Rustlers Roost and Quest 29 Open-Cut Mine Redevelopment

Draft Environmental Impact Statement (EIS)

Sections 1 to 4 – Introduction, Regulatory context, Stakeholder Engagement and Project Description

Prepared pursuant to the Environment Protection Act 2019

October 2021

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Key Project Terms

Term	Definition
Adaptive Management	Systematic process for incrementally improving management practices by learning from the outcomes of past and current practices.
Carbon in Leach	This process uses a dilute alkaline cyanide solution to leach (dissolve) gold from the ore material. Activated carbon removes gold out of dilute cyanide solution by adsorption (sticking). The leaching agent and activated carbon are added together in a slurry of ore and water.
Development Envelope	Defined as the maximum area within which the Project footprint could occur. The development envelope for the Project encompasses 790 ha, inclusive of Rustlers Roost, Quest 29, the accommodation camp and haul road.
Environmental Aspect	An element of the Primary Gold's activities, products or services that can interact with the environment.
Environmental Impact	Change to the environment whether adverse or beneficial, wholly or partially resulting from the Primary Gold's environmental aspects. Environmental impacts can be caused directly or indirectly from a Project activity or cumulatively with other non-Project related activities in a set area.
Environmental Factor	The NT EPA listed environmental objectives to identify environmental matters that have value to the Northern Territory and that need to be protected; and to state the objective to be achieved for each matter. The NT EPA has prepared these environmental objectives and organised these in structured divisions of the environment, called environmental factors.
Existing Disturbance Footprint	Defined as the direct disturbance area from known historical activities associated with the Rustlers Roost, Quest 29, accommodation camp and haul road areas. For Rustlers Roost and Quest 29 this is taken from the existing Mine Management Plans. The existing direct disturbance footprint encompasses 169.4ha within the development envelope.
Heap Leach Pad	Existing areas where historic mining placed ore for processing via a leaching solution to dissolve and capture the mineral. The pads contain the remaining material.
Maximum Vegetation Clearing Extent	The maximum extent of native vegetation clearing proposed for the Project based on mapped vegetation extent layers which account for historic anthropogenic disturbances to the development envelope (e.g. historic mining and pastoral activities). This area constitutes a total of 368.86 ha.
Project	The Project includes the expansion of existing pits, waste rock landforms, water storage dams and internal roads in both the Rustlers Roost and Quest 29 MLs. Two new pits will be constructed at Rustlers Roost and new infrastructure includes an onsite processing plant, a tailings storage facility, a landfill, laydown area, magazine, administration office, accommodation camp and groundwater bores for water supply. The Project is inclusive of an expanded connecting haul road between the non-contiguous extraction areas and an accommodation camp.
Project Area	The Project area is defined as wholly including ML1083 (Rustlers Roost), ML 29783 (Quest 29), ML 29814 (accommodation camp) and the connecting haul road. The entire Project area covers 1,143.25 ha.
Direct Disturbance Footprint	Defined as the direct disturbance area based on the current proposed infrastructure and material placement inclusive of Rustlers Roost, Quest 29, the accommodation camp and haul road. This area covers both historically disturbed and undisturbed areas. The disturbance footprint encompasses 532.84 ha within the Project area.
Significant Impact	A significant impact of an action is an impact of major consequence having regard to: (a) the context and intensity of the impact; and (b) the sensitivity, value and quality of the environment impacted on and the duration, magnitude and geographic extent of the impact.
Study Area	Refers to the area of survey or investigation for a specific study. This area may be beyond the Project area or development envelope.
Tailings Storage Facility	A specially engineered and constructed impoundment into which tailings (residue) from the ore processing plant is deposited for placement in perpetuity. The storage facility is constructed with confining embankments consisting of earthen material (e.g. rock and soil) and capped following closure.
Waste Rock Dump	An engineered and constructed impoundment into which overburden from the mining process is placed for safe storage in perpetuity.

Acronyms, Abbreviations and Units

Abbreviation, Acronym or Unit	Definition
$m	Million dollars
%	Percentage
+ve	Assessment of positive
µS	Microsiemens
4WD	Four-wheel drive
AADT	Average Annual Daily Traffic
AAS	Atomic Absorption Spectrophotometer
AAPA	Aboriginal Areas Protection Authority
AARL	Anglo American Research Laboratory
ABS	Australian Bureau of Statistics
AE	Aquatic Ecosystems
AEP	Annual Exceedance Probability
AFANT	Amateur Fishermen's Association of the Northern Territory
AHD	Australian Height Datum
ALA	Atlas of Living Australia
ALARP	As Low As Reasonably Practicable
AMD	Acid and Metalliferous Drainage
ANC	Acid Neutralising Capacity
ANCOLD	Australian National Committee on Large Dams
ANFO	Ammonium Nitrate
ANZG	Australia and New Zealand Government
ARI	Average Recurrence Interval
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
AS	Australian Standard
ASRIS	Australian Soil Resource Information System
ASX	Australian Stock Exchange
AS/NZS	Australian/New Zealand Standards
AUSRIVAS	Australian River Assessment System
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
Bq	Becquerel
BUD	Beneficial Use Declaration
CAD	Computer-Aided Design
CAPEX	Capital Expenditure
CCTV	Closed Circuit Television
CE	Community and Economy
CEO	Chief Operating Officer
CH_4	Methane

Abbreviation, Acronym or Unit	Definition
CIL	Carbon in Leach
CO_2	Carbon Dioxide
CO_2-e	Carbon Dioxide Equivalent
COPC	Contaminant of Potential Concern
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSL	Compact Soil Liner
CSM	Conceptual Site Model
C&D	Construction and Demolition
C&I	Commercial and Industrial
DAWE	Department of Agriculture, Water and Environment (Cth) (current)
DEPWS	Department of Environment, Parks and Water Security (NT) (current)
DGV	Default Guideline Value
DIDO	Drive-in Drive-out
DITT	Department of Industry, Tourism and Trade (NT) (current)
DIWA	Directory of Important Wetlands of Australia
DO	Dissolved Oxygen
DotE	Department of the Environment (Cth) (former)
DotEE	Department of the Environment and Energy (Cth) (former)
EC	Electrical Conductivity
EH&S	Environment, Health and Safety
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
EP Act	*Environment Protection Act 2019*
ERA	Energy Resources of Australia
ERP	Emergency Response Plan
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development
GDE	Groundwater Dependent Ecosystem
GGAP	Greenhouse Gas Abatement Plan
GHG	Greenhouse Gas
GJ	Gigajoule
GL	Gigalitre (1,000 Megalitres)
GPS	Global Positioning System
GRP	Gross Regional Product
GST	Goods and Services Tax
g/t	Grams Per Tonne
GV	Guideline Value
GWP	Global Warming Potential
ha	Hectare

Abbreviation, Acronym or Unit	Definition
HDPE	High Density Polyethylene
HEC-HMS	Hydrologic Modelling System
HFC	Hydrofluorocarbons
HP	Hydrological Processes
HSE	Health, Safety and Environment
IAP2	International Association for Public Participation
IBC	Intermediate Bulk Container
ID	Identification
IECA	International Erosion Control Association
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Provider
ISO	International Organisation for Standardisation
IWEQ	Inland Water Environmental Quality
JORC	Joint Ore Reserve Committee
kL	Kilolitre
km	Kilometre
km^2	Square Kilometre
kV	Kilovolt
L	Litre
L/s	Litre Per Second
LED	Light Emitting Diode
LiDAR	Light Detection and Ranging
LNG	Liquefied Natural Gas
LOM	Life-of-Mine
LPG	Liquefied Petroleum Gas
M	Million
m	Metre
m^2	Metre squared
m^3	Cubic metre
mAHD	Metres Australian Height Datum
mBGL	Metres Below Ground Level
MCP	Mine Closure Plan
MEDLI	Model for Effluent Disposal Using Land
mg	Milligram
ML	Mining Lease (Granted)
MLA	Mining Lease Application
mm	Millimetre
MMP	Mining Management Plan
MNES	Matter of National Environmental Significance
MP	Management Plan
mRL	Metres Reduced Level
Mt	Million Tonnes

Abbreviation, Acronym or Unit	Definition
Mtpa	Million Tonnes Per Annum
MW	Megawatt
N_2O	Nitrous Oxide
NAF	Non-Acid Forming
NAPP	Net Acid Producing Potential
N/A	Not Applicable
NGER Act	*National Greenhouse Energy Reporting Act 2007*
NLC	Northern Land Council
NMD	Neutral Mine Drainage
NORM	Naturally Occurring Radioactive Material
NOI	Notice of Intent
NO_2	Nitrogen Dioxide
NSESD	National Strategy for Ecologically Sustainable Development
NT	Northern Territory
NTG	Northern Territory Government
NTU	Nephelometric Turbidity Unit
NT Act	*Native Title Act 1993*
NVIS	National Vegetation Information System
OPEX	Operational Expenditure
PAF	Potentially Acid Forming
PASS	Potential Acid Sulfate Soil
PER	Public Environmental Report
PET	Plecoptera, Ephemeroptera and Trichoptera
PFC	Perfluorocarbon
PGO	Primary Gold Limited, a wholly owned subsidiary of Hanking Australia Investment Pty Ltd
PMF	Probable Maximum Flood
PMLU	Post Mining Land Use
PMST	Protected Matter Search Tool
PPL	Perpetual Pastoral Lease
Q	Quarter
RL	Reduced Level
RMP	Risk Management Plan
RO	Reverse Osmosis
ROM	Run of Mine
RRMPL	Rustlers Roost Mining Pty Ltd
RSWL	Reduced Standing Water Level
SA	Statistical Area
SD	Saline Drainage
SDS	Safety Data Sheet
SEP	Stakeholder Engagement Plan
SEIFA	Socio-Economic Indexes for Areas
SF_6	Sulfur Hexafluoride
SGV	Site-Specific Guideline Value

Abbreviation, Acronym or Unit	Definition
SIGNAL	Stream Invertebrate Grade Number – Average Level
SoBS	Site of Botanical Significance
SoCS	Site of Conservation Significance
SSAN	Security Sensitive Ammonium Nitrate
SSC	State Suburb Code
SSTV	Site-Specific Trigger Values
STP	Sewage Treatment Plant
SWGs	Stock Water Drinking Guidelines
SWL	Standing Water Level
t	Tonne
TAMS	Territory Asset Management Services
TARP	Trigger Action Response Plan
TBD	To Be Determined
TE	Terrestrial Ecosystems
TEC	Threatened Ecological Community
TEQ	Terrestrial Environmental Quality
Th	Thorium
TN	Total Nitrogen
ToR	Terms of Reference
TP	Total Phosphorus
TPWC Act	*Territory Parks and Wildlife Conservation Act 1976*
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
TSSC	Threatened Species Scientific Committee
U	Uranium
UC	Uncertain
V	Volt
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
WCD	Water Control District
WDL	Waste Discharge Licence
WMP	Water Management Plan
WONS	Weed of National Significance
WRD	Waste Rock Dump
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Section 1 Introduction

1.1 Overview

Rustlers Roost and Quest 29 are brownfield sites on Mineral Leases (ML) located in the Mount Bundey locality, approximately 85 km south-east of Darwin in the Northern Territory (NT). These sites will be redeveloped for open-cut mining, involving connection of the non-contiguous areas by a haul road and construction of an accommodation camp (the Project). The sites have a history of gold mining activity, with first gold being discovered in the 1940s and activities occurring over intermittent periods during the past 70 years (refer to Section 1.6). Primary Gold Limited (PGO) (the Proponent) is proposing to redevelop the existing mine by expanding open-cut gold mining operations and connecting the two non-contiguous sites with a haul road. PGO is a fully owned subsidiary of Hanking Australia Investment Pty Ltd (Hanking).

The mine sites are located approximately 11 km apart and are connected by an existing unsealed access track, which will be upgraded to accommodate haulage of ore from the Quest 29 satellite pits to a proposed processing facility at Rustlers Roost. Ore mined at both sites will be processed at a new purpose-built processing facility located at the Rustlers Roost site to produce gold bullion which will be trucked offsite for sale. The rate of production will be up to 5 million tonnes per annum (Mtpa) over an approximately 10 year life-of-mine (LOM). Following completion of mining activities, the Project area will be closed and rehabilitated in accordance with an approved Mine Closure Plan (MCP).

The main Project areas of Rustlers Roost and Quest 29 are located between 5 km and 12 km directly south-west of the Arnhem Highway on Old Mount Bundey Station, Perpetual Pastoral Lease (PPL) 1163 and McKinlay River Pastoral Station (PPL 1184). An accommodation camp for the Project workforce will be located on ML 29814 which is part of the Toms Gully Mine tenements (Figure 1-1). The proponent for Toms Gully Mine is PGO; however, that project has undergone a separate environmental assessment process and, with the exception of the camp, no additional activities or infrastructure for this Project are proposed in the Toms Gully ML. The accommodation camp will be utilised for both the construction and operational phases of the Project.

Investigations are being progressed to construct a gas pipeline connecting the processing plant directly to the existing Amadeus Gas Pipeline. A direct connection would forego the requirement to transport gas to site via road. The route options, feasibility and planning for the gas pipeline are being progressed by a third-party and any environmental approvals required to facilitate that infrastructure will be completed separately from this Project.

The Project includes the expansion of existing pits, waste rock landforms, water storage dams and internal roads. Two new pits will be constructed at Rustlers Roost (Annie's Dam pit and Annie's Oakley pit) and new infrastructure includes an onsite processing plant, a tailings storage facility, a landfill, laydown area, magazine, administration office, accommodation camp and groundwater bores for water supply. At Quest 29 the Project includes expansion of the five existing pits (Zamu, Taipan, South Koolpin, North Koolpin and BHS pits). The Project includes an entire development envelope of 790 ha which as the maximum area within which the Project disturbance could occur. However, a large portion of the additional Project footprint is within historically disturbed areas and the Project footprint is not required to encumber the entire Project development envelope. Therefore, the maximum vegetation clearing extent within this area represents less than half of the development envelope (368.86 ha, 47%).

A proponent initiated Environmental Impact Statement (EIS) referral was submitted by PGO to the Northern Territory Environment Protection Authority (NT EPA) on 3 February 2021 for consideration under the *Environment Protection Act 2019* (EP Act). The referral was accepted for consideration on 23 February 2021 and a public consultation period held from 25 February 2021 to 9 April 2021. The NT EPA determined a standard assessment by EIS to be an appropriate method of assessment for the proposed action to address the requirements of section 42 and section 43 of the EP Act. The NT EPA issued a formal Notice of Decision and Statement of Reasons on the assessment approach concurrently with the Terms of Reference (ToR) for the EIS on 11 May 2021.

In accordance with the ToR, the NT EPA considers that the proposed action has the potential to significantly impact environmental values associated with six environmental factors being:

1. Terrestrial Environmental Quality;
2. Terrestrial Ecosystems;
3. Hydrological Processes;
4. Inland Water Environmental Quality;
5. Aquatic Ecosystems; and
6. Community and Economy.

The NT EPA considered other environmental factors during its assessment of the referral; however, the impact on those factors was not considered to be significant. This Draft EIS has been prepared to address the requirements of the ToR and the NT EPA 'Preparing an environmental impact statement (EIS): environmental impact assessment guidance for proponents' (NT EPA 2021a). The key environmental factors listed for assessment in the ToR are addressed in Section 7, while other factors not considered likely to be significantly impacted are addressed in Section 8 of this Draft EIS.

As the Project engineering has been further refined and informed by additional data that has been recently acquired (e.g. environmental, geological, geochemical), the Project has been progressively refined to the scope included in this Draft EIS. These changes result in an increase to the development envelope, vegetation clearing extent, LOM, processing throughput and waste volume outputs detailed in the original referral (refer to Section 1.10 for specific details of the changes). As such, in accordance with Section 51 of the EP Act, PGO notified the NT EPA of a significant variation on 08 August 2021.

The NT EPA issued a notice of decision to accept the significant variation to the action on 26 August 2021 and the documents associated with the variation were made available for public consultation from 30 August 2021 to 24 September 2021. During this period 5 public submissions related to the significant variation were received; however, these were withheld from publication in accordance with regulation 269 of the *Environment Protection Regulations 2020*. A subsequent notice of decision and statement of reasons about assessment of the significant variation was released by the NT EPA on 5 October 2021. It was determined the revised Project could be adequately assessed through the Key Environmental Factors identified in the original ToR; however, minor amendments were made to the ToR to account for the Project changes.

1.2 Key Objectives

The NT EPA guidance for preparing an EIS (NT EPA 2021a) requests identification of key objectives of the proposal and a description of how the Project meets these objectives. The following are the key objectives for the Project:

1. **Economic** – Advance Project environmental studies and approvals to enable operation and recovery of unutilised gold reserves in a timely manner – the Project will add significant value to the Rustlers Roost and Quest 29 deposits through the development of new infrastructure and the accessing of large gold deposits within the area of historic mining and wholly within the existing MLs. The Project capitalises on the location of the two deposits to maximise synergies (e.g. single processing plant, accommodation camp, administration etc.) and limit overall disturbance while maximising the Project footprint within historically disturbed areas. PGO has progressively completed studies to build baseline data over the preceding years and improve confidence in the analysis and outcomes.

2. **Environment and Cultural** – Safeguard the surrounding biophysical, cultural and social environment in accordance with the objectives associated with each of the relevant environmental factors – The studies supporting the analysis, risk assessment and proposed controls in this Draft EIS have been developed based on consultation with the NT EPA and aligned to address aspects of risk and information gaps as identified in the original referral and ToR. The assessment has sought to achieve residual risks that are 'As Low As Reasonably Practicable' (ALARP) through application of the environmental decision-making hierarchy (to avoid or mitigate potentially significant environmental impacts) and implementation of an adaptive management approach in accordance with current NT EPA guidelines and industry standards (e.g. AS/ISO 31000 risk management series). In accordance with Section 43 of the EP Act, the Project has also considered the principles of ecologically sustainable development in each stage and application of the waste management hierarchy in design of the action.

3. **Social** – Involve key stakeholders in the Project to seek consultative feedback to inform the consideration of relevant issues in the environmental assessment process, and to inform PGO's longer term activities and community involvement. Also, utilise input in the design and approvals, and to build a social licence to operate from the beginning of the Project – In developing the approach for Project engagement, PGO has considered the general environmental duty to consult under Section 43 of the EP Act and referred to industry leading standards and practice including the NT Stakeholder Engagement and Consultation guidance (NT EPA 2021b), NT guidance for preparing an environmental impact statement (NT EPA 2021a), the International Association for Public Participation's (IAP2) Quality Assurance Standard For Community and Stakeholder Engagement (IAP2 2015) and relevant International Finance Corporation guides (IFC 2007). Active stakeholder consultation has been completed in accordance with a Stakeholder Engagement Plan (SEP) (refer to Appendix A) which has informed this Draft EIS. Ongoing consultation will be completed in accordance with the future engagement identified in Section 3.8.

All potential significant environmental, social, cultural and economic impacts, identified in the environmental impact assessment process, have been considered with regard to the hierarchies listed in Section 42 of the EP Act. This has also included consideration of potential impacts of climate change (where applicable) and controls have been developed relating to ecosystem-based management accounting the interrelated environmental interactions and ecosystem components (refer to Section 6 – Risk Assessment of Environmental Factors, Section 11 – Holistic Impacts and Appendix B – Risk Assessment Register).

To address the specific information requested by NT EPA, this Draft EIS provides a detailed compilation of information developed and informed by desktop reviews, field surveys, modelling studies, qualitative and quantitative analysis and risk assessment. The information requested in the ToR is provided in Appendix C in the format of a detailed cross-reference. A summary cross-reference against the requirements of the ToR is provided in Section 1.9. While the scope of this documentation is focused on providing the information necessary to address the ToR and relevant NT EPA guidelines, the Draft EIS is also required to be 'stand-alone' and therefore a range of additional information has been included to provide the reader with a comprehensive document (e.g. locational information, legislation, approvals process etc.). Technical studies supporting the information and analysis presented in the main Draft EIS document are provided as appendices.

1.3 Location and Regional Setting

The Project is located in the Mount Bundey locality, approximately 85 km south-east of Darwin. The main Project areas of Rustlers Roost and Quest 29 are located between 5 km and 12 km directly south-west of the Arnhem Highway on Old Mount Bundey Station (PPL 1163) and McKinlay River Pastoral Station (PPL 1184). An accommodation camp for the Project's construction and operational personnel will be located on ML 29814 which is part of the Toms Gully Mine tenements (Figure 1-1).

Regionally, the closest portion of the Project area is situated approximately 10 km south-east of the rural subdivision of Marrakai and 55 km from the source of labour and services in the community of Humpty Doo. Access to all three non-contiguous portions of the Project is via a station track located south of the Arnhem Highway (Figure 1-1). Proximal

infrastructure includes the Goanna Park junior police ranger training centre located approximately 2.5 km from the Project area, Corroboree Park Tavern and roadhouse located approximately 11 km north, several granite quarries to the east, and the Mary River Wilderness Retreat and Bark Hut Inn 8 km east at the closest point.

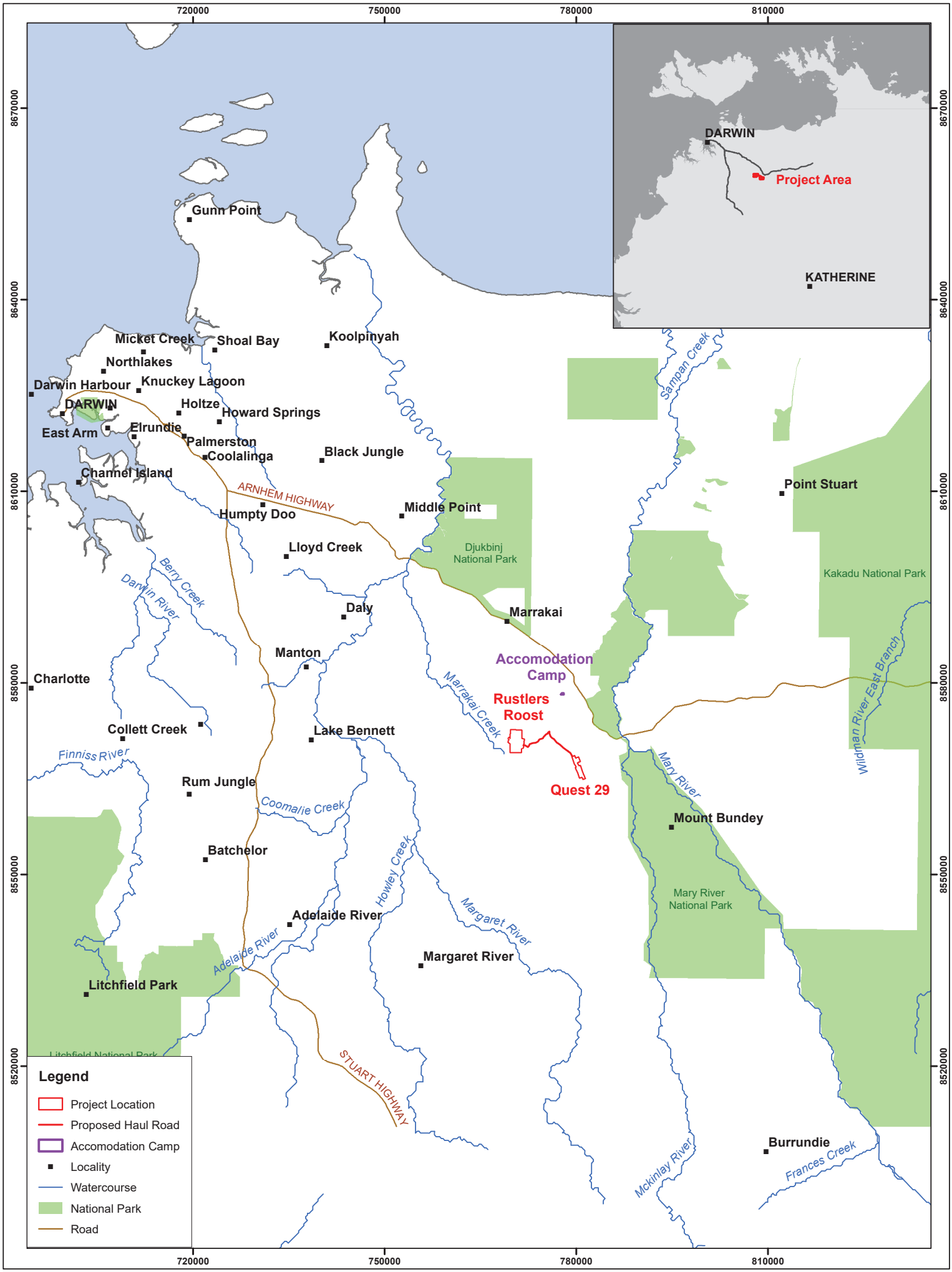
The Mount Bundey Military Training Area encompasses a major land use in the region, consisting of over 100,000 ha. The training area is located approximately 11 km to the east of the Project area and adjoins the eastern boundary of the Mary River National Park. The property is used by the Australian Government Department of Defence for a variety of military training activities including mechanised battle group sized field firing and manoeuvre training and aerial bombing.

Tourism, mining, grazing and horticulture are the principal contributors to the regional economy. Predominant land use in the region includes agriculture (pastoral stations and orchards) and mining. The most extensive land use in the vicinity of the Project area is pastoral, involving low intensity grazing of beef cattle over the woodland terrain. Grazing is widespread in neighbouring areas including Adelaide River, Jabiru, Pine Creek and further afield in the greater Darwin and Katherine regions. In addition to the historical small scale gold mining over the Project area and neighbouring Toms Gully ML, the region has historically been mined for iron ore.

Tourism and recreational fishing in the region are driven by the location of several conservation reserves and National Parks. The boundary of the Kakadu National Park lies 40 km to the east of the Project area. Kakadu National Park encompasses the drainage systems associated with the Wildman, West Alligator and South Alligator Rivers. In closer proximity, Mary River National Park is located approximately 6 km east of the Project and Djukbinj National Park is 10 km north. All the regional conservation areas and National Parks are primarily accessed by the Arnhem Highway.

The climate of the region is broadly classified as tropical monsoonal. It is characterised by seasonal shifting of the prevailing winds and consequently marked changes of air mass properties. Two distinct seasons can be identified, a summer wet season and winter dry season, with two subsidiary transitional periods between them. The dry season occurs from May to September and is characterised by prevailing south-easterly winds. The hot, "dry-wet" transition from October to November has high humidity and variable winds. The wet season occurs from December to March, with dominant northwest to westerly winds. The hot, "wet-dry" transition of April has variable winds, although predominantly from a westerly direction.

The natural vegetation in the region is typified by savannahs of the Top End, dominated by *Eucalyptus miniata, E. tetradonta, E. tintinans* with a *Sarga spp*. grassy understorey. Riparian forest occurs along various drainage features and associated wetlands. Disturbed areas are often colonised by introduced species such as *Acacia spp*., *Sarga spp*. and *Andropogan gayanus* (Gamba Grass).



R	Details	Date
1	First Draft	29/06/21
2	Final	27/07/21
-	-	
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-	-	
-	-	
-	-	

DESIGNED	SS	CHECKED	TK
DRAWN	SS	CHECKED	TK
APPROVED	TK	DATE	27/07/21

Notes:

N

0 3,950 7,900 15,800

Meters

1 cm = 5,219 meters

GCS GDA 1994 MGA Zone 56

DATA SOURCE
NT Government Open Source Data

DESIGNER

CDM Smith

CLIENT

PRIMARY GOLD

FIGURE 1-1

Project Location and Regional Setting

DRG Ref: 1001087-EIS-01-1.1

\\bga1svr1\Projects\US DOT\Aust\Roads\Hanking Gold Mine EIS\1001087 - Rustlers Roost EIS\1001087 - Rustlers Roost EIS\02 MXD\Chapter 1\Figure 1-1.mxd

1.4 Proponent Details

PGO is a minerals exploration company listed on the Australian Stock Exchange (ASX: PGO) and based in Perth, Western Australia. The company is the proponent for three non-contiguous mine development areas at Mount Bundey in the NT, being the Toms Gully Mine (subject of prior environmental assessment), and the Rustlers Roost and Quest 29 sites (this Proposal). The company maintains an exploration portfolio covering an area of approximately 1,500 square kilometres (km^2) in the NT and is separately progressing a gold mining project located near the town of Coolgardie in the Western Australian Goldfields.

The company was formed through the union of the listed entity Hydrotech International and the privately-owned Primary Minerals NL. PGO completed acquisition of a number of gold assets, including the Quest 29 Project Area, from Crocodile Gold in early 2013. PGO was acquired by Hanking Australia Investment Pty Ltd (Hanking) in April 2018 and is now a fully owned subsidiary of Hanking.

1.4.1 Contact Details

The proponent details for the Project are provided in Table 1-1 and consultant details in Table 1-2.

Table 1-1 Proponent Contact Details

	Proponent
Business Name:	Primary Gold Limited
ACN/ABN:	ACN: 122 726 283
Managing director:	Mark Qiu
Company website:	www.hankingmining.com/en/
Project Representative:	Charles Hastie (Chief Mining Engineer)
Postal address:	Level 26, 140 St Georges Terrace, Perth WA 6000
Contact Details:	charles.hastie@hanking.com.au

Table 1-2 Consultant Contact Details

	Environmental Consultant
Business name:	CDM Smith Australia Pty Ltd (CDM Smith)
ACN/ABN:	ABN: 88 152 082 936
Representative:	Paul Davey (Principal Environmental Scientist)
Company website:	www.cdmsmith.com/en-AU/
Postal address:	Level 1, 48-50 Smith Street, Darwin, NT 0800
Contact Details:	daveyp@cdmsmith.com

1.4.2 Organisational Structure

The overall management/organisational structure of PGO is shown in Figure 1-2. The structure reflects the relatively new nature of the Company. As the PGO assets develop, the organisational structure is expected to expand and will be updated accordingly. The Managing Director and Departmental Managers are responsible for:

- Compliance with all relevant statutory Acts and regulations;
- Compliance with safety management and emergency response plans;

- Ensuring environmental management plans are adhered to; and
- Establishing and maintaining environmental and safety performance monitoring.

Overall responsibility for environmental management, permitting and compliance for the Project lies with the Managing Director. Resourcing and maintaining environmental management commitments identified in this Draft EIS is the responsibility of the Chief Mining Engineer and delegated personnel.

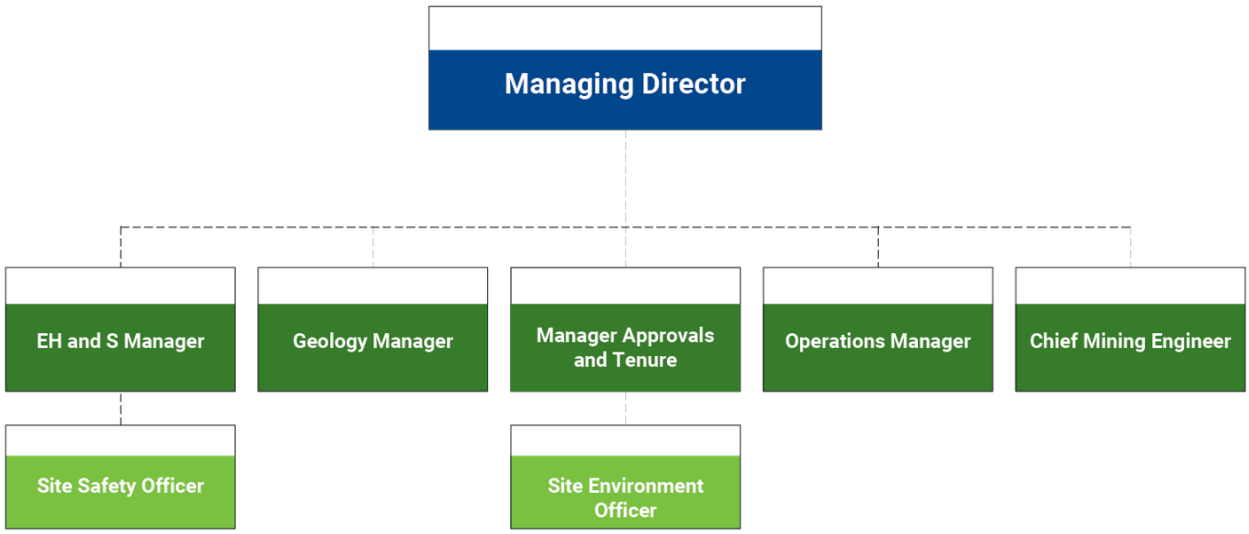


Figure 1-2 Organisational Structure

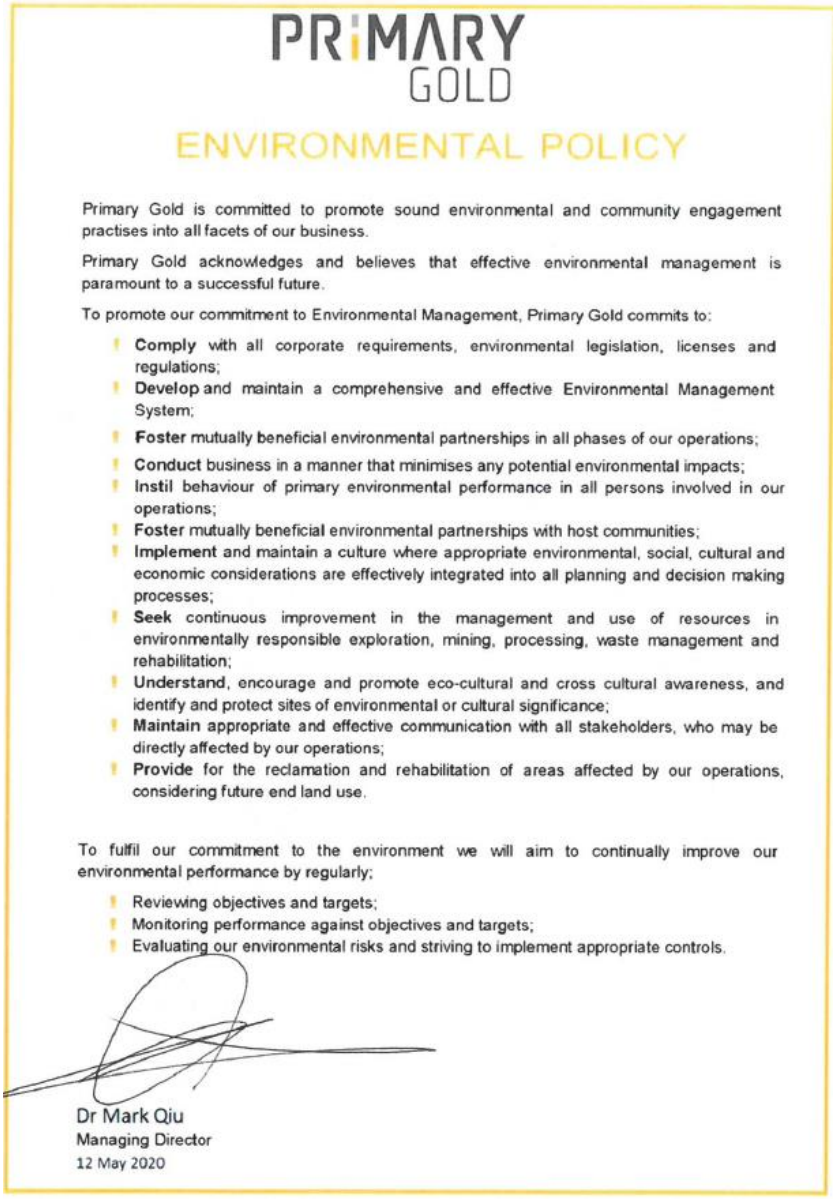
1.4.3 Environmental Record

PGO is committed to proactively identifying and mitigating environmental and social risks, including risks posed by historic activities and new developments for the Project. Since taking over the site, PGO has commissioned a range of studies to improve understanding around site conditions to inform the management approach and has actively engaged with the NT EPA and other stakeholders and community representatives.

The company has been operating in accordance with approved separate Mining Management Plans (MMP) for both the Rustlers Roost and Quest 29 areas (both re-submitted in 2020), which are regulated by the NT Department of Industry, Tourism and Trade (DITT). PGO has also been operating in accordance with the Mine Closure Plan (MCP) for the Rustlers Roost area which was also updated in 2020 (these documents can be found at https://www.hankingmining.com/en/plus/list.php?tid=19). There have been no proceedings against PGO in relation to environmental performance associated with these activities or any other actions.

PGO will continue to develop its Environmental Management System (EMS) which includes an Environmental Policy, Environmental Management Plans (EMPs) and Standard Operating Procedures (SOPs) which enable the systematic review and management of site environmental aspects and impacts. Electronic records of all key environmental information and data are stored digitally on a server, with appropriate back up procedures.

PGO believes that effective environmental management is paramount to a successful future. The company is committed to compliance with legal and other requirements, developing an effective EMS, continuous improvement, and minimising environmental impacts. The PGO Environmental Policy outlines these commitments and is provided in Figure 1-3.



PRIMARY GOLD

ENVIRONMENTAL POLICY

Primary Gold is committed to promote sound environmental and community engagement practises into all facets of our business.

Primary Gold acknowledges and believes that effective environmental management is paramount to a successful future.

To promote our commitment to Environmental Management, Primary Gold commits to:

- **Comply** with all corporate requirements, environmental legislation, licenses and regulations;
- **Develop** and maintain a comprehensive and effective Environmental Management System;
- **Foster** mutually beneficial environmental partnerships in all phases of our operations;
- **Conduct** business in a manner that minimises any potential environmental impacts;
- **Instil** behaviour of primary environmental performance in all persons involved in our operations;
- **Foster** mutually beneficial environmental partnerships with host communities;
- **Implement** and maintain a culture where appropriate environmental, social, cultural and economic considerations are effectively integrated into all planning and decision making processes;
- **Seek** continuous improvement in the management and use of resources in environmentally responsible exploration, mining, processing, waste management and rehabilitation;
- **Understand**, encourage and promote eco-cultural and cross cultural awareness, and identify and protect sites of environmental or cultural significance;
- **Maintain** appropriate and effective communication with all stakeholders, who may be directly affected by our operations;
- **Provide** for the reclamation and rehabilitation of areas affected by our operations, considering future end land use.

To fulfil our commitment to the environment we will aim to continually improve our environmental performance by regularly;

- Reviewing objectives and targets;
- Monitoring performance against objectives and targets;
- Evaluating our environmental risks and striving to implement appropriate controls.

Dr Mark Qiu
Managing Director
12 May 2020

Figure 1-3 Primary Gold Environmental Policy

1.5 Land Tenure and Zoning

The land tenure underlying the Project area is pastoral leasehold land (Table 1-3 and Figure 1-4). Pastoral leases have been a significant land tenure type for the growth of the Australian agriculture industry (ATIC 2021). Pastoral leases cover approximately 44% of Australia's mainland (338 million hectares) and are generally situated in arid and semi-arid regions and the tropical savannahs. These leases predominantly allow people to use the land for grazing traditional livestock such as cattle and sheep (ATIC 2021).

