1. Introduction

The chapter provides a brief overview of the McArthur River Mine Phase 3 Development Project (the Project) and its proponent, McArthur River Mining Pty Ltd (the Proponent). This chapter also describes the purpose and structure of the Environmental Impact Assessment (EIA) process for the proposed Project.

1.1 The Project

The proposed Project involves the expansion of the existing McArthur River Mine (MRM) open pit zinc-lead-silver mining and concentrate processing operation. The Project is located approximately 70 kilometres (km) south-west of the township of Borroloola, 120 km south of the Bing Bong concentrate storage and ship loading facility (Bing Bong) on the Gulf of Carpentaria, Northern Territory. Regional location of the Project is shown on Figure 1-1.

The Project would build on the successful conversion of MRM from an underground to an open-pit mining operation, approved as part of the 2005 EIS process, by further extending the life of the existing open-pit operation and increasing MRM's minable ore reserves and mine life.

Based on preliminary mine planning, MRM's minable reserves are expected to increase from 53 million tonnes (Mt) to 115 Mt, extending the life of mine by a further nine years from 2027 to 2036 at a higher rate of production.

MRM's current mine production is limited to a maximum run-of-mine (ROM) ore capacity of up to 2.5 million tonnes per annum (Mtpa) to produce approximately 360,000 dry metric tonnes per annum (dmtpa) of zinc-lead concentrate for export markets. The Project involves increasing this ROM capacity up to 5.5 Mtpa to produce approximately 800,000 dmtpa of zinc-lead concentrate. Over its lifetime the Project is expected to produce approximately 20 million tonnes of bulk concentrate for export.

The Project is part of Xstrata Zinc's (MRM's owner) US$900 million integrated expansion plan that involves increasing MRM's concentrate production to feed its upgraded offshore smelting and refining operations. This plan is dependent upon the future expansion of MRM's current operation.

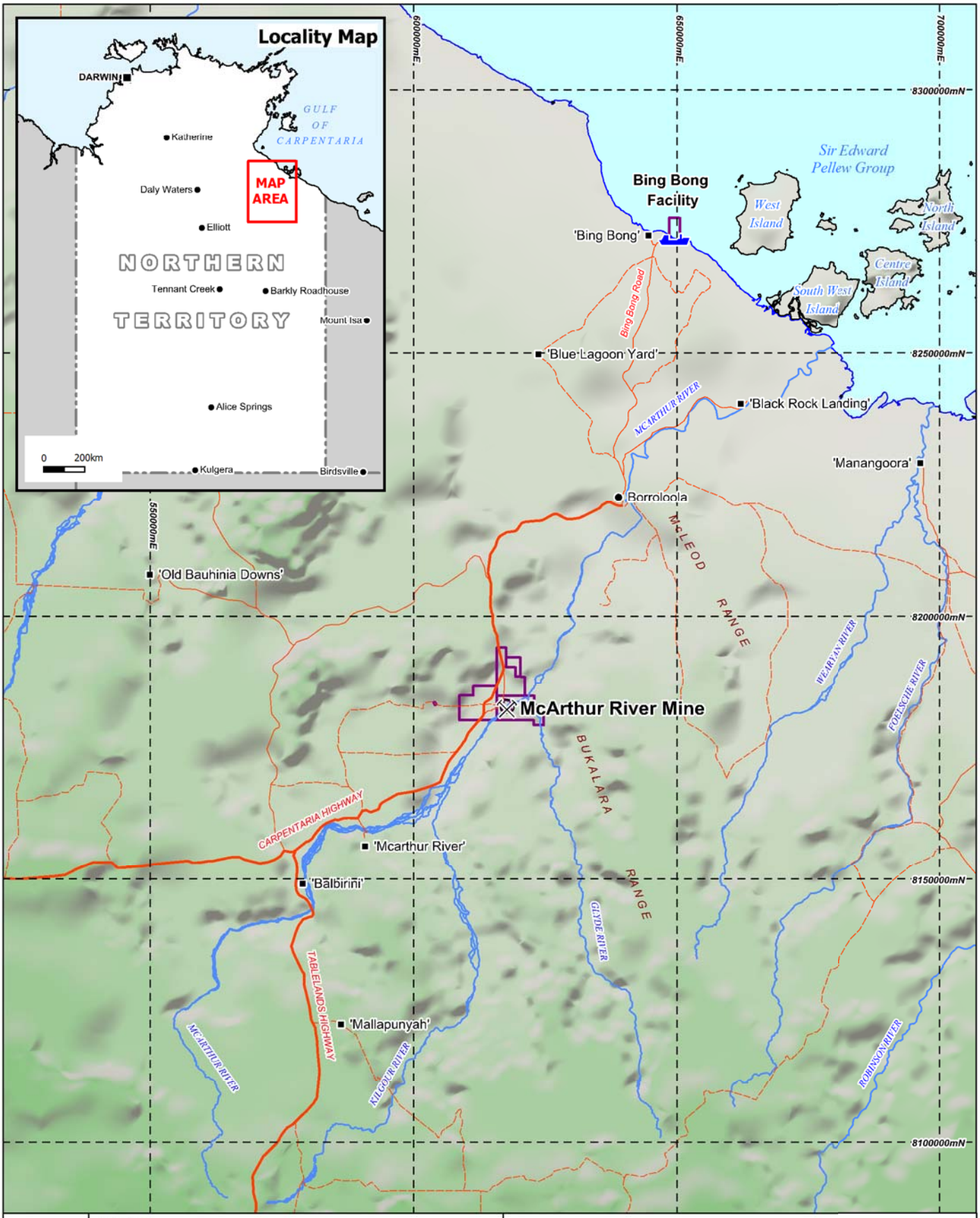
The outlook for zinc is expected to remain positive supporting the Project's development.

