

MINARA RESOURCES LIMITED



Energy Efficiency Opportunities Public Report (2008-2009)

Controlling Corporation

Minara Resources Limited

Period to which this report relates

Start 1st July 2008

End 30th June 2009

Part 1 – Information on assessments completed to date

Table 1.1 – Description of the way in which the Corporate Group (or part of it) has carried out its assessments

Minara Resources conducted Energy Efficiency Opportunities (EEO) assessments from December 2007 to June 2008. During this time, approximately 90% of the corporation's energy use was assessed.

During the assessment process, workshops were conducted in all departments across the organisation. These were attended by relevant personnel within each department with the ability to influence energy usage. The workshops resulted in a number of energy efficiency opportunities being identified within each area. Opportunities were then recorded and prioritised, taking into account factors such as payback period, energy savings and implementation costs. Once this process was completed the appropriate business response could be enacted.

Progress on the opportunities identified during this assessment period is shown in Table 2.3.

Minara Resources has continued to identify and evaluate new energy efficiency opportunities during the 2008-2009 reporting period. A summary of these is shown in Table 2.1. Extensive work has also been done throughout the reporting period to improve the accuracy of energy use data (refer to Table 1.3 of this document).

Outcomes of the assessments are communicated to employees and progress of the EEO program is presented at management meetings. A summary of the information is also presented to the Board during board meetings and is included in the Minara Resources Limited Annual Report.

Despite the challenges associated with the global economic downturn, Minara Resources remains committed to improving energy efficiency across the organisation.

Table 1.2 – Energy use assessed		
Group member and/or business unit and/or key activity and/or site that has had an assessment completed by the end of this reporting period.	Period over which assessment was undertaken	Energy use per annum in GJ in the current reporting year
Murrin Murrin Joint Venture	01.07.06 – 30.06.08	11,664,075 GJ
	01.07.08 – 30.06.09	
Total energy assessed		10,497,667 GJ
Total energy use of the group in the current reporting year		11,664,075 GJ¹
Total energy assessed expressed as a percentage of total current energy use		90%

- 1 There was an increase in the energy usage reported for the Murrin Murrin JV in 2008/2009 compared to 2007/2008. This increase is predominantly due to a change in the conversion factor used for Sulfur burning. The 2007/2008 report assumed that the energy from Sulfur burnt onsite was all converted to electrical energy. However, at Murrin Murrin, a large fraction of the steam generated via the Sulfuric Acid Plant is actually utilised as steam in the Leaching Circuit (without conversion to electrical energy).

a. Part 1 – Information on assessments completed to date (continued)

Table 1.3 – Accuracy of energy use data		
Entity	% achieved	Reasons for not achieving data accuracy to within $\pm 5\%$
Murrin Murrin Joint Venture	$\pm 5\%$	Not applicable

Minara Resources has made extensive improvements to its data collection and verification process. This has resulted in an improvement in the accuracy of energy use data from $\pm 20\%$ as reported in the Assessment and Reporting Schedule, to $\pm 5\%$ for the 2008/2009 reporting period.

Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

Part 2A - New Assessments completed during the reporting period

Name of Group member or business unit or key activity or site: **Murrin Murrin Joint Venture**

Energy use of the entity during the current reporting period

11,664,075	GJ
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Table 2.1 – Opportunities assessed to an accuracy of $\pm 30\%$ or better

Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – ≤ 4 years	> 4 years	
Outcomes of assessment*	Total Identified	9	1,038,525	310,927	nil	1,349,452
Business Response*	Under Investigation	1	90,687			90,687
	To be Implemented	2	51,411			51,411
	Implementation Commenced	6	896,427	310,927		1,207,354
	Implemented	0				
	Not to be Implemented	0				

Name of Group member or business unit or key activity or site:

Energy use of the entity during the current reporting period

11,664,075	GJ
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Table 2.2 - Opportunities assessed to an accuracy of worse than $\pm 30\%$

Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – ≤ 4 years	> 4 years	
Outcomes of assessment	Total Identified					
Business Response	Under Investigation					
	To be Implemented					
	Implementation Commenced					
	Implemented					
	Not to be Implemented					

Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

Part 2B - Update of assessments originally reported in previous reporting periods