Table 1-3 Pastoral Leasehold Land Details

Property Name	PPL Number	Parcel	Date Created	Total Area (km^2)	Planning Zone
Old Mount Bundey	1163	4938	8 November 1996	384.7	Unzoned
McKinlay River	1184	4938	8 November 1996	470.4	Unzoned

A pastoral lease is a title issued for the lease of an area of Crown land to use for a limited purpose such as grazing of stock and associated activities. It is a limited property right and does not provide the leaseholder with all the rights that attach to freehold land (ATIC 2021). Specific conditions are often attached to pastoral leases, including a time period and the type of activity that may be permitted (ATIC 2021).

The primary responsibility for the management of pastoral leases falls on the NT Government. In the NT, pastoral leases are governed by the *Pastoral Land Act 1992* and *Crown Lands Act 1992*. Mining operations throughout the NT are often co-located on pastoral leasehold land. Nevertheless, there are areas in the NT subject to reservations under the *Mineral Titles Act 2010* that can restrict exploration and mining activities. The Project is outside mineral reserve land, with the closest reserve covering the Goanna Park junior police ranger training centre approximately 2.5 km from the Project area.

The Project area is outside declared Local Government Areas and is classified as an unincorporated area which is unzoned under the *NT Planning Scheme 2020.* Under the *NT Planning Scheme 2020,* planning controls only apply to unzoned land where a proponent seeks to subdivide or consolidate the land, clear more than one hectare of native vegetation, where an overlay applies or where development is located in some Aboriginal communities.

Rustlers Roost is located on ML 1083 which covers approximately 756 ha. Quest 29 is located 10 km south-east of Rustlers Roost; and is located across five MLs, which collectively cover approximately 658 ha. There are currently no proposed activities, other than exploration, on Quest 29 ML 29781, ML 29785 or ML 29786.

Toms Gully lease ML 29814 will be used to locate the accommodation camp for the construction and operation personnel which will have access to mains electrical power. Also, the accommodation camp is located in close proximity to the sealed Arnhem Highway allowing easy access back to Darwin if heavy rains limit access to the Project.

Table 1-4 provides a summary of the PGO MLs (also shown in Figure 1-5). For illustration purposes, the green shading indicates those MLs which form part of the Project area included within this Draft EIS.

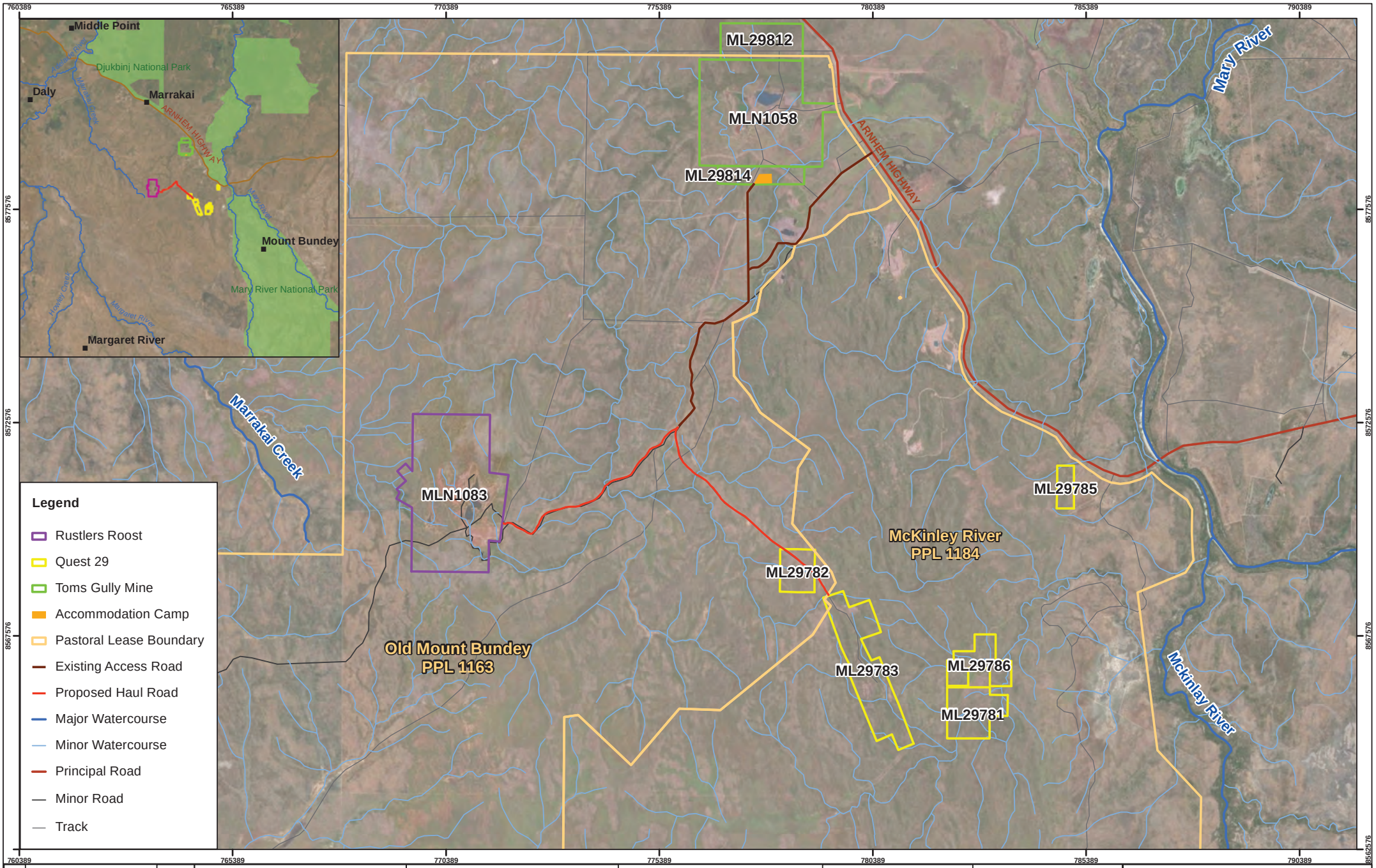
Table 1-4 PGO Mineral Lease Details

Project Area	Title Number	Title Holder	Grant Date	Area (ha)	Expiry Date
Toms Gully	ML 29812	Primary Minerals Pty Ltd	06 February 2013	158	05 February 2023
	ML 29814	Primary Minerals Pty Ltd	06 February 2013	84.3	05 February 2023
	ML 1058	Primary Minerals Pty Ltd	03 August 1989	681.8	02 February 2039
Rustlers Roost	ML 1083	Primary Minerals Pty Ltd	04 March 1991	755.6	31 December 2045
Quest 29	ML 29781	Primary Minerals Pty Ltd	06 February 2013	140	05 February 2023
	ML 29782	Primary Minerals Pty Ltd	06 February 2013	80	05 February 2023
	ML 29783	Primary Minerals Pty Ltd	06 February 2013	285	05 February 2023
	ML 29785	Primary Minerals Pty Ltd	06 February 2013	40	05 February 2023
	ML 29786	Primary Minerals Pty Ltd	06 February 2013	112.52	05 February 2023
			Total	**2,337.22**	

Table 1-5 provides a summary of the exploration and mineral tenure holders surrounding the Project area which is also shown in Figure 1-5. The region supports a number of extractive resources enterprises, including the HB Quarry (highlighted in **Red**), McKinlay Quarry (highlighted in **Blue**), Boral Quarry (highlighted in **Green**) and Ostojic Quarry (highlighted in **Orange**), as shown in Table 1-5. This Draft EIS has considered the impact from these quarries within the Project's cumulative impact assessment, which is described further in Section 6.3.5.

Table 1-5 Regional Exploration and Mineral Leases

Title Holder or Agent	Title Type (Exploration or Mineral)	Title References[1]
Allan King & Sons Construction Pty Ltd	Exploration	**EML27133**, EMP32501
Ausgold Trading Pty Ltd	Mineral	ML29772, ML29770
Austmin Development Pty Ltd	Exploration	EML32262, EML46, EML51, EML50, EML47, EML48
Australian Mining & Exploration Title Services Pty Ltd	Exploration	EML32262, EML46, EML51, EML47, EML50, EML48
	Mineral	ML29783, ML29785, ML29781, ML29812, ML29772, ML29786, ML29782, ML29814, ML29770, ML1083, ML1058
Austwide Mining Title Management Pty Ltd	Exploration	EML23943, EML23214, EML30475, EML30476, EML66, EML80, EML59, EMP24615, EMP1284
Berno Bros Pty Limited	Exploration	EMP25079, EMP22188, EMP1107, EMP1108, EMP1106
Boral Resources (QLD) Pty Limited	Exploration	**EML66**, EML80, **EML59**, EMP24615, **EMP1284**
Boral Resources (SA) Limited	Exploration	**EML23943**, EML23214
Capricorn Mapping & Mining Title Services	Exploration	EML27174, EML24309, EMP29893, EMP30060, EMP24619, EMP30942, EMP32501, EMP30063, EMP30062, EMP30061
Darwin Christian Ministries Inc	Exploration	EML31404, EMP30299
Halkitis Bros Pty limited	Exploration	EML24124, **EML28048**, EML28049, **EML24124**, **EML24202**, EML28196, **EML27975**, **EML75**, **EML76**, **EML74**, **EMP30803**
Hy-Tec Industries (Northern Territory) Pty Ltd	Exploration	EML30475, EML30476
Jack Berno	Exploration	EMP22188, EMP1107, EMP1108, EMP1106
Mousellis & Sons Pty Ltd	Exploration	EMP24619
Ostojic Group Pty Ltd	Exploration	**EML27174**, **EML24309**, EMP29893, **EMP30060**, **EMP30942**, **EMP30063**, EMP30062, EMP30061
Tomazos Group Pty Ltd	Exploration	EMP29320



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Notes:

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Meters

1 cm = 800 meters

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FIGURE 1-4

Rustlers Roost and Quest 29 Project Location

DRG Ref: 1001087-EIS-01-1.4

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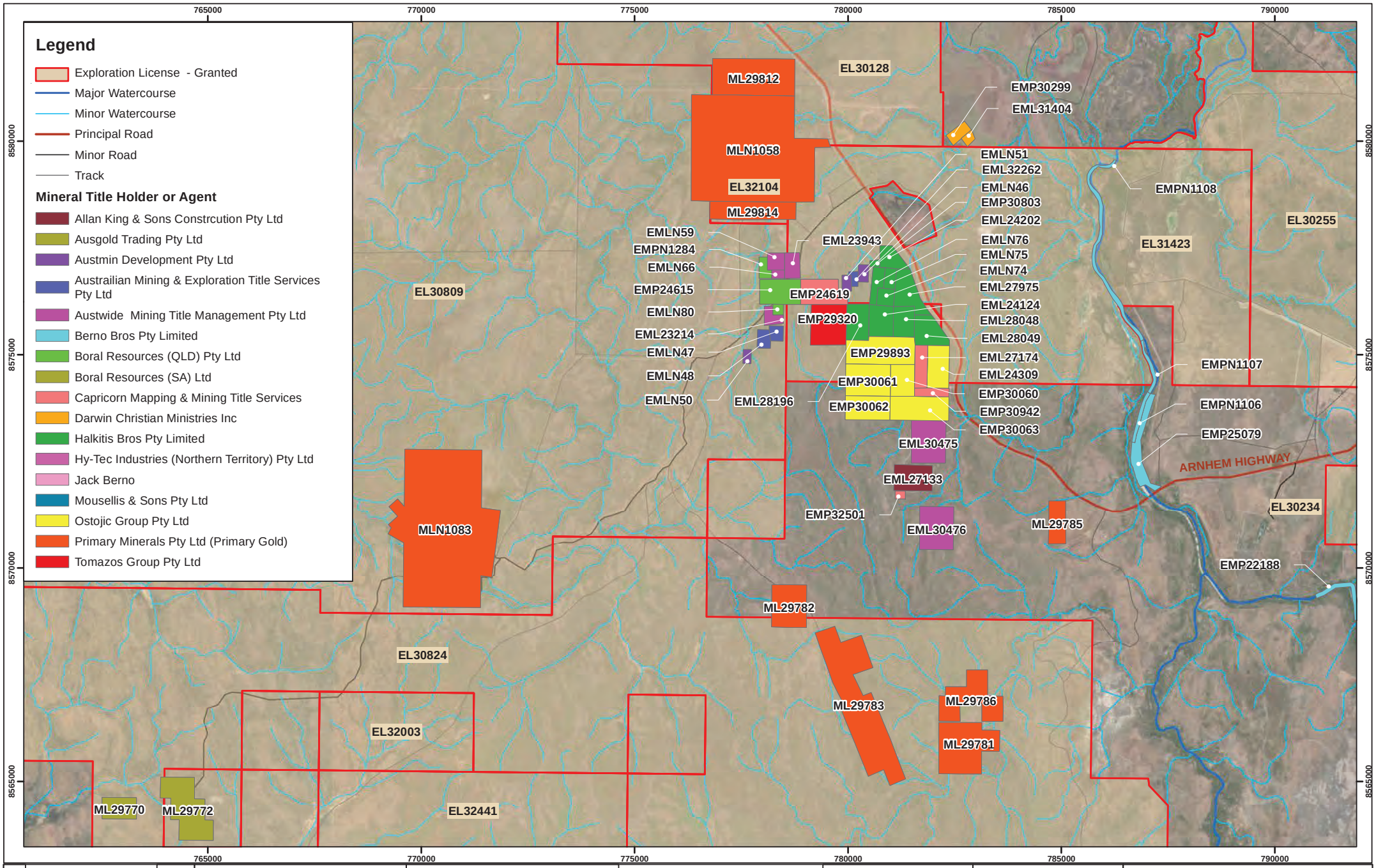

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FIGURE 1-5

Regional Exploration and Mineral Leases

DRG Ref: **1001087-EIS-01-1.3**

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1.6 Proposal Background and Proposed Changes

1.6.1 Current Land Use

The Project area maintains two active mining authorisations (0738-01 and 0739-01) for the purpose of care and maintenance activities. Rustlers Roost has been in care and maintenance since 1998, with exploration works conducted by PGO in 2003, 2017 to 2018 and more recently during 2020. At Quest 29, limited exploration activities have taken place until more recently, during 2020. No mining activities have been conducted at Quest 29 since 2004. Since its purchase in 2013, PGO has undertaken reconnaissance and desktop investigations and maintained site environmental monitoring, maintenance and reporting as detailed further in this Draft EIS.

Under a state of care and maintenance, the pastoral landowner of Old Mount Bundey Station has been engaged by PGO to assist in monitoring and managing the mining tenements, in terms of weed, fire and water management compliance requirements. Despite historic mining activities the area including and surrounding the Project is used by pastoralists for beef cattle grazing.

1.6.2 Historic Land Use

This section provides an overview of historical land use related to the mining disturbance and associated landforms and existing infrastructure on Rustlers Roost and Quest 29. A summary of prior approvals relevant to the Project area is also provided for context.

1.6.2.1 Rustlers Roost

Approximately 15% of ML 1083 has been disturbed historically for mining the Rustlers Roost gold deposit. Rustlers Roost is a former open-cut gold mine and heap leach facility with gold first being discovered in the 1940s. Over a three to four-year period, the oxide ore was mined and trucked to a nearby stamp battery plant for processing. The mine was abandoned until the 1970s when sporadic alluvial gold mining commenced and was undertaken until the early 1980s.

In 1994, a Public Environmental Report (PER) was lodged by Valdora Minerals NL and an approval was granted under the former NT *Environmental Assessment Act 1982*, for the recommencement of mining operations. The PER outlined a two-stage expansion of the mine. Stage one proposed the mining of four oxide pits; construction of two Waste Rock Dump (WRD) landforms; four heap leach pads; surface water containment infrastructure; processing facilities and additional haul access roads. Stage one covered an area of 110.5 ha.

Valdora was acquired by William Resources Inc in late 1995, and in 1996 Valdora was renamed to Rustlers Roost Mining Pty Ltd (RRMPL). In August 1996, RRMPL lodged a Notice of Intent (NOI) for the Stage 2 expansion of the Rustlers Roost Mine. A Draft EIS was prepared in January 1997 which outlined the proposed combining and deepening of the existing pits, combining and increasing the height of the WRDs, installation of a new carbon in leach (CIL) process and the addition of a Tailings Storage Facility (TSF) over an area of 236.4 ha.

The assessment of the Draft EIS (and supplementary information) was completed by the NT Government Environment Protection Division in August 1997. The Environmental Assessment Report and Recommendations accepted the proposal and noted that several matters needed to be further addressed before granting approval to proceed via an MMP.

Due to low commodity prices, the stage two expansion, which would have seen the mine expand over an additional 70.5 ha, did not proceed and mining ceased in August 1997. A Decommissioning and Rehabilitation Plan was prepared; however, the work was partially completed. The infrastructure and landforms that remain on the site are listed below, and locations are shown on Figure 1-6 and Figure 1-7.

- Associated open pits that have flooded and have become a single pit (approximate dimensions 50 m depth, 1,000 m length and 300 m width) (refer to Plate 1-1). The pit lake currently holds approximately 3.16 Gigalitres (GL) of water based on post mining pit shell bathymetry and current water level of 56.90 mAHD (surveyed on 3 November 2020);
- Remnants of old processing plant. In 1997 most of the plant, buildings and other mining infrastructure were removed, apart from three large tanks and some concrete footings (refer to Plate 1-2);
- Annie's Dam covering approximately 11.4 ha and with an estimated capacity of 200,000 kilolitres (kL);
- Existing WRD (approximate dimensions 30 m in height, 1,000 m length and 400 m width) (refer to Plate 1-3); and
- Two heap leach pads (total approximate dimensions 20 m in height, 600 m in length and 450 m width) and heap leach ponds (refer to Plate 1-4).

From 1997 to present day, exploration and care and maintenance activities have been undertaken at the Project area.

There is no indication of acid and metalliferous drainage (AMD) issues associated with the existing infrastructure and landforms at Rustlers Roost (Appendix D). A high-level desktop and field geochemical assessment was conducted on the existing surface waste material (WRD, Run of Mine pad (ROM), heap leach pad). The objective was to assess the spatial distribution and quantities of the various mine wastes on site and to provide advice on the likelihood of AMD to be released off site. The assessment determined that the materials currently stored on-site had low potential to leach significant dissolved chemical load into the receiving environment. This was informed by surface and groundwater quality monitoring.

1.6.2.2 Quest 29

Of the five Mineral Leases covering Quest 29, ML 29783 is the only tenement that has had historical disturbance, aside from exploration drilling. Approximately 7.5% of ML 29783 has been disturbed for the purpose of mining the gold deposit. Quest 29 was operated as an open-cut gold mine from 1999 to early 2002. The existing infrastructure and landforms on the site are listed below and locations are shown in Figure 1-7.

- Five open-cut pits (largest of the pits approximately 25 m depth, 280 m length and 50 m width);
- Five WRD's (largest of the WRDs approximately 10 m height, 280 m length and 80 m width);
- One heap leach pad (approximate dimensions 20 m in height, 200 m length and 200 m width);
- Heap leach ponds; and
- Remaining infrastructure of the CIL tanks.

The existing disturbances and landforms cover an area of approximately 21 ha.

The current indicated AMD risk from previously mined materials is considered low based on the existing shallow pit depth, predominantly mining of the weathered oxide zone, available pit water quality and no visual AMD observations from site visits or satellite imagery.

Plate 1-1 **Existing Flooded Rustlers Roost Pit**

Plate 1-2 **Remaining Tanks from Former Processing Plant at Rustlers Roost**

Plate 1-3 **Existing Waste Rock Dump at Rustlers Roost**

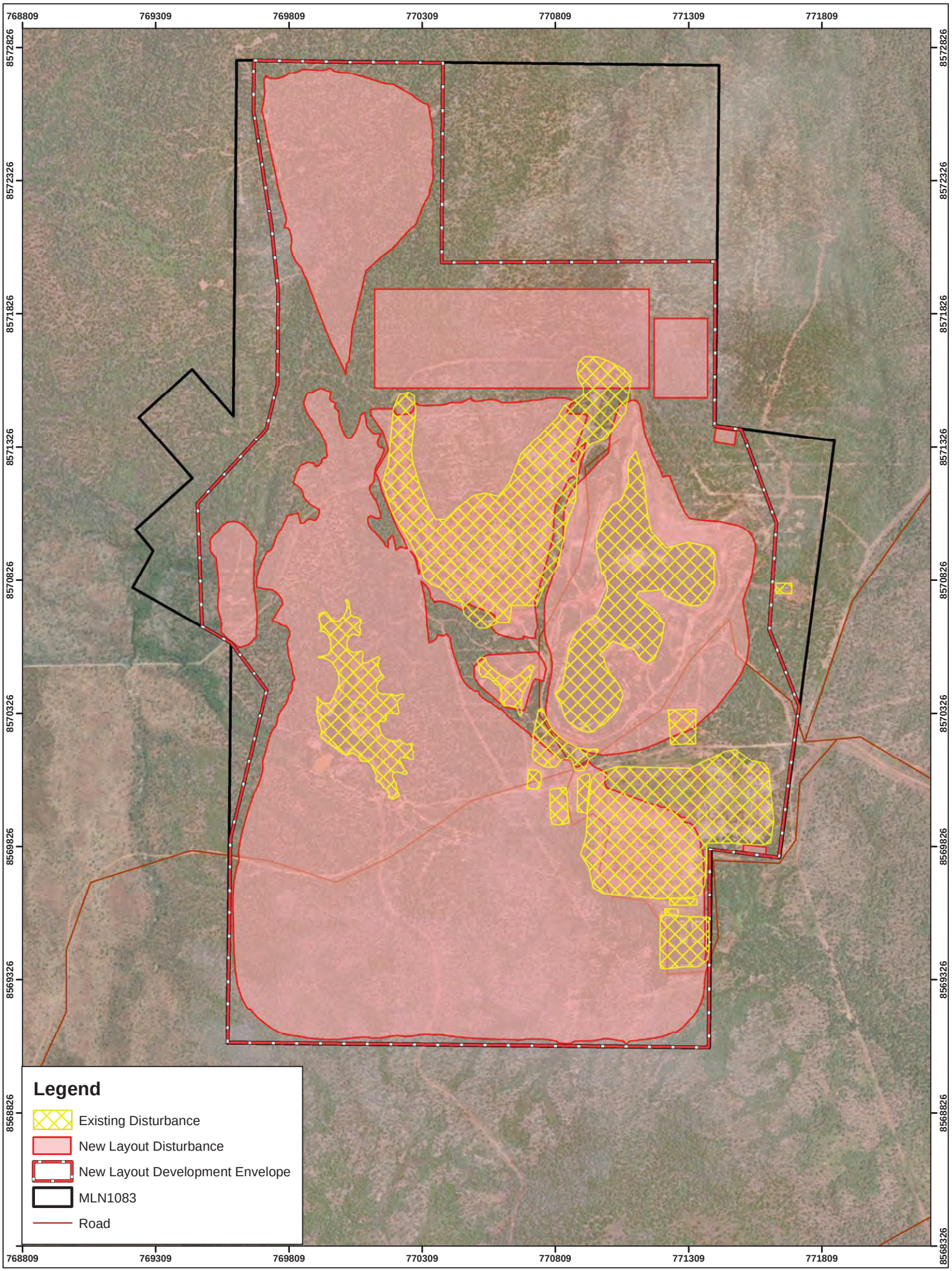
Plate 1-4 **Existing Heap Leach Pad at Rustlers Roost**

Plate 1-5 **Existing Zamu Pit with Regrowth at Quest 29**

Plate 1-6 **Existing Zamu Pit at Quest 29**

Plate 1-7 **Remaining Heap Leach Pond at Quest 29**

Plate 1-8 **Remaining Heap Leach Pad at Quest 29**



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Meters

1 cm = 125 meters

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FIGURE 1-6

Existing Infrastructure and Proposed Disturbance at Rustlers Roost

DRG Ref: 1001087-EIS-01-1.5

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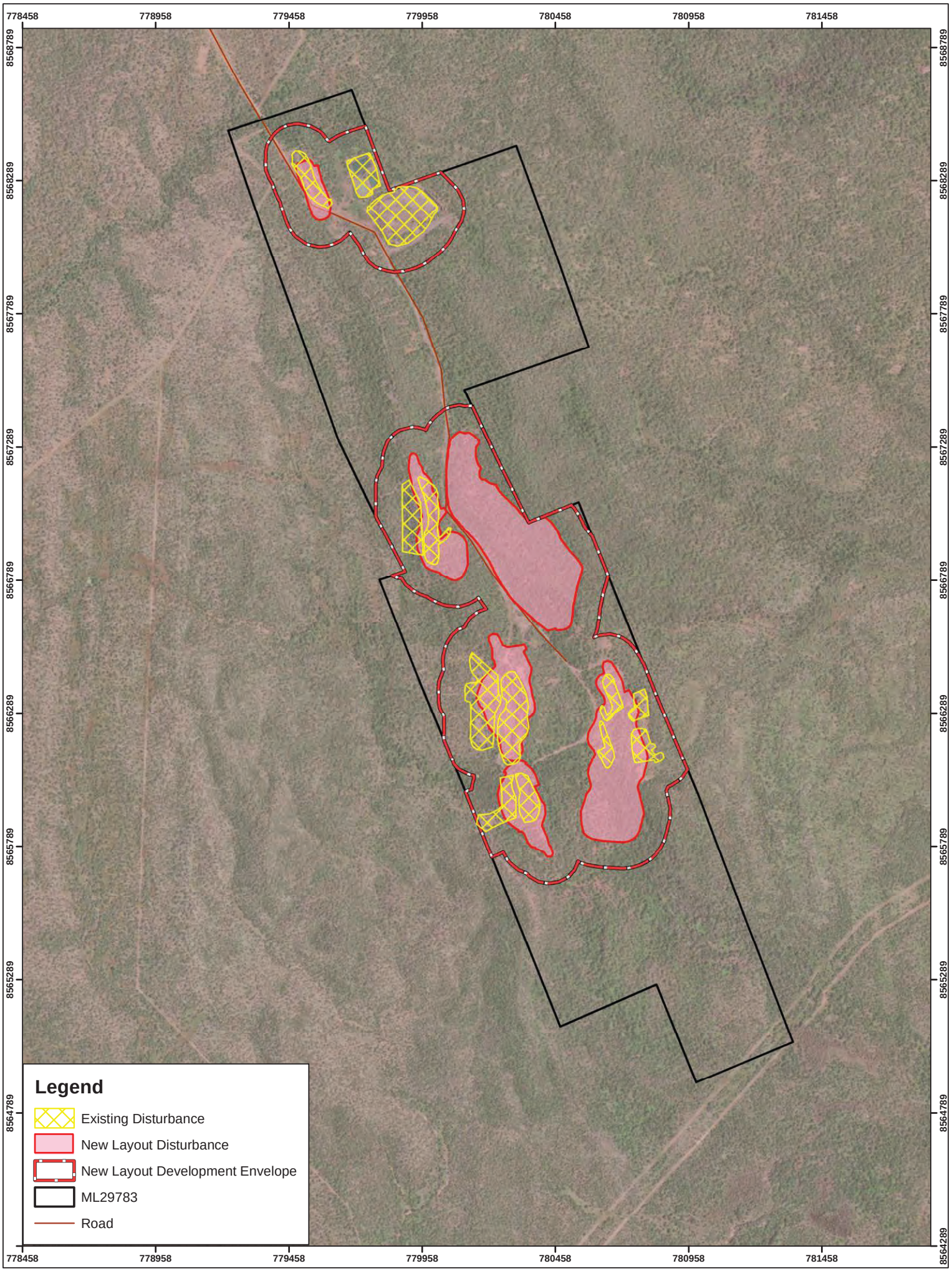

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Meters

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CDM Smith

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FIGURE 1-7

Existing Infrastructure and Proposed Disturbance at Quest 29

DRG Ref: 1001087-EIS-01-1.6

\\bga1svr1\Projects\US DOT\Ausdfroads\Hanking Gold Mine EIS\1001087 - Rustlers Roost EIS\1001087 - Rustlers Roost EIS\02 MXD\Chapter 1\Figure 1-6.mxd

1.6.3 Proposed Changes

As described in Section 1.1, PGO is proposing to re-develop and expand the Project area and gold mining operations. The Project involves open cut mining of ore from a number of pits located across both Rustlers Roost and Quest 29. A summary of the proposed changes is provided in Table 1-6.

Table 1-6 Construction and Operational Components of Proposed Action

Components	Location	Tenement	Existing Extent	Proposed Extent
Construction				
Open cut mine and associated infrastructure at Rustlers Roost	Figure 4-4	ML 1083	126.5 ha of 755.6 ha of ML 1083 is currently disturbed from historic mining. Refer to Table 4-2 for breakdown of infrastructure.	Additional clearing of no more than 333.4 ha of native vegetation within 611.0 ha mine disturbance / development envelope.
Open cut mine and associated infrastructure at Quest 29	Figure 4-5	ML 29783	Approximately 21 ha of the total 285 ha of ML 29782 is currently disturbed from historic mining. Refer to Table 4-2 for breakdown of infrastructure.	Additional clearing of no more than 26.16 ha of native vegetation within 139.5 ha mine development envelope.
Haul road	Figure 4-12 and Figure 4-13	No tenement. Private access road on PPL 1163 (Old Mount Bundey Station).	Approximately 10.9 ha (11 km long x 10 m wide).	Total of 21.7 ha (11 km long x 20 m wide) requiring an additional clearing of no more than 2 ha of native vegetation.
Accommodation camp	Figure 1-4 and Figure 4-9	ML 29814	Approximately 2.3 ha currently disturbed for existing road disturbance within ML29814.	Clearing of no more than 7.3 ha of native vegetation within 17.8 ha development envelope. Total disturbance of 9.6 ha including existing road disturbance (2.3 ha) and proposed extent of the accommodation camp.
Landfill	Figure 4-4	ML 1083	Approximately 2.9 ha of historical disturbance.	Proposed total landfill area is 4 ha, with additional clearing of approximately 1.1 ha is required (clearing area is accounted within the overall values for Rustlers Roost).
Operational				
Open cut mining (drill and blasting)	Figure 4-4 and Figure 4-5	ML 1083, ML 297839	Quest 29 - 5 pits (8 ha and maximum depth of 10 m). Rustlers Roost – 1 pit (22.93 ha and 50 m depth)	**Quest 29** - Five pits (additional 20.2 ha and depth 25 m to 75 m). Total pits area of 28.2 ha: ▪ BHS pit = 1.7 ha ▪ North Koolpin pit = 4.7 ha ▪ South Koolpin pit = 6.4 ha ▪ Taipan pit = 4 ha ▪ Zamu pit = 11.4 ha **Rustlers Roost** – One main pit (additional 46.97 ha and from 50 m to 189 m depth).

Components	Location	Tenement	Existing Extent	Proposed Extent
				Two small oxide pits (additional 10.6 ha total - one within and one adjacent to TSF footprint). Total pits area of 76.1 ha: ▪ Main pit = 69.9 ha ▪ Annie's Dam pit = 4.4 ha[1] ▪ Annie Oakley pit = 6.2 ha Use of ammonium nitrate for mining explosives.
Waste rock disposal – surface WRD	Figure 4-16 and Figure 4-17	ML 1083, ML 297839	Quest 29 – 7.9 ha Rustlers Roost – 37.4 ha	Quest 29 – 16.6 ha. Rustlers Roost – 92.0 ha. Disposal of no more than 74.3 Mt of waste rock for the LOM into surface waste rock dumps at Rustlers Roost and Quest 29 at current cut-off grade of 0.4 g/t.
Waste rock disposal - backfilling of pits	Figure 4-4 and Figure 4-5	ML 297839	N/A	A total 12.25 Mt of waste material backfilled into open-cut pits.
Dewatering of pits	Figure 4-4 and Figure 4-5	ML 1083, ML 297839	N/A	Water will be transferred within existing pits at Quest 29 at various stage of mining. Water will be dewatered from the pit at Rustlers Roost during mining to an existing water storage dam and proposed ponds for reuse.
Ore processing	Figure 4-4 and Figure 4-7	ML 1083	N/A	CIL process with use of cyanide
Tailings disposal	Figure 4-4	ML 1083	N/A	Disposal of no more than 4 Mt per annum of potentially acid forming (PAF) tailings into the new TSF at Rustlers Roost.
Water use and water management systems	Figure 4-18 and Figure 4-19	ML 1083, ML 297839, ML 29782	N/A	Overall water demand for operations is estimated to be 6.5 GL/yr. Groundwater bores to supply potable water and raw water; North end of new TSF dam, catchment rainfall and pit dewatering; Process water dam supplied by north end of new TSF and processing return water from TSF/decant dam.
Workforce	-	N/A	N/A	Approximately 210 people during production. Approximately, 100 people will be required for the construction stage.

[1] Annie's Dam Pit is located wholly within the footprint of the TSF and, for the purpose of calculating Project disturbance extent, has been excluded from the total area.

1.7 Project Benefits

The Project presents an opportunity to redevelop and expand a former gold mine. Rustlers Roost has been in care and maintenance since 1997 with only limited exploration activities occurring on site. Quest 29 was mined until 2002 (ML 29783) and PGO is proposing to resume its operations and expand the five pits. The recommencement of mining operations will enable the employment of approximately 210 people during production. Approximately, 100 people will be required for the construction stage and locally sourced construction personnel and material will be prioritised.

With the intention of directing positive economic impacts to the local area, PGO is committed to prioritising employment for local community members. Where necessary, PGO will also provide training and development to local residents and work with regional training providers to develop programs that provide unskilled members of the community an opportunity to gain employment with the Project. In addition, PGO will work with the NT Government on placement of former mining industry personnel seeking to re-enter the workforce, whom may have been impacted from mine closures (e.g. Ranger Uranium Mine).

The recommencement of mining operations will enable the employment of approximately 210 people during production and represents a $0.63 billion investment in the NT and Mount Bundey region. This investment consists of an estimated capital expenditure (CAPEX) of $282 million, with operational expenditure of approximately $344.3 million over the 10 year LOM. The feasibility studies indicate that roughly 73% ($251.06 million) of the operational costs will be directed towards Project personnel.

Reactivation of mining at the Rustlers Roost and Quest 29 site will allow PGO to further invest in management actions to improve the condition of the site with regard to legacy mining disturbance. The Project design has prioritised the utilisation of historic mining structures and disturbance areas. While new structures, such as the process plant, WRDs and TSF are proposed, these will be developed in accordance with current best practice design. The proposed layout at Rustlers Roost and Quest 29 has been designed to provide a more manageable and safe post-closure environment (e.g. encapsulation of the new TSF, incorporation of the eroding heap leach pad material at Rustlers Roost into the TSF and rehabilitation of the decommissioned heap leach facility at Quest 29). These approaches are consistent with the requirement of actions under Section 42 of the EP Act to account for the potential to *"enhance or restore environmental quality through restoration or rehabilitation"*. The outcome is for the Project to realise economic and social benefits associated with recommencement of mining, combined with an opportunity to rectify and reduce the hazards associated with the historic activities by application of contemporary industry practice in environmental management.

1.8 Draft EIS Structure

The Draft EIS report follows the structure advised by the NT EPA in the ToR and 'preparing an environmental impact statement – guidance for proponents' (NT EPA 2021a). Section 4 of the NT EPA guidance for preparing an EIS, and specifically, Table 1 provide a recommended structure. The NT EPA recommended structure has been included side-by-side with this Draft EIS structure as outlined in Table 1-7.

Table 1-7 Draft EIS Structure

NT EPA Recommended Structure	Draft EIS Structure
Executive Summary	Executive Summary
Introduction	Section 1 – Introduction
Alternatives	Section 4.15 – Alternatives Assessment
How TOR matters have been addressed	Section 1.9 – Cross-Reference and Appendix E
Proposal Description	Section 4 – Project Description
Strategic and Statutory Context	Section 2 – Regulatory Context
Stakeholder Engagement	Section 3 – Stakeholder Engagement
Matters of National Environmental Significance	Section 9 – Commonwealth Government Matters
Environmental Impact Assessment	Section 6 – Risk Assessment of Environmental Factors Section 7 – Key Environmental Factors Section 8 – Other Environmental Themes and Factors Section 10 – Environmental Management

Technical studies and management plans were commissioned to support the environmental impact assessment program. Details of these specialist studies and key companies involved in the preparation of this Draft EIS are provided in Table 1-8.

Table 1-8 Key Companies Involved in the Draft EIS

Component	Report Title and Location	Author
Draft EIS Compilation	Rustlers Roost and Quest 29 Open-Cut Mine Redevelopment – Draft Environmental Impact Statement (EIS)	CDM Smith Australia Pty Ltd
Flora and Fauna	Vegetation and Threatened Species Survey Report (Appendix M)	EcOz Pty Ltd
	Toms Gully, Rustlers Roost and Quest 29 Flora and Fauna Report (Appendix K)	Low Ecological Services P/L
Hydrology, Groundwater and Water Quality	Hydrology and Flood Assessment Report (Appendix N)	Surface Water and Erosion Solutions (Enviroconsult Australia Pty Ltd)
	Pit Stratification Report (Appendix O)	EcOz Pty Ltd
	Pit Lake Water Quality and Trends Analysis Report (Appendix P)	Mine Lakes Consulting Ltd

Component	Report Title and Location	Author
	Groundwater Investigation and Modelling Report (Appendix H)	CDM Smith Australia Pty Ltd
	Erosion and Sediment Control Plan (Appendix L)	Surface Water and Erosion Solutions (Enviroconsult Australia Pty Ltd)
	Water Management Plan (Appendix I)	CDM Smith Australia Pty Ltd
	Acid and Metalliferous Drainage Management Plan (Appendix T)	CDM Smith Australia Pty Ltd
Geochemistry	Materials Characterisation Study Memorandum (Appendix D)	Land & Water Consulting Pty Ltd
Aquatic Ecology	Macroinvertebrate and Sediment Monitoring (Appendix Q)	EcOz Pty Ltd
Stakeholder Consultation	Stakeholder Engagement Plan (Appendix A)	CDM Smith Australia Pty Ltd
Mine Closure	Draft Mine Closure Plan (Appendix J)	Sally Horsnell Environmental Consultant

1.9 Cross-Reference

Appendix E provides a full cross-reference, indicating where the information sought in the ToR has been included in this Draft EIS. Table 1-9 is a refined version of the cross-reference which includes limited extracts from the ToR.

