24/08/2012	7:29:41	1.3471	1169.683333	106.6529	17.6624
24/08/2012	7:30:11	1.3476	1170.183333	106.6524	17.6619
24/08/2012	7:30:41	1.3478	1170.683333	106.6522	17.6617
24/08/2012	7:31:11	1.3502	1171.183333	106.6498	17.6593
24/08/2012	7:31:41	1.3449	1171.683333	106.6551	17.6646
24/08/2012	7:32:11	1.3474	1172.183333	106.6526	17.6621
24/08/2012	7:32:41	1.3482	1172.683333	106.6518	17.6613
24/08/2012	7:33:11	1.3508	1173.183333	106.6492	17.6587
24/08/2012	7:33:41	1.3499	1173.683333	106.6501	17.6596
24/08/2012	7:34:11	1.3424	1174.183333	106.6576	17.6671
24/08/2012	7:34:41	1.349	1174.683333	106.651	17.6605
24/08/2012	7:35:11	1.3526	1175.183333	106.6474	17.6569
24/08/2012	7:35:41	1.3531	1175.683333	106.6469	17.6564
24/08/2012	7:36:11	1.3484	1176.183333	106.6516	17.6611
24/08/2012	7:36:41	1.3499	1176.683333	106.6501	17.6596
24/08/2012	7:37:11	1.3462	1177.183333	106.6538	17.6633
24/08/2012	7:37:41	1.3489	1177.683333	106.6511	17.6606
24/08/2012	7:38:11	1.3468	1178.183333	106.6532	17.6627
24/08/2012	7:38:41	1.3497	1178.683333	106.6503	17.6598
24/08/2012	7:39:11	1.3463	1179.183333	106.6537	17.6632
24/08/2012	7:39:41	1.3477	1179.683333	106.6523	17.6618
24/08/2012	7:40:11	1.3452	1180.183333	106.6548	17.6643
24/08/2012	7:40:41	1.3489	1180.683333	106.6511	17.6606
24/08/2012	7:41:11	1.3477	1181.183333	106.6523	17.6618
24/08/2012	7:41:41	1.3485	1181.683333	106.6515	17.661
24/08/2012	7:42:11	1.3527	1182.183333	106.6473	17.6568
24/08/2012	7:42:41	1.3501	1182.683333	106.6499	17.6594
24/08/2012	7:43:11	1.3507	1183.183333	106.6493	17.6588
24/08/2012	7:43:41	1.3548	1183.683333	106.6452	17.6547
24/08/2012	7:44:11	1.3432	1184.183333	106.6568	17.6663
24/08/2012	7:44:41	1.3495	1184.683333	106.6505	17.66
24/08/2012	7:45:11	1.3481	1185.183333	106.6519	17.6614
24/08/2012	7:45:41	1.3508	1185.683333	106.6492	17.6587
24/08/2012	7:46:11	1.3459	1186.183333	106.6541	17.6636
24/08/2012	7:46:41	1.3418	1186.683333	106.6582	17.6677
24/08/2012	7:47:11	1.3462	1187.183333	106.6538	17.6633
24/08/2012	7:47:41	1.3448	1187.683333	106.6552	17.6647
24/08/2012	7:48:11	1.3466	1188.183333	106.6534	17.6629
24/08/2012	7:48:41	1.3486	1188.683333	106.6514	17.6609
24/08/2012	7:49:11	1.3454	1189.183333	106.6546	17.6641
24/08/2012	7:49:41	1.3473	1189.683333	106.6527	17.6622
24/08/2012	7:50:11	1.3471	1190.183333	106.6529	17.6624
24/08/2012	7:50:41	1.3476	1190.683333	106.6524	17.6619
24/08/2012	7:51:11	1.3451	1191.183333	106.6549	17.6644
24/08/2012	7:51:41	1.3479	1191.683333	106.6521	17.6616
24/08/2012	7:52:11	1.3493	1192.183333	106.6507	17.6602
24/08/2012	7:52:41	1.3463	1192.683333	106.6537	17.6632
24/08/2012	7:53:11	1.3487	1193.183333	106.6513	17.6608
24/08/2012	7:53:41	1.3517	1193.683333	106.6483	17.6578
24/08/2012	7:54:11	1.3476	1194.183333	106.6524	17.6619
24/08/2012	7:54:41	1.3477	1194.683333	106.6523	17.6618
24/08/2012	7:55:11	1.3526	1195.183333	106.6474	17.6569
24/08/2012	7:55:41	1.3511	1195.683333	106.6489	17.6584
24/08/2012	7:56:11	1.3507	1196.183333	106.6493	17.6588
24/08/2012	7:56:41	1.348	1196.683333	106.652	17.6615
24/08/2012	7:57:11	1.3481	1197.183333	106.6519	17.6614
24/08/2012	7:57:41	1.3447	1197.683333	106.6553	17.6648
24/08/2012	7:58:11	1.3478	1198.183333	106.6522	17.6617
24/08/2012	7:58:41	1.3464	1198.683333	106.6536	17.6631
24/08/2012	7:59:11	1.348	1199.183333	106.652	17.6615
24/08/2012	7:59:41	1.3485	1199.683333	106.6515	17.661
24/08/2012	8:00:11	1.3475	1200.183333	106.6525	17.662
24/08/2012	8:00:41	1.345	1200.683333	106.655	17.6645
24/08/2012	8:01:11	1.345	1201.183333	106.655	17.6645
24/08/2012	8:01:41	1.3481	1201.683333	106.6519	17.6614
24/08/2012	8:02:11	1.3444	1202.183333	106.6556	17.6651
24/08/2012	8:02:41	1.3455	1202.683333	106.6545	17.664
24/08/2012	8:03:11	1.3469	1203.183333	106.6531	17.6626
24/08/2012	8:03:41	1.3448	1203.683333	106.6552	17.6647
24/08/2012	8:04:11	1.3449	1204.183333	106.6551	17.6646
24/08/2012	8:04:41	1.3478	1204.683333	106.6522	17.6617
24/08/2012	8:05:11	1.3469	1205.183333	106.6531	17.6626
24/08/2012	8:05:41	1.3456	1205.683333	106.6544	17.6639
24/08/2012	8:06:11	1.352	1206.183333	106.648	17.6575
24/08/2012	8:06:41	1.3499	1206.683333	106.6501	17.6596
24/08/2012	8:07:11	1.3513	1207.183333	106.6487	17.6582
24/08/2012	8:07:41	1.3508	1207.683333	106.6492	17.6587
24/08/2012	8:08:11	1.3491	1208.183333	106.6509	17.6604
24/08/2012	8:08:41	1.3487	1208.683333	106.6513	17.6608
24/08/2012	8:09:11	1.3502	1209.183333	106.6498	17.6593
24/08/2012	8:09:41	1.3507	1209.683333	106.6493	17.6588
24/08/2012	8:10:11	1.3505	1210.183333	106.6495	17.659
24/08/2012	8:10:41	1.3524	1210.683333	106.6476	17.6571
24/08/2012	8:11:11	1.3456	1211.183333	106.6544	17.6639
24/08/2012	8:11:41	1.3535	1211.683333	106.6465	17.656
24/08/2012	8:12:11	1.3502	1212.183333	106.6498	17.6593
24/08/2012	8:12:41	1.3486	1212.683333	106.6514	17.6609
24/08/2012	8:13:11	1.3499	1213.183333	106.6501	17.6596
24/08/2012	8:13:41	1.3519	1213.683333	106.6481	17.6576
24/08/2012	8:14:11	1.3476	1214.183333	106.6524	17.6619
24/08/2012	8:14:41	1.352	1214.683333	106.648	17.6575
24/08/2012	8:15:11	1.3496	1215.183333	106.6504	17.6599
24/08/2012	8:15:41	1.3492	1215.683333	106.6508	17.6603
24/08/2012	8:16:11	1.3451	1216.183333	106.6549	17.6644
24/08/2012	8:16:41	1.3502	1216.683333	106.6498	17.6593
24/08/2012	8:17:11	1.3489	1217.183333	106.6511	17.6606
24/08/2012	8:17:41	1.3447	1217.683333	106.6553	17.6648
24/08/2012	8:18:11	1.3478	1218.183333	106.6522	17.6617
24/08/2012	8:18:41	1.3497	1218.683333	106.6503	17.6598
24/08/2012	8:19:11	1.3476	1219.183333	106.6524	17.6619
24/08/2012	8:19:41	1.3524	1219.683333	106.6476	17.6571
24/08/2012	8:20:11	1.3487	1220.183333	106.6513	17.6608
24/08/2012	8:20:41	1.3488	1220.683333	106.6512	17.6607
24/08/2012	8:21:11	1.3488	1221.183333	106.6512	17.6607
24/08/2012	8:21:41	1.3515	1221.683333	106.6485	17.658
24/08/2012	8:22:11	1.3528	1222.183333	106.6472	17.6567
24/08/2012	8:22:41	1.3507	1222.683333	106.6493	17.6588
24/08/2012	8:23:11	1.3532	1223.183333	106.6468	17.6563
24/08/2012	8:23:41	1.3479	1223.683333	106.6521	17.6616
24/08/2012	8:24:11	1.352	1224.183333	106.648	17.6575
24/08/2012	8:24:41	1.3508	1224.683333	106.6492	17.6587
24/08/2012	8:25:11	1.3541	1225.183333	106.6459	17.6554
24/08/2012	8:25:41	1.3533	1225.683333	106.6467	17.6562
24/08/2012	8:26:11	1.3414	1226.183333	106.6586	17.6681
24/08/2012	8:26:41	1.3467	1226.683333	106.6533	17.6628

