3.12.5 Heritage

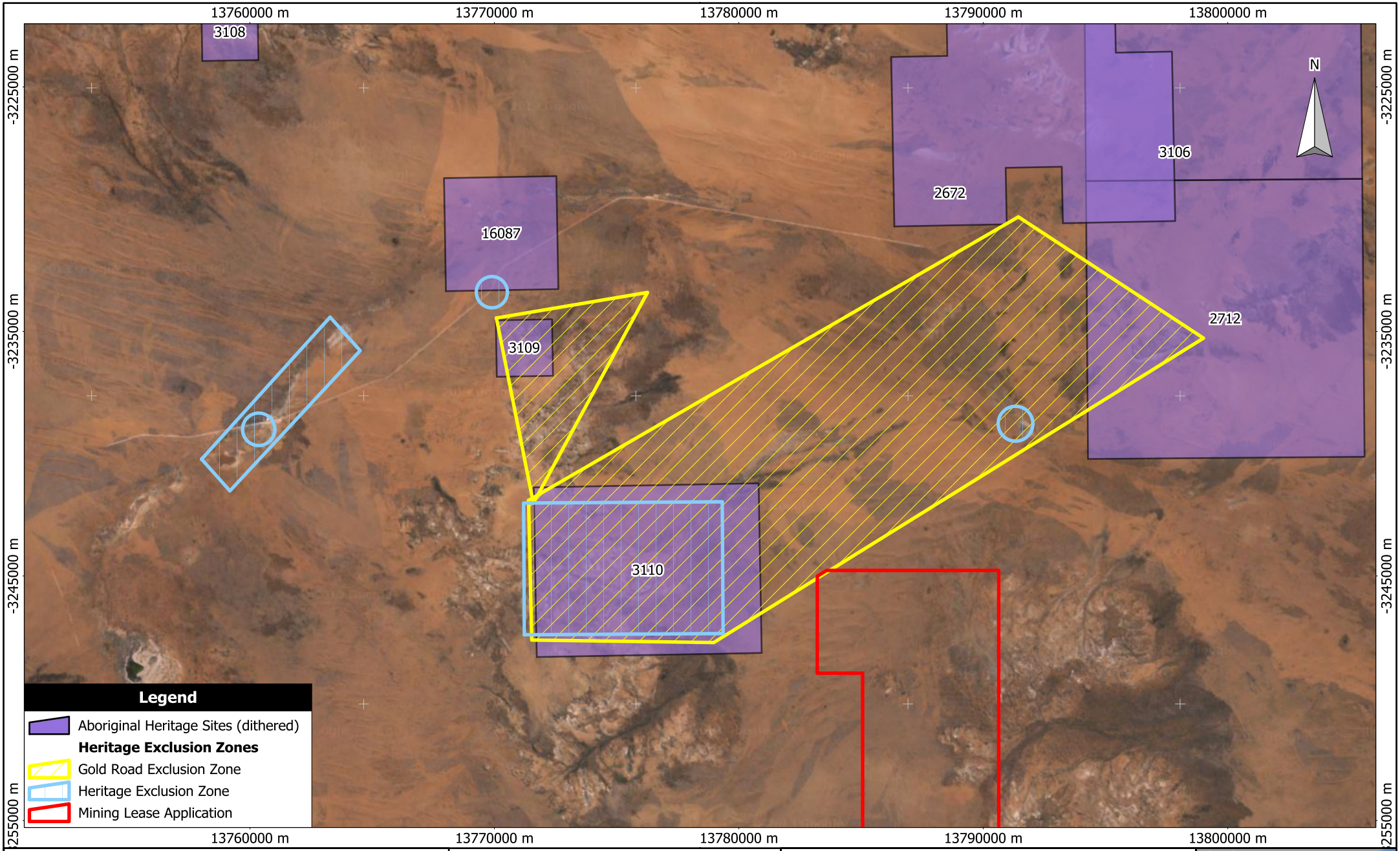
In order to determine the presence of items or sites of State, National or Aboriginal heritage, a search of the Heritage Council's State Heritage Register and the Department of Aboriginal Affairs' (DAA) register of heritage places using the Heritage Inquiry System was undertaken for a radius of 20 km around the Gruyere Gold Project area. No registered Aboriginal heritage sites are located within MLA38/1267. Registered heritage sites occurring within the wider Gruyere area include (Figure 19):

- **Registered Site 3110 Pildpirl**: possibly associated with Minnie Creek, approximately 5 km west of the Gruyere deposit. This is registered for ceremonial, mythological and manmade structure reasons.
- **Registered Site 2672 Marlu Ngura**: a mythological Marlu (Kangaroo) Dreaming Track, located approximately 12.4 km north of the Gruyere deposit.
- **Registered Site 3106 Kunti Tjutinpa**: registered for ceremonial, mythological, artefacts/scatters, located approximately 15.8 km north-east of the Gruyere deposit.
- **Registered Site 16087 Point Virginia**: a registered mythological site, located approximately 17.2 km north-west of the Gruyere deposit.
- **Lodged Site 2712 Tjida Rockhole**: a mythological site, located approximately 0.4 km north-east-east of the Gruyere deposit.
- **Lodged Site 3109 Tjinintjara**: a ceremonial and mythological site, located approximately 12 km north-east of the Gruyere deposit.

A search of the *EPBC Act* Protected Matters Database Search was undertaken to determine the presence of any Registers of the National Estate (RNE) listed under the *Australian Heritage Council Act 2003* within the Gruyere Gold Project area with a buffer zone of 10 km. The Protected Matters Database Search identified one RNE, named Pildpirl Protected Area, located within an 8 km radius of the central point which was listed for its mythological and ceremonial site values in November 1979. This RNE appears to correspond with Registered Site 3110.

Gold Road commissioned a heritage survey within the Yamarna exploration area during 2004; however the information from this survey is unavailable due to a Confidentiality Agreement. A '*Yamarna Pastoral Lease Heritage Agreement'* and the *'Yamarna Project Agreement*' was made in 2004 between Gold Road and Harvey Murray as applicant for and on behalf of the Cosmo Newberry Claim Group which governs exploration activities inside the Pastoral Lease. Gold Road has agreed on areas that will not be accessed and has subsequently established a number of 'Gold Road exclusion zones' and 'Heritage exclusion zones' to the north-west of the Gruyere Gold Project (Figure 19).

