Rustlers Roost and Quest 29 Open-Cut Mine Redevelopment

Draft Environmental Impact Statement (EIS)

Section 12 - Conclusion of Predicted Impacts

Prepared pursuant to the Environment Protection Act 2019

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Project Manager:	Paul Davey
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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 12 Conclusion of Predicted Impacts

In accordance with the NT EPA Guidance on preparing an Environmental Impact Statement (NT EPA 2021a), each of the key environmental factor sub-sections within Section 7 provides details of the predicted outcome. Table 12-1 provides a summary of the predicted outcome for each of the environmental factors relevant based on the analysis completed and studies prepared to support the Draft EIS. Table 12-1 does not provide further detail of the potential impacts or the avoidance and mitigation measures as these are already presented in Section 7, Section 11, Appendix B, in the EIS commitments register in Appendix U and closure specific commitments in Appendix J.

Table 12-1 Assessment of Project Against NT EPA Environmental Factor Objective

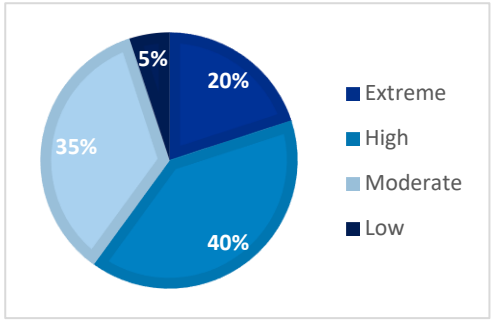
<table>
<tr><th>Factor</th><th>NT EPA Objective</th><th>Predicted Outcome and Significant Residual Impact (If Relevant)</th></tr>
<tr><td>Terrestrial Environmental Quality</td><td>Protect the quality and integrity of land and soils so that environmental values are supported and maintained.</td><td>
Summary

Characteristics of soils, including chemical, physical, biological, and aesthetic qualities will be degraded in the vegetation clearing areas. This will result in less productive soils within the clearing areas; however, this impact is anticipated to be contained within the site disturbance area. Also, the Project commitments include the stripping and retention of topsoils and organic matter for progressive rehabilitation purposes. Therefore, while it is predicted certain areas may take longer to establish native vegetation of local provenance (e.g. WRDs) the impacts can be overcome through progressive rehabilitation, appropriate planning, management of weeds and the fire regime, and limiting access/disturbance of these areas.

During operations, rehabilitation will be undertaken on the decommissioned heap leach facilities 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 (Zamu). 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. The predicted outcome of this approach is an end stable and safe post-closure landform that does not contribute to ongoing cumulative impacts in the surrounding environment.

Risk Assessment

The results of the environmental risk assessment for Terrestrial Environmental Quality are summarised below. The full risk assessment is provided in Appendix B.

Inherent Risk


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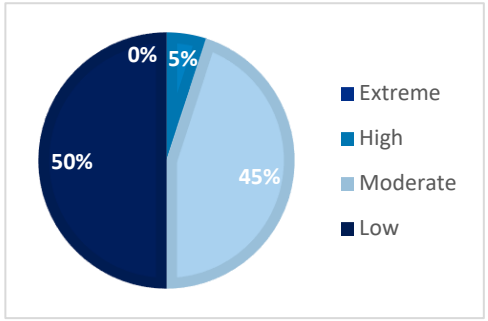

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<tr><td>0</td><td>1</td><td>11</td><td>9</td></tr>
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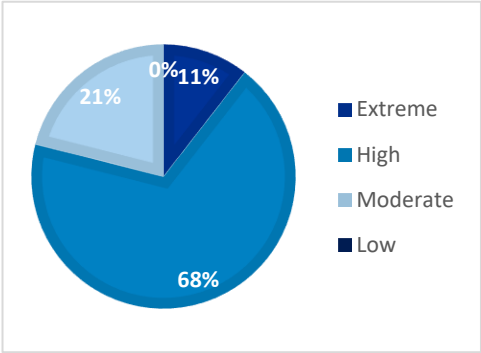
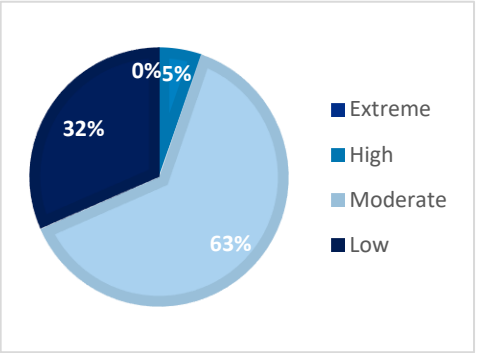
</td></tr>
</table>