24/08/2012	8:27:11	1.346	1227.183333	106.654	17.6635
24/08/2012	8:27:41	1.3465	1227.683333	106.6535	17.663
24/08/2012	8:28:11	1.3424	1228.183333	106.6576	17.6671
24/08/2012	8:28:41	1.341	1228.683333	106.659	17.6685
24/08/2012	8:29:11	1.3415	1229.183333	106.6585	17.668
24/08/2012	8:29:41	1.3429	1229.683333	106.6571	17.6666
24/08/2012	8:30:11	1.3449	1230.183333	106.6551	17.6646
24/08/2012	8:30:41	1.3439	1230.683333	106.6561	17.6656
24/08/2012	8:31:11	1.3444	1231.183333	106.6556	17.6651
24/08/2012	8:31:41	1.3431	1231.683333	106.6569	17.6664
24/08/2012	8:32:11	1.3451	1232.183333	106.6549	17.6644
24/08/2012	8:32:41	1.3468	1232.683333	106.6532	17.6627
24/08/2012	8:33:11	1.343	1233.183333	106.657	17.6665
24/08/2012	8:33:41	1.3417	1233.683333	106.6583	17.6678
24/08/2012	8:34:11	1.3424	1234.183333	106.6576	17.6671
24/08/2012	8:34:41	1.3415	1234.683333	106.6585	17.668
24/08/2012	8:35:11	1.3455	1235.183333	106.6545	17.664
24/08/2012	8:35:41	1.3473	1235.683333	106.6527	17.6622
24/08/2012	8:36:11	1.3374	1236.183333	106.6626	17.6721
24/08/2012	8:36:41	1.3435	1236.683333	106.6565	17.666
24/08/2012	8:37:11	1.3363	1237.183333	106.6637	17.6732
24/08/2012	8:37:41	1.3421	1237.683333	106.6579	17.6674
24/08/2012	8:38:11	1.3439	1238.183333	106.6561	17.6656
24/08/2012	8:38:41	1.3398	1238.683333	106.6602	17.6697
24/08/2012	8:39:11	1.3401	1239.183333	106.6599	17.6694
24/08/2012	8:39:41	1.3402	1239.683333	106.6598	17.6693
24/08/2012	8:40:11	1.3454	1240.183333	106.6546	17.6641
24/08/2012	8:40:41	1.3395	1240.683333	106.6605	17.67
24/08/2012	8:41:11	1.3419	1241.183333	106.6581	17.6676
24/08/2012	8:41:41	1.3391	1241.683333	106.6609	17.6704
24/08/2012	8:42:11	1.3392	1242.183333	106.6608	17.6703
24/08/2012	8:42:41	1.3493	1242.683333	106.6507	17.6602
24/08/2012	8:43:11	1.3426	1243.183333	106.6574	17.6669
24/08/2012	8:43:41	1.3421	1243.683333	106.6579	17.6674
24/08/2012	8:44:11	1.3443	1244.183333	106.6557	17.6652
24/08/2012	8:44:41	1.3487	1244.683333	106.6513	17.6608
24/08/2012	8:45:11	1.3461	1245.183333	106.6539	17.6634
24/08/2012	8:45:41	1.3406	1245.683333	106.6594	17.6689
24/08/2012	8:46:11	1.3342	1246.183333	106.6658	17.6753
24/08/2012	8:46:41	1.3379	1246.683333	106.6621	17.6716
24/08/2012	8:47:11	1.3382	1247.183333	106.6618	17.6713
24/08/2012	8:47:41	1.34	1247.683333	106.66	17.6695
24/08/2012	8:48:11	1.3372	1248.183333	106.6628	17.6723
24/08/2012	8:48:41	1.3343	1248.683333	106.6657	17.6752
24/08/2012	8:49:11	1.33	1249.183333	106.67	17.6795
24/08/2012	8:49:41	1.3405	1249.683333	106.6595	17.669
24/08/2012	8:50:11	1.3388	1250.183333	106.6612	17.6707
24/08/2012	8:50:41	1.3123	1250.683333	106.6877	17.6972
24/08/2012	8:51:11	1.3433	1251.183333	106.6567	17.6662
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24/08/2012	8:52:11	1.3472	1252.183333	106.6528	17.6623
24/08/2012	8:52:41	1.3385	1252.683333	106.6615	17.671
24/08/2012	8:53:11	1.3413	1253.183333	106.6587	17.6682
24/08/2012	8:53:41	1.3291	1253.683333	106.6709	17.6804
24/08/2012	8:54:11	1.3403	1254.183333	106.6597	17.6692
24/08/2012	8:54:41	1.3431	1254.683333	106.6569	17.6664
24/08/2012	8:55:11	1.3429	1255.183333	106.6571	17.6666
24/08/2012	8:55:41	1.3449	1255.683333	106.6551	17.6646
24/08/2012	8:56:11	1.3314	1256.183333	106.6686	17.6781
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24/08/2012	8:57:11	1.3307	1257.183333	106.6693	17.6788
24/08/2012	8:57:41	1.3333	1257.683333	106.6667	17.6762
24/08/2012	8:58:11	1.335	1258.183333	106.665	17.6745
24/08/2012	8:58:41	1.3371	1258.683333	106.6629	17.6724
24/08/2012	8:59:11	1.3311	1259.183333	106.6689	17.6784
24/08/2012	8:59:41	1.3382	1259.683333	106.6618	17.6713
24/08/2012	9:00:11	1.3294	1260.183333	106.6706	17.6801
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24/08/2012	9:01:41	1.3398	1261.683333	106.6602	17.6697
24/08/2012	9:02:11	1.3376	1262.183333	106.6624	17.6719
24/08/2012	9:02:41	1.3449	1262.683333	106.6551	17.6646
24/08/2012	9:03:11	1.3416	1263.183333	106.6584	17.6679
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24/08/2012	9:05:11	1.3411	1265.183333	106.6589	17.6684
24/08/2012	9:05:41	1.3359	1265.683333	106.6641	17.6736
24/08/2012	9:06:11	1.3326	1266.183333	106.6674	17.6769
24/08/2012	9:06:41	1.3389	1266.683333	106.6611	17.6706
24/08/2012	9:07:11	1.3359	1267.183333	106.6641	17.6736
24/08/2012	9:07:41	1.3275	1267.683333	106.6725	17.682
24/08/2012	9:08:11	1.3317	1268.183333	106.6683	17.6778
24/08/2012	9:08:41	1.3368	1268.683333	106.6632	17.6727
24/08/2012	9:09:11	1.3426	1269.183333	106.6574	17.6669
24/08/2012	9:09:41	1.332	1269.683333	106.668	17.6775
24/08/2012	9:10:11	1.3304	1270.183333	106.6696	17.6791
24/08/2012	9:10:41	1.3203	1270.683333	106.6797	17.6892
24/08/2012	9:11:11	1.3274	1271.183333	106.6726	17.6821
24/08/2012	9:11:41	1.3322	1271.683333	106.6678	17.6773
24/08/2012	9:12:11	1.3349	1272.183333	106.6651	17.6746
24/08/2012	9:12:41	1.3261	1272.683333	106.6739	17.6834
24/08/2012	9:13:11	1.3318	1273.183333	106.6682	17.6777
24/08/2012	9:13:41	1.3287	1273.683333	106.6713	17.6808
24/08/2012	9:14:11	1.3257	1274.183333	106.6743	17.6838
24/08/2012	9:14:41	1.3273	1274.683333	106.6727	17.6822
24/08/2012	9:15:11	1.3312	1275.183333	106.6688	17.6783
24/08/2012	9:15:41	1.3284	1275.683333	106.6716	17.6811
24/08/2012	9:16:11	1.3289	1276.183333	106.6711	17.6806
24/08/2012	9:16:41	1.3346	1276.683333	106.6654	17.6749
24/08/2012	9:17:11	1.3366	1277.183333	106.6634	17.6729
24/08/2012	9:17:41	1.3296	1277.683333	106.6704	17.6799
24/08/2012	9:18:11	1.3359	1278.183333	106.6641	17.6736
24/08/2012	9:18:41	1.3295	1278.683333	106.6705	17.68
24/08/2012	9:19:11	1.3279	1279.183333	106.6721	17.6816
24/08/2012	9:19:41	1.3333	1279.683333	106.6667	17.6762
24/08/2012	9:20:11	1.3257	1280.183333	106.6743	17.6838
24/08/2012	9:20:41	1.3411	1280.683333	106.6589	17.6684
24/08/2012	9:21:11	1.3356	1281.183333	106.6644	17.6739
24/08/2012	9:21:41	1.3426	1281.683333	106.6574	17.6669
24/08/2012	9:22:11	1.3281	1282.183333	106.6719	17.6814
24/08/2012	9:22:41	1.3387	1282.683333	106.6613	17.6708
24/08/2012	9:23:11	1.3337	1283.183333	106.6663	17.6758
24/08/2012	9:23:41	1.3351	1283.683333	106.6649	17.6744
24/08/2012	9:24:11	1.3404	1284.183333	106.6596	17.6691
24/08/2012	9:24:41	1.3288	1284.683333	106.6712	17.6807
24/08/2012	9:25:11	1.3295	1285.183333	106.6705	17.68