Name of Group member or business unit or key activity or site: **Murrin Murrin Joint Venture**

Energy use of the entity during the current reporting period

11,664,075	GJ
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Table 2.3 - Opportunities assessed to an accuracy of $\pm 30\%$ or better						
Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – \leq 4 years	> 4 years	
Outcomes of assessment*	Total Identified	14 (14)	305,497 (305,497)	9152 (9152)	nil (nil)	314,649 (314,649)
Business Response*	Under Investigation	4 (8)	7699 (26,514)	6334 (6334)	nil (nil)	14,033 (32,848)
	To be Implemented	0 (1)	0 (1247)	0 (0)	nil (nil)	0 (1247)
	Implementation Commenced	2 (1)	8977 (7726)	0 (0)	nil (nil)	8977 (7726)
	Implemented	7 (4)	285,317 (270,010)	2818 (2818)	nil (nil)	288,135 (272,828)
	Not to be Implemented	1 (0)	3504 (0)	0 (0)	nil (nil)	3504 (0)

Originally reported outcomes are (in brackets) underneath the updated evaluation outcomes which are **bolded**.

Name of Group member or business unit or key activity or site: **Murrin Murrin Joint Venture**

Energy use of the entity during the current reporting period

11,664,075	GJ
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Table 2.4 - Opportunities assessed to an accuracy of worse than $\pm 30\%$

Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – ≤ 4 years	> 4 years	
Outcomes of assessment*	Total Identified					
Business Response*	Under Investigation					
	To be Implemented					
	Implementation Commenced					
	Implemented					
	Not to be Implemented					

Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

Part 2C - Details of at least three significant opportunities found through EEO assessments

Table 2.5 – Description of 3 significant opportunities

Opportunity 1

Replacement of the 3B Economiser.

This project involves replacing the 3B Economiser within the Sulfuric Acid Plant.

The 3B Economiser is a shell and tube heat exchanger and forms part of the boiler feed water system, which preheats high pressure boiler feed water to the waste heat boiler.

Corrosion products (in the form of sulfates) have accumulated in the shell side of the heat exchanger as a result of acid plant shutdowns since commissioning of the Acid Plant in 1998. These sulfates resist heat transfer and result in insufficient heating of the high pressure boiler feed water.

Chemical cleaning to remove the corrosion products has been considered, however the effectiveness of this method for improving the heat transfer coefficient is limited. As such, Minara Resources have decided to completely replace this piece of equipment during the next major maintenance shutdown, which is scheduled for September 2010.

This project will incur approximately \$825,000 in capital plus additional costs for transport and installation and has the potential to save around 340,000 GJ in natural gas consumption per annum.

Project Status: *Implementation Commenced.*

Opportunity 2**High Density Sludge in the Existing Solution Neutralisation Circuit**

This project involves the implementation of a High Density Sludge circuit into the existing Solution Neutralisation circuit. This will improve the characteristics of the gypsum residue resulting in a number of improvements within the circuit, including improved nickel and cobalt recoveries, improved water and energy efficiency and a reduction in overall calcrete consumption and subsequent mining activity.

This project will incur approximately \$92M in expenditure and has the potential to save around 310,000 GJ in steam consumption per annum.

Project Status: *Implementation Commenced.*

Opportunity 3**Density Optimisation of the Ore Preparation Circuit**


This project involves increasing the leach feed density by optimising the leach feed circuit.

Significant density improvements can be achieved by increasing the percentage of mill discharge reporting to the cyclones from around 75% to 95% and increased density via the Paste Thickener. These density improvements translate to energy savings through a reduction in the volume of process liquor that requires heating per tonne of autoclave feed.

This project will incur approximately \$100,000 in capital expenditure and has the potential to save about 16,000 GJ in steam consumption per annum.

Project Status: *Implementation Commenced.*

Table 4.1 - Declaration of accuracy and compliance (mandatory information)

The information included in this report has been reviewed and noted by the board of directors and is to the best of my knowledge, correct and in accordance with the <i>Energy Efficiency Opportunities Act 2006</i> and <i>Energy Efficiency Opportunities Regulations 2006</i> .	
	Peter Johnston – Managing Director & CEO
	23.12.09