Factor	NT EPA Objective	Predicted Outcome and Significant Residual Impact (If Relevant)
		Significant Residual Impact Up to 368.86 ha of additional land disturbance. **Offset** Accounted for in approach to Terrestrial Ecosystem impacts.
Terrestrial Ecosystems	Protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.	**Summary** The Project will result in an additional 333.4 ha of land for the Rustlers Roost, 26.16 ha for Quest 29, 7.3 ha for the accommodation camp, and 2 ha for the haul road (total of 368.86 ha). The clearing may result in some localised destabilisation of soils and erosion; however, through implementation of the ESCP controls and management measures erosion and loss of topsoil is anticipated to be retained within the site with minimal offsite movement of material. Bushfires commonly occur in the dry season within the region. Should fires be started due to Project activities (other than controlled burns) they could impact onsite fauna and flora and easily spread offsite. However, through the appropriate implementation of the proposed avoidance, mitigation and management measures the predicted outcome for the area will be implementation of a fire regime that is more suited to ecosystem functioning and maintenance of surrounding habitats. Weed species also contribute to fire regimes and intensities that are adverse to native ecosystem function. The Project presents opportunities to gain a better understanding of the terrestrial ecological values that are in the area; and will be able to contribute to the management of introduced and feral species, including weed management, and the control of wild dogs, pigs and cats. Based on the proposed avoidance, mitigation and management measures, it is predicated proactive management will reduce pest fauna and flora within and surrounding the Project. With implementation of the proposed measures, there is predicted to be a positive impact on the habitat condition surrounding the disturbance footprint. While there is potential for contribution to airborne particulates from Project activities, this is only likely to occur during severe weather events. Such circumstances are unlikely to result in detrimental impacts to ecological or human receptors in the area. Furthermore, any impacts to fauna through noise and artificial light are predicted to be localised and result in temporary behavioural changes (e.g. avoidance of areas) and will not result in long-term impacts. The two species of particular concern highlighted by the NT EPA in 2016 and 2017 were the Yellow-snouted Gecko (*Lucasium occultum*) and the sub-shrub *H. macrothrix* (both listed as Endangered under the EPBC Act). The 2021 ToR for the Project also identified the flora species *S. ensatum* (Endangered) for consideration, due to the Project area intersecting modelled habitat for the species. For the Yellow-snouted Gecko no individuals were recorded and it was determined that, due to marginal quality of habitat in the area, there was a low residual likelihood the species occurs.

Factor	NT EPA Objective	Predicted Outcome and Significant Residual Impact (If Relevant)
		H. macrothrix surveys in 2016 and 2017 did not detect the species. Additional targeted surveys for both *H. macrothrix* and *S. ensatum* were completed in 2020 and 2021, for portions of the Project area intersecting modelled potential habitat. Neither were detected and no other threatened flora species were identified. Furthermore, quality of the habitats present in the Project area are marginal and significant impacts to Northern Territory or Commonwealth Government listed species is considered unlikely. Therefore, there is predicted to be no significant residual impact to habitat that could be considered important to a listed threatened flora or fauna species. After the application of mitigation measures, the Project will result in the direct loss of 368.86 ha of native vegetation and subsequently, associated fauna habitat. Although only a single TPWC Act listed species, the Merten's Water Monitor has been recorded in the Project area, the clearing still constitutes potential habitat; however, none of the habitat is considered high quality for listed species and would not support an important population of a listed species, should they occur. Progressive rehabilitation efforts will further mitigate regional impacts. **Risk Assessment** The results of the environmental risk assessment for terrestrial ecosystems are summarised below. The full risk assessment is provided in Appendix B. Inherent Risk  Residual Risk  	Extreme	High	Moderate	Low
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2	13	4	0 | | Extreme	High	Moderate	Low
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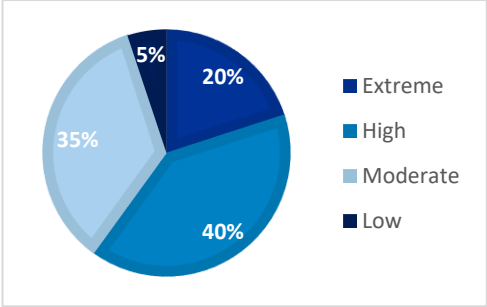
0	0	12	6	 **Significant Residual Impact** Clearance of up to 368.86 ha of Eucalypt woodland and the habitat this constitutes.