24/08/2012	9:25:41	1.3287	1285.683333	106.6713	17.6808				
24/08/2012	9:26:11	1.335	1286.183333	106.665	17.6745				
24/08/2012	9:26:41	1.3183	1286.683333	106.6817	17.6912				
24/08/2012	9:27:11	1.3321	1287.183333	106.6679	17.6774				
24/08/2012	9:27:41	1.3328	1287.683333	106.6672	17.6767				
24/08/2012	9:28:11	1.3344	1288.183333	106.6656	17.6751				
24/08/2012	9:28:41	1.3252	1288.683333	106.6748	17.6843				
24/08/2012	9:29:11	1.3315	1289.183333	106.6685	17.678				
24/08/2012	9:29:41	1.3297	1289.683333	106.6703	17.6798				
24/08/2012	9:30:11	1.3362	1290.183333	106.6638	17.6733				
24/08/2012	9:30:41	1.3269	1290.683333	106.6731	17.6826				
24/08/2012	9:31:11	1.3251	1291.183333	106.6749	17.6844				
24/08/2012	9:31:41	1.3379	1291.683333	106.6621	17.6716				
24/08/2012	9:32:11	1.3363	1292.183333	106.6637	17.6732				
24/08/2012	9:32:41	1.3347	1292.683333	106.6653	17.6748				
24/08/2012	9:33:11	1.3293	1293.183333	106.6707	17.6802				
24/08/2012	9:33:41	1.3355	1293.683333	106.6645	17.674				
24/08/2012	9:34:11	1.3356	1294.183333	106.6644	17.6739				
24/08/2012	9:34:41	1.3335	1294.683333	106.6665	17.676				
24/08/2012	9:35:11	1.3355	1295.183333	106.6645	17.674				
24/08/2012	9:35:41	1.335	1295.683333	106.665	17.6745				
24/08/2012	9:36:11	1.3336	1296.183333	106.6664	17.6759				
24/08/2012	9:36:41	1.3367	1296.683333	106.6633	17.6728				
24/08/2012	9:37:11	1.3302	1297.183333	106.6698	17.6793				
24/08/2012	9:37:41	1.3327	1297.683333	106.6673	17.6768				
24/08/2012	9:38:11	1.338	1298.183333	106.662	17.6715				
24/08/2012	9:38:41	1.3394	1298.683333	106.6606	17.6701				
24/08/2012	9:39:11	1.3254	1299.183333	106.6746	17.6841				
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24/08/2012	9:40:11	1.3292	1300.183333	106.6708	17.6803				
24/08/2012	9:40:41	1.327	1300.683333	106.673	17.6825				
24/08/2012	9:41:11	1.3251	1301.183333	106.6749	17.6844				
24/08/2012	9:41:41	1.3314	1301.683333	106.6686	17.6781				
24/08/2012	9:42:11	1.3273	1302.183333	106.6727	17.6822				
24/08/2012	9:42:41	1.3281	1302.683333	106.6719	17.6814				
24/08/2012	9:43:11	1.324	1303.183333	106.676	17.6855				
24/08/2012	9:43:41	1.3296	1303.683333	106.6704	17.6799				
24/08/2012	9:44:11	1.3309	1304.183333	106.6691	17.6786				
24/08/2012	9:44:41	1.3175	1304.683333	106.6825	17.692				
24/08/2012	9:45:11	1.3337	1305.183333	106.6663	17.6758				
24/08/2012	9:45:41	1.325	1305.683333	106.675	17.6845				
24/08/2012	9:46:11	1.3249	1306.183333	106.6751	17.6846				
24/08/2012	9:46:41	1.3268	1306.683333	106.6732	17.6827				
24/08/2012	9:47:11	1.3307	1307.183333	106.6693	17.6788				
24/08/2012	9:47:41	1.3265	1307.683333	106.6735	17.683				
24/08/2012	9:48:11	1.3267	1308.183333	106.6733	17.6828				
24/08/2012	9:48:41	1.3246	1308.683333	106.6754	17.6849				
24/08/2012	9:49:11	1.3296	1309.183333	106.6704	17.6799				
24/08/2012	9:49:41	1.3241	1309.683333	106.6759	17.6854				
24/08/2012	9:50:11	1.3336	1310.183333	106.6664	17.6759				
24/08/2012	9:50:41	1.3307	1310.683333	106.6693	17.6788				
24/08/2012	9:51:11	1.3367	1311.183333	106.6633	17.6728				
24/08/2012	9:51:41	1.3311	1311.683333	106.6689	17.6784				
24/08/2012	9:52:11	1.3308	1312.183333	106.6692	17.6787				
24/08/2012	9:52:41	1.3369	1312.683333	106.6631	17.6726				
24/08/2012	9:53:11	1.3365	1313.183333	106.6635	17.673				
24/08/2012	9:53:41	1.3226	1313.683333	106.6774	17.6869				
24/08/2012	9:54:11	1.3309	1314.183333	106.6691	17.6786				
24/08/2012	9:54:41	1.3328	1314.683333	106.6672	17.6767				
