Metro Mining's Bauxite Hills Project
Transport Assessment Report

CDM Smith
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1. **Background**

1.1 **Introduction**
TTM Consulting Pty Ltd (TTM) has been engaged by CDM Smith Australia Pty Ltd (CDM Smith) to undertake a Transport Assessment for a proposed bauxite mine.

1.2 **Project Description**
Metro Mining Pty Ltd (Metro Mining) proposes to develop the Bauxite Hills Mine (the ‘Mine’) within Exploration Permit for Minerals (EPM) 15376 and 16899, located approximately 95 km north of Weipa on the Western Cape York, Queensland, as shown in Appendix A. The bauxite resource lies in two main plateaus (referred to as BH1 and BH6) between Skardon and Ducie Rivers and five kilometres from the existing port at Skardon River, as shown in Appendix A.

1.3 **Tenure Status**
Metro Mining Pty Ltd (Metro Mining) proposes to develop the Mine within Exploration Permit for Minerals (EPM) 15376 and 16899. BH1 lies within EPM 15276 and BH6 lies within EPM 16889. The deposits declared resources are overlayed with MLA 20676, MLA 20688 and MLA 20689. These lease applications are held by Aldoga Minerals Pty Ltd, a wholly subsidiary of Metro Mining Limited.

1.4 **Social Impacts**
The Project is located within the driving distance of the Weipa Township which has a population of approximately 2,800 persons.
The broader Weipa region supports two operating mines (Rio Tinto’s East Weipa and Andoom) of similar deposit types.
This Project will potentially source its work force from the local community and also a fly in fly out component from leaving from Cairns Airport. It is anticipated that staff will travel as follows:
- 30% flown in or by barge from Weipa (local community); and
- 70% flown in directly from Cairns and/or Cooktown (fly in fly out component).

1.5 **Study Scope**
The aim of this report is to investigate the air and road transport aspects associated with the proposed Project, with the following areas to be reviewed:
- Review of the key access routes to be used during construction and operation;
- Review of the Project generated road and air transport volumes, distribution and composition and throughputs;
- Review of the Project transport impact on both the public transport network and State Controlled transport networks; and
• Review of any upgrades to mitigate the overall Project transport impact.

The investigations associated with Project related shipping activities will be reported in a separate standalone shipping report.
2. The Project

2.1 Introduction
Metro Mining proposes wherever possible to utilise existing or construct new shared infrastructure at the Project site so as to minimise impacts arising from the duplication of key transport infrastructure. The proposed Infrastructure Plan for the Project is provided in Appendix A.

2.2 Proposed Mining Operation Summary
The following provides a summary of the key mining operations for the Project:

- The Project is proposed have an annual production of less than 2 Mt per annum, with a life of 27 years and commencing in 2016, as shown by Figure 2.1;
- The Project proposes an open cut mining method utilising front end loaders and trucks for hauling;
- Working days: 275 per annum, with hours: 12 hours per day being typically 7 am to 7 pm;
- 75 man operation, with 50 permanent, up to 25 more casual, consultant and management;
- Roster based on 2 weeks on, with 1 week off;
- It is anticipated that staff will travel as follows:
  - 30% flown in or by barge from Weipa (local community); and
  - 70% flown in directly from Cairns and/or Cooktown (fly in fly out component).
- A new on-site worker camp facility will be constructed;
- It is assumed the existing Gulf Airstrip (excluding Cairns and Weipa), will be upgrading and managed by Gulf, unless separate commercial agreement is entered into;
- It is intended for light vehicles to move workers between camp and pits;
- All construction equipment and large loads are proposed to be barged in from Cairns to site or barged from Weipa (i.e. departing Evans Landing) to site if local equipment is available;
- Fuel deliveries will be made to site via barge and stored in 3 x 100,000 litre tanks;
- All other supplies for the worker camp to come by barge via Weipa;
- It is anticipated that any non-mine related vessel activity will be infrequent recreational fishing craft;
- It is not proposed for the internal mine roads to be open to public use;
- Any fatigue issues will be managed through site based EHS policies; and
- The use of the existing roads to and from the site is envisaged to be minimal with emergency evacuation access by airstrip, chopper, barge or existing access roads.
2.3 Mining Boundaries

It is proposed for two key mine lease boundaries to be developed as part of the Project plan, which will also cover subsequent mining reserves. The mining Lease boundaries have been given a 50 metres clearance offset as to allow for adequate haulage space and an environmental buffer.

