

KATHERINE

MINING N.L.



MAUD CREEK OXIDE PROJECT

PUBLIC ENVIRONMENTAL REPORT

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	7
1 PROJECT DESCRIPTION AND ENVIRONMENTAL ISSUES	9
1.1 BACKGROUND	9
1.2 PROPONENT DETAILS	9
1.3 PUBLIC ENVIRONMENTAL REPORT	9
1.3.1 STRUCTURE OF PER	9
1.3.2 FUNCTION	10
1.4 TENEMENT STATUS	10
2 DESCRIPTION OF PROPOSED DEVELOPMENT	10
2.1 PROJECT DESCRIPTION	10
2.2 PROJECT MANAGEMENT	12
2.2.1 MANAGEMENT STRUCTURE	12
2.2.2 ENVIRONMENTAL MANAGEMENT	13
2.2.3 OCCUPATIONAL HEALTH AND SAFETY	14
2.2.4 ADMINISTRATION	14
2.2.5 STATUTORY OBLIGATIONS	15
2.3 GEOLOGICAL SETTING	16
2.3.1 REGIONAL GEOLOGY	16
2.3.2 PROJECT GEOLOGY	16
2.4 MINING OPERATIONS	16
2.4.1 MINING METHOD AND FLEET	16
2.4.2 GRADE CONTROL	16
2.4.3 DRILLING AND BLASTING	16
2.4.4 ORE AND WASTE MINING	17
2.4.5 MINE SCHEDULE	17
2.4.6 INFRASTRUCTURE	17
2.4.7 SECURITY ARRANGEMENTS	17
2.5 PIT DESIGN AND DEVELOPMENT	18
2.5.1 PERSONNEL	18
2.5.2 OPEN PIT DESIGN AND PARAMETERS	18
2.5.3 PIT WALL MONITORING PROGRAM	18
2.5.4 PIT WATER MANAGEMENT	18
2.6 ORE STOCKPILE AND HAULAGE	18
2.7 ACCESS AND HAUL ROAD DESIGN	18
2.8 ORE HAULAGE	19
2.9 ORE PROCESSING	20
2.9.1 TAILINGS MANAGEMENT	20
3 ENVIRONMENTAL MANAGEMENT & MONITORING	20
3.1 CLIMATE	20
3.2 GEOLOGY	20
3.3 TERRAIN	20
3.4 FLORA	21
3.5 FAUNA	21

3.6	WATER RESOURCES	21
3.7	SOCIAL CONDITIONS	21
4	POTENTIAL AND ACTUAL ENVIRONMENTAL IMPACTS, PROPOSED ANALYSES AND REPORTING	21
4.1	LAND CLEARANCE REQUIREMENTS	21
4.2	WASTE ROCK MANAGEMENT	22
4.2.1	MAUD CREEK WASTE ROCK	22
4.2.2	WASTE ROCK CHARACTERISATION PROGRAM	22
4.2.3	WASTE ROCK SAMPLING AND TESTING PROCEDURES	22
4.2.3.1	SELECTION CRITERIA	22
4.2.3.2	DRILL HOLE PLANNING	23
4.2.3.3	FIELD SAMPLING AND DATA MANAGEMENT	23
4.2.3.4	NAG TESTING	23
4.2.3.5	ARSENIC TESTING	24
4.2.3.6	DELINEATION AND MINING METHOD	25
4.2.3.7	WASTE DUMP LOCATION	25
4.3	WATER MANAGEMENT	25
4.3.1	GROUNDWATER DEWATERING	25
4.3.2	TURBID RUN OFF	27
4.3.3	POTABLE WATER	27
4.3.4	FLOOD ASSESSMENT	27
4.4	HISTORICAL & ABORIGINAL SITES MANAGEMENT	29
4.4.1	EXISTING CULTURAL AND HERITAGE MANAGEMENT	29
4.4.2	PROPOSED MANAGEMENT MEASURES	29
4.4.3	MONITORING AND REPORTING	30
4.5	FIRE MANAGEMENT	30
4.6	BIOLOGICAL MANAGEMENT	30
4.6.1	FLORA	30
4.6.2	FAUNA	30
4.6.3	WEEDS	30
4.7	DUST MANGEMENT	31
4.7.1	POTENTIAL DUST SOURCES AND MANAGEMENT.	31
4.8	WASTE AND HAZARDOUS SUBSTANCE MANAGEMENT	31
4.8.1	SEWERAGE AND GENERAL WASTE DISPOSAL STRATEGIES	31
4.8.2	HAZARDOUS AND DANGEROUS GOODS	32
5	SCHEDULE OF MONITORING, MEASUREMENTS, SAMPLE ANALYSIS AND REPORTING	32
5.1	GROUNDWATER MONITORING PROGRAM	32
5.2	DUST MONITORING AND REPORTING	32
5.3	HAZARDOUS SUBSTANCE MONITORING AND REPORTING	33
5.4	FAUNA AND FLORA REPORTING PROCEDURES	33
5.5	REHABILITATION MONITORING AND REPORTING	33
6	REHABILITATION AND DECOMISSIONING	33
6.1	TOPSOIL MANAGEMENT	33
6.2	OXIDE PIT	34

6.3	WASTE DUMP	34
6.4	RIM PAD	34
6.5	INFRASTRUCTURE	34
6.6	ACCESS ROAD	34
6.7	REVEGETATION SPECIES SELECTION	34

7	LIST OF COMMITMENTS	35
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8	REFERENCES	38
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APPENDIX A	39
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LIST OF FIGURES

FIGURE 1 - MAUD CREEK TENEMENT LOCATIONS (NOT TO SCALE).....	11
FIGURE 2 - MCOP MANAGEMENT STRUCTURE.....	12
FIGURE 3 - ACACIA RESOURCES LIMITED ENVIRONMENTAL POLICY.....	13
FIGURE 4 - ACACIA RESOURCES LIMITED SAFETY AND HEALTH POLICY.....	15
FIGURE 5 - RIGHT OF WAY ACCESS ROAD (NOT TO SCALE).....	19
FIGURE 6 - CROSS SECTION MAUD CREEK OREBODY (9325N).....	24
FIGURE 7 - KATHERINE REGION AVERAGE CLIMATIC CONDITIONS#.....	26
FIGURE 8 - MCOP FLOOD INUNDATION BOUNDARIES	28
FIGURE 9 - MCOP ARCHAEOLOGICAL SITE LOCATIONS.....	29

LIST OF TABLES

TABLE 1 - MINE SCHEDULE.....	17
TABLE 2 - LAND CLEARNACE REQUIREMENTS	22
TABLE 3 - MAUD CREEK MINE IRRIGATION/LAND APPLICATION GROUND WATER QUALITY.....	26
TABLE 4 - MCOP OPERATIONAL WATER MONITORING PROGRAM.....	32

LIST OF TERM AND ABBREVIATIONS

TERM/ ABBREVIATION	MEANING
AAPA	Aboriginal Areas Protection Authority
ANZECC	Australian and New Zealand Environment and Conservation Council
ANFO	Ammonium Nitrate and Fuel Oil
AMD	Acid Mine Drainage
ANGLOGOLD	AngloGold Pine Creek
ARD	Acid Rock Drainage
ARI	Average Recurrence Interval
AS	Australian Standard
BCM	Bank Cubic Metre
CIP	Carbon in pulp
DEIS	Draft Environmental Impact Statement
DLPE	Department of Lands, Planning and Environment
DME	Department of Mines and Energy
DPI&F	Department of Primary Industries and Fisheries
EGI	Environmental Geochemistry International
EIS	Environmental Impact Statement
EMS	Environmental Management System
g/t	Grams per Tonne
ha	Hectare
Kg	Kilogram
km	Kilometre
L	Litre
MCN	Mineral Claim North
MCOP	Maud Creek Oxide Project
MEMP	Mine and Environmental Management Plan
m	Metre
m ³	Cubic Metres
mBGL	Metres Below Ground Level
mg/kg	Milligrams per kilogram
mg/L	Milligrams per Litre
ML	Megalitre (1 Million Litres)
MLN	Mineral Lease North
mm	Millimetre
MSDS	Material Safety Data Sheet
Mtpa	Million tonnes per annum
NAG	Net Acid Generation
NAPP	Net Acid Producing Potential
NATA	National Association of Testing Authorities
NH&MRC	National Health and Medical Research Council
No	Number
NT	Northern Territory
PCGO	Pine Creek Gold Operations
PER	Public Environmental Report
PL(No)	Pastoral Lease (No)
PMF	Probable Maximum Flood
PPE	Personal Protective Equipment
ppm	Parts per million
RAAF	Royal Australian Air Force
RIM	Run In Mine
RL	Relative Level
ROM	Run Of Mine
SDO	Sample Dispatch Order
t	Tonnes
ug/L	Micrograms per Litre
URGGM	Union Reefs Gold Mine
WA	Western Australia
WRC	Waste Rock Classification

EXECUTIVE SUMMARY

Overview of the Project

Katherine Mining NL (Katherine Mining) proposes to develop a small open cut oxide project at Maud Creek, approximately 20 km east northeast of Katherine in the Northern Territory. The development is located within the Mineral Claims 4135, 4136, 4137, 4138, 4218, 4219, 4220, 4221, 4222 and 4223. AngloGold Pine Creek (ANGLOGOLD) will undertake the mining, under an agreement in which AngloGold Australasia Ltd. (AngloGold) has purchased the right to mine the Maud Creek oxide resource.

The Maud Creek Oxide Project will involve approximately 6 months of mining, using open cut methods. Approximately 400,000 bcm of material will be mined during the project life and 56,000 bcm of this will be ore. The pit maximum depth will be 35 – 40 meters. Expected grade for this open cut resource will be 4.5 g/t. Road trains will haul ore from the project to the AngloGold Union Reef Gold Mine, for processing. The benefit of this project is that no processing facilities will be established at Maud Creek, thus ensuring the protection of the Katherine River Water Catchment from any impacts from the operation.

Layout and construction of facilities.

Mine and support facilities to be constructed for the project include:

- Open cut pit
- RIM pad (on the edge of the pit)
- Waste Dump
- Transportable Office/Crib
- Mine contractor workshop
- Access and haulage roads

The layout of facilities has been designed to suit local conditions with minimal disturbance.

Operations

Ore mined from the pit will be stockpiled on a RIM pad. This will then be loaded into triple road trains for transport to the Union Reef Gold Mine. Waste rock from the operation will be handled according to characterisation results and placed into a waste dump. All of the waste rock mined is expected to be non-problematic. However, appropriate waste rock handling and characterisation procedures will be implemented. If problematic material is mined, it will be placed on a temporary stockpile and then returned into the pit at the end of the mining programme.

It is expected the waste dump will be constructed to an approximate height of ten vertical metres, with slopes battered to an angle in the vicinity of 14 degrees from the horizontal. Rehabilitation will be completed according to standard practices currently employed by AngloGold.

Decommissioning

Mine closure will involve the removal of mine infrastructure and rehabilitation of project land prior to the onset of the 2000/2001 wet season. Wherever possible, progressive rehabilitation will be conducted utilising stockpiled topsoil and vegetative matter as areas become available. Under the terms of the mining agreement, AngloGold is to provide for, and carry out the final rehabilitation requirements.

Comparison of Katherine Mining Proposal to Kilkenny Gold's Proposal

In comparison to Kilkenny's proposed project, the Katherine Mining project is significantly smaller, has a shorter project life and less issues to manage. The following comparison applies;

- The proposed opencut pit is significantly smaller;

- Approximately 400,000bcm's of material will be mined compared to 2,150,000bcm's;
 - Approximately 150,000t of ore will be mined compared to 636,000t (open cut pit);
 - The pit will be 35-40m deep compared to 110m deep;
 - The pit dimensions will be approximately 230m x 125m compared to 400m x 150m.
 - Total metal mined will be approximately 22,000oz, for approximately 20,000oz recovered. This is about 2% of the global resource or 8.8% of the high grade resource.
- There will be no mining of sulphide ores;
- The proposed waste dump will be significantly smaller, approximately 344,000bcm compared to 4,830,000bcm. The area will be 4.7ha compared to 15ha and the dump will be 10m high compared to 20m.
- The waste dump will not contain any potentially acid producing waste. All waste will be oxide;
- There will be minimal disturbance to groundwater and no disturbance to surface water routes, ie Gold Creek will not be diverted.
- There will be no processing on site, therefore there will be no issues relating to the bacterial oxidation process or use of reagents such as cyanide, caustic soda or acids on site.
- The mine life will be 7 months compared to 6 years. Again, subject to government approvals, the project activities will be carried out during the NT dry season, site rehabilitation is scheduled for September and October, with hand back to Katherine Mining in November.

In summary, many of the potential environmental impacts associated with the original project have either been removed or are greatly reduced.