An Ethnographic Cultural Mapping survey was completed in September 2015 by expert Anthropologists and Senior men who are the cultural custodians of the land and across the greater Gruyere Gold Project region, taking in the likely Project footprint including infrastructure corridors. Results of the survey will assist Gold Road in managing heritage values and Gruyere Gold Project planning processes during the FS.



Scale: 1:200000
Original Size: A4
Air Photo Date: 2014
Grid: Latitude / Longitude

0 10000 m

Gold Road Resources Limited
Gruyere Gold Project
EPA Referral

Figure 19

Location of Heritage Sites and Exclusion Zones

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West Perth WA 6005
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MBS ENVIRONMENTAL

W:\Gold Road Resources\Gruyere\Approvals\EPA Referral\Drawings\Heritage.map 31/03/2016 F19 Location of Heritage Sites and Exclusion Zones Layout

3.13 FIRE REGIMES

Fire is a common occurrence though out the GVD, particularly lightning derived fires and is listed as one of the existing disturbances in the area along with exploration activities and stock grazing.

In 2008 and 2012, two fires were prevalent in an area located approximately 122 km south-east of the Gruyere Gold Project (Botanica 2015).

In 2009, 2012 and 2013 the Gruyere borefields areas were subjected to major fire events, with some sections of the borefields being subjected to multiple successional fires in 2012 and 2013 (Botanica 2016).

3.14 AIR QUALITY AND NOISE

The closest community is Cosmo Newberry, located approximately 80 km north-west of the Gruyere Gold Project. The second closest community is Laverton, which is located approximately 160 km south-west of the Gruyere Gold Project.

Due to the distance from the Gruyere Gold Project and borefields areas, the receptors of potential air quality and noise issues associated with the Gruyere Gold Project will only be the employees of the Gruyere Gold Project. Placement of the permanent Gruyere Gold Project camp and work locations have taken into consideration the predominant wind directions and topography of the area to minimise any risk of potential air quality and noise impacts.

4. IDENTIFICATION OF ENVIRONMENTAL FACTORS AND ASSESSMENT OF POTENTIAL IMPACTS

Based on a preliminary assessment, Table 12 provides an assessment of the key environmental factors identified as being relevant to each of the three development envelopes for the proposal.

Table 12: Key Environmental Factors

Factors	Mine Site	Access Corridor	Yeo Palaeochannel Borefield
Landform	X	X	X
Flora and Vegetation	✓	X	✓
Terrestrial Fauna	✓	X	X
Terrestrial Environmental Quality	X	X	X
Subterranean Fauna	X	X	✓
Hydrological Processes	X	X	X
Inland Waters Environmental Quality	X	X	X
Air Quality	X	X	X
Heritage	X	X	X
Amenity	X	X	X
Human Health	X	X	X
Offsets	X	X	X
Rehabilitation and Decommissioning	✓	X	X
Coastal Processes	X	X	X
Benthic Communities and Habitat	X	X	X

Information regarding each of the environmental factors including a description of the potential environmental impact and preliminary management and mitigation actions is contained in Table 13.

Table 14 summarises the reasoning behind the assessment of the environmental factors for the Gruyere Gold Project.

Figure 20 illustrates the likely significance of each of the environmental factors considering the inherent and residual risk after management and mitigation measures have been applied. From this it can be seen that the residual risk for each factor is considered below the point where formal assessment under the *EP Act* is warranted.

Table 13: Assessment of Likely Impact on Environmental Factors by the Gruyere Gold Project

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Landforms	To maintain the variety, integrity, ecological functions and environmental values of landforms and soils.	**Mine Site:** • Permanent changes to the landform as a result of development of an open pit and construction of an IWL. • Short term changes to landform for construction of Gruyere Gold Project infrastructure. Impacts on landform are only for the life of the Gruyere Gold Project (12 years). • Increased erosion within disturbed areas. **Access Corridor/Yeo Palaeochannel Borefield:** • Short term changes to landform for construction of borefields infrastructure. Impacts on landform are only for the life of the Gruyere Gold Project (12 years). • Increased erosion within disturbed areas.	• Gruyere Gold Project design has considered minimising landform disturbance and ensuring constructed landforms aim to be no higher than surrounding hills (~40 m). • Traditional Owners have been consulted in regards to the constructed landform and the target height has been agreed upon by both parties. • Clearing activities will be managed to ensure clearing is strictly limited to that necessary for the operations. • Disturbed areas will be rehabilitated as they become available. • A Mine Closure Plan will be developed and implemented. Closure criteria will consider EPA objectives for this factor. • Topsoil will be stripped and stockpiled for later use in rehabilitation activities. • Woody vegetation cleared for the Gruyere Gold Project will be stockpiled and retained for use in rehabilitation. • Topsoil stockpiles will be seeded if required to minimise erosion and develop a self-sustaining seedbank. • Borrow pits, if required, will be rehabilitated with slopes battered to a 1:3 slope to reduce water erosion and ponding and blend with the surrounding environment. • Consultation will be undertaken with stakeholders regarding the future use of Gruyere Gold Project roads and other infrastructure such as the airstrip and borefields post Gruyere Gold Project.