2.4 Workforce and Accommodation Details

It is expected that there will be on average 105 mine workers employed plus contractors, with the following roles anticipated to be included as part of this workforce:

- Engineers and managers;
- Supervisors and inspectors;
- Administrative personnel;
- Health, Safety and Environment (HS&E) officers;
- Operators (machinery, earthmoving, trucks etc.);
- Unskilled labourers, semi-skilled labourers and skilled labourers; and
- Chemists and non-destructive testing technicians.

It is proposed for a new accommodation village to be constructed as part of the Project, which will be located on site, as shown by the Project Infrastructure Plan provided in Appendix A.

2.5 Project Maintenance Requirements

The Project will be operated approximately nine months of the year. Maintenance activities will typically be undertaken during the day time, except for breakdown maintenance. Any major maintenance and repair requirements will typically be undertaken by subcontractors who will fly-in during the scheduled maintenance periods.
2.6 Road Transport and Haul Road Operations

There will be no external Council or State road network use to access the Project area. The Project site is remote and difficult to get to by the existing road network once off the Peninsula Development Road (PDR). Conservatively it is expected that it would take approximately a day to travel between Weipa and the Project area by light vehicle. The existing track leading off the PDR is unsealed, not maintained and only suitable for use by 4wd during the dry season. Furthermore, approval is required from Rio Tinto to use the sections of the track that cross their existing Mining Leases.

The development of the road network within the Project area will commence in 2016. During the first year it proposed for 7km of haul roads to be constructed for mining at the BH6 - Pit 1. As the mining progresses each year, further development of the haul roads will be required including the provision of culvert structures.

It is estimated that an additional 7km of haul road construction will occur in 2017 and 3km in 2018, and thus providing access throughout the proposed mining area.

The bauxite material will be hauled to the ROM stockpile using Road Train trucks. It is proposed for dual lane surface haul roads and in-pit ramps which will be designed to suit the dump truck size capacity being 130 tonne (Powertrans T1250 Road Train Double). In-pit ramp widths will be designed for a 30m width, with the surface haul roads including haulage access to waste dumps and the ROM to be 40 metres in width, as to allow for adequate drainage.

2.7 Air Transport Operations

It is currently proposed to upgrade the Skardon River Kaolin Mine (SRKM) airstrip, which is centrally located within the resource area, and reach a shared operating agreement with the existing airstrip operator, with the intention that this airstrip would service the mine site throughout the life of the Project.

It is intended that the Project will utilise this existing facility to support fly in fly out operations for staff transport to and from site. The existing runway is in reasonably good condition and as noted, the existing facilities will be upgraded as required.

The SRKM airstrip will be utilised to transport both construction and operational work forces by charter flights, from both Weipa and Cairns. The anticipated number of flights for the construction and operations phases are shown at Table 2.4 and Table 2.5.

There is also the possibility of using the Cooktown airport with a charter flight into Skardon; however, this will depend on the workforce location.

Table 2.4: Air Transport (Construction Operations)

<table>
<thead>
<tr>
<th>Air Transport</th>
<th>At 2Mt Per annum</th>
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<tr>
<td>Flights - Weipa and Cairns</td>
<td>10 flights per week (in-bound)</td>
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Table 2.5: Air Transport (Mining Operations)

<table>
<thead>
<tr>
<th>Air Transport</th>
<th>At 2Mt Per annum</th>
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<tr>
<td>Flights - Weipa and Cairns</td>
<td>3 flights per week (in-bound)</td>
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2.8 Project Waste Material Operations

It is proposed for any overburden material generated by the project to be initially stored Ex-Pit onto a cleared area of land, while the In-Pit overburden dumping is expected to commence within the first six months of production.

The overburden volume is expected to be low for this deposit material type and it is not expected to represent a major problem in terms of storage or required capacity of mining equipment. It is envisaged for the following waste operations envisaged:

- Waste oil – transported by barge down to JJ Richards treatment plant;
- Other oily wastes e.g. rags, filters etc. barge to Karumba and land to Mt Isa, or barge to Cairns;
- General waste – bunded containers – barge to Mt Isa and/or Cairns facilities; and
- Recyclable waste – paper cardboard plastics – container with hydraulic ram – barge to Mt Isa and/or Cairns.

2.9 Project Equipment Requirements

A preliminary analysis has been undertaken to determine the most appropriate size and type of machinery/plant equipment required for the Project based on the likely workforce and annual operations (under 2.0Mt per annum), with a summary of Projects key fleet equipment requirements, as follows:

- 2 x Front end loaders (CAT 992);
- 2 x Front end loaders (CAT988);
- 6 x Road Train Trucks (Power Trans T1250)
- 1 x Excavator (CAT 329);
- 1 x Tracked Dozer (CAT D10);
- 1 x Wheeled Dozer (CAT 834);
- 1 x Grader (CAT 16H);
- 1 x Water Truck (CAT 773);
- 1 x Service Truck;
- 3 x Lighting Plants; and
- 2 x Dewatering Plants (Skyes XH150).