Note:

AngloGold recently acquired 100% of Acacia Resources. Some documentation still refers to Acacia Resources (eg policies). These policies and statements will be honoured by AngloGold.

1 PROJECT DESCRIPTION AND ENVIRONMENTAL ISSUES

1.1 BACKGROUND

Kilkenny Gold NL (Kilkenny) was a publicly listed company which held all the shares in Katherine Mining. It submitted a Draft Environmental Impact Statement (DEIS) to the NT Government in September 1998, to mine and process gold bearing ores at the Maud Creek Gold Project. The mine was planned to have commenced as an open cut, going to underground; extracting initially oxide ore, then supplied ore, (pyrite and arsenopyrite). Processing was planned to have occurred on site, to produce a final product of gold doré.

Due to falling world gold prices in late 1998 and 1999, the Directors of Kilkenny decided not to proceed with the full development of the proposed project until the gold price improved. However, the Directors also decided to seek opportunities to “sell” direct leach oxide ore to neighbouring gold operations. An agreement was subsequently reached with Anglo Gold Australasia Ltd (AngloGold).

1.2 PROPONENT DETAILS

The project proponent is Katherine Mining NL. The project contacts are Mr Tony Brennan and Mr Robert Rigo and contact details are as follows:

Address: Katherine Mining
10 Walker Ave
West Perth WA
Phone: (08) 9486 8033
Fax: (08) 9486 8044

1.3 PUBLIC ENVIRONMENTAL REPORT

For the purposes of this PER the following definition will apply;

- the “Maud Creek Oxide Project” (MCOP) will mean mining and associated activities carried out on or off the Mineral Claims 4135-4138 and 4218 - 4220, for the purposes of extracting gold from an open cut pit and development of associated infrastructure.

This Public Environmental Report (PER) outlines the proposed development by AngloGold of the Maud Creek Oxide Project, (MCOP). Development of the MCOP entails the construction of an open cut pit and associated infrastructure. The project is located 20 km east-northeast of the township of Katherine in the Northern Territory. Ore will be carted by road to Union Reef Gold Mine (URGM), and processed through the established plant facilities there. URGM is situated on MLN 1109, approximately 15km north west of Pine Creek and 175km south east of Darwin.

1.3.1 Structure of PER

The MCOP PER uses information from:

- the Draft Environmental Impact Statement and Appendices for the Maud Creek Project – Mineral Lease Application MLN1978A (Dames and Moore, 1998); and
- the Union Reef Gold Mine MEMP (PCGO, 1999)

There are seven major sections in the document covering a project description, proposed project development, mining and processing operations, environmental issues, environmental management plans, rehabilitation and decommissioning. Although processing will not occur within the project area, a section on management measures at Union Reef Mine (MLN 1109) is required as a supplement to the current URGM MEMP 1999. This will cover management measures and modifications to the Run of Mine (ROM) pad associated with the haulage and processing of ore through the URGM processing plant.

1.3.2 Function

This PER has been drafted to describe the mining and associated activities, and to outline a set of clear management and operational procedures for the protection of the environment to oversee these mining activities at the MCOP. All personnel are expected to comply with and utilise this document during all phases of the operation.

1.4 TENEMENT STATUS

The project is located on freehold land, owned by Katherine Mining.

Mineral Claims addressed in the PER are;

- MCN 4135, 4136, 4137, 4138 (main mining area MCOP)
- MCN 4218, 4219, 4220, 4221, 4222 and 4223 (access and haulage roads)

Mineral claims 4135 to 4138, impacted by the main operational pit and infrastructure, are currently covered under a mineral lease application MLN 1978A. Mineral claims 4218 to 4223 will be mainly impacted by upgrades to the existing access tracks.

All tenements are in good order.

2 DESCRIPTION OF PROPOSED DEVELOPMENT

2.1 PROJECT DESCRIPTION

The MCOP is located 285 km southeast of Darwin, approximately 20 km east-northeast of the township of Katherine. The project will be established on freehold land owned by Katherine Mining. The development area is presently used for grazing cattle from the nearby Maud Creek Station (NT Portion 4192, a subdivision of NT Portion 4159).

The Maud Creek project area is part of the Katherine region and thus has a tropical savannah climate with two distinct season patterns – the ‘wet’ monsoon and the ‘dry’ season. The average rainfall is approximately 971 mm and the majority of rainfall occurs from November through to April (Figure 7).

The project area is located on Gold Creek, a tributary of Maud Creek, which flows into the Katherine River below the Katherine Gorge and upstream of the Katherine Township. Both Maud and Gold Creeks are ephemeral and do not generally flow in the dry season.

Ore mined from the open-cut pit will be hauled via road trains to the Union Reef Gold Mine mill for processing. Waste rock mined from the operation will be stockpiled in a waste dump adjacent to the pit. Refer to figure 8 for project site layout and location of facilities. A rock sampling programme will be established to provide early identification of problematic rock. If any problematic rock is mined, it will be placed in a temporary stockpile and returned into the pit at the end of the mining programme. It should be noted that previous geochemical testwork indicated that there should not be any acid producing material in the oxide zone.

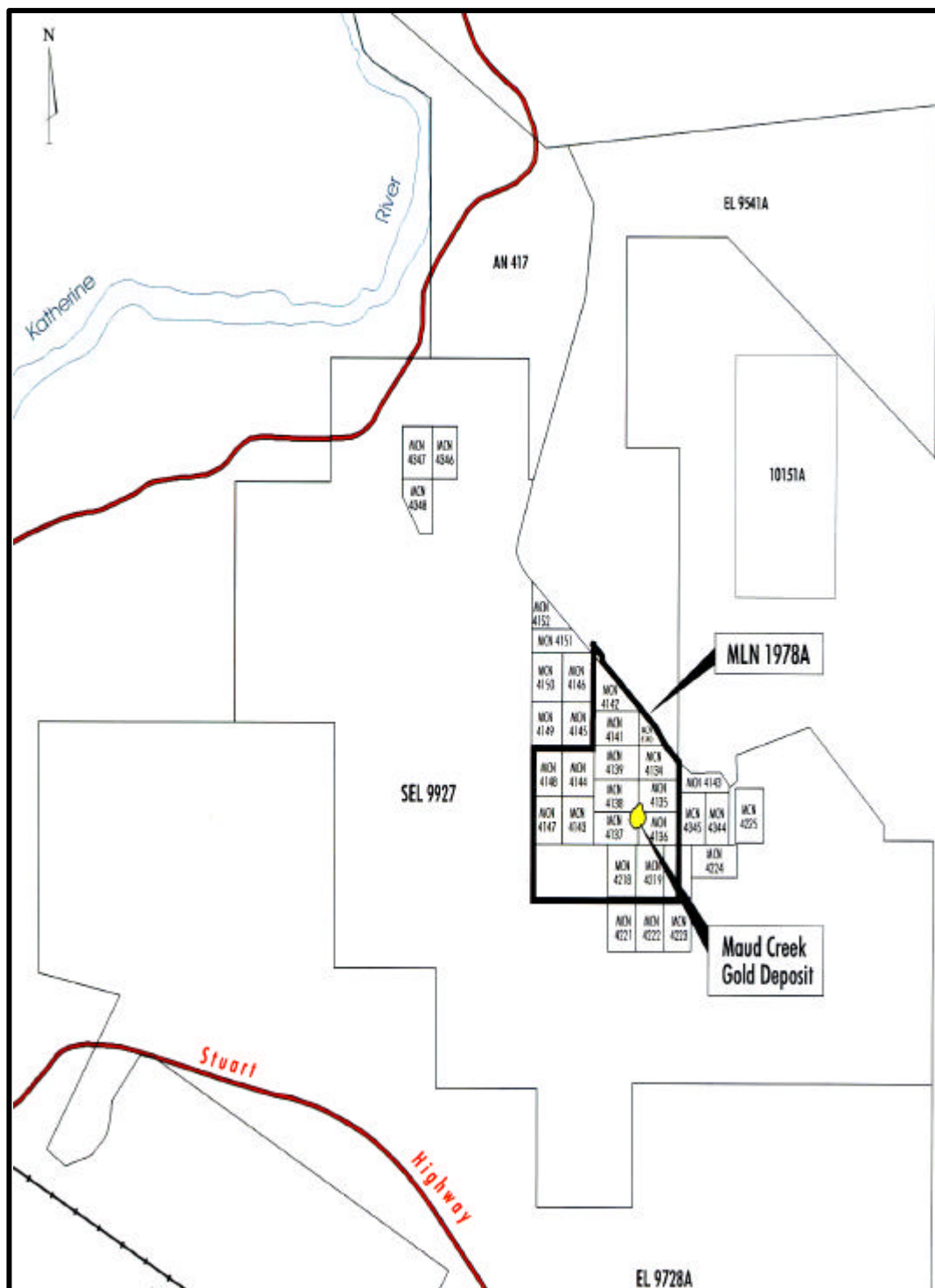
Vegetation and topsoil will be stripped from footprint areas and stockpiled for reuse in rehabilitation. Clearing will be kept within the designated areas already assigned to the project by Katherine Mining (Figure 3, DEIS 1998).

Ore hauled to the URGM ROM stockpile will be processed at a rate 2.8 Mtpa by the Carbon in Pulp process (CIP), to produce gold bullion. Maud Creek oxide ore will displace marginal ore currently processed from Crosscourse pit. Therefore, throughput rate will not change. Resultant tailings will be discharged into the existing Tailings Storage facility at URGM.

Rehabilitation of the site will be undertaken on a progressive basis. Rehabilitation will be consistent with current best practices implemented at URGM.

All personnel will be accommodated in the township of Katherine and commute to site daily. Temporary on-site facilities will include crib, administration, workshop and storage areas.

FIGURE 1 - MAUD CREEK TENEMENT LOCATIONS (NOT TO SCALE).



2.2 PROJECT MANAGEMENT

2.2.1 Management Structure

Figure 2 illustrates the MCOP management structure with areas of responsibility. As a supplementary mining activity of URG, AngloGold will undertake and manage the operation under a mining agreement with Katherine Mining. The MCOP Mine Supervisor is responsible for the day to day operations and management of staff working within the project area.

The Environmental Coordinator and Safety Adviser report directly to the Mine Manager and advise management on issues pertaining to the project. They may recommend a corrective course of action, but it is up to the appropriate manager/superintendent to initiate action. The environmental, health and safety responsibilities of the AngloGold Mine Manager, in conjunction with the other senior managers extends to:

- Ensuring compliance with all relevant Statutory Acts and Regulations,
- Ensuring compliance with AngloGold Safety Management and Emergency Response Plans,
- Ensuring MEMP's are adhered to,
- Establishing and maintaining environmental and safety performance monitoring,
- Initiation of action if monitoring programs or incidents indicate non-compliance with established procedures and,
- Ensuring that all incidents, which may result in an adverse environmental or safety impact are recorded, investigated and corrected.