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Flora and Vegetation	To maintain representation, diversity, viability and ecological function at the species, population and community level.	**Mine Site:** • Localised loss of vegetation from clearing. • Loss of biological diversity and reduced regional representation of flora and vegetation communities. • Fragmentation of land. • Spread of existing weed species and introduction of new weed species due to increased vehicle movement in the local area. • Vegetation damage due to increased fire risk. • Death of vegetation due to saline water and tailings spills/leaks. • Alteration to vegetation communities resulting from changed drainage patterns. • Reduction in vegetation condition due to dust emissions. **Access Corridor/ Yeo Palaeochannel Borefield:** • Localised loss of vegetation from clearing. • Spread of existing weed species and introduction of new weed species due to increased vehicle movement in the local area. • Vegetation damage due to increased fire risk. • Death of vegetation due to saline water leaks. • Alteration to vegetation communities resulting from changed drainage patterns. • Reduction in vegetation condition due to dust emissions.	• Local provenance seed collection will be undertaken with assistance from the Traditional Owners both prior to vegetation clearing and throughout the Gruyere Gold Project life. • Clearing activities will be managed to ensure clearing is strictly limited to that necessary for the operations. • Disturbance will be minimised through careful design of site layout. Disturbed areas will be rehabilitated as they become available. • Vehicle and equipment hygiene procedures will be implemented to minimise entry of weed and soil borne diseases. • Fire breaks will be installed in consultation with Department of Fire and Emergency Services (DFES) to protect key infrastructure where required and mosaic burns will be conducted to assist with minimising spread of fire and reducing the severity of fire when it does occur. • Firefighting equipment will be located on site and personnel trained in fire response. • Lightning protection equipment will be installed as part of Gruyere Gold Project design where necessary. • Gruyere Gold Project and borefields design will consider location of drainage lines and flood levels with the aim of minimising disturbance of these areas. • Pipes transferring saline water and tailings will be located within bunds. • Dust control measures will be implemented. • Speed limits will be implemented to minimise dust emissions. • Dust suppression agents will be used as needed to minimise dust emissions from roads and other disturbed areas. • A Mine Closure Plan will be developed and implemented. Closure criteria will consider EPA objectives for this factor.

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Terrestrial Fauna	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.	**Mine Site:** • Removal and fragmentation of fauna habitat. • Reduction in connectivity of fauna habitat. • Disturbance of potential conservation significant fauna species by clearing of habitat. • Increased risk of fauna mortality from vehicle strikes. • Potential increase in pest species (populations and number of species) through establishment of domestic waste disposal and permanent water storage facilities. • Death of fauna due to bogging in the TSF or drowning in water storages. **Access Corridor:** • Removal and fragmentation of fauna habitat. • Reduction in connectivity of fauna habitat. • Increased risk of fauna mortality from vehicle strikes. **Yeo Palaeochannel Borefield:** • Removal and fragmentation of fauna habitat. • Reduction in connectivity of fauna habitat. • Increased risk of fauna mortality from vehicle strikes. • Death of fauna due to drowning in water sumps.	• Clearing activities will be managed to ensure clearing is strictly limited to that necessary for operations. • Gruyere Gold Project and borefields design has considered location of fauna species and habitat of significance. • Disturbed areas will be rehabilitated as they become available. • Speed limits will be implemented to minimise fauna mortality due to vehicle strike. • Open holes, trenches, the refuse impoundment and any water holding facilities will be inspected regularly for fauna. • The site induction programme will provide information on fauna of conservation significance including their appearance and habitats. • Domestic waste facilities will be fenced and putrescible wastes will be regularly covered.

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Terrestrial Environmental Quality	To maintain the quality of land and soils so that the environment values, both ecological and social, are protected.	**Mine Site:** • Contamination of soils through spillage of reagents, chemicals, hydrocarbons, tailings or saline water. **Access Corridor/ Yeo Palaeochannel Borefield:** • Contamination of soils through spillage of saline water.	• Pipelines will be located within bunds to prevent uncontrolled discharge of saline water and tailings to the environment. • Tailings and return water pipelines will be fitted with leak detection systems and will be routinely inspected. • Borefield pipelines will be fitted with leak detection systems and will be routinely inspected. • Reagents and hydrocarbons will be stored within bunded areas. • Spill kits will be located at strategic locations throughout the Gruyere Gold Project area and employees trained in their use. • Water storages potentially storing saline or poor quality water will be lined to prevent or minimise seepage.
Subterranean Fauna	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.	**Mine Site:** Baseline studies within the Gruyere Gold Project proposed open pit footprint, identified 3 species of stygofauna and no troglofauna species. These 3 species are indicated to have wide distributions through hydraulic connection within the secondary aquifer system and therefore impacts on stygofauna from open pit development are considered negligible. Potential impacts on subterranean fauna from the development of the Gruyere Gold Project include: • Direct loss of potential subterranean fauna habitat due to open pit development. • Alteration of groundwater tables *i.e.* drawdown associated with pumping. **Access Corridor:** There will be no impacts to subterranean fauna within the access corridor.	Management actions to minimise impacts on stygofauna in the Yeo Palaeochannel will include: • Designing the water abstraction network to minimise localised groundwater drawdown in the proposed Yeo Palaeochannel borefield where a number of stygofauna species of restricted distribution have been identified. This may include location of borefield abstraction points further to the north and/or south than what was considered during the PFS. • Implementing groundwater level monitoring programmes to determine if levels are changing in accordance with modelled predictions. • Implementing subterranean fauna monitoring programs to determine if population numbers and species diversity are being adversely impacted. • Adoption of an adaptive borefield management approach and avoidance of stygofauna through design. • Consideration of the use of a contingency borefield to the west

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
		Yeo Palaeochannel Borefield: Baseline studies within the Gruyere borefield areas collected 42 species of stygofauna representing 12 higher taxonomic groups. Thirty six species were collected in the Yeo Palaeochannel, while six species were recorded only from upland areas. Thirty of the species collected are likely to be restricted to the vicinity of the Yeo Palaeochannel and adjacent uplands in the vicinity of the Gruyere Gold Project. Eight of these 30 species are known only from a single bore, three are known from two bores (but sometimes many samples) and 19 species are known from three or more bores. Twenty eight species are known only from the Yeo Palaeochannel. Impacts from development of the Yeo Palaeochannel therefore need to be managed. Potential impacts on subterranean fauna from the development of the borefield include: • Direct disturbance and loss of potential subterranean fauna habitat due to borefield pumping activities. • Alteration of groundwater tables *i.e.* drawdown associated with pumping. Groundwater abstraction has the potential to threaten the persistence of any species of stygofauna that is restricted to groundwater drawdown areas through loss of habitat. However, when calculating the area of drawdown, it is recognised that stygofauna habitat has a three-dimensional structure and small amounts of drawdown at a site may not affect the amount of stygofauna habitat available. The saturated component of the Quaternary Detritals has 4 - 14 m thickness through most of the Yeo Palaeochannel and it is considered that drawdown of up to 2 m is unlikely to threaten persistence of a species. Accordingly, it is considered that the area in which restricted stygofauna species may be threatened is where modelled groundwater drawdown is >2 m.	of the Yeo Palaeochannel borefield, which would be subject to native title negotiations.