24/08/2012	9:55:11	1.3314	1315.183333	106.6686	17.6781				
24/08/2012	9:55:41	1.3379	1315.683333	106.6621	17.6716				
24/08/2012	9:56:11	1.3296	1316.183333	106.6704	17.6799				
24/08/2012	9:56:41	1.3445	1316.683333	106.6555	17.665				
24/08/2012	9:57:11	1.3239	1317.183333	106.6761	17.6856				
24/08/2012	9:57:41	1.3328	1317.683333	106.6672	17.6767				
24/08/2012	9:58:11	1.3394	1318.183333	106.6606	17.6701				
24/08/2012	9:58:41	1.3421	1318.683333	106.6579	17.6674				
24/08/2012	9:59:11	1.3249	1319.183333	106.6751	17.6846				
24/08/2012	9:59:41	1.3276	1319.683333	106.6724	17.6819				
24/08/2012	10:00:11	1.3311	1320.183333	106.6689	17.6784	6.8	1086	22.7	Clear discharge water. Sample collected for laboratory analysis
24/08/2012	10:00:41	1.3362	1320.683333	106.6638	17.6733				
24/08/2012	10:01:11	1.328	1321.183333	106.672	17.6815				
24/08/2012	10:01:41	1.3421	1321.683333	106.6579	17.6674				
24/08/2012	10:02:11	1.335	1322.183333	106.665	17.6745				
24/08/2012	10:02:41	1.33	1322.683333	106.67	17.6795				
24/08/2012	10:03:11	1.327	1323.183333	106.673	17.6825				
24/08/2012	10:03:41	1.3375	1323.683333	106.6625	17.672				
24/08/2012	10:04:11	1.3302	1324.183333	106.6698	17.6793				
24/08/2012	10:04:41	1.3299	1324.683333	106.6701	17.6796				
24/08/2012	10:05:11	4.769	1325.183333	103.231	14.2405				
24/08/2012	10:05:41	10.5245	1325.683333	97.4755	8.485				
24/08/2012	10:06:11	15.1562	1326.183333	92.8438	3.8533				
24/08/2012	10:06:41	18.4143	1326.683333	89.5857	0.5952				
24/08/2012	10:07:11	19.4318	1327.183333	88.5682	-0.4223				
24/08/2012	10:07:41	19.8339	1327.683333	88.1661	-0.8244				
24/08/2012	10:08:11	20.0169	1328.183333	87.9831	-1.0074				
24/08/2012	10:08:41	20.086	1328.683333	87.914	-1.0765				
24/08/2012	10:09:11	20.0781	1329.183333	87.9219	-1.0686				
24/08/2012	10:09:41	20.023	1329.683333	87.977	-1.0135				
24/08/2012	10:10:11	19.9577	1330.183333	88.0423	-0.9482				
24/08/2012	10:10:41	19.8641	1330.683333	88.1359	-0.8546				
24/08/2012	10:11:11	19.7626	1331.183333	88.2374	-0.7531				
24/08/2012	10:11:41	19.643	1331.683333	88.357	-0.6335				
24/08/2012	10:12:11	19.5334	1332.183333	88.4666	-0.5239				
24/08/2012	10:12:41	19.3639	1332.683333	88.6361	-0.3544				
24/08/2012	10:13:11	19.2573	1333.183333	88.7427	-0.2478				
24/08/2012	10:13:41	19.1546	1333.683333	88.8454	-0.1451				
24/08/2012	10:14:11	19.0626	1334.183333	88.9374	-0.0531				
24/08/2012	10:14:41	18.9884	1334.683333	89.0116	0.0211				
24/08/2012	10:15:11	18.9352	1335.183333	89.0648	0.0743				
24/08/2012	10:15:41	18.898	1335.683333	89.102	0.1115				
24/08/2012	10:16:11	18.8755	1336.183333	89.1245	0.134				
24/08/2012	10:16:41	18.8606	1336.683333	89.1394	0.1489				
24/08/2012	10:17:11	18.8505	1337.183333	89.1495	0.159				
24/08/2012	10:17:41	18.8417	1337.683333	89.1583	0.1678				
24/08/2012	10:18:11	18.8384	1338.183333	89.1616	0.1711				
24/08/2012	10:18:41	18.8331	1338.683333	89.1669	0.1764				
24/08/2012	10:19:11	18.8293	1339.183333	89.1707	0.1802				
24/08/2012	10:19:41	18.8289	1339.683333	89.1711	0.1806				
24/08/2012	10:20:11	18.8257	1340.183333	89.1743	0.1838				
24/08/2012	10:20:41	18.8264	1340.683333	89.1736	0.1831				
24/08/2012	10:21:11	18.8252	1341.183333	89.1748	0.1843				
24/08/2012	10:21:41	18.8247	1341.683333	89.1753	0.1848				
24/08/2012	10:22:11	18.8248	1342.183333	89.1752	0.1847				
24/08/2012	10:22:41	18.8273	1342.683333	89.1727	0.1822				
24/08/2012	10:23:11	18.8239	1343.183333	89.1761	0.1856				
24/08/2012	10:23:41	18.8254	1343.683333	89.1746	0.1841				