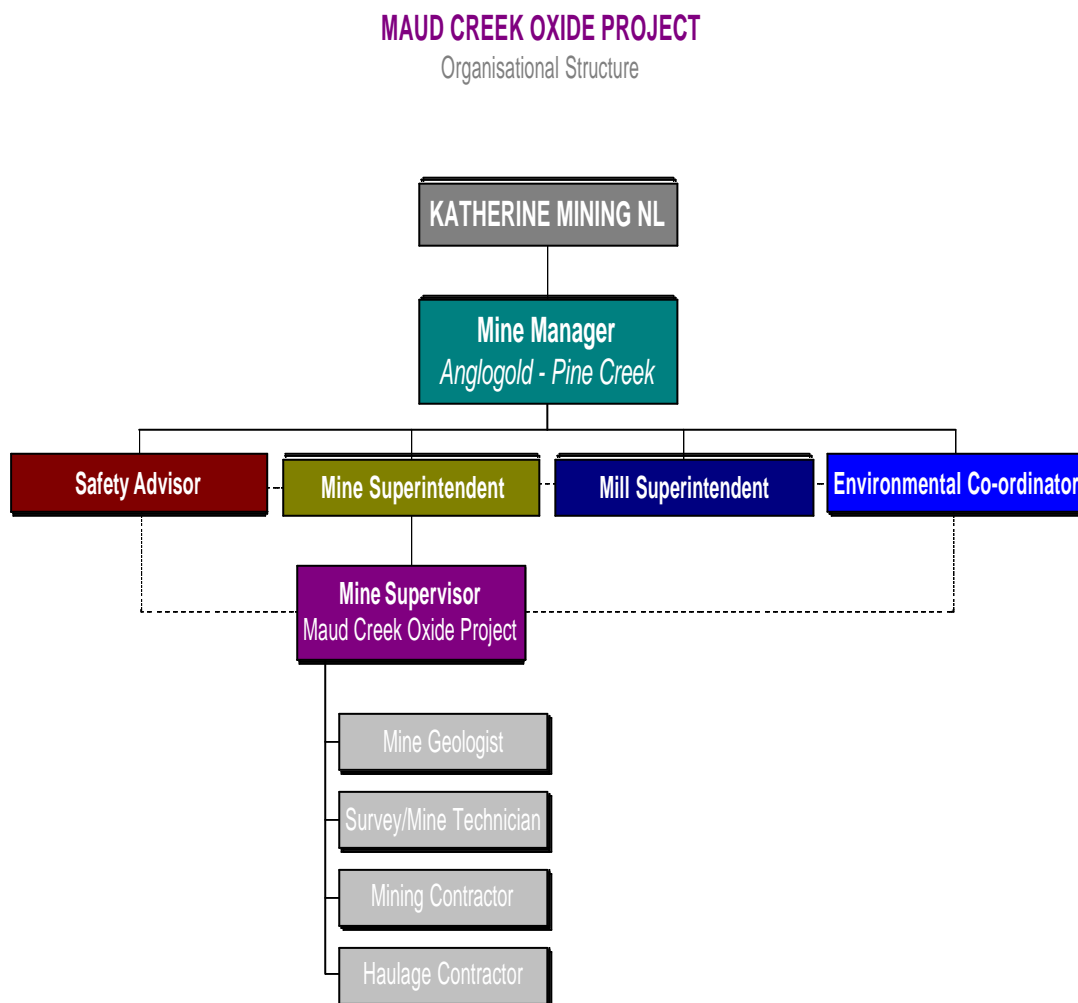


FIGURE 2 - MCOP MANAGEMENT STRUCTURE

2.2.2 Environmental Management

The AngloGold/Acacia Resources Limited Environmental Policy was reviewed in June 1998 and is shown in Figure 3 and is due for review in June 2000. It is AngloGold's intention to operate MCOP within the parameters set out in this PER, a Mine and Environmental Management Plan (MEMP) and under the auspices of the AngloGold/Acacia Resources Limited - Environmental Systems, Standards and Guidelines. The following principles provide the framework for the AngloGold/Acacia Resources Limited Environmental Management System:

- Environmental Policy and Implementation
- Compliance with legal obligations and other requirements
- Management commitment
- Key responsibilities and reporting structure
- Communication
- Assessment of environmental issues and risk
- Objectives and Targets
- Standards, guidelines and procedures
- Education and training
- Analysis and reporting of environmental performance
- Environmental audits and inspection
- EMS and MEMP review.

Every employee is given an environmental induction prior to commencing work on site. Responsibility for environmental management and performance rests with line management. It is line management's responsibility to ensure operations are carried out in an environmentally sensitive manner.

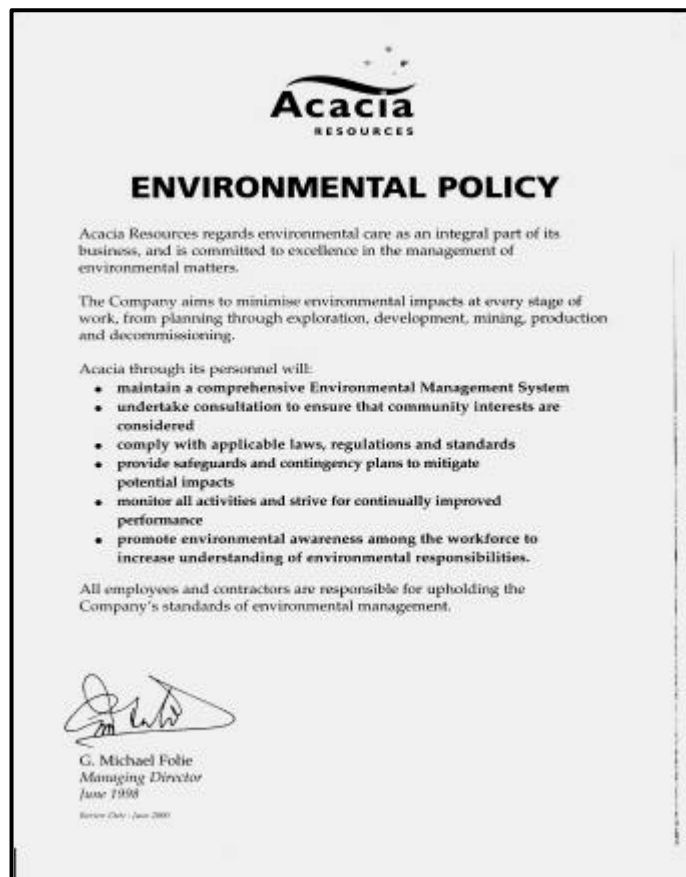


FIGURE 3 - ACACIA RESOURCES LIMITED ENVIRONMENTAL POLICY.

Responsibility for all environmental duties has been assigned to the Environmental Coordinator. The coordinator also undertakes environmental studies, field monitoring and sampling duties on behalf of the Superintendents and Mine Manager. A list of commitments (Section 7) for the project has been compiled utilising the Maud Creek DEIS (1998) and URG MEMP (1999).

2.2.3 Occupational Health and Safety

AngloGold, through its safety management policy (Figure 4) and plan, is committed to providing a safe place of employment for all employees and contractors. The policy is due for review in June 2000. High priority is placed on safety and AngloGold maintains that workplace accidents and injuries are preventable through sound training, education and commitment at all levels of the company.

The safety and health policy and the Safety Management System is based on the following ten elements;

- Visible management commitment
- Sound safety and health policy
- Clear understanding of duty of care
- Realistic objectives and plans
- Relevant understandable standards and practices
- Effective education and training
- Measurement and analysis of performance
- Audits of compliance with Standards, guidelines and established practices
- Thorough investigation and follow-up of injuries, incidents and hazards
- Effective motivation and communication

AngloGold has adopted the MARCSTA general mine safety induction as a standard accreditation requirement for its entire workforce. Through the use of SiteSafe incident and hazard software and data analysis, our operations have an improved understanding of activities that have a high probability of causing injury or damage. By utilising this and other Australia wide data, has established work procedures, inspection programs and training activities to ensure the high-risk activities are eliminated or controlled. To help control these risks AngloGold ensures that the following aspects of project activities are addressed:

- Emergency response plan that identifies potential incidents and how to deal with them.
- Emergency response equipment
- A trained emergency response team
- Site medical facilities

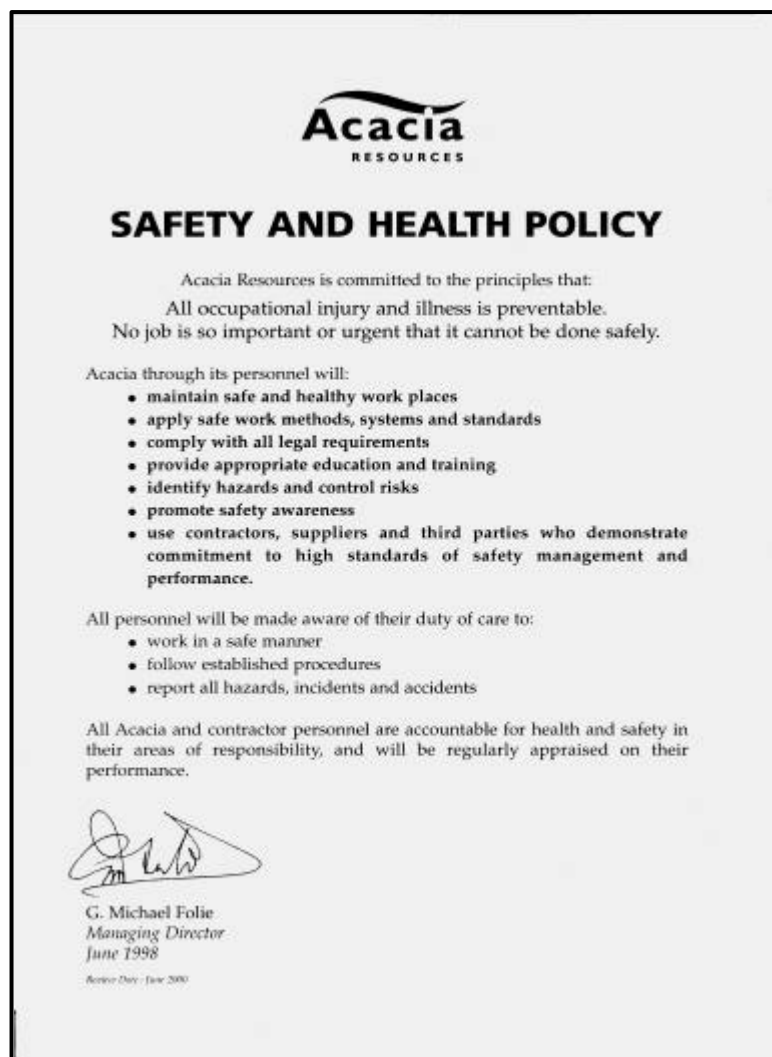
Accountability for safety and occupational health management rests with AngloGold's management. All employees and contractors are required to conduct their work safely and without risk to their health. Safety management depends on the enthusiastic support of the entire team, under the guidance of its managers.

2.2.4 Administration

AngloGold will directly employ about six full time personnel, and contractors are expected to employ approximately 30 personnel at MCOP. Major contracts will be in place for mining, drill and blast, grade control and haulage. AngloGold is an equal opportunity employer and works to provide a work environment free from harassment and discrimination. New employees are provided with extensive induction training, which is followed by job specific and development training.

Human resource policies and procedures are regularly reviewed and updated in line with our changing business requirements. Most employees will live in accommodation in Katherine. AngloGold requires a pre-employment medical and police clearance for all staff. All applicants must also pass a drug and alcohol screening and agree to ongoing random testing.

FIGURE 4 - ANGLOGOLD /ACACIA RESOURCES LIMITED SAFETY AND HEALTH POLICY.



2.2.5 Statutory Obligations

AngloGold complies with the primary Northern Territory legislation in the following manner:

- *Mine Management Act* (1995) and Regulations - the operations are conducted in accordance with the terms of this legislation.
- *Mining Act* (1990) and Regulations - operates the mine in accordance with the conditions of the leases and legislation.
- *Heritage Conservation Act* (1991) & Associated Amendments - the mine receives advice from the Lands, Planning & Environmental Heritage Section regarding the management of archaeological, historical and aboriginal sites.
- *Aboriginal Sacred Site Act* (1989) - Management of Aboriginal archaeological sites will be agreed with the Authority.

2.3 GEOLOGICAL SETTING

2.3.1 Regional geology

The Maud Creek project is situated within the Katherine - El Sherana area that occurs in the southeastern part of the Pine Creek geosyncline. The El Sherana Group consists of a 2.5 km thick sequence of fluviatile sediments and volcanic rocks and is subdivided into the following formations:

- Scinto Breccia
- Coronation Sandstone
- Pul Pul Rhyolite
- Big Sunday
- Tollis

Three major trends were identified associated with gold mineralisation within the Pine Creek geosyncline (Simpson et al., 1980), namely:

- 140-150 Pine Creek Shear Zone and associated trends
- 45-50 Clustered near and parallel with the axis of the Burnside Granite
- 105-110 Mount Shoobridge-Sleisback lineament

(Note: the above positions are given in degrees from north)

2.3.2 Project geology

The main zone gold deposits within the MCOP area are formed as a result of multiple mineralising events within a wide, steep easterly dipping shear zone on the contact between overlying mafic volcanics and footwall Tollis formation sediments. Within the shear zone, a southerly plunging pie-like structure is evident. Gold occurs as a free particulate gold as well as refractory gold (at depth) associated with pyrite and arsenopyrite. Mineralogy varies locally comprising of different amounts of quartz, pyrite, arsenopyrite and graphite. Surrounding alteration assemblages variously consist of silica, chlorite, sericite, carbonate, fuchsite and haematite

2.4 MINING OPERATIONS

2.4.1 Mining Method and Fleet

Mining will be conducted by conventional open pit methods, similar to those employed by AngloGold's Union Reef and Brocks Creek gold mines (both operated by AngloGold Resources Limited). Grade control drilling will occur ahead of blasthole drilling and blasting. Broken waste rock and ore will be mined using a hydraulic excavator loading into dump trucks for haulage to the waste dump and RIM pad respectively. Ore on the RIM pad will then be loaded into road trains for haulage to the Union Reefs site for processing.

2.4.2 Grade Control

Three grade control-drilling programs will occur over the life of the pit. Angled holes will be drilled to a depth of 15m and samples will be collected every one metre for assay. The holes will be drilled on a regular pattern of 4.5m across strike in rows 10m apart along strike. Geologists at URG M will interpret the assay results.

