

TECHNICAL REPORT - NUMBER 8

**WOODCUTTERS  
SILVER - LEAD - ZINC  
MINE.  
ENVIROMENTAL  
ASSESSMENT REPORT.**



JUNE 1984

CONSERVATION COMMISSION OF THE NORTHERN TERRITORY  
DARWIN N.T.

## CONTENTS

	<u>Page</u>
1. Project Synopsis	1
2. Local Environment	2
3. Environmental Assessment History	2
4. Environmental Impacts	4
4.1 Clearing and Construction	4
4.1.1 Soil Erosion	4
4.1.2 Dust	4
4.1.3 Noise	5
4.1.4 Visual	5
4.1.5 Transportation	5
4.2 Dewatering	5
4.2.1 Vegetation	6
4.2.2 Water Disposal	6
4.3 Open-Cut Mining	7
4.4 Overburden Dump	7
4.5 Milling	8
4.6 Tailings Dump	8
4.7 Decommissioning	8
4.8 General Operational Aspects	9
4.8.1 Waste Services	9
4.8.2 Bushfires	9
4.8.3 Socio-economic Aspects	9
3.8.4 Resource Use	9
5. Environmental Management Programme	10
6. Assessment Conclusions	11
7. Recommendations	12

## 1. Project Synopsis

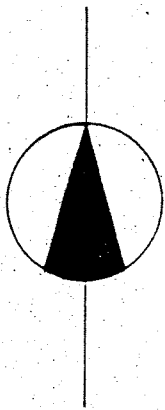
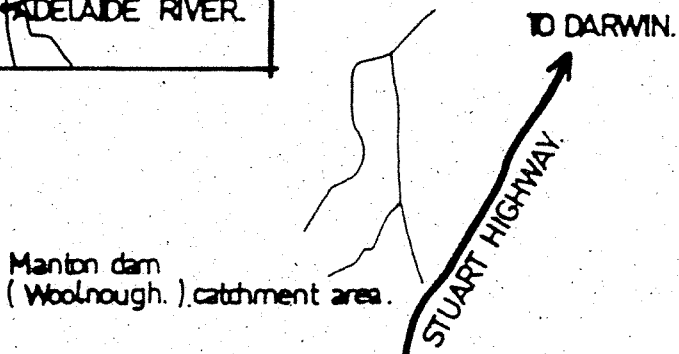
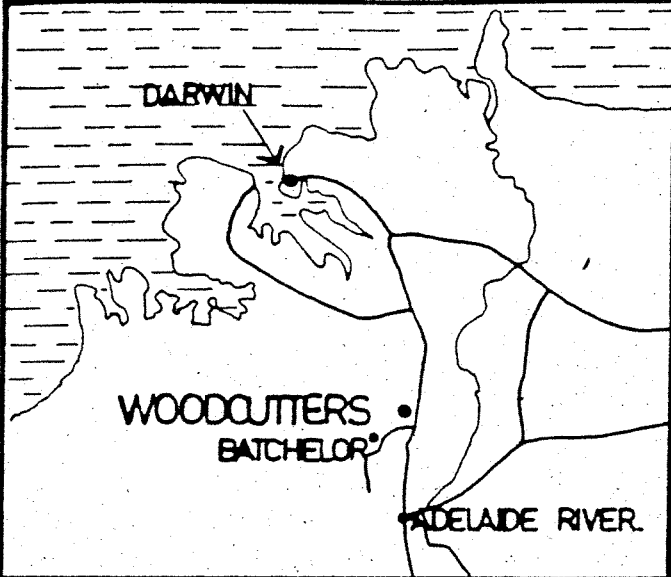
The Woodcutters Joint Venture propose to mine, concentrate and transport to market a deposit of silver, lead and zinc minerals. The proposed mine is adjacent to the Stuart Highway, 80 kilometres south of Darwin and 2 kilometres on the northern side of the Batchelor turnoff. Mining will be by open cut techniques in the initial phase, followed possibly by underground mining. Ore will be processed through a conventional flotation plant producing concentrates which will be shipped to market through the Darwin Port.