Table 1-9 Summary Cross-Reference Table for ToR Requested Additional Information

Reference	Required Information	Section in this Draft EIS
2.0 – Matters to be addressed in the Draft EIS		
2.1	Summary - A summary of the Draft EIS is required as part of the EIS documentation.	Executive Summary
2.2 2.2.1	Proposal Description > Overview - Provide a clear description of the proposal and scope of works for which approval is sought.	Section 1.1
2.2 2.2.2	Proposal Description > Proponent - Clearly identify the proponent of the proposal and the title holder/s for the areas proposed to be developed.	Section 1.4
2.2 2.2.3	Proposal Description > Objectives of the proposal - State the rationale and justification for the proposal, considering social, economic and other environmental benefits and costs to the NT.	Sections 1.6 and 1.7
2.2 2.2.4	Proposal Description > Statutory framework - Provide information on the statutory framework including a description of any permits, consents, or other approvals that will be required from Northern Territory agencies and/or authorities	Section 2
2.2 2.2.5	Proposal Description > Construction and operation - Provide a detailed description of all construction and operational aspects of the proposal including: - Site layout maps - detailed maps and graphic illustrations.	Section 4

Reference	Required Information	Section in this Draft EIS
	- Design - describe mine site layout options considered, reasons for selection of the preferred layout, and how the proposed layout avoids and/or mitigates environmental constraints and potential impacts. - Construction - describe all elements of the construction phase. - Mine operation - describe all elements of the proposed mining operation. - Processing - describe the requirements of ore processing for the proposal. - Tailings management. - Water use and disposal - prepare a water management system schematic and water balance for each proposal phase. - Waste and hazardous materials - Describe the expected waste streams and volumes for non-processing wastes at the mine and accommodation facilities. - Transport and traffic - describe traffic and transport activities during construction and operation. - Energy - provide relevant information with respect to energy during construction and operation. - Workforce - provide a summary for each phase of the proposal.	
2.2 2.2.6	Proposal Description > Rehabilitation and closure - This section is to outline the planned rehabilitation, decommissioning and closure of the proposal, and establish closure objectives and goals.	Section 4.14
3.0 – Information requirements for environmental factors		
3.1	Terrestrial Environmental Quality: - Environmental values - describe and map the soil types and land units of the Project area and surrounding areas. Describe the environmental values supported by land and soils. - Potential impacts and risks - describe potential impacts to land and soils and the NT EPA's environmental objective associated with the proposal. - Avoidance, mitigation and management - outline the measures for avoiding, mitigating, or offsetting impacts identified. - Monitoring and reporting - describe proposed monitoring and reporting of potential impacts and risks to land and soils. - Residual impact - assess the significance of any residual impact or risk of the proposal to identified values. - Offsets - where a significant residual impact remains after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offset Framework.	Section 7.1
3.2	Terrestrial Ecosystems: - Environmental values - Describe and map the extent of terrestrial ecosystems of the proposal footprint and area. Describe existing condition of habitat and vegetation communities. Assess the likelihood of occurrence for threatened species listed under the TPWC Act and EPBC Act. Provide details of survey program timing, locations and methodology. - Potential impacts and risks - Describe potential impacts to terrestrial ecosystems associated with the proposal and the NT EPA's environmental objective. - Avoidance, mitigation and management - Outline the measures for avoiding, mitigating, or offsetting impacts identified.	Section 7.2

Reference	Required Information	Section in this Draft EIS
	- Monitoring and reporting - Outline proposed monitoring and reporting related to potential impacts and risks to terrestrial ecosystems. - Residual impact - Assess the significance of any residual impact or risk of the proposal to identified values. - Offsets - Where a significant residual impact may remain after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offset Framework.	
3.3	Hydrological Processes: - Environmental values - Describe the environmental values and sensitivities associated with hydrological processes in the proposal footprint and area of influence. - Potential impacts and risks - Describe potential impacts to hydrological regimes associated with the proposal, and the NT EPA's environmental objective. Determine the proposal footprint and influence that could feasibly experience those impacts. - Avoidance, mitigation and management - Describe the measures for avoiding, mitigating, or offsetting impacts identified. - Monitoring and reporting - Outline proposed monitoring and reporting activities in the WMP related to potential impacts and risks to hydrological processes. - Residual impact - Assess the significance of any residual impact or risk of the proposal to identified values. - Offsets - Where a significant residual impact remains after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offset Framework.	Section 7.3
3.4	Inland Water Environmental Quality: - Environmental values - Describe the water quality (chemical, physical and biological) of surface water and groundwater in the proposal footprint and area of influence. Describe and map the environmental values and beneficial uses supported in the area of influence. - Potential impacts and risks - Describe potential impacts and risks to water quality associated with each phase of the proposal, and the NT EPA's environmental objective. - Avoidance, mitigation and management - Describe the measures for avoiding, mitigating, or offsetting impacts identified. - Monitoring and reporting - Outline proposed monitoring and reporting activities in the WMP related to potential impacts and risks to inland water environmental quality. - Residual Impact - Assess the significance of any residual impact or risk of the proposal to identified values. - Offsets - Where a significant residual impact remains after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offset Framework and EPBC Act environmental offsets policy.	Section 7.4
3.5	Aquatic Ecosystems: - Environmental values - Describe and map the aquatic habitats and species supported by those habitats within the Project area and areas downstream that may be impacted by changes to water quality associated with the proposal.	Section 7.5

Reference	Required Information	Section in this Draft EIS
	- Potential impacts and risks - Describe potential impacts and risks to aquatic ecosystems and the NT EPA's environmental objective. - Avoidance, mitigation and management - Outline the measures for avoiding, mitigating, or offsetting impacts identified. - Monitoring and reporting - Outline proposed monitoring and reporting activities related to potential impacts and risks to aquatic ecology and the effectiveness of mitigation and management measures. - Residual impact - Assess the significance of any residual impact or risk of the proposal to identified values. - Offsets - Where a significant residual impact remains after applying the environmental decision-making hierarchy, identify offsets and describe how any proposed offset is consistent with the NT Offset Framework and EPBC Act environmental offsets policy.	
3.6	Community and Economy: - Environmental values - Describe the existing socio-economic profile of the proposal's area of influence. - Potential impacts and risks - Describe potential impacts to community and economy and the NT EPA's environmental objective (including net positive benefits) associated with the proposal. - Avoidance, mitigation and management - Outline the measures for preferentially avoiding, mitigating, or offsetting adverse impacts, and maximizing benefits identified. - Monitoring and reporting - Outline proposed monitoring and reporting activities related to potential impacts and risks to community and economy, and mitigation and management measures. - Residual impact - Assess the significance of any residual impact or risk of the proposal to identified values. - Offsets - Where a significant residual impact remains after applying the environmental decision-making hierarchy, identify any offsets proposed.	Section 7.6
4.0 – Other Requirements		
4.1	Whole of environment considerations - provide a holistic assessment of the impacts of the proposal on the whole of the environment, in particular, a description of the connections and interactions between the environmental factors, and cumulative impacts.	Section 11
4.2	Stakeholder engagement and consultation - proponents must engage and consult with stakeholders who are affected by and interested in the proposal. The proponent must document the stakeholder engagement in the EIS.	Section 3 and Appendix A
4.3 4.3.1	Public consultation requirements > Submission period - The NT EPA proposes a period (usually between 30 and 60 business days) for consultation on the Draft EIS. The duration of the period will be confirmed during the Draft EIS pre-lodgement phase.	N/A
4.3 4.3.2	Public consultation requirements > Submission period - The Draft EIS should be provided to and be made available for public consultation.	Section 3 and Appendix A

1.10 Changes Since Project Referral

As described in Section 1.1, the Project engineering has been further refined, and informed by additional data that has been recently acquired (e.g. environmental, geological, geochemical), therefore the Project has been progressively refined to the scope included in this Draft EIS. The nature of the mining Project in essence did not change; however, the alterations represent a 23% increase to the development envelope from what was presented in the Referral. During a meeting held on 20 July 2021 between representatives of the NT EPA, PGO and CDM Smith, proposed changes to the Project were discussed. Due to pit optimisation, engineering analysis and design refinements, several components of the Project as referred to the NT EPA on 3 February 2021 have been refined.

This section provides a summary of the spatial/physical and volumetric changes to the Project since Referral submission. The systems for extraction, processing and disposal were not altered from the original referral. The proposed alterations are listed below, and provided in more detail in Table 1-11:

- Amending the nominal rate of production from 3 Mtpa up to 5 Mtpa;
- The LOM changed from an anticipated 7 years in the referral to 10 years in the Draft EIS;
- Vegetation clearing of 368.86 ha compared to the previous clearing area of 319.4 ha (Table 1-10);
- New location for the accommodation camp;
- Expansion of the TSF;
- Inclusion of an additional WRD to the north of the TSF and processing plant;
- Expansion of the existing southern WRD over the historic WRD;
- Expansion of the main pit and two new minor pits at the Rustlers Roost site;
- A new mine laydown area;
- New location of the administration facility; and
- A new landfill.

Refer to Table 1-11 for more detail of the above changes.

The haul road connecting the two non-contiguous areas was already included in the original referral, and the alignment and width have not altered. However, the condition of the existing haul road bridge crossing Mount Bundey Creek has been subsequently identified as unsuitable for continued use and will be replaced as part of the Project.

In the referral, the processing plant and ROM were identified to be two separate areas. In the layout presented in this Draft EIS, these two areas have been combined into a single area.

Table 1-10 Vegetation Clearing Comparison

	Referral Disturbance (Ha)	EIS Disturbance (Ha)[1]	Net Cleared Vegetation (Ha)	Total Difference (Ha)	Notes
Rustlers Roost	Additional clearing of 274.8 ha of native vegetation within a 497 ha mine development envelope	Additional clearing of 333.4 ha of native vegetation within a 611 ha mine development envelope (vegetation clearance based on disturbing entire development envelope)	333.4	+58.6	The clearing extent has been conservatively calculated based on disturbance of the entire development envelope. Complete disturbance is not expected to be required for the Project.
Quest 29	Additional clearing of no more than 44.6 ha of native vegetation within a 139.5 ha development envelope	Additional clearing of 26.16 ha of native vegetation within a 139.5 ha development envelope (vegetation clearance based on infrastructure footprints within development envelope)	26.16	-18.44	Whilst no changes were made to the Quest 29 component, revised analysis of the disturbance areas against the existing vegetation layer provides a value that is 2.1 ha greater. This original referral value accounted for the accommodation camp, which has been identified separately and is in a different location and with a resized disturbance footprint.
Accommodation Camp	Clearing of 7.3 ha of native vegetation within a 21.2 ha development envelope. Total disturbance of 9.6 ha including existing road disturbance and proposed extent of the accommodation camp.	Clearing of 7.3 ha of native vegetation within a 17.8 ha development envelope (vegetation clearance based on disturbing entire development envelope)	7.3	0	The development envelope was reduced for the EIS to be wholly contained within ML 29814. The clearance area is based on the disturbance footprint which adjoins the access road and contains sufficient area to accommodate the camp. The referral combined the development envelope for the accommodation camp with Quest 29 and accounted for this entire area in clearance. As noted, the clearance area for the accommodation camp is now contained to the footprint rather than the envelope.
Haul Road	Total disturbance of 22 ha. No nominated clearing extent.	Additional clearing of 2 ha of native vegetation within a 21.7 ha Haul Road disturbance (vegetation clearance based on disturbing entire development envelope)	2.0	-	The referral did not nominate a clearing extent for the haul road. The haul road Project area has been analysed against existing disturbance and intact vegetation layers to determine the haul would result in a maximum 2.0 ha clearance of mapped vegetation.
		Total	**368.86**	**40.16**	

1 – Clearing extent is based on the existing disturbance and intact vegetation layers in NVIS 2007. The values for the Rustlers Roost and Quest 29 Project areas have been derived utilising the Project development envelope, which is defined as the maximum area within which the activity could occur. While this may not represent the ultimate disturbance footprint (which will be less), it presents the maximum (conservative) extent of potential disturbance.

Table 1-11 Rustlers Roost Referral Infrastructure Layout and Draft EIS Infrastructure Layout Disturbance Comparison

Proposed Changes		Referral Disturbance (Ha)	EIS Disturbance (Ha)	Total Difference in Disturbance Area (Ha)	% of Change (Area/Volume)	Details of Change
The accommodation camp has been relocated from ML 29782 north of Quest 29 to ML 29814 in close proximity to the Toms Gully Mine and the Arnhem Highway (refer to Figure 1-4). This allows for more direct access to the primary external transportation route and enables connection to mains power, thus removing the requirement for diesel generators.		7.3 ha	7.3 ha	0	0%	Although the location of the accommodation camp has changed, the spatial extent has not been altered. The proposed location has been included within the Draft EIS which provides consideration of the camp's potential impact to environment factors. The site of the accommodation camp was included in ecological surveys undertaken by Low Ecological in 2016 and 2017. Vegetation in this area is mapped as Eucalyptus with grass understorey (open forest and woodland (vegetation units 4 and 15). The vegetation type is consistent with the previous site north of Quest 29. To the east is the Mary River Site of Conservation Significance (SoCS). Table 2 of the ToR requires details of the accommodation facility. The revised location is considered a change that will reduce overall Project impacts through removing diesel generators, resultant air emissions and reduced heavy vehicle movements for fuel supply.
A new WRD has been introduced to the north of the TSF and processing plant. The	Southern WRD	29.4	43.2	62.7	113%	The total WRD area has expanded by 62.7 ha, and disposal volume has increased to 74.3 Mt which represents an increase of 150%. The layout increased to include the historical WRD area to the west of the current pit. The southern WRD is wholly

Proposed Changes		Referral Disturbance (Ha)	EIS Disturbance (Ha)	Total Difference in Disturbance Area (Ha)	% of Change (Area/Volume)	Details of Change
southern WRD identified in the referral has been expanded to include the historic WRD north-west of the current pit. Waste rock disposal volume has changed from 29.71 Mt for the LOM to 74.3 Mt.	Northern WRD	0	48.9			within the development envelope nominated in the referral; however, the northern WRD is only partially within the previous referral development envelope. The northern WRD is outside mapped potential *Stylidium ensatum* habitat but is within modelled potential habitat for *Helicteres macrothrix* (refer to Section 7.2. Additional surveys were commissioned within the northern WRD to confirm presence / absence of the *Helicteres macrothrix.* The northern WRD expands the Project footprint for the entire upper catchment of an unnamed watercourse flowing north in Mount Bundey Creek and thus increases risks associated with surface water runoff. Nevertheless, hydrology studies and potential impacts through surface water runoff have considered the new northern WRD and additional volumes are not anticipated to cause any significant impact to additional environmental factors not previously identified in the referral and accounted for in the ToR.
The TSF has been expanded north of Annie's Dam to utilise the existing landform contours to assist with the impoundment and reduce earthworks (refer to Figure 4-1). Tailings disposal volume has been changed from 3 Mt per annum to 4 Mt per annum.		165.1	257.1	92	56%	Although the proposed new TSF area has increased in 56% and tailing disposal volume to over 4 Mtpa, the proposed new area is largely within the development envelope identified in the referral and will be located in an area which will require less earthworks due to its favourable contours. The revised layout consumes the artificial Annie's Dam and will incorporate the entire upper catchment feeding Annie's Dam thus allowing for easier runoff management. While the size and tailings volume increased, details around the TSF design and potential impacts to hydrological processes and inland waters are accounted for in the Draft EIS. The expanded footprint does not intersect any known cultural heritage site, will not introduce additional impacts to air and risks to human health have been considered through the existing Key Environmental Factors.

Proposed Changes		Referral Disturbance (Ha)	EIS Disturbance (Ha)	Total Difference in Disturbance Area (Ha)	% of Change (Area/Volume)	Details of Change
Expanded main pit and two new small pits are now proposed at the Rustlers Roost site (Annie's Oakley pit and Annie's Dam pit*) (refer to Figure 4-4). These have been introduced to avoid sterilisation of the ore resource.	Main Pit	44.6	69.9	31.5	70%	To access ore that has been recently identified through drilling, and to prevent future sterilisation through placement of the TSF over and immediately adjacent these areas, PGO is proposing to mine two small additional pits (Annie's Oakley and Annie's Dam pits). Annie's Dam pit is proposed within the TSF area and following extraction will be utilised for placement of overburden from the main pit and will eventually be encapsulated within the TSF. The main pit area has increased by 57% to the east and west, but it is still proposed to be wholly within the development envelope. The main pit expansion directly results in increased overburden, thus requiring the additional northern WRD. Given the location of Annie's Dam pit within the TSF, Annie's Oakley pit is considered to pose the greatest risk of additional environmental impacts. Annie's Oakley pit is located adjacent to the western boundary of the Project area and next to an unnamed drainage line discharging to Marrakai Creek. These features have been accounted for in the environmental impact assessment.
	Annie's Oakley and Annie's Dam Pit	0	6.2			
A mine laydown area was introduced to the east of the processing plant and ROM (refer to Figure 4-4).		0	6.0	6.0	100%	Although no new laydown area was required in the referral as the existing laydown area was to be utilised, however the proposed laydown is now located partially within the previous development envelope and will only occupy an area of 6.0 ha.
The administration facility has been shifted from the southern portion of the development envelope, to be in proximity of the laydown area and processing facility in the north of Rustlers Roost (refer to Figure 4-4).		0.25	0.42	0.17	68%	Although the location of the administration facility has changed and has a 68% spatial extent increase, the area of increase is considered minor (0.17 ha). The new location is outside mapped potential habitat for the *Stylidium ensatum* and *Helicteres macrothrix.*

Proposed Changes	Referral Disturbance (Ha)	EIS Disturbance (Ha)	Total Difference in Disturbance Area (Ha)	% of Change (Area/Volume)	Details of Change
A site landfill has been introduced in a predominantly disturbed area between the eastern TSF embankment and the western edge of the main pit (refer to Figure 4-4).	0	4	4	100%	Although no landfill was proposed in the referral, the proposed landfill will be located within a highly disturbed area and it is expected only minimal waste from the mining operation to be disposed in the landfill. The landfill will be constructed over 4 ha to a depth of 5 m and be utilised for the 10 year Project period. The landfill will be designed and constructed in accordance with the NT EPA Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the NT. Solid waste materials including non-putrescible commercial and industrial (C&I) waste, non-putrescible construction and demolition (C&D) waste, green waste and limited hazardous waste in the form of contaminated soils will be placed in the landfill. Other hazardous wastes will not be landfilled onsite and will be taken from site by a licensed contractor to an authorised collection or licensed waste disposal facility.
Overall water demand estimate for the operations has changed from 3.3 GL/yr to 6.5 GL/yr.	NA	NA	NA	96%	The overall water demand for the Project has increased; however, a large volume of this water will come from onsite water (e.g. pit water and TSF decant water) which will be re-used for the processing plant. Groundwater may be sourced from a bore field. The bore field will supply potable water and raw water as required. Potable water supply will be required for the accommodation camp, offices, ablutions and safety showers. A water supply bore is within proximity to the accommodation camp at Toms Gully.
Total	246.65	443.02	196.37	80%	
Development Envelope	**497.50**	**611.00**	**113.50**	**23%**	

* The 4.5 ha of Annie's Dam pit is wholly within the TSF disturbance area and therefore the disturbance of the Annie's pits only accounts for Annie's Oakley Pit.

Section 2 Regulatory Context

2.1 Commonwealth

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage Matters of National Environmental Significance (MNES); including nationally and internationally important flora, fauna, Threatened Ecological Communities (TECs) and heritage places. There are nine MNES listed under the EPBC Act:

- World heritage properties;
- National heritage places;
- Wetlands of international importance (Ramsar wetlands);
- Nationally threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas;
- Great Barrier Reef Marine Park;
- Nuclear actions; and
- A water resource in relation to coal seam gas and large coal mining development (the 'water trigger').

The EPBC Act implements obligations under international conventions and treaties, such as the protection of migratory species under the Migratory Bird Agreement[2] and Bonn Convention (CMS 1979) and the protection of world heritage area values under the World Heritage Convention (WHC 1972).

The EPBC Act is administered by the Commonwealth Minister for the Department of Agriculture, Water and Environment (DAWE) and establishes a process and criteria for the environmental assessment and approval process of proposed actions that have, or are likely to have, a significant impact on MNES (DotE 2013). A self-assessment of potential impacts from the Project on MNES has considered the requirements of the significant impact criteria detailed in the Significant Impact Guidelines 1.1 (DotE 2013). The evaluation of potential impacts on MNES has considered the results of on-ground surveys and latest context specific to the Project. A separate referral to DAWE has not been submitted by PGO. In accordance with the ToR for this EIS, the consideration of MNES has been incorporated into this EIS, and a full summary is provided in Section 9.

[2] Australia has three bilateral migratory bird agreements with Japan (JAMBA) (1981), China (CAMBA) (1988) and the Republic of Korea (ROKAMBA) (2007).

2.1.2 Native Title Act 1993

The *Native Title Act 1993* provides for the recognition and protection of native title. It is intended to set standards for the determination of claims to native title and establish pathways to deal with compensations relating to such claims. It also enables Indigenous Land Use Agreements to be made between native title parties and other interest holders. The Project area is not located on land subject to native title claim and therefore the Native Title Act does not apply.

2.2 Northern Territory

2.2.1 Environment Protection Act 2019

The EP Act and associated regulations has recently replaced the Environmental Assessment Act 1999 on 28 June 2020. The EP Act aims to protect the environment through sustainable development and manage significant disturbances through an environmental approval process.

Developments that may have a significant impact on the environment are assessed in accordance with the EP Act and *Environment Protection Regulations 2020*. The EP Act requires that development proponents implement a hierarchy of:

- Avoid significant impacts wherever possible;
- Where significant impacts cannot be avoided, mitigate those impacts to the greatest extent practicable; and
- Where significant impacts cannot be avoided or mitigated, offset the impacts.

Where a project cannot avoid or mitigate, or where measures have been applied but a significant residual impact remains, it may require offsetting. To support the use of offsets under the EP Act, the NT Government has established the Northern Territory Offsets Framework (Figure 2-1).

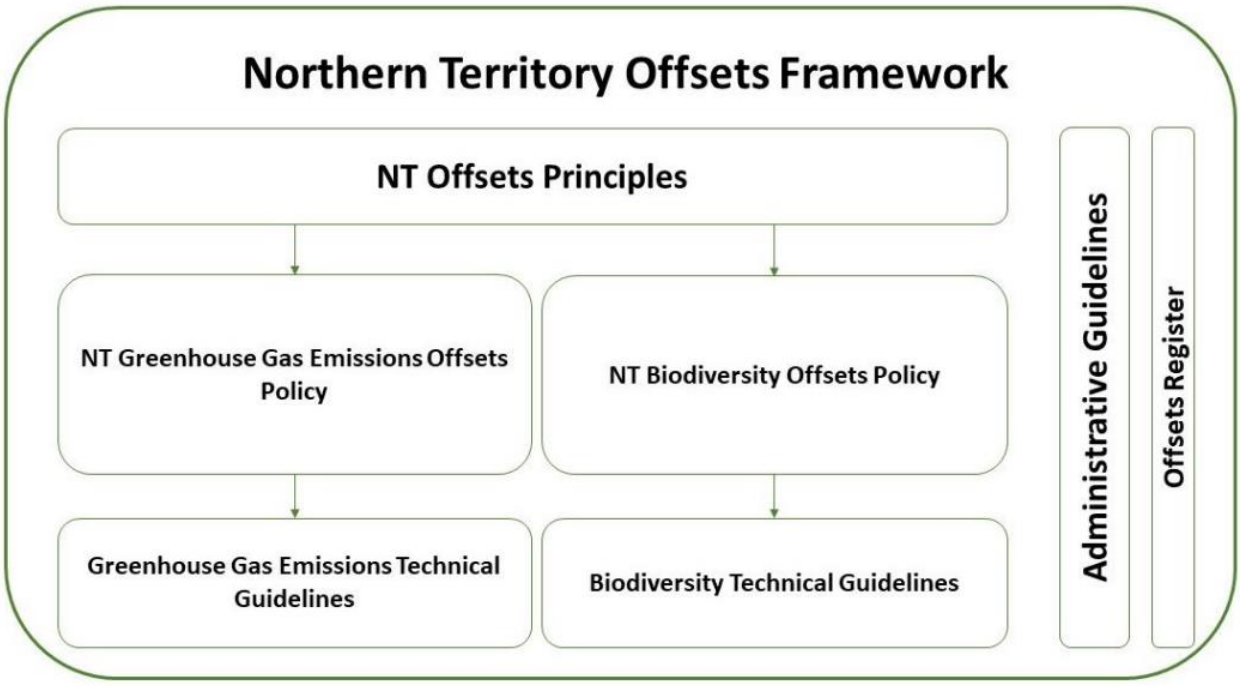


Figure 2-1 Components of the Northern Territory Offsets Framework

The Offsets Framework comprises of a number of related but separate policies and guidelines, including the Northern Territory Offsets Principles, Offsets Policies, Technical Guidelines and Administrative Guidelines. There are two forms of potential offsets in the NT; greenhouse gas (GHG) emission offsets and biodiversity offsets. While the NT Government has release draft versions of the GHG offset policy and technical guidance, the biodiversity offset equivalents were under development at the time of writing this Draft EIS. Nevertheless, the NT Government has released the Northern Territory Offset Principles (Northern Territory Government 2020). The Offset Principles outline the foundations for the use of offsets in the NT.

A GHG inventory has been developed as part of this Draft EIS. The inventory indicates that the NT Greenhouse Emissions Offset Policy is applicable (for further information refer to Section 8.2). While the NT Biodiversity Offset Policy and Biodiversity Technical Guidelines have not been released by the NT Government, PGO understands that the Project may have significant residual and unavoidable impacts to the Terrestrial Ecosystems environmental factor (Eucalypt woodland clearing) and the Aquatic Ecosystems factor (disturbance of mapped drainage features and riparian vegetation). The predicted impacts and proposed voluntary offset approach are identified in Section 12.

Under the Act, the NT EPA regulates the environment impact assessment process to identify potential environmental impacts of development proposals. This initial step is undertaken through a referral in which the NT EPA determines if further assessment is required (i.e. the tier of assessment).

A proponent initiated EIS referral was submitted by PGO to the NT EPA on 3 February 2021 for consideration under the EP Act. The NT EPA determined a standard assessment by EIS to be an appropriate method of assessment for the proposed action to address the requirements of section 42 and section 43 of the EP Act. The NT EPA issued a formal Notice of Decision and Statement of Reasons on the assessment approach concurrently with the ToR for the EIS on 11 May 2021. This Draft EIS has been prepared in accordance with the ToR, and subsequent Significant Variation (finalised 5 October 2021), as a basis for release for public comment.

2.2.2 Mining Management Act 2001

The *Mining Management Act 2001* and regulations enables authorisation of mining activities, management of mining sites, protection of the environment on mining sites and related purposes. The *Mining Management Act 2001* is administered by the DITT. The objectives of the *Mining Management Act 2001* are to:

- Ensure development of the NT's mineral resources in a manner consistent with best environmental practice for the mining industry;
  - Protect the environment by:
  - Requiring authorisation for and monitoring of mining activities;
  - Requiring management of mine sites through implementation of management systems;
  - Fostering consultation and cooperation between management and the mine workforce in implementing environment management systems;
  - Implementing audits, inspections, investigations, monitoring and reporting to ensure compliance with agreed standards and criteria; and
  - Specifying personnel obligations on mine sites to protect the environment.
- Assist the mining industry introduce continuous improvement initiatives to achieve best practice environmental management;

- Enable people connected with the mining industry to participate in implementation of the Act through establishment of a Mining Board to advise the Minister on:
  - Industry guidelines;
  - Competencies required by persons involved in the industry;
  - Best practice in mining activities; and
  - Minimising liability of the NT Government by having a system requiring payment of security to provide for rehabilitation of mining sites or rectify environmental harm caused by mining activities.

A MMP and Authorisation for the proposed work is required from the Minister of Mines and Energy before any mining activities (as defined in the *Mining Management Act 2001*) can commence. The environmental assessment process will allow the Minister to be informed of potential environmental impacts and proposed management to assist in the decision making process.

2.2.3 Mineral Titles Act 2010

The *Mineral Titles Act 2010* provides a framework for granting and regulating mineral titles that authorise exploration, extraction and processing of minerals and extractive minerals. Minerals may only be removed by operators authorised to do so under the *Mineral Titles Act 2010* by the grant of a title. The Project will be carried out on existing mineral titles registered to PGO under this Act as detailed in Table 1-4 of this Draft EIS.

2.2.4 Territory Parks and Wildlife Conservation Act 2000

The *Territory Parks and Wildlife Conservation Act 2000* (TPWC Act) lists flora and fauna taxa protected in the NT. Under this Act, permits are required to take or interfere with protected flora or fauna. It is not expected that any permits under this Act will be required for the Project at this stage however this may apply if protected flora or fauna are encountered during the life of the Project.

2.2.5 Other Northern Territory Legislation

Table 2-1 provides a summary of other legislation, permits and licences relevant to the Project.

Table 2-1 Summary of Other Legislation and Approvals Applicable to the Project

Legislation	Regulation/approval	Proposal Relevance
Flora and Fauna		
Planning Act 1999	Land Clearing Permit	The Act provides framework of controls for the orderly use and development of land.
Weeds Management Act 2001	N/A	Declares certain plants to be weeds, classifies weeds according to management requirements, and places obligations on landowners and occupiers to manage weeds. A Weed Management Plan will be required for this Project to facilitate compliance with this Act.
Soil Conservation and Land Utilisation Act 1969	N/A	Provides for the prevention of soil erosion and for the conservation and reclamation of soil. Erosion and Sediment Control Plans (ESCPs) will be required to facilitate compliance with the general provisions of this Act.
Public and Environmental Health Act 2011	Wastewater works design approval	Approvals will be required for onsite wastewater management systems that accept black and greywater from ablutions. These approvals are obtained from the Department of Health.

Legislation	Regulation/approval	Proposal Relevance
Water Act 1992	Permit to construct or alter works Licence to take or use surface water or groundwater Waste Discharge Licence (WDL)	The *Water Act 1992* (NT) is the overarching legislation to water mitigation in the NT. The *Water Act 1992* provides for the investigation, allocation, use, control, protection and management of surface water and groundwater resources, as well as the administrative process for licensing these activities. The Project is not within a Declared Water Control District (WCD) or Management Zone. As a result, surface water extraction from Annie's Dam and groundwater bores to supply the mine sites, does not require a licence. A Waste Discharge Licence (WDL) may be required in the event that any wastewater will be disposed of offsite. It is noted the NT Government is progressing a regulatory reform of the *Water Act 1992*, with anticipated amendments in 2022-2023.
Aboriginal Sacred Sites Act 1989	Authority Certificate	The Act outlines the need to preserve and promote Aboriginal tradition in relation to land in the NT. This Act establishes procedures for the protection and registration of sacred sites. The Act establishes offences for entry onto, work on or, desecration of, sacred sites without appropriate certification or in contravention of the certification. PGO has an existing Authority Certificate (C2016/168) for exploration activities and ongoing maintenance over the Project area. No recorded or registered sacred sites were identified within the area covered by Authority Certificate C2016/168.
Heritage Act 2011	Work Approval	The Act provides for the conservation of the NT's cultural and natural heritage. The Heritage Council established under the Act makes assessments and regulate work on heritage places. All sites on the NT Heritage Register and yet to be discovered sites are protected under this Act. There are no registered heritage areas within the Project area.
Work Health and Safety (National Uniform Legislation) Act	Risk Management Plan (RMP)	Mine sites in the NT must not permit any mining activity or a related mining activity to be carried out unless the mine operator has provided to the regulator an RMP for the mine site that has been certified in accordance with regulation 614.
Dangerous Goods Act 1998	Explosive Permits	Provides for the safe storage and handling of dangerous goods. The storage and transport of explosives requires an approval to be obtained from Worksafe NT. Explosives will be stored in a magazine to be constructed at the mine site. An Explosives Business Licence will be obtained. All fuel storages must meet Australian Standard 1940: Storage and Handling of Flammable and Combustible Liquids.
Waste Management and Pollution Control Act 1998	Environment Protection Approval or Licence (EPA and EPL)	The Act protects the environment through the encouragement of effective waste management and prevention and control practices of pollution. Applicable to this Project common contaminants and waste that may be generated from site without any mitigation measures may include and not limited to spills, soil erosion, sedimentation, construction waste, light pollution and dust emissions. Schedule 2 of the Act identified activities that require an environmental protection approval. This includes constructing, installing or carrying out works for the disposal of waste by burial. Schedule 2 of the *Waste Management and Pollution Control (Administration) Regulations 1998* (subordinate legislation to the Act) lists prescribed wastes. As the Project involves development of an Industrial Waste Landfill it will require approval. It is noted the NT Government is progressing a regulatory reform of the *Waste Management and Pollution Control Act 1998*, with anticipated amendments to occur in due course.

2.3 Relevant Agreements

An access agreement with the existing leaseholder of Old Mount Bundey Station was executed on 6 February 2014. A separate agreement with the leaseholder of McKinlay River Station will be finalised prior to Project construction and is expected to align with the existing agreement. The existing agreement requires that in addition to compliance with governing laws, regulations and conditions, PGO shall communicate with the pastoralist and minimise interruption to pastoral activities including:

- Timely consultation with pastoralist prior to exploration activities;
- Timely consultation regarding proposed mining activities, new (or variations to) infrastructure, and new disturbances;
- Reasonable compensation to the pastoralist for interference to pastoral activities, repairs, maintenance and damage;
- Timely consultation prior to exploration and/or mining activities;
- Vehicle speed limits;
- Measures to limit damage to, or loss of stock;
- No fires, dogs or firearms;
- Gates left as they are found;
- Limited access outside tenement;
- Limited access to pastoral infrastructure; and
- Follow Pastoralist guidelines with respect to weeds, pests and diseases.

With respect to the environment and rehabilitation, the agreement stipulates that PGO shall:

- Keep tenements clean and tidy of rubbish;
- Implement reasonable measures to prevent erosion;
- Rehabilitate damage ensuing from surface exploration activities;
- Consult with the pastoralist regarding rehabilitation of pastoral land and improvements; and
- Mine infrastructure shall be removed or rehabilitated to enable safe and sustainable mine closure.

With respect to water resources, PGO shall:

- Consistent with operational requirements and approval conditions, take reasonable measures to limit interference with surface and groundwater resources;
- Provide the Pastoralist with necessary regulatory approvals;
- Obtain Pastoralist consent prior to interference with any water way, wetland or habitat (including bores);
- Make available to the Pastoralist any excess or non-required water pumped from the mine or bores;
- Rectify any of the Pastoralist's bores affected by mining activities; and
- Provide pastoralist opportunity to provide commercial water sampling services.

The mining tenements were granted prior to the *Native Title Act 1993* (Cth) (NT Act) and hence there is no applicable Native Title agreement. PGO has maintained contact with the Northern Land Council (NLC) in planning and preparing the Project.

Section 3 Stakeholder Engagement

3.1 Engagement Purpose, Objectives and Outcomes

3.1.1 Purpose and Objectives

Stakeholder engagement is an essential process supporting environmental impact assessment as it provides potentially affected and interested stakeholders information about the Projects potential impacts and benefits and also, provides the opportunity to communicate any concerns which will be taken into consideration during the Project design. Meaningful stakeholder engagement supports the early identification of issues, addresses community concerns and expectations into decisions that may affect them, and leads to better decision-making and outcomes.

The purpose of this section is to provide a summary of the stakeholder analysis and approach to consultation that has conducted to date, based on a Project specific Stakeholder Engagement Plan (SEP) (refer to Appendix A). The SEP has been developed to meet the requirements under the EP Act and the *NT EPA's guidance for proponents: Stakeholder engagement guidance* (NT EPA 2021b).

The EP Act states that public consultation, particularly with Aboriginal people and communities is an important part in the environmental impact assessment process. These are expressed under the EP act as:

- Provide for broad community involvement during the process of environmental impact assessment and environmental approval; and
- Recognise the role that Aboriginal people have as stewards of their country as conferred under their traditions and recognised in law, and the importance of participation by Aboriginal people and communities in environmental decision-making processes.

The SEP aims to achieve outcomes by:

- Creating a structured process focused on:
  - Building trust and mutual understanding between PGO and Project stakeholders;
  - Addressing statutory stakeholder consultation requirements; and
  - Meaningfully engaging with stakeholders, specifically with regards to the environmental assessment and approvals process.
- Providing opportunities for PGO to understand stakeholder values and expectations;
- Embedding the importance of using local contractors and employees as much as possible throughout the Project;
- Ensuring that Traditional Owners and Indigenous groups are engaged wherever possible;
- Securing stakeholder feedback that will be used as input for the environmental assessment process and to inform PGO's longer term activities and community involvement; and
- Aligning with PGO's corporate approach to stakeholder engagement.

3.1.2 Outcomes

Engagement for the Project has been focused on achieving the following outcomes:

- All identified key stakeholders are appropriately informed of the Project;
- The Project environmental assessment is completed in a manner that is consistent with the EP Act;
- Stakeholders are provided with meaningful opportunities to participate in consultation for the Project;
- Traditional Owners feel as if they have been provided opportunities for meaningful engagement, that they have been listened to, and their culture and values respected; and
- The Project specific environmental risk assessment has been actively informed by the input and feedback received from stakeholders and where necessary, any adjustments to the Project as a result of this consultation has been considered.

3.2 Stakeholder Engagement Strategy

3.2.1 Overview of Approach

PGO is committed to undertaking projects in a manner that will both deliver on all regulatory requirements and that engage and contribute to the communities in which it operates. More broadly, PGO is focused on understanding and integrating those matters that will provide long-term outcomes aspired to by relevant stakeholders. To achieve this, the stakeholder engagement strategy for the Project has focussed on:

- Governance and systems frameworks to support the business operations and how PGO works with stakeholders;
- The formation of long-term, meaningful relationships and partnerships with stakeholders;
- Alignment with relevant NT standards regarding stakeholder impact assessment, management and social investment; and
- An active risk management approach and focus on creating long term value for the communities where PGO operates.

3.2.2 Principles for Project Engagement

In developing its approach to Project engagement, PGO has referred to industry leading standards and practice including the NT Stakeholder Engagement and Consultation guidance (NT EPA 2021b), NT guidance for preparing an environmental impact statement (NT EPA 2021a), the International Association for Public Participation's (IAP2) Quality Assurance Standard For Community and Stakeholder Engagement (IAP2 2015) and relevant International Finance Corporation guides (IFC 2007).

As outlined above, PGO actively builds community investment into its overall business and planning process. Engagement for this Project will be based on the following key principles:

- Focusing on achieving genuine outcomes for communities;
- Providing a flexible and proactive approach;

- Being visible and transparent;
- Where investment in communities is undertaken, supporting projects that encourage community self-sufficiency and sustainability; and
- Enhancing social return on investment through strategic reviews of outcomes.

To achieve engagement objectives and outcomes it is important to define and explain the parameters of the Project including decisions that have already been made, decision-making processes and governance structures, statutory obligations and regulatory requirements. When PGO engages with stakeholders it is necessary that there is clarity regarding what 'can' and what 'cannot' be influenced with regards to the Project. This is particularly important in terms of managing and aligning with stakeholder expectations. The SEP provides this framework as detailed in Appendix A.

3.2.3 Significant Variation Process

The pit optimisation, engineering analysis and design have been refined during the EIS stage of the approvals process and as such a 'Significant Variation' to the Project was sought. This has been previously described in Section 1.1 and Section 1.10. It is considered unlikely that these changes will result in significant additional impacts to environmental aspects. However, it is acknowledged that this triggers an additional engagement step, that was not originally anticipated at the time of the referral.