2.4.3 Drilling and Blasting

Blasting will be necessary from surface for the whole of the pit. A hydraulic blasthole drill rig will drill vertical holes to a bench depth of 7.5m on a regular pattern. The holes will be charged with ANFO if the ground is dry, otherwise a waterproof emulsion will be used. Bulk explosives will be delivered from the Orica manufacturing facility at the URG M site. Blasts will be relatively small, in keeping with the size of the pit, and will occur on average, every 3 days at the end of day shift; about 5:30pm.

2.4.4 Ore and Waste Mining

After blasting, the ore body interpretation based on the grade control drilling program will be marked on the broken ground. The 7.5m bench will then be mined in three successive flitches, each nominally 2.5m deep. A hydraulic excavator will mine the waste from the hanging wall side of the ore, gradually exposing the hanging wall contact of the ore and the waste. The ore will then be mined along strike, working across the ore body to the footwall contact. The footwall waste will then be mined. When all three flitches have been mined, the second bench will be drilled and blasted and the process repeated. After the second bench is mined, the grade control rig will return to sample the next 15m or two benches and the cycle will continue.

2.4.5 Mine Schedule

Table 1 below illustrates the proposed mining schedule.

TABLE 1 - MINE SCHEDULE

Activity	Mar 00	Apr 00	May 00	Jun 00	Jul 00	Aug 00	Sep 00	Oct 00	Nov 00
Project preparation/approval									
Dewatering									
1 st Grade control program									
Mining									
Ore haulage									
2 nd grade control program									
3 rd grade control program									
Site rehabilitation									
Hand back site									

2.4.6 Infrastructure

The site infrastructure will be the minimum required to safely and efficiently conduct the mining program. Where possible facilities will be shared between AngloGold and contractors and will be constructed in a single location. All employees will be accommodated within the township of Katherine. Expected infrastructure is to include:

- Transportable administration/crib facilities
- Stores area
- Workshop for earth moving, drill and blast and grade control contractors.
- Fuel Storage tanks
- Explosives magazine area

Minimal power will be required on site. Small, mobile, diesel powered generating sets will be utilised to power pit dewatering bore pumps and the administration facilities.

ANFO will be mixed at the URG M Orica depot and delivered to site as required. Portable and vehicle mounted two-way systems will be used for communication within the project site. Emergency communication systems will be developed prior to the commencement of operations. Cooperation with neighbours and relevant agencies (fire brigade, RAAF Tindal Air base and police, including the emergency rescue police team) will help to ensure that communication do not fail in times of emergency.

2.4.7 Security Arrangements

The project site is currently fenced. Present access is through a standard agricultural gate on the southern access road. The following management measures are proposed:

- No visitors are allowed to enter the site without prior authorisation from the AngloGold Mine Superintendent.

- Warning signs will be erected on the access road advising visitors to report to the site administration office.
- All persons entering the area will be required to sign an entry/ exit log book.
- Blasting times will be sign posted and entry restricted.
- All visitors will be briefed on the dangers of entering an active mine area together with mandatory safety requirements.
- Access gates will be locked during non-mining periods.

2.5 PIT DESIGN AND DEVELOPMENT

2.5.1 Personnel

The mine will be managed by AngloGold personnel drawn from the existing AngloGold Pine Creek. It is expected that the maximum number of full time AngloGold personnel on site will not be more than six. Contractors will be engaged to do the grade control drilling, the mining (including drill and blast) and the haulage of ore to Union Reefs.

2.5.2 Open Pit Design and Parameters.

After the initial grade control drilling program the pit design will be finalised. The existing ore body model will be optimised again with updated ore reconciliation factors and actual contract mining costs and the resultant outlines used to design the final pit. Bench heights are expected to be 7.5metres, with berms not less than 5 meters wide every 15 vertical metres. Actual bench face slope angles are expected to be 55° to 60°.

2.5.3 Pit Wall Monitoring Program

The geotechnical performance of the pit walls will be monitored by periodic walk over inspections of the pit crest and berms.

2.5.4 Pit Water Management.

The pit will need to be continually de-watered as mining proceeds. There are two existing water bores that can be equipped for pumping. These will be set up prior to mining so that the ground water level in the pit area can be drawn down. During mining, additional bores may be established, sump pumps used or a combination of both. The water will be discharged in accordance with section 4.3 "Water Management".

2.6 ORE STOCKPILE AND HAULAGE

The RIM pad will be constructed as a base layer of oxide waste upon which mined ore will be stockpiled. It will abut the waste rock dump. The ore may be segregated into separate stockpiles depending on weathering type or gold grade. Access to the pad will be via a designated haul road. The ore will later be loaded by front-end loader into triple road trains and hauled to Union Reef Mine for processing. It is expected that ore haulage will occur at a similar rate to ore mining and that the RIM pad is finally depleted of ore after mining is completed.

2.7 ACCESS AND HAUL ROAD DESIGN

All vehicular access to the site will be via the Stuart Highway, turning onto Ross Road (20km south of Katherine). Approximately 1.5 km from the highway a gravel access road will be upgraded and developed to the project site. An updated Aboriginal Areas Protection Authority (AAPA) Certificate has been approved, covering the development of the access road and the mine (Appendix A). A right of way agreement has been negotiated and agreed upon with the owner of Maud Creek Station. This will allow AngloGold to have access to the site from the Maud Creek bitumen road along an existing pastoral dirt road, which passes directly in front of the Maud Creek homestead (Figure 5)

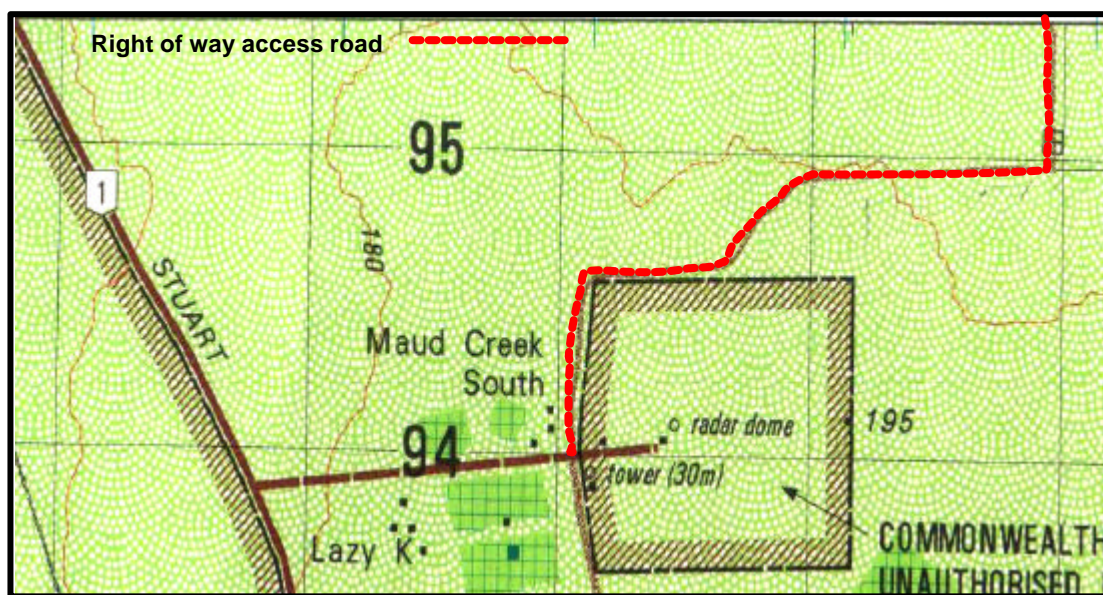
Careful siting and construction of the access road will ensure that interference with current fencing and drainage is kept to a minimum. Maintenance of unsealed haul roads within the mineral claim areas and

along the access tracks into the project area will involve regular grading and watering. Water for dust suppression will be sourced from dewatering bores.

Expected turn-around time for haulage trains will be one train every 2-3 hours depending upon the rate of ore removal from the pit. AngloGold will upgrade the Ross Road and Stuart Highway intersection to a “Type B”, as recommended by the Department of Transport and Works. Advice will also be sought from the department regarding appropriate signage and management measures required for the haulage of material along the Stuart Highway. The Katherine Weighbridge is available for compliance load checks (during the day only) of road trains. Printed dockets can also be requested to check on load weights for reconciliation of ore moved.

Cattle grids will be placed along the mine access road to restrict the requirement for gates. However, gates may be retained/developed and locked to provide security to the project after hours. This will also allow the neighbouring landholder to safely muster stock if required. Speeding restrictions will be placed on all roads entering and exiting the project area.

FIGURE 5 - RIGHT OF WAY ACCESS ROAD (NOT TO SCALE).



Maud Creek Station has retained the right to graze cattle and buffalo within the mineral claim areas, which will increase the risk of road incidents with wandering stock. However, it should be noted that there has been a program to reduce stock numbers on Katherine Mining’s property over the last 15 months. All vehicle incidents regarding stock will be immediately reported to the MCOP Mine Supervisor. An AngloGold incident report form must be completed. The AngloGold Environmental Coordinator and the manager of Maud Creek Station must also be immediately informed.

2.8 ORE HAULAGE

AngloGold intends to award an ore haulage contract, following project approval. The mining rate indicates that 10 to 13 road train cycles will be required on a 24 hr/day, 7 days/week basis (or a loaded truck every 2-3 hours). Advice has been received that 100 to 120 road trains pass through Katherine every day. The proposed ore haulage trucks will increase this value by approximately 20%, for the 5 month haulage programme.

To comply with the Department of Transport and Works requirements, the T-junction of Ross Road and the Stuart Highway will be upgraded to a “Class B” standard.

The haulage trucks will be loaded and covered to control potential spillage or dusting.

It is anticipated that the successful contractor will want to drive up Stuart Highway, through Katherine. Katherine Mining and AngloGold understand that road trains travelling through Katherine is a sensitive issue. However, Katherine Mining and AngloGold suggest that this is a safer option than using the

bypass road and Victoria Highway. Road trains have been observed to be relatively slow and cumbersome when negotiating the Stuart and Victoria Highway intersection, and interfering with the flow of traffic on the Stuart Highway. Concern has also been expressed regarding the integrity of the bypass road's surface.

If this proposed haulage method/route offers any concerns, then AngloGold has indicated a willingness to participate in discussions with appropriate regulatory authorities and other heavy transport road users to develop an acceptable resolution to the issue.

2.9 ORE PROCESSING

Ore will be processed at the URGM plant approximately 180 km north of the MCOP. Processing is via the conventional CIP circuit at a rate of 2.8 Mtpa and will be blended with current ROM ore stockpiles at Union Reef. Ore processed from Maud Creek will actually displace marginal ore currently utilised on site from Crosscourse Pit. Therefore, the actual through put rate will not increase. Approximately 150,000 tonnes of Maud Creek Ore will be processed.

2.9.1 Tailings Management

Tailings storage options were evaluated in the report "Tailings Disposal Options and Tailings Management Plan 1999-2003" by MPA Williams and Associates, December 1998. Raising of the wall was completed in October 1999. The capacity of the tailings dam, from January 2000, is 9 Mt and two more raises are scheduled for 2000 and 2001. All tailings will be contained within the current tailings storage facility at URGM. Management of tailings, rehabilitation, water sampling and hazardous goods will be addressed under the auspices of the current Union Reef MEMP, 1999. No raising is required in 2002 as disposal to the Crosscourse pit commences in late 2002. Maud Creek ore is only 1.8 % of the available storage capacity and 5% of the year 2000 capacity.

3 ENVIRONMENTAL MANAGEMENT & MONITORING

A detailed description of the projects' existing environment is provided in chapter 3 of the DEIS (page 40 to 95).

A summary of the existing conditions follow :

3.1 CLIMATE

The Maud Creek area has a tropical savannah climate with two distinct seasonal patterns – 'the wet' monsoon and 'the dry' season. The mean daily temperature in the project area is 31°C with humidity levels ranging between 51% and 81% throughout the year. The average rainfall is approximately 971mm, and data from two historic rainfall events has been recorded and used as reference in this draft EIS. The severe floods of January 1998 provided considerable data with which to plan for future 'worst-case scenarios'.

3.2 GEOLOGY

The Maud Creek Goldfield is situated within the Katherine-El Sherana area which occurs in the south-eastern part of the Pine Creek Geosyncline. Rock units present within the project are the Tollis Formation, the Maud Dolerite, the Edith River Volcanics, the Kombolgie Formation and the Antrim Plateau Volcanics.