The Project will continue to use and expand, where appropriate, MRM's current mine and processing infrastructure and operational practices such as drilling, blasting, loading and transportation systems and concentrate storage.

Subject to the completion of further feasibility studies and Northern Territory Government approval, the Project will be developed in stages, with construction work expected to commence in 2012 for completion over a two year period. Peak mining rates will occur between the years of 2020 to 2025, and will then steadily decline until the end of mining currently planned for 2036.

The capital cost of approximately $270 million for the Project is expected to boost industry output by approximately $8.4 billion within the Northern Territory economy during the construction and operational periods. Nationally, the Project will boost industrial output by $9.3 billion.

Peak employment levels are expected to be 930 during construction and 735 during the operational phase up from the current 440 permanent employees.



LEGEND

- Project tenement
- Principal road
- Road (sealed)
- Road (unsealed)
- River
- Town
- Homestead
- Darwin
- McArthur River Mine
- Bing Bong Concrntrate, Storage and Ship Loading Facility

Data Source:
Topography - Geoscience Australia. Tenement - NT Gov.

METSERVE Mining & Energy Technical Services Pty Ltd

xstrata zinc

McArthur River Mine
Phase 3 Development Project

Regional Location

0 20 40
Kilometres
Scale: 1:1,000,000 (A4)

09/01/2012

Datum: GDA94
Projection: MGA53

FIGURE 1 - 1

S:\Projects\XZ003 MRM Extension EIS_MapInfo\Workspaces\XZ003_M001D.wor

1.1.1 Project Description

Key Project elements include:

- Mining operations:
  - expansion of the existing open pit mine from the current footprint of 145 hectares (ha) to 210 ha and to a depth up to 420 metres (m) from 210 m within the currently approved bunded area
  - expansion of the existing North Overburden Emplacement Facility (OEF) and the construction of new OEFs to the east and south of the open-pit mine to store the additional 530 Mt of excavated overburden from the expanded operation.
- an upgraded and expanded mine water management system including clean water diversion drains, integrated mine area run-off collection, storages, settlement traps, on-site water reuse procedures and infrastructure to support an off-mining lease irrigation scheme located on the adjoining pastoral lease.
- upgrade to the on-site ore processing facilities
- use of the existing and already approved Tailings Storage Facility (TSF) to store Project tailings generated from ore processing, with the addition of a new TSF cell
- upgrade and expansion of site offices, workshop facilities, the accommodation village and other supporting infrastructure
- upgrade and expansion of the existing power supply.

In order to limit disturbance to additional areas the Project will utilise existing MRM infrastructure such as the sewage treatment facility, ore processing facility, wastewater management system, site offices and industrial areas.

As is the current practice, ROM ore will be trucked from the pit to the processing plant where it will be crushed and ground. The ground ore will then be slurried with flotation reagents and pumped to flotation cells and a leach circuit where the zinc and lead bearing minerals will be recovered in the form of a bulk concentrate. Fine wastes (tailings) from the processing operation will be disposed of into the upgraded TSF.

As is the current practice, the bulk concentrate will be trucked to Bing Bong for export.

The Project's open-pit mining schedule reflects the current optimised mining profile in terms of economically recoverable ore. However over the life of the Project, mining plans will be continually reassessed to maximise ore recovery and economic returns. If mining plans are updated they will be provided through the annual Mining Management Plan process as required by Section 40 of the Northern Territory Government's *Mining Management Act 2001*.

No major watercourses will be diverted as part of the Project.

The layout of MRM's existing operations compared with the Project's operating footprint is shown on Figure 4-1 in Chapter 4 – Project Description. Further detail of the Project is provided in Chapter 4 – Project Description.

At this stage, no additional satellite ore-bodies have been identified on tenements surrounding the Project site.

1.1.2 Project Proponent

McArthur River Mining Pty Ltd is the current operator of MRM and is wholly-owned by global mining group Xstrata Zinc.

Headquartered in Madrid, Spain, Xstrata Zinc is one of the world's largest producers of zinc and one of the commodity business units within the major global diversified mining group Xstrata plc. Xstrata Zinc's zinc and lead operations and exploration projects are located in Australia, Canada, Germany, Peru, Spain and the United Kingdom. Xstrata Zinc's operations in Spain comprise the San Juan de Nieva zinc smelter, the Arnao zinc semis plant in Asturias and the Hinojedo roasting plant in Cantabria.

In Australia, operations comprise: the Mount Isa, George Fisher underground, Handlebar Hill Open Cut and Black Star Open Cut zinc-lead mines, zinc-lead concentrator, lead smelter and Bowen Coke Works in north Queensland; the McArthur River open pit zinc-lead mine, processing and loading facility in the Northern Territory; and the Lady Loretta mine in north-west Queensland.

In Canada, operations and exploration projects include the Brunswick zinc-lead mine and lead smelter in New Brunswick; 25% of the CEZ zinc smelter near Montreal; and the Perseverance zinc deposit in Quebec. Xstrata Zinc also operates the Nordenham zinc smelter in northern Germany; the Northfleet lead refinery in the United Kingdom; and owns 33.75% of the Antamina mine in Peru.

