ASSESSMENT REPORT 45

BOOTU CREEK MANGANESE PROJECT

SUPPLEMENTARY ENVIRONMENTAL ASSESSMENT REPORT

AND

RECOMMENDATIONS

by the

OFFICE OF ENVIRONMENT AND HERITAGE

NORTHERN TERRITORY GOVERNMENT

October 2004

Northern Territory Government
Office of Environment and Heritage

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report assesses the information provided by Bootu Creek Resources Pty Ltd in response to the Requirements outlined in Section 3 of the Bootu Creek Assessment Report No. 44 and Recommendations.

The Public Environmental Report (PER) and additional information (submitted on 24 September 2004 at the request of the Minister for the Environment and Heritage) prepared by MBS Environmental on behalf of Bootu Creek Resources did not provide sufficient information to allow the Office of Environment and Heritage to come to the conclusion that the proposed Bootu Creek Manganese Mine would not have unacceptable environmental impacts. Of particular concern were the issues relating to water management. As a result, the Assessment Report No. 44 recommended that approval to commence the mining operation was deferred until the three requirements pertaining to surface water management issues were addressed in considerably more detail and provided to the Office of Environment and Heritage for further assessment.

On 22 October 2004 MBS Environmental submitted further information regarding surface water management to the Office of Environment and Heritage, which addresses the three requirements outlined in Section 3 of the Assessment Report No. 44.

The outcome of this additional environmental impact assessment for this proposal is that the Office of Environment and Heritage considers that the environmental issues associated with surface water management have been adequately identified.

Conclusion

Appropriate environmental management of some of the environmental issues associated with the proposed project has been resolved through the assessment process, while the remainder will be addressed through monitoring and management actions detailed in a comprehensive Environmental Management Plan (EMP), included as part of the Mining Management Plan.

Based on its review of the PER and the additional information provided by the proponent, the Office of Environment and Heritage considers that the mining project can be managed in a manner that avoids unacceptable environmental impacts, provided that the environmental commitments, safeguards and recommendations detailed in the PER, supplementary material, Assessment Report and Supplementary Assessment Report are implemented with regular reporting and compliance auditing.

LIST OF RECOMMENDATIONS

Recommendation 1

Information on the impact on downstream hydrology and ecology of the disposal of the excess groundwater from the dewatering program is to be provided to the Office of Environment and Heritage for assessment prior to commissioning. Management and mitigation measures of any predicted impacts are to be included in the Mining Environmental Management Plan.

Recommendation 2

Further sampling of the groundwater is to be undertaken to confirm that the water is of suitable quality for discharge to the environment and that the salinity of the water is within acceptable limits. Bootu Creek Resources are to collect water quality information for the project area before, during and after construction (should water be available at the time). This information is to be included in the Mining Environmental Management Plan and the Water Management Plan.

A Monitoring Program is to be developed that records conductivities as well as extraction volumes. Based on the monitoring results Bootu Creek Resources are to explore the possibility of preferentially using groundwater of poorer quality in the process, allowing lower salinity water to discharge to the creeks.

Recommendation 3

Erosion control measures for the proposed creek diversion channels, including the haul road crossing, are to be included in the Mining Environmental Management Plan. Methods of construction of the proposed creek diversion channels must be undertaken in such a way as to not impact on the downstream hydrological regime of the creeks.

1 INTRODUCTION AND BACKGROUND

This report assesses the information provided by Bootu Creek Resources Pty Ltd in response to the Requirements outlined in Section 3 of the Bootu Creek Assessment Report No. 44 and Recommendations.

1.1 Environmental Impact Assessment History

The Public Environmental Report (PER) and additional information (submitted on 24 September 2004 at the request of the Minister for the Environment and Heritage) prepared by MBS Environmental on behalf of Bootu Creek Resources Pty Ltd did not contain sufficient information to enable the Minister for the Environment and Heritage to conclude that the proposal would not result in unacceptable environmental impacts. Of particular concern was the issue of surface water management and the impact of disposing excess groundwater from the dewatering program into the ephemeral creeks. As a result the Minister for the Environment and Heritage made the recommendation that mining approval be deferred until the water management issue was addressed in considerably more detail and provided to the Office of Environment and Heritage for further assessment.

MBS Environmental have submitted further information regarding surface water management to the Office of Environment and Heritage, which addresses the three requirements outlined in Section 3 of the Assessment Report No. 44.

2 ENVIRONMENTAL IMPACT ASSESSMENT

2.1 Supplementary Assessment

The main purpose of this Supplementary Environmental Assessment Report is to determine if the proposed project can proceed without unacceptable environmental impacts to the ephemeral creek system.

The environmental acceptability of this aspect of the project is based on consideration of the information, provided at the request of the Minister for the Environment and Heritage, in terms of the following:

- adequacy of information outlining the surface water management measures of the proposal;
- adequacy of information on the existing environment;
- adequacy of information on the range and extent of potential impacts; and
- adequacy of the proposed safeguards to avoid or mitigate potential impacts.

The outcome of this additional environmental impact assessment for this proposal is that the Office of Environment and Heritage considers that the environmental issues associated with surface water management have been adequately identified.

Section 3 contains recommendations (in **bold**), each of which are preceded by text that identifies concerns, suggestions and undertakings associated with the project. For this reason, the recommendations should **not** be considered in isolation.