2.10 Parking Arrangements and On-site Manoeuvring

A formal parking area will be provided for vehicles stationary on-site. These parking areas will include designated parking provisions for light vehicles, limited private vehicles and service vehicles that maybe on site at any given time.

The formal parking area will be kept clear of any haul vehicle manoeuvring and Metro Mining will look at opportunities to minimise haul vehicle routes interacting with other vehicle movements within the site.
Further Project planning and design will be undertaken to ensure for adequate clearance zones between any pedestrian, operational, parking and emergency area requirements, with further details to be provided as part of the General Operational Management Plans and Operational Approvals.

2.11 Project Decommissioning

It is assumed that the Project will have a long operational life span 27 years) after which it may be decommissioned. As part of the decommissioning process, it is expected that there will be some minor impacts, with materials likely to be removed from site by barge with only minor use of existing road network and will require several operations, including:

- Removal of any hazardous material;
- Decommissioning of buildings and structures on site;
- Removal of waste material;
- Potential environmental actions; and
- Removal of plant and machinery from site.
3. Existing Road Transport Infrastructure

3.1 Introduction
This Chapter will review the existing road transport networks that may serve the Project.

3.2 Road Transport Network
There will be no external road network use to access the Project area. The Project site is remote and difficult to get to by the existing road network once off the Peninsula Development Road (PDR). As such no assessment against the Department of Transport and Main Roads (DTMR) “Guidelines for Assessment of Road Impacts for Development” (2006a) or the “DTMR Road Planning and Design Manual” (2006b).

There are no new or alterations to public road infrastructure proposed during the construction and operational phases of the Project. Use of the current road network in Weipa is expected to be extremely limited and is likely to be limited to light vehicles associated with personnel movements and obtaining supplies. Given the infrequent and minor nature of the use it is expected that the current level of service of the existing public road network will be maintained.
4. Existing Air Transport Infrastructure

4.1 Introduction
This Chapter will review the existing air transport networks that may serve the Project.

4.2 Local Air Transport Network
The following airstrips are located in the vicinity of the Project:

- Agnew airstrip, which is approximately 20km to the south east;
- Mapoon airstrip, which is located on the southern bank of the Ducie river; and
- The SKRM airstrip, which is centrally located within the resource area.

An allowance has been made with the capital and operation Project costs to upgrade and assist with management of the SRKM airstrip. The intention being that this would be used to service the mine site throughout the life of the Project.

Weipa airport is located 13km south east of Weipa and is managed by Aerodrome Management Services on behalf of Rio Tinto. QantasLink and Skytrains both service the airport and Oceania manage the ground handling activities on their behalf. In 2014 there were 34,000 arrivals and 33,000 departures through the airport. There were approximately 2,560 inbound flights during 2014 averaging approximately 49 arrivals per week or seven arrivals per day over the year.

4.3 Regional Air Transport
Over 3.5 million passengers pass through Cairns airport’s T2 (Domestic Terminal) each year. There are direct domestic flights to Brisbane, Gold Coast, Sydney, Melbourne, Adelaide, Perth, Darwin and Townsville as well as to Alice Springs, Ayers Rock (Uluru) and regional centres across North Queensland.

Cairns airport is Australia’s seventh busiest for international passengers with direct flights from Tokyo, Osaka, Hong Kong, Guam and Port Moresby. There are also seasonal flights from Shanghai, Guangzhou and Auckland.

Cairns airport carried a total of 343,000 passengers in March 2015 with 3,630 flights and approximately 114 flights per day both in and outbound. From a review of available information, TTM are unaware of any flight capacity issues.

TTM understand that there are proposals for the redevelopment of Cairns airport with ten new direct air routes between Cairns, Asia and Australia as revealed in a submission to the Northern Australia White Paper committee.

The Cook Council owns and operates the Cooktown Aerodrome, which is a certified aerodrome with a runway classification of 3C and is suitable for a design aircraft not needing a pavement concession with a MTOW of 15500 kg e.g. a Dash 8 – 100.

There were in 2,180 aircraft movements in 2013 and 2,291 in 2014. Hinterland Aviation are the largest user of the airport on a regular public transport basis with a fleet of 11 aircraft.
Hinterland Aviation services the Cooktown airport ex-Cairns with three return flights Monday and Friday, two flights Tuesday – Thursday, one flight on Saturdays and a single Sunday flight each fortnight. Charter flights are also available on an as needed basis. Hinterland Aviation uses Cessna 208s (Cessna Caravans) to service these flights and typically carry on average nine passengers each leg or approximately 7,500 passengers annually.
5. Road Transport Impacts

5.1 Introduction
This Chapter will review any potential Project road transport impacts and identify any measures that mitigate any impacts.