Xstrata Zinc is a wholly-owned subsidiary of Xstrata plc, a global diversified mining group, listed on the London and Swiss Stock Exchanges. Headquartered in Zug, Switzerland, Xstrata maintains a meaningful position in seven major international commodity markets: copper, coking coal, thermal coal, ferrochrome, nickel, vanadium and zinc with additional exposure to gold, cobalt, lead and silver. The Xstrata Group also comprises a growing platinum group metals business, iron ore projects, recycling facilities and a suite of global technology products, many of which are industry leaders. The Group's operations and projects span 20 countries.

The Proponent's contact details for the Project and this Draft Environmental Impact Statement (EIS) are as follows:

The Project Manager
McArthur River Mine Phase 3 Development Project
Xstrata Zinc
Address: GPO Box 1421 Brisbane, Queensland Australia 4001
Telephone: (07) 3295 7588
Fax: (07) 3295 7666
Website: www.xstratazinc.com

The Manager
McArthur River Mining Pty Ltd
Address: PO Box 36821 Winnellie, Northern Territory Australia 0821
Telephone: Information Line: 1800 211 573, or (08) 8975 8179
Fax: (08) 8975 8170
E-mail: mrmprojenq@xstratazinc.com.au
Website: www.mcarthurrivermine.com.au

The primary contact for the Project's EIA process is Mining and Energy Technical Services Pty Ltd (Met Serve) are as follows:

The Project Manager
McArthur River Mine Phase 3 Development Project
Address: PO Box 306 Fortitude Valley, Queensland Australia 4006
Telephone: 1300 078 518
Fax: (07) 3105 3048
E-mail: mrmphase3@metserve.com.au

1.1.3 Project Context

The Project is part of a US$900 million integrated plan involving MRM and Xstrata Zinc's European and Canadian smelters. The plan aims to secure the long-term future of MRM in the face of a decline in the traditional international markets for the bulk zinc-lead concentrate produced by the mine. The Imperial Smelting Furnaces which currently consume MRM bulk concentrate now produce less than 6% of the world's primary zinc and this market is declining. Over 90% of zinc produced globally is produced by electrolytic smelters that cannot use bulk concentrate.

The plan involves the increase in mine production at MRM, the installation of proprietary hydrometallurgy technology in Xstrata Zinc's San Juan de Nieva smelter in Spain and Nordenham smelter in Germany, and potentially, further improvements in the Brunswick Lead Smelter in Canada.

The feasibility of this integrated plan is dependent on the Project's development: that is, it is reliant on increasing production at MRM and reducing unit costs for the overall plan to become financially viable.

The plan will also create a new guaranteed market for MRM bulk concentrate that justifies more than doubling the resource utilisation of the deposit from 53 Mt to 115 Mt, and extending the mine life by 9 years to 2036. The integrated plan therefore creates a new market for MRM's expanded production in addition to the current customers in Europe and Asia.

1.1.4 Project Land Tenure

All of the proposed Project activities will take place within the existing MRM tenements and no further tenement applications will be required.

MRM spans seven individual existing Mineral Leases as detailed in Table 1-1.

Table 1-1 MRM Land Tenure

Lease Type	Name	Lease No.	Area (hectares)	Term (Years)	Expiry Date
Mining	HYC	MLN1121	372	25	5/1/2018
Mining	GLYDE	MLN1122	3,348	25	5/1/2018
Mining	BUFFALO	MLN1123	3,884	25	5/1/2018
Mining	Emu	MLN1124	3,283	25	5/1/2018
Mining	Emu East	MLN1125	657	25	5/1/2018
Mining	Bing Bong Port	MLN1126	900	25	5/1/2018
Mining	Batten	MLN582	16	20	31/12/2019
Pastoral	Dredge Spoil	PPL1051	89	3	31/12/2012
Authorisation	Emu Fault	AN366	9	2	4/6/2012
		Total Area	**12,558**		

MRM's mine site is contained within five contiguous leases (MLN1121, MLN1122, MLN1123, MLN1124 and MLN1125), located on the McArthur River Station Pastoral Lease, which is made up of the McArthur River Pastoral Lease (PL860), the Tawallah Pastoral Lease (PL864) and the Bing Bong Pastoral Lease (PL868).

These leases were combined and exist as the McArthur River Station. This property lease is 100% owned by Colinta Holdings Pty Ltd, an Xstrata subsidiary.

Also contained on the McArthur River Station Pastoral Lease is the minor Mineral Lease MLN582.

MRM's mining operations encompass MLN1121, MLN1122 and MLN1124. The TSF, accommodation village and part of the airport are located on MLN1123.

