Jack Hills Iron Ore Project, Murchison Region

Murchison Metals Ltd

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1220
May 2006

Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
25 Aug 05	**Referral received**	
23 Jan 06	**Intention to set EPS Level of Assessment advertised (no appeal rights)**	**21 weeks**
20 Apr 06	**Proponent's final EPS document received by EPA**	**12 weeks**
22 May 06	**EPA report to the Minister for the Environment**	**4 weeks**

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Contents

1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to a proposal by Murchison Metals Ltd to mine iron ore (haematite) at Jack Hills

The EPA was advised of the proposal on 25 August 2005. Based on the information provided, the EPA considered that, while the proposal had the potential to have an effect on the environment, it could be readily managed to meet the EPA's environmental objectives. Consequently it was notified in *The West Australian* newspaper on 23 January 2006 that, subject to preparation of a suitable Environmental Protection Statement (EPS) document, the EPA intended to set the level of assessment at EPS.

The proponent has prepared the EPS which accompanies this report (Murchison Metals Ltd, 2006). The EPA considers that the proposal described can be managed in an acceptable manner subject to the recommended conditions being made legally binding.

The EPA therefore has determined under Section 40 (1) that the level of assessment for the proposal is EPS, and this report provides the EPA advice and recommendations in accordance with Section 44 (1).

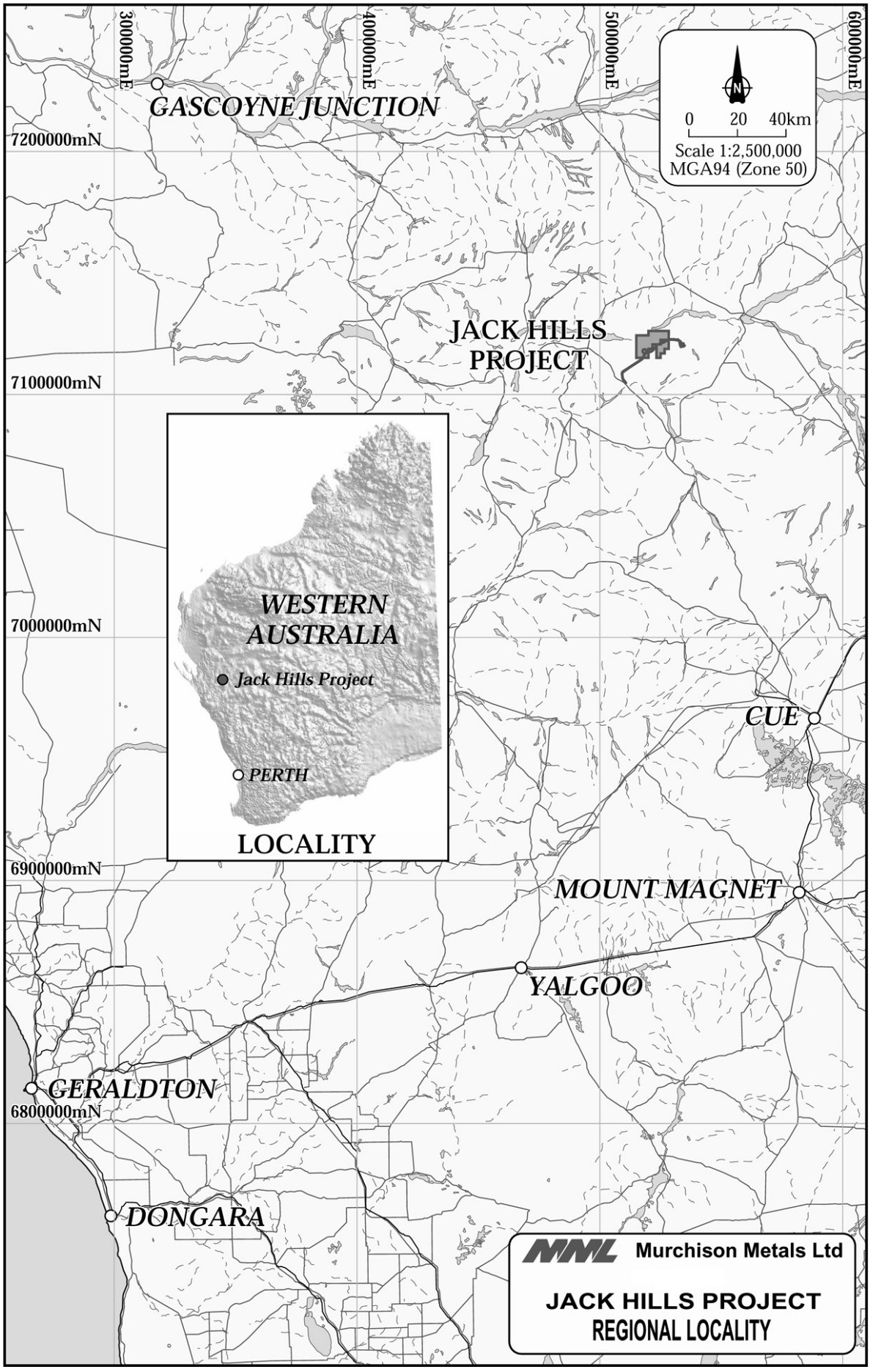

Figure 1: Jack Hills Project Location

2. The proposal

The proposal is described in detail in the proponent's EPS document (Murchison Metals Ltd, 2006). The proponent proposes to develop an iron ore (haematite) mine at Jack Hills approximately 100 km west of Meekatharra. The project will have a lifespan of approximately 7 years (5 years of mining, 2 years of closure activities) and will be a contract mining operation. The project will consist of an open cut mine with one pit up to 140 metres deep (approximately 41.2 MT of ore and waste rock). The floor of the pit will be above the watertable and the pit will not be backfilled.