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Hydrological Processes	To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.	**Mine Site:** The Gruyere Gold Project has potential to affect hydrological processes through: • Localised reduction in surface water volumes. • Flooding of the Gruyere Gold Project area and associated infrastructure. • Ponding of water in infrastructure areas. **Access Corridor:** There will be no impacts to hydrological processes within the access corridor. **Yeo Palaeochannel Borefield:** The primary water supply for operations will be abstracted from a deep, hypersaline aquifer within the northern and western part of the Yeo Palaeochannel. The high salinity results in the Yeo palaeochannel aquifer means it has no beneficial use other than ecosystem maintenance. Two potential GDE's have been identified within the Yeo palaeochannel. Baseline flora surveys have identified these are widespread on a regional nature and are not unique. Groundwater abstraction will be from a deep hyper saline aquifer that is not hydrologically connected to the shallow aquifers supporting GDE's. The Gruyere Gold Project has potential to affect hydrological processes through: • Localised lowering of groundwater levels within the Yeo Palaeochannel over time. • Over-abstraction of aquifers. • Adverse impact on health of GDEs.	• Gruyere Gold Project and borefield design has considered locations of ephemeral drainages and minimised disturbance of these. • Gruyere Gold Project and borefield design has incorporated surface water diversion measures to minimise risk of flooding or ponding of Project infrastructure. • Gruyere Gold Project and borefield design has considered flood levels and made adequate provision to minimise risk of flooding affecting Project infrastructure. • Culverts or floodways will be installed where necessary to prevent blockage of ephemeral drainages. • Preliminary borefield design has considered water quality, groundwater drawdown, location of impact of drawdown and presence of stygofauna populations and GDE. Detailed borefield design will focus on minimising groundwater drawdown in areas that support unique and diverse stygofauna populations or GDE. • Borefield infrastructure (pipes, tanks, power supply) will be located to avoid or minimise creek crossings and pipe will be buried where it crosses creeks. • A detailed hydrological review and on-going monitoring will be conducted to ensure sustainable abstraction of groundwater.

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Inland Waters Environmental Quality	To maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected.	**Mine Site:** • Contamination of underlying groundwater from seepage. • Contamination of ephemeral drainage lines from saline water, tailings or hydrocarbon spills. • Increased sediment entering ephemeral drainage lines during construction. **Access Corridor:** • The access corridor will have no impact on inland waters environmental quality. **Yeo Palaeochannel Borefield:** • Contamination of ephemeral drainage lines from saline water.	• Gruyere Gold Project and borefield design has considered locations of ephemeral drainages and minimised disturbance of these. • Potentially contaminated water will be captured and either re-used or treated before discharge. • Diversion bunds will be constructed to separate clean and potentially contaminated water. • Pipelines will be located within bunds to prevent uncontrolled discharge of saline water and tailings to the environment. Scour pits will be located at intermittent intervals along the bunded trench to collect potential spillage of saline water. • Tailings and return water pipelines will be located in bunds and fitted with leak detection sensors. • Reagents and hydrocarbons will be stored within bunded areas. • Spill kits will be located at strategic locations throughout the Gruyere Gold Project area and employees trained in their use. • Water storages potentially storing saline or poor quality water will be lined to prevent or minimise seepage. • Sediment control measures will be implemented during construction.

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions

Air Quality	To maintain air quality for the protection of the environment and human health and amenity.	**Mine Site:**
		The Gruyere Gold Project is remote and the nearest sensitive receptor, Cosmo Newberry, is located approximately 80 km north-west of the Gruyere Gold Project.
		
		The Gruyere Gold Project has potential to affect local air quality through:
		• Generation of dust via:
		  • Land clearing during construction.
		  • Open pit blasting.
		  • Erosion from topsoil and ore stockpiles.
		  • Vehicle movement on unsealed roads within the Gruyere Gold Project area.
		  • Emissions from ore crushing and grinding and material transfer during ore processing.
		  • Wind erosion of IWL surfaces.
		• Generation of greenhouse gas emissions via:
		  • Engine exhaust emissions from construction equipment, open pit mining equipment and light vehicles.
		  • Generation of power using gas with diesel backup power.
		  • Transport of materials on and offsite.
		
		Access Corridor/Yeo Palaeochannel Borefield:
		The access corridor and Yeo Palaeochannel borefield will have no impact on air quality.
			• The Gruyere Gold Project access road will be properly formed and compacted with appropriate drainage.
			• Vehicle traffic will be confined to defined roads and tracks.
			• Dust suppression measures will be implemented using water sprays and other means, as necessary.
			• Disturbed areas will be rehabilitated as they become available.
			• Vehicles and power generation equipment will be maintained to minimise emissions.
			• Energy efficiency and greenhouse gas emissions will be considered as part of equipment selection and purchase.
			• Diesel emissions will be reduced by relying on natural gas to power the Gruyere Gold Project.

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Heritage	To ensure that historical and cultural associations are not adversely affected.	**Mine Site:** • Disruption of access to sites of cultural significance. • Direct disturbance of archaeological sites. **Access Corridor:** There will be no impacts to heritage within the access corridor. **Yeo Palaeochannel Borefield:** • Disruption of access to sites of cultural significance. • Direct disturbance of archaeological sites.	• Gruyere Gold Project and borefields design will consider the results of the archaeological and ethnographic surveys. • Gruyere Gold Project and borefields inductions will include information on heritage aspects of the Project area. • Traditional Owners will continue to have uninterrupted access along existing pastoral and public roads.
Amenity	To ensure that historical and cultural associations are not adversely affected.	**Mine Site:** The Gruyere Gold Project area is remote and is not visited by people other than Traditional Owners. The nearest sensitive receptor is Cosmo Newberry which is approximately 80 km north-west of the Gruyere Gold Project. Potential Impacts of the Gruyere Gold Project are: • Disruption to traditional use of the land. • Visual scar on the landscape if rehabilitation of disturbed areas is ineffective. **Access Corridor/ Yeo Palaeochannel Borefield:** There will be no impacts to amenity within the access corridor and Yeo Palaeochannel borefield.	• Gold Road will enter into a Native Title Agreement with the Claimant Group. • Stakeholder consultation will continue to be undertaken. • A Mine Closure Plan will be developed and implemented in consultation with Traditional Owners. • Monitoring will be implemented once areas are rehabilitated to ensure progression towards completion criteria.

Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Human Health	To ensure that human health is not adversely affected.	**Mine Site:** The Gruyere Gold Project area is remote and is not visited by people other than Traditional Owners. Potential impacts on health of employees relevant to the *EP Act* include: • Noise. • Air quality (particulates). • Chemical exposure. **Access Corridor/Yeo Palaeochannel Borefield:** There will be no impacts to human health within the access corridor and Yeo Palaeochannel Borefield.	• Gruyere Gold Project and borefields design has considered exposure to noise and dust emissions. The accommodation village has adequate separation to minimise adverse impacts. • Compliance with occupational hygiene requirements for noise, dust and chemicals in operational areas.
Offsets	To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets.	**Mine Site/Access Corridor/Yeo Palaeochannel Borefield:** No critical or high value environment assets as defined by the EPA will be affected by the Gruyere Gold Project. Offsets are not anticipated to be required.	Gruyere Gold Project and borefields design has considered critical and high value environmental assets and avoided direct or indirect impact on them.

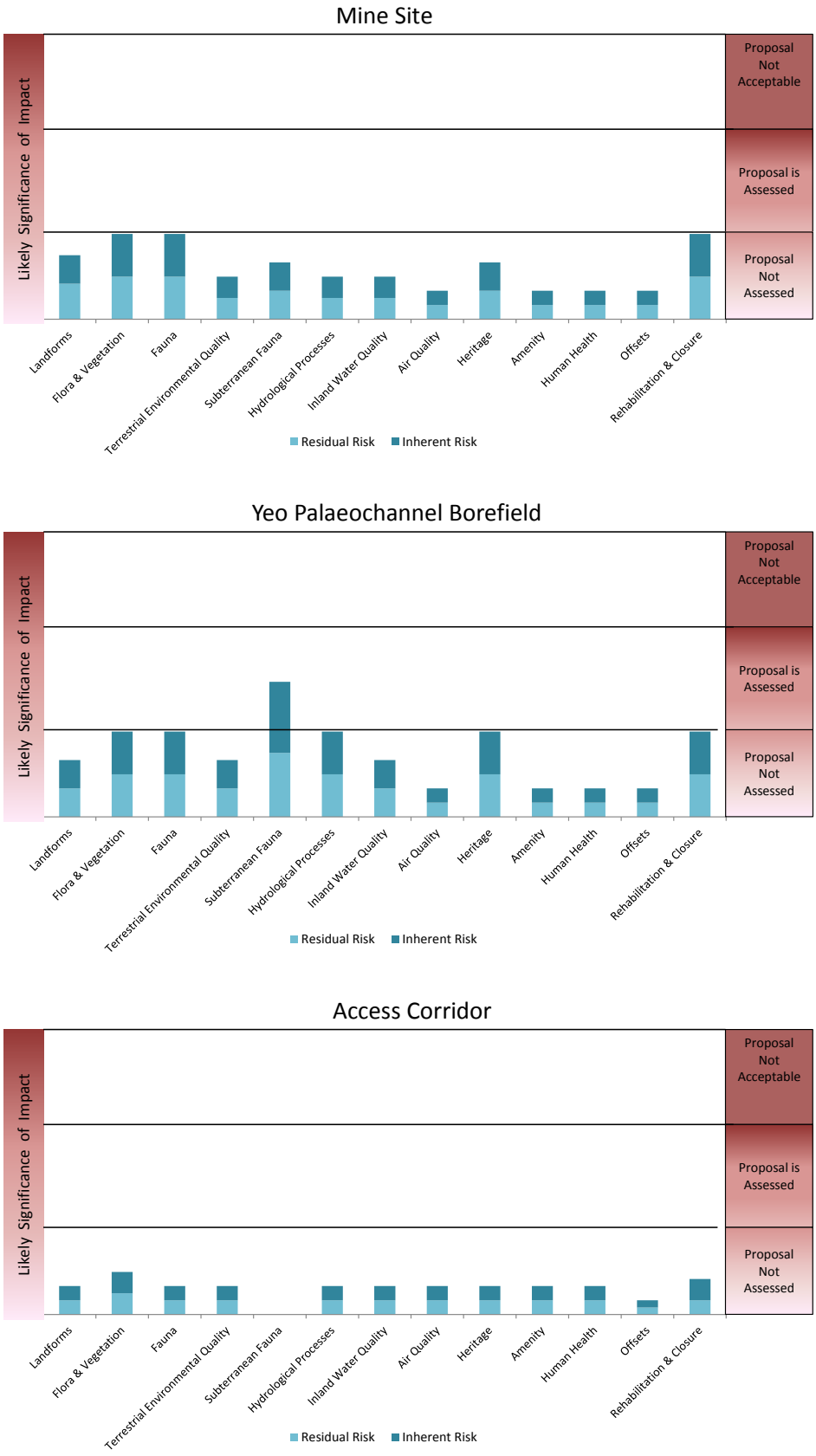
Environmental Factor	EPA Objectives	Potential Impacts of Gruyere Gold Project	Preliminary Mitigation and Management Actions
Rehabilitation and Closure	To ensure that premises are closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the State.	**Mine Site:** • Wind and water erosion of disturbed areas. • Off-site discharge of potential pollutants from un-rehabilitated land. • Ineffective establishment of vegetation and habitat. • Disruption to or poor re-establishment of local drainage paths. • Safety risks associated with infrastructure and the mine workings. **Access Corridor/Yeo Palaeochannel Borefield:** • Wind and water erosion of disturbed areas. • Ineffective establishment of vegetation and habitat. • Disruption to or poor re-establishment of local drainage paths. • Safety risks associated with borefield infrastructure.	• A Mine Closure Plan will be developed and implemented. • Monitoring will be implemented once areas are rehabilitated to ensure progression towards completion criteria. • Annual payments will be made to the Mining Rehabilitation Fund.