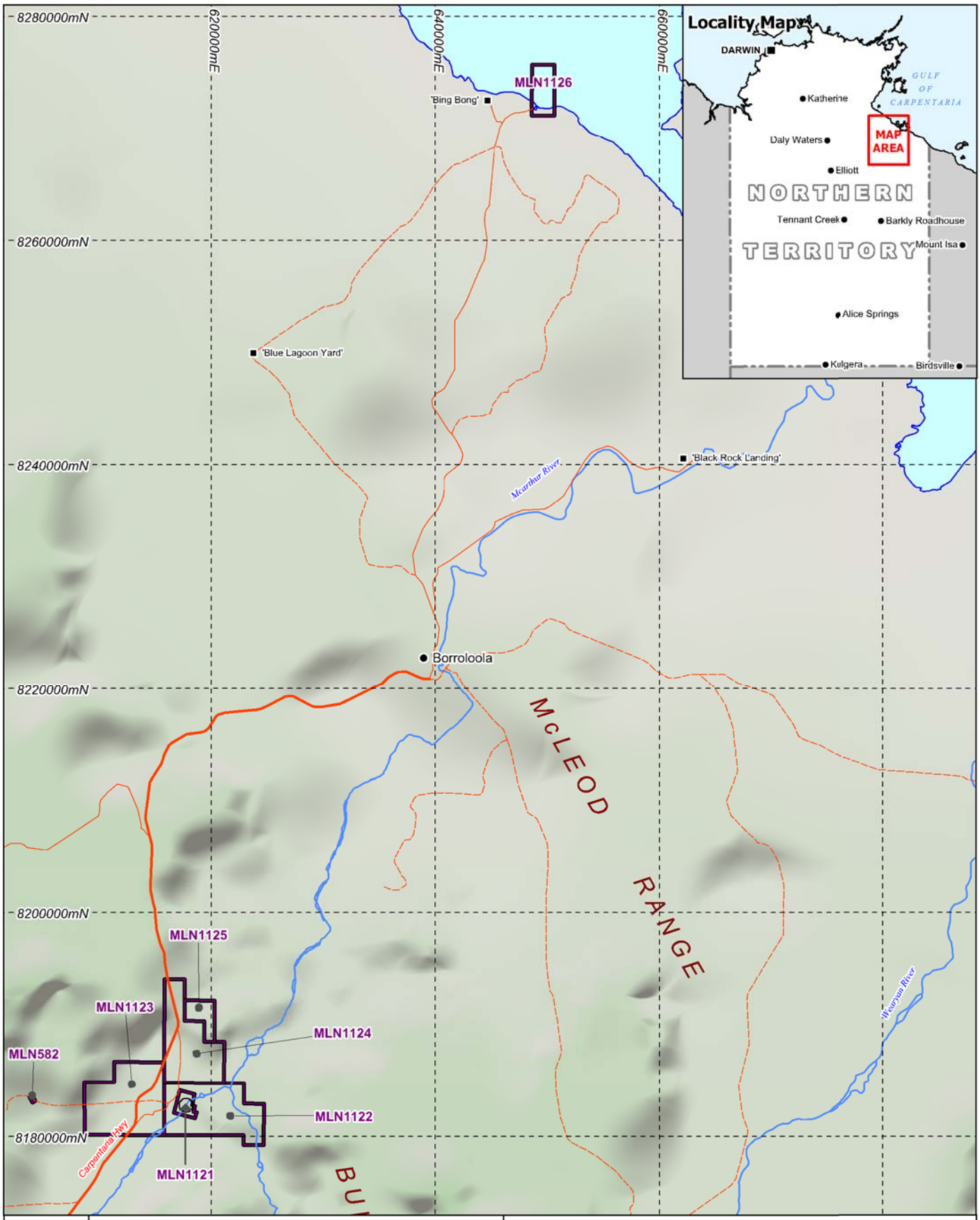
Bing Bong is situated on MLN1126, located on the Bing Bong Pastoral Lease. Adjacent to the Bing Bong Mineral Lease is the Bing Bong dredge spoil emplacement facility area, located on the Non-Pastoral Land Use Approval NP035.

The general locations of the MRM's site leases are shown in Figure 1-2**.**

1.1.5 Project Objectives

Key Project objectives are to:

- maintain and sustainably operate an efficient and profitable mine
- construct and operate a mine that complies with all relevant statutory obligations and continues to improve operations to facilitate sustainable environmental management
- construct, design and operate a mine in a way to meet sustainable environmental and social indicators and standards
- make efficient use of current infrastructure and the mineral resource
- use proven practices and strategies to minimise impacts, for example:
    - salvage and stockpiling topsoil and other landform materials
    - progressive rehabilitation of disturbed areas wherever practicable
    - protection of water quality through utilisation of appropriate water management systems
    - adoption of appropriate landform designs to maximise sustainability
    - planning for a nominated final land use.



LEGEND

- Project tenement
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- Road (unsealed)
- Railway
- River
- Town
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- Darwin

Data Source:
Topography - Geoscience Australia. Tenement - NT Gov.

McArthur River Mine
Phase 3 Development Project

McArthur River Mine and Bing Bong Leases

0 10 20
Kilometres
Scale: 1:470,000(A4)

09/01/2012

Datum: GDA94
Projection: MGA53

FIGURE 1 - 2

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xstrata zinc

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1.2 Environmental Impact Assessment Process

This Draft EIS has been prepared in accordance with the requirements of the Northern Territory Government's *Environmental Assessment Act 1982* (EA Act) and the Environmental Assessment Administrative Procedures 1984 (Administrative Procedures) under which the EA Act is implemented.

This EIA process has seven key phases:

1. **Notice of Intent (NOI).** A NOI for the Project was submitted to the Northern Territory's Department of Resources (DoR) on 11 March 2011. The NOI outlined the Project's scope and enabled the Minister for Natural Resources, Environment and Heritage (the Minister) to determine the Project's level of assessment

2. **Level of assessment.** There are two levels of assessment defined under the Northern Territory EIA process, a Public Environmental Report (PER) or an EIS. To determine the level of assessment, the Minister considered the Project's impacts on the environment, which can be considered significant, but limited in extension for a PER. On 16 June 2011, the Minister advised that an EIS be prepared for the Project

3. **Public review of EIS Guidelines.** The information within the NOI and consultation with relevant agencies assisted in the preparation of the Project's EIS Guidelines concerning matters to be addressed in the Draft EIS. Draft EIS Guidelines were released for public comment on 23 July 2011 for a four week period. On 19 August 2011, Final EIS Guidelines (included as Appendix A – Final EIS Guidelines) were issued to Xstrata Zinc taking into account comments received from the community and Northern Territory Government agencies. There is no statutory time limit imposed on the life of the Final EIS Guidelines