Product will be crushed on site and will be carried to the Port of Geraldton via road. A haul road approximately 24 km long will be constructed to connect the project to the Beringarra-Cue road.

The key components of the proposal are summarised in Table 1 below:

Table 1 – Key Proposal Characteristics

Element	Description
Project Life (approximate)	7 years (including mining and closure)
Construction (approximate)	3 months
Mining (approximate)	5 years
Closure (approximate)	2 years
Rehabilitation	Progressive during operations.
Land Tenure	Mining and Miscellaneous leases over Pastoral leases
Mine Tenements	Mining Lease ML20/506 and Miscellaneous Licences L20/47 and L20/53
Ore Volume	8.2 MT
Waste Rock Volume	32.7 MT
Rate of Extraction (waste rock and ore)	Up to 11 MT per year
Processing Rate	1.8 MT per year
Extraction Method	Open pit mining with crushing and screening
Number of Mine Pits	One
Size of Mine Pit	260m wide by 1050m long
Depth of Mine Pit	Approx 140m
Area of Disturbance	25.6 Ha for the pit
Area of Vegetation Disturbance	Total area of disturbance 127.7 Ha
Water Supply Source	Bores in structurally controlled aquifers
Groundwater Abstraction Rates	250,000 kilolitres per annum.
Maximum Process Water Requirements	Included in above and only for dust suppression in the crushing and screening circuit.

Abbreviations

Ha - Hectares
ML – Mining lease
MT – Million tonnes

3. Consultation

During the preparation of the EPS, the proponent has undertaken consultation with government agencies and key stakeholders. The organisations and stakeholders consulted, the comments received and the proponent's response are detailed in the EPS (Murchison Metals Ltd, 2006). The proponent consulted with Aboriginal people connected with the area, with relevant Government agencies, pastoralists, and conservation organisations. The main matters raised by stakeholders were biodiversity and mine closure issues.

4. Relevant environmental factors

A description of all of the environmental factors and proposed management is provided in the EPS document (Murchison Metals Ltd, 2006).

In the EPA's opinion the following are the key environmental factors relevant to the proposal:

a) Vegetation and flora;

b) Fauna; and

c) Closure planning, landforms and rehabilitation.

These factors are discussed below.

The EPA has also provided other advice in relation to:

- rehabilitation bonds to be imposed by the Department of Industry and Resources;
- cumulative impacts from future mining proposals in the area;
- further studies required on the native plant *Acacia cockertoniana*; and,
- implications for the proposed Square Kilometre Array (radio telescope project).

4.1 Vegetation and flora

Description

Vegetation communities

A distinctive upland Spinifex community is found in this part of Jack Hills. Botanical work commissioned by the proponent has classified the Spinifex community into a number of structural community types (T1, T2, T3 and T4). However the Department of Conservation and Land Management (CALM) has advised that it does not consider this classification to be valid and that any assessment of impacts should instead be based on consideration of the upland Spinifex community as a whole. CALM has further advised that the upland Spinifex community is of particular conservation significance as, based on current information, it is only known to occur at Jack Hills.

According to the surveys commissioned by the proponent, the total area of the upland Spinifex community at Jack Hills is approximately 189 ha. The area to be disturbed by the present proposal (including previous clearing for exploration) is 25.6 ha or 13.5 % of the total extent of the community.

Flora species

A wattle species *Acacia cockertoniana* is associated with the upland Spinifex community. CALM has advised that this species is also of particular conservation significance as the population at Jack Hills is isolated from the only other known population of the species, which is at Windarling, north of Koolyanobbing. The Jack Hills population may therefore be genetically distinct.

At the request of the EPA, the proponent commissioned additional field surveys to estimate the percentage of the population of *A. cockertoniana* which will be lost as a result of the current proposal. Based on those further surveys, the total population in the area of Mt Hale / Mt Mathew is estimated at between 13,204 and 30,556 individual plants. A total of between 1056 and 3340 individual plants fall within the area of the proposed pit and waste dump (other parts of the project footprint such as the camp area and ROM pad area do not contain suitable habitat for this species). This equates to between 8% and 11% of the total population in this part of Jack Hills which will be lost as a result of the current proposal.

A second plant species found in the upland areas, *Lobelia heterophylla* subsp. *pilbaraensis* (an annual) was initially considered significant as it had been recorded from only a limited number of areas. However further surveys have now demonstrated that the species is more widely distributed than originally thought and the project will therefore not have a significant impact on its conservation status.

In addition, three other priority flora species occur in the vicinity of the proposed haul road. The species are: *Calytrix verruculosa* (Priority 1), *Gunniopsis divisa* (Priority 1) and *Verticordia jamiesoni* (Priority 3). The proponent has carried out further surveys of those species and has modified the haul road route to minimise impacts on the species. CALM has advised that the proposed re-alignment of the haul road route is satisfactory for this purpose.

Assessment

The EPA's environmental objectives for this factor are:

- To maintain the abundance, diversity, geographic distribution and productivity of native flora at species, community and ecosystem levels through avoidance or mitigation of adverse impacts and improvement of knowledge.

- To ensure that native flora are conserved consistent with the *Wildlife Conservation Act (1950)* and the *Environment Protection and Biodiversity Conservation Act (1999).*

Vegetation communities

The EPA notes that the upland Spinifex community is of particular conservation significance as it is only known to occur at Jack Hills. The present proposal (including previous clearing for exploration) will result in a direct loss of 25.6 ha out of a total area of 189 ha, which equates to a loss of 13.5 % of the total area of this community.