The major mineralised area is on vacant Crown land which borders the area currently subject to the Finnis River Land Claim. It is secured under mineral leases that were granted under the superseded *Mining Act 1939-1979* and subsequently reissued when the current *Mining Act 1982-1983* came into force.

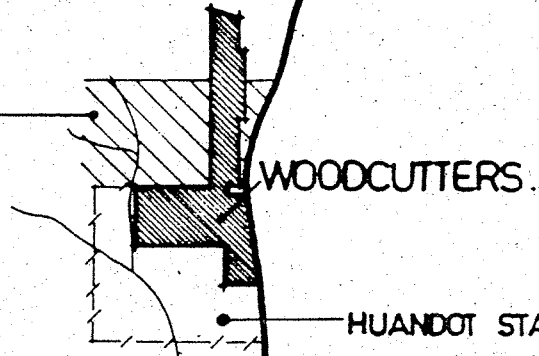
The area to the north is reserved as a water catchment for Manton Dam, whilst the area to the south is freehold agricultural land. The Stuart Highway is located immediately to the east of the leases and the proposed Darwin-Alice Springs Railway is planned to run along the western boundary.

The Woodcutters Joint Venture consists of four companies: Nicron Resources Ltd (74%); Petrocarb Exploration N.L. (10%); Lachlan Resources N.L. (12%); and MPES Pty Ltd (4%). They acquired the prospect in 1983 from Peko-Wallsend and E.Z. Industries, and began a systematic programme to fully evaluate the resource. The results of this programme will be assessed in early to mid-1984 and a decision on project availability made at that time.

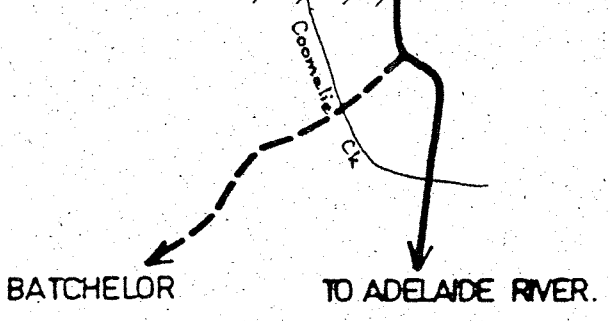
If the decision is to proceed, the project will be fully operational by December 1984. It will process up to 140,000 tonnes per year to produce 50,000 tonnes of concentrate. Project life is estimated to be eight to ten years.



Finnis river land claim.



13° 00'



13° 10'

(Source: Coffey and Partners, Woodcutters Project Dewatering Studies, (for Woodcutters Joint Venture), November, 1983.)

There are no permanent residents close to the mine, the closest being Coomalie Farm homestead, 2 km to the south-east. There are also reported to be intermittent residents during periods of pastoral activity. Batchelor township (population approximately 300) is 15 km to the south-west. Power lines run adjacent to the site but the supply is not sufficient for the proposal's requirements, and a diesel generation unit will need to be installed. Telecom communications lines are available. Water supply will be developed on site, as will sewerage and waste disposal facilities.

## 2. Local Environment

The project area lies in the Rumwaggon Land System which consists of low rounded hills and gravelly ridges with a eucalypt woodland or low woodland interspersed with grassland on the flats. The climate is monsoonal with an annual rainfall similar to that of Darwin.

The topography of the project site is flat to gently undulating with a ground slope generally to the west at a gradient of 0.02. The site is in the headwaters of an ephemeral drainage system which drains to the west as sheet flow until it joins Woodcutters and Coomalie Creeks, crosses the Batchelor Road, the Stuart Highway and eventually joins the Adelaide River.

## 3. Environmental Assessment History

The Woodcutters Joint Venture, the proponent, indicated in early 1983 to the Department of Mines and Energy (DME) that they were initiating a detailed feasibility programme for their mining proposal involving economic, engineering and environmental impact assessment. In conjunction with DME, they arranged a briefing session for all relevant Government departments in July and submitted a Preliminary Environmental Report in August.

Environmental assessment of the project was required to satisfy the *Mining Act*, but was implemented in accordance with the provisions of

the *Environmental Assessment Act*. Although this Act had not commenced, the Administrative Procedures under which the Act will operate had been finalised, and these were essentially followed in fulfilling Government assessment requirements.