4. **Preparation of the Draft EIS.** Work began on the Draft EIS in March 2011 and was prepared in accordance with the Final EIS Guidelines. The Draft EIS was developed in conjunction with a review of the Project's feasibility study

5. **Submission of the Draft EIS and Public Review.** The submission of this Draft EIS will be followed by its release for review to enable the public and Northern Territory Government agencies to comment on the Project. Notification of the display centres, submission procedures, and purchasing details have been advertised in local newspapers. The public and government agencies have a minimum of 28 days from the date of submission of the Draft EIS to submit comments

6. **Preparation of EIS Supplement.** Any comments received by the close of the public review period will be addressed in an EIS Supplement which will be prepared by the Proponent and submitted to the Northern Territory Government. The Draft EIS together with the EIS Supplement will constitute the Final EIS which will be reviewed by the Northern Territory Government

7. **Government review and decision.** Following this review, the Northern Territory Government will prepare an Environmental Assessment Report and recommendations on the Project's acceptability for the Minister's consideration. Following this, the Minister for Natural Resources, Environment and Heritage will make a recommendation to the Minister for Primary Industry, Fisheries and Resources regarding the project's environmental acceptability and its compliance with the requirements of the *Environmental Assessment Act 1982*. Because the Project is a mining activity, approval for the Project is given by the Minister for Primary Industry, Fisheries and Resources under the requirements of the *Mining Management Act 2001*.

1.2.1 Consultation process

The Project's EIA process makes provision for community consultation and facilitates environmental protection by comprehensive consideration of potential impacts and management strategies. The Northern Territory Government is responsible for coordinating the Project's EIA process.

The Draft EIS has been prepared to inform decision makers, affected parties, interest groups and the public about potential environmental impacts relating to the Project's development and operation, and more importantly how these impacts will be managed. The content of the Draft EIS reflects the assessment requirements contained in the Final EIS Guidelines issued by the Northern Territory Government. During the development of the Draft EIS, members of the public and other interested or affected parties have been encouraged to participate in the EIA process by providing input during public consultation programs.

A community consultation process was undertaken to provide the community with an opportunity to:

- become fully informed of the Project status and the likely impacts of any development prior to approval
- express any concerns regarding current or planned Project activities and their environmental impacts
- discuss, review and contribute to the formulation of strategies proposed for the Project for mitigation of any potential environmental impacts that may arise.

The public consultation program has included the distribution of newsletters, continuation of the Community Reference Group, community information meetings and intensive meetings with groups and individuals to review Project plans. Responses from all parties have been collated and considered in the design of environmental and social plans and strategies.

Key subjects raised by stakeholders during the consultation program include:

- local employment opportunities
- regional development and the MRM Community Benefits Trust
- increased traffic levels on local roads
- environmental management issues including the OEFs and TSF
- cultural heritage.

A key component of the Draft EIS preparation process has been the involvement of various advisory bodies and other stakeholders. Advisory body and stakeholder consultation included one-on-one meetings with key stakeholders and affected persons and addressing meetings of interested groups. Traditional Owners and the Northern Territory Government were included in the process.

Further information regarding the public consultation program and the results of consultation activities is provided in Chapter 15 - Social Environment and Appendix D10. The methodology used for consultation throughout the preparation of the Draft EIS and contact details for all advisory bodies and stakeholders consulted is presented in Appendix C – Consultation Report.

The Draft EIS will be placed on public display and copies will be made available to interested persons. Copies of the Draft EIS will be on display at the following locations:

- Environment and Heritage Division, Department of Natural Resources, Environment, The Arts and Sport, 2nd Floor, Darwin Plaza, 41 Smith Street Mall, Darwin
- Minerals and Energy Information Centre, Department of Resources, 3rd Floor, Paspalis Centrepoint, 48 Smith Street Mall, Darwin
- Borroloola Community Government Council Building, Broad Street, Borroloola

- Roper Gulf Shire office, 29 Crawford Street, Katherine
- Northern Territory Library, Parliament House, Darwin
- The Environment Centre NT, Unit 3, 98 Woods St, Darwin.

Any person, group or organisation can make a written submission about the Draft EIS. Such submissions do not have to relate to the whole of the Draft EIS and may relate to any aspect. Persons making a submission do not have to be an expert in any of the issues assessed in the Draft EIS. Comments and submissions must be made in writing within the comment period, as advertised in the public notice about the Draft EIS. Once received by Northern Territory Government, submissions on the Draft EIS will be collated and forwarded to the Proponent for consideration. As required by the EIA process, the Proponent is required to address the submissions and provide appropriate responses to the Northern Territory Government.

Anyone who wishes to make comment on the Draft EIS is invited to make submissions to the Environment and Heritage Division, Department of Natural Resources, Environment, The Arts and Sport, PO Box 496, Palmerston NT 0831, facsimile: (08) 8924 4053 or email: eia.nretas@nt.gov.au

Submissions will be treated as public documents unless confidentiality is requested. Copies of all submissions will be forwarded to MRM.

Following consideration of these submissions, the Northern Territory Government may require the Proponent to address any relevant matters raised in an EIS Supplement. A final decision on the Project's overall acceptability will be made on the basis of the information provided in the Draft EIS and EIS Supplement if required.

The Project's EIA process and approval time frame are further discussed in Chapter 2 – Regulatory Environment.

1.3 Relevant Legislation and Policies

1.3.1 Legislation

The Northern Territory Government has jurisdiction over environmental and other legislation relating to the Project's siting, construction and operation. Preparation of the Draft EIS has been undertaken in accordance with the requirements of the Northern Territory Government's *Environmental Assessment Act 1982*.