24/08/2012	10:24:11	18.8256	1344.183333	89.1744	0.1839	
24/08/2012	10:24:41	18.8252	1344.683333	89.1748	0.1843	
24/08/2012	10:25:11	18.8258	1345.183333	89.1742	0.1837	
24/08/2012	10:25:41	18.8266	1345.683333	89.1734	0.1829	
24/08/2012	10:26:11	18.825	1346.183333	89.175	0.1845	
24/08/2012	10:26:41	18.824	1346.683333	89.176	0.1855	
24/08/2012	10:27:11	18.8237	1347.183333	89.1763	0.1858	
24/08/2012	10:27:41	18.8263	1347.683333	89.1737	0.1832	
24/08/2012	10:28:11	18.8246	1348.183333	89.1754	0.1849	
24/08/2012	10:28:41	18.8262	1348.683333	89.1738	0.1833	
24/08/2012	10:29:11	18.8264	1349.183333	89.1736	0.1831	
24/08/2012	10:29:41	18.8232	1349.683333	89.1768	0.1863	
24/08/2012	10:30:11	18.827	1350.183333	89.173	0.1825	
24/08/2012	10:30:41	18.8279	1350.683333	89.1721	0.1816	
24/08/2012	10:31:11	18.8289	1351.183333	89.1711	0.1806	
24/08/2012	10:31:41	18.8309	1351.683333	89.1691	0.1786	
24/08/2012	10:32:11	18.8287	1352.183333	89.1713	0.1808	
24/08/2012	10:32:41	18.8278	1352.683333	89.1722	0.1817	
24/08/2012	10:33:11	18.8257	1353.183333	89.1743	0.1838	
24/08/2012	10:33:41	18.8278	1353.683333	89.1722	0.1817	
24/08/2012	10:34:11	18.8309	1354.183333	89.1691	0.1786	
24/08/2012	10:34:41	18.8303	1354.683333	89.1697	0.1792	
24/08/2012	10:35:11	18.8327	1355.183333	89.1673	0.1768	
24/08/2012	10:35:41	18.8112	1355.683333	89.1888	0.1983	
24/08/2012	10:36:11	18.8277	1356.183333	89.1723	0.1818	
24/08/2012	10:36:41	18.8241	1356.683333	89.1759	0.1854	
24/08/2012	10:37:11	18.8363	1357.183333	89.1637	0.1732	
24/08/2012	10:37:41	18.8381	1357.683333	89.1619	0.1714	
24/08/2012	10:38:11	18.8399	1358.183333	89.1601	0.1696	
24/08/2012	10:38:41	18.8411	1358.683333	89.1589	0.1684	
24/08/2012	10:39:11	18.8396	1359.183333	89.1604	0.1699	
24/08/2012	10:39:41	18.8418	1359.683333	89.1582	0.1677	
24/08/2012	10:40:11	18.8397	1360.183333	89.1603	0.1698	
24/08/2012	10:40:41	18.839	1360.683333	89.161	0.1705	
24/08/2012	10:41:11	18.8402	1361.183333	89.1598	0.1693	
24/08/2012	10:41:41	18.8398	1361.683333	89.1602	0.1697	
24/08/2012	10:42:11	18.8405	1362.183333	89.1595	0.169	
24/08/2012	10:42:41	18.841	1362.683333	89.159	0.1685	
24/08/2012	10:43:11	18.8381	1363.183333	89.1619	0.1714	
24/08/2012	10:43:41	18.839	1363.683333	89.161	0.1705	
24/08/2012	10:44:11	18.842	1364.183333	89.158	0.1675	
24/08/2012	10:44:41	18.84	1364.683333	89.16	0.1695	
24/08/2012	10:45:11	18.8446	1365.183333	89.1554	0.1649	
24/08/2012	10:45:41	18.8651	1365.683333	89.1349	0.1444	
24/08/2012	10:46:11	18.9151	1366.183333	89.0849	0.0944	
24/08/2012	10:46:41	18.8918	1366.683333	89.1082	0.1177	
24/08/2012	10:47:11	18.891	1367.183333	89.109	0.1185	
24/08/2012	10:47:41	18.0182	1367.683333	89.9818	0.9913	started pulling pump out