Table 14: Summary of Assessment of Environmental Factors

Environmental Factor	Mine Site	Access Corridor	Yeo Borefield	Comments
Benthic Communities & Habitat	N/A	N/A	N/A	Not aquatic, not coastal.
Coastal Processes	N/A	N/A	N/A	Not aquatic, not coastal.
Flora and Vegetation	**Yes**	**Yes**	**Yes**	~1,200 ha of vegetation clearing required for implementation of the whole project of which the majority (12%) is within the Mine Site Development Envelope. No conservation significant or priority species to be affected, not located within Environmentally Sensitive Areas or Schedule 1 Areas, not located within any DPaW managed land; no Threatened Ecological Communities or Priority Ecological Communities and none of the vegetation communities were found to have National Environmental Significance. Impact can be mitigated using standard mining industry practices.
Landforms	No	No	No	No impact to surrounding landforms.
Subterranean Fauna	**Yes**	No	**Yes**	Stygofauna populations in the deposit area are low in density and comprise common species in aquifers to be dewatered to allow open pit mining. Similarly stygofauna populations are of low density and are comprised of common species in the aquifer dewatered by the Anne Beadell borefield. Dewatering will as such not impact local population health or survival. A number of stygofauna species not observed outside of the Yeo Palaeochannel have been identified within a small area of the Yeo Palaeochannel characterised by shallow calcrete conditions, fresh water inflows and differing geological characteristics. These have potential to be impacted as a result of groundwater drawdown over time. Stygofauna populations outside of this area are lower in population density and species are represented outside of any potential impact area. Potential impacts on the restricted distribution stygofauna species can be mitigated by careful bore field design and adaptive management during operations.
Terrestrial Environmental Quality	No	No	No	Not a key factor. Localised disturbance that will not cause significant disruption of pastoral station activities. Project designed to minimise risk of land and soil contamination and preserve soil quality for rehabilitation.
Terrestrial Fauna	**Yes**	No	No	~1,200 ha of fauna habitat to be cleared, the majority of which is within the Mine Site Development Envelope. No critical habitat or species to be affected. Impact can be mitigated using standard mining industry practices.

Environmental Factor	Mine Site	Access Corridor	Yeo Borefield	Comments
Hydrological Processes	**Yes**	No	**Yes**	Groundwater abstraction systems will be designed to minimise long-term drawdown impacts. Limited beneficial users of saline to hypersaline water resources are present in the region. Two potential GDE's have been identified within the Yeo Palaeochannel. Baseline flora surveys have identified these are widespread on a regional nature and are not unique. Groundwater abstraction will be from a deep hyper saline aquifer that is not hydrologically connected to the shallow aquifers supporting GDE's. Surface water diversions within the Mine Site development envelope designed to manage flood and potential water quality issues.
Inland Waters Environmental Quality	No	No	No	No excess water discharge will be required.
Air Quality and Atmospheric Gases	No	No	No	There are no communities in close proximity to the proposal. The nearest community is Cosmo Newberry which is located approximately 80 km northwest of the Gruyere Gold Project.
Amenity	No	No	No	There are no sensitive receptors given the remoteness of the Gruyere Gold Project area.
Heritage	No	No	No	Close consultation with the Traditional Owners has not identified significant issues to date. Potential impacts can be mitigated by Project design.
Human Health	No	No	No	There are no communities in close proximity to the proposal. The nearest community is Cosmo Newberry which is located approximately 80 km north-west of the Gruyere Gold Project.
Offsets	No	No	No	No critical or high value environment assets will be affected by the Gruyere Gold Project. Offsets are not anticipated to be required.
Rehabilitation and Decommissioning	**Yes**	**Yes**	**Yes**	Waste rock and tailings are NAF with high ANC. Large volumes of good quality competent rock, soils and subsoils available for rehabilitation. Can be mitigated with good project planning and implementation of site specific rehabilitation measures.

Figure 20: Assessment of Likelihood of Significant Impact by Factor for Each Development Envelope



5. STAKEHOLDER CONSULTATION

5.1 STAKEHOLDER IDENTIFICATION

Gold Road is working to establish economically, environmentally and socially responsible exploration and mining development at the Gruyere Gold Project. A comprehensive consultation programme was commenced upon the discovery of the Central Bore deposit in 2009 and has since been expanded following the 2014 discovery of the Gruyere deposit and Gold Road's decision to develop it. The program was designed to ensure all relevant stakeholders, from Federal, State and local government authorities, through to affected Traditional Owners, underlying tenement holders and environmental interest groups were all identified and effectively consulted with to address potential stakeholder concerns or requirements in regards to the Gruyere Gold Project. A formal 'Stakeholder Management Plan' has been developed by Gold Road. Table 15 lists the stakeholders identified for the Gruyere Gold Project.

Table 15: Key Stakeholders for the Gruyere Gold Project

Stakeholder Sector	Organisation	Interest
State Government Departments and Agencies	Office of the Environmental Protection Authority (OEPA).	• Administers *EP Act*. • Part IV (*EP Act*) Environmental Impact Assessments.
	Department of Aboriginal Affairs (DAA).	• Indigenous and native title requirements. • Heritage, cultural, ethnographic and archaeological sites.
	Department of Mines and Petroleum (DMP). Mine Safety Inspectorate.	• Administers *Mining Act 1978 (Mining Act)* and Regulations. • Level 2 Lead Agency Status. • Tenement conditions. • Mining proposals, programmes of work. • Mining rehabilitation fund. • Rehabilitation standards. • Safety in resource sector.
	Department of Water (DoW).	• Provision of licences to take and abstract water. • Groundwater quality and quantity.
	Department of Environment Regulation (DER).	• Administers Part V (*EP Act*), Industry Regulation and Licensing and *Contaminated Sites Act 2003*.
	Department of Parks and Wildlife (DPaW).	• Administers *Wildlife Conservation Act 1950 (WC Act)*. • Flora, fauna and habitat conservation. • Interest in Projects that are located on DPaW-managed land only. • Baseline surveys and licences to take flora and fauna.
	Department of Fire and Emergency Services (DFES).	• Fire breaks. • Provision of emergency services.
	Department of Health (DoH).	• Environmental health, building and planning compliance.
	Pastoral Lands Board (PLB).	• Pastoral leases, stations.
	Main Roads Western Australia (MRWA).	• Use of public roads.
Federal Government Departments	Civil Aviation Safety Authority (CASA).	• Airstrip certification.