Another significant piece of legislation for the Project is the *Mining Management Act 2001* (MM Act). An 'Authorisation to Operate' the existing mine has been received in accordance with the requirements of the MM Act. The Authorisation to Operate requires the mine to operate in accordance with an approved Mining Management Plan (MMP) that is annually reviewed and updated, or when significant changes are proposed to existing approved operations. Approval for the Project will be sought under the MM Act and, if granted, a revised Authorisation to Operate will be issued.

In addition to the Northern Territory Government's EIA process, under the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), developments require assessment if they have the potential to affect one or more of six Matters of National Environmental Significance (MNES), namely:

- World Heritage values of a declared World Heritage property
- Ecological character of a declared Ramsar wetland
- Listed threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat
- Listed migratory species or their habitat
- Commonwealth marine areas
- Commonwealth land.

A referral for the Project under the *EPBC Act* was submitted to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) in April 2011. A decision was made on 9 June 2011 that the Project did not constitute a 'Controlled Action' as it did not impact on MNES. Notification was received from SEWPAC that the Project would be assessed through the Northern Territory EIA process only.

The legislation pertinent to the Project's assessment and approval process is further discussed in Chapter 2 - Regulatory Environment.

1.3.2 Policies

Xstrata Zinc Sustainable Development Policy

Xstrata Zinc is committed to the goal of sustainable development and balanced social, environmental and economic considerations in how the business is managed. Operating to leading standards of health, safety and environmental management contributes to the development of sustainable communities.

MRM operates in accordance with Xstrata's Sustainable Development framework, aspiring to achieve the highest international standards regardless of location and without exception. Xstrata Zinc conducts regular internal and external audits of the business and operations to assure compliance with their Business Principles, Sustainability Policy and Sustainable Development Standards.

Established business principles underpin all of Xstrata's operations including those at MRM. Xstrata is committed to the highest standards of health, safety and environmental performance, community co-operation and principles of sustainable development. The environmental component of this commitment is achieved by adherence to Sustainable Development Policy which is presented in Figure 1-3.

Xstrata Zinc is fully compliant with Australian law and regulations.

Minerals Council of Australia – Enduring Value Principles

Xstrata is also a signatory to the Minerals Council of Australia's Enduring Value Principles for Sustainable Development. The Proponent's performance against sustainable development standards is reported annually in a detailed Sustainability Report. An overview of Enduring Value is provided at http://www.minerals.org.au/focus/sustainable_development.

Figure 1-3 Xstrata Zinc – Sustainable Development Policy

1.4 Draft EIS Structure and Objectives

1.4.1 Objectives

The principal objective of the Draft EIS is to identify and assess the potential environmental and related impacts that may occur as a result of the Project's construction and operation, as well as to develop appropriate strategies to manage these impacts where required. Impacts are considered for relevant aspects of the natural, social, and economic environment. The Draft EIS also outlines how these impacts will be managed.

The Draft EIS aims to be a self-contained and comprehensive document that has been prepared to provide:

- a source of information from which individuals and groups may gain an understanding of the proposal, the need for the Project, the alternatives, any environmental effect, impacts that may occur and measures taken to minimise impacts
- a basis for public consultation and informed comment on the Project
- a framework against which decision-makers can assess the environmental aspects of the project and have input to the environmental management and monitoring programs.

The Draft EIS relates to the entire life of the Project including construction, operation, maintenance, rehabilitation and decommissioning. The level of analysis and detail in the Draft EIS reflects the level of significance of particular impacts.

1.4.2 Environmental studies

For the Draft EIS, a number of studies were undertaken on the Project area that included baseline studies and assessments of flora, fauna, land resources, surface water, groundwater, air quality, noise, traffic and cultural heritage. A brief description of these activities is provided in this section. The environmental studies and Draft EIS have been coordinated and compiled by Mining and Energy Technical Services Pty Ltd (MET Serve) with, and on behalf of the Proponent, with the assistance of specialist sub-consultants.

Project environmental studies and assessments included in the Draft EIS are as follows:

- terrestrial flora impact assessment (Ecoscience Pty Ltd)
- terrestrial fauna and aquatic biology impact assessment (URS Pty Ltd)
- surface water assessment (WRM Water and Environment Pty Ltd)
- groundwater (URS Pty Ltd)
- air quality assessment and greenhouse gas management plan (URS Pty Ltd)
- noise and vibration impact assessment (SVT Consultants)
- cultural heritage assessment (Begnaze Pty Ltd)
- transportation assessment (Halcrow)
- social impact assessment and community consultation (Rowlands)
- irrigation assessment (Treetop Technologies Pty Ltd)
- economic impact assessment (Aurecon).

Flora and fauna

- Flora and fauna investigations involved site scoping using aerial photography, broad ground-truthing and detailed fieldwork in the period from 27 to 30 May 2011. Further information on the flora and fauna investigations is provided in Chapter 13 - Nature Conservation, Appendix D7 and Appendix 8.

Surface water

- Surface water management and flood modelling studies undertaken included a water balance model over various stages of the Project. Further information on the surface water investigations is provided in Chapter 10 - Water Resources and Appendix D3.

Groundwater

- A comprehensive groundwater investigation to determine potential impacts on groundwater resources incorporated results from existing monitoring bores and computer modelling of existing and proposed mining operations. Further information on the groundwater investigations is provided in Chapter 10 - Water Resources and Appendix D4.

Air quality and greenhouse gases

- An air quality impact assessment of the Project was undertaken and included computer modelling to determine the potential impacts on air quality and the emission of greenhouse gases.Further information on the air quality assessment is provided in Chapter 11 – Air Quality and Greenhouse Gases and Appendix D5.