Assessment was co-ordinated by DME who liaised closely with Water Division, Department of Transport and Works (WDTW), and the Conservation Commission of the N.T. (CCNT), the two most relevant Government agencies.

Comments on the Preliminary Environmental Report were made by only these three agencies and a synthesised response was made to the proponent in August. This indicated the scope and content of further information that was required.

The proponent submitted a further detailed report titled Environmental Review and Management Programme in January 1984. This was assessed by Government agencies and a meeting was held between the proponent DME, CCNT and WDTW on 9 February 1984.

The discussion of environmental issues concluded that there were two major concerns which would require further investigation and several minor concerns. The proponent indicated that the investigations that would satisfy these concerns were currently being performed.

The proponent submitted a response on 30 March 1984 which was assessed by Government agencies. On the basis of all the information submitted and in view of the small size and expected limited impact of the proposal, it was considered that a full EIS would not be required. The two major concerns - aspects of the dewatering programme and acid leachate potential - were identified, and arrangements were made to ensure that continuing studies and monitoring would cover unexpected developments.

This advice was submitted to the Minister for Housing and Conservation on 9 May 1984, who made recommendations on the environmental aspects of the project to the Minister for Mines and Energy. The mineral leases were issued on 15 May 1984.

#### 4. Environmental Impacts

The environmental impacts of the project are those commonly associated with a small open-cut mining operation. They have been identified by the proponent and are discussed below.

##### 4.1 Clearing and Construction

Approximately 80 hectares of vegetation and topsoil will be removed for the project. The topsoil will be stockpiled for use either immediately or in the future on various earthen structures. The loss of vegetation and the associated faunal habitat is an obvious impact however, the vegetation unit is quite extensive regionally. This impact is an accepted cost of the project proceeding.

The other impacts of clearing and construction are discussed below.

##### 4.1.1 Soil Erosion

The potential for soil erosion will be greatly increased and some short-term effects on surface water quality can be expected. The effect of the more turbid water during the wet season is difficult to predict but with suitable erosion control measures it is not considered to be a major long-term concern.

##### 4.1.2 Dust

Dust generation during clearing and construction will add to the normal dust burden and affect air quality of the area, but in the absence of nearby permanent residents, the effects will be mainly upon surrounding vegetation during the dry season.

#### 4.1.3 Noise

The increase in noise is not expected to be noticeably greater than normal traffic noise on the Stuart Highway, and as there are no permanent residents surrounding the project area, disturbance of fauna, including possible movement away from the area, is expected to be the major impact.

#### 4.1.4 Visual

Clearing and construction activity will be partially visible from the Stuart Highway. This impact will be mitigated to a large extent by the construction of bunds which will also serve as water management structures.

#### 4.1.5 Transportation

During construction, a work force of about 60 people will be on site. The majority will commute from Darwin and, along with the transport of material, will increase the traffic volume on Stuart Highway by an average of 100 vehicles per day. The work force is expected to decrease to 20 people after six months, so this impact will be of short duration.

#### 4.2 Dewatering

The dewatering operation has been identified as potentially the major impact of the project. Dewatering the pit involves drawing large volumes of water out of the ground via bores and disposing of it into Woodcutters Creek. This will result in a lowering of the water table for a radius of up to 5 km from the pit. The only other user of groundwater within this area has a bore that draws water from an aquifer for farming and domestic purposes. It is considered by WDTW that this aquifer may be hydrogeologically discrete from the main aquifer which is to be dewatered. A significant effect is not expected although the situation will be further examined and monitored by that Division.



The major impacts will be upon the vegetation and the capacity of Woodcutters Creek.

#### 4.2.1 Vegetation

The lowering of the water table will affect the vegetation that is reliant upon the water table over quite a large area. A survey of the types of vegetation and communities is being undertaken by the proponent to identify any species at risk. This impact is considered to be potentially very serious and may result in the destruction of a large area of vegetation. Although the survival of particular species is not in question, a degree of long-term change in the vegetation communities is anticipated and must be considered as a cost of the project.