The EPA believes that this level of impact from the current proposal is not so great as to pose a significant threat to the continued existence of this community. However should the proponent come forward in future with further mining or exploration proposals involving further clearing of these communities, detailed consideration will need to be given to cumulative impacts (see also "Other Advice").

In addition, for both the present proposal and any future exploration or mining proposals, careful monitoring and management will be required to ensure that the upland Spinifex community is not threatened by indirect impacts, such as from dust deposition, runoff from water used for dust control on unsealed roads, increased fire frequency, or from introduction and spread of weeds.

Flora species

The EPA notes that, for the species *Acacia cockertoniana*, the present proposal will result in the direct loss of between 8% and 11% of the total population in the Mt Hale / Mt Mathew area. The EPA considers that this percentage of loss is not sufficiently large as to pose a significant risk to the conservation status of the Jack Hills population of this species. However, should the proponent come forward in future with proposals for further clearing for additional exploration or mining, the cumulative impacts on the population of *A. cockertoniana* will need to be very carefully assessed. Again as noted above in relation to the whole upland Spinifex community, careful management of potential indirect impacts on the population of *A. cockertoniana* will also be required.

Vegetation Management Plan

The EPA notes that the proponent has prepared a detailed Vegetation Management Plan which is included in the EPS (Murchison Metals Ltd, 2006) The vegetation management plan includes provision for:

- Vegetation monitoring (including impacts from dust);
- Weed hygiene and management; and,
- Rehabilitation, including requirement for using seed from native plant species of local provenance.

Conclusion

The EPA concludes that the proposal can be managed to meet its environmental objectives for this factor provided that:

- a condition is imposed which requires that the proposal be implemented according to the Vegetation Management Plan contained in the EPS. The condition should provide for update and review of the Plan as necessary.

4.2 Fauna

Description

Vertebrate fauna

The proponent has commissioned comprehensive surveys for vertebrate fauna and the reports of those surveys are included in the EPA document (Murchison Metals Ltd, 2006).

The results of the surveys show that the proposal will not have a significant impact on the conservation status of any vertebrate fauna species.

Invertebrate fauna

In regard to invertebrate fauna, the Museum of Western Australia has advised that:

- there is not expected to be any significant impact on surface short-range endemic (SRE) invertebrates as the areas proposed to be mined in the present (Phase 1) project are unlikely to be suitable habitat for such species. This is because SRE habitat is expected to be located on south and east facing hillsides, which will not be impacted by the current proposal.
- there is not likely to be any significant impact on troglofauna ("dry" underground fauna) since, if troglofauna species are present in the ore body or overburden, it is most unlikely that their habitat is restricted to the area to be mined by the present project. This is because the project is located on part of an extensive range of hills and not on an isolated mesa or similar "biogeographic island."

In respect to stygofauna, the proponent's EPS document states that the weathered granitoids and structurally controlled aquifers within the foothills of the Jack Hills range (ie the areas from which groundwater will be abstracted) do not support subterranean fauna.

Assessment

The EPA's environmental objectives for this factor are:

- To maintain the abundance, diversity, geographic distribution and productivity of native fauna at species, community and ecosystem levels through avoidance or mitigation of adverse impacts and improvement of knowledge.

- To ensure that native fauna are conserved consistent with the *Wildlife Conservation Act (1950)* and the *Environment Protection and Biodiversity Conservation Act (1999).*

Vertebrate fauna

The EPA notes that it is unlikely that there will be significant impacts on vertebrate fauna species resulting from the current proposal.

The report from the most recent vertebrate fauna survey notes that there are two species of reptile (lizards), *Delma butleri* and *Cyclodomorphus melanops*, which appear to be restricted to the upland Spinifex community. However the EPA is satisfied that the two species in question are widely distributed and not restricted to the upland Spinifex community.

Nevertheless, if there are proposals for further mining proposals in the area, it will be important to ensure that fauna habitat is not broken up into separate habitat islands containing fragmented and isolated fauna populations.

The EPA also notes that Murchison Metals Ltd has indicated that it will confer with CALM about possible support for feral animal control in the Jack Hills region. The EPA commends this initiative.

Invertebrate fauna

In relation to invertebrate fauna, the EPA notes that it is unlikely that the present proposal will have any significant impacts on any species of short range endemic invertebrates or troglofauna which may occur in the area. However further consideration will need to be given to potential impacts on such fauna should additional mining projects be proposed in the Jack Hills area.

In relation to stygofauna the EPA notes that Dr Brenton Knott of the University of Western Australia, who is an authority on such fauna, has confirmed that it is most unlikely that stygofauna would occur in the granite aquifers which will be the water source for the proposed mining project. Based on that advice, the EPA is satisfied that there should not be any significant impacts on stygofauna from the current proposal.

Conclusion

The EPA concludes that the proposal can be managed to meet its environmental objectives for this factor provided that conditions be imposed requiring that:

- drill holes be capped to prevent native fauna falling in them; and,
- no domestic pets be brought into the area.

The EPA has also provided "Other Advice" is relation to potential cumulative impacts from future mining proposals in this area.

4.3 Closure planning, landforms and rehabilitation

Description

The proponent has put forward a conceptual closure strategy consistent with the ANZMEC/MCA *Strategic Framework for Mine Closure*. This includes the following:

- the waste dump will be located and designed so as to "blend in" with the surrounding landscape and to minimise visual impacts;

- the waste dump will be internally draining so as to minimise potential for accelerated surface erosion; and,

- topsoil will be progressively stripped and placed directly on the waste dump outer surface so as to optimise potential for natural regrowth of native vegetation.