Noise and vibration

- A noise and vibration impact assessment undertaken included a baseline survey of the existing noise levels, as well as computer modelling to determine the potential Project impacts on noise and vibration to surrounding sensitive receptors. Further information on the noise and vibration assessment is provided in Chapter 12 - Noise and Vibration and Appendix D6.

Cultural heritage

- Indigenous and non-Indigenous cultural heritage surveys were undertaken that included consultation with Traditional Owners. Further information on the cultural heritage assessments is provided in Chapter 14 - Cultural Heritage and Appendix D9.

Traffic and transport

- A transport impact assessment was undertaken of the Project's proposed transport and traffic systems and infrastructure.Further information on the transport assessment is provided in Chapter 8 – Traffic and Transport and Appendix D2**.**

Social environment

- Examination of the Project's impact on the social environment included an extensive consultation process. Further information on the social assessment is provided in refer to Chapter 15 - Social Environment and Appendix D10.

Economic environment

- Aspects of the economic environment that have been considered include: existing economic environment that may be affected by the Project; costs and revenues to government; and value of lost opportunities for other economic activities. Further information on the economic environment is provided in Chapter 16 – Economic Environment and Appendix D11.

Irrigation

- Review of options for a potential irrigation scheme to manage the beneficial use of groundwater is provided in Chapter 10 – Water Resources, Appendix D3 and Appendix D12.

Draft Study Team

Details of the Draft EIS study team are provided below.

Table 1-2 Study Team

Chapter no. or Appendix no.	Chapter Name	Study Component	Team Member Name and Company	Qualifications and Experience
Executive Summary	Executive Summary	All	Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years
Chapter 1	Introduction	All	Brett Harwood MET Serve	B. Bus, 10 years
Chapter 2	Regulatory Approvals	All	Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years
Chapter 3	Needs and Alternatives	All	Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years
Chapter 4	Project Description	All	Xstrata Zinc	N/A
Chapter 5	Rehabilitation and Decommissioning	All	Damien Plucknett MET Serve	B. Sci Environment, 5 years
Chapter 6	Climate	EIS Chapter	Damien Plucknett MET Serve	B. Sci Environment, 5 years
Chapter 7, Appendix D1	Land	EIS Chapter	David McIntyre MET Serve	B. Sci (Hons) – Environmental Earth Science, 6 years
Chapter 8, Appendix D2	Transport	EIS Chapter	Jonathan Evers MET Serve	B. Env. Man, M. Env. Law, 20 years
		Transport Technical Report	Mac Hulbert Halcrow	B. Eng. Tech. (Civil), Ass. Dip. Civil Eng., 18 years
			Trish Robertson Halcrow	B. Eng. (Civil), 5+ years
Chapter 9	Waste	EIS Chapter	David McIntyre MET Serve	B. Sci (Hons) – Environmental Earth Science, 6 years
			Damien Plucknett MET Serve	B. Sci Environment, 5 years

Table 1-2 Study Team (cont)

Chapter no. or Appendix no.	Chapter Name	Study Component	Team Member Name and Company	Qualifications and Experience
Chapter 10, Appendix D3, Appendix D4	Water Resources	EIS Chapter	Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years
			Dave Moss MET Serve	B. Env. Man (Hons), 8 yrs
		Surface Water Infrastructure Technical Report	Sharmil Markar – WRM Water and Environment	B. Sci (Hons, Class 1 – Engineering), PhD, 30 years
			Julian Orth WRM Water and Environment	BE (Hons – Civil Double Major), 6 years
		Groundwater Technical Report	Chris MacHunter URS	B. Sci Geophysics (Hons), 16 years
			Kwadwo Osei-Bonsu	PhD (Hydrogeology),14 years
Chapter 11, Appendix D5	Air	EIS Chapter	Damien Plucknett MET Serve	B. Sci Environment, 5 years
		Technical Report	Chris Taylor URS	PhD Atmospheric Chem, 9 years
Chapter 12, Appendix D6	Noise and Vibration	EIS Chapter	Damien Plucknett MET Serve	B. Sci Environment, 5 years
		Technical Report	Peter Glorie SVT Consultants	B. Eng. (Mech), 8 years
Chapter 13, Appendix D7, Appendix D8	Nature Conservation	EIS Chapter	Scott van Barneveld MET Serve	PhD (Ecology), 14 years
		Terrestrial and Aquatic Ecology Technical Reports	Kristin Metcalfe Ecoscience (Terrestrial Flora)	PhD, 30 years
			Keith Martin URS (Terrestrial Fauna and Aquatic Ecology)	Appl Sci., 30 years
Chapter 14, AppendixD9	Cultural Heritage	EIS Chapter	Brett Harwood MET Serve	B. Bus, 10 years
		Cultural Heritage Technical Report	Christine Crassweller Begnaze Pty Ltd	B.Sci (Hons, Anthropology) 18 years
Chapter 15 , Appendix D10	Social	EIS Chapter	Andrew Ellis MET Serve	B. Bus, Grad Cert, Bus, M. Urban and Regional Planning (Current) 7 years.
		Social Impact Assessment	Amanda Wild Rowlands	B. Bus (Marketing/Public Relations), 11 years
			Holly Williamson Rowlands	B. Communications (Creative Writing), 11 years

Table 1-2 Study Team (cont)