2.2 Final Conclusions

Appropriate environmental management of some of the environmental issues associated with the proposed project has been resolved through the assessment process, while the remainder will be addressed through monitoring and management actions detailed in a comprehensive Environmental Management Plan (EMP), included as part of the Mining Management Plan.

Based on its review of the PER and the additional information provided by the proponent, the Office of Environment and Heritage considers that the mining project can be managed in a manner that avoids unacceptable environmental impacts, provided that the environmental commitments, safeguards and recommendations detailed in the PER, supplementary material, Assessment Report No. 44 and Supplementary Assessment Report are implemented with regular reporting and compliance auditing.

3 SURFACE WATER MANAGEMENT

The potential surface water issues posed by the proposed mining and processing operations are mainly related to deterioration in surface water quality and the potential adverse effect of excess mine dewatering on natural drainage systems. The PER states that the worst case scenario of the dewatering program is an excess of water in all years of mining, with a maximum excess of 2 292 mega litres in year 4 of mining. After eight years of mining it is estimated that at the most a total of 11 885 mega litres will have been released to the ephemeral streams.

Discharge is proposed to occur at two locations, namely one in each of the unnamed creeks located north east and south east of the Gogo pit and waste rock stockpile. Water will be abstracted from a large number of bores located parallel to the Gogo and Shekuma pits. Water from these bores will be pumped into pipelines running parallel to the haul roads on the western side of the pits. Water from bores located in the northern sections of each pit will be abstracted and pumped to the unnamed northern creek. Water from bores located in the southern sections of both pits will be pumped to the south where some will be directed to the ore processing plant and the remainder directed to the unnamed southern creek for discharge. The location of the discharge point in each creek will be determined after additional groundwater modelling and baseline vegetation surveys of the creek lines have been completed. Discharge will occur outside of the cone of depression to ensure recharge of the aquifer in the vicinity of the pits does not occur during operations.

It has been estimated that the discharge water will flow a maximum of 5 kilometres down each creek. This is based on peak discharge volumes in year 3 of mining. The distance of flow will increase gradually up to year 3, and then decrease gradually from year 4 to year 7 of mining.

The additional information supplied states that experience from other similar mining operations where there has been a discharge continuously into ephemeral creeks shows that native vegetation displays an increased lushness and regeneration of water tolerant species. After cessation of discharge the high water tolerant species die out over time and the creek reverts to being dominated by low water tolerant species. Environmental baseline studies have not yet been undertaken, however, are scheduled to occur in November 2004.

Recommendation 1

Information on the impact on downstream hydrology and ecology of the disposal of the excess groundwater from the dewatering program is to be provided to the Office of Environment and Heritage for assessment prior to commissioning. Management and mitigation measures of any predicted impacts are to be included in the Mining Environmental Management Plan.

Little information exists on the quality of the groundwater to be discharged to the ephemeral creeks. Based on 3 samples only, groundwater of the area ranges from 710 mg/L Total Dissolved Solids (TDS) to 2 060 mg/L. Using the Australian Drinking Water Guidelines for Salinity Classification this water would be classified as marginal to brackish.

The beneficial use of the area affected by the discharge of groundwater is grazing. The salinity levels of the 3 samples are well below the Northern Territory groundwater quality criteria for use by cattle (10 000 mg/L TDS).

Information provided by MBS Environmental on 23 October 2004 indicates that the salinity levels are well below the typical discharge limits for other mining operations similar to Bootu Creek Manganese Project.

Recommendation 2

Further sampling of the groundwater is to be undertaken to confirm that the water is of suitable quality for discharge to the environment and that the salinity of the water is within acceptable limits. Bootu Creek Resources are to collect water quality information for the project area before, during and after construction (should water be available at the time). This information is to be included in the Mining Environmental Management Plan and the Water Management Plan.

A Monitoring Program is to be developed that records conductivities as well as extraction volumes. Based on the monitoring results Bootu Creek Resources are to explore the possibility of preferentially using groundwater of poorer quality in the process, allowing lower salinity water to discharge to the creeks.

Two diversion channels are proposed to divert surface water flows away from the pits to prevent flooding of operational areas. Inadequate design and/or construction of creek diversion channels can lead to siltation of watercourses downstream of the mine posing a significant hazard to riparian flora and fauna.

The design of the diversions was derived considering the annual rainfall volume, creek flow characteristics and catchment size. Subsoil material removed from construction of the diversion channels will be used to construct the adjacent diversion banks. The banks will be protected from erosion by placement of inert waste rock sourced from mining operations. Waste rock will also be placed on bends within the channel to prevent scouring and reduce sediment transport. Remaining drain surfaces will be compacted to minimise the risk of scouring.

The amount of sediment reporting to the ephemeral creeks will be minimised by sediment fences installed at key locations within the diversion channels. It is not expected that there will be an increase in the volume of water reporting to the creeks as a result of the diversion channels.

Recommendation 3

Erosion control measures for the proposed creek diversion channels, including the haul road crossing, are to be included in the Mining Environmental Management Plan. Methods of construction of the proposed creek diversion channels must be undertaken in such a way as to not impact on the downstream hydrological regime of the creeks.