The meaning of a significant variation of an action is defined under section 12 of the EP Act is a variation that:

a. Will alter the action to the extent that a referral trigger that did not previously apply to the action now applies;

b. Has the potential to have a significant impact on the environment; or

c. Will result in new or additional areas being subject to a potential significant impact on the environment (NT EPA n.d.).

The NT EPA were engaged, and the proposed significant variation was tabled along with a checklist identifying the NT EPA factors and objectives and an explanation as to how the changes are unlikely to have additional impacts on these objectives or alter the existing ToR.

The significant variation process requires the variation to be placed on public exhibition for 30 business days and issued for review to the government agencies[3]. Within 30 business days after the conclusion of the public consultation process the NT EPA must determine:

1. Whether the proposal can continue within its existing environmental impact assessment process (i.e. by referral information, supplementary environmental report, an environmental impact statement process, or by inquiry);
2. Whether the proposal requires a different method of environmental impact assessment;
3. A new environmental impact assessment is required just for the components of the significant variation;
4. Environmental impact assessment is no longer required; or

[3] NT EPA assessments in progress register: Rustlers Roost and Quest 29 open-cut mine redevelopment: https://ntepa.nt.gov.au/your-business/public-registers/environmental-impact-assessments-register/assessments-in-progress-register/rustlers-roost-and-quest-29-open-cut-mine-redevelopment

5. For the EIS or Inquiry methods only, that the assessment can continue with amended ToR (NT EPA n.d.).

The outcomes of the significant variation process, including any feedback received through this consultative process, are to be incorporated into this Draft EIS.

3.3 Stakeholder Analysis

The analysis of stakeholders was undertaken with a focus on understanding stakeholder values, understanding concerns and opportunities arising from the Project, and understanding potential impacts, risks, and levels of interest and influence. The intent of this initial analysis is to provide PGO with the foundation through which to inform the EIS and to continue engagement as the Project develops.

3.3.1 IAP2 Core Values

Stakeholder values are an important frame through which to understand what may be of importance. In accordance with the NT EPA stakeholder engagement and consultation guidelines, consultation was guided by the principles of engagement, based on stakeholder level of interest and concern as outlined by the International Association for Public Participation (IAP2). The IAP2 core values for practicing public participation and community engagement are:

1. Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process;

2. Public participation includes the promise that the public's contribution will influence the decision;

3. Public participation promotes sustainable decisions by recognising and communicating the needs and interests of all participants, including decision makers;

4. Public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision;

5. Public participation seeks input from participants in designing how they participate;

6. Public participation provides participants with the information they need to participate in a meaningful way; and

7. Public participation communicates to participants how their input affected the decision (IAP2 2015).

The purpose of these core values is to help make better decisions which reflect the interests and concerns of potentially affected people and entities (IAP2 2015).

3.3.2 Key Stakeholders

Table 3-1 identifies the list of key stakeholder groups considered as part of the SEP. This is an initial list and as the Project develops further and recognising the Draft EIS will be released for public comment, further stakeholders may be introduced. The SEP is therefore considered a live document that will be reviewed and updated by PGO.

Table 3-1 Key Project Stakeholders

Group	Stakeholders
Pastoral Stations/Lease Owners	▪ Old Mount Bundey Station ▪ McKinlay River Station
Indigenous Stakeholders, Traditional Owners or representative organisations	▪ Northern Land Council ▪ Limilngan and Uqynmil Traditional Owners (Local Management Committees of the Mary River and Djukbinj National Parks)
Local and Regional Community	▪ Community members who reside or work in the Marrakai-Douglas Daly and greater Darwin area or surrounding region
Local and Regional Supplier and Business Organisations	▪ Marrakai-Douglas Daly-based suppliers ▪ Darwin-based suppliers ▪ Northern Territory Chamber of Commerce ▪ Any companies who have registered their details in the ICN gateway
Local Government	▪ Unincorporated Marrakai-Douglas Daly (no dedicated city, shire or council). ▪ Local Government Association of the NT
NT Government Agencies	▪ Aboriginal Areas Protection Authority (AAPA) ▪ Department of Environment, Parks and Water Security ▪ Department of Health ▪ Department of Industry, Tourism and Trade ▪ Department of Territory Families, Housing and Communities ▪ Department of Chief Minister and Cabinet ▪ NT Police, Fire and Emergency Services
Territory and Federal Politicians	**State** ▪ The Hon. Michael Patrick Francis Gunner MLA, Chief Minister ▪ The Hon. Nicole Susan Manison MLA, Deputy Chief Minister ▪ The Hon. Natasha Kate Fyles MLA, multiple ministerial titles ▪ The Hon. Eva Dina Lawler MLA, multiple ministerial titles ▪ The Hon. Lauran Jane Moss MLA, multiple ministerial titles ▪ The Hon. Selena Jane Malijarri Uibo MLA, multiple ministerial titles ▪ The Hon. Paul Andrew Kirby MLA, multiple ministerial titles ▪ The Hon. Kate Jane Worden MLA, multiple ministerial titles ▪ The Hon. Chanston James Paech MLA, multiple ministerial titles **Federal** ▪ The Hon. Warren Snowdon MP, Federal Member for Lingiari ▪ The Hon. Sussan Ley MP, Federal Minister for the Environment
Commonwealth Government	▪ Department of the Environment and Energy ▪ Department of Defence (Mount Bundey Training Area)
Regional Agencies / Coordinating Bodies	▪ Regional Development Australia Northern Territory

Group	Stakeholders
Neighbouring Commercial Businesses and Local Operators	▪ Allan King & Sons Construction Pty Ltd ▪ Boral Resources Limited ▪ Halkitis Bros Pty Limited ▪ Mousellis & Sons Pty Ltd ▪ Ostojic Group Pty Ltd ▪ Tomazos Group Pty Ltd ▪ Corroboree Park Inn ▪ Mary River Wilderness Retreat ▪ Bark Hut Inn ▪ Wildman Wilderness Lodge ▪ Point Stuart Wilderness Lodge
Interest Groups	▪ Amateur Fishermen's Association of NT (AFANT)
Public	▪ General public

3.4 Level of Engagement

The Project consultation associated with the EIS and subsequent phases of the Project has been in accordance with the IAP2 principles to determine the appropriate levels of engagement (IAP2 2015). As the Project progresses, the level of engagement will be identified and determined on a case-by-case basis and certain stakeholders may be involved to collaborate on aspects of the Project. Stakeholder engagement is an essential component in the process of assessing the Project's social, economic and environmental impact.

For the purpose of managing the level of stakeholder engagement, stakeholders have been grouped as follows:

- Level 1: Landholders, Indigenous Stakeholders or Traditional Owners, surrounding tenure holders and Government;
- Level 2: Key interest groups (e.g., AFANT) and local communities; and
- Level 3: General public, community and special interest groups, wider region and Territory-based organisations.

Table 3-2 provides the IAP2 spectrum's level of engagement and PGO's relevant approach at each level. For Level 3 stakeholders the level of participation for this Project has been to inform and consult, for Level 2 stakeholders inform, consult and involve, and for Level 1 stakeholders, collaboration.

Table 3-2 IAP2 Levels of Engagement

	Level of Engagement	Stakeholder Level	Approach to the Community and Stakeholders
Increasing Impact on the Decision ↓	**Inform**	1, 2 and 3	PGO will aim to keep stakeholders informed
	Consult	1, 2 and 3	PGO will keep stakeholders informed, listen to and acknowledge concerns and aspirations, and provide feedback on how stakeholder input influenced the decision.
	Involve	1 and 2	PGO will work with stakeholders to ensure that their concerns and aspirations are directly reflected in the assessment completed and control measures employed and provide feedback on how stakeholder input influenced decision.
	Collaborate	1	PGO will look to stakeholders for advice and innovation in formulating solutions and incorporate their advice and recommendations into the decisions to the maximum extent possible.
	Empower	1	PGO will implement relevant stakeholder decisions where appropriate and feasible.

Amended from IAP2 2015

The process is intended to be flexible and open to including relevant stakeholders to the maximum extent possible, while maintaining focus on targeted engagement where it makes sense.

3.5 Identification of Potential Concerns and Opportunities

Potential concerns and opportunities that may be experienced by stakeholders during the lifecycle of the Project are outlined in SEP. The purpose of this identification is to understand stakeholder perspectives on what may be of concern to them regarding the Project so that PGO can understand potential impacts to stakeholders and corresponding potential risks.

Understanding stakeholder concerns and their views regarding potential impacts (both actual and perceived) means that PGO can tailor 'why' and 'how' it engages with stakeholders and can control the key messages that are communicated. This is also critical to understanding potential stakeholder risks, which in many cases are driven by perceptions that stakeholders have of things that are important to them and may often be emotive and subjective. Often these perceptions may not be 'actual impacts' or supported by technical studies but it is critical to understand and acknowledge these, nonetheless.

The SEP provides initial identification of potential concerns and opportunities and as such must be re-visited once PGO has undertaken more detailed engagement with stakeholders during the life of the Project. It is important that as part of this, environmental concerns and opportunities are identified as these are often key areas of interest for stakeholders. Although the SEP is initially focused on the pre-construction phase, potential concerns and opportunities have been identified across the Project lifecycle as these perceptions and potential impacts influenced how stakeholders have been engaged from the beginning of the Project. As the Project progresses and further consultation is undertaken, the SEP will be updated accordingly to account for all phases of the Project.

3.6 Level of Engagement and Activities

Based on the analysis above, the following levels of engagement have been identified for stakeholder groups. These levels are based on the principle that engagement has been tailored by considering levels of stakeholder impact, interest and influence, and risk – with the assumption that the higher the level of impact and risk – the deeper the level of engagement required. This approach needs be flexible based on each specific stakeholder group and potential changes in stakeholder expectations and risk. Description of engagement levels and example activities are provided in Table 3-3.

Engagement levels are further outlined in Table 3-4, specific to each stakeholder group.

Table 3-3 Different Depths of Engagement / Communication

Level of Engagement	Description	Example Activities
General	▪ Generalised provision of Project information and updates (this includes overview of potential impacts and mitigation / management strategies) ▪ Opportunities to provide feedback through general activities and communication mechanisms (e.g. via website, email, as part of statutory consultation approach) ▪ Audience: all stakeholders have access to information and activities	▪ Website ▪ Project information sessions ▪ Media releases ▪ Public consultation process
Targeted	▪ Targeted engagement and communications specific to stakeholder group ▪ Targeted engagement and communication activities designed to gain specific feedback ▪ Ongoing opportunities to provide feedback and discuss key Project elements (e.g. how potential impacts to a specific value could be managed) ▪ Audience: while information may or not be publicly available activities are targeted towards specific group of stakeholders and are generally not open to 'general public'	▪ Targeted group briefings or presentations ▪ Targeted group or individual meetings ▪ Targeted information portal e.g. ICN ▪ Access to all general activities
Individualised	▪ Engagement and communications developed for needs and expectations of specific stakeholder ▪ Focus on gaining specific feedback and input from individuals / small group of individuals ▪ Information in the form it was provided only accessible to specific party with which it was shared e.g. while a Minister may be provided information about jobs etc. that is available to the public the content of the conversation will be confidential	▪ One-on-one meetings focused on specific topic of interest for both parties e.g. negotiation of lease agreement or cultural heritage agreement ▪ Negotiation of formal contract or partnership (e.g. supplier agreement) ▪ Shared value definition workshop / partnership regarding social investment ▪ Personalised email / phone conversations
Regulatory	▪ Ongoing interaction with the regulator. This will be tailored depending on agency roles ▪ More structured and individualised engagement will occur with lead agency ▪ Ongoing opportunities to provide feedback	▪ Structured meetings and communication schedule with lead agency ▪ One-on-one / group meetings as required ▪ Ongoing email and phone communication as required

Table 3-4 Engagement Activities by Stakeholder Groups

Group	IAP2 Stakeholder Level	Engagement Level	Potential Engagement Activities[4]
Pastoral Stations/Lease Owners	Level 1	Individualised	▪ One-on-one meetings ▪ Ongoing communication via email, phone etc. ▪ Statutory consultation period (General) ▪ Website (General)
Indigenous Stakeholders, Traditional Owners or representative organisations	Level 1	Individualised	▪ Ongoing communication via email, phone etc. ▪ One-on-one meetings (where relevant) ▪ Partnerships with employment agencies / contractors ▪ Statutory consultation period (General) ▪ Website (General) ▪ Media releases and media appearances (General)
Interest Groups	Level 3	Individualised	▪ Ongoing communication via email, phone etc. ▪ One-on-one meetings (where relevant) ▪ Website (General)
Local Government	Level 1	Regulatory	▪ Communication via email, phone etc. (where enquiry received) ▪ Statutory consultation period (General) ▪ Website (General)
Local and Regional Community	Level 2	General	▪ Communication via email, phone etc. (where enquiry received) ▪ Statutory consultation period (General) ▪ Website (General) ▪ Media releases and media appearances (General)

[4] Note – these are potential engagement activities and not all activities may be undertaken for each stakeholder group. For example, should communication via email be considered sufficient to convey Project understanding and to obtain necessary feedback, a one-on-one meeting may not be warranted.

Group	IAP2 Stakeholder Level	Engagement Level	Potential Engagement Activities[4]
Local and Regional Supplier and Business Organisations	Level 3	General	▪ Partnerships with employment agencies / contractors ▪ Statutory consultation period (General) ▪ Website (General) ▪ Media releases and media appearances (General)
Neighbouring Commercial Business and Local Operations	Level 3	General	▪ Communication via email, phone etc. (where enquiry received) ▪ One-on-one meetings (where relevant) ▪ Partnerships with employment agencies / contractors ▪ Ongoing email / phone communication
Territory and Federal Politicians	Level 3	General	▪ Communication via email, phone etc. (if required) ▪ Statutory consultation period (General) ▪ Website (General) ▪ Media releases and media appearances (General)
The Public	Level 3	General	▪ Communication via email, phone etc. (where enquiry received) ▪ One-on-one meetings (where relevant) ▪ Ongoing email / phone communication
NT Government Agencies	Level 1	Regulatory	▪ One-on-one meetings ▪ Technical meetings and briefings if required following review ▪ Formal agency comments period ▪ Ongoing email / phone communication ▪ Website (General) ▪ Media releases and media appearances (General)
Commonwealth Government	Level 1	Regulatory	▪ Communication via email, phone etc. ▪ Technical meetings and briefings (if required) ▪ Website (General)

3.7 Stakeholder Engagement to Date

PGO undertook initial engagement during Project planning and feasibility. The focus of initial engagement was with the leaseholders for the properties on which the Project is located. The public was provided an opportunity to review and comment on the Project referral documentation to the NT EPA via the dedicated online consultation portal. Submissions from eight NT Government agencies/departments and one anonymous submitter were received during this process. As part of the Draft EIS development, targeted stakeholder engagement was completed in accordance with the SEP. Table 3-5 provides a summary of the stakeholder consultation completed during the Draft EIS development, the issues raised and how this has been addressed in the Draft EIS.

Table 3-5 Stakeholder Engagement to Date and Issues Raised

Stakeholder	Date	Description of Engagement	Stakeholder Comments/Issues	Consideration in the Draft EIS
Old Mount Bundey Station	15/8/2016	Meeting on site. Discussed livestock access to Toms Gully in particular access to the Oxbow area at Mount Bundey Creek and water quality at Rustlers Roost that meets livestock drinking quality.	Pastoralist indicated that stock had not gone through the fence at Toms Gully and also the paddock covering the oxbow was not used as the vegetation made the mustering and management of stock hard.	Ongoing management of stock exclusion at Toms Gully.
Old Mount Bundey Station	13/12/2016	Telephone conversation	Concerns were raised about vegetation across Toms Gully and next to infrastructure.	Pastoralist contracted to spray vegetation around infrastructure, maintain firebreaks and undertaken controlled burning during cooler months to limit fire load.
Old Mount Bundey Station	28/6/2017	Onsite meeting	Details on the proposed acid and metalliferous drainage baseline testing and water quality at Toms Gully. WRD drilling and tailings sampling were discussed and the reasons why.	Consultation ongoing regarding on site acid and metalliferous drainage conditions and assessments.
Old Mount Bundey Station	15/12/2017	Telephone conversation	Pastoralist interested in using treated water for pasture irrigation and use for mango production. Water needs to be of appropriate quality.	Water treatment needs to be “fit for purpose”.

Stakeholder	Date	Description of Engagement	Stakeholder Comments/Issues	Consideration in the Draft EIS
NT EPA	3/6/2018	Meeting. PGO provided an update on EIS Supplement preparation, requirements for the Section 14A, proposed water and tailings treatment option	The NT EPA raised the matter of providing a level of certainty when presenting environmental and closure outcomes.	Further baseline geochemical and water studies completed to inform closure planning. Throughout the risk assessment process and within the completion criteria in the EIS supplement, PGO has justified the level of certainty for residual risk levels relating to closure.
	20/07/2021	Meeting. PGO provided an update on studies being prepared to inform the Draft EIS and sought feedback on specific aspects. PGO also provided details of the Project that had been updated since referral of the Project.	The NT EPA identified that the changes from the version of the Project submitted in the referral likely constituted a significant variation. It was confirmed the pipeline being progressed by a third-party could be considered separately from the Draft EIS.	The Draft EIS has been prepared to account for the revised Project arrangement
Allan King & Sons, Bark Hut Inn, Tomazos Group	1/7/2021	Telephone discussion	No response from stakeholder other than to pass on their contact details	The Draft EIS has identified all known surrounding operators and activities. Consideration has been given to surrounding operators position in relation to the Project and the potential for direct, indirect and cumulative impacts to affect local stakeholders. While each key environmental factor section considers the surrounding environment and users, Section 7.6 specifically identifies potential impacts to the surrounding community and includes avoidance, mitigation and management measures to prevent or minimise impacts. Activities of the surrounding extractive operators have been considered with regard to potential cumulative impacts in the environmental assessment. Regarding the use of local material and supplies, PGO have included a commitment to develop and implement a procurement policy that prioritises local and Northern Territory procurement.
Corroboree Park Inn, Mary River Retreat, Ostojic, Boral	2/7/2021	Telephone discussion	No response from stakeholder other than to pass on their contact details	
Halkitis, Mousellis & Sons, Point Stuart Lodge, Wildman Lodge	6/7/2021	Telephone discussion	No response from stakeholder other than to pass on their contact details	
Bark Hut Inn, Boral, Corroboree Park Inn, Mary River Retreat, Old Mount Bundey Station, Ostojic, Tomazos Group	6/7/2021	Email with attached overview flyer of the Project	Only response was related to utilising local material for the Project and opportunities to supply the Project.	
Allan King & Sons, Halkitis, Mousellis & Sons, Point Stuart Lodge	11/7/2021	Email with attached overview flyer of the Project	No responses to date	

Stakeholder	Date	Description of Engagement	Stakeholder Comments/Issues	Consideration in the Draft EIS
McKinlay River Station	21/7/2021	Posted overview flyer of the Project	No responses to date.	Consideration of surrounding pastoral activities and downstream beneficial use of watercourses intersected by the Project for stock watering.
Old Mount Bundey Station	18/8/2021	Letter from PGO to Pastoral Leaseholder about the repair of the culvert bridge over the Mount Bundey Creek.	Pastoral Leaseholder signed the letter and agreed to the repairs.	
AFANT, Allan King & Sons, Bark Hut Inn, Tomazos Group, Corroboree Park Inn, Mary River Retreat, Ostojic, Boral, Halkitis, Mousellis & Sons, Point Stuart Lodge, Old Mount Bundey Station	30/8/2021	Email with attached information about the significant variation.	No responses to date.	Various uses of the downstream receiving environments have been identified in the Draft EIS (including recreational fishing, tourism, cultural heritage activities). The potential for the Project to impact such activities has been considered in the assessment. Downstream receiving environment water quality has been a key focus of the assessment.
McKinlay River Station	1/9/2021	Posted information about the significant variation.	No responses to date.	As above.

In addition to the stakeholder consultation undertaken for the Draft EIS, PGO has submitted a new Authority Certificate application with the AAPA. The new application is currently going through processing and consultation requirements but is anticipated to give more certainty that cultural values associated with sacred sites have been identified and will be protected from potential impacts from the Project. As part of the application, AAPA is obliged to consult with custodians of sacred sites on or in the vicinity of the area to which the application relates. By law, these consultations must commence within 60 days of the acceptance. However, depending on the distances and complexity involved, the consultations may take some time to complete. In some cases it may take up to 180 days to process an application from the time it has been accepted by the AAPA.

3.8 Future Engagement

The following consultation program provided in Table 3-6 establishes the activities to be undertaken and key Project milestones. All consultation activities undertaken for the Project will be recorded within a register for the Project.

Table 3-6 Consultation Phases

Stage	Description	Who	Activities	Progress
Pre-EIS Site Investigation and Survey Stage	▪ Initial regulatory engagement to outline the Project and confirm necessary inclusions in the assessment; and ▪ Early engagement with pastoral leaseholders regarding proposal.	▪ Pastoral Stations/Lease Owners ▪ NT Government Agencies	▪ Communication via email, phone etc. ▪ One-on-one meetings	Complete
Draft EIS Development Stage	▪ Activities to improve general stakeholder awareness of the Project and avenues for providing input; ▪ Targeted engagement and communications specific to stakeholder groups; ▪ Targeted engagement and communication activities designed to gain specific feedback to inform the Draft EIS; ▪ Additional engagement specific to the Significant Variation Process (during Draft EIS Development Stage)	▪ Pastoral Stations/Lease Owners ▪ Indigenous Stakeholder and Traditional Owners ▪ NT Government Agencies ▪ Local and Regional Community ▪ Territory and Federal Politicians ▪ Federal Government ▪ Neighbouring Commercial Businesses and Local Operators ▪ Interest group(s) (AFANT)	▪ Communication via email, phone etc. ▪ One-on-one meetings ▪ Technical meetings and briefings ▪ Website (General) ▪ Media releases (General)	Complete

Stage	Description	Who	Activities	Progress
Post-Draft EIS Stage (Supplement Stage)	▪ Update the Stakeholder Engagement Plan as necessary; and ▪ Undertake additional targeted consultation as necessary to address specific issues raised in comments on the Draft EIS.	▪ Pastoral Stations/Lease Owners ▪ Indigenous Stakeholder and Traditional Owners ▪ NT Government Agencies ▪ Local and Regional Community ▪ Territory and Federal Politicians ▪ Federal Government ▪ Neighbouring Commercial Businesses and Local Operators ▪ Interest group(s) (AFANT)	▪ Communication via email, phone etc. ▪ One-on-one meetings ▪ Technical meetings and briefings ▪ Website (General)	Planned
Notification of Approval and Conditions	▪ Update the Stakeholder Engagement Plan as necessary; ▪ Undertake activities to inform stakeholders of the approval and conditions; and ▪ Provide information to stakeholders on the next steps and Project schedule.	▪ Pastoral Stations/Lease Owners ▪ Indigenous Stakeholder and Traditional Owners ▪ NT Government Agencies ▪ Local and Regional Community ▪ Territory and Federal Politicians ▪ Federal Government ▪ Neighbouring Commercial Businesses and Local Operators ▪ Interest group(s) (AFANT) ▪ Local and Regional Supplier and Business Organisations ▪ Public	▪ Communication via email, phone etc. ▪ Website (General)	Planned

Stage	Description	Who	Activities	Progress
Construction Stage	▪ Update the Stakeholder Engagement Plan as necessary; and ▪ Early notification to key potentially affected stakeholders (e.g. local community) of Project construction commencement and actions being implemented to manage risks; and ▪ Undertake stakeholder and community engagement as required to satisfy approval conditions and achieve compliance with statutory obligations for construction. ▪ Provide general awareness of the avenues for stakeholder complaints.	▪ Pastoral Stations/Lease Owners ▪ Indigenous Stakeholder and Traditional Owners ▪ NT Government Agencies ▪ Local and Regional Community	▪ Communication via email, phone etc. ▪ One-on-one meetings ▪ Website (General)	Planned
Operational Stage	▪ Update the Stakeholder Engagement Plan as necessary; and ▪ Undertake stakeholder and community engagement as required to satisfy approval conditions and achieve compliance with statutory obligations for the operation; ▪ Undertake activities to maintain community and stakeholder awareness regarding avenues for Project information and complaints.	▪ Pastoral Stations/Lease Owners ▪ Indigenous Stakeholder and Traditional Owners ▪ NT Government Agencies ▪ Local and Regional Community	▪ Communication via email, phone etc. ▪ One-on-one meetings ▪ Website (General)	Planned
Decommissioning	▪ Update the Stakeholder Engagement Plan as necessary; and ▪ Notification of closure of the facility to relevant stakeholders; ▪ Inform local and regional community of ongoing site management following closure.	▪ Pastoral Stations/Lease Owners ▪ Indigenous Stakeholder and Traditional Owners ▪ NT Government Agencies ▪ Local and Regional Community	▪ Communication via email, phone etc. ▪ One-on-one meetings ▪ Website (General)	Planned

Section 4 Project Description

4.1 Overview

The Project will involve open-cut mining and expansion of all existing open-cut pits, and two additional new pits at Rustlers Roost and supporting infrastructure.

The mine sites are located approximately 11 km apart and are connected by an existing unsealed access track, which will be upgraded to accommodate haulage of ore from the Quest 29 satellite pits to Rustlers Roost processing facility. Ore mined at both sites will be processed at a new purpose-built processing facility located at the Rustlers Roost site to produce gold bullion. The mining operations will use a drill and blast technique involving the use of ammonium nitrate (ANFO). The rate of production will be up to 5 Mtpa over an approximately 10 year LOM.

Waste rock generated in the extraction and production process will be deposited in surface WRDs and will be used to backfill a number of pits where mine scheduling permits. At Quest 29, a new surface WRD is proposed to be developed to dispose of the waste from mining Zamu pit, with waste material from the remaining pits to be backfilled into Zamu pit. A portion of oxide material from BHS pit will also be used for rehabilitation of the decommissioned heap leach facility in the Project area. At Rustlers Roost, the majority of the waste rock material will be deposited within the existing surface WRD (expansion to the north-west) and a portion backfilled into the existing Rustlers Roost pit.

Mined ore will be processed using a CIL processing method, which extracts gold from the ore by mixing with a cyanide solution. Tailings produced from the processing facility will be deposited in a TSF to be constructed as part of the proposal. The key physical components of the Project are summarised below and further discussed in Section 4.5 to Section 4.7:

- Processing plant and ROM – The processing facility will be constructed in the northern portion of Rustlers Roost, immediately north of the WRD and will be contained in an area approximately 1000 m long and 400 m wide. The area of direct disturbance will be approximately 40 ha. The processing plant area will include the crushed ore stockpile, process water and stormwater pond, process plant infrastructure, power station and transformers, diesel facility, refuelling area, Liquefied petroleum gas (LPG) tanks, process plant and reagent stores, building infrastructure (administration, maintenance, ablutions, crib room, laboratory and prep room, mining contractor area);

- Expanded existing main pit and two minor pits at Rustlers Roost – The Rustlers Roost main pit is proposed to be expanded by approximately 57% to the east and west and increased in depth from 50 m to 175 m. Dewatering of the pits will be undertaken with diesel powered in-pit sumps. Dewatering will occur as required as a result of direct precipitation from rain events and groundwater in-flow. To access ore that has been recently identified through drilling and prevent future sterilisation through placement of the TSF over and immediately adjacent these areas, PGO is proposing to mine two small additional pits (Annie's Oakley and Annie's Dam pits). Annie's Dam pit is proposed within the TSF area, and following extraction will be utilised for placement of overburden from the main pit and will eventually be encapsulated within the TSF;

- Expanded existing pits at Quest 29 – The five existing pits at Quest 29 are proposed to be expanded and mined to a depth of 75 m from the current depth of 25 m. On completion of mining Zamu pit, the pit will be backfilled with waste material from mining of the remaining Quest 29 pits;

- Haul road – A haul road is required to transport product ore from Quest 29 to Rustlers Roosts ROM for processing. The 11 km existing access road between the Project areas will be upgraded to accommodate heavy vehicles for haulage of ore. This will require widening the existing road from approximately 10 m to 20 m, building up the road

with screening of suitable material from the existing oxide WRDs, upgrade of existing culverts and construction of a new bridge at the Mount Bundey Creek crossing closest to Rustlers Roost;

- Accommodation camp – Due to the remote location of the Project area, construction of an accommodation camp is required to accommodate the construction and operational workforce within proximity to the mine. The accommodation camp, to be located in the Toms Gully ML, will have an overall capacity of approximately 202 personnel and will accommodate personnel for both the Rustlers Roost and Quest 29 operations;

- Tailings storage facility – The TSF will be located in the southern section of ML 1083 and will occupy 243.0 ha of land. The TSF size is based on a nominal tailings disposal volume of over 4 Mtpa for a total of 48 Mt capacity (i.e. 10 years production). The TSF will be raised in height progressively over a 10-year period to reach storage capacity for the LOM;

- Rustlers Roost waste rock dumps – The area including and to the north of the existing U-shaped WRD will be the designated location for the disposal of waste rock from Rustlers Roost pit. Waste rock will be placed in two separate WRDs termed the northern WRD and the southern WRD. A total of 50.9 Mt of waste material will be produced from the main Rustlers Roost pit. Approximately 45.6 Mt will be placed within the surface WRDs and 5.36 Mt of fresh waste backfilled into the pits;

- Quest 29 waste rock dump – The proposed surface WRD at Quest 29 will be developed in the area north of Zamu Pit. This was selected to minimise haulage distances for the initial stage of mining Zamu pit. During construction the WRD face angle will be 37°, with a berm width of 19.5 m and 4 x 10 m lifts. The WRD construction will commence with the placement of non-acid forming (NAF) material for the base and outer annulus. Potentially acid forming (PAF) material encountered will be placed onto of the NAF base and encapsulated within the centre of the WRD. No PAF material will be placed on outer perimeter, slopes, toe, surface or base of the dump;

- Mine laydown area – A compacted earth mine laydown area covering approximately 6.0 ha will be constructed in the Rustlers Roost portion of the Project area;

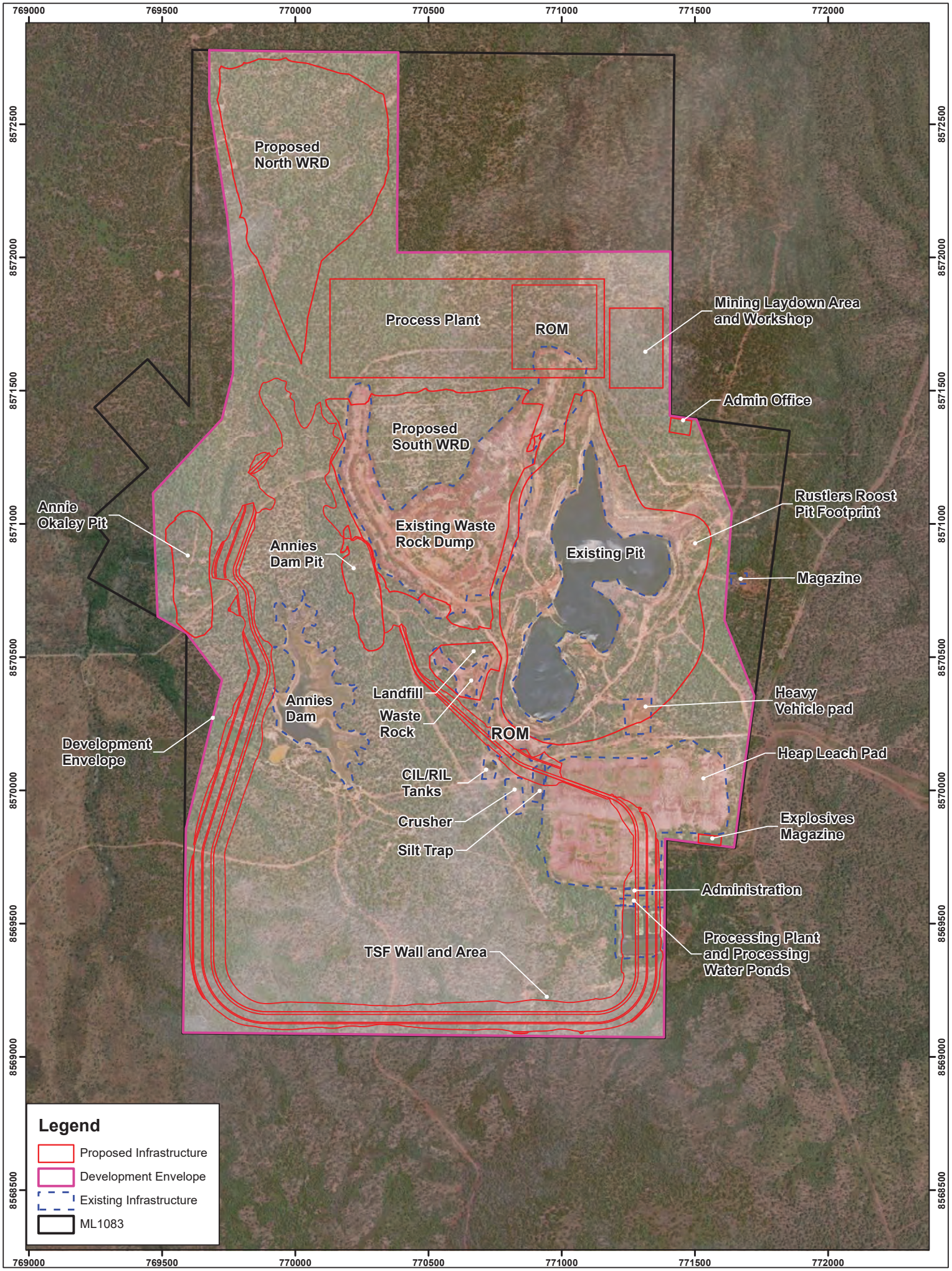
- Administration facility – An administration facility covering approximately 0.42 ha will be constructed in proximity of the laydown area and processing facility in the north of Rustlers Roost; and

- Landfill – A landfill is proposed to be constructed at Rustlers Roost encompassing largely disturbed land to the west of the main pit and east of the TSF. The landfill will be constructed over 4.0 ha to a depth of 5 m and be utilised for the 10 year Project period.

The recommencement of mining operations will enable the employment of approximately 210 people during the production process and an estimated capital expenditure investment of $282 million, with a total operational expenditure over the 10 year LOM of $344.3 million (refer to Section 7.6). Approximately, 100 people will be required for the construction stage and locally sourced construction material will be prioritised.

The disturbance footprint is defined as the direct disturbance area. The mine development envelope is defined as the maximum area within which the proposed footprint will occur. This terminology has been used below to assess the overall extent of potential disturbance.

The existing and proposed disturbance footprints for the Rustlers Roost and Quest 29 portion of the Project area are presented in Figure 4-1 and Figure 4-2 respectively.



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DRAWN	SS	CHECKED	TK
APPROVED	TK	DATE	19/07/21

Notes:

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0 95 190 380

Meters
1 cm = 125 meters
GCS GDA 1994 MGA Zone 52

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DATA SOURCE
NT Government Open Source Data

DESIGNER
CDM Smith

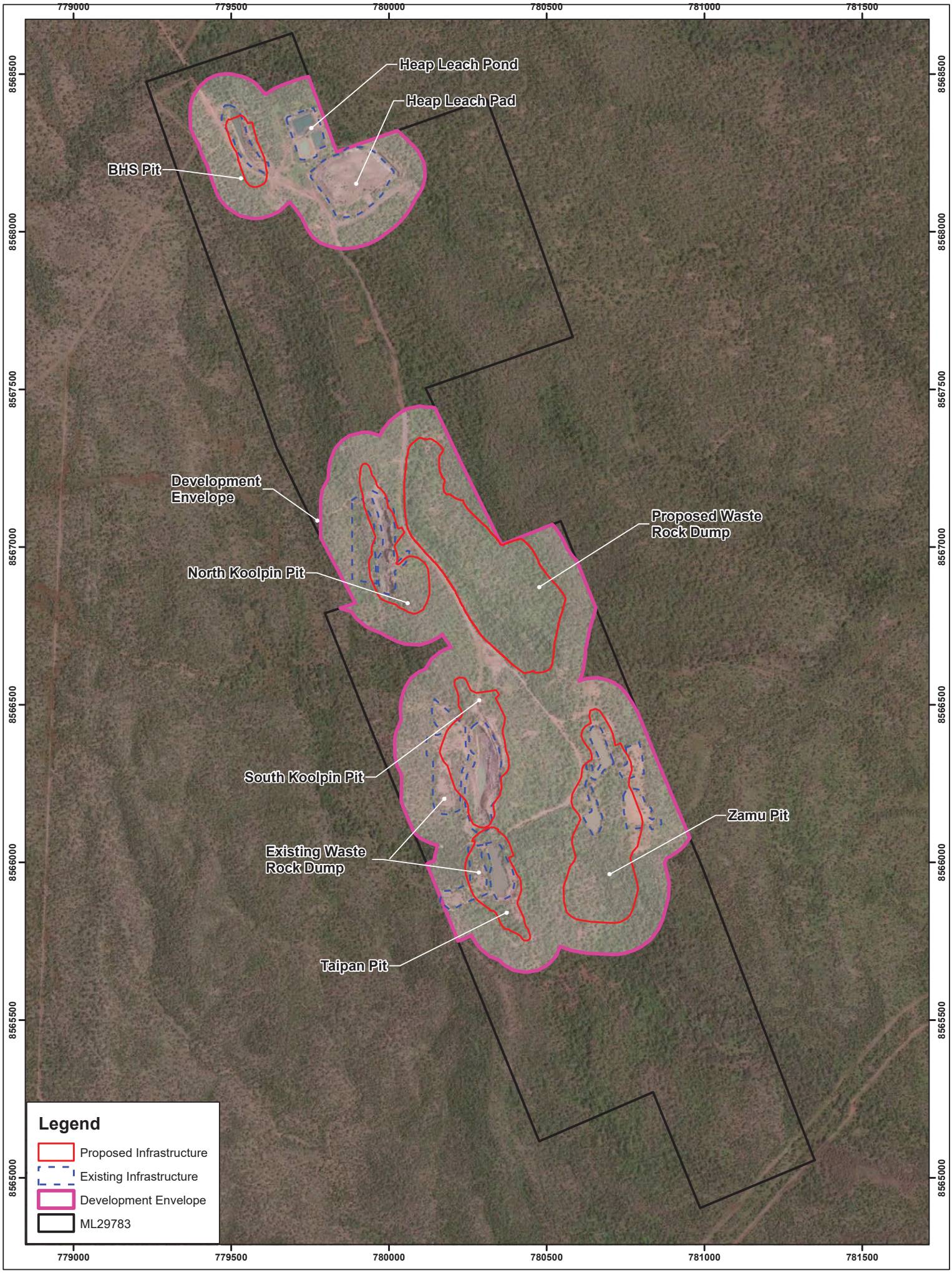
CLIENT
PRIMARY GOLD

FIGURE 4-1

Rustlers Roost Existing and Proposed Disturbance Footprint

DRG Ref: 1001087-EIS-04-4.1

\\bgaTsvr1\Projects\US DOT\AustRoads\Hanking Gold Mine EIS\1001087 - Rustlers Roost EIS\1001087 - Rustlers Roost EIS\02 MXD\Chapter 4\Figure 4-1.mxd



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APPROVED	TK	DATE	22/07/21

Notes:

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Meters
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DATA SOURCE
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FIGURE 4-2

Quest 29 Existing and Proposed Disturbance Footprint

DRG Ref: 1001087-EIS-04-4.2

\\bga1swr1\Projects\US DOT\Aust\Roads\Hanking Gold Mine EIS\1001087 - Rustlers Roost EIS\1001087 - Rustlers Roost EIS\02 MXD\Chapter 4\Figure 4-2.mxd

4.2 Resource Details

In accordance with the Australasian Joint Ore Reserve Committee (JORC) 2012 guidelines, the proved ore reserve estimate is based on mineral resources classified as measured, and the probable ore reserve is based on indicated classified mineral resources. The reported mineral resource estimate is inclusive of the resources converted to ore reserves. The resource estimate is based on a cut-off grade of 0.35 g/t for Rustlers Roost and 0.385 g/t for Quest 29. The total Project ore reserve is provided in Table 4-1.