There will be limited scope for re-establishment or "restoration" of the upland Spinifex communities. In particular any vegetation which will re-establish on the waste dump will be

predominantly lowland / slope vegetation. This is because the topsoil (and the seed bank contained in the topsoil) will be mainly sourced from lowland areas within the waste dump footprint and because the new habitat provided by the waste dump is unlikely to be suitable for re-establishment of the upland Spinifex communities.

The mine void (pit) will not be backfilled. As is normal for projects of this type, there will be minimal if any potential for regrowth of vegetation within the void itself.

There are no landscape features of outstanding scenic or geoheritage value which will be removed by the proposal. In regard to Aboriginal heritage values, the proponent commissioned the Yamatji Land and Sea Council to carry out archaeological and ethnographic surveys of the area. The surveys indicated that there were no landforms or other features of Aboriginal heritage significance in the areas to be disturbed.

Assessment

The EPA's environmental objectives for this factor are:

- To ensure that closure and rehabilitation achieves stable, non-polluting and functioning landforms which are consistent with the surrounding landscape and other environmental values.

- That self-sustaining native vegetation communities are returned after mining, which in species composition and ecological function, are as close as possible to naturally occurring analogue sites.

- To protect landforms or geological features of heritage significance or of outstanding scenic or scientific value.

The EPA notes that, as is normal in the initial stages of planning a mining project, the closure strategy does not include detailed rehabilitation (closure) criteria at this stage. The proponent intends to employ Ecosystem Function Analysis (EFA) to monitor rehabilitation success. The EFA framework was developed by CSIRO and involves monitoring of both vegetation and erosion parameters. EFA is widely used in the mining industry and is accepted by the Department of Industry and Resources (DOIR) as an acceptable method to monitor rehabilitation success and, importantly, to predict the likely future progress of rehabilitation.

The EPA is of the view that this approach is appropriate for a project of this scale and has recommended a condition requiring that mine closure and decommissioning be carried out according to the Decommissioning and Closure Plan contained in the proponent's EPS document The condition makes provision for review and update of the plan as appropriate.

The EPA notes that the waste dump design will also require approval from DOIR under the *Mining Act* and the design will be vetted by that Department's geotechnical experts.

The EPA notes that there are no features of particular heritage, scenic or scientific significance which will be removed as a result of the proposal. However, the EPA notes that there is a prominent rock overhang (shallow cave) situated close to the present exploration camp. The overhang falls outside of the project footprint and will not be directly disturbed by mining. The EPA understands that, because the overhang is outside the project footprint, it was not included in the ethnographic and archaeological surveys. Because such features may

be of archaeological significance, the EPA believes that, as a precautionary measure, it would be prudent to protect the overhang area by installing fencing to exclude human access.

Conclusion

The EPA concludes that the proposal can be managed to meet its environmental objectives provided that:

- a condition is imposed requiring that mine closure and decommissioning be carried out according to the Decommissioning and Closure Plan contained in the proponent's EPS document. A final Decommissioning and Closure Plan to be prepared at least two years prior to expected mine closure; and that,
- a condition is imposed requiring the proponent to install and maintain fencing to exclude human access to the rock overhang (shallow cave) which is situated close to the present exploration camp.

5. Other Advice

5.1 Rehabilitation bonds

The Department of Industry and Resources DOIR) routinely requires that proponents lodge rehabilitation performance bonds for mining projects. The EPA recommends that DOIR requires performance bonds commensurate with the likely difficulties in successfully rehabilitating this mine site, given the semi-arid environment in which the proposal is situated.

5.2 Cumulative impacts

The proposal currently before the EPA is for a limited scale mining operation and the impacts on biodiversity and other environmental values are therefore considered acceptable. The EPA is aware however that the proponent is currently preparing a second proposal for a substantially larger scale mining operation in the area with a duration of approximately 50 years ("Jack Hills Phase 2"). Any such future proposal for further mining in the area will require careful assessment of cumulative impacts (including impacts from any other mines in the area) on:

- vegetation and flora; and,

- habitat for both vertebrate fauna (reptiles, amphibians, mammals, birds) and invertebrate fauna (short-range endemic fauna, troglofauna and stygofauna).

5.3 Further research on *Acacia cockertoniana*

Before consideration can be given to further proposals for mining in the Jack Hills area, further research is required on the native plant species *Acacia cockertoniana*. In particular studies are required on the genetics of this species to determine:

- whether the population at Jack Hills is genetically distinct from the other known population at Windarling; and,
- the degree of genetic heterogeneity in the Jack Hills population.

5.4 Square kilometre array

To the east of the project site is a proposal for a square kilometre array (SKA) radio telescope project. Trucks carrying product from the Jack Hills Phase 1 mining project will travel through the area proposed for the SKA. However the Phase 1 mining project is expected to be completed before construction of the SKA starts.

There may however be some potential for interference with preliminary testing work being carried out for the SKA project. This interference may come from electromagnetic radiation from truck and vehicle engines or from radios used for the mining project. It is understood that these issues are readily manageable (by shielding of engine components and by restricting the frequencies used for radios). The DOIR is liaising with Murchison Metals and with CSIRO about this matter.

6. Other Approvals

The proposal will also require approvals by the DOIR under the *Mining Act 1978* and it is intended that the EPS will also function as a Mining Proposal for the purposes of that Act.

The on-site crushing plant and the conveyor belt at the Port of Geraldton will require approval under Part V of the *Environmental Protection Act 1986*. Water abstraction will require approvals under relevant legislation administered by the Department of Water.