5.2 Road Transport Impacts
The Project area is not serviced by a road network and is only accessible during the dry season by 4WD from the PDR. As discussed earlier in this report, Metro Mining do not intend to use the existing track connecting the Project area and the PDR to service the Project.

The following provides summary of the key road transport aspects:

- No new road infrastructure external to the Project area will be required to support either the Project construction or operational phases;
- There are no new or alterations to public road infrastructure proposed during the construction and operational phases of the Project;
- Use of the current road network in Weipa is expected to be extremely limited and is likely to be limited to light vehicles associated with personnel movements and obtaining supplies;
- Given the infrequent and minor nature of the use of the existing road network in Weipa it is expected that the current level of service of the existing public road network will be maintained; and
- No significant impacts are therefore anticipated in relation to the Project's road transport activities.
6. Air Transport Impacts

6.1 Introduction
This Chapter will review any potential Project air transport impacts and identify any measures that mitigate any impacts.

6.2 Air Transport Impacts
Metro Mining propose to operate flights into the SRKM airstrip during construction and operation phases from both Weipa and Cairns airports. The current pavement supports services by smaller commuter airliners such as the twin-turboprop Embraer EMB 120 Brasilia and it is anticipated that these classifications of aircraft will be used for the flights into and out of the existing airstrip.

Once economic and commercial terms have been agreed with the existing operator, it is proposed to upgrade and co-operatively manage the SRKM airstrip, which is centrally located within the resource area and would be used to service the mine site throughout the life of the Project. It is expected that these upgrades will be to a standard suitable to maintain a level of service for the two Projects proposed for the area.

As noted, Cairns airport carried a total of 343,000 passengers in March 2015 or approximately 86,000 per week, with 3,630 flights and approximately 114 flights per day both in and outbound. The level of flights leaving Weipa are between one to three times daily.

It is envisaged that there will be minor increases (with approximately 100 additional passengers per week) or an increase of less than 0.1% in the passenger use of Cairns airport during the operational phase. TTM note that it is intended to use the existing Qantas flight from Cairns to Weipa which has a 16 flight per week service.

As such, TTM considers that the Project will have no significant impacts upon the State or Commonwealth controlled and privately operated airports, with no changes to any airport infrastructure.
7. General Operational Management Plan

A General Operational Management Plan is intended be developed which will cover transport related activities (covering marine, air and road transport) and implemented for the duration of the construction and operational activities.

This plan will be developed in conjunction with both Council and DTMR (if required) and will consider any other planned infrastructure works in the area.

As part of the preparation of the Plan potential site access hazards and risks related to the Projects construction and operation will be reviewed and identified. This will include transport of hazardous substances for the Project activities which will comply with specific Australian Codes for Transport of Dangerous Goods.

It is intended that this Plan will be further developed during the detailed design and operational approvals.
8. Conclusions and Recommendations

The following conclusions have been established from the Transport Study.

8.1 Project Transport Generation and Distribution
TTM has undertaken an estimate of the likely Project transport generation, mode and distribution.

The main modes of transport that will be used during all Project phases (construction and operation) will be by either air and marine (assessed via a separate report) modes of travel. The use of any public roads will be very infrequent as barges and planes will be the predominate transport use serving the development.

8.2 Road Transport Impacts
It is intended that the Project will not rely upon the local and state controlled road network for its main transport routes and therefore a detailed road transport assessment is not required.

8.3 Air Transport Impacts
It is proposed for the SRKM airstrip to be upgraded and to be managed and will service the mine throughout the life of the Project. From a review of worker flight demands, there will be negligible increase in passenger activity, particularly at Cairns airport.

8.4 General Operational Management Plan
A General Operational Management Plan will be developed for both the construction and operational activities, which will be in place prior to on-site construction activities commencing.

8.5 Conclusion
In relation to development road activities and travel, there will be no reduction in level of service and no road improvements as the state / federal road network is not intended to be used. It is expected that there will be typical mining activity type traffic which will be contained within the mining lease area.

In relation to air activities and travel, there will be no reduction in the level of service throughput at the airports due to the anticipated low level of worker demands.
Appendix A

LOCATION AND SITE PLANS
Regional Context [CDM Smith, 2015]
Bauxite Hills Mine Location [Metro Mining, 2015]
Appendix B

BIBLIOGRAPHY
Department of Transport and Main Roads (DTMR) (2006a). “Guidelines for Assessment of Road Impacts for Development”