Table 4-1 Project Ore Reserve Summary

Description	Units	Rustlers Roost	Quest 29	Total
Probable	Mt	42.1	2.8	**44.9**
	g/t	0.83	1.14	**0.85**
	Mozs	1.13	0.10	**1.23**
Waste	Mt	56.4	12.1	**68.5**
Total	**Mt**	**98.5**	**14.9**	**113.4**

The Rustlers Roost deposit is hosted within a turbidite sequence within the Mt Bonnie Formation (Figure 4-3). The sequence is at least 1,500 m thick and comprises shale, siltstone, minor tuff, greywacke and bedded chert units (GR Engineering 2021). Sedimentary units outcrop as banded carbonaceous siltstone and mudstone. The sediments have undergone regional greenschist grade metamorphism and later contact metamorphic events.

The gold mineralisation at Rustlers Roost is located on both sides of the west to south-west dipping fold limb between the Backhoe Syncline to the west and the Dolly Pot Anticline to the east. Elevated gold grades (>0.5 g/t Au over 2 m intervals) were obtained mostly from intervals that contain one or more sulfidic chert beds. These chert beds are generally only 5-20 cm thick and less commonly 20-40 cm thick and comprise only 10-20% of the sample intervals, predominantly from RC and diamond drilling.

Oxide resources of 4.71 Mt at 1.05 g/t Au were mined and heap-leach treated between June 1994 and March 1998 for a return of 113,000 ounces of gold (estimated at 71% recovery). From 2017 to 2020, further infill, step out and deep drilling programs have been conducted within the resource area and on nearby prospects. A total of 95 holes for 15,015 m of RC and diamond drilling has been completed by PGO since the previous resource work in 2017, including regional prospects drilling. Drill holes that were used to inform the 2021 totalled 36 holes for 8,667 m of RC and diamond drilling.

The mineral resource area has an overall length from south to north of approximately 1,450 m, with the current known width from west to east of the mineralisation envelope being approximately 1,300 m. The modelled sedimentary sequence within a broad fold hinge in cross-section, has a maximum width of 200 m and when unfolded, varies between 50 m to 100 m true thickness. The mineral resource is currently modelled to approximately 350 m vertical depth.

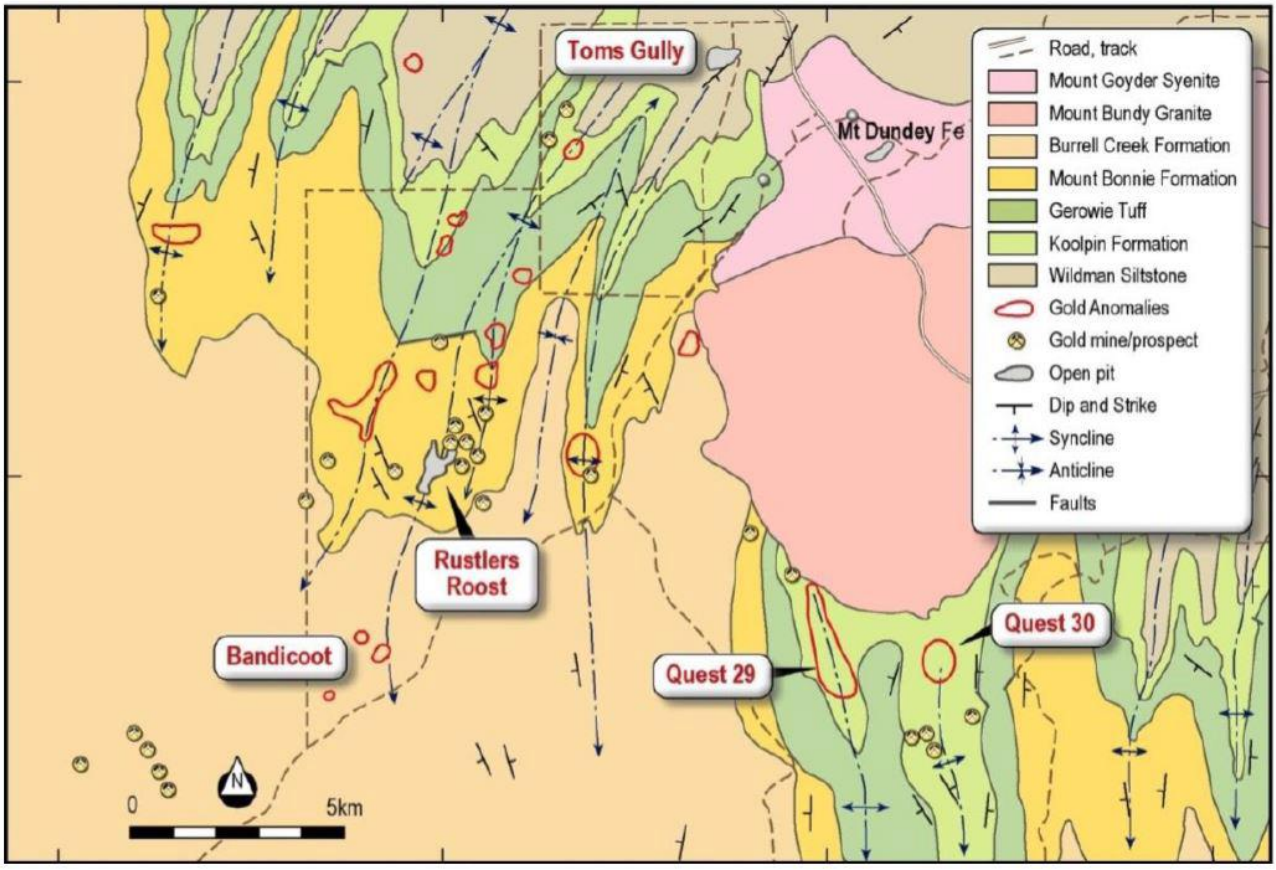


Figure 4-3 Geology and Structures of the Mount Bundey Area (GR Engineering 2021)

4.3 Existing Disturbance and Proposed Footprint

4.3.1 Existing Disturbance Footprint

PGO has been operating in accordance with approved separate care and maintenance MMP for both the Rustlers Roost and Quest 29 areas (both re-submitted in 2020). The MMPs provide existing disturbance areas based on historic documentation and aerial imagery analysis. Table 4-2 provides these disturbance areas from the MMPs for Rustlers Roost and Quest 29. The existing disturbance areas for the haul road and accommodation camp have been established from aerial imagery analysis and review of mapped vegetation layers.

Table 4-2 Existing Disturbance Footprint within the Project Area

Description Area	Existing Disturbance (Ha)
Rustlers Roost	
Waste Rock Landforms and Extractive Product Stockpiles	66.2
Pits	27.0
Water Dam and Leach Ponds	3.3
Access and Haul Roads	19.6
Accommodation Camp	2.0
Infrastructure	8.4
Sub-total 1	**126.5**
Quest 29	
Waste Rock Landforms and Extractive Product Stockpiles	10.95
Pits	8.65
Water Dam and Leach Ponds	1.3
Access and Haul Roads	0
Accommodation Camp	0
Infrastructure	0
Sub-total 2	**20.9**
Accommodation Camp	
Existing Road Disturbance	2.3
Sub-total 3	**2.3**
Haul Road	
Haul Road	19.7
Sub-total 4	**19.7**
Total	**169.4**

4.3.2 Proposed Disturbance Footprint

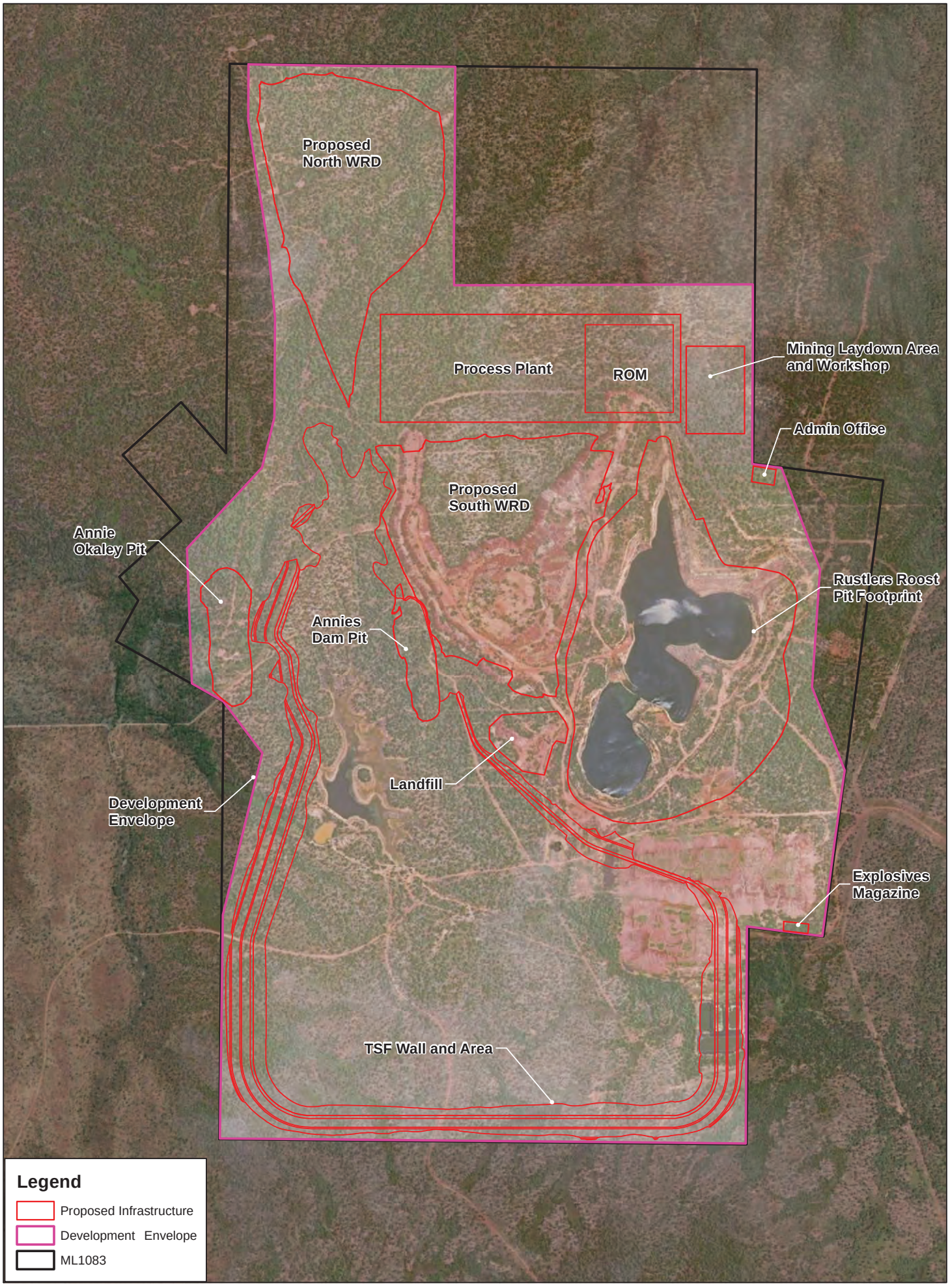
The proposed disturbance footprints for the Project have been calculated using current native vegetation mapping layers. The Rustlers Roost mine development envelope will encompass 611.0 ha, of which 277.6 ha is mapped as being previously cleared/disturbed by historic mining or pastoral activities. The Project will require clearing of a further 333.4 ha of land mapped as containing native vegetation. This clearance value is based on disturbing the entire development envelope, which is considered overly conservative.

The Quest 29 mine development envelope will encompass 139.5 ha, of which 46.7 ha is mapped as being previously cleared/disturbed by historic mining or pastoral activities. The Project will require clearing of a further 26.16 ha of land mapped as containing native vegetation. This clearance value is based on infrastructure footprints within the development envelope.

The accommodation camp development envelope encompasses 17.8 ha, of which 2.3 ha is mapped as being previously disturbed by existing roads. The Project will require clearing of a further 7.3 ha of land mapped as containing native vegetation. This clearance value is based on disturbing the entire development envelope, which is considered overly conservative.

The haul road development envelope will encompass 21.7 ha, of which 19.7 ha is mapped as being previously disturbed by the existing haul road and bridges. The Project will require clearing of a further 2 ha of land. This clearance value is based on disturbing the entire development envelope.

The total mapped vegetation clearing extent for the Project is conservatively calculated at 368.86 ha.



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APPROVED	TK	DATE	27/07/21

Notes:

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Meters
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GCS GDA 1994 MGA Zone 52

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DATA SOURCE
NT Government Open Source Data

DESIGNER CDM Smith

CLIENT PRIMARY GOLD

FIGURE 4-4

Rustlers Roost Proposed Site Layout

DRG Ref: 1001087-EIS-04-4.3

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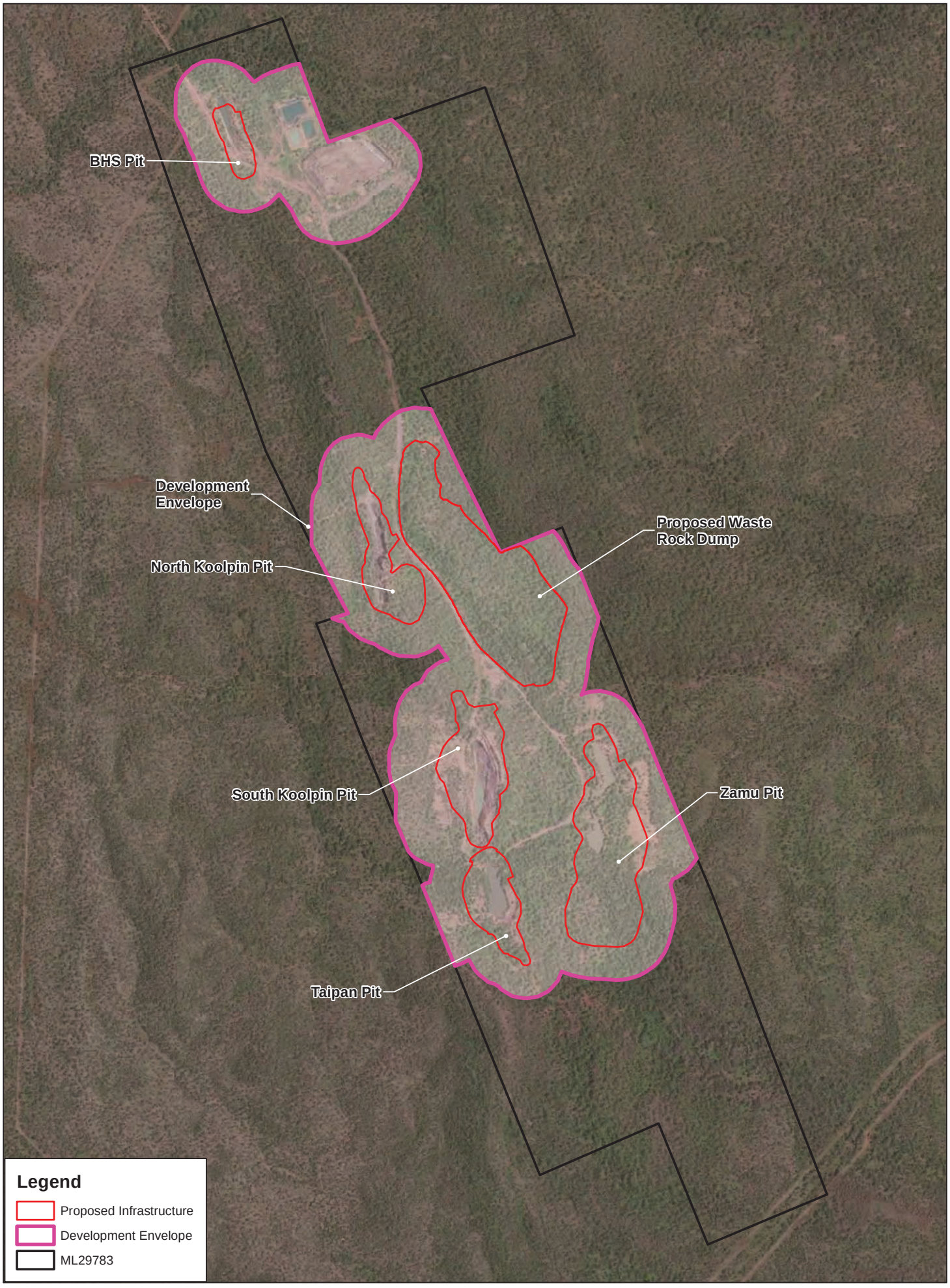

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Notes:

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Meters
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DATA SOURCE
NT Government Open Source Data

DESIGNER
CDM Smith

CLIENT
PRIMARY GOLD

FIGURE 4-5

Quest 29 Proposed Site Layout

DRG Ref: 1001087-EIS-04-4.4

\\bga1svr1\Projects\US DOT\Aust\Roads\Hanking Gold Mine EIS\1001087 - Rustlers Roost EIS\1001087 - Rustlers Roost EIS\02 MXD\Chapter 4\Figure 4-4.mxd

4.4 Project Schedule

Subject to receipt of all relevant government approvals, PGO intend to commence mining activities in Q2 of 2022 with site preparation and construction activities. The proposed Project timeline is provided in Figure 4-6.

4.4.1 Construction

Construction activities will occur within the first 12 months following approvals. Construction will employ 100 full time personnel, comprised of mainly contractors. Construction will be undertaken between up to 24 hours per day, and activities will include:

- Land clearing and site preparation;
- Upgrade of access/haul road;
- Office/administration and amenities;
- Processing facility;
- Accommodation camp; and
- Construction of TSF.

4.4.2 Operations

Mining operations will commence in year two on completion of the critical infrastructure. The Rustlers Roost open-cut pit mining schedule is proposed to occur in five stages over an approximate 9 to 10 year duration.

Quest 29 will be mined over a 4 to 6-year period in five stages as a satellite reserve to feed the processing plant located at Rustlers Roost.

4.4.3 Processing

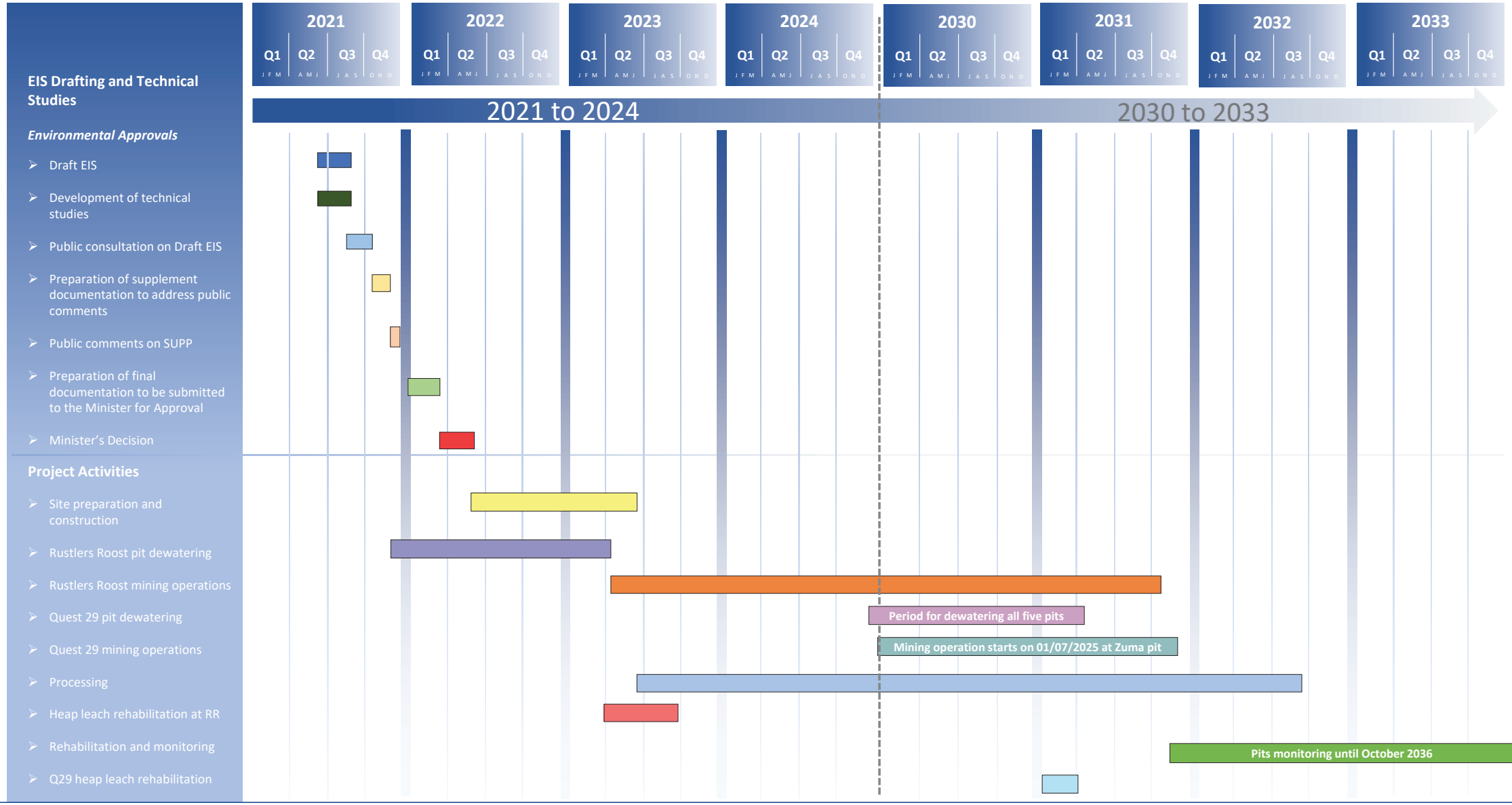
Processing will occur in year two following commencement of mining and will be on-going (24/7) for the ten year mine duration. Processing will continue for a number of months following cessation of mining until all remaining ore stockpiles have been processed.

4.4.4 Closure and Rehabilitation

During operations, rehabilitation will be undertaken on the decommissioned heap leach facilities at Quest 29 and Rustlers Roost using suitable available oxide waste material.

The proposed surface WRD at Quest 29 will be rehabilitated during year three following mining of the first pit (Zuma). The Rustlers Roost surface WRD will be rehabilitated on completion of mining during year eleven, as oxide material from the existing WRD will be utilised to ensure sufficient available oxide capping material for the WRD expansion. The TSF will be rehabilitated at completion of processing (year eleven) following sufficient drying time prior to capping and revegetation. All infrastructure will be removed from site and disturbed areas will be rehabilitated.

Figure 4-6: Project Timeline



4.5 Construction Activities

Proposed areas of disturbance will be progressively cleared as required and with consideration of seasonal conditions to reduce the potential for erosion (e.g. the wet season). The methodology for removal of vegetation from the open pits and WRDs will be consistent over the two sites and will be conducted by a standard clearing and grubbing method. The topsoil will be stripped and stockpiled adjacent to the pit and dumps for reuse during rehabilitation. Any cleared material from the historic mining activities that cannot be recycled will be placed in the onsite landfill. A waste segregation area will be established in the laydown to properly manage and sort material prior to recycling or landfilling.

Dewatering will be required prior to mining at Rustlers Roost and Quest 29. At Rustlers Roost it is proposed that this water will be pumped out of the pit and discharged during the wet season into the drainage lines. For Quest 29 each pit will be dewatered into other existing pits. Therefore, the first pit for expansion at Quest 29 will be dewatered during the construction phase for the entire Project.

The key components to be constructed on site will be the processing facility, TSF, haul road upgrade and landfill and further details of these components are provided below.

4.5.1 Processing Plant

4.5.1.1 Overview

The processing facility will be constructed in the northern portion of Rustlers Roost, immediately north of the WRD and will be contained in an area approximately 1000 m long and 400 m wide (Figure 4-4). The area of direct disturbance will be approximately 40 ha. The processing facility location and layout were selected based on the following criteria:

- The ROM pad will be located to the north of the existing pit and outside the 500 m blast radius;
- The process plant site and ROM pad will be located as close to the open pit ramp as practical, thus reducing haulage distances;
- The process plant site will be formed with a low slope to minimise stormwater flow. Any stormwater flow collected will be directed towards the stormwater pond (Figure 4-7);
- The main administration building will be located in the vicinity of the main access road to allow visitors to visit the administration personnel without exposure to the mining and processing areas;
- The warehouse and workshop will be located adjacent and close to the process plant;
- The office, crib room and toilet block will be grouped at one location;
- Annie's Dam wall will be refurbished, and the dam utilised as an interim raw water storage until such time as it is consumed in the TSF; and
- The internal plant roads and access hard stands will be wide enough to enable a 50 t mobile crane to be set up for maintenance at the required locations.

The processing plant area will include the crushed ore stockpile, process water and stormwater pond, process plant infrastructure, power station and transformers, diesel facility, refuelling area, Liquefied petroleum gas (LPG) tanks, process plant and reagent stores, building infrastructure (administration, maintenance, ablutions, crib room, laboratory and prep room, mining contractor area) (Figure 4-7). Construction of the processing plant will include:

- ROM Area – The ROM area will be constructed in two phases. The earthworks contractor will remove topsoil and clear and grub the area of the ROM pad immediately adjacent to the crusher retaining wall. The earthworks contractor will backfill the area behind the crusher retaining wall to the extent required for support of the wall, using suitable material from the waste dump.

  The second phase of ROM pad construction will be undertaken by the surface mining fleet following the commencement of surface mining. The surface fleet will dump waste from the surface mining operations to form the ROM pad. The ultimate size and shape of the ROM pad will be determined by mining, subject to the ore and waste storage requirements of the operation.

- Processing Plant Buildings – The administration buildings will be established close to the mine access road at the entrance to the mine site facilities (i.e., south-east of the proposed process plant). A car park will be constructed adjacent to the administration buildings to provide parking for the public. The administration building complex will include the following transportable buildings with approximate dimensions:

  – Main administration/processing office (18 m long by 15 m wide).

  – Training and induction building (9 m long by 6 m wide).

  – First aid and emergency response training building (14.5 m long by 10 m wide).

  – A plant crib room (12 m long by 3 m wide).

  – Plant toilet block (12 m long by 3 m wide).

  – The processing plant workshop office (24 m long by 18 m wide).

  – Warehouse and stores office (24 m long by 18 m wide).

- Processing Plant Workshop – A processing plant workshop will be a single clad, steel framed building, approximately 24 m long by 18 m wide with 5 m eaves. The building will include a dividing wall on one end separating the boiler making area. The building will include roller doors of 5 m width, front and rear for vehicle access. The floors will be concrete, and each doorway will include a roughly 6 m wide concrete apron. High bay lighting will be included with roof and wall vents.

- Plant Stores – A warehouse will be contained within a single clad, steel framed building, approximately 24 m long by 18 m wide with 5 m eaves. Each section of the building will include two roller doors of 5 m width, front and rear for vehicle access. The floors will be concrete, and each doorway will include a 6 m wide concrete apron. High bay lighting will be included with roof and wall vents. A fenced compound will be installed at the rear of the warehouse to enable secure storage of large bulk items.

- Gold Room Building – A steel framed building approximately 20 m long by 7.5 m wide and with 10 m eaves will be constructed for the gold room. The building will be insulated and lined with security mesh. A 4 m wide roller door and heavy-duty personnel access door will be included. A mezzanine floor will be installed for the electrowinning cells. The electrowinning cells rectifiers will be installed in a lean-to section abutting the gold room. A security system will be installed in the gold room.

- Assay Laboratory – An assay laboratory and sample preparation shed will be installed at the site. The purpose of the facility is to support the metallurgical control of the processing plant and is not intended to process large quantities of solid samples from grade control or daily process plant control. An off-site commercial laboratory will be used for bulk samples.

The sample preparation area will consist of a clad steel framed building and will be approximately 15 m long by 8 m wide and approximately 3 m high. The building will have a concrete floor and a concrete apron to the laboratory building. The sample preparation area will be fitted with dust extraction, size reduction, screening and metallurgical testing equipment. A covered breezeway will be installed between the sample preparation building and the laboratory.

The laboratory will be approximately 14.5 m long by 3.5 m wide transportable building. The laboratory will be equipped to analyse a limited number of solution samples for process control purposes. The laboratory will be equipped with fume cupboards, an atomic absorption spectrophotometer (AAS) and miscellaneous equipment required to support the services.

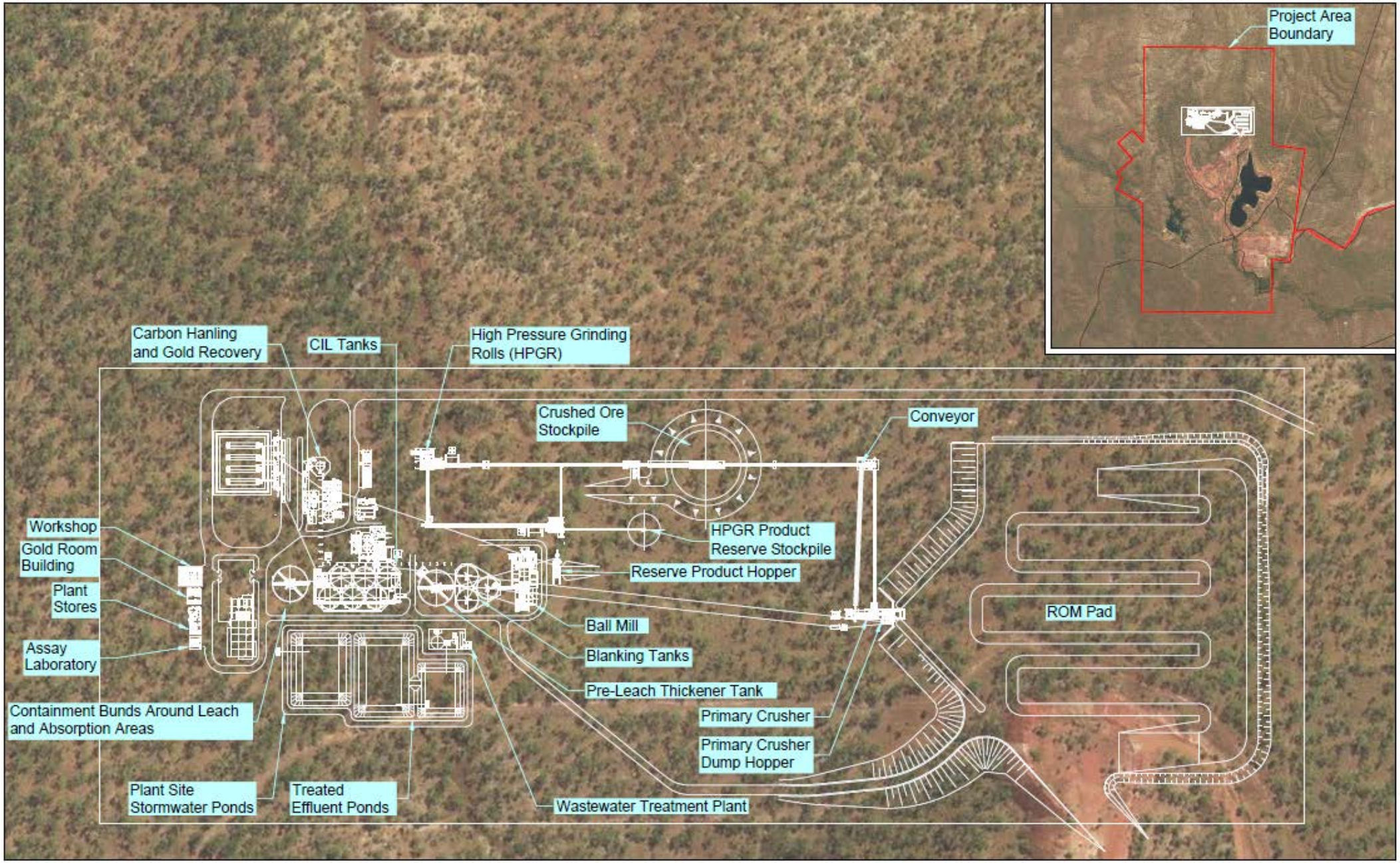
- Light Vehicle Wash Bay – A wash down bay for plant equipment and light vehicles will be installed adjacent to the processing plant workshop. This facility will consist of a bunded concrete slab, a drive-in sump to pick up solid waste with a bobcat, an oily water separator and sump pump.

- Plant Site Drainage Pond – A drainage and stormwater pond will be excavated at the southern end of the processing plant to capture rainwater runoff from the plant area and capture any spillage from the plant. The event pond will have a capacity of 10,000 m^3, sufficient to contain the runoff from a 1 in 100-year average recurrence interval (ARI), 72-hour storm event. A submersible pump will be installed in the site drainage pond and will periodically transfer water from the pond to the processing plant.

- Sewage Treatment – Non-production waste sewage generated at the mine and processing plant will be treated using a package Sewage Treatment Plant (STP). The treated effluent will be discharged through sub-surface irrigation using an arrangement similar to a French drain. Further details of the package STP are provided in Section 4.5.3.4.

Cyanide leaching will be used for recovering gold from ore, with the CIL processing method of extraction. Carbon recovery involves the activation of carbon by adsorbing the gold onto the surface of the carbon. Due to the high graphite content in some of the ore, the process requires crushing and milling, followed by a blanking stage to deactivate carbonaceous/graphite material, prior to the CIL process to extract the gold (Figure 4-8).

Tailings within the processing circuit will be screened to recover carbon and will then go through a detoxification to remove residual cyanide. The recovered carbon and residual cyanide will be reused in the processing circuit. The tailings will be thickened at the processing facility prior to being pumped to the TSF for disposal.



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1 cm = 161 meters

GCS GDA 1994 MGA Zone 52

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FIGURE 4-7

Processing Plant Layout

DRG Ref: 1001087-EIS-04-4.15

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4.5.1.2 Processing Plant Circuit

The process plant for the Project will be designed to process up to 5 Mtpa of gold ore. The plant will be designed to operate 24 hours a day seven days per week at a nominal treatment rate of 500 dry t/h. The design milling utilisation is 91.3% or 8,000 hours per year. The process facility will utilise recognised technology for gold processing circuits and follows a processing route described below (also illustrated in Figure 4-8):

- Two stage crushing using a primary gyratory crusher and a secondary cone crusher to produce a -30 mm crushed product to be stockpiled;
- A High Pressure Grinding Rolls (HPGR) circuit closed with wet fines screens to yield a final crushed product of 80% passing 3.4 mm, with an ancillary dry screening circuit to produce additional fine feed to a stockpile to maintain feedstock for the ball mill if the HPGR is off-line;
- Grinding in a single ball mill circuit closed with hydrocyclones to achieve a product size of 80% passing 75 µm;
- Treatment of a portion of the cyclone underflow stream by centrifugal gravity concentration, followed by batch intensive leaching of the gravity concentrate and electrowinning of the resulting pregnant solution;
- Addition of diesel into the cyclone overflow slurry as a blanking agent to counteract the preg-robbing carbonaceous material in the ore;
- Thickening of the leach feed stream to 55% solids prior to leaching, with recycling of the thickener overflow water (with no cyanide) to the HPGR wet screening circuit and to the grinding circuit;
- Leaching and adsorption in a CIL circuit comprising six CIL leach/adsorption tanks;
- Hydrochloric acid washing of the loaded carbon followed by elution with a sodium cyanide/sodium hydroxide eluant in a dual column split Anglo American Research Laboratory (AARL) elution circuit, with integral electrowinning; and
- Smelting of cathode sludge from electrowinning to produce a final product of gold doré.

Process water containing cyanide will be recycled from the back end of the process, from the tailings thickener and the TSF, to the process water pond. This will be a nominal 2,000 m³ capacity pond lined with 1.0 mm HDPE. During normal operation, the level in this pond will be managed to maintain the level at approximately 90% full. If the pond is over-filled, it will overflow to the site drainage pond. Water from the site drainage pond will be returned to the process water pond as required.