7. Conclusions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The EPA concludes that the relevant factor of Vegetation and flora, can be managed to meet the EPA's environmental objectives provided that a condition is imposed requiring that the proposal is implemented in accordance with the Vegetation Management Plan contained in the proponent's EPS document.

The EPA concludes that the relevant factor of fauna, can be managed to meet the EPA's environmental objectives provided that a condition is imposed requiring that:

- drill holes be capped to prevent native fauna falling in them; and,
- that no domestic pets should be brought into the area.

The EPA concludes that the relevant factor of Closure and Decommissioning, can be managed to meet the EPA's environmental objectives provided that a condition is imposed requiring that the proposal is implemented in accordance with the Decommissioning and Closure Plan contained in the proponent's EPS document, with a final Decommissioning and Closure Plan to be prepared at least two years prior to expected mine closure.

The EPA has also recommended that a condition be imposed requiring fencing of a prominent rock overhang (shallow cave) situated near the current mine camp. This is because this feature may be of archaeological significance.

The EPA has also provided other advice in relation to:

- rehabilitation bonds to be imposed by the Department of Industry and Resources;
- cumulative impacts from future mining proposals in the area;
- further studies required on the native plant *Acacia cockertoniana*; and,
- implications for the proposed Square Kilometre Array (radio telescope project).

8. Recommendations

The EPA considers that the proponent has demonstrated, in the EPS document, that the proposal can be managed in an environmentally acceptable manner and provides the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for the Jack Hills Iron Ore Project, Murchison Region.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 4.
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions (Appendix 2).
4. That the Minister imposes the recommended conditions and procedures (Appendix 2).

Appendix 1

References

Murchison Metals Ltd, 2006 *Jack Hills Iron Ore Project, Murchison Region, Western Australia – Environmental Protection Statement* (released 22 May 2006).

Australian and New Zealand Minerals and Energy Council / Minerals Council of Australia, 2000, *Strategic Framework for Mine Closure.*

Appendix 2

Recommended Environmental Conditions

Statement No. XXXX

RECOMMENDED CONDITIONS AND PROCEDURES

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED (PURSUANT TO THE PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986)

JACK HILLS IRON ORE PROJECT,
SHIRE OF MEEKATHARRA, MURCHISON REGION

Proposal: To develop and operate an open cut iron ore mine at Jack Hills, approximately 100 kilometres west of Meekatharra. The proposal will consist of one open pit and a crushing plant and will produce approximately 40 million tonnes of ore and waste material. The proposal is further documented in schedule 1 of this statement.

Proponent: Murchison Metals Ltd, ACN 078257799

Proponent Address: Level 1, 610 Murray Street WEST PERTH WA 6005

Assessment Number: **1637**

Report of the Environmental Protection Authority: Bulletin 1220

The proposal referred to above may be implemented by the proponent subject to the following conditions and procedures:

1 Proposal Description

1-1 The proponent shall implement the proposal as documented and described in schedule 1 of this statement subject to the conditions and procedures of this statement.

2 Proponent Nomination and Contact Details

2-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal.

2-2 The proponent shall notify the Chief Executive Officer of the Department of Environment (CEO) of any change of the name and address for the serving of notices or other correspondence within 30 days of such change.

3 Time Limit of Authorisation

3-1 The authorisation to implement the proposal provided for in this statement shall lapse and be void within five years after the date of this statement if the proposal to which this statement refers is not substantially commenced.

3-2 The proponent shall provide the CEO with written evidence which demonstrates that the proposal has substantially commenced on or before the expiration of five years from the date of this statement.

4 Compliance Reporting

4-1 The proponent shall submit to the CEO Compliance Reports in accordance with a schedule approved by the CEO.

4-2 The Compliance Reports shall be prepared in accordance with the compliance monitoring guidelines, and shall**:**

1. describe and provide evidence of the status of the implementation of the proposal;
2. include evidence of compliance with the conditions, procedures and commitments of this statement;
3. provide a review of the effectiveness of corrective and preventative actions contained in the environmental management plans and programs;
4. provide verifiable evidence of the fulfilment of requirements specified in the environmental management plans and programs;
5. identify all confirmed non-conformities and non-compliances and describe the related corrective and preventative actions taken; and
6. identify potential non-conformities and non-compliances and provide evidence of how these are being determined for corrective action.

4-3 The proponent shall make Compliance Reports publicly available on request.

5 Performance Review

5-1 The proponent shall submit a Performance Review report every two years after the start of production to the CEO, which addresses:

1. the major environmental issues associated with implementing the project; the environmental objectives for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those objectives;
2. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;
3. significant improvements gained in environmental management, including the use of external peer reviews;
4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and
5. the proposed environmental objectives over the next two years, including improvements in technology and management processes.

6 Responsibility for On-site Environmental Matters

6-1 At all stages of the proposal from construction through to closure and decommissioning, the proponent shall have a senior employee based on site who shall be the designated officer with lead responsibility for environmental matters.

7 Environmental Induction for Employees and Contractors

7-1 At all stages of the proposal from construction through to closure and decommissioning, the proponent shall provide environmental induction for all employees and contractors before they start work on the site.

7-2 The environmental inductions required by condition 7-1 shall address:

(1) statutory requirements for protection of the environment;
(2) relevant work procedures;
(3) environmental management measures;
(4) weed hygiene and control measures; and,
(5) incident reporting requirements.

8 Vegetation Management

8-1 Prior to ground disturbing activities, the proponent shall implement the Vegetation Management Plan contained within the proponent's Environmental Protection Statement for the proposal published on 22 May 2006.

In the event that a difference exists between the Vegetation Management Plan and conditions 8-2 to 8.9, then conditions 8-2 to 8.9 shall prevail.