#### 4.2.2 Water Disposal

The disposal of up to about 90 megalitres/day into Woodcutters Creek will affect the vegetation, may inundate low-lying areas and possibly erode the channel, and may affect the Batchelor Road crossing and waterholes in Coomalie Creek.

The change from ephemeral to perennial flow in Woodcutters Creek will generally enhance the growth of all fringing vegetation, though certain species may be favoured, particularly in areas which become permanently inundated.

The quality of the water is presently within drinking water standards and no contamination is expected; however, mining operations may affect groundwater quality and this will need to be monitored.

The potential for channel erosion is greatest at the discharge point. Further downstream, erosion is expected to be minor as the wet season maximum flow almost certainly exceeds the discharge flow rate according to WDTW. This is inferred from stream gauging data from Coomalie Creek and will be confirmed by further investigations in Woodcutters Creek. The discharge point will be designed to stop erosion.

The Batchelor Road crossing is intermittently flooded during high flow periods in the wet season and the increased flow may increase the duration of these periods. Further investigations are necessary and an upgrading of the crossing may be required. Flood heights of Coomalie Creek will be monitored to ensure that Coomalie Farm crops and buildings are not subject to increased flooding risk.

#### 4.3 Open-cut Mining

The mining activity will contribute to the dust and noise impacts but the major impact will occur at the completion of mining. It is proposed that the pit will be allowed to fill with fresh water and form an artificial lake, depending on water quality and safety considerations. The final structure and use of the lake will be determined at a later date in consultation with appropriate Government authorities.

Water in the lake is expected to be potable as there is little potential for acid formation from the country rock. This will be verified at the appropriate time.

#### 4.4 Overburden Dump

The overburden dump will ultimately be rehabilitated to form a naturally vegetated low mound of 28 hectares which will blend with the surrounding countryside. The dumping will contribute to the dust, noise and soil erosion impacts, but the main potential impact is the possibility of acid leachate.

This potential is considered to be slight because of the natural buffering capacity of the domomitic country rock; the proposed design of the dump will minimise rain infiltration and oxidation of sulphidic materials.

#### 4.5 Milling

The operation of the ore treatment plant will contribute to the dust, noise, visual and transportation impacts. The only other impact concerns the use of the process chemicals, and this is expected to be minor because of the lack of airborne emissions, good design for storage and spillage containment and adherence to dangerous goods transport regulations.

#### 4.6 Tailings Dump

The tailings dump will ultimately be rehabilitated to form a naturally vegetated low mound of 16 hectares which will blend with the surrounding countryside. The main potential impact is the seepage of relatively contaminated water into the groundwater system.

The quantity of seepage will be minimised by the use of relatively impermeable dam wall and floor design, and by the method of depositing the tailings (described in the proponent's Environmental Review and Management Programme, section 4.4.3). The concentration of dissolved materials will be quite low and relatively innocuous. Seepage will be intercepted by drains and returned to the process water circuit. Any seepage escaping to the groundwater will be rapidly diluted and collected by the dewatering bores.

The potential impact of seepage is considered to be minor because of the quality and low quantity expected to enter the groundwater system.

#### 4.7 Decommissioning

Decommissioning of the mine will involve the removal of buildings and other facilities, the disposal of hard refuse and the rehabilitation of the site. Impacts will be minor if the disposal and erosion control techniques outlined in the Environmental Review and Management Programme are used. Final design of the revegetation method, tailings and overburden dump and pit edge will be made at a later date following further investigations. The long-term impacts of the project are expected to be minimal.

#### 4.8 General Operational Aspects

Impacts arising from the general operation of the project are associated with the provision of waste services, bushfire control, socio-economic aspects and resource use considerations.

##### 4.8.1 Waste Services

The provision of on-site septic systems and garbage services can produce impacts if they are poorly designed or mismanaged. The small size of the Woodcutters Project means that the potential impact of these facilities will be minimal.

##### 4.8.2 Bushfires

The provision of firebreaks involves clearing and maintaining vegetation-free zones which are then susceptible to erosion. Drainage control structures and good design are required to minimise the potential for soil erosion.