Appendix F

Laboratory Certificates and Chain-of-Custody

CERTIFICATE OF ANALYSIS

Work Order	: **EM1207961**	Page	: 1 of 3
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MR STEVEN GRAY	Contact	: Bronwyn Sheen
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC, AUSTRALIA 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: steven.gray@aecom.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9636
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60266544 Glenaladale Mineral Sands	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 12-JUL-2012
Sampler	: SJ	Issue Date	: 20-JUL-2012
Site	: ----		
		No. of samples received	: 1
Quote number	: EN/004/11	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020F: Filtered iron results for EM1207961-001 have been confirmed by re-preparation and re-analysis.**
- **Specific Gravity, Density and Viscosity conducted by ALS Sydney (Tribology).**

Analytical Results

Sub-Matrix: **WATER**			Client sample ID	**MW1**	----	----	----	----
			Client sampling date / time	11-JUL-2012 11:30	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1207961-001**	**----**	**----**	**----**	**----**
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	**990**	----	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	**596**	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**132**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Iron	7439-89-6	0.05	mg/L	**3.48**	----	----	----	----
EG051G: Ferrous Iron by Discrete Analyser								
Ferrous Iron	----	0.05	mg/L	**3.19**	----	----	----	----
EG053FG-MS: Dissolved Ferric Iron by ICPMS and DA								
Ferric Iron	----	0.05	mg/L	**0.29**	----	----	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	**5**	----	----	----	----

QUALITY CONTROL REPORT

Work Order	: **EM1207961**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MR STEVEN GRAY	Contact	: Bronwyn Sheen
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC, AUSTRALIA 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: steven.gray@aecom.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9636
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60266544 Glenaladale Mineral Sands	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 12-JUL-2012
Sampler	: SJ	Issue Date	: 20-JUL-2012
Order number	: ----		
		No. of samples received	: 1
Quote number	: EN/004/11	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA
WORLD RECOGNISED
ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA010: Conductivity (QC Lot: 2400969)									
EM1207961-001	MW1	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	990	1030	4.0	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 2403064)									
EM1207961-001	MW1	EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	596	598	0.3	0% - 20%
EM1207976-007	Anonymous	EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	3400	3360	1.3	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2401716)									
EM1207912-005	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EM1207973-003	Anonymous	EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 2404456)									
EM1207806-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	0.09	0.06	41.1	No Limit
EM1207877-001	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 2403664)									
EM1207961-001	MW1	EP002: Dissolved Organic Carbon	----	1	mg/L	5	5	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA010: Conductivity (QCLot: 2400969)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1413 µS/cm	101	98	102
EA015: Total Dissolved Solids (QCLot: 2403064)								
EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	<10	2000 mg/L	101	98	104
EG020F: Dissolved Metals by ICP-MS (QCLot: 2401716)								
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.3	79	119
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2404456)								
EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	2 mg/L	108	85.3	112
EP002: Dissolved Organic Carbon (DOC) (QCLot: 2403664)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	100 mg/L	99.9	81	111

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	Concentration	MS	Low	High
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2404456)							
EM1207806-002	Anonymous	EG051G: Ferrous Iron	----	2 mg/L	104	70	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 2403664)							
EM1207973-002	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	96.5	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1207961**	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Melbourne
Contact	: MR STEVEN GRAY	Contact	: Bronwyn Sheen
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC, AUSTRALIA 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: steven.gray@aecom.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9636
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60266544 Glenaladale Mineral Sands	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 12-JUL-2012
Sampler	: SJ	Issue Date	: 20-JUL-2012
Order number	: ----		
		No. of samples received	: 1
Quote number	: EN/004/11	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
***Container** / Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA010: Conductivity							
Clear Plastic Bottle - Natural MW1	**11-JUL-2012**	**----**	----	----	**13-JUL-2012**	08-AUG-2012	✓
EA015: Total Dissolved Solids							
Clear Plastic Bottle - Natural MW1	**11-JUL-2012**	**----**	----	----	**16-JUL-2012**	18-JUL-2012	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered MW1	**11-JUL-2012**	**---**	07-JAN-2013	----	**13-JUL-2012**	07-JAN-2013	✓
EG051G: Ferrous Iron by Discrete Analyser							
Clear Plastic Bottle - HCl - Filtered MW1	**11-JUL-2012**	**----**	----	----	**16-JUL-2012**	18-JUL-2012	✓
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved MW1	**11-JUL-2012**	**----**	----	----	**16-JUL-2012**	08-AUG-2012	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Conductivity	EA010	1	1	**100.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Organic Carbon	EP002	1	2	**50.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Conductivity	EA010	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Organic Carbon	EP002	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Conductivity	EA010	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Organic Carbon	EP002	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Organic Carbon	EP002	1	2	**50.0**	**5.0**	✓	ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Conductivity	EA010	WATER	APHA 21st ed., 2510 B Conductivity is determined by ISE, either manually or automated measurement. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of \`filterable\` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Hardness as CaCO3	EA065	WATER	APHA 21st ed., 2340 B. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Sodium Absorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Total Hardness is calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ferric Iron - Dissolved	EG053FG-MS	WATER	APHA 21st ed., 3500 Fe-B. The 0.45um filtered Ferric Iron is determined as the difference between Filtered Iron and Filtered Ferrous Iron quantify by ICPMS and Discrete Analyser.
Dissolved Organic Carbon	EP002	WATER	APHA 21st ed., 5310 B. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Viscosity in Water	VISC-WAT	WATER	Viscosity analysis of water matrices conducted by Subcontracting Laboratory