3.3 TERRAIN

Land units occurring within the proposed project site include: rugged terrain with slopes 15-40% with shallow or skeletal soils; hilly terrain with slopes 5-15% rocky and boulder strewn with shallow and skeletal soils; gently undulating crests and upper slopes to 5% with shallow rocky soils; undulating terrain with slopes 5-10% with grey and brown clays; and major creeks and severely gullied tributaries. Other soils types in the area include red earths and red clay soils, brown clays and grey-brown (cracking) clay soils.

3.4 FLORA

The vegetation of the project area consists largely of woodlands and open woodlands (predominant species – Eucalypts) which have been degraded by cattle, buffalo and wild donkeys. No rare, threatened or endangered plant species have been identified in the proposed project area.

3.5 FAUNA

Native amphibians, reptiles, mammals and birds inhabit the proposed project area, although population density has been affected by the presence of introduced species. No species endemic to the proposed project area have been identified. A high diversity of parrots has been noted.

3.6 WATER RESOURCES

The availability and quality of both surface and groundwater in the project area have been studied and considered in context of the greater area, including the catchment of the Katherine River. Elevated levels of arsenic have been recorded in some of the area's groundwater, and surface water from the Maud and Gold Creeks shows seasonal variations in dissolved metals. Relevant ANZECC /NH&MRC guidelines were used to assess water quality.

3.7 SOCIAL CONDITIONS

The town of Katherine is the closest residential area to the mine site, and has an existing capacity for provision of the majority of the support services. Mine workforce accommodation will be in Katherine, and where possible, current residents will be employed.

No sacred or significant sites have been identified within the project area.

4 POTENTIAL AND ACTUAL ENVIRONMENTAL IMPACTS, PROPOSED ANALYSES AND REPORTING

This section describes environmental and project issues which are considered significant to the MCOP and surrounds. AngloGold will manage these issues in order to mitigate or minimise the potential environmental impacts.

4.1 LAND CLEARANCE REQUIREMENTS

AngloGold will endeavour to minimise the area of disturbed land by adopting the following management controls;

- No clearing will be undertaken without the approval of the Manager.
- Areas will be clearly marked out prior to clearing.
- Facilities will be located on areas which have been disturbed by previous activities such as clearing for drilling.
- Topsoil will be stockpiled for use in rehabilitation, and
- Cleared areas will be rehabilitated as soon as they are no longer required.

It is estimated that approximately 12.25ha of land will be required to be cleared to allow the development of the project.

TABLE 2 - LAND CLEARANCE REQUIREMENTS

Component	Total Clearance Area (ha)
Pit	3.00
Waste dump	4.70
RIM pad	1.30
Administration facilities	0.25
Mine contractors area	1.00
Access Road (from Ross Road, upgrade pastoral roads)	2.00
TOTAL	12.25

4.2 WASTE ROCK MANAGEMENT

4.2.1 Maud Creek Waste Rock

Geochemical characterisation of waste rock and ore samples was completed in the DEIS by Campbell and Associates (DEIS Appendices – Appendix G, 1997). Testwork results indicated that Acid Rock Drainage (ARD) should not be produced by the waste rock dump at Maud Creek. This prediction reflected the low content of pyrite and abundance of carbonates in the waste rock produced from the Weathered-Zone and Fresh-Zone during pit development. The MCOP will mine the oxide zone and only the upper level of the transition zone. Consequently the waste dumps could be constructed as a run-of-mine activity without selective handling and placement. Nevertheless, AngloGold will implement a waste rock characterisation program based on current procedures utilised at the Union Reef Mine.

4.2.2 Waste Rock Characterisation Program

The waste rock characterisation (WRC) program forms a dual management effort between the AngloGold Geology and Mining Departments. AngloGold (Union Reefs) has adapted recommendations made by EGI (January 1996 & May 1998) for the Life of Mine plan.

The management program is designed to:

- Ensure the correct identification, logging and placement of elevated arsenic and acid producing material into designed waste dumps
- Minimise the environmental impact of stockpiled waste material during and after mining operations.

Procedures have been formulated to ensure that waste material which is (or potentially) acid forming and/or contains elevated arsenic values, is stabilised and contained. The identification of acid generating waste rock areas within transitional/primary zones is the responsibility of the Mining and Geology Departments. Accurate and timely information regarding waste rock characterisation is conveyed to the Mining Department for mine scheduling and strategic planning of waste dump construction.

4.2.3 Waste Rock Sampling and Testing Procedures

Characterisation of waste material involves taking a 7.5m composite sample through the entire mining bench from a discrete location. The sample interval can be modified in line with any changes in blasting depth, mining height or the geological nature of potentially problematic material.

4.2.3.1 Selection Criteria

Waste material is considered to be **‘problematic’** if NAG and/or arsenic results satisfy the following selection criteria:

NAG > 1

Arsenic > 1000ppm

4.2.3.2 Drill Hole Planning

Collar locations are generated in plan view for a new mining bench at the crest RL (reduced level). A standardised 40m(Y) x 20m(X) pattern is applied to the entire bench. This pattern does not discriminate between mineralised or waste zones and examines the potential for acid generating waste and/or elevated arsenic values both distal and proximal to mineralised haloes. Variations in ROM cut-off grade can produce 'mineable' ore zones with variable geometry. The 'waste' surrounding any 'mineable' ROM block (still within the mineralised structure) may still host significant concentrations of problematic sulphides.

The Survey Department pegs collar positions in the field and drilling activities are carried out as a campaign utilising open-hole percussion methods (blast-hole). This allows sufficient time for the samples to be dispatched, analysed and the results processed prior to excavation.

The standardised grid is wide spaced and hole collars (generally) do not require re-surveying after being drilled. Any minor adjustments to collar coordinates are applied prior to updating the database.

4.2.3.3 Field Sampling and Data Management

The rock-chip pile is sampled by 'quartering' the cone of cuttings around the collar position producing a sample of approximately 3kg (1-sample represents around 6,000BCM of in-situ material). The Pit Mapping Geologist coordinates all sampling activities. The Hole ID is the same as the Sample ID because only one (1) sample is taken from each hole. The numbering convention is outlined below:

- MCWBD 005
- MC - Maud Creek
- W - waste designation
- BD - indicates the bench RL
- 005 - Indicates the Hole & Sample Identifier (WBD prefix for all holes)

The Pit Mapping Geologist produces a geological log of each waste rock sample. This log examines lithology, % quartz, oxidation state (O - oxide, T - transitional, F - fresh), alteration, sulphide content (% Pyrite & Arsenopyrite). This information can be used to critically analyse any 'problematic' results and relate these to recognised geological parameters.

A sample dispatch order (SDO) is produced for each batch of samples sent for analysis. Laboratory procedure codes, which identify the type and detection limit associated with the analytical procedure, are indicated on the SDO. These include:

- **NAG** - as per EGI guidelines
- **Arsenic - AA1**. This is a perchloric acid digest providing acid soluble values (detection limit 50 ppm).

4.2.3.4 NAG Testing

The current waste rock monitoring program at URGM will be applied to MCOP and is based on a simplified field NAG (net acid generating) test procedure presented by EGI, January 1996. This procedure classifies 4 main waste rock types and 7 sub-types. These are:

Type 1	Non Acid Forming
Type 2a	Potentially Acid Forming - Low Capacity 0-5 kg H₂SO₄ / tonne of waste
Type 2b	Potentially Acid Forming- Low Capacity 5-10 kg H₂SO₄ / tonne of waste
Type 3a	Potentially Acid Forming - High Capacity 10-20 kg H₂SO₄ / tonne of waste
Type 3b	Potentially Acid Forming - High Capacity 20-35 kg H₂SO₄ / tonne of waste
Type 4a	Potentially Acid Forming - High Capacity 35-60 kg H₂SO₄ / tonne of waste
Type 4b	Potentially Acid Forming - High Capacity > 60 kg H₂SO₄ / tonne of waste

For operational classification purposes, waste rock assaying with a NAG value <1 will be considered Non-Problematic and material assaying more than >1 will be considered Problematic.

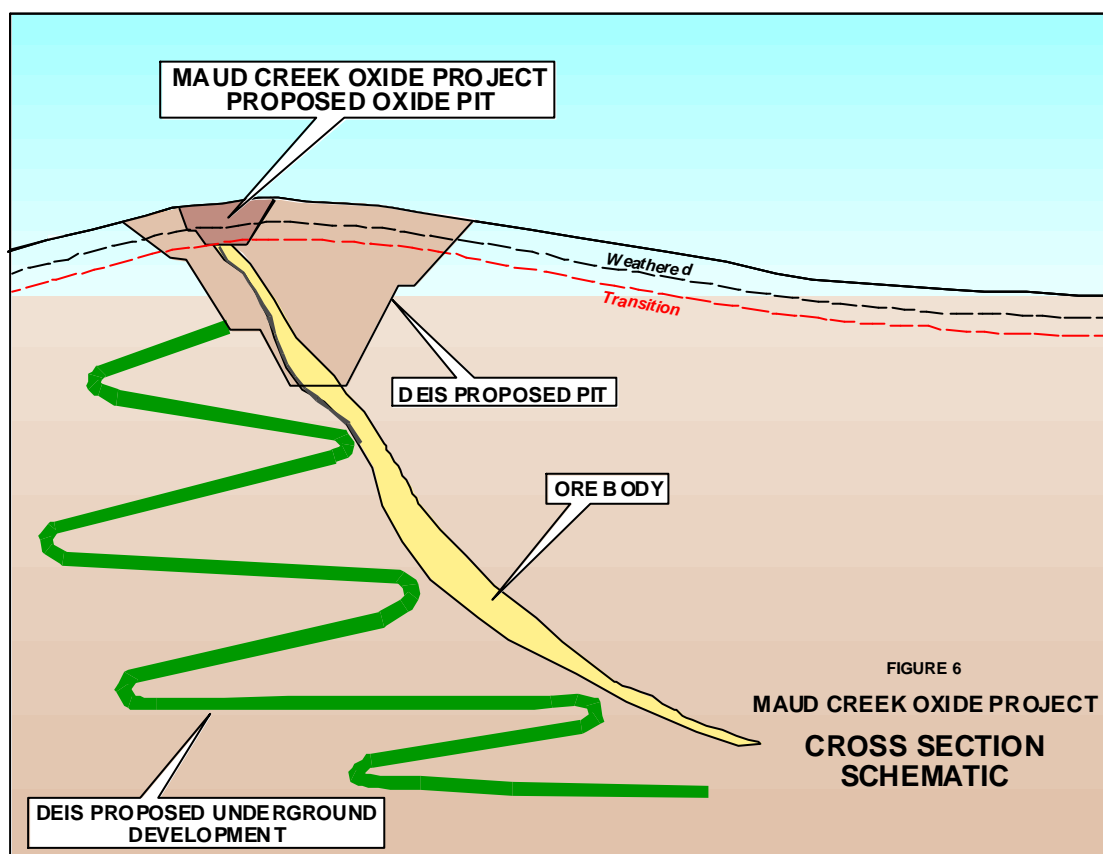
4.2.3.5 Arsenic Testing

Weathered, transitional and primary material may contain elevated As values. The following As groups will be utilised to classify the waste rock:

Group	As (ppm)	Environmental Significance
Group 1	0 - 30 ppm	Environmental Investigation Criteria (ANZECC, 1992)
Group 2	30 - 100 ppm	Environmental Investigation Criteria (ANZECC, 1992)
Group 3	100 - 500 ppm	Environmental Investigation Criteria (ANZECC, 1992)
Group 4	500 - 1000 ppm	Environmental Investigation Criteria (ANZECC, 1992)
Group 5	> 1000 ppm	Environmental Investigation Criteria (ANZECC, 1992)

For operational classification purposes, waste rock assaying less than 1000 ppm will be considered Non-Problematic and material assaying more than 1000 ppm will be considered Problematic.

FIGURE 6 - CROSS SECTION SCHEMATIC MAUD CREEK



4.2.3.6 Delineation and Mining Method

The Pit Mapping Geologist interprets 2D polygons of 'problematic' material for both NAG (> Type 1) and/or Arsenic (>1000ppm) onto flitch plans accompanied by ore block outlines (Appendix 2). All problematic results will have a minimum selective mining unit of 40m(Y) X 20m(X) relating to the minimum drill pattern density ie. Two (2) 'problematic' results which occur along strike will have a polygonal area of 80m(Y) X 20m(X).

The Pit Supervisor will examine relevant WRC plans and develop a mining strategy, which is then presented to the mining contractor. Benign material will be the only waste type sent to the dump. If any waste rock is accessed from a 'problematic' area then it will be directed to a temporary stockpile adjacent to the waste rock dump. At completion of mining any acid producing waste will be placed back into the pit, which will flood to natural ground water level, cover the waste and prevent the generation of acids.