##### 4.8.3 Socio-economic Aspects

The project will employ about 60 people for a short period and only 20 people for eight to ten years. Most of the workforce can be expected to come from Darwin and possibly Batchelor, and there is not expected to be a significant impact upon the population structure or services of these towns.

There will be an impact upon the local economy with an estimated 18 million dollars being spent during construction and 2 million dollars annually for the life of the mine. A further stimulus to the economy will ensue from royalties and both company and personal taxes.

##### 4.8.4 Resource Use

The project is located in an area mainly used for pastoral activity, although some farming ventures occur nearby. The project site is a small part of the area and therefore will not unduly affect pastoral land use. The area will

be rehabilitated to a standard suitable for pastoral use so the impact will only be temporary. Effects on farming will be monitored, enabling necessary action to be taken to minimise any adverse impacts.

The project area is outside the area presently recommended for consideration as a land claim by Aboriginals of the Finnis River area. The project managers have liaised with Aboriginal agencies such as the Office of Aboriginal Liaison of the Department of the Chief Minister, and the Aboriginal Sacred Sites Authority, and no impact upon the Aboriginals or their culture has been identified.

Following the rehabilitation of the area the main evidence of the project will be the proposed lake. There are several possible beneficial uses of the lake such as for agricultural activity or recreational use. The final use will be determined in the future. Long-term changes to vegetation may be a possibility; however, these will be faced if and when the problem arises.

#### 5. Environmental Management Programme

The proponent has undertaken to minimise detrimental environmental impacts and to implement their project in an environmentally acceptable manner. In some instances they have specified some detailed techniques, but in other instances the most suitable management technique will be determined at a later date following further investigations, on-site experience and consultation with the appropriate Government authorities.

With regard to the previously identified impacts the following management techniques have been proposed:

Soil Erosion - drainage channels will be constructed to control runoff from all cleared areas.

- Dust - watering of roads will be instigated.
- Dewatering - the ground-water levels will be monitored and the effect upon the vegetation will be observed; also, the disposal of the water will be adjusted depending upon the flow in Woodcutter's Creek and the channel will be regularly inspected for any erosion.
- Overburden Dump - investigations of the leaching characteristics will continue and depending upon the results, the design of the dump will be formulated to include clay blankets or lime as necessary.
- Tailings Dump - the quantity and quality of seepage in the seepage drains will be monitored and will be appropriately handled during the life of the mine. The final rehabilitation technique will be determined depending upon this information.
- Open-cut Pit - the future of the artificial lake will be determined at a later date and the margins of the pit will be profiled to suit the proposed use, to minimise mosquito breeding and to control erosion.
- General Monitoring - an environmental monitoring programme will be devised in consultation with Government agencies to monitor water quantities and quality, air quality and other parameters as necessary.

## 6. Assessment Conclusions

The Woodcutters Silver-Lead-Zinc Project has been assessed as to the beneficial and detrimental environmental impacts and the measures

proposed to mitigate the latter. The assessment was co-ordinated by the Department of Mines and Energy in close liaison with the Environment Unit, Conservation Commission, and generally followed the procedures of the *Environmental Assessment Act*.

The main conclusions of the assessment are:

1. the project is relatively small in size, scope and impact and is of short duration;
2. the proponents, WJV, have identified the detrimental impacts and have planned appropriate investigations and mitigation measures;
3. there are no significant land or resource use conflicts and no expected major long-term detrimental impacts;
4. the beneficial socio-economic impacts are relatively large compared with the essentially short-term detrimental impacts; and
5. the proponents have made affirmations of their intentions to minimise the detrimental impacts and to work co-operatively with Government authorities to ensure the project is operated in an environmentally acceptable manner.

7. Recommendations

Considering the preceding conclusions, it is recommended that:

1. there is no necessity to proceed to the EIS stage of the formal assessment process;
2. the project be encouraged to proceed under the intent described in the proponent's Environmental Review and Management Program and associated correspondence; and
3. the project proceed in co-operation with the regulatory authority, the Department of Mines and Energy, and in consultation with other appropriate Government agencies such as the Water Division

of the Department of Transport and Works, and the Land Conservation  
and Environment Units of the Conservation Commission.