Factor	NT EPA Objective	Predicted Outcome and Significant Residual Impact (If Relevant)
		Offset In accordance with the NT Offsets Principles (Northern Territory Government 2020), PGO will seek to implement voluntary offsets as part of its corporate responsibilities. PGO commits to directly or indirectly implement biodiversity improvement initiatives in consultation with the NT EPA and in alignment with the forthcoming NT Biodiversity Offset Policy and Biodiversity Technical Guidelines NT EPA.
Hydrological Processes	Protect the hydrological regimes of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.	**Summary** Surface water modelling for Quest 29 indicated that mining and the planned water management during dewatering will have little impact on downstream environmental flows. From a flood risk assessment standpoint, for a 1% AEP event there are flood risks, but these are not widespread. For a Probable Maximum Flood (PMF) scenario, there is a high risk in nearly every channel and around the Taipan pit, however appropriate post-mine safety bunding to 2 m is expected to ameliorate this. For the Rustlers Roost portion of the Project there is little risk to humans due to direct rainfall and runoff from the mine site as access to the site is through fences and locked gates. The broader area of the mine site is entered from the Arnhem Highway through fenced private property and through the quarry at Mount Bundey. All remaining water bodies will be bunded. A site water balance model was developed to estimate the viability of the proposed WMP in its ability to prevent uncontrolled spills to the environment; to keep a dry working environment during mining phases and to evaluate the likelihood of overflowing of the pit lakes. The output of the water balance model indicated that groundwater seepage is the biggest contributor to the water balance amounting to ~83% of all inflows. While there is a notable amount of uncertainty regarding the degree of groundwater inflow to be managed (i.e. 100 L/s to 600 L/s), monitoring of pit seepage during the initial phase of operation will significantly reduce this uncertainty. Water is planned to be released from the mine site and directed to Mounty Bundey or Marrakai Creeks at times when it cannot be stored or utilised onsite. Over the LOM, it is estimated that around 65 GL of water may be released between 2022 and 2031, which is well within the limits of environmental water flows for these water bodies. A numerical groundwater model was developed to estimate the potential maximum drawdown induced by mining the pits at Rustlers Roost and Quest 29, and the potential groundwater inflows to the proposed mining pits. The model predicted that the drawdown induced by the proposed pumping may extend up to 5 km to the north and 3 km to the south of the Rustlers Roost pits and 2 km to the south-west of the Quest 29 pits. The modelling demonstrates that the probability of Marrakai Creek, Mary River and McKinlay River being impacted by the proposed pits is minimal. **Risk Assessment** The results of the environmental risk assessment for hydrological processes are summarised below. The full risk assessment is provided in Appendix B.

<table>
<tr><th>Factor</th><th>NT EPA Objective</th><th>Predicted Outcome and Significant Residual Impact (If Relevant)</th></tr>
<tr><td></td><td></td><td>
Inherent Risk


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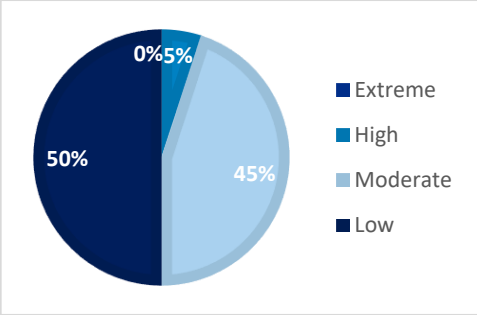

<table>
<tr><td>Extreme</td><td>High</td><td>Moderate</td><td>Low</td></tr>
<tr><td>0</td><td>1</td><td>9</td><td>10</td></tr>
</table>
Significant Residual Impact
None.