8-2 In consultation with the Department of Conservation and Land Management, the proponent shall put in place measures (which may include fencing and/or signposting) to delineate and protect the locations of plants, vegetation, or other areas of particular conservation significance.

8-3 The proponent shall ensure, through weed hygiene, monitoring and control procedures, that no weed species are introduced into the proposal area.

8-4 In the event that weed species are introduced into the proposal area, the proponent shall undertake appropriate weed control measures and shall continue those measures for such duration as required by the Minister for the Environment on advice of the Environmental Protection Authority.

8-5 In carrying out rehabilitation activities, the proponent shall only use native plant species of local provenance (defined as plant material or seeds collected within ten kilometres of the project site), except with permission in writing from the Department of Conservation and Land Management.

8-6 The proponent shall construct and maintain roadside drains or other structures as necessary to contain runoff from roads and to prevent runoff impacts on adjacent native vegetation.

8-7 The proponent shall carry out monitoring, and shall take such remedial or management action as may be required, to ensure that surrounding native vegetation is not significantly adversely affected by dust, water used for dust control or other emissions or factors resulting from implementation of the proposal.

8-8 The proponent shall review and revise as appropriate the Vegetation Management Plan referred to in condition 8-1 to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management..

8-9 The proponent shall make any revisions of the Vegetation Management Plan, as required by condition 8-8, publicly available in a manner approved by the Department of Environment.

9 Fauna Management

9-1 The proponent shall cap all open drill holes each day before nightfall to prevent native fauna from falling into them.

9-2 The proponent shall not permit cats, dogs or other domestic pets to be brought onto the site of the proposal, except with permission in writing from the Department of Conservation and Land Management.

10 Decommissioning and Closure Plan

10-1 The proponent shall implement the Decommissioning and Closure Plan contained within the proponent's Environmental Protection Statement for the proposal published on 22 May 2006.

In the event that a difference exists between the Decommissioning and Closure Plan and conditions 10-2 to 10-4, then conditions 10-2 to 10-4 shall prevail.

10-2 At least two years prior to the anticipated date of decommissioning and closure, or at a time agreed with the Environmental Protection Authority, the proponent shall prepare a Final Decommissioning and Closure Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, the Department of Conservation and Land Management and the Department of Industry and Resources

The Final Decommissioning and Closure Plan shall include:

1. removal or, if appropriate, retention of plant and infrastructure in consultation with relevant stakeholders;
2. long-term management of ground and surface water systems affected by the mining operations, including groundwater drawdown and diversion;
3. rehabilitation to a standard suitable for the agreed new land use(s); and
4. identification of contaminated areas, including provision of evidence of notification and proposed management measures to relevant statutory authorities.

10-3 The proponent shall implement the Final Decommissioning and Closure Plan required by condition 10-2 until such time as the Minister for the Environment determines, on advice of the Environmental Protection Authority, that the proponent's decommissioning and closure responsibilities have been fulfilled.

10-4 The proponent shall make the Final Decommissioning and Closure Plan required by condition 10-2 publicly available in a manner approved by the Department of Environment.

11 **Rock Overhang**

11-1 The proponent shall protect the rock overhang located at 523,895 E 7,119,178 N (see figure 3 attached) by installing and maintaining fencing at an appropriate setback to exclude human access.

Notes

1. The CEO may seek the advice of the Environmental Protection Authority, government agencies and relevant parties, as necessary, for the preparation of written notice to the proponent.

2. The proponent shall relinquish the nomination following the procedure under section 38(6a) of the *Environmental Protection Act 1986*.

3. The proponent is required to apply for a Works Approval and Licence for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

The Proposal (Assessment No. 1637)

The main characteristics of the proposal are summarised in Table 1 below.

Table 1 – Key Proposal Characteristics

Element	Description
Project Life (approximate)	7 years (including mining and closure)
Construction (approximate)	3 months
Mining (approximate)	5 years
Closure (approximate)	2 years
Rehabilitation	Progressive during operations.
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Mine Tenements	Mining Lease ML20/506 and Miscellaneous Licences L20/47 and L20/53
Ore Volume	8.2 MT
Waste Rock Volume	32.7 MT
Rate of Extraction (waste rock and ore)	Up to 11 MT per year
Processing Rate	1.8 MT per year
Extraction Method	Open pit mining with crushing and screening
Number of Mine Pits	One
Size of Mine Pit	260m wide by 1050m long
Depth of Mine Pit	Approx 140m
Area of Disturbance	25.6 Ha for the pit
Area of Vegetation Disturbance	Total area of disturbance 127.7 Ha
Water Supply Source	Bores in structurally controlled aquifers
Groundwater Abstraction Rates	250,000 kilolitres per annum.
Maximum Process Water Requirements	Included in above and only for dust suppression in the crushing and screening circuit.

Abbreviations

BCM – Bank Cubic Metres

Figures (attached)