4.2.3.7 Waste Dump Location

The waste dump will be located on "high ground" on the north western side of the pit (refer to the location plan – Figure 8). This location is above the PMF and 100 year flood inundation zones, as defined and shown in figure 10 of the DEIS (Dames and Moore, September 1998). This will ensure that the dump remains stable and as stated previously. Any run-off due to rain events will be collected in a toe drain and directed into the pit void.

4.3 WATER MANAGEMENT

With mining taking place in the dry season the following waters will be generated and used by the project:

- Groundwater from pit-dewatering activities
- Drainage from disturbed areas
- Potable water

Average climatic conditions for the Katherine area are summarised in Figure 7. Dewatering will occur prior to and during mining operations. The following sections describe the proposed management strategies for each of the above mentioned waters.

4.3.1 Groundwater Dewatering

Dewatering will need to commence well before mining of the open cut pit due to water levels being so close to ground level. Static ground water levels within the area in June 1998 ranged between 1.75m and 5.15m below ground level. Preliminary investigations on quality and quantity of groundwater was completed by Dames and Moore, 1998 (Appendix I - DEIS). In pit de-watering requirements may not be warranted, as average historical rainfall for the Katherine region during the mining period is insignificant (Figure 7).

The mining schedule and options for disposal/utilisation of the water will govern the pumping rates. Dewatering will primarily involve the pumping of water from two established bores WB2 and WB3 to achieve drawdown around the pit. Indicated aquifer transmissivity for WB2 is about 46m³/d/m and WB3 24m³/d/m. Utilising previous pump testwork data, it is estimated based on a 35 m deep open cut pit, that 2 bores at a pump rate of 200 – 500 m³/day would reduce the groundwater levels to approximately 38 mBGL over six months.

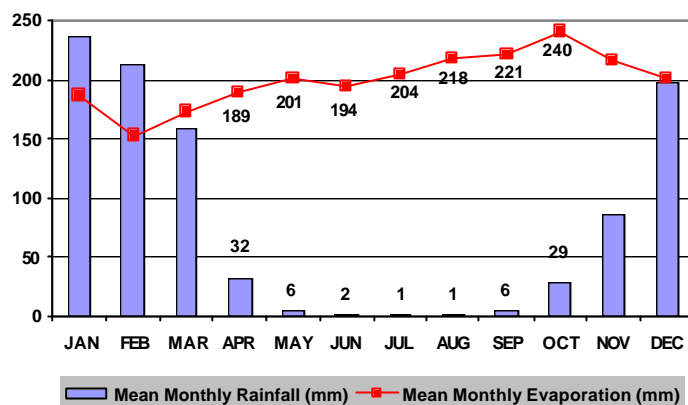


FIGURE 7 - KATHERINE REGION AVERAGE CLIMATIC CONDITIONS#.

Derived from Katherine weather station rainfall records and evaporation values from Dames and Moore (DEIS Appendices, 1998)

Water abstracted from the bores during preliminary investigations, indicated the water is not of potable quality with elevated concentrations of arsenic, selenium, barium and lead which exceed NH&MRC (1996) drinking water guidelines. However, these water samples were taken at depth; within the main lode of the sulphide orebody. In 1999, pump testing of the upper portion of the aquifer indicated that this water will be suitable as a dust suppressant, for agricultural purposes, or for evaporative land application (Table 3). In fact the only element outside the potable water guideline was Arsenic (As), with values of 15.6 and 21.2ug/L for WB2 and WB3 respectively. The potable water guideline for Arsenic is less than 7ug/L.

Dewatering water will be stored in tanks for use as a dust suppressant within the pit and haul roads. Water which is excess to dust suppression requirements will initially be land-applied using a series of sprinkler irrigation systems onto a black soils (2:1 montmorillonite clays) plain, near the waste dump. These systems will be designed to maximise the evaporation of water without run-off. These clays also have a high attenuation capacity for binding the small amounts of heavy metals contained in the irrigation water. As the project progresses and as soon as rehabilitation commences, then any excess water will be used to promote revegetation.

TABLE 3 - MAUD CREEK MINE IRRIGATION/LAND APPLICATION GROUND WATER QUALITY.

Indicator	Units	Irrigation ** Water	WB 2# Sulphides	WB3# Sulphides	WB2# Oxides	WB3# Oxides
pH		4.5-9.0	Neutral*	Neutral*	Neutral*	Neutral*
Total Dissolved Solids	mg/L		515	520	540	540
Aluminium	µg/L	5000.0	32	37	1.3	0.9
Arsenic	µg/L	100.0	18	100	15.6	21.1
Barium	µg/L	NA	250	1700	215	235
Beryllium	µg/L	100.0	<0.5	<0.5	<0.05	<0.05
Boron	µg/L	500.0	N/A	N/A	N/A	N/A
Cadmium	µg/L	10.0	<0.1	<0.1	0.04	<0.02
Chloride	mg/L	30-700	10	12	26	26
Chromium (CrVI)	mg/L	100.0	<0.1	<0.1	10	11
Cobalt	µg/L	50.0	<1	<1	<1	<1
Copper	µg/L	200.0	6	9	<1	<1
Fluoride	µg/L	1000.0	N/A	N/A	N/A	N/A
Iron	µg/L	1000.0	36	56	<20	<20
Lead	µg/L	200.0	6	7	0.06	0.01
Lithium	µg/L	75.0	N/A	N/A	N/A	N/A
Manganese	µg/L	2000.0	23	310	66	68
Mercury	µg/L	2	N/A	N/A	N/A	N/A

Molybdenum	µg/L	10.0	<1	4	0.5	0.6
Nickel	µg/L	200.0	4	6	2	2
Selenium	µg/L	20.0	33	16	0.5	0.5
Uranium	µg/L	10.0	<1	<1	1.2	1.3
Vanadium	µg/L	100.0	<1	<1	0.8	0.7
Zinc	µg/L	2000.0	100	26	7.2	5.5

** ANZECC Guideline 1992

Analytical Results DEIS Appendices, 1998 – Appendix I.

Water Quality from these bores will be sampled on a monthly basis for the relevant parameters for irrigation quality. Every fortnight, field tests will be completed for pH and electrical conductivity. Daily records of flows and volumes of water discharged under either dust suppression or evaporative land application will be logged and reported to the AngloGold Environmental Coordinator.

Following further pump tests and analytical water quality results, a full plan will be submitted to the DME outlining the method of application and suitability of systems.

4.3.2 *Turbid Run Off*

Turbid water generation is expected to develop from disturbed areas within the project area mostly from the waste rock dump, after the closure of the mine when the 2000/2001 wet season commences. The waste dump will be bunded and any run off directed into the pit void. Other areas of disturbance include haul and access roads and areas of cut and fill. Primary silt traps will be constructed along drainage lines downstream of these areas. These silt traps will be constructed of oxide rock fill allowing sediment to settle out and clean water to percolate through the traps for small rainfall events during the dry season.

Monitoring and maintenance of these traps will be the responsibility of Katherine Mining upon closure of operations.

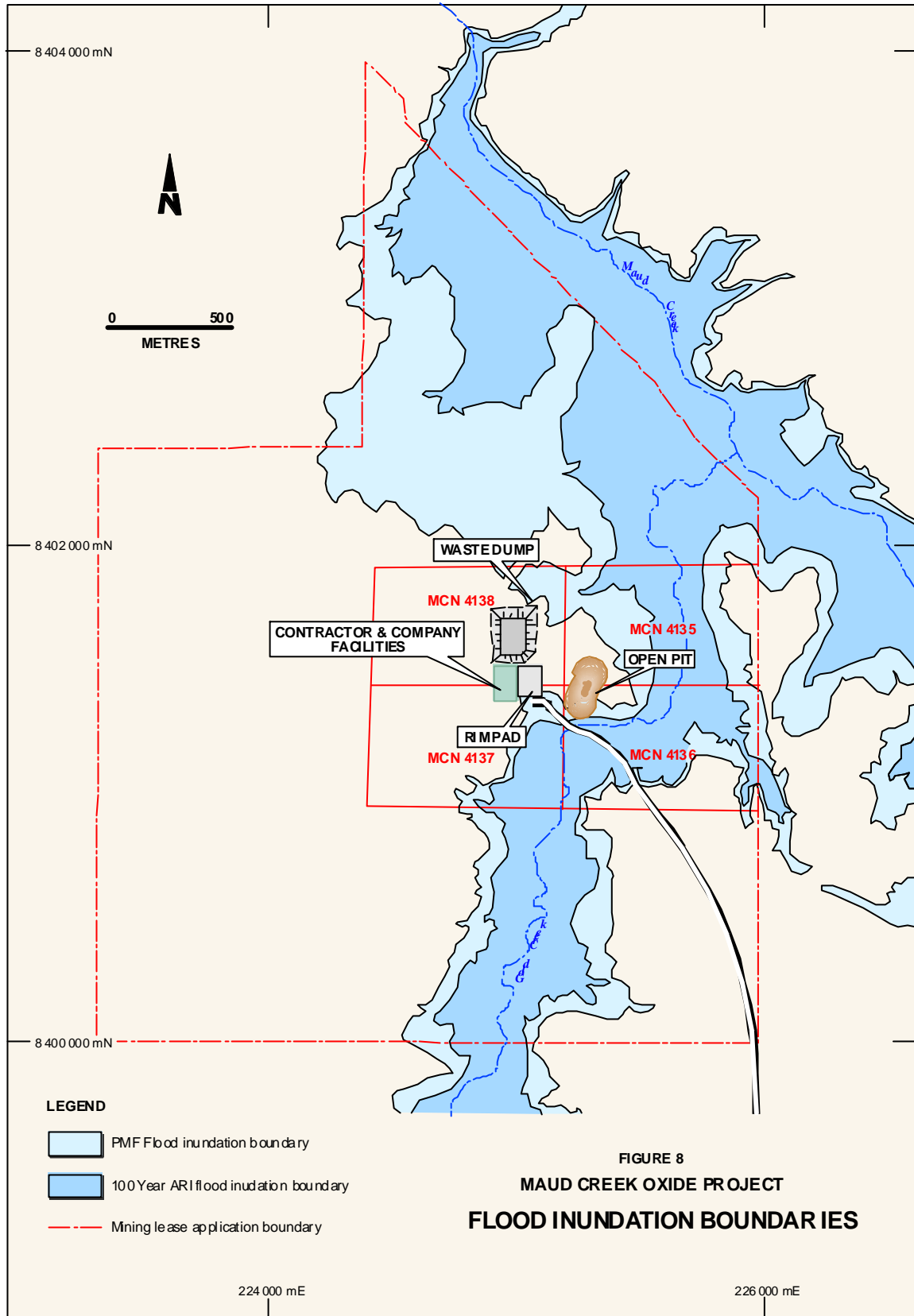
4.3.3 *Potable Water*

Potable water for the operations will be either sourced from the Katherine Regional Water Supply or supplied to site in bottled form. Raw water from dewatering will supply much of the supplementary water for ablution and wash down facilities. Bacteriological analysis will be performed on a monthly basis for the duration of the operation if potable water is accessed through the town water supply. Samples will be dispatched to the Department of Primary Industries and Fisheries – Microbiology Laboratory for analysis.

4.3.4 *Flood Assessment*

During the DEIS process, Dames and Moore carried out a detailed analysis of rainfall events and subsequently modelled flood scenarios for the project area (Dames and Moore, September 1998). PMF and 100 year ARI flood inundation boundaries were defined. These boundaries are shown in figure 8, with the location of the oxide pit, waste dump and associated facilities. All facilities are located outside the 100 Year ARI level and only the pit becomes inundated if a PMF event is experienced.

FIGURE 8 – MCOP FLOOD INUNDATION BOUNDARIES



4.4 HISTORICAL & ABORIGINAL SITES MANAGEMENT

4.4.1 Existing Cultural and Heritage Management

An archaeological survey of MCN 4135-4138 and MCN 4143 was performed by “Heritage Surveys” during May and June of 1996 (DEIS Appendices – Appendix P). The “NTU Archaeological Service” completed previous survey work in 1994. Approximate locations of the sites are identified in Figure 9.

Custodians advised that the land within the area of Mineral Claims 4135-4138 and 4143 in Maud Creek region is clear of any sacred site constraints. In accordance with Section 22 of the *NT Aboriginal Sacred Sites Act 1989*, Authority Certificate C2000/06 from the AAPA was issued for the Maud Creek Oxide Project (Appendix A). However the southern access road, previously proposed by Katherine Mining into this area, is in the vicinity of a site previously recorded in the Jawoyn Land Claim as 5369-27.