Offset
None proposed.
</td></tr>
<tr><td>Inland Water Environmental Quality</td><td>Protect the quality of groundwater and surface water so that environmental values including ecological health, land uses and the welfare and amenity of people are maintained.</td><td>
Summary

Pit lake water quality as an aquatic ecosystem habitat for the Rustlers Roost pit lake was moderately poor, with high nutrient concentrations and low oxygen concentrations. However, pit lake water quality as COPC concentrations was good, with only slight exceedances of ecosystem values for total iron and ammonium and drinking water for ammonium. While the groundwater modelling and water balance assessment indicate connectivity with the groundwater aquifers and potential loss of water from the pits into the aquifers (more likely during the dry season), the good water quality indicates that seepage of pit lake water into groundwater is unlikely to contribute significant contaminants that would adversely affect the surrounding environment.

Based on the hydrology assessment there is a risk under extreme flood scenarios that runoff could result in erosion and scouring that would contribute to the transportation of sediment. However, the risk of transporting sediments from the Project site to the environment at levels that would result in detrimental impacts to ecosystem functioning, is largely limited to extreme rainfall scenarios that exceed the ESCP design criteria. During operation, the implementation of erosion and sediment control in accordance with the management plans is anticipated to
</td></tr>
</table>

Factor	NT EPA Objective	Predicted Outcome and Significant Residual Impact (If Relevant)
		maintain soil and structure stability and limit the release of sediment from the site to acceptable levels. Furthermore, through the closure, rehabilitation and capping of historic mining features currently constituting to erosion (e.g. heap leach pads) it is possible the Project will result in a net reduction in the offsite movement of sediments. Thus, it is considered highly unlikely the Project would introduce contaminants to the receiving environments through sedimentation that would increase contaminates to a level that would impact ecosystem functioning, cause a human health risk or impacts either recreation or cultural uses. Based on the material characterisation study there is risk of transporting material throughout the site that could result in contamination if not appropriately managed (inclusive of AMD and NORMS). However, there is high certainty that runoff from WRDs can be captured onsite and management and that seepage from both WRDs and the TSF can be prevented based on the chosen design criteria. The determination that runoff can be contained and treated is support by the water balance model and implementation of the proposed control measures, including development of a geochemical block model. With appropriate implementation and design and controls, the Project should not contribute to impacts associated with release of chemicals into the environment. The Project will maintain hazardous chemicals onsite. PGO is committed to operating in accordance established guidelines associated with the storage and handling of hazardous chemicals in Australia. Furthermore, the Project design incorporates significant bunding around the process plant and a sump. Therefore, the risk of stored or transport hazardous chemical release from the site contributing cumulatively to contamination in the surrounding environment is low. While the risk of small scale leaks and spills during operation is an inherent risk in any mining operation, release of these chemicals to the environment during such a scenario can be prevented though employment of appropriate standard operating procedures, training and provision of spill kits. All these measures are proposed for the Project and therefore the risk of release to the environment is low. It is predicted the design, implementation of standard operating procedures and implementation of the environmental management system will sufficiently prevent chemical releases and any incident would be sufficiently minor to be contained and treated with spill kits and through landfilling the contaminated material. **Risk Assessment** The results of the environmental risk assessment for inland water environmental quality are summarised below. The full risk assessment is provided in Appendix B.