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

ALS WearCheck - a division of ALS

WEAR CHECK

CERTIFICATE OF ANALYSIS

Sample No.	10203699117	**Date Sampled**	11/07/12
Sample ID	EM7961	**Date Received**	19/07/12
Description	Fuel	**Date Reported**	20/07/12

TESTS - Description/Method	**RESULTS**	**UNITS**
Density		
Density at 15°C (ASTM D4052)	0.9997	g/mL
Specific Gravity at 15°C (ASTM D4052)	1.0004	
Kinematic Viscosity		
Viscosity at Ambiant Temp (ASTM D445)	0.912	cSt

Filter Image

Filter patch test is not performed Contact laboratory for more information

CLIENT NAME

ALS ENVIRONMENTAL VICTORIA

CLIENT ADDRESS

Site

Unit Make

Unit Model

Cmpt Make

Cmpt Model

Fluid Mnft Unidentified

Type Water

Grade ?

Capacity

NA1
02B3048
abbie.guanco
Ivan.Lo

COMMENTS

Results were obtained on the top layer of sample as received. Diagnosis not applicable.

Signatory -

Kane Ashworth - Regional Manager NSW ☐ Jack Shepherd - Petroleum Specialist ☐ Alina Stefanescu - QC Chemist ☐

TESTING LABORATORY - SYDNEY

Note: This analysis report shall not be reproduced except in full, without the written approval of the laboratory.

ALS Tribology - NSW
Attn:
Locked Bag 106
WETHERILL PARK BC NSW 1851

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000

Tel: 61 3 9653 1234
Fax: 61 3 9653 1234
Email: steven.gray@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address:
Contact Name: Samantha Smith
Lab. Ref:

Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Glenaladale Mineral Sands
Project Number: 60266544
Purchase Order Number:

Sample collected by: ~~Ian Ullah~~ SCOTT JENKE
Sample Results to be returned to: steven.gray@aecom.com

Environmental Division
Melbourne
Work Order
EM1207961
Telephone : +61-3-8549 9600

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _______days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☑ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A

7. Report Format:
8. Project Manager: tel:

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix			Preservation				Container	Analysis Requ															
				soil	water	other	filt'ed	acid	ice	other	(No. & type)	Specific gravity	Density	Viscosity	EC	Dissolved Organic Carbon	Total Hardenss as CaCO3	TDS	Iron (dissolved)	Ferric iron	Ferrous iron						
①	MW1	11/07 1130am	. —		Y		Y	Y	Y		3x1L BOTTLE	✱ →									→						
											1 x 40mL VIAL 2x 60mL VIAL	-															HEAVY METALS + FERROUS IRON

Relinquished By:
Name: SCOTT JENKE ~~Ian Ullah~~ Date: 11/07
of: AECOM Time: 1130Am

Received by:
Name: Jacqui Date: 12/7
of: ALS Time: 2.35

Received in good condition?	Yes/No/NA	**Method of Shipment**	☑ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	**Consignment Note No.**	
	Yes/No/NA	**Transport Co:**	

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: Date:
of: Time:

Received in good condition?	Yes/No/NA	**Method of Shipment**	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	**Consignment Note No.**	
	Yes/No/NA	**Transport Co:**	

Printed copies of this document are uncontrolled

Revision: Oct 09

CERTIFICATE OF ANALYSIS

Work Order	: **EM1209885**	Page	: 1 of 3
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MR STEVEN GRAY	Contact	: Bronwyn Sheen
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC, AUSTRALIA 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: steven.gray@aecom.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9636
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60266544 Glenaladale Mineral Sands	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 28-AUG-2012
Sampler	: GJ	Issue Date	: 31-AUG-2012
Site	: ----		
		No. of samples received	: 1
Quote number	: EN/004/11	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **Ionic Balance out of acceptable limits due to analytes not quantified in this report.**
- **Ionic balances were calculated using: major anions - chloride, alkalinity and sulfate; and major cations - calcium, magnesium, potassium and sodium.**

Analytical Results

Sub-Matrix: **WATER**			*Client sample ID*	**MW1**	----	----	----	----
			Client sampling date / time	[27-AUG-2012]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1209885-001**	**----**	**----**	**----**	**----**
EA005: pH								
pH Value	----	0.01	pH Unit	**6.31**	----	----	----	----
EA010: Conductivity								
Electrical Conductivity @ 25°C	----	1	µS/cm	**1090**	----	----	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	**660**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**68**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**68**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**68**	----	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	**295**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**29**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**17**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**155**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**12**	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**11.1**	----	----	----	----
Total Cations	----	0.01	meq/L	**9.90**	----	----	----	----
Ionic Balance	----	0.01	%	**5.73**	----	----	----	----

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1209885**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Melbourne
Contact	: MR STEVEN GRAY	Contact	: Bronwyn Sheen
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC, AUSTRALIA 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: steven.gray@aecom.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9636
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60266544 Glenaladale Mineral Sands	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-AUG-2012
Sampler	: GJ	Issue Date	: 31-AUG-2012
Order number	: ----		
		No. of samples received	: 1
Quote number	: EN/004/11	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA
WORLD RECOGNISED
ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA005: pH (QC Lot: 2472450)									
EM1209846-001	Anonymous	EA005: pH Value	----	0.01	pH Unit	5.72	5.73	0.2	0% - 20%
EM1209847-004	Anonymous	EA005: pH Value	----	0.01	pH Unit	7.36	7.39	0.4	0% - 20%
EA010: Conductivity (QC Lot: 2472076)									
EM1209851-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	2110	2070	1.7	0% - 20%
EA015: Total Dissolved Solids (QC Lot: 2474075)									
EM1209874-002	Anonymous	EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	4300	4300	0.0	0% - 20%
EM1209902-001	Anonymous	EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	35	32	9.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 2472732)									
EM1209869-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	70	69	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	70	69	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2472809)									
EM1209847-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1290	1300	0.8	0% - 20%
EM1209874-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	----	-	Not Authorised	# Not Authorised	----	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 2472807)									
EM1209847-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	4800	4740	1.4	0% - 20%
EM1209902-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	8	8	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 2472805)									
EM1209847-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	853	782	8.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	333	308	7.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2200	2050	7.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	33	31	6.6	0% - 20%