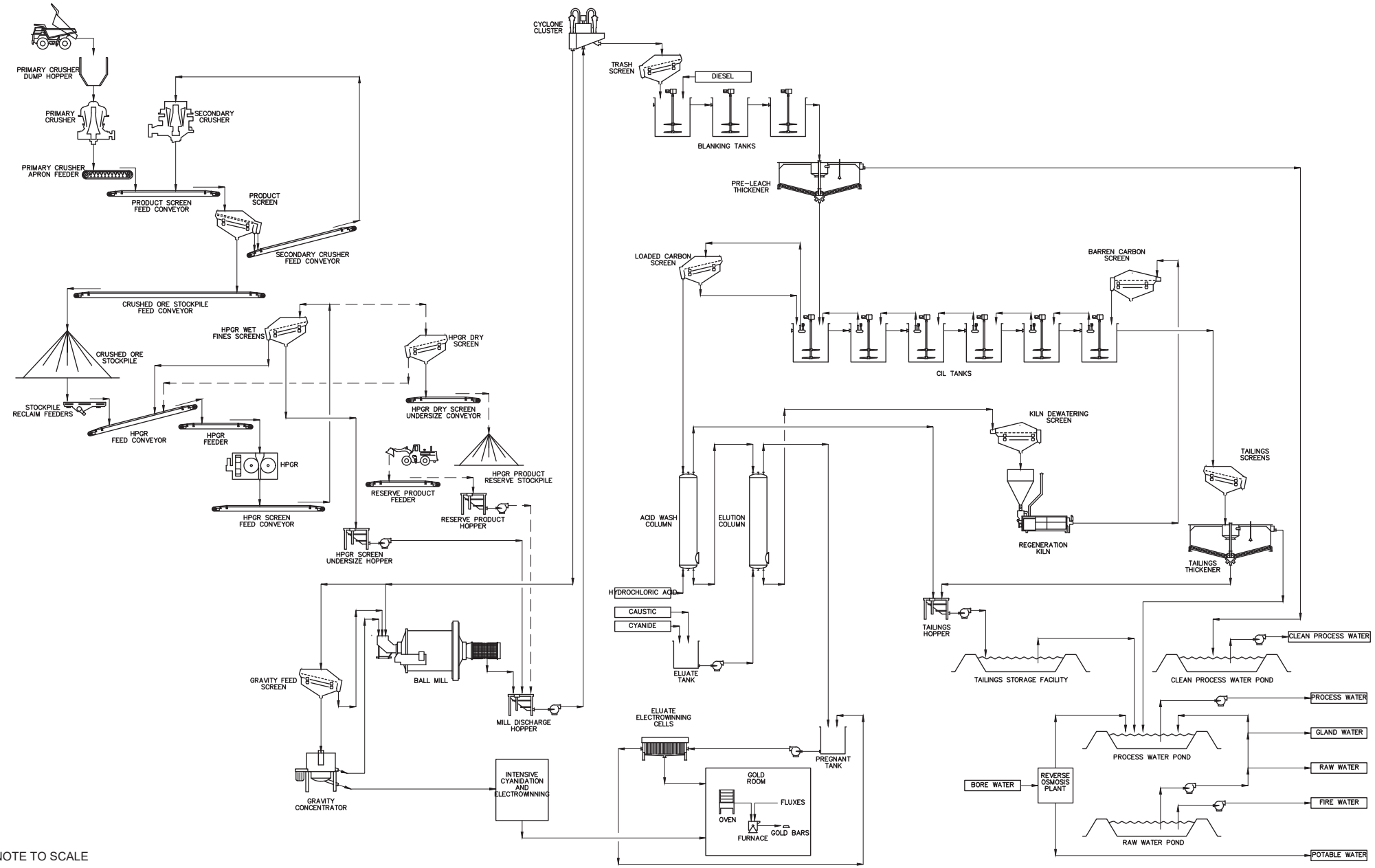

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FIGURE 4-8

Processing Plant Circuit

DRG Ref: 1001087-EIS-04-4.7

4.5.1.3 Process Plant Power

A 31 Megawatt (MW) gas-fired power station, to be located adjacent to the process plant, will provide power for the plant and other operations at Rustlers Roost. The power station will be located adjacent to the processing plant and within the nominated plant and ROM footprint. Power will be generated and supplied to the main switchboard at the process plant at 11 kV. An indicative image of such a power station is provided in Plate 4-1.

The power station is proposed to be designed, constructed and operated by an independent power provider (IPP) on a build-own-operate (BOO) or build-own-operate-transfer (BOOT) basis. The power station will initially be supplied by trucking gas to the site until a permanent gas pipeline is connected from the existing network. The route of a connecting pipeline is currently under investigation by the IPP and will be subject to separate environmental studies and will be required to address environmental regulatory approvals separate to the Project. An indicative configuration for the power station is detailed in Table 4-3.

Table 4-3 Anticipated Power Station Configuration

Component	Details
Fuel	Natural Gas
Fuel Transport	Initial operation – trucking (maximum 12 months) Ongoing operation – gas pipeline
Gas Engines	25 MW – (10 x 2.5 MW CAT G3520H)
Battery Energy Storage System (BESS)	6 MW/6 MWh
Total installed capacity	31 MW

During the feasibility design for the Project, several power supply options for the processing plant were investigated including the use of solar, diesel generators and extension of the high voltage lines from the Arnhem Highway to the Rustlers Roost portion of the Project area. However, LNG was selected as the preferred fuel source due to capacity constraints of the existing mains network, large spatial extent required for a suitable solar plant and the ability to connect the plant into an existing gas pipeline, thus removing the requirement to truck fuel. It is also notated that LNG has a significantly lower emissions factor than diesel (DISER 2020) and is thus a better option when considering GHG emissions.

Plate 4-1 Indicative Power Station

4.5.1.4 Power Distribution

Power will be distributed throughout the site at a voltage of 11 kV. The main 11 kV switchboard will be located in a substation adjacent to the power station, and it will be used to distribute power to the following substations:

- Crushing area;
- Reclaim and HPGR;
- Grinding and Classification area;
- Leaching and tails area;
- Administration area;
- Water services area; and
- Open pit mining area.

Power will generally be distributed to the substations via buried cables. Separate 11 kV overhead power lines feeding directly from the power station will distribute power to the Rustlers Roost bores, Annie's Dam and tailings return water pumps.

Transformers will be installed in fenced, bunded compounds located adjacent to the low voltage switchboard or motor control centre that they supply. Prefabricated transportable switchrooms constructed from non-combustible materials and fitted with smoke detection and handheld fire extinguishers will be installed in the plant areas. The switchrooms will be elevated above the ground on either concrete or steel plinths to allow for the installation of cables from below the building floors. These switchrooms will house the 415 V and 690 V motor control centres, variable speed drives, instrument marshalling and programmable logic controller cubicles for the various areas of the plant.

The plant electrical, control and instrumentation systems will all be designed and installed in accordance with the relevant Australian standards and statutory requirements.

4.5.1.5 Lighting

LED lighting will be used for general plant lighting. Battery back-up lighting will be installed in all switch-rooms and access ways to ensure safe evacuation is possible in the event of a blackout. Small power circuits feeding socket outlets and lighting circuits will be protected by residual current devices.

4.5.1.6 Fire Water

An electric fire water pump, a diesel-powered back up pump and electric jockey fire water pump will draw raw water from the base of the raw water pond to supply fire water to hydrants and hose reels located throughout the process plant. The raw water pond will have a nominal 1,000 m^3 dedicated fire water reserve capable of sustaining two fire hydrants for at least four hours.

4.5.2 Tailings Storage Facility

4.5.2.1 Overview

The TSF will be located in the southern section of ML 1083 and will occupy 243 ha of land. The TSF size is based on a nominal tailings disposal volume of over 4 Mtpa for a total of 48 Mt capacity (i.e. 10 years production). The TSF will be raised in height progressively over a 10-year period to reach storage capacity for the LOM.

The embankment alignment is designed to take advantage of natural topography (ridge lines) to reduce the volume of embankment construction materials required. The TSF is designed to encapsulate the existing Annie's Dam. The TSF footprint has been limited to provide a 50 m corridor between the downstream toe of the embankment and the site boundary.

The TSF has been designed to store a total of 48 Mt of tailings. The required stormwater storage capacity has been confirmed as part of the dam break and consequence category assessment for the TSF completed in accordance with ANCOLD (refer to Section 0 and Appendix F). The embankment will be constructed in staged raises, with the upstream low permeability zone and any transitional material zones being constructed by a specialised earthworks contractor. The downstream structural fill zones will be progressively constructed by the mining fleet as part of the mine operations.

TSF construction will occur during the dry season of the construction and development phase. The area will be cleared and topsoil stripped and stockpiled for later use. The foundation will be worked and any unsuitable material removed to prepare the ground for construction.

Construction material will be sourced from within the TSF basin as well as pre-stripped areas of the initial Rustlers Roost main pit redevelopment. Suitable (geochemically benign and structurally apt) mine waste material (waste rock and existing heap leach dump) will be used for the construction of the TSF. The current estimate of construction material volumes is 1,179,000 m^3 over a 20.4 ha embankment as part of the initial stage of TSF development, and 5,590,000 m^3 over 41.7 ha for the final layout.

The finalised TSF lining design requirements will be determined from the geochemical characterisation of the ore. It is not expected that tailings will contain high levels of cyanide, as residual cyanide will be removed from tailings during the refining process and re-used in the processing circuit.

The TSF design parameters are provided in Table 4-4.

Table 4-4 Tailings Storage Facility Design Parameters

Component	Criteria
Throughput Storage Capacity - Stage 1 - Stage 10 (Final)	>4.0 Mtpa 5.33 Mt (16 months) 48 Mt
Tailings density - Stage 1 - Final	 1.0 t/m^3 1.4 t/m^3
Tailings beach slope	150H:1V
Tailings beach slope 150H:1V Cut-off Trench	Upstream toe cut-off through residual/transported material.
Embankment	Multi-zoned earth fill embankment, with upstream low permeability zone and downstream structural zone.

Component	Criteria
Raise technique	Downstream raise construction methods for all raises
Basin treatment	Compacted Soil Liner (CSL) over entire TSF basin area.
Underdrainage	System of finger and collector drains within low lying areas of the TSF basin.
Design speed	A turret system connected to an access causeway located with the TSF basin and will be used to draw water from the supernatant pond and will be relocated as required (nominally every 2 3 months during early stages of operation, reducing to annually) as the supernatant pond migrates up the valleys. The turret system will be located initially within the eastern valley of the TSF, before being relocated to the western valley in approximately month 8 of operation. The Turret will be moved along the causeway to in the latter stages of Stage 1, before being lifted into Annie's Dam reservoir, where the Turret will remain during subsequent operation (with some migration further up slope as required).
Construction materials Low permeability fill (Zone A) Structural fill (Zone C)	Selected low permeability borrow material or selected mine waste stockpile for use by civil contractor fleet. Mine waste (placed by the mining operations) and traffic compacted by loaded haul trucks.
Embankment slopes - Intermediate - Closure	3H:1V Downstream 2H:1V Upstream 3.5H:1V downstream (overall), with 5 m horizontal benches at 10 m height increments.
Cover profile	Generally shaped to achieve dry closure with no ponding (water shedding).
Capping	Coarse rockfill over tailings (nominal 0.5 m thickness), Low permeability mine waste (nominal 0.3 m thickness), Covered with topsoil (0.2 m), revegetation.

Note – the final tailings are unlikely to contain sufficient gold residuals to make reprocessing of tailings economical and therefore this Project does not account for tailings reprocessing.

4.5.2.2 Dam Break and Consequence Assessment

As part of the Project feasibility design a TSF dam break and consequence assessment was completed in order to establish severity of impact and population at risk in the event of a dam failure, and to assign minimum design criteria for the facility (Appendix F).

A consequence assessment was completed for the TSF in accordance with the requirements of the Australian National Committee on Large Dams (ANCOLD) "Guidelines on the Consequence Categories for Dams" (2012). The severity rating of a facility is derived by considering the potential impacts of a significant embankment breach and resulting release of tailings slurry in terms of safety, environmental and economic factors.

A dam breach assessment was conducted for potential dam break scenarios for both the eastern and western embankments assuming significant loss of containment (Knight Piesold Consulting 2021) (Appendix F). Dam breach modelling is based on the impact should a failure occur and does not consider the likelihood of such a failure occurring. The identified flow paths were used to determine the population at risk, the severity of damage and loss, and hence the consequence category of the facility. For this assessment, the possible breach flow paths for each embankment at final height (when the facility is at its maximum tailings storage volume) were assessed.

Based on analysis of aerial imagery and topography, it is recognised there is risk of a tailings breach impacting downstream receptors including the Adelaide River or Mary River, national parks, local agriculture and large floodplains. A number of sites and local access roads are at risk of being cut off and a number of unclassified buildings are located

downstream of the TSF. Based on categorisation in line with ANCOLD (2012) the dam failure consequence category is high A. In accordance with the ANCOLD "Guidelines on Tailings Dams" (2019) the minimum design criteria for this consequence category are summarised in Table 4-6.

Table 4-5 ANCOLD Tailings Storage Facility Design Parameters (minimum)

Component	Criteria
Dam failure consequence category	High A
Dam spill consequence category	Significant
Design Storage Allowance Parameters	
Design storage allowance	10% AEP notional wet season runoff (1 in 10)
Extreme storm storage	1% AEP, 72-hr flood (1 in 100)
Contingency freeboard (wave run-up)	10% AEP wind
Contingency freeboard (additional freeboard)	0.3
Emergency Spillway Design Parameters	
Design flood	Probable maximum flood
Wave freeboard allowance	Nil for given design flood
Design Earthquake Loadings	
Operating basis earthquake	0.1% AEP
Safety evaluation earthquake	0.01% AEP (median 50% fractile 1 in 10,000)
Maximum credible earthquake for post closure	Ground motion from known active faults calculated deterministically or probabilistically 1 in 10,000 AEP
Factors of Safety	
Long-term drained	1.5 (effective strength)
Short-term under drained (potential loss of containment)	1.5 (consolidated under drained strength)
Short-term under drained (no potential loss of containment)	1.3 (consolidated under drained strength)
Post-seismic	1.0-1.2 (post seismic shear strength)
Dam Safety / Inspection Frequency	
Comprehensive inspection	By Dams Engineer and Specialist (where relevant) after first year of operation then every five years.
Intermediate inspection	By Dams Engineer annually
Routine inspection	Weekly to twice weekly inspection by operations personnel/inspector

The dam break and consequence category assessment will be further refined as design is progressed and data becomes available. Nevertheless, the TSF design criteria and control measures for the TSF are based on the above ANCOLD requirements.

4.5.2.3 Tailings Deposition System

Tailings will be discharged into the facility by sub-aerial deposition methods, using banks of spigots at regular intervals predominantly from the main embankments for supernatant pond location control. The active tailings beach will be regularly rotated around the facility so as to maximise tailings density and control the supernatant pond.

Deposition will be managed from eastern, southern and western embankments to ensure that the supernatant pond will be located in the northern valley of the TSF. During the later stages of operation, deposition will be relocated to the head of the northern valley to push the supernatant pond further south towards the proposed closure spillway location.

4.5.2.4 Seepage Control

A compacted soil liner, comprising primarily reworked in situ soils, will be constructed over the full TSF basin, with the exception of the Annie's Dam reservoir area. The design incorporates an underdrainage system to reduce pressure head acting on the compacted soil liner, reduce seepage, increase tailings densities, and improve the geotechnical stability of the embankments. The underdrainage system comprises a network of finger drains and collector drains. The underdrainage system drains by gravity to a collection sump located at the lowest point in the basin. Solution recovered from the underdrainage system will be pumped back to the plant for re-use in the process circuit.

A decant turret system (comprising floating pump/s attached to a HDPE 'turret') will recycle water from the TSF supernatant pond for use in the process throughout operation.

4.5.2.5 Decant Water Return System

The TSF will operate with a turret system which will be constructed, operated and subsequently de-commissioned to suit the staged development of the facility and the tailings beach. A decant turret trench will be constructed along the planned supernatant pond migration paths, alongside an access causeway to facilitate access to the turret and relocation as required during the operation.

The decant turret system will consist of the following components:

- A decant turret trench within the natural drainage courses within the TSF basin (the planned supernatant pond migration paths);
- An access causeway constructed of Zone D material (generally comprising excavated material from the decant turret trench);
- A floating polyethylene decant turret unit, with associated piped connections;
- A pump affixed to the decant turret unit (pumping system designed by others); and
- A mobile standing pump unit on the decant access causeway, to pump water abstracted by the turret pump to the process plant (via the decant water return pipeline).

The decant turret unit(s) will be re-located along the decant access causeway on a regular basis throughout operation to locate the turret at the supernatant pond location, and to ensure that no tailings enter the pump intake.

4.5.2.6 Emergency Spillway

The TSF will be designed to contain a range of design storm and rainfall sequences events up to and greater than the required design criteria. The design criteria for the TSF will be governed by the ANCOLD consequence category, to be determined during the subsequent design phase based on a TSF dam break assessment.

In the event that a storm event greater than the TSF design criteria occurs, rainfall and supernatant water which cannot be stored will discharge from the TSF in a controlled manner via an engineered spillway. The operational emergency spillway will be constructed as part of each embankment raise.

4.5.2.7 Monitoring

A comprehensive monitoring program for the TSF will be required to ensure that the risks are appropriately managed, in accordance with industry best practice. The monitoring systems will include the following items:

- Regular inspections of all TSF infrastructure;
- Survey pins to monitor embankment displacement;
- Piezometers to measure pore water pressure within the embankment;
- Boreholes to monitor water quality and seepage levels downstream of the TSF;
- Surface water monitoring stations to monitor water quality in surface flows downstream of the TSF; and
- Ongoing operational monitoring and water balance calibration for the TSF.

Any problems identified will result in an increase in monitoring frequency and the Engineer of Record will be notified immediately to assess the situation.

4.5.2.8 Emergency Controls

The following emergency controls will be implemented in the TSF:

- The tailings pipeline will be located on the upstream crest of the embankment, which will have a minimum cross fall to the tailings beaches of 2%. Any leakage from the pipeline should therefore flow towards the TSF;
- The facility is protected by a spillway so that in the unlikely event of an overflow situation, water will be discharged and the embankment will not be overtopped; and
- Between the plant site and the TSF, the tailings pipeline, and water return lines will be contained within a bunded corridor.

4.5.2.9 Rehabilitation

The main focus of the rehabilitation for the TSF will be re-vegetation, erosion control and stormwater management. At the end of the mining operation, the embankment will have a downstream slope of 3H:1V with 5 m benches at 10 m intervals for erosion and drainage control. The adopted downstream profile will allow for revegetation.

During the later stages of operation, deposition will be relocated to the head of the northern valley to push the supernatant pond further south towards an existing drainage course in the east of the Annie's Dam basin. The TSF closure spillway will be excavated from this valley, running around the waste dump and discharging into the open pit.

Rehabilitation of the tailings surface will commence upon termination of tailings deposition. At this stage, soil fill covers are proposed for the TSF as the most appropriate long-term solution. This is subject to ongoing geochemistry testing during operation.

4.5.3 Accommodation Camp

Due to the remote location of the Project area, construction of an accommodation camp is required to accommodate the construction and operational workforce within proximity to the mine. The accommodation camp is proposed for construction within tenement ML 29814 at Toms Gully (Figure 1-4). The accommodation camp will have an overall capacity of approximately 202 personnel and will accommodate personnel for both the Rustlers Roost and Quest 29 operations. The accommodation camp will be developed in two stages which are discussed further below. The accommodation camp will have an approximate maximum disturbance area of 9.6 ha (7.3 ha native vegetation and 2.3 ha existing disturbed area) within a 17.8 ha development envelope.

4.5.3.1 Stage 1 Development

The first stage will consist of an 80 person facility with the following buildings:

- Up to 20 x four room ensuite accommodation units;
- Two laundry buildings complete with linen and cleaners storeroom;
- One administration/reception/shop building complex;
- One first aid / emergency response building including an ambulance shelter;
- One ice room including ice making machines for personnel;
- One wet mess facility complete with a covered outdoor area suitable for 202 personnel;
- One camp recreation room;
- One ablution block for male/female and disabled persons;
- One fully equipped gymnasium sized for 202 person camp; and
- One bus shelter.

These will be utilised for the initial construction works, predominantly earthworks. Post construction, these accommodation units will remain for use by operational personnel.

The following temporary facilities will be required to support occupancy of the Stage 1 camp until the final services are operational. The temporary facilities will then be demobilised:

- Power generators and diesel tank – one generator to stay and act as emergency supply in event of mains power failure;
- Reverse Osmosis (RO) Water Treatment Plant (WTP);
- Wastewater Treatment Plant (WWTP); and
- Portable satellite communications system including phone and television services.

4.5.3.2 Stage 2 Development

Stage 2 works will bring the camp to an overall capacity of 202 personnel. The Stage 2 works will consist of the additional buildings as nominated below:

- Up to 30 four room ensuite accommodation units;
- One two-person disabled ensuite accommodation unit;
- Two laundry buildings complete with linen and cleaners storeroom;
- One ice room complete with ice making machines for personnel; and
- One ablution block for male/female and disabled persons.

All buildings will be prefabricated modular serviced with power, communications, information technology infrastructure, air conditioning, potable water and sewerage and conform for Region C Cyclonic Wind Design. The buildings will have verandahs attached, providing shelter along the concrete pathways that access sides of the accommodation units and the amenity buildings.

Car parking will be provided for all personnel with private vehicles at the camp accommodation and a regular daily bus service will be provided travelling between the camp, mine and plant areas from a designated bus shelter.

The addition of a sporting court with a combination of activities including cricket, tennis, soccer and basketball as well as a swimming pool and shade sail areas with landscaping will also be provided in the stage two construction.

The camp will be landscaped using plants which are native to the region. Limited grassed areas will be provided around the central facilities. All landscaping will be reticulated. In addition, a fire water system will be irrigated throughout the accommodation camp to provide protection against any potential fire.

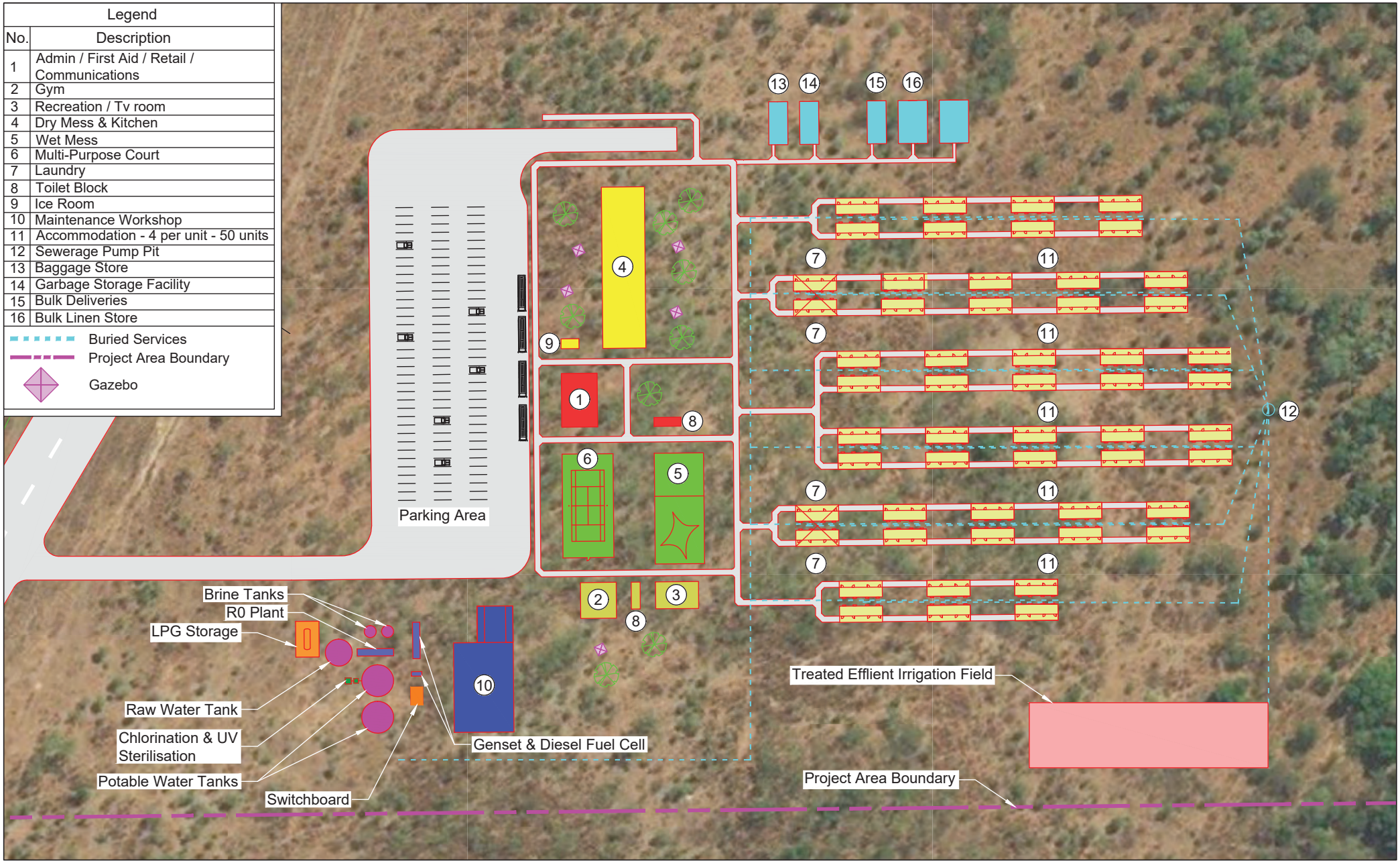
4.5.3.3 Site Development, Roads and Drainage

The bulk earthworks for the camp will be formed by benching into the existing terrain to create a pad using cut and fill methods. The pad will drain with a cross-fall of 1% in keeping with the terrain. Where necessary, structures will be located on detailed earthwork pads, with ramps to suit the required access.

Cut off drains will be constructed on the northern and eastern sides of the camp to capture the runoff generated from a 1 in 100 year ARI, 72 hour duration storm event. The depth of flow from this event was also used to set the minimum building pad heights to avoid inundation and divert clean stormwater away from working hardstand areas. Peripheral drainage and all culverts will be designed to accommodate a 1 in 20 year event. Where piped drainage systems are required, they will discharge to open table drains. Table drains will discharge to sedimentation ponds prior to discharging into Coulter Creek.

A 1.5 km long section of road will be refurbished to connect the main access road to the accommodation camp light vehicle car park. Truck and bus parking will be segregated to minimise noise impact on the accommodation area. A ring road will provide access to accommodation rooms and satellite car parks around the camp perimeter, while a service road through the centre of the camp will be provided for deliveries to the kitchen and tavern. All access roads will be sealed to reduce dust. Refer to Figure 4-9 for a conceptual layout of the accommodation camp.

Apart from service deliveries, which typically occur during working hours, the camp will be a pedestrian zone with illuminated concrete footpaths connecting accommodation units to the kitchen, tavern and other recreational facilities. This will minimise the risk of traffic and pedestrian interaction.



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Meters

1 cm = 150 meters

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FIGURE 4-9

Accommodation Camp Layout

DRG Ref: 1001087-EIS-04-4.16

4.5.3.4 Services and Utilities

Potable Water System

Water for the accommodation camp will be sourced from existing bores in the adjacent Toms Gully ML. In addition to the office, gold room and site amenities the accommodation camp is estimated to require 30 ML of potable water per year. The potable water for the camp is based on 275 L per day per person with a peak workforce of 300 people on-site/in camp on any one day (includes operations and construction personnel).

Potable water for the mine site and accommodation camp will be supplied by separate RO plants, located at the raw water pond at the Rustlers Roost site and at the accommodation camp. The mine RO plant will have the capacity to produce 100 m^3/day of potable water, while the camp RO plant will have the capacity to produce 170 m^3/day of potable water. Generators will provide power to Toms Gully bores for water supply to the accommodation camp.

Potable water will be pumped to two storage tanks at the camp each with a capacity of 200 m^3. The storage tanks have been sized to hold three days' consumption. A chlorinator and UV stabiliser unit will be located adjacent to the potable water storage tanks to ensure that the quality of drinking water is maintained. Two 5 L/s capacity water distribution pumps will be provided to supply drinking water throughout the camp via buried polyethylene pipes. The water supply will be metered.

Wastewater Treatment System

Sewage production will be assumed to match the potable water consumption and will be treated in a modular wastewater treatment plant (WWTP) similar to the one shown in Figure 4-10. It will be located adjacent to the camp and sewage will be pumped directly from the camp to the WWTP for treatment. Treated effluent will be discharged to an irrigation area south of the camp Figure 4-9). The exact location and size of the treated effluent irrigation area will be confirmed during detailed design using the Model for Effluent Disposal using Land Irrigation (MEDLI) program.

Figure 4-10 Indicative Wastewater Treatment Plant Layout

Fire System

Fire-fighting infrastructure will comprise fire hydrants at the kitchen complex and fire hose reels at all other buildings. Fire water for the hydrants will be supplied via a dedicated underground polyethylene ring main from a 300 kL capacity fire-fighting reserve tank and a fire pump set comprising an electrically driven pump, an electric jacking pump, and a diesel driven pump with 20 L/s capacity. Fire water for the hose reels will be supplied from the potable water distribution network.

Security

A guard house will be located on the camp access road to control traffic. Eight closed circuit television (CCTV) cameras will be provided to allow area surveillance at strategic locations within the camp. The CCTV system will be monitored at the camp administration office and guard house and will be connected to the mine CCTV network to facilitate monitoring at operational control and selected administration area workstations if necessary.

4.5.4 Haul Road Upgrade

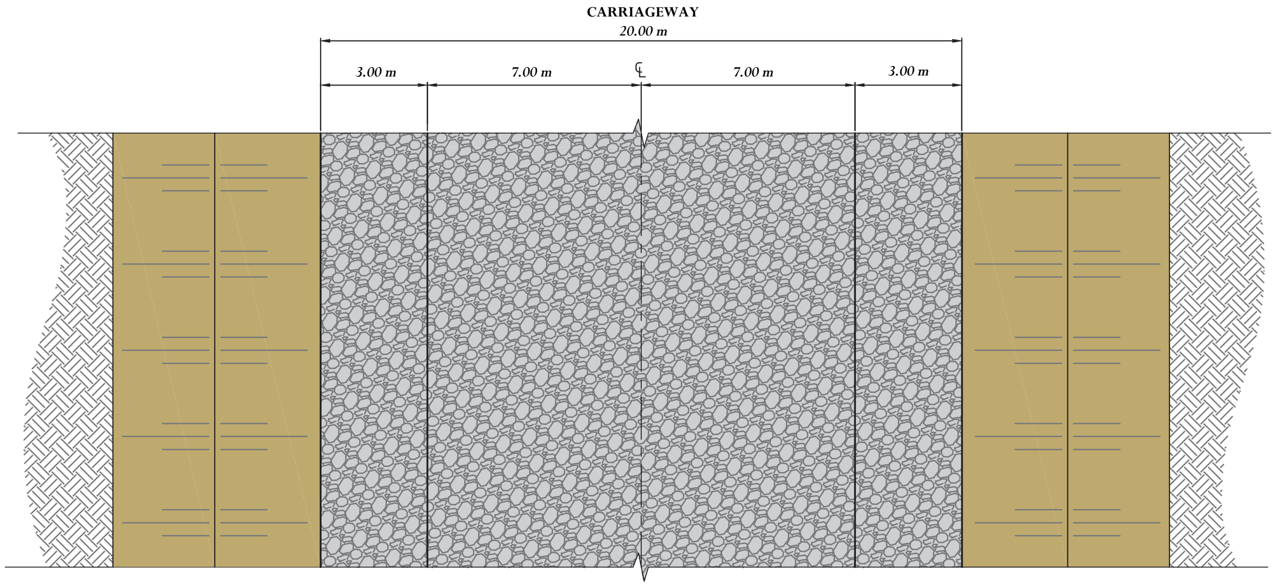
A haul road is required to transport product ore from Quest 29 to Rustlers Roosts ROM for processing. The 11 km existing access road between the Project areas will be upgraded to accommodate heavy vehicles for haulage of ore (refer to Figure 4-12 and Figure 4-13). This will require widening the existing road from approximately 10 m to 20 m, building up the road with screening of suitable material from the existing oxide WRDs, upgrade of existing culverts and construction of a new bridge at the Mount Bundey Creek crossing closest to Rustlers Roost.

The haul road design will be based on acceptable road design standards such as Austroads Guide to Rural Road Design and the NT Road Design and Specification. The basic design criteria adopted for the indicative design process is presented in Table 4-6, and Figure 4-11 provides an indicative haul road design.

A number of borrow pits will be required to supply material for the construction and ongoing maintenance of the haul roads and for bulk earthworks. The borrow pits are proposed to be located adjacent to the haul roads within already cleared and disturbed area. Borrow pits that are not required past the initial construction period will be rehabilitated.

Table 4-6 Project Haul Road Design Criteria

Design Element	Criteria
Design vehicle	Multi-train haul truck
Number of traffic lanes	2 lanes (one lane each travel direction) except across culverts where one way traffic is designated to minimise area of disturbance
Traffic lane width	4 m
Traffic lane crossfall	3%
Shoulder width	2 m
Shoulder crossfall	4%
Cut batter slope	2H:1V
Fill batter slope	4H:1V
Design speed	60 km/h
Maximum longitudinal gradient	8%
Minimum K value for crest curves	40
Minimum K value for sag curves	35



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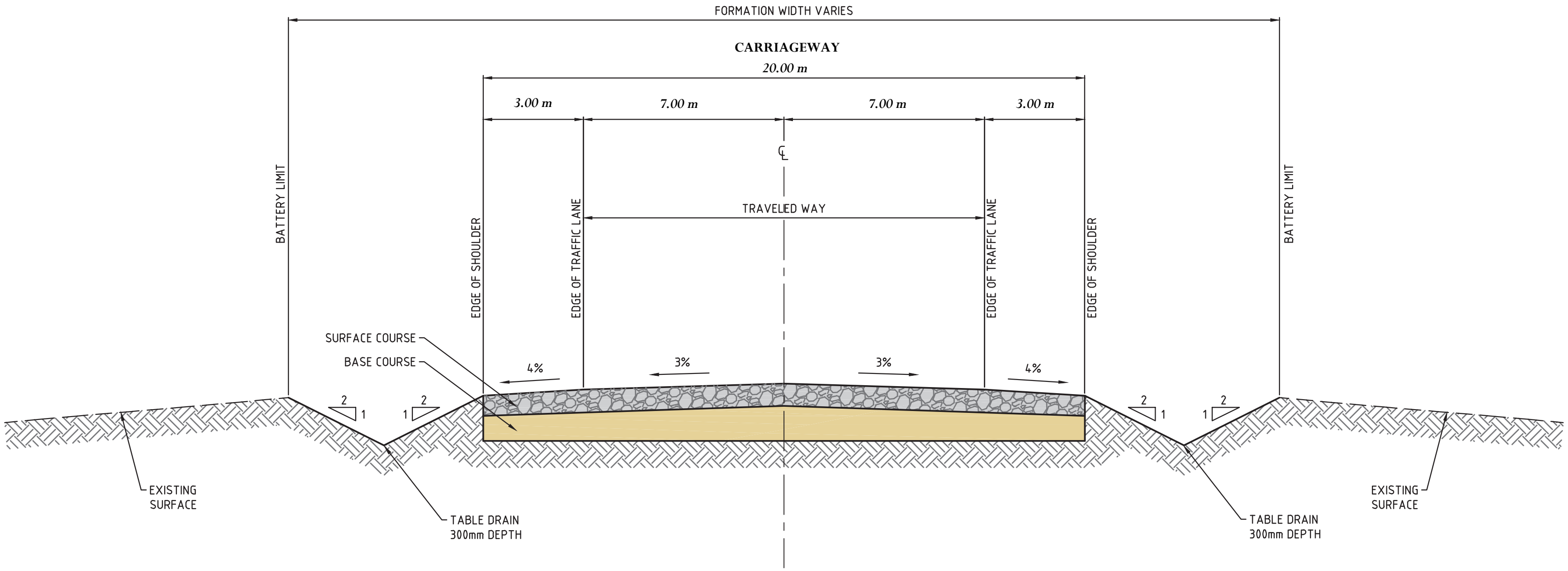

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DESIGNER
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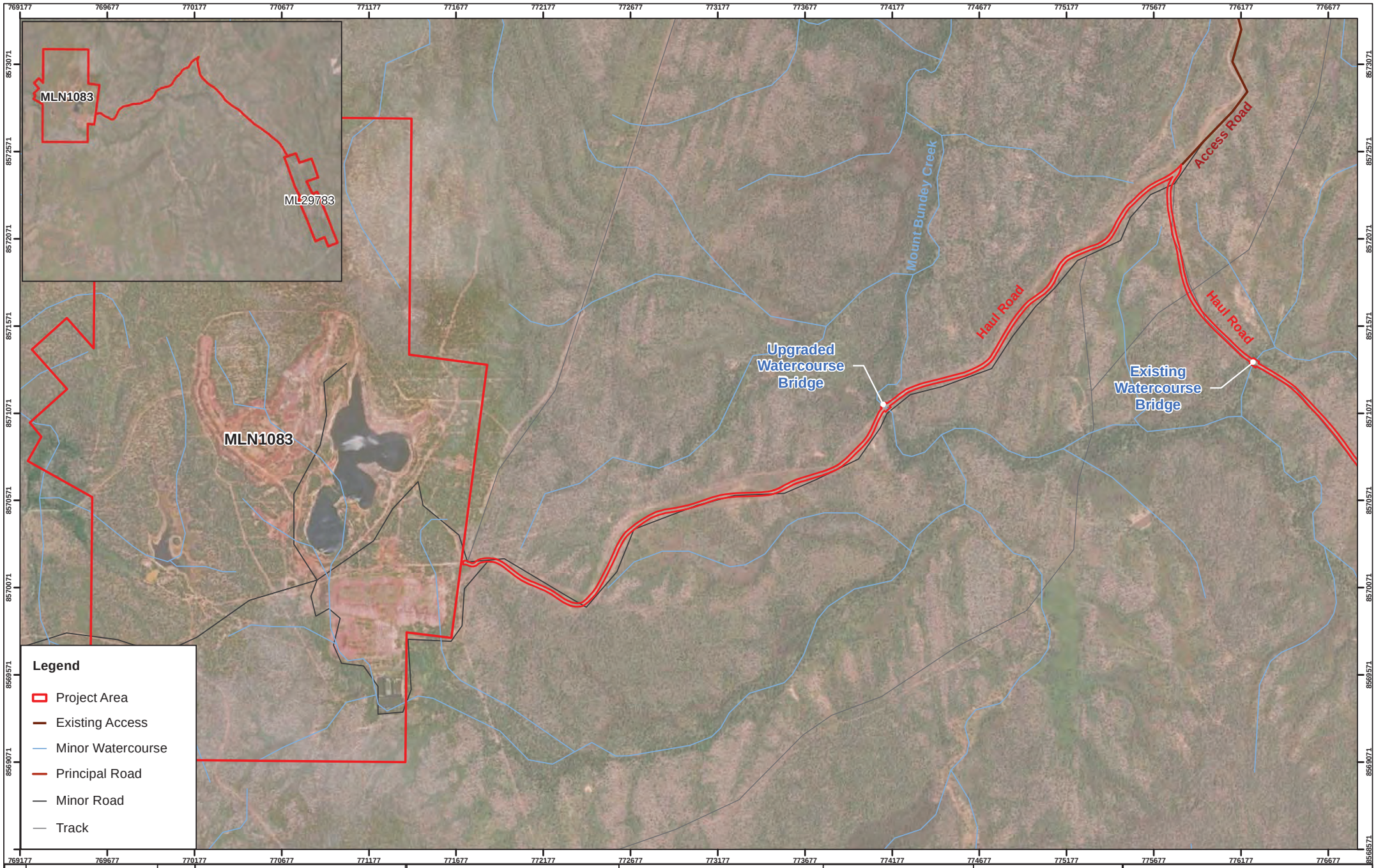
CLIENT DRG NO.
TITLE
Figure 4-11 - Indicative Haul Road Cross-section Design
STATUS FOR INFORMATION
CDM SMITH DRG NO. 1001087-001
REV. A



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Meters

1 cm = 196 meters

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FIGURE 4-12

Project Proposed Haul Road - Overview A Rustlers Roost

DRG Ref: 1001087-EIS-04-4.8

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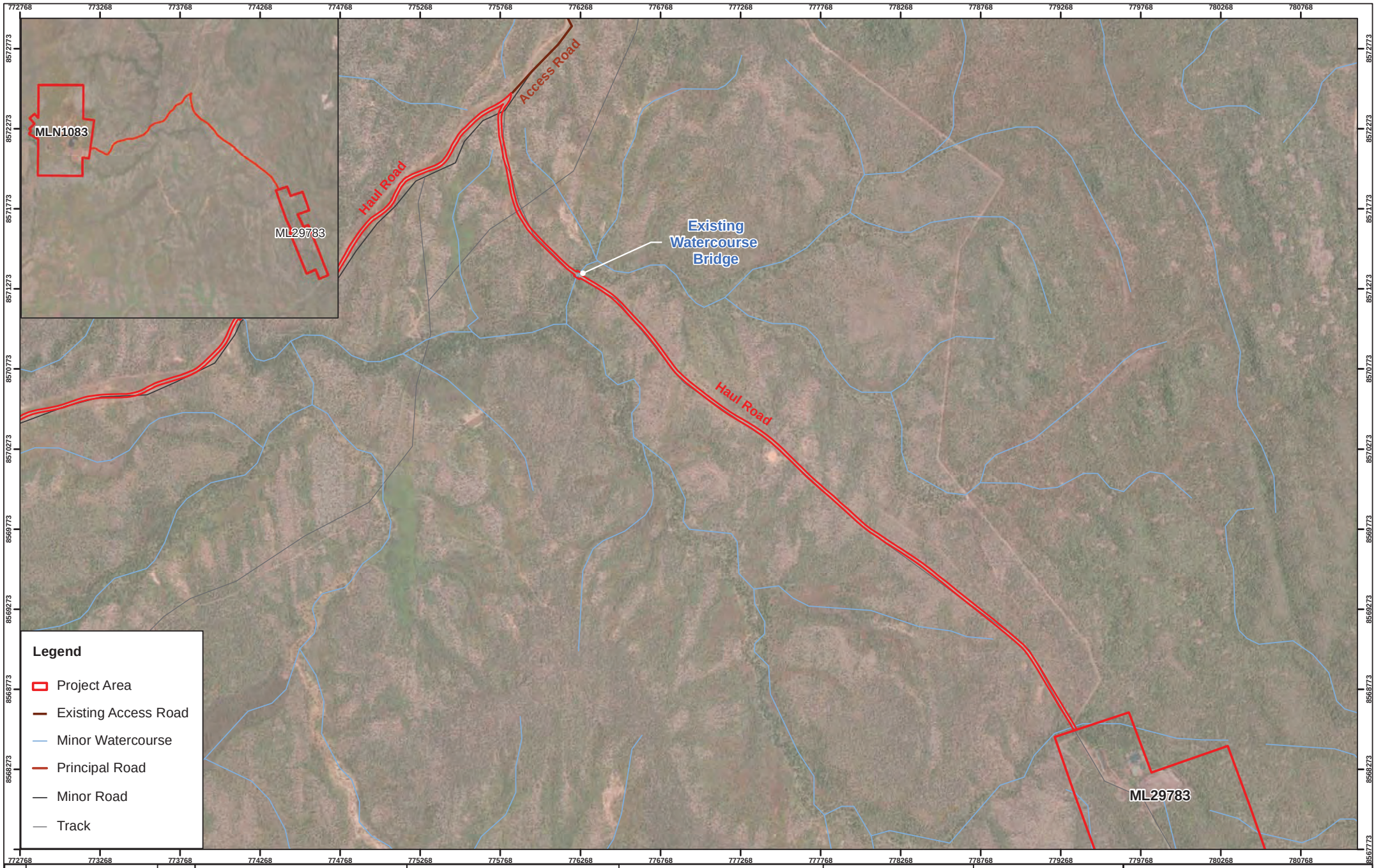

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Meters

1 cm = 213 meters

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DATA SOURCE
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FIGURE 4-13

Project Proposed Haul Road - Overview B Quest 29

DRG Ref: 1001087-EIS-04-4.9

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4.5.5 Landfill

The proposed landfill will be constructed at Rustlers Roost encompassing 4 ha of largely disturbed land to the west of the main pit and east of the TSF (refer to Figure 4-4). PGO assessed alternative areas within the Rustlers Roost development envelope for the location of the landfill, but all locations were either intersected undisturbed areas or would potentially inhibit future access of gold reserves east of the current pit (refer to Section 4.15.5).