<table>
<tr><th>Factor</th><th>NT EPA Objective</th><th>Predicted Outcome and Significant Residual Impact (If Relevant)</th></tr>
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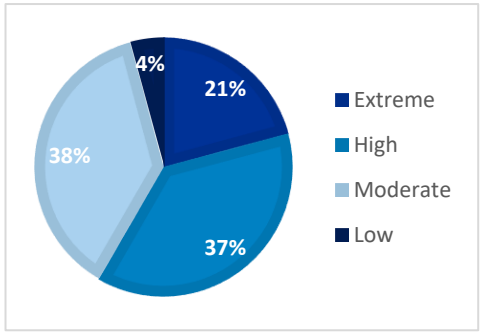
Inherent Risk


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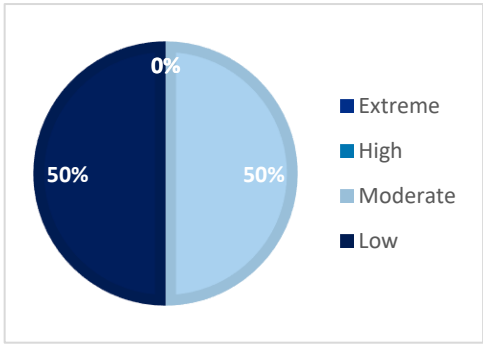

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<tr><td>0</td><td>0</td><td>12</td><td>12</td></tr>
</table>
Significant Residual Impact

None

Offset

None proposed.
</td></tr>
<tr><td>Aquatic Ecosystems</td><td>Protect aquatic habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning.</td><td>
Summary

Pit lake water quality as an aquatic ecosystem habitat for the Rustlers Roost pit lake was moderately poor, with high nutrient concentrations and low oxygen concentrations. However, pit lake water quality as COPC concentrations was good, with only slight exceedances of ecosystem values for total iron and ammonium and drinking water for ammonium. Therefore, discharge or seepage of pit lake water into surface water or groundwater is unlikely to contribute significant contaminants that would adversely affect the receiving environment.

Based on the hydrology assessment there is a risk under extreme flood scenarios that runoff could result in erosion and scouring that would contribute to the transportation of sediment. However, the risk of transporting sediments from the Project site to the environment at levels that would result in detrimental impacts to ecosystem functioning, is largely limited to extreme rainfall scenarios that exceed the ESCP design
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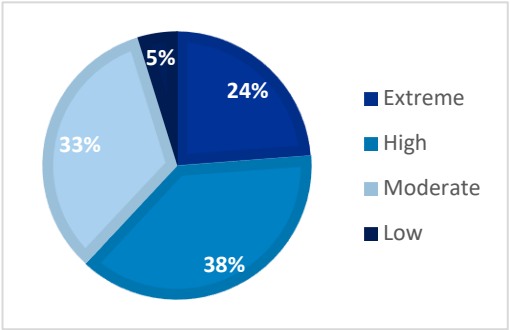
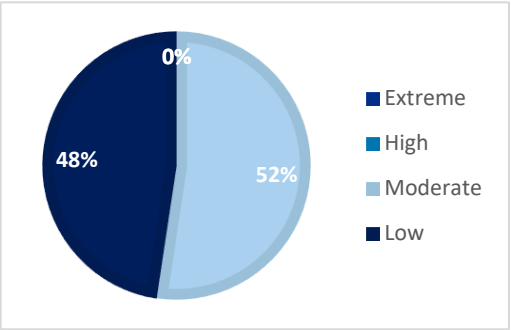
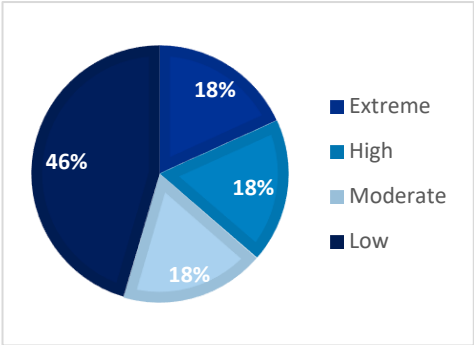
Factor	NT EPA Objective	Predicted Outcome and Significant Residual Impact (If Relevant)
		criteria. During operation, the implementation of erosion and sediment control in accordance with the management plans is anticipated to maintain soil and structure stability and limit the release of sediment from the site to acceptable levels. Furthermore, through the closure, rehabilitation and capping of historic mining features currently constituting to erosion (e.g. heap leach pads) it is possible the Project will result in a net reduction in the offsite movement of sediments. Thus, it is considered highly unlikely the Project would introduce contaminants to the receiving environments through sedimentation that would increase contaminates to a level that would impact ecosystem functioning, cause a human health risk or impacts either recreation or cultural uses. It is predicted the design, implementation of standard operating procedures and implementation of the environmental management system will sufficiently prevent chemical releases and any incident would be sufficiently minor to be contained and treated with spill kits and through landfilling the contaminated material. The Project will result in the removal and/or intersection of approximately 2,500 m of natural drainage and creek lines due to the construction of the TSF, pit expansion, and haul road. However, it will be highly unlikely that any significant aquatic fauna will be affected due to the highly ephemeral characteristics of these drainage lines. **Risk Assessment** The results of the environmental risk assessment for inland water environmental quality are summarised below. The full risk assessment is provided in Appendix B. Inherent Risk  Residual Risk  Inherent Risk | Extreme | High | Moderate | Low | | --- | --- | --- | --- | | 5 | 8 | 7 | 1 | Residual Risk | Extreme | High | Moderate | Low | | --- | --- | --- | --- | | 0 | 0 | 11 | 10 |