Stakeholder Sector	Organisation	Interest
	Department of the Environment (Commonwealth, Territories and Assessment Branch) (DoE).	• Administers Environment Protection and Biodiversity Conservation Act 1999 • Part 7 (Referral) and Part 8 (assessment) environmental impact assessments of matters of national environmental significance.
Local Government Authorities	Shire of Laverton (SoL).	• Use of public roads and infrastructure.
Indigenous Groups	• Native Title Claimant Group. • Central Desert Native Title Services (CDNTS). • Cosmo Newberry Aboriginal Corporation.	• Access to and use of Traditional Owner land. • Cultural heritage values. • Native Title rights.
Underlying Land/Tenement Owners	• Breaker Resources. • Eastern Goldfields Mining Company. • Magnis Resources. • Montezuma Mining Company Ltd. • Landslide Investments. • MRG Metals Exploration.	• Land access approvals for baseline surveys and installation of liner infrastructure.
Environmental Interest Groups	• Wildflower Society of Western Australia. • Conservation Council of Western Australia (CCWA). • Goldfields Naturalist Club. • Great Victoria Desert (GVD) Biodiversity Trust.	• Potential interest in baseline surveys and significance of data.

5.2 CONSULTATION

Since the implementation of the stakeholder consultation program in 2009, Regulatory authorities and Traditional Owners (Yilka, Cosmo Newberry Aboriginal Corporation (CNAC) and *Wati* Senior Men) have been thoroughly and effectively consulted with in relation to all of Gold Roads exploration activities in the Yamarna region, and more recently with respect to the Gruyere Gold Project.

Yilka, CNAC and the *Wati* have been actively involved in all the Aboriginal cultural and heritage clearance survey requirements, and Level 2 flora and fauna baseline surveys for the Gruyere Project. During the surveys, their interests have related to heritage exclusion zones, rocky breakaway vegetation communities and the conservation of species of cultural importance. In terms of reaching an equitable Native Title Mining Agreement for the Gruyere Gold Project, a considerable amount of time and effort has gone into detailed negotiations with Yilka/CNAC Native Title claimants via monthly on-country negotiation meetings since June 2015. These consultation and engagement efforts resulted in successfully reaching an in-principle agreement in December 2015. It is expected that a final Native Title Mining Agreement will be signed and executed in Q2, 2016 and have numerous financial flow-on effects through employment and contracting opportunities and compensation. The strong and successful long-term relationship between Yilka/CNAC and Gold Road has resulted from the effective consultation and engagement strategies implemented.

Gold Road approached DPaW on 2 July 2015 regarding the opportunity to provide a Gruyere Gold Project briefing presentation and to discuss surveys for short range endemics. On 7 July 2015, DPaW informed Gold Road that it was not necessary to meet at this stage of the Gruyere Gold Project to discuss matters relevant to DPaW responsibilities and instead, suggested a meeting be arranged for late 2015. DPaW acknowledged that the Gruyere Gold Project is not located on DPaW managed lands and the nearest reserve is approximately 13 km to the east, this being the class “A” Yeo Lake Nature Reserve.

Gold Road approached DMP and on 13 March 2015 had a meeting to provide a Gruyere Gold Project briefing presentation and discussion around DMP’s Level 2 Lead Agency Status involvement. Further to this, DMP have been active participants in other regulatory meetings such as the OEPA Referral meeting.

Gold Road had a pre-referral meeting with the OEPA on 31 August 2015 and another meeting post submission of the draft EPA Referral on the 6 November 2015. Concerns and specific items raised by the OEPA have been addressed in this supporting documentation. One of these concerns was regarding whether Gold Road had briefed DER on the Gruyere Gold Project. Gold Road responded that contact with DER was planned for closer to a time when the Part V Works Approval and Licencing process comes into effect, which is currently scheduled for early 2016. The OEPA however suggested Gold Road make contact with DER at this stage of the Gruyere Gold Project as OEPA and DER liaise closely on Referral documents. Gold Road made contact with DER on 2 September 2015 with the offer of providing a briefing presentation on the Gruyere Gold Project and to discuss the Part V Works Approval and licencing process however no response was received. Gold Road made contact with the DER on 12 February 2016 and is currently organising a scoping meeting with DER to introduce the Gruyere Gold Project.

Pennington Scott on behalf of Gold Road has undertaken extensive consultation with DoW regarding water availability and abstraction, H3 hydrogeological reporting, RIWI licensing and groundwater quality and data.

Gold Road identified and contacted relevant non-government agencies with potential environmental interests in the Gruyere Gold Project. An opportunity was provided to discuss concerns of the project in relation to any particular special environmental interests or values in the area. To-date, no concerns have been raised or advised by the Wildflower Society, the Conservation Council or Wilderness Society. The Great Victoria Desert Biodiversity Trust expressed an interest in the proposed project and ideas were exchanged on how Gold Road may be able to contribute to biodiversity conservation in the future.

Details of consultation outcomes with stakeholders listed in Table 15 are provided in the Stakeholder Consultation Register in Appendix 9. Gold Road will continue to genuinely engage with relevant stakeholders on matters associated with the Gruyere Gold Project to ensure stakeholder concerns are addressed and that potential impacts will be managed through implementation of best practice environmental management measures.

6. EPA PRINCIPLES

The EPA has identified a set of principles for environmental management. Gold Road has considered these initially in the Gruyere Gold Project's PFS report. Further consideration of the EPA principles will be considered during the Gruyere Gold Project's FS (anticipated to be completed in Quarter 4 2016) when Gold Road's environmental design standards will be incorporated and implemented in the engineering specifications of the Gruyere Gold Project. Details of how these have currently been considered in early Gruyere Gold Project design are provided in Table 16.

Table 16: Gruyere Gold Project – Principles of Environmental Management

Principle	Application
Precautionary Principle Where there are threats of serious irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by: • Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and • An assessment of the risk-weighted consequences of various options.	Gold Road will make use of the results of baseline environmental investigations to identify potential impacts and assess the environmental risk of the Gruyere Gold Project's implementation on these aspects. Environmental risks will be considered when finalising options for key Gruyere Gold Project and borefield design choices. Gold Road commits to develop and implement measures to avoid serious or irreversible damage to the environment.
Intergenerational Equity The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.	Gold Road commits to managing those environmental factors within its control such that future adverse impacts are minimised and that, wherever possible, the quality of the environment is maintained or enhanced. Long-term land management proposals are being discussed between Gold Road and the Native Title Claimant Group who are charged as the custodians of their Country to preserve and enhance environmental and cultural values of the region so that the land can be protected for future generations. A Mine Closure Plan will be prepared for the Gruyere Gold Project in consultation with regulatory and traditional owner stakeholders to ensure that post mining land use is consistent with agreed stakeholder objectives and so that rehabilitation can be progressively implemented.