The landfill will be constructed over 4 ha to a depth of 5 m and be utilised for the 10 year Project period. The landfill will be designed and constructed in accordance with the NT EPA Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory (NT EPA 2013). Solid waste materials including non-putrescible commercial and industrial (C&I) waste, non-putrescible construction and demolition (C&D) waste, green waste and limited hazardous waste in the form or contaminated soils will be placed in the landfill. Other hazardous wastes will not be landfilled onsite and will be taken from site by a licenced contractor to an authorised collection or licenced waste disposal facility. The proposed wastes to be disposed in the landfill align with the 'Industrial Waste Landfill' type detailed in the NT EPA Guidelines (NT EPA 2013).

The landfill will be lined and progressively filled on a staged basis. The backfill material will be moved by either dozer push or by excavator and truck. Batter liners will be applied to the reprofiled batters formed for each stage of the landfill. As successive areas of the final landform for the landfill are reached, each area would be subject to rehabilitation works. The landfill capping will include sufficient soil depth and type to protect the landfill capping and to sustain proposed vegetation. The revegetation proposed for the final landform surface would comprise shrubs and small trees (similar to the surrounding environment), with a need for a thick growth layer to support this growth, whilst minimising penetration of roots into the geonet and geomembrane layers.

4.5.6 Communications

There is an existing guyed communications tower centrally located on the south-eastern side of the existing pit at Rustlers Roost. The existing directional radio antenna will be replaced with a microwave dish to increase bandwidth to the site. Fibre optic cables will be run from the tower to the mine administration building, gatehouse and camp. A mobile communications trailer will be utilised for the pit.

Initial investigations into provision of site data and mobile communications determined that the closest working Telstra tower is located at the town of Marrakai, approximately 17 km from the proposed site. It is highly likely that a fibre optic link exists between this location and the next Telstra mobile tower location at Mount Bundey, running along the Arnhem highway. The most practical and cost effective communications link would therefore be a microwave link from Marrakai to the existing site communications tower. The final arrangement will be confirmed during detailed design; however, should the microwave link not be feasible a fibre-optic link direct from Marrakai or satellite communication link are alternative options.

4.6 Mining Operations

4.6.1 Overview

The mining methodology will be consistent over Rustlers Roost and Quest 29, with the open-cut mining operation being conducted with conventional truck and shovel methods. Detailed mine designs were completed using MineSight and Vulcan mining software, incorporating all available geotechnical and practical considerations. The selected mining method is considered appropriate and assessed as feasible by the geotechnical evaluation, as it provides a balance of economic recovery of the resource, cost minimisation and safety.

Mining of Rustlers Roost and Quest 29 will be undertaken concurrently with each site having their own mining fleet. The fleet will be comprised of excavators, haul and dump trucks, dozers, grader, water cart and front-end loader at each site.

Dewatering of the pits will be undertaken with diesel powered in-pit sumps. Dewatering will occur as required as a result of direct precipitation from rain events and groundwater in-flow.

Mined ore from Rustlers Roost will be hauled directly to the ROM pad adjacent to the pit. Mined ore from each of the Quest 29 pits will be placed on the surface crest of the pit where it will be loaded into a haul truck and carted to the Rustlers Roost ROM for processing. Processing will continue for a number of months following cessation of mining until all remaining ore stockpiles have been processed.

All existing pits (one at Rustlers Roost and five pits at Quest 29) are proposed for expansion in surface area and depth. Two new smaller pits are proposed at Rustlers Roost to prevent ore from being sterilised by the placement of the TSF. Figure 4-14 and Figure 4-15 show the Rustlers Roost pit shells and Quest 29 pit shell designs respectively, and the proposed mining stages. The proposed mining stages are summarised below and shown in Figure 4-6:

- Rustlers Roost pit dewatering starting at the end of 2021 and finishing in April 2023;
- Rustlers Roost mining operations starting in April 2023 and finishing at the end of 2031;
- Quest 29 pits dewatering starting at the end of 2024 and finishing in April 2031;
- Quest 29 mining operations starting at the end of 2024 and finishing at the end of 2031; and
- Processing operation is proposed to run from July 2023 until March 2033.

4.6.2 Mining Equipment

It is expected that the mining equipment will be a combination of readily available new and used fit-for-purpose equipment. Due to the size of the operation an experienced earthmoving contractor will be engaged to undertake mining and haulage of waste rock and ore. The type and quantities of mining equipment expected to be required, is outlined in Table . The mining equipment inventory will be finalised once further technical studies are completed and contracts are awarded for the mining, crushing and screening operations.

Table 4-7 Mining and Processing Equipment

Type	Size	Maximum Quantity
Excavator	125 – 200-t class	2
Excavator	30-t class	1
Trucks	90 – 100-t class	8
Dozer	50-t class	2
Grader	4.3-m Moldboard	1
Water Cart	80 kL	1
Drill	Track mounted top hammer	3
MMU	Open pit unit	1
Stemming loader	3-m3 class	1
Crusher loader	6.5-m3 class	1
Fire tender	TBD	1

Type	Size	Maximum Quantity
Workshop truck	TBD	1
Service truck	TBD	1
Boiler makers truck	TBD	2
Light vehicles	Various	10
Lighting plants	5 Head LED	5
Crane	25 t	1
Forklift	TBD	1

4.6.3 Mining Maintenance

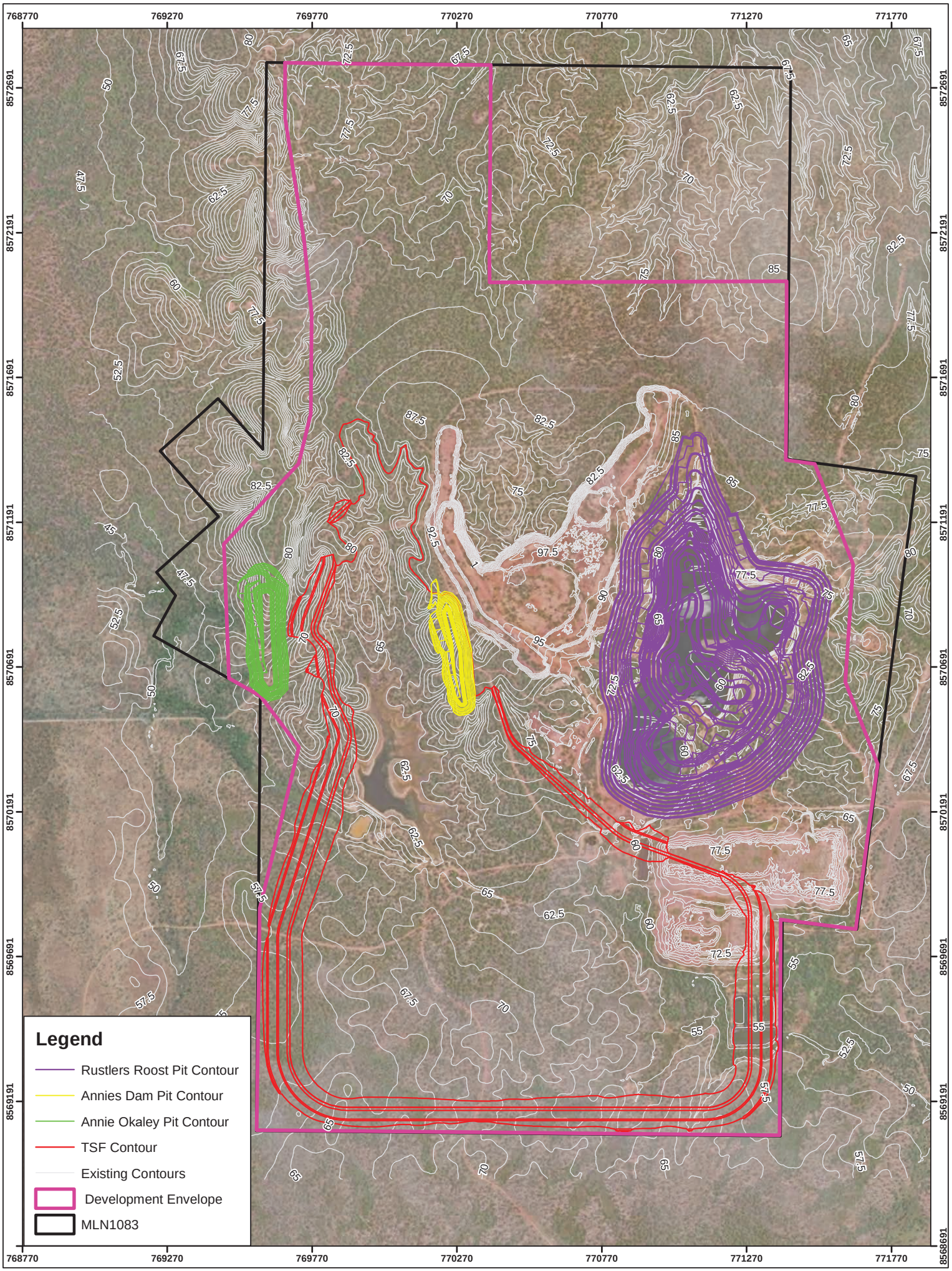
Road and building maintenance (e.g. painting, minor carpentry, repairs, etc.) will be contracted to local companies and most other onsite maintenance will be completed by an internal team. The internal maintenance team will require the ability to conduct repairs on equipment which is not cost/time effective to transport from site for repair, as well as be able to conduct emergency repairs on components to enable production to continue until replacement components are available. However, the site-based workshop facilities will be based on a component preparation and change-out philosophy as they are not primarily intended for overhauls on site. Machinery or vehicles requiring major overhauls will be transported offsite for the maintenance.

The site will hold a comprehensive selection of spare parts to enable quick turnaround in the event of equipment failures. Rotatable part assemblies will be used where possible to minimise change-out times. The rotatable spares will be repaired offsite minimising the size of the maintenance workforce and maintenance facilities on site. Urgent parts not held on site may be obtained by road from Darwin or by air from East Coast Capitals.

The maintenance of the mining fleet and facilities will be managed by the mining contractor. The maintenance facilities for the heavy vehicle fleet will be provided by the mining contractor to allow for routine servicing and general breakdown repairs to be undertaken on site. The facilities will comprise heavy vehicles maintenance bays, wash-down and lube areas, as well as a tyre workshop and stores.

Maintenance facilities for the processing plant will comprise a main workshop area, as well as separate bays for mechanical, boiler-making / steel fabrication work and electrical and instrumentation work (in an enclosed clean area).

The processing plant workshop will be adjacent to the plant warehousing facilities. The spares holdings will be developed based on adequate stocks of replacement parts, sub-assemblies, and rotatable items to support the component preparation and change-out being undertaken in the on-site maintenance workshops.



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Meters

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FIGURE 4-14

Rustlers Roost Pit Designs and Proposed Mining Stages

DRG Ref: 1001087-EIS-04-4.10

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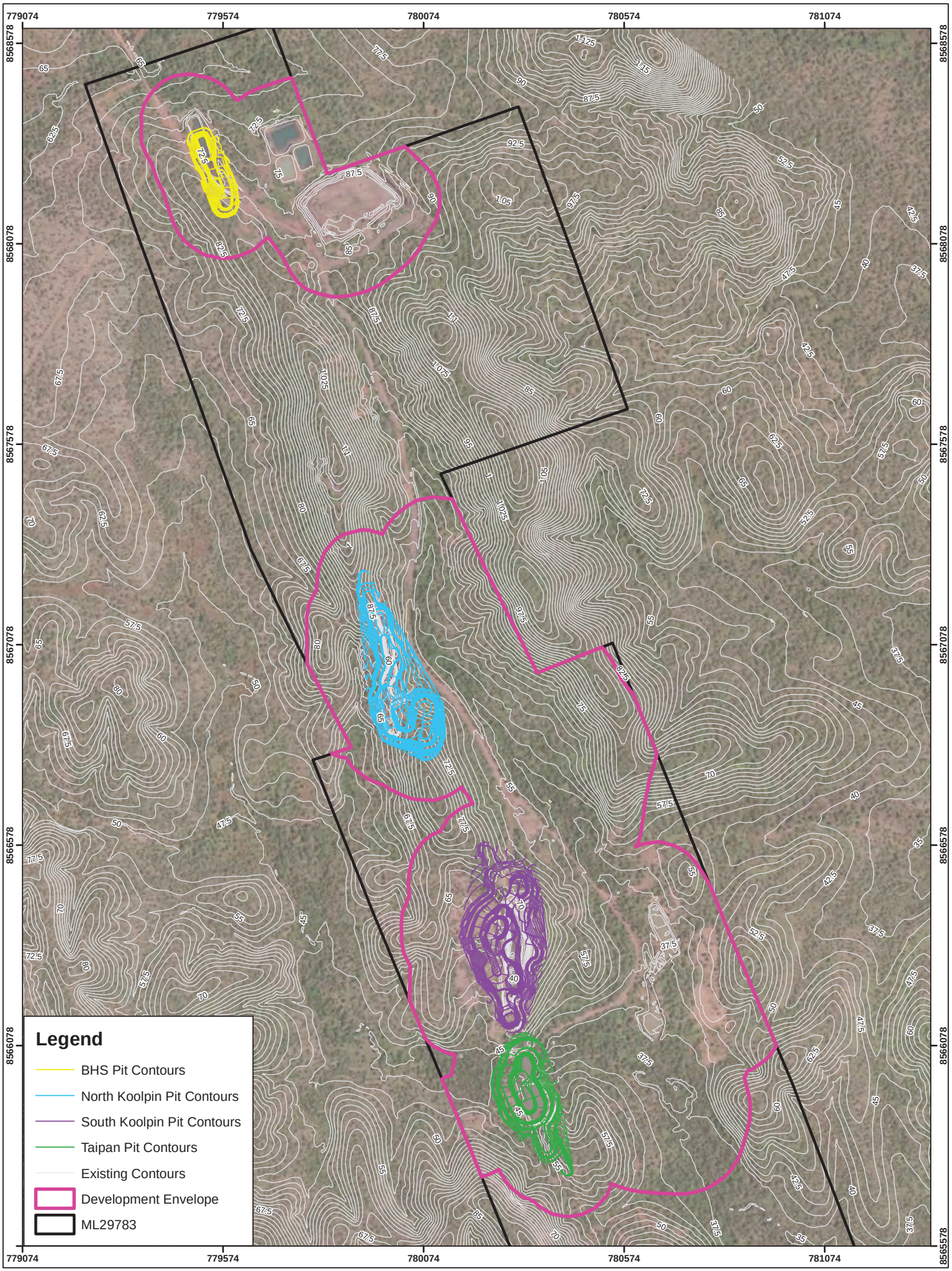

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FIGURE 4-15

Quest 29 Pit Design and Proposed Mining Stages

DRG Ref: 1001087-EIS-04-4.11

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4.7 Waste Rock Material

Waste rock material mined at both Rustlers Roost and Quest 29 will be deposited in surface WRD's. Details of the proposed dump designs are provided below.

4.7.1 Rustlers Roost Waste Rock Dump Design

The area to the north of the existing U-shaped WRD will be the designated location for the disposal of waste rock from Rustlers Roost pit. The expansion of the existing WRD was selected to minimise haulage distances and to keep haulage costs low as it is close to the main pit exit.

During construction, the WRD face angle will be 37°, with a berm width of 19.5 m and 3 x 10 m lifts. Final landform WRD design will have a continuous 17° slope and a height of 30 m.

Material classified as NAF will be placed at the outer annulus of the WRD. NAF material with sufficient acid neutralising capacity (ANC) will be placed on the natural surface, lining the drainage lines. Potentially-acid forming (PAF) material will be encapsulated with the central areas of the dump, not near the outer slopes or toe areas and covered with NAF waste material from the outer perimeter of the existing WRD. The estimated quantity of NAF and PAF waste rock is provided in Table 4-9 (for Rustlers Roost) and Table 4-12 (for Quest 29), respectively. The quantity of available NAF material is considered sufficient for construction, capping and rehabilitation requirements.

A total of 50.9 Mt of waste material will be produced from the main Rustlers Roost pit. Approximately 45.6 Mt will be placed within the surface WRDs and 5.36 Mt of fresh waste backfilled into the pit. A large portion of the waste material will be transitional (16%) and fresh (47%) (refer to Table 4-8). The other two smaller pits will be mined and completely backfilled, including Annie Oakley pit (3.9 Mt oxide) and Annie's Dam pit (1.6 Mt). Where possible, fresh waste from the Rustlers Roost pit will be placed in the bottom of these two pits.

Table 4-8 Rustlers Roost Pit, Annie Oakley and Annie's Dam Pit Waste Volumes by Weathering Zone

Waste Zone	Quantity (Mt)	% Total Waste
Oxide	20.7	37
Transitional	9.0	16
Fresh	26.7	47
Total Waste	**56.4 Mt**	**100%**

Based on geochemical analysis, the estimate of NAF and PAF waste volumes are provided in Table 4-9. The number in parenthesis is the total number of samples characterised for NAF, PAF and UC (acid generation classification). Based on these volumes, there is sufficient NAF for construction, encapsulation and rehabilitation requirements at Rustlers Roost. These estimates are considered representative of the total waste generated through mining all pits at Rustlers Roost.

Table 4-9 Estimate of NAF and PAF Waste Material Quantities at Rustlers Roost

Waste Zone	Quantity (Mt)	No. Samples Assessed	No. Containing S	NAF	PAF	UC
Oxide	20.7	8	1	0(1)	0(1)	1(1)
Transitional	9.0	76	26	0(14)	3(14)	11(14)
Fresh	26.7	47	43	12(15)	2(15)	1(15)
Total Waste	**56.4 Mt**	**131**	**70**	**12(30)**	**5(30)**	**13(30)**

1 – UC = Uncertain, S = Sulfur

Based on the data, 46% of the waste rock at Rustlers Roost will not contain sulfur and thus up to 54% (~30.46 Mt) of this waste rock could be PAF, with 46% NAF (~25.94 Mt) available for construction purposes.

4.7.2 Quest 29 Waste Rock Dump Design

The proposed surface WRD will be developed in the area north of Zamu Pit. This was selected to minimise haulage distances for the initial stage of mining Zamu pit. During construction the WRD face angle will be 37°, with a berm width of 19.5 m and 4 x 10 m lifts. The WRD construction will commence with the placement of NAF material for the base and outer annulus. PAF material encountered will be placed onto of the NAF base and encapsulated within the centre of the WRD. No PAF material will be placed on outer perimeter, slopes, toe, surface or base of the dump.

A perimeter drain and sediment basin will be constructed at the down-gradient base of each of the surface WRDs (tow drain) to manage sediment and monitor surface water quality runoff and seepage. Sediment will be cleaned out of the sediment basins as required. The sediment basins will remain post rehabilitation until the landform is stable.

Total waste produced from Quest 29 is estimated to be approximately 12.1 Mt (refer to Table 4-10). The total volumes and placement of waste material produced at Quest 29 is detailed Table 4-11.

Table 4-10 Quest 29 Pit Waste Volumes by Weathering Zone

Waste Zone	Quantity (Mt)	% Total Waste
Oxide	4.6	38
Transitional	2.8	23
Fresh	4.7	39
Total Waste	**12.1 Mt**	**100%**

Table 4-11 Quest 29 Pit Waste Material Volumes and Placement

Waste Rock Placement	Quantity (Mt)
Surface WRD	5.4
Backfilled Zamu pit	5.9
Heap leach pad and ponds backfill to BHS pit	0.8
Total Waste Material	**12.1 Mt**

On completion of mining Zamu pit, the pit will be backfilled with waste material from mining of the remaining Quest 29 pits. The final landform WRD design will have a continuous 17° slope and a maximum height 40 m in total from initial surface. Based on geochemical analysis, the estimate of NAF and PAF waste volumes are provided in Table 4-12. The number in parenthesis is the total number of samples characterised for NAF, PAF and UC (acid generation classification). Based on these quantities, there is sufficient NAF for construction, encapsulation and rehabilitation requirements at

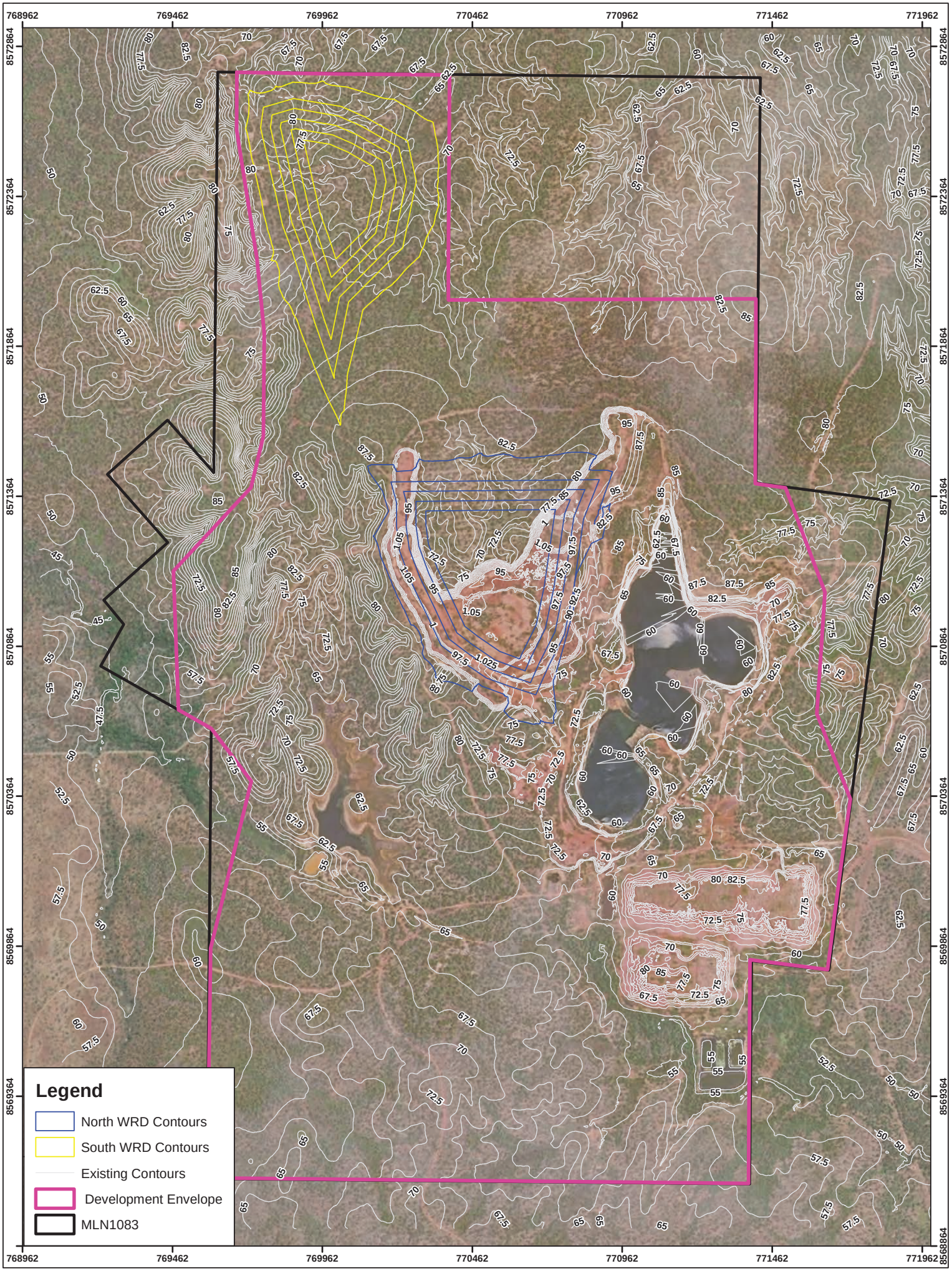
Quest 29. These estimates are considered representative of the total waste generated through mining all pits at Quest 29.

Table 4-12 Estimate of NAF and PAF Waste Material Quantities at Quest 29

Waste Zone	Quantity (Mt)	No. Samples Assessed	No. Containing S[1]	NAF	PAF	UC[1]
Oxide	4.6	13	13	2(3)	1(3)	0(3)
Transitional	2.8	9	9	4(6)	2(6)	0(6)
Fresh	4.7	36	36	2(11)	9(11)	0(11)
Total Waste	**12.1 Mt**	**58**	**58**	**8(20)**	**12(20)**	**0(20)**

1 – UC = Uncertain, S = Sulfur

Based on the data, all waste at Quest 29 will contain sulfur and approximately 60% (~7.26 Mt) of this waste rock will be PAF, with 40% NAF (~4.84 Mt).



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Meters

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FIGURE 4-16

Rustlers Roost Proposed Final Waste Rock Dump Designs

DRG Ref: 1001087-EIS-04-4.12

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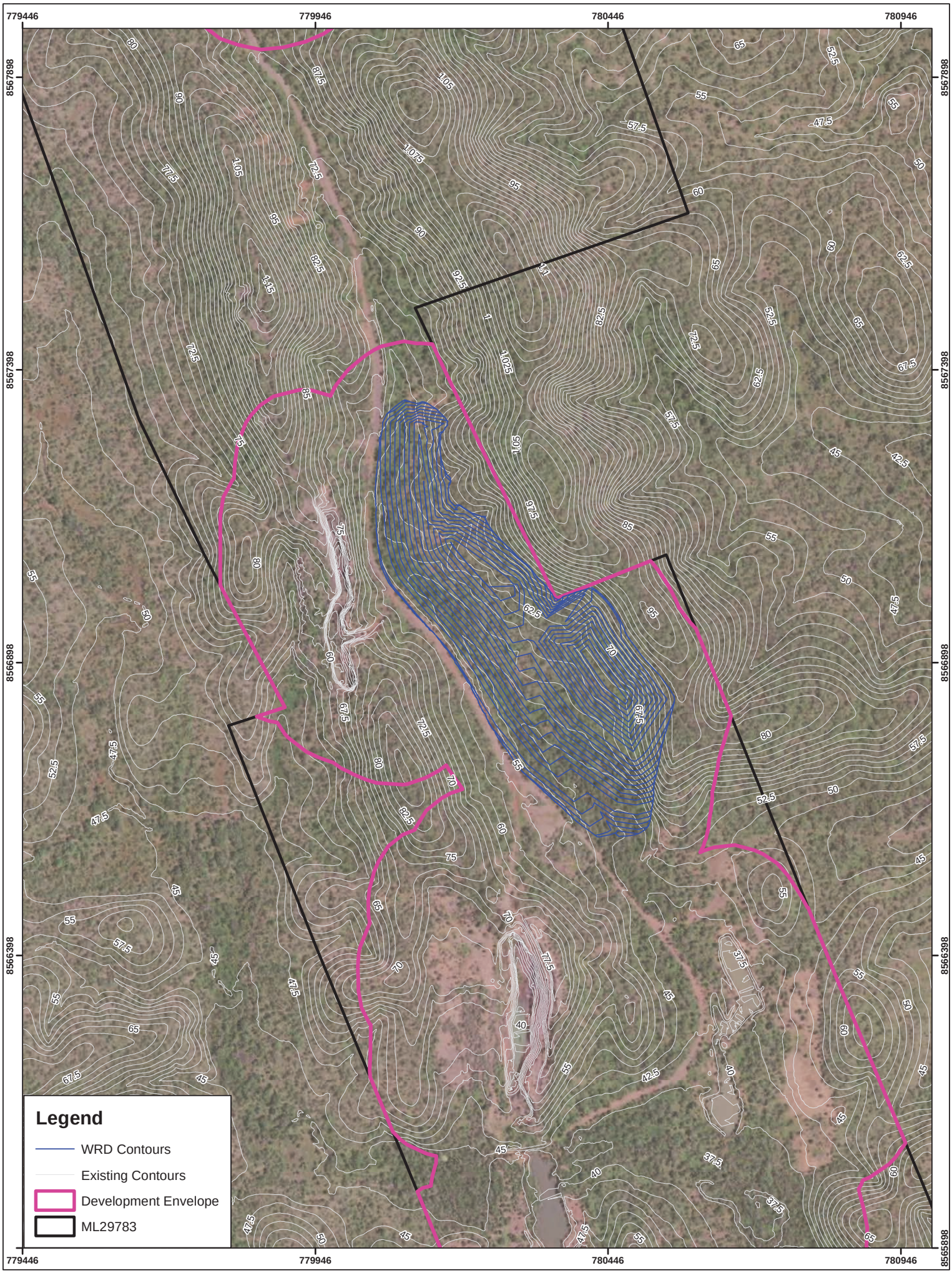

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Meters

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FIGURE 4-17

Quest 29 Proposed Final Waste Rock Dump Designs

DRG Ref: 1001087-EIS-04-4.13

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4.8 Transport and Traffic

The Arnhem Highway will be the primary route for transportation to and from the Project. Access to the Project area will be by the existing road infrastructure off the Arnhem Highway to the Toms Gully Mine project (refer to Figure 1-4). Ore will be hauled from Quest 29 via the 11 km haul road to the Rustlers Roost ROM for processing. Gold bullion will be secured in the gold room vault at the Rustlers Roost processing facility until it is required for transport off site in an armoured van. It is expected that services vehicles will access the Project area during operation from the Arnhem Highway, however, this is not expected to significant impact the existing local traffic condition.

Further information on transport and traffic for the Project is provided in Section 7.6.1.2. A traffic management plan has also been developed for the Project to account for the increased vehicle movement during the construction and operation phase of the Project (refer to Appendix G).

4.9 Wastewater Discharge Requirements

Both the Rustlers Roost and Quest 29 sites contain previously mined pits that have filled with water over time. The base of the pits is below the groundwater table and groundwater flows into the pits. Dewatering will be required prior to mining at Rustlers Roost and during mining at both sites.

4.9.1 Rustlers Roost

Prior to commencement of mining, the calculated 3.16 GL (volume at water level 56.90 mAHD) of 'clean' water accumulated in the pit will need to be emptied. It is proposed that this water will be pumped out of the pit and control discharged during the wet season into the drainage lines that flow to Mount Bundey Creek and/or Marrakai Creek. It is expected that it will take two wet seasons to empty the pit. A WDL application has been submitted to DEPWS and an amendment to the Care and Maintenance MMP for Rustlers Roost to DITT.

Dewatering of groundwater and surface water inflows will be required during mining activities. A dewatering bore may be installed to actively reduce the groundwater level adjacent to the pit. The rates of dewatering are currently being investigated. Water may also be pumped from within the pit sump to a turkey's nest dam for re-use as dust suppression and/or raw water for processing. This is accommodated in the water use and supply summarised in Section 4.10. Any excess water during the wet season will be discharged into the drainage lines that flow to Mount Bundey Creek and/or Marrakai Creek under an approved operational WDL.

4.9.2 Quest 29

The existing pits are shallow and contain only small volumes of water. Bunding surrounding existing pit crests will be improved to reduce surface water ingress. Immediately prior to and during mining, each pit will be dewatered into other existing pits.

4.10 Water Use and Supply

4.10.1 Water Demand

The Project requires approximately 175 ML/yr of non-potable water, which will be sourced from the turkey's nest dam during the mining operation. The water is assumed to be suitable for dust suppression (pit, road and other site infrastructures).

The processing plant (operating from February 2024 to April 2032) has a water demand of 5,898 ML/year. The demand is to be covered by recirculation of 4,8881 ML/yr from the TSF, and the remaining to be provided by the water produced on site from pits dewatering. When the pit dewatering is not able to satisfy the ore processing water demand, make-up water is to be sourced from the bore field.

The potable water demand (394 ML/yr) is to be sourced from the bore field and treated with Reverse Osmosis. The total demand of non-potable and potable water for the Project has been included in the water balance model (refer to Appendix H).

The water management of the Rustler Roost and Quest 29 sites consists initially of dewatering historical pits lake, then maintaining a dry working environment by continuously dewatering pit inflows during mining operation while supplying enough water to respond to the demand of the ore processing, dust suppression activities and other site water demand (drinkable water). Any demand shortfall is to be supplied by the site bore field. Clean surplus water that cannot be stored on site is to be controlled released to the tributaries of Mount Bundey Creek and Marrakai Creek for the Rustlers Roost operations and to an unnamed tributary of the McKinlay River. Any discharge of water will undertake a treatment process (e.g. settling) and will be tested to ensure compliance with approved discharge criteria prior to release.

The water management system is conceptualised as a network of surface water storages (pit lakes, dams, turkey's nest storages), operational processes (pumping) and natural processes (rainfall, runoff, groundwater seepage, evaporation). Each water storage balances its inflows and outflows and is connected to other water storages by transfer of water (pumping). The water management schematic for Rustler Roost is illustrated on Figure 4-18 and in Figure 4-19 for Quest 29. The water balance model provided in Appendix H provides detailed information on the water management system at Rustlers Roost and Quest 29. The following section provides a summary of the water management system for the Project.

4.10.2 Rustlers Roost Water Management System

Surface water management systems proposed at Rustlers Roost include the existing Annie's Dam (raw water dam), Rustlers Roost pit, process water pond, turkey's nest, TSF and TSF decant pond and stormwater runoff pond (Figure 4-18). Although, it is noted Annie's Dam will be decommissioned early in the Project is not discussed further as a source of supply. Table 4-13 provides the Project's proposed surface water infrastructure and conceptual storage capacity. Processing facility water requirements include reagent mixing, gravity concentrators and elution circuit.

Groundwater may be sourced from a bore field. The bore field will supply potable water and raw water as required. Potable water supply will be required for the accommodation camp, offices, ablutions and safety showers. A camp water supply bore is within proximity to the accommodation camp at Toms Gully which will be on a separate MMP. The bore will supply fresh water and will be treated by reverse osmosis (RO) water treatment plant. Total potable water requirements are estimated at 394,200 m^3/yr.

Table 4-13 Proposed Surface Water Infrastructure and Conceptual Storage Capacity

Infrastructure	Purpose	Capacity (m^3)
Open-cut pit	Dewatering during mining activities	-
Turkey's nest	Dust suppression activities and/or raw water for processing, estimated to be 175,000 m^3/yr.	50,000
Process water dam	Process water supply dam (receives return water from decant pond, raw water from Annie's dam and stormwater runoff from processing plant.	100,000
Tailings dam	Receives tailings from processing plant and catchment rainfall.	100,000
Decant dam	Receives decant water from tailings dam and tailings dam seepage. Decant water returned to process water dam for reuse in processing plant.	50,000
Stormwater pond	Capture process plant stormwater runoff. Water transferred to process pond for reuse.	50,000

A conceptual water balance for the proposed operations and water management systems is illustrated in Figure 4-18, based on up to 5 Mtpa production rate.

4.10.3 Quest 29 Water Management System

Current water management systems at Quest 29 comprise of the five existing pits and the decommissioned heap leach ponds. The heap leach ponds and pad are proposed to be rehabilitated at the commencement of mining Quest 29. Active management of pit water during mining operations will involve the pumping of water from one pit into another in accordance with mine scheduling. Existing pit water will be used for dust suppression activities. As material will only be mined and hauled from Quest 29 to Rustlers Roost, a site specific raw or potable water supply for Quest 29 is not required. The water management system at Quest 29 is illustrated in Figure 4-19, and Appendix H provides a detailed water balance model for the Project, including Quest 29.