Factor	NT EPA Objective	Predicted Outcome and Significant Residual Impact (If Relevant)
		Significant Residual Impact Removal of approximately 2,500 m of natural drainage lines of which 4.85 ha constitutes riparian habitat. **Offset** In accordance with the NT Offsets Principles (Northern Territory Government 2020), PGO will seek to implement voluntary offsets as part of its corporate responsibilities. PGO commits to directly or indirectly implement biodiversity improvement initiatives in consultation with the NT EPA and in alignment with the forthcoming NT Biodiversity Offset Policy and Biodiversity Technical Guidelines NT EPA.
Community and economy	Enhance communities and the economy for the welfare, amenity and benefit of current and future generations of Territorians.	**Summary** The Project presents economic and community opportunities at a scale that is not problematic for services, existing infrastructure or social fabric and are expected to have on balance an overall positive socio-economic impact. Risks to the community from transport related interactions, altered water quality (affecting downstream recreational and cultural uses) and the risk of unexpected closure resulting in legacy issues that affect the community will remain. During peak operation the Project is anticipated to result in a negligible increase (3.74%-4.0) to current traffic volumes along the Arnhem Highway. However, both the likelihood and consequence of such risks are considered to be sufficiently low through the application of controls applied in accordance with the environmental decision-making framework. The environmental objective identified in the ToR (NT EPA 2021b) for community and economy risk was to enhance communities and the economy for the welfare, amenity and benefit of current and future generations of Territorians. The Project provides an opportunity to enable further mining increment to generate local economic opportunities with minimal environmental risk and creates the opportunity to manage the unrehabilitated historic disturbance area, waste rock and water management according to international best practice for mine closure such that the ToR objective for this factor is able to be met. **Risk Assessment** The results of the environmental risk assessment for inland water environmental quality are summarised below. The full risk assessment is provided in Appendix B.

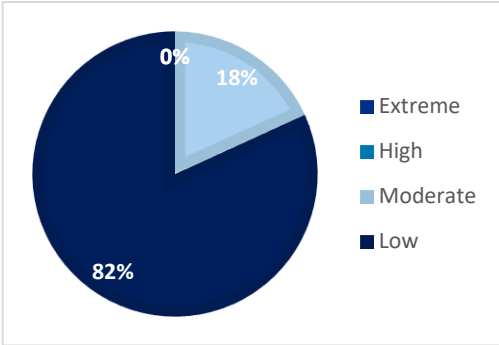
Factor	NT EPA Objective	Predicted Outcome and Significant Residual Impact (If Relevant)

Inherent Risk



Extreme	High	Moderate	Low
2	2	2	5

Residual Risk



Extreme	High	Moderate	Low
0	0	2	9

Significant Residual Impact

No significant residual adverse impacts.

Offset

None.