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EA010: Conductivity (QCLot: 2472076)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1413 µS/cm	100	98	102
EA015: Total Dissolved Solids (QCLot: 2474075)								
EA015H: Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	<10	2000 mg/L	101	98	104
ED037P: Alkalinity by PC Titrator (QCLot: 2472732)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	98.8	77	127
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2472809)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	12.5 mg/L	104	81	125
ED045G: Chloride Discrete analyser (QCLot: 2472807)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	99.6	89	117
ED093F: Dissolved Major Cations (QCLot: 2472805)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	5 mg/L	101	83	129
ED093F: Magnesium	7439-95-4	1	mg/L	<1	5 mg/L	99.7	80	124
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.3	77	125
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.3	77	123

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2472809)							
EM1209847-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70	130
ED045G: Chloride Discrete analyser (QCLot: 2472807)							
EM1209847-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1209885**	Page	: 1 of 5
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Melbourne
Contact	: MR STEVEN GRAY	Contact	: Bronwyn Sheen
Address	: LEVEL 45, 80 COLLINS STREET MELBOURNE VIC, AUSTRALIA 3004	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: steven.gray@aecom.com	E-mail	: bronwyn.sheen@alsglobal.com
Telephone	: +61 03 9653 1234	Telephone	: +61-3-8549 9636
Facsimile	: +61 03 9654 7117	Facsimile	: +61-3-8549 9601
Project	: 60266544 Glenaladale Mineral Sands	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-AUG-2012
Sampler	: GJ	Issue Date	: 31-AUG-2012
Order number	: ----		
		No. of samples received	: 1
Quote number	: EN/004/11	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non -volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA005: pH							
Miscellaneous Plastic bottle -unpreserved MW1	**27-AUG-2012**	**----**	----	----	**29-AUG-2012**	27-AUG-2012	✗
EA010: Conductivity							
Miscellaneous Plastic bottle -unpreserved MW1	**27-AUG-2012**	**----**	----	----	**29-AUG-2012**	24-SEP-2012	✓
EA015: Total Dissolved Solids							
Miscellaneous Plastic bottle -unpreserved MW1	**27-AUG-2012**	**----**	----	----	**30-AUG-2012**	03-SEP-2012	✓
ED037P: Alkalinity by PC Titrator							
Miscellaneous Plastic bottle -unpreserved MW1	**27-AUG-2012**	**---**	10-SEP-2012	----	**29-AUG-2012**	10-SEP-2012	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Miscellaneous Plastic bottle -unpreserved MW1	**27-AUG-2012**	**---**	24-SEP-2012	----	**30-AUG-2012**	24-SEP-2012	✓
ED045G: Chloride Discrete analyser							
Miscellaneous Plastic bottle -unpreserved MW1	**27-AUG-2012**	**---**	24-SEP-2012	----	**30-AUG-2012**	24-SEP-2012	✓
ED093F: Dissolved Major Cations							
Miscellaneous Plastic bottle -unpreserved MW1	**27-AUG-2012**	**---**	03-SEP-2012	----	**31-AUG-2012**	03-SEP-2012	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(where) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		*Count*		*Rate (%)*			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by PC Titrator	ED037-P	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	9	**22.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity	EA010	1	6	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH	EA005	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	9	**22.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity	EA010	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Chloride by Discrete Analyser	ED045G	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Conductivity	EA010	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
pH	EA005	WATER	APHA 21st ed. 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Conductivity	EA010	WATER	APHA 21st ed., 2510 B Conductivity is determined by ISE, either manually or automated measurement. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Sodium Absorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO4 by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EM1209847-001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride Discrete analyser	EM1209847-001	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

Matrix: **WATER**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA005: pH						
Miscellaneous Plastic bottle -unpreserved MW1	----	----	----	29-AUG-2012	27-AUG-2012	**2**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Melbourne
Level 9, 8 Exhibition Street
Melbourne VIC 3000

Tel: 61 3 9653 1234
Fax: 61 3 9653 1234
Email: steven.gray@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 4 Westall Road Springvale 3171
Contact Name: Samantha Smith
Lab. Ref:
Tel: 8549 9644
Fax
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Glenaladale Mineral Sands
Project Number: 60266544
Purchase Order Number:

Sample collected by: Glenn Johnson
Sample Results to be returned to: steven.gray@aecom.com

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _______days)	☐ Yes	☑ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☑ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☑ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☑ No	☐ N/A
5. Preservation requirements?	☐ Yes	☑ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☑ Yes	☐ No	☐ N/A

7. Report Format:
8. Project Manager:
tel:

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	EC	TDS	Sulphate	Chloride	Alkalinity	Calcium (Ca)	Potassium (K)	Magnesium (Mg)	Sodium (Na)	pH				
1	MW1				Y		N	N	Y		2 x 1L	X	X	X	X	X	X	X	X	X	X				

Remarks & comments

pH, EC, TDS and major cations/anions (standard testing) (noted that pH will be outside holding time)

Environmental Division
Melbourne
Work Order
EM1209885

Telephone : + 61-3-8549 9600

Relinquished By:		**Received by:**		**Received in good condition?**	Yes/No/NA	**Method of Shipment**	☑ Courier ☐ Postal ☐ By Hand
Name: Glenn Johnson	Date: 27/8/12	Name:	Date: 28/8	**Samples received chilled?**	Yes/No/NA	**Consignment Note No.**	
of: AECOM	Time: 4 Pm	of: Als	Time: 9-35		Yes/No/NA	**Transport Co:**	

Relinquished By:		**Received by:**		**Received in good condition?**	Yes/No/NA	**Method of Shipment**	☐ Courier ☐ Postal ☐ By Hand
Name:	Date:	Name:	Date:	**Samples received chilled?**	Yes/No/NA	**Consignment Note No.**	
of:	Time:	of:	Time:		Yes/No/NA	**Transport Co:**	

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Revision: Oct 09

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Appendix 6
Mineral Characterisation Processes