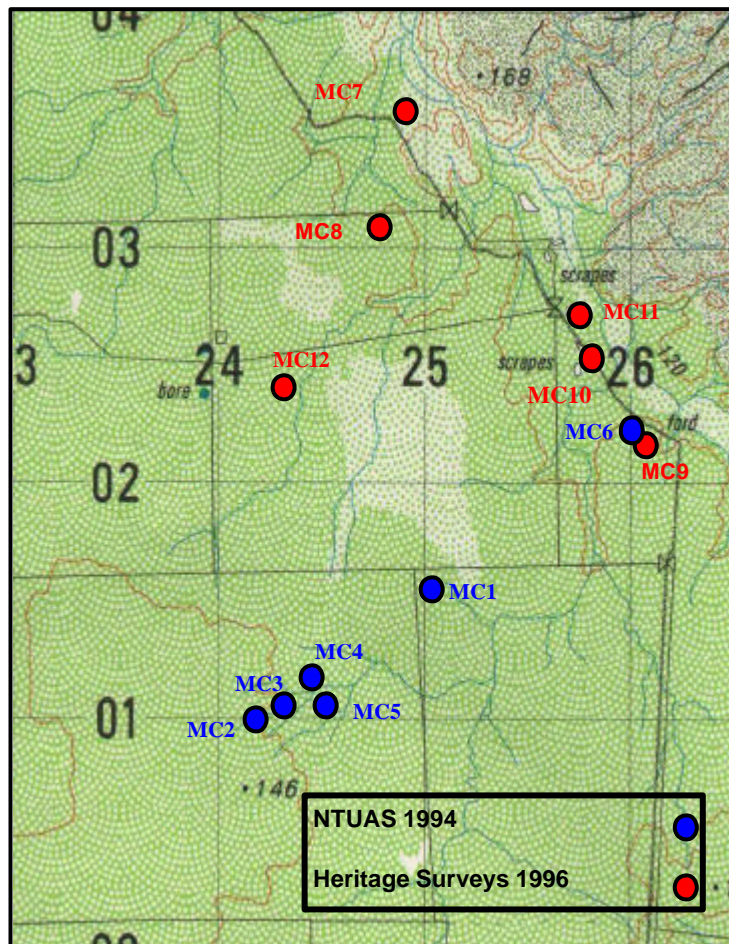


FIGURE 9 - MCOP ARCHAEOLOGICAL SITE LOCATIONS

4.4.2 Proposed Management Measures

Site MC1 is located within the development zone of MCN 4137 and may be impacted by the operations. Guse and Gregory (NTUAS, 1994) recommended that the disturbance of this site should be granted under the NT Heritage Conservation Act 1991, following surface collection of artefacts. Surface artefacts should be lodged with the NT Museum and Art Gallery. Therefore, should this site warrant disturbance, an application to “Salvage or Destroy” shall be lodged with the Department of Lands Planning and Environment – Heritage Conservation Branch. Once approval is given, a salvage program shall be instigated, prior to the commencement of mining activities.

4.4.3 Monitoring and Reporting

All sites in close proximity to mining operations will be clearly identified in the field by appropriate signage and employees will be made aware of their approximate location during the induction process. If any new sites are discovered or any known sites disturbed, the Heritage Conservation Branch of the DLPE will be informed immediately. The AngloGold Environmental Coordinator will conduct regular visits to the project to check on site status.

4.5 FIRE MANAGEMENT

In general, it is expected that there will be no requirement for the lighting of fires on the minesite and unauthorised lighting of fires will be prohibited.

All equipment and facilities will be fitted/provided with fire extinguishers.

In case there is a need for fire management, it will be undertaken in consultation with the neighbouring pastoralist and the Katherine Regional Bushfires Council. Due to grazing stock being present within the project area it is unlikely that a controlled burning program will be implemented by ANGLOGOLD. However, firebreaks will be constructed around facilities and water trucks will be available as fire fighting units. If any controlled burning is required it will be performed according to a "Permit To Burn" under the *Northern Territory Bushfires Act, 1989* and with the approval of the neighbouring landowner.

4.6 BIOLOGICAL MANAGEMENT

4.6.1 Flora

An assessment of the vegetation communities represented within the project area was undertaken by Dames and Moore, 1996 (DEIS Appendices – Appendix N). No rare, threatened or endangered plant species were identified on site from surveys. Clearing of flora within the project area will be performed according to the ANGLOGOLD Clearing Permit system. The ANGLOGOLD Environmental Coordinator or MCOP Mine Supervisor must give authority prior to the clearing of any areas. The permit system ensures that no unauthorised disturbance of areas occur. Topsoil management and clearing procedures are outlined in Section 6.1.

4.6.2 Fauna

Fauna surveys were conducted in 1994, 1996 and 1997, and Dames and Moore conducted a search of the NT Parks and Wildlife Biological Records; refer to the DEIS (Dames and Moore Sept 1998). It was concluded that there are no rare or threatened fauna species within the project area.

The Maud Creek project is currently an operational grazing area for cattle and buffalo. This situation will remain whilst mining operations are in progress. Management measures for grazing stock will be negotiated with the manager of Maud Creek Station. This might include fencing requirements, cattle grids, mustering times and access to site for cattle management. To reduce the risk and manage any stock mortalities the following measures are proposed:

- Fencing around the pit void and infrastructure (if required).
- Speed restrictions along the road train haulage roads.
- Appropriate signage warning of wandering stock.
- Register of mortality events and procedures for reporting.

It should be noted that there has been a program to reduce stock numbers within the project area over the last 15 months.

4.6.3 Weeds.

The most abundant weed species currently within the project area is *Hyptis suaveolens* along with minor infestations of *Sida cordifolia* and *Sida acuta*. Spread of such weeds within the project area and to the Union Reef Mine is expected to be low. Movement of vehicles in and out of the site will be

during the dry season when the potential for weed spread via caked on mud is very low. However, every precaution will be taken to check vehicles and equipment entering the site for cleanliness. A weed control program will be coordinated with the manager of Maud Creek Station.

4.7 DUST MANGEMENT

4.7.1 Potential Dust Sources and Management

Potential sources of fugitive dust generation from MCOP's operation will be:

- open cut mining activities
- blasting
- haulage on and off site
- disturbed and bare areas.

The majority of these dust sources will cause localised impacts. Nuisance dust along the access road from road train and light vehicular traffic has the potential to impact on Maud Creek Station. The access road runs directly in front of the homestead.

It is important that standard best practices for the reduction and prevention of dust during operations are implemented. The following six strategies will be employed to manage dust on site:

Strategy	Action
Mechanical	Watering of roads, dust collection units on drilling rigs, covered loads on haulage trucks.
Progressive rehabilitation	Limit exposed areas to wind erosion, minimise unwarranted land disturbance
Regulation	Provision of PPE to employees, appropriate signage, and speed restrictions.
Reporting	Reporting of non-compliant equipment, Incident reporting of excessive dust generation.
Monitoring	Regular inspections of equipment access road condition and vehicles.

4.8 WASTE AND HAZARDOUS SUBSTANCE MANAGEMENT

The management of solid/industrial waste and hazardous goods is required to prevent occupational, environmental and health hazards. The following wastes and hazardous goods are likely to be utilised or generated by the project:

- Explosives (ammonium nitrate and fuel oil)
- Flammable liquids (diesel, lubrication and hydraulic fluids)
- Domestic waste water and effluent
- Putrescible solid wastes (food stuffs and packaging)
- Reusable/recyclable solid waste (tyres/scrap metal)

4.8.1 Sewerage and General Waste Disposal Strategies

Sewerage and domestic waste water effluent generated on site will be treated via an approved septic system to comply with the *Public Health and General Sanitation Regulation, 1996*. This system will be designed in consultation with the Northern Territory Health Services.

Most solid rubbish generated from the operations will be putrescible waste from crib/office facilities and packaging. The key principle for general waste disposal is segregation and removal of waste material from site. A waste disposal contractor from Katherine will conduct regular removal of rubbish from site. Mobile bins will be provided on site for the collection and disposal of waste materials.

4.8.2 Hazardous and Dangerous Goods

Explosive suppliers will deliver and store bulk explosive material on site. Transportation of dangerous goods will be carried out in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADGC, 1992). A copy of this code will be located at the site administration office. The storage and handling of all explosives on site will be in accordance with AS 2188 as per the Mine Management Act 1990 (NT).

Diesoline will be utilised for light vehicles and mining equipment associated with the operation of the open cut pit. AngloGold and the mining contractor will have a common fuel storage facility. This facility will be bunded in accordance with AS 1940 – *The Storage and Handling of Flammable and Combustible Liquids*, 1993.

Waste engine oils and hydraulic fluids will be collected in recycle drums for treatment/disposal off site.

Copies of MSDS forms relating to all hazardous or dangerous goods on site, will be kept in the administration, stores and contractors areas.

5 SCHEDULE OF MONITORING, MEASUREMENTS, SAMPLE ANALYSES AND REPORTING

The following section provides details of the proposed monitoring and reporting procedures practices. A monitoring programme will be finalised after consultation with the DME. Reporting will be to the DME.

5.1 GROUNDWATER MONITORING PROGRAM

TABLE 4 - MCOP OPERATIONAL WATER MONITORING PROGRAM

Site Code / Sample Location		Analysis Type				
		1	2	3	4	5
		** Frequency				
Dewatering Bores						
MCWB2	Dewatering Bore 2	F	D	M	Q	
MCWB3	Dewatering Bore 3	F	D	M	Q	
Potable						M
MCPOT	Potable water tank					M

• Types of Analysis

- Type 1: pH & EC in field units.
- Type 2: Water Levels and flow rates
- Type 3: pH, EC, TDS, TSS, Alkalinity, CO₃, HCO₃, Turbidity, Cl, Ca, Na, Fe, Al, As, Cl, Cu, Mg, Mo, Ni, Pb, Se, Zn
- Type 4: Filterable; Cl, Ca, Na, Fe, Al, As, Cl, Cu, Mg, Mo, Ni, Pb, Se, Zn
- Type 5: Faecal coliforms /100ml

** Sampling Frequency

D = Daily M = Monthly Q = Quarterly F = Fortnightly

5.2 DUST MONITORING AND REPORTING

During operations the MCOP Mine Supervisor is responsible for the day to day management of dust on site. Complaints received from neighbouring landholders, regarding dust from roads, must be registered through the ANGLOGOLD Incident Reporting Procedures. The ANGLOGOLD Environmental Coordinator must be informed immediately upon the receipt of any public complaints regarding excessive dust. Appropriate remedial actions will be implement to rectify problems. Regular checks will be performed by the ANGLOGOLD Environmental Coordinator or Safety Advisor whilst visiting the project site.

5.3 HAZARDOUS SUBSTANCE MONITORING AND REPORTING.

Any incidents regarding spills of hazardous material must be reported immediately to the MCOP Mine Supervisor and the ANGLOGOLD Environmental Coordinator utilising the ANGLOGOLD Incident Reporting Procedure. The non-recoverable substance should be contained and removed from site by a licensed waste disposal contractor. In the event of a severe emergency the Katherine Police and, Fire Brigade and Emergency Response Police Team will be contacted for assistance.

5.4 FAUNA AND FLORA REPORTING PROCEDURES

All personnel are informed of their responsibilities with respect to caring for flora and fauna during the induction program. Any clearing of land is controlled by the Clearing Request Procedure. This requires the area of land to be identified by map coordinates and an inspection of the proposed clearing area by the Environmental Coordinator to identify areas of significance that may require preservation.

The Environmental Coordinator maintains a register of animal deaths occurring within the project area and along the access road. Access to all mine areas is restricted to MCOP employees, official visitors and mining contractors. No firearms or domestic animals (pets) will be allowed on site. In extenuating circumstances, for the mustering or destruction of stock, approval from the ANGLOGOLD Mine Manager must be granted.

5.5 REHABILITATION MONITORING AND REPORTING

Monitoring of rehabilitated areas by AngloGold will be from photographic records. Ongoing monitoring of revegetation success will be the responsibility of Katherine Mining. Records will be kept of earthworks and seeding rates/species for areas rehabilitated by AngloGold. A final rehabilitation closure report will be developed upon cessation of operations.

Permission from the AngloGold Environmental Coordinator and Mine Superintendent is to be gained if access through a rehabilitated area is required. Reporting of any disturbance noticed within a rehabilitated area will use AngloGold's Incident Reporting Procedure.

6 REHABILITATION AND DECOMMISSIONING

The following section outlines the proposed rehabilitation and mine closure works to be performed at the Maud Creek Oxide Project during and after mining operations. Katherine Mining will hold responsibility for environmental management after mine closure.

6.1 TOPSOIL MANAGEMENT

The access road, pit/RIM pad and waste dump footprint areas will require clearing of existing vegetation prior to mining commencing. Mining infrastructure will be kept within areas already marginally cleared from prior activities. Areas will be cleared/grubbed with residual vegetative and at least 100 mm of topsoil stockpiled for rehabilitation purposes. Stockpile age should not exceed six months.