Figure 1 –Project Location.
Figure 2 –General Mine Layout.
Figure 3 – Detailed Mine Layout
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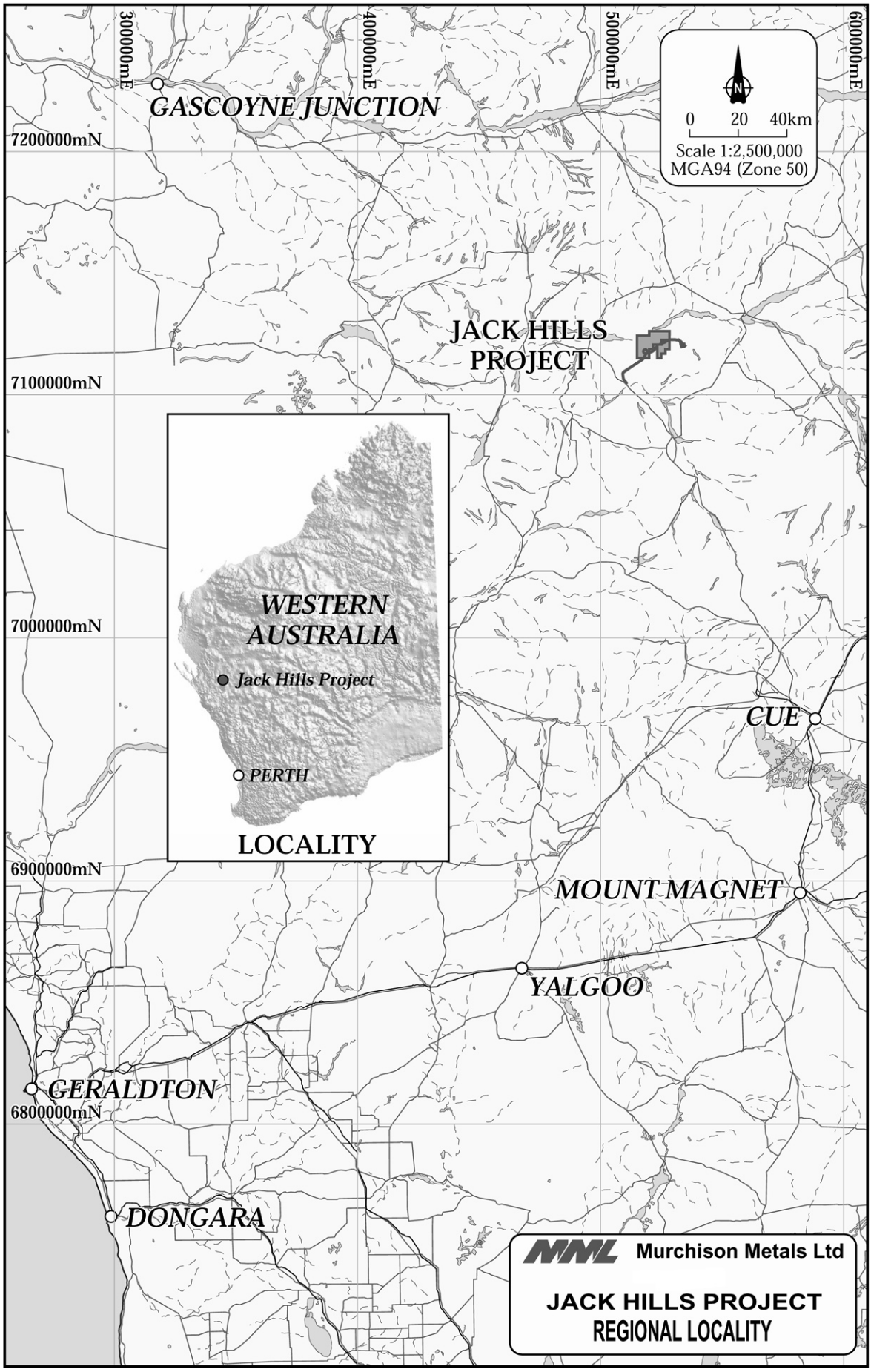