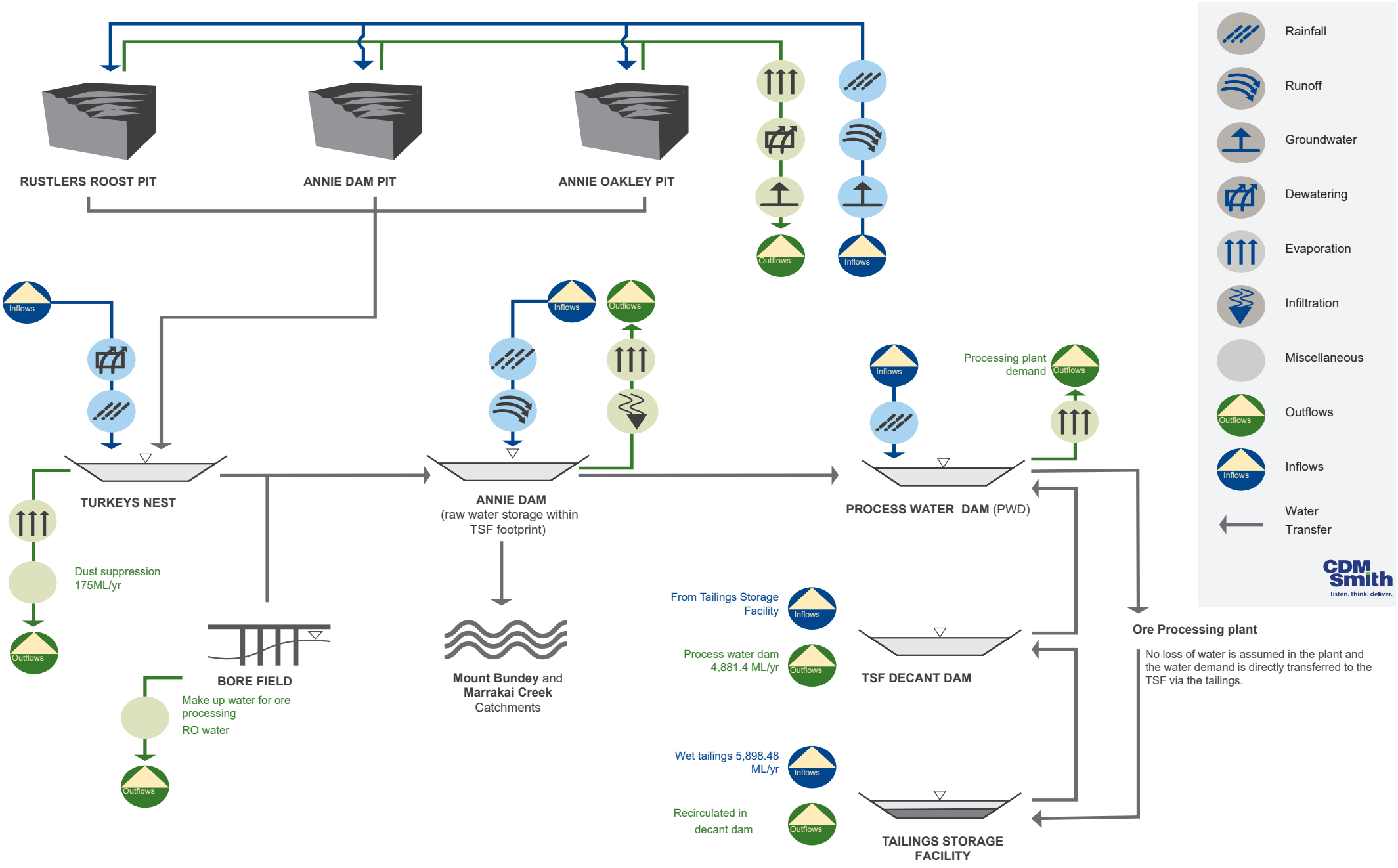
4.10.4 Sewage Waste

Sewage wastewater from the accommodation camp will be treated through a suitably designed sewerage treatment plant. The finalised on-site wastewater systems will comply with the requirements of the Code of Practice for On-site Wastewater Management (DoH 2014).

4.10.5 Site Water Management to Prevent Biting Insects

Earthworks will be undertaken to contour the landforms such that runoff is directed to the formal site water collection and storage features and areas for ponding are prevented in order to limit the potential breeding sites for biting insects.

Where excessive mosquito and larvae are identified as emanating from a site water storage area, control measures will be implemented to either remove the habitat (e.g. habitat modification through filling in the breeding areas) or chemical controls will be employed. Pesticides will only be used as a secondary measure should habitat modification be unable to control the onsite mosquito population.



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Meters
1 cm = 644 meters
GCS GDA 1994 MGA Zone 56

DISCLAIMER
CDM Smith has endeavoured to ensure accuracy and completeness of the data. CDM Smith assumes no legal liability or responsibility for any decisions or actions resulting from the information contained within this map.

DATA SOURCE
NT Government Open Source Data

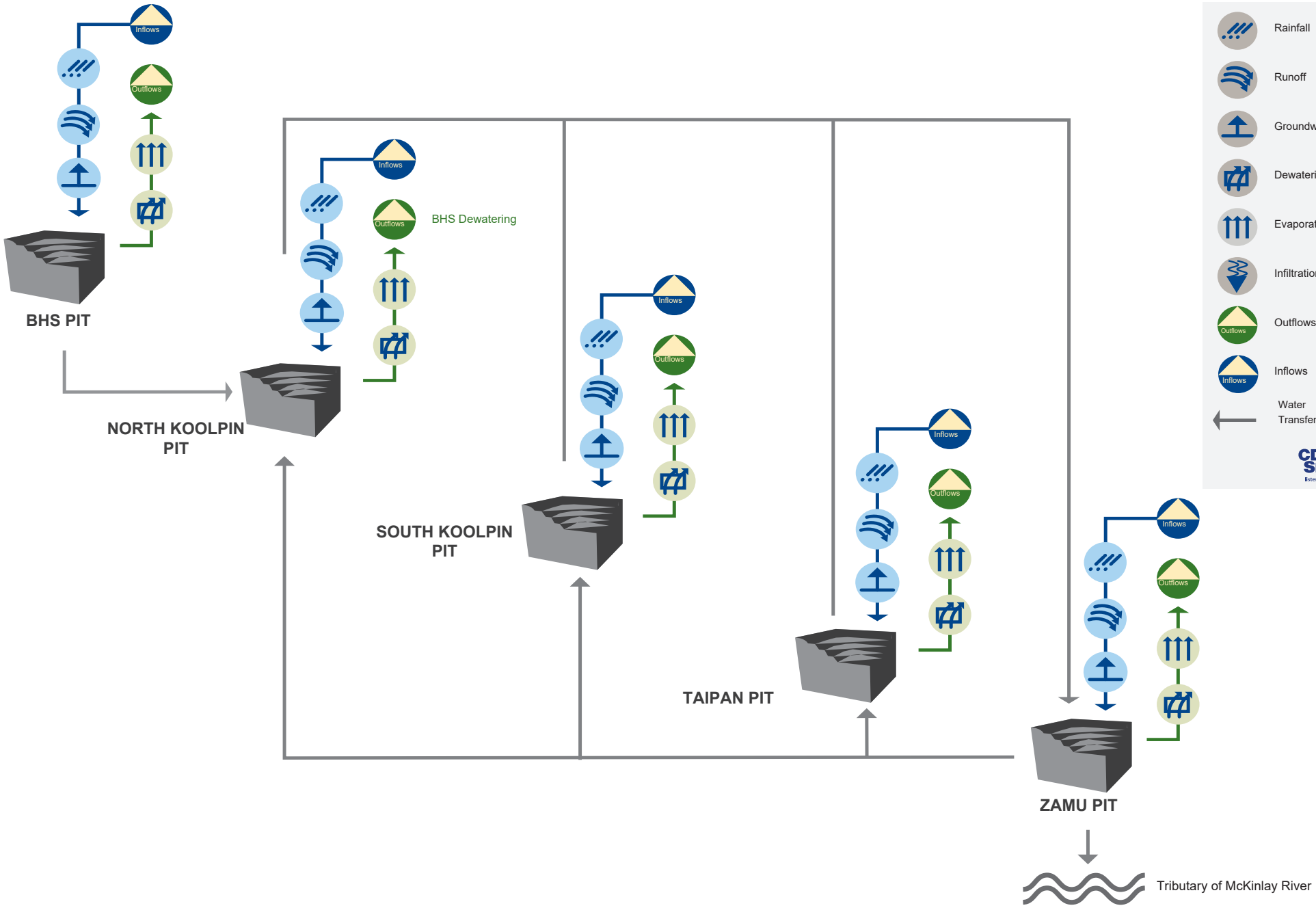
DESIGNER
CDM Smith
cdmsmith.com

CLIENT
PRIMARY GOLD

FIGURE 4-18

Rustlers Roost Water Management Schematic

DRG Ref: **1001087-EIS-04-4.14**



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DATA SOURCE
NT Government Open Source Data

DESIGNER
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cdmsmith.com

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FIGURE 4-19

Quest 29 Water Management Schematic

DRG Ref: **1001087-EIS-04-4.15**

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4.11 Energy Supply and Demand

4.11.1 Rustlers Roost

The processing facility will be powered by Liquefied Natural Gas (LNG) for the plant and Liquefied Petroleum Gas (LPG) for the elution circuit via a dedicated gas pipeline. Annual estimated gas use is 930,000 GJ LNG and 1,140,000 L LPG gas.

The existing power line running along the Arnhem Highway does not have the capacity of carrying the load requirements of the proposed processing facility. A further feasibility study assessing power alternatives such as solar energy will be undertaken during detailed design.

4.11.2 Quest 29

Only diesel powered pumps will be required for dewatering of the pits and an 80 kVA diesel powered generator for the crib room / go bay area.

4.12 Handling (Storage and Transport) of Hazardous Chemicals

Several hazardous chemicals will be required during construction and operation of the Project. Hazardous material used in the processing facility and the estimated storage volumes are indicated in Table 4-14. The hazardous materials storage will be located within the designated processing facility area.

Ammonium nitrate (ANFO) will be required for the open-cut drill and blast mining operations. An explosives compound (magazine) will be located within ML 1083. The magazine will be used for both Rustlers Roost and Quest 29 Projects. Storage for security sensitive ammonium nitrate (SSAN) will be in accordance with the *NT Dangerous Goods Act 1998* and the *NT Work Health and Safety (National Uniform Legislation) Act 2011*.

Cyanide is a chemical compound that will be used to dissolve and separate gold from ore. Storage and management of cyanide will be in accordance with the Commonwealth of Australia *Leading Practice Handbook for Sustainable Mining - Cyanide Management* (Australian Government 2008*).*

Table 4-14 Hazardous Materials and Storage Volumes for Processing Activities

Hazardous Materials	Estimated Storage Volumes
Cyanide	165 m^3
Hydrochloric acid	70 m^3
Sodium hydroxide	30 m^3
Copper sulfate	10 m^3
Hydrogen peroxide	16.7 m^3
Blanking agent (diesel)	700 m^3
Quicklime	100 t
Flocculent	54.0 m^3
Activated carbon	Nil
Liquefied Petroleum Gas (LPG)	66 m^3
Smelting fluxes	4 t
Diesel fuel	68,000 L

Hazardous Materials	Estimated Storage Volumes
ANFO	2,000 kg

4.13 Social and Economic

This section provides an overview of the social and economic components of the proposal, including workforce extent; rostering and accommodation requirements, and economic contribution.

4.13.1 Workforce and Accommodation

The majority of workforce will be working roster arrangements consisting of 8 days on 6 days off (8:6) or 14 days on 7 days off (14:7). They will reside in the Toms Gully accommodation camp during their 'on' roster and commute back home for their time off. The roster will be based on 12 hour days, 2 shifts (day/night) and a 3-crew panel.

4.13.2 Economic

The recommencement of mining operations will enable the employment of approximately 210 people during the production process and an estimated capital expenditure investment of $282 million. A further $344.3 million is anticipated to be invested during the operational period with roughly 73% of the investment directed at staffing and personnel costs. Approximately 100 people will be required during the construction stage. Construction material will be sourced locally where possible to support local businesses and enterprises.

4.14 Closure and Rehabilitation

Following completion of mining activities, the mine site will be closed and rehabilitated in accordance with an approved Mine Closure Plan (MCP). A draft of the MCP is provided in Appendix J. The final land use and closure objectives will be confirmed in consultation with the pastoral lease holders and other stakeholders; however, initial Project closure objectives have been identified in the draft MCP and are presented in Table 4-15 below.

The processing plant and associated mining infrastructure will be removed from site and the areas rehabilitated. The final WRD and TSF landforms will be suitably shaped, capped, rehabilitated and remain in-situ. Abandonment bunds will be constructed around the remaining open pits, which will be left to form pit lakes. The historical heap leach facilities will be capped and revegetated and the backfilled pits will be covered with topsoil, shaped and revegetated. Haul roads, ROM, go-line and all other disturbed areas will be ripped and revegetated.

The MCP and progressive rehabilitation will minimise the potential mosquito breeding sites that will remain after the cessation of mining operations. All disturbed areas will be rehabilitated to be free draining where practicable.

PGO will revegetate with local native species as well as easily established ground covers. The following measures will be undertaken:

- Rehabilitation trials will commence during the first year of operations to determine the most adaptive plant species; and
- To benefit from wet season rains, revegetation will be conducted in the late dry season.

A post-closure monitoring programme will be implemented when closure commences. Monitoring will continue for an estimated 5 years after closure and decommissioning. Monitoring will include weed and pest management with monitoring and assessment, water quality monitoring, maintenance of firebreaks and monitoring of erosion with rehabilitation where necessary.

Post mining monitoring would be based on current management and monitoring practices with surface and groundwater monitoring plans for the water bodies and creeks. Weed management will be undertaken on site. Fire management will also be undertaken including controlled burning to manage weeds, maintain firebreaks and to keep fuel sources to a minimum. A monitoring program has been incorporated into the draft MCP provided in Appendix J.

Table 4-15 Project Closure Objectives

Aspect	Broad Project Objectives
Safety	Protect public safety through LOM and leave the site free of hazards to the public after closure.
Compliance	Rehabilitation and closure activities are compliant with applicable legislation, authorisations, licences, permits and commitments.
Consultation	Incorporate the concerns and interests of all relevant stakeholders into mine closure planning.
Governance/Financial	Manage closure objectives through effective planning and management. Relinquish the site with no outstanding legal or social liability. Ensure adequate financial provision is in place for all closure liabilities.
Contamination	Contaminated soil/waters treated, remediated and or disposed of appropriately throughout LOM and in accordance with applicable legislation and guidelines.
Flora and Fauna	Reinstatement of disturbed areas using available rehabilitation resources capable of supporting the agreed post-mining land use. Protect fauna through LOM and leave the site free of hazards after closure.
Post-Mining Land Use	Formalised ownership, responsibility, and ongoing management agreements at closure for the agreed post-mining land use: To be physically safe to humans and animals, geotechnically stable, geochemically non-polluting/non contaminating, and capable of sustaining an agreed land use of natural habitat compatible with restricted pastoral use in perpetuity. To ensure all Project domains are decommissioned and rehabilitated in an ecologically sustainable manner.
Waste	Waste will be recycled or re-used where practicable or disposed of appropriately throughout LOM and in accordance with applicable legislation and guidelines.
Surface Water / Groundwater	Surface drainage patterns are reinstated or managed where practicable to be consistent with the regional drainage function. Post-mining water quality does not adversely impact the surrounding beneficial uses and landforms that could allow pooling are re-contoured to limit areas for biting insect breeding.
Infrastructure	All mine infrastructure is removed, contamination remediated, and disturbed areas rehabilitated to reflect the agreed post-mining land use (unless agreed to retain with key stakeholders).
Landforms (WRDs TSF and pits)	Landforms are geotechnically safe, stable, non-polluting, erosion resistant functioning landform and the surface stability is consistent with the landform design and comparable to the local landscape and other environmental values and will remove the potential for long term, post closure impacts on downstream water quality, beneficial uses and environmental values. The pit is geotechnically safe, stable, entry is restricted, and the abandonment bund is constructed in accordance with guidelines. The final pit design does not present an unacceptable risk to environmental or human receptors
Existing Mine Features	Existing landforms/infrastructure is removed, contamination remediated, and disturbance areas rehabilitated to reflect the agreed post-mining land use (unless agreed to retain with key stakeholders).

4.15 Alternatives Assessment

An assessment of Project alternatives was undertaken to fulfil the requirements of the ToR and the NT EPA Guidelines as outlined in Figure 4-20. During the Project design process, a number of scenarios were considered and screened to evaluate the relative social, economic and environmental advantages and disadvantages of different Project alternatives. This included consideration of potential environmental effects, engineering feasibility, social and community acceptability and any cost implications.

This section provides a summary of the alternatives assessment process undertaken together with the alternatives that were assessed and the preferred alternatives that form the basis of this Draft EIS Project description. Results from this analysis were used to select the final scope in the context of fixed locations for the ore resource and the existing ML areas. This process ensures the Project design has considered the environmental decision-making hierarchy and has been underpinned by relevant environmental, social and economic drivers.

Alternative scenarios considered were those that are practicable, feasible and available to PGO. These included locality, technological and conceptual alternatives. While exploration continues within the Mount Bundey area, there are no alternative resource areas identified to be mined. Therefore, all Project alternatives are based on the Rustlers Roost and Quest 29 deposits.

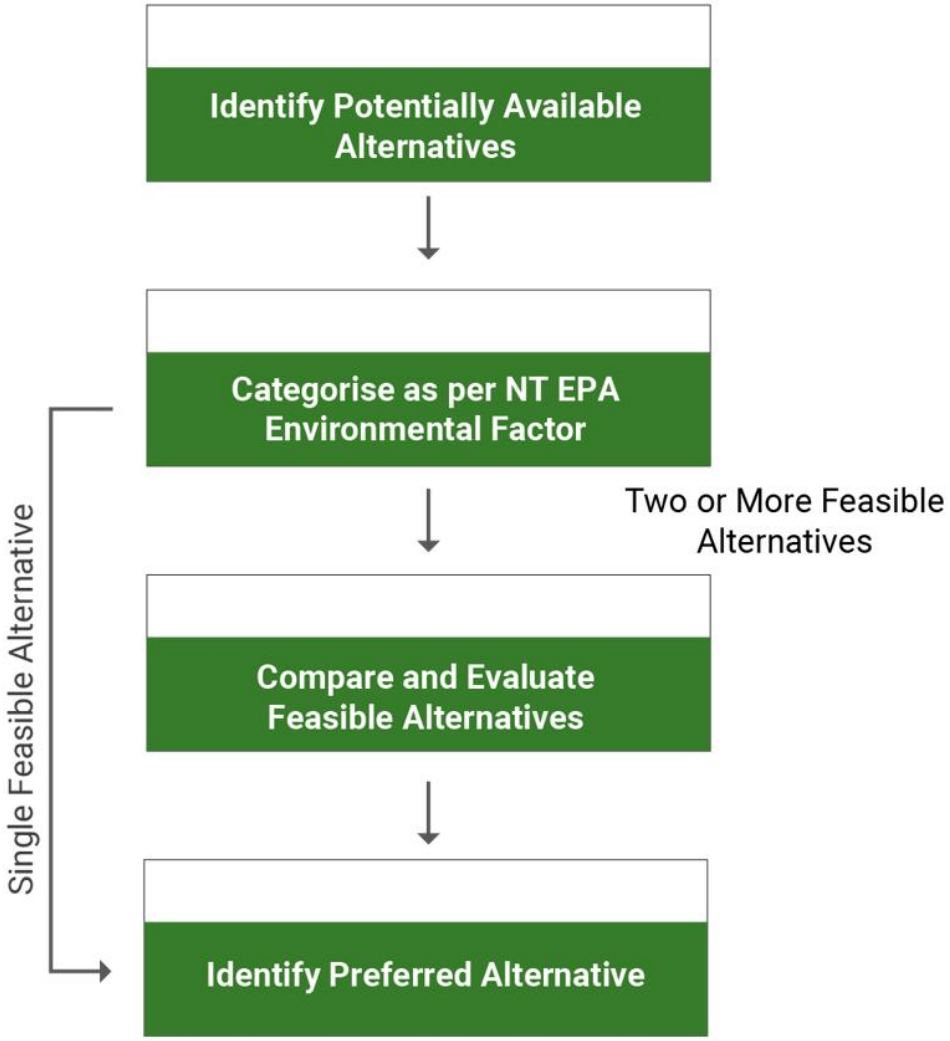


Figure 4-20 Assessment Approach for Considering Alternatives

4.15.1 Waste Rock Dumps

In accordance with NT EPA guidance with similar projects, the preferred option for disposal of waste rock is pit backfilling. Backfilling a portion of fresh waste material within open-cut pit voids is proposed for Quest 29, where mine scheduling permits to minimise volumes of potentially PAF waste to be disposed of within surface WRDs. This approach can be implemented at Quest 29 due to the multiple smaller pits. A new surface WRD is proposed to dispose of the waste from initial mining Zamu pit (largest pit at Quest 29), with waste material from the remaining pits to be backfilled into Zamu pit and a portion of oxide material from BHS pit used for rehabilitation of the decommissioned heap leach facility. The alternative to this option would be to establish a larger WRD at the Quest 29 area or multiple smaller WRDs. On the basis of limiting the extent of disturbance, and the creation of further areas for runoff management, the backfilling arrangement is proposed for Quest 29 and will deliver a better environmental outcome.

The same arrangement is not considered feasible for the main Rustlers Roost pit. Rustlers Roost will have a main large pit and two smaller satellite pits (Annie's Oakley and Annie's Dam pits). Alternatives to disposal of the main pit waste rock have been considered and PGO will seek to backfill the two satellite pits (once exhausted) with waste rock from the main pit up to the previous ground level. However, this is only a fraction of the rock that will be produced during the mining process. Simultaneous placement of waste rock within the working pit was also considered as an alternative to external WRDs; however, this was not progressed as a feasible option due to the depth of the pit, limited working area, potential stability issues in the pit and potential for multiple movement (trucking). As such, this approach would make the Project unviable and was not progressed through the initial designs, and external WRDs are therefore necessary. Furthermore, it is not considered economically feasible to double handle waste rock post-completion of the Project via backfilling the pit void.

4.15.2 Tailings Storage Facility

A TSF location option study was undertaken in 2018 and an updated assessment was completed in 2021 (Knight Piesold 2021). Five locations were considered in the Rustlers Roost area during the 2018 analysis and a refined list of three options were considered in 2021 (refer to Figure 4-22). Locating the TSF in the Quest 29 ML was not considered in the analysis due to the distance from the proposed processing plant location, necessity to implement a conveyance or transport system and limited suitable topography within the ML. Use of the TSF in the nearby Toms Gully Mine was also considered; however, the approved storage volume of that structure is significantly less than required for the Project and similarly introduces risks associated with transporting the tailings (e.g. discharges).

During 2021, PGO re-assessed these options and selected the location of the proposed TSF within the eastern and southern section of ML 1083 (Figure 4-22). The location was selected on the basis that it was within available area of the existing ML 1083, suitable site topography, minimised the distance of tailing transport, included a large portion of historically disturbed land and further economic potential to the north-east of the ML 1083 (refer to Section 4.5.5 for further discussion on maintaining future viability of the ore body).

The anticipated tailing volumes necessitates a large singular structure. Multiple structures would increase the overall extent of embankments and make ongoing management more difficult. The topography in the western and southern section of the Rustlers Roost site is considered the most appropriate for development of the TSF. The natural contours allow for construction of embankments in the upper reaches of the two unnamed drainage features that flow east to Mount Bundey Creek and west to Marrakai Creek. This allows for minimal earthworks and embankments on the northern side of the TSF as it utilises the natural contours to impound the material thereby minimising environmental impacts. Where natural ground can be utilised, this is preferred due to existing stability. The original TSF option, which was identified in the referral, required a constructed embankment around the entire perimeter, whereas the alternative design now included in the Project enables use of contours in the very north and reduces embankment height on the north-eastern side.

The placement of the TSF over the two site drainage features was considered from an environmental, engineering and economical perspective in the Project design. Due to the Project's headwater location in the catchment, there is no upstream riparian habitat beyond the TSF. While the TSF placement will result in loss of riparian habitat, much of this is disturbed due to historic mining activities adjacent to the main channel (EcOz 2021). Weeds are common along the banks (*Hyptis suaveolens* and *Sida sp*.) (EcOz 2021). Some clearing of vegetation near tracks and stockpiling of fill material from mining activities has also occurred. Ground cover is also sparse in the creek bed with some *Pandanus spiralis* and mixed tussock grasses including *Themeda triandra*, *Aristida sp*. and *Sorghum sp*. occurring on the upper banks (EcOz 2021).

The placement of the TSF was also considered regarding surface water runoff potential and future management. Given the Project placement there is limited upstream catchment. The proposed TSF design covers the majority of the upstream catchment for Annie's Dam, thus allowing for water shedding and a limited necessity for clean water diversion. With regard to the eastern feature that drains to Mount Bundey Creek, the upstream catchment extent will be significantly altered through the placement of Project infrastructure. A clean water runoff diversion will be constructed to alter the flow paths and prevent runoff from impacting the embankment wall integrity (refer to Figure 4-21).

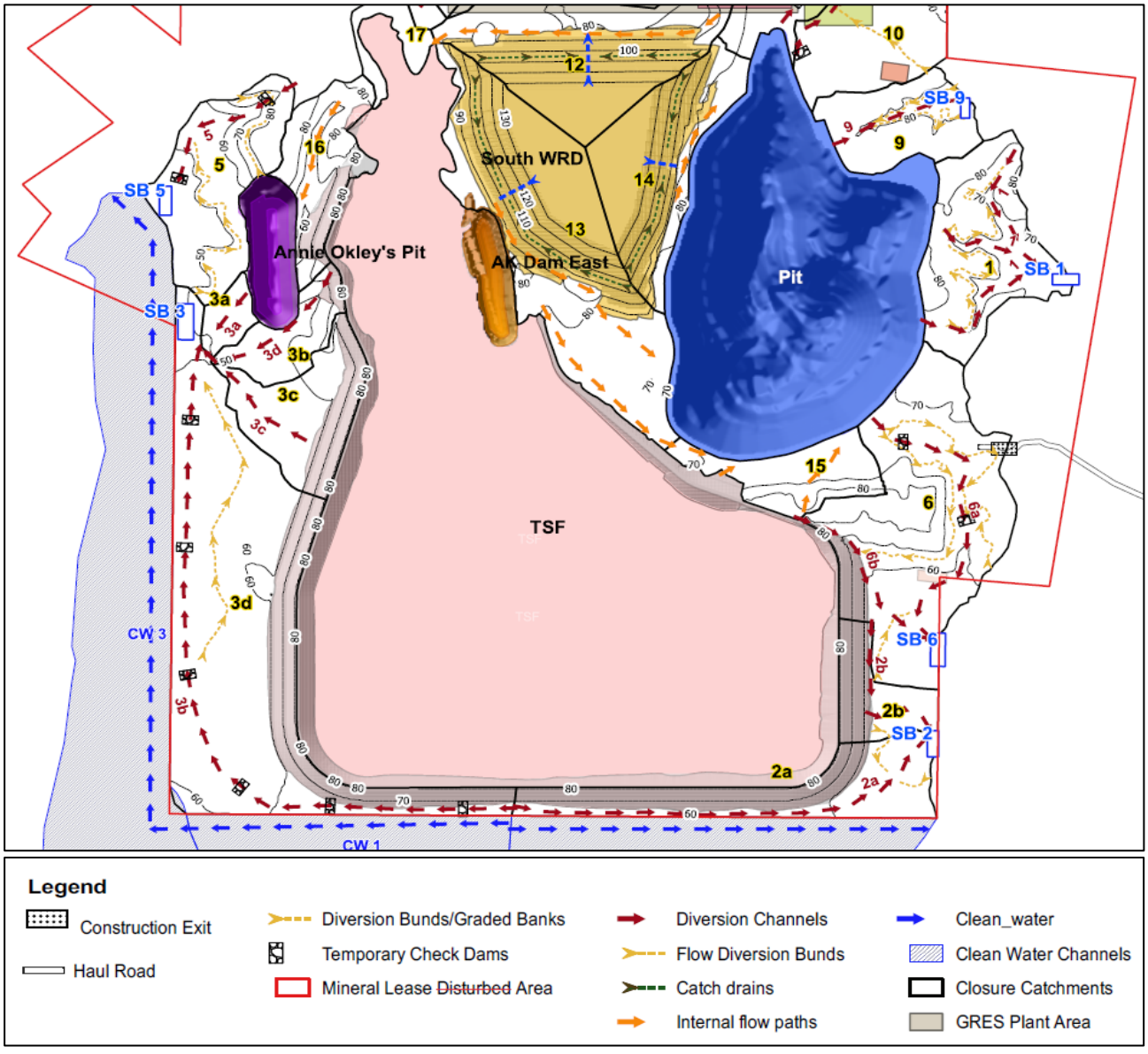


Figure 4-21 Tailings Storage Facility Drainage Arrangement

With regard to environmental flows, Erskine *et al.* (2003) in their study of the Daly River, NT considered that to maintain environmental health of the system reductions of flow should be less than 20%. A hydrology assessment indicates that the Annie's Dam catchment will be the only catchment to experience a reduction of surface water flows higher than this value. However, the Annie's Dam model domain is small, and it is in the headwaters of the very large Adelaide River catchment. The analysis indicates that reductions in flows entering the unnamed tributary to Marrakai Creek and the upper Mount Bundey Creek are unlikely to reduce environmental flows to a volume that would adversely impact on the health and function of the downstream waterways.

The current TSF design will encapsulate a large portion of the heap leach pad and the legacy leach ponds. This is considered a benefit for future management of the site post-closure as it will reduce the area susceptible to erosion (historically occurred on the leach pads) and decommissions the legacy leach ponds.

4.15.3 Processing Plant

Initially, the processing facility at the Rustlers Roost mine was assessed for the processing of ore from all projects within the Mount Bundey Project area. However, the type of ore from Rustlers Roost and Quest 29 requires a different process to extract the gold from that at the Toms Gully Mine site meaning PGO could not use the Rustlers Roost mine process facility for Toms Gully Mine ore. There were no nearby gold possessing plants to toll treat the ore from the Project, thus a new processing plant was required to be built (refer to Section 4.5.1).

An assessment of power supply options to operate the processing facility has been undertaken. The existing power line running along the Arnhem Highway does not have the capacity for carrying load requirements for the proposed processing facility. Initial analysis of renewable energy options (primarily solar) indicates the process plant load is too great for a solely renewable option; however, further studies are being progressed to determine if a hybrid solution would be viable. As such, it was determined that processing facility would need to be supplied by Liquefied Natural Gas (LNG) for the plant and Liquefied Petroleum Gas (LPG) for the elusion circuit. The current power supply solution does include a BESS that provides both load smoothing and load shifting capabilities. The BESS will improve efficiency of the power supply system.

4.15.4 Accommodation Camp

Similar to the nearby Toms Gully Mine project, PGO initially considered offsite accommodation options for Project personnel. However, the current Project workforce is over double the peak workforce for the Toms Gully Mine (210 personnel) and the lack of local large-scale accommodation options necessitates a Project-specific accommodation camp. The Project area is also too far from Darwin and other neighbouring suburbs to make commuting each day a viable option.

In assessing offsite and onsite accommodation options, consideration was given to local availability of existing accommodations, increased vehicle movements on the Arnhem Highway and the increased risks to staff and the community. The selection of the onsite accommodation option does not preclude local resident employment, but significantly reduces risks and the likelihood for detrimental impacts to local stakeholders.

The specific location of the accommodation camp was assessed with regard to enabling efficient access for the workforce as well as safety considerations should workers require medical attention (e.g. location to the Arnhem Highway) and potential environmental impacts. The initial location included in the Project referral was to the north of Quest 29 on ML 29782. An alternative location was selected in proximity to Toms Gully Mine on ML 29814. The preferred location is on the primary access track leading to both portions of the Project. The preferred location is no longer in proximity to the haul road and allows for more direct access to the Arnhem Highway.

Power supply options for the camp were also considered in the initial feasibility analysis. Due to the inability to power the processing plant utilising existing mains power the most feasible option was initially to run both the processing plant

and accommodation on the same supply, being LNG. A power line between the processing plant and the accommodation camp was proposed to be constructed sometime during operation with interim diesel generators supplying power to the camp. However, with the selection of the revised camp location on ML 29814 at Toms Gully, the camp is within close proximity to the main powers line adjacent to the Arnhem Highway. As such, selection of the new location for the camp allows for connection to the main grid, no longer requiring diesel generator and thus reducing noise and atmospheric emissions from the Project. The revision also reduces the amount of diesel required to be trucked to site and thus vehicle movements on the external network.

4.15.5 Landfill

Rustlers Roost was selected as the site for a landfill as it is the primary operational area for the Project and will maintain the processing plant, ROM and administration office. Three areas were considered for placement of a landfill at Rustlers Roost, with two being on the east of the pit expansion and the third on the west, between the pit and the TSF (refer to Figure 4-22). Each of the three options were located in the proposed development envelope and within areas of historic disturbance.

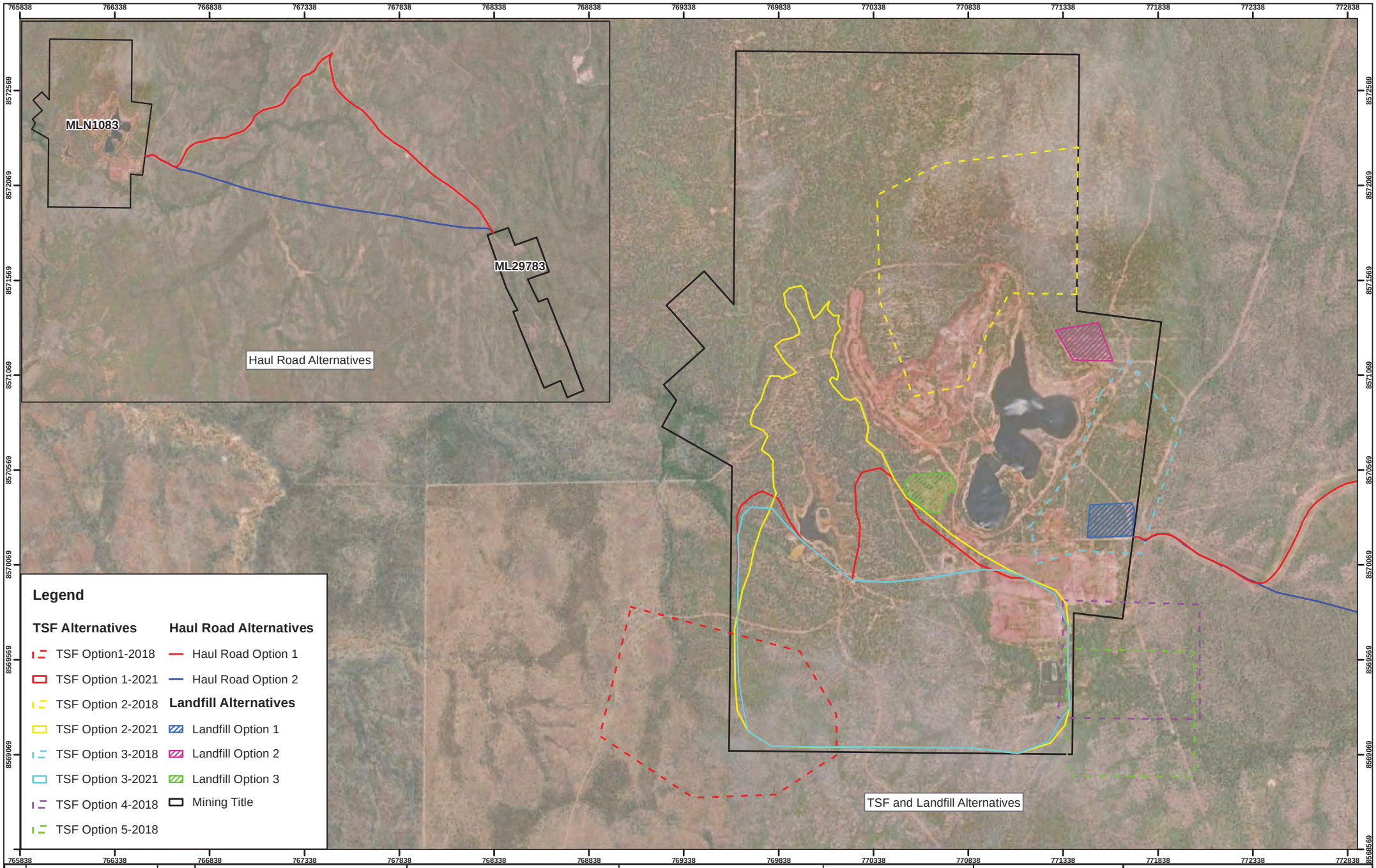
The 4 ha size of the landfill proved challenging to locate on the eastern size of the pit and would likely necessitate construction of a non-standard cell shape which could increase construction and management challenges. Furthermore, the target gold bearing ore is more prominent in the eastern portion of the ML and should future expansion beyond the current Project be progressed in the future placement of a landfill to the east of the current pit would necessitate re-excavation of the waste to access the resource. As such, the current location between the western edge of the pit and TSF was considered the most appropriate location. This location utilises an already disturbed portion of the ML, is located outside key drainage lines and is unlikely to receive significant runoff from the adjacent TSF or WRD following closure.

4.15.6 Haul Road

A haul road is required to transport ore from Quest 29 to the processing plant at Rustlers Roost. Two options for the haul road were considered, with the first being a new dedicated haul road directly linking the two non-contiguous areas and the second being an upgrade to the existing access road (refer to Figure 4-22). A direct haul road would be shorter at 7 km versus the existing road route at 11 km; however, upgrading the current road provides an existing formation and largely cleared area to preferentially utilise. A direct option would necessitate the clearing of approximately 14 ha of native vegetation (based on a 20 m wide disturbance footprint, whereas upgrading the existing alignment is anticipated to intersect 2 ha of additional native vegetation[5]. Therefore, the upgrade and use of the existing access road represents a better environmental outcome.

The current road alignment crosses three mapped drainage features whereas a direct route would require intersection of a minimum five features. This would necessitate construction of at least five new crossing structures (causeways, culverts or bridges) and introduces increased cost and risk of erosion and mobilisation of sediments. A review of the current road waterway crossings has confirmed a single upgrade to the bridge closest to Rustlers Roost will be required. This has been discussed and agreed with the consent of the leaseholder, to repair the existing culvert bridge that will be available for mutual use (refer also Section 3). Based on the alternative analysis, upgrading the existing road was considered to have the least environmental impact and the most cost-effective solution.

[5] Based on the NVIS vegetation mapping layer and a 20 m disturbance area.



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Notes:

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Meters

1 cm = 180 meters

GCS GDA 1994 MGA Zone 52

DESIGNER

CDM Smith

CLIENT

PRIMARY GOLD

FIGURE 4-22

Alternative TSF, Landfill and Haul Road Locations Assessed

DRG Ref: 1001087-EIS-04-4.16

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