Chapter no. or Appendix no.	Chapter Name	Study Component	Team Member Name and Company	Qualifications and Experience
Chapter 16 , Appendix D11	Economics	EIS Chapter	Brett Harwood MET Serve	B. Bus, 10 years
		Economic Technical Report	Terry Whiteman Aurecon	B. Econ., 28 years
			John Switala	B. App. Sc. (Hons), Grad. Dip. Financial Analysis, PhD Econ./Man. Sc., 14 years
Chapter 17	Health and Safety	EIS Chapter	Nick Lefebvre MET Serve	B. Sc. (Geology) (Hons), 30 years
			Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years
Chapter 18	Hazard and Risk	EIS Chapter	Nick Lefebvre MET Serve	B. Sc. (Geology) (Hons), 30 years
			Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years
Chapter 19	Environmental Management Plan	EIS Chapter	Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years
Chapter 20	References	EIS Chapter	Collated by MET Serve	N/A
Appendix A	Final EIS Guidelines	EIS Appendix	Collated by the Northern Territory Department of Natural Resources, Environment, The Arts and Sport (NRETAS)	N/A
Appendix B	Final EIS Guidelines Cross Reference	EIS Appendix	Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years
Appendix C	Consultation Report	EIS Appendix	Amanda Wild Rowlands	B. Bus (Marketing/Public Relations), 11 years
			Holly Williamson Rowlands	B. Communications (Creative Writing), 11 years
Appendix D	Technical Reports	EIS Appendix	Collated by MET Serve	N/A
Appendix E	Management Plans	EIS Appendix	Collated by MET Serve	N/A
			David McIntyre MET Serve	B. Sci (Hons) – Environmental Earth Science, 6 years
			Nick Lefebvre MET Serve	B. Sc. (Geology) (Hons), 30 years
Appendix F	Study Team	EIS Appendix	Anthony Bianco MET Serve	B. Sci (Hons, Class 1 – Botany/Geography), 14 years

1.4.3 Draft EIS structure

The Draft EIS has the following structure:

VOLUMES 1 and 2

Executive Summary

- A brief overview of the Project, its potential environmental and social effects and the proposed mitigation strategies.

Chapter 1 – Introduction

- Introduction to the Draft EIS outlining the objectives, purpose and structure of the EIA process, as well as the proposed Project and Proponent.

Chapter 2 - Regulatory Environment

- The main legislative requirements for the Project are outlined in this chapter, including whole-of-project approvals, permits and licences for specific activities. In addition, the Northern Territory Government's requirement for an Environmental Impact Statement (EIS) has been recognised, together with legislation, policy, standards and codes of practice that are relevant to the Project.

Chapter 3 – Project Rationale and Alternatives

- Provides details of the Project's potential alternatives and needs.

Chapter 4 – Project Description

- Provides a full description of the proposed Project.

Chapter 5 – Rehabilitation and Decommissioning

- Outlines the proposed rehabilitation and decommissioning methods to be used at the Project.

Chapter 6 – Climate

- Discusses the climate of the region.

Chapter 7 – Land Resources

- Land resources present at the Project are described in this chapter. Geology, land systems, soils, geochemistry, land capability and visual amenity are included, together with potential impacts and mitigation measures on land resources.

Chapter 8 – Traffic and Transport

- Potential impacts of increased road, air and sea traffic to existing infrastructure at the McArthur River Mine and Bing Bong port concentrate storage and ship loading facility are detailed, together with mitigation measures for the Project.

Chapter 9 – Waste Management

- Environmental values considered in relation to waste management at the Project include identification of potential waste streams and volumes, potential impacts of waste generation, together with management measures applied to minimise impacts.

Chapter 10 – Water Resources

- Assesses the Project's water resources impacts (surface water and groundwater) together with management strategies.

Chapter 11 – Air Quality and Greenhouse Gases

- Discusses potential impacts on air quality and the emissions of greenhouse gases associated with the Project. Mitigation measures where required are also provided.

Chapter 12 – Noise and Vibration

- Identifies noise and vibration values present for the Project based on detailed noise and vibration assessments of the Project, including the existing McArthur River Mine, Bing Bong port concentrate storage and ship loading facility (Bing Bong) and the MRM to Bing Bong haulage route. Potential impacts on the acoustic values associated with the Project are outlined and where appropriate, mitigation measures proposed.

Chapter 13 – Nature Conservation

- Ecological values of the overall study area are characterised and biodiversity values determined for areas potentially impacted by the Project. Focus is on significant species and habitats. Potential impacts are identified and mitigation strategies provided.

Chapter 14 – Cultural Heritage

- Potential impacts and mitigation measures of the project relating to Indigenous and non-Indigenous cultural heritage cultural heritage issues are discussed.

Chapter 15 – Social Environment

- The current socio-demographic baseline environment in the Project area is described. Analysis also takes into account any potential impacts identified that may result from the Project, together with measures to avert or mitigate impacts.

Chapter 16 – Economic Environment

- Potential direct and indirect economic impacts of the Project are assessed for the local, regional, state and national economies. Aspects of the economic environment that have been considered include the existing economic environment that may be affected by the Project; costs and revenues to government; and value of lost opportunities for other economic activities.

Chapter 17 – Health and Safety

- Describes the existing values for health and safety associated with the construction, operation and decommissioning of the Project. The necessary mitigation strategies to minimise risk to the health and safety of Project employees, contractors, visitors and the community are outlined and assessed where appropriate.

Chapter 18 – Hazard and Risk

- Details the Project's risk assessment and the proposed risk management strategies.

Chapter 19 – Environmental Management Plan

- Outlines the Project's strategic environmental management plan.

Chapter 20 - References

- A list of documentation used in the preparation of the EIS.

VOLUMES 3 to 7

Appendices

- Contains additional technical details and management plans which support the assessments provided in Volumes 1 and 2.