Figure 1: Jack Hills Project Location

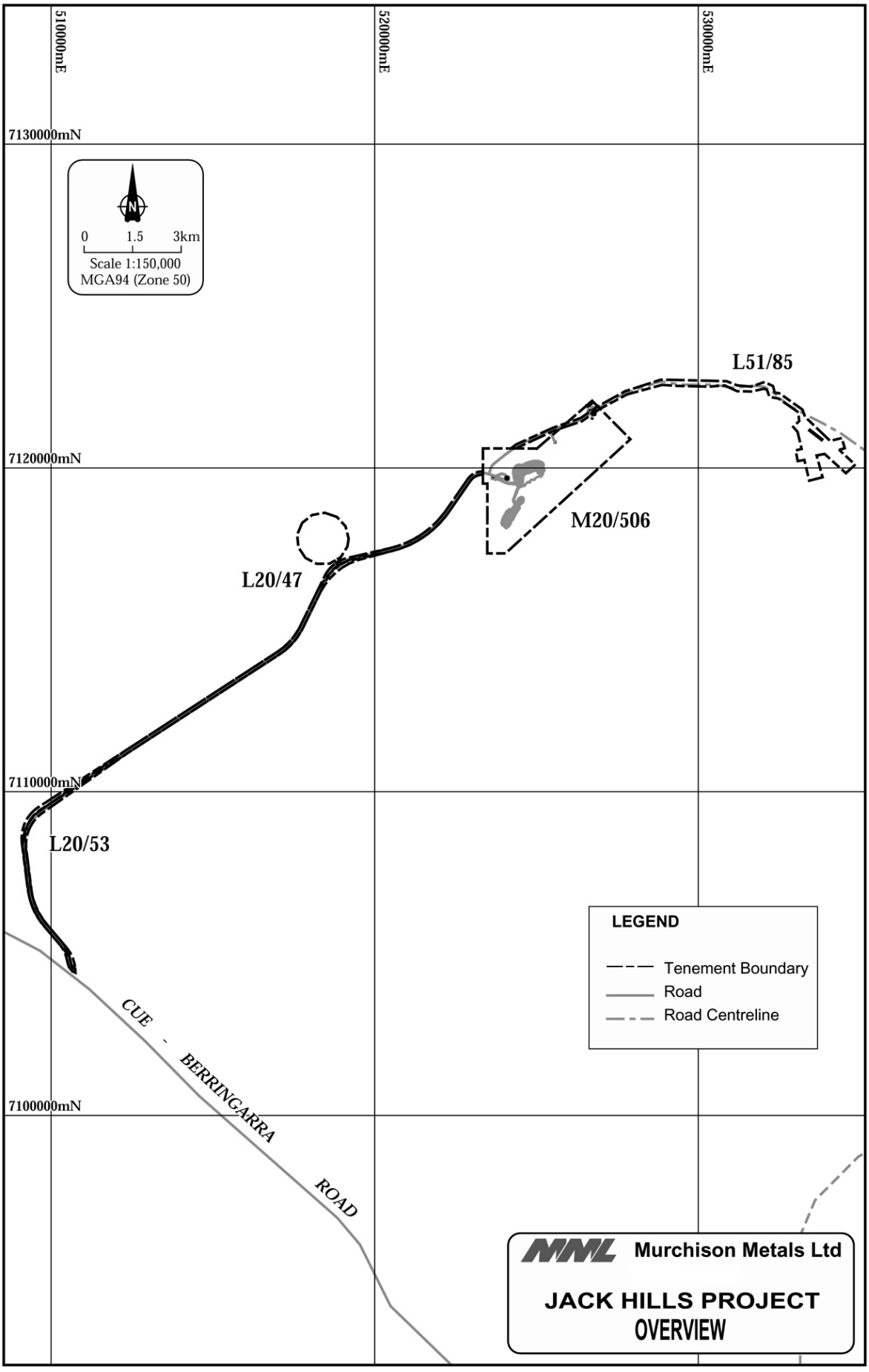

Figure 2: Jack Hills Project General Mine Layout.

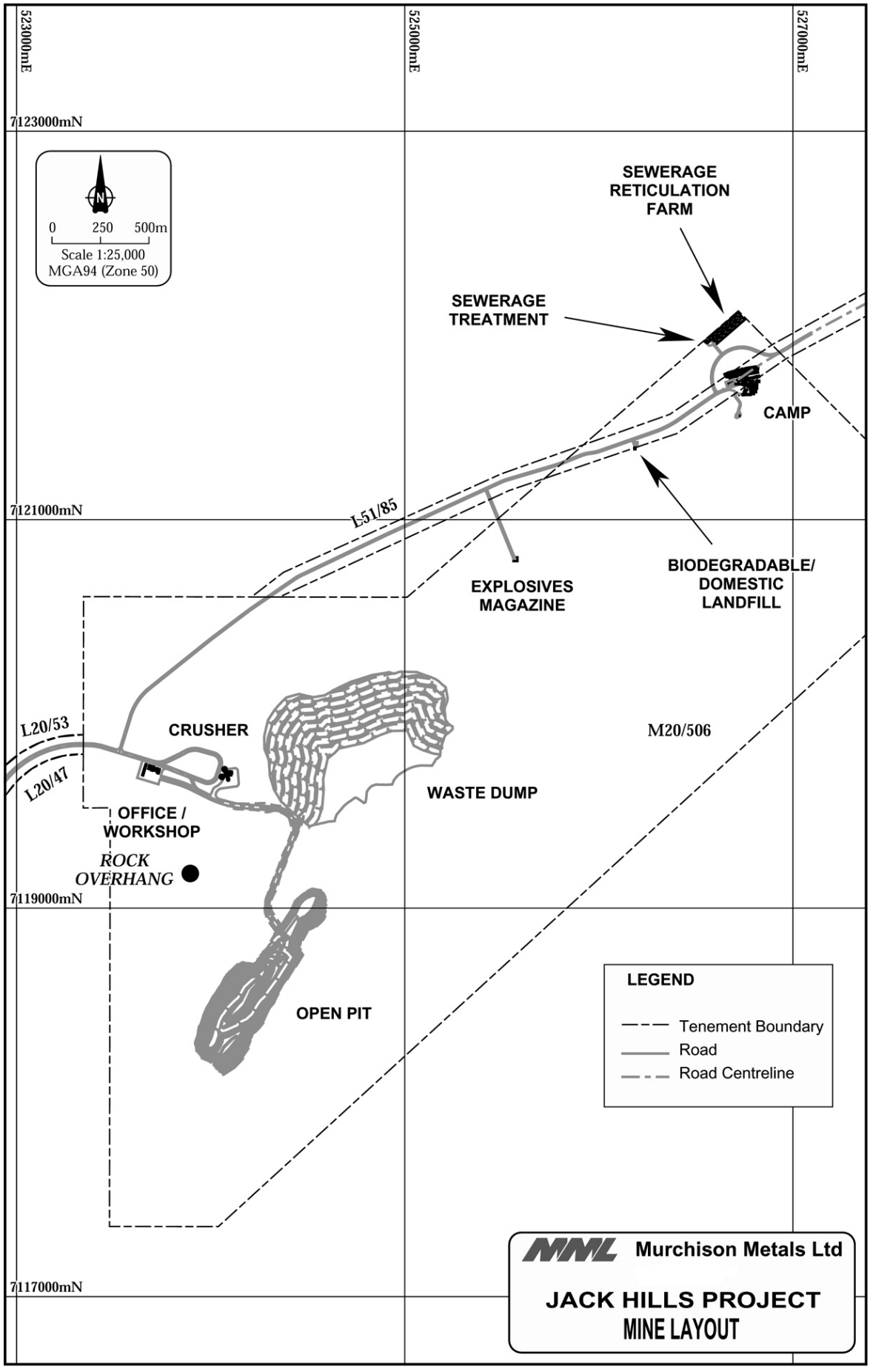

Figure 3: Jack Hills Project Detailed Mine Layout