The footprint for the waste dump covers an area of approximately 4.7ha. This includes areas set aside for the waste dump itself, toe drains and topsoil/vegetative stockpiles. The pit and RIM cover an area of approximately 4.3ha, which should also allow for a safety bund to be placed around the pit upon closure. Only vegetation will be removed and stockpiled from the pit footprint, due to the skeletal nature of the topsoil on the ridge.

Stockpiled topsoil and vegetative matter will be spread over the final waste dump and disturbed areas. All rehabilitation is scheduled to be completed prior to the wet season commencing in December 2000. Rehabilitation of the access road will be negotiated with all stakeholders according to future requirements for access to the site.

6.2 OXIDE PIT

At the completion of mining, the oxide pit void will be left open. The void will be protected by a safety bund constructed from run-of-mine oxide waste material. The bund will be located between 10 and 25 metres from the pit edge to ensure it is not affected by any pit wall failures that may occur post mining. The bund will be at least 1.5 metres high to prevent vehicular access to the pit area post mining. The bund will incorporate signage to warn of the pit void danger. A drain will collect and direct surface run-off water contained within the bunded area back into the final pit void.

6.3 WASTE DUMP

At the completion of mining, the dump side slopes will be contour ripped, vegetative material replaced and seeded. The dump cap will be seeded with grass and native seed mix but not ripped. It is proposed to leave the dump cap paddock dumped (dimpled) to inhibit the flow of water across the top surface and hence reduce erosion. Water infiltration into the dump is not seen as a problem due to the non-acid forming properties of the waste material. Therefore, compaction of the cap will be merely by haul trucks as a run of mine activity. The waste dump will incorporate a bund and drain to collect and direct surface run-off water back into the final pit void.

6.4 RIM PAD

The pad and the RIM area used to stockpile ore during the mining and haulage operation will be shaped, ripped and seeded at the completion of the haulage operation.

6.5 INFRASTRUCTURE

Any infrastructure installed or erected during the operational phase will be removed and any ground disturbance remedied by ripping and seeding. Any contaminated soils will also be removed from site.

6.6 ACCESS ROAD

The proposed access road at the completion of the operation will be ripped and seeded where necessary. If required, some portion of the upgraded access road may remain open to provide future access to the site and surrounding area.

6.7 REVEGETATION SPECIES SELECTION

All seed for revegetation work will be purchased from Top End Seeds, who buy seed from individual collectors within the region. Quality seed with a proven germination rate is essential for rehabilitation activities. Direct seeding will be required on areas where topsoil is unavailable for replacement. This includes areas such as the waste dump cap and bunded areas around the pit. These will be seeded at a rate of 2.5kg/ha native seed mix comprising of the following species representative of the surrounding vegetation:

- Eucalyptus foelsheanna
- Eucalyptus tectifica
- Eucalyptus dicromophloia
- Eucalyptus pruniosa
- Eucalyptus tetradonta
- Erythrophloeum chlorostachys
- Hakea aborescens
- Lophostemon grandiflorus
- Brachyiton megaphyllus
- Terminalia grandiflora
- Cochlospermum fraserii

7 LIST OF COMMITMENTS

	SUMMARISED COMMITMENTS	ORIGINAL SOURCE	CURRENT STATUS
1.0	<i>Environmental Policy and Management</i>		
1.1	MCOP will ensure that the PER is used as a guide to overall policy, future planning and the day-to-day environmental management of the project.	PER Section 2.2.2	PER completed
1.2	To operate the Maud Creek Oxide Project in accordance with best industry practice and the highest standards of care as embodied in "Acacia Resources Limited" Environmental Policy 1998 and Environmental System, Standards and Guidelines.	PER Section 2.2.2	Acacia Resources Limited Policy review date June 2000.
2.0	<i>Legislative Requirements</i>		
2.1	To comply with the <i>Mine Management Act 1995</i> by appointing a mine manager and deputy manager before commencement of operations.	PER Section 2.2.5	Mine Manager and Deputy Site Manager established
2.2	To comply with the <i>Mining Act 1990</i> by operating the mine in accordance with the conditions of a mineral lease.	PER Section 2.2.5	Submission of PER
2.3	To comply with the <i>Heritage Conservation Act 1991</i> by receiving advice from DLPE Heritage Conservation Branch, regarding the management of historic sites.	PER Section 2.2.5	Identification and avoidance of located sites.
2.4	To comply with the <i>Aboriginal Sacred Sites Act 1989</i> by obtaining sacred sites clearances for the sites in the project area from the AAPA.	PER Section 2.2.5	AAPA Certificate obtained.
3.0	<i>Infrastructure</i>		
3.1	Siting facilities so that they encompass areas designated for clearance during the DEIS.	DEIS (1998) Figure 3 PER Section 4.1	
3.2	Site infrastructure will be the minimum required to safely and efficiently conduct the operations.	PER Section 2.4.6	
4.0	<i>Rehabilitation and Land Management</i>		
4.1	Disturbance areas will be cleared and grubbed retaining vegetative material and topsoil stockpiles for revegetation purposes.	PER Section 6.1	
4.2	Rehabilitation will be undertaken progressively with the objective being that the site is supporting a self-sustaining vegetation cover that is consistent with the flora in surrounding areas.	PER Section 6.1 & 6.7	
4.3	The waste dump will be constructed with an oxide base, walls and surface cap	PER Section 6.3	
4.4	The waste dump will be constructed to an approximate height of 10 meters with slopes battered to a final angle of 14°	PER Section 6.3	
4.5	Topsoil will be replaced on the waste dump batters and disturbed areas and contour ripped.	PER Section 6.3	
4.6	Representative sites of rehabilitation will be logged described and photographed from fixed reference points.	PER Section 5.5	

	SUMMARISED COMMITMENTS	ORIGINAL SOURCE	CURRENT STATUS
5.0	Pits		
5.1	Two existing dewatering bores will be equipped around pits to dewater pit aquifers where required.	PER section 4.3.1	
5.2	A plan for land application will be developed with assistance from the DME	PER Section 4.3.1	
5.3	Dewatering water from active pits will be used for road watering, raw water supply or evaporated via a land application system.	PER Section 4.3.1	
5.4	Geotechnical performance of pit walls will be monitored by periodic walkover inspections of the pit crest and berms.	PER Section 2.5.3	
6.0	Water Monitoring		
6.1	To monitor water levels, flow rates and groundwater quality in existing dewatering bores for dust suppressant usage and land application.	PER Section 5.1	
7.0	Waste Rock		
7.1	Placement a segregation of problematic waste material will be performed utilising characterisation procedures currently utilised at URGM.	PER Section 4.2.3	Waste Rock Characterisation Procedures in place
7.2	Problematic waste which is (or potentially) acid producing and/or contains elevated arsenic levels, is placed in a temporary stockpile and returned into the pit void at the end of the mining programme.	PER Section 4.2.3.6	
8.0	Haul and Access Roads		
8.1	Careful siting and construction of the access road to ensure minimal interference with drainage lines, established fencing and pastoral access.	PER Section 2.7	
8.2	Provide regular grading and watering of roads to limit dust generation.	PER Section 2.7	
8.3	Upgrade the Ross Road and Stuart Highway intersection to a "Type B" arrangement for the safe entry/exit of road trains onto/off the Stuart Highway.	PER Section 2.7	Recommendation from Department of Transport and Works to upgrade to a "Type B" arrangement.
8.4	Development of appropriate signage and management measures for road train usage of the Ross Road and Stuart Highway in conjunction with the Department of Transport and Works.	PER Section 2.7	To be developed in conjunction with the Department of Transport and Works during the upgrade.
9.0	Safety and Hygiene		
9.1	All personnel on site will be fully inducted in safety, cultural matters, environmental matters, organisation responsibility, security, etc.	PER Section 2.2.2 & 2.2.3	General induction program currently in place for all AngloGold employees and contractors.
9.2	Security gates will be established at the main mine access road that will restrict after hours access.	PER Section 2.7	Signs currently at entrance to discourage visitors.
9.3	Access to mine areas will be restricted to MCOP personnel, contractors and authorised visitors.	PER Section 2.7	
9.4	Dangerous goods will be stored and managed in accordance with the existing legislation and current best industry practice.	PER Section 4.8.2	
9.5	A waste disposal contractor will remove putrescible and general waste from site.	PER Section 4.8.1	
9.6	All sewerage will be disposed of in an approved system as advised by the Territory Health Services.	PER Section 4.8.1	
9.7	The entry of firearms and pets will be banned.	PER section 5.4	
9.8	Firebreaks will be established around facilities and water trucks available a fire fighting units. Equipment and facilities will be fitted with fire extinguishers.	PER Section 4.5	

	SUMMARISED COMMITMENTS	ORIGINAL SOURCE	CURRENT STATUS
9.9	Using an approved system will provide potable water, which meets relevant health standards.	PER 4.3.3	
10.0	<i>Biological Management</i>		
10.1	Clearing within the project area will be in accordance with the "ANGLOGOLD Clearing Permit System".	PER Section 4.6.1	Clearing permit system in place
10.2	A fire management plan will be developed in consultation with neighbouring landholders and the Katherine Bushfires Council	PER Section 4.5	
10.3	Management measures for grazing stock will be negotiated with the manager of Maud Creek Station	PER Section 4.6.2	
10.4	Speed restrictions, signage and a mortality register will implemented for the management of fauna deaths on the access and haul roads.	PER Section 4.6.2	Mortality register in place
10.5	All incidents will be reported immediately to the MCOP Mine Supervisor and ANGLOGOLD Environmental Coordinator	PER Section 2.2.2	Incident reporting procedures in place
11.0	<i>Mine Closure</i>		
11.1	Mine closure will involve the removal of mine infrastructure and rehabilitation of project land, in accordance with best practices, prior to the onset of the 2000/2001 wet season	PER Section 6.5	

8 REFERENCES

Acacia Resources Limited (1999)	Environmental Management System, Standards and Guidelines (controlled document).
ANZECC (1992)	Australian Water Quality Guidelines for Fresh and Marine Waters.
Campbell, G and Associates Pty Ltd (1997)	Maud Creek Gold Project – Geochemical Characterisation of Waste Rock and Ore Samples.
Dames and Moore (1998)	Preliminary Dewatering Investigation Maud Creek Project for Katherine Mining.
Dames and Moore (September 1998)	Maud Creek Gold Project Draft Environmental Impact Statement and Appendices.
Environmental Geochemistry International (EGI) (1998)	Waste Rock Geochemistry Review – URGM Site Visit Report.
Gregory, R and Guse, D (1994)	An Archaeological Survey of the Proposed Maud Creek Mining Prospect, Northern Territory NTU Archaeological Service Report No 26.
Heritage Surveys (1996)	Archaeological Investigation at leases MCN 4139,4140,4141,4142 and 4144 Maud Creek Northern Territory.
MPA Williams and Associates (1998)	Tailings Disposal Options and Tailings Management Plan 1999-2003.
Pine Creek Gold Operations (1999)	Union Reef Gold Mine – Mine and Environmental Management Plan 1999/2000.

APPENDIX A – ABORIGINAL AREAS PROTECTION AUTHORITY CERTIFICATE.

**PROPOSED
WORK OR USE:**

Mining and processing of gold. Construction and use of an access road.

CONDITIONS:

1. The applicant shall ensure that the conditions of this Certificate are included in any subsequent contract or tender documents for the works or use described herein.
2. The applicant shall ensure any agent, contractor or employee is aware of the conditions of this Certificate and the obligations of all persons (who enter on, or carry out works or use land on which there is a sacred site) under Part IV of the *Northern Territory Aboriginal Sacred Sites Act 1989*.
3. This Certificate shall lapse and be null and void if the works in question or the proposed use is not commenced within 24 months of this Certificate.
4. The applicant shall ensure any agent, contractor or employee is aware of the content of section 40(1) of the *Northern Territory Aboriginal Sacred Sites Act 1989* which provides that this Certificate does not negate the need for consent, approval or permission for the subject works or use of the land which may be required under another statute.

The COMMON SEAL of the
ABORIGINAL AREAS PROTECTION AUTHORITY
was hereto affixed on the 9th day of
February 2000



DAVID RITCHIE
Chief Executive Officer



ABORIGINAL AREAS PROTECTION AUTHORITY
AUTHORITY CERTIFICATE

Issued in accordance with Section 22 of the Northern Territory Aboriginal Sacred Sites Act 1989

REFERENCE:

D89/199;90/804 (Doc:34045)

C2000/06
(Variation of C98/136)

APPLICANT:

Acacia Resources Limited
Level 11, 60 City Road
SOUTHBANK VIC 3006

SUBJECT LAND:

MLN 1978A (Maud Creek) and associated access road, as shown on the map which is annexure 'A' hereto.