Principle	Application
Conservation of Biological Diversity and Ecological Integrity Conservation of biological diversity and ecological integration should be a fundamental consideration	The Gruyere Gold Project and borefields design, including site layout, environmental protection measures, and engineering specifications has taken into account conservation of biological diversity. There will be no direct impacts on conservation significant flora and fauna species, and risks to other fauna and flora will be minimised. Biological studies undertaken as part of collation of baseline information for the Gruyere Gold Project and borefields has greatly assisted the scientific community in understanding the biological diversity of this previously poorly studied area and gained knowledge of the historical impacts of pastoral activity (at the Gruyere Gold Project site) in comparison to the greater GVD region. Gold Road undertakes to fully assess the effects of its operations, both direct and indirect, on the biological environment and to implement measures to protect remaining biodiversity. This assessment will be documented in the Gruyere Gold Project approval environmental management submissions provided to regulatory authorities.
Improved Valuation, Pricing and Incentive Mechanisms • Environmental factors should be included in the valuation of assets and services. • The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement. • The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste. • Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, which benefit and/or minimise costs to develop their own solutions and responses to environmental problems.	Costs and environmental impact associated with power generation and energy use options were considered as part of the Scoping Study and then refined as part of the PFS. Diesel compared to natural gas or LNG/CNG was evaluated considering environmental life cycle analysis, environmental footprints, market drivers, taxation and economic advantages. A solar PV pumping with integrated diesel back-up business case for the Gruyere Gold Project's water supply borefield is being considered. Costs associated with waste generation and disposal have been considered as part of the PFS. In particular, the decision to go with an IWL solution substantially reduces environmental impact and emissions. Specialist waste engineering models have also been completed to design minimal haulage and tailings pipeline distances thereby minimising fuel use and power requirements. Similar assessments will be undertaken during detailed designs of the package sewerage treatment plants. Costs associated with Gruyere Gold Project closure have been considered as part of the PFS and will be further refined as part of the FS engineering designs. Costs associated with life cycle of reagents and other major Gruyere Gold Project consumables have been considered as part of the PFS.

Principle	Application
Waste Minimisation All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment. Wastes should be managed in accordance with the following order of preference: • Avoidance. • Re-use. • Recycling. • Recovery. • Treatment. • Containment. • Disposal.	Waste minimisation principles have been considered in Gruyere Gold Project design. This includes: • Striving to design the TSF and waste rock dump landforms into a single landform (IWL) in order to minimise the number of landforms at the site. • Re-use of topsoil and cleared vegetation in rehabilitation of areas during operations and post-mining. • Recycling and re-treatment of waste water from the IWL to reuse within the processing plant. • Designing the Gruyere Gold Project to be 'zero discharge' with a balanced water supply without generating or the need to dispose of excess waste water off-site. • Containment of tailings in a clay-lined, engineered IWL which will be safe, stable and non-polluting in the long term. • Disposal of putrescible wastes in a purpose built onsite landfill. • Minimising packaging wastes associated with reagents by importing in bulk and requiring return of packaging to suppliers.

7. ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The Gruyere Gold Project is located in a remote greenfield location within a pastoral lease and as such there was a limited amount of environmental data available for the region prior to Gold Road's presence. Baseline environmental studies undertaken by Gold Road thus far have significantly contributed to the scientific knowledge of the area and have given Gold Road a well-developed understanding of the Gruyere Gold Project area, the surrounding environmental aspects and potential impacts.

Gold Road has engaged key stakeholders of the area since 2009 and intends to continue the stakeholder consultation program as further environmental and engineering investigations are initiated and Gruyere Gold Project design details are refined.

Gold Road considers the significant environmental issues associated with the Gruyere Gold Project are limited in nature and extent. None of these are associated with the Mine Site or Access Corridor development envelopes. Potentially significant impacts are associated with groundwater abstraction from the Yeo Palaeochannel for process water supply. Environmental issues can be managed effectively within the following regulatory frameworks:

- **Native Vegetation Clearing Permit**: This is a well-documented assessment process with opportunity for public comment. Impacts of land clearing can be adequately assessed by DMP using this process.
- **Mining Proposal**: This is a well-documented assessment process managed by DMP Environmental Officers. DMP Officers have a strong technical understanding of the potential impacts of mining and associated activities such as ore processing, waste disposal, power generation and borefield development to supply water for mining projects and what are appropriate management measures to safeguard the environment. Requirements for lodgement of an annual Mining Rehabilitation Fund fee will assist in minimising environmental liabilities to the State in the case of unplanned closure. A Mine Closure Plan will be developed in accordance with EPA and DMP guidelines, incorporating progressive rehabilitation, closure monitoring and maintenance.
- **Works Approval**: This is a well-documented assessment process with opportunity for public comment. Design of equipment and infrastructure associated with pollution management specifically discharges to air; land and water can be adequately assessed by DER using this process.
- **Environmental Licence**: This is a well-documented assessment process with opportunity for public comment. Impacts of discharges to air, land and water during Project operation can be adequately assessed and regulated by DER using this process. DER has powers to assess and ensure compliance with licence conditions.
- **Water Licence**: Applications for the abstraction and use of water for mine dewatering activities, a dedicated process water borefield and a dedicated potable water borefield will be made during future phases of study when the quantities required are more clearly defined. This is part of a well-documented assessment process and impacts on aquifers can be adequately assessed by DoW using this process.

8. CONCLUSION

The Gruyere Gold Project and associated borefield areas are located in a remote greenfields area historically used for pastoral activities and mineral exploration. Limited baseline environmental information was available prior to Gold Road engaging a wide range of specialists to conduct baseline studies. The information obtained from these studies has contributed significantly to the scientific understanding of the area as well as allowing Gold Road to design the Project in a way that identifies, prevents and minimises adverse environmental impacts.

Gold Road has engaged key stakeholders since 2009 through an extensive stakeholder consultation program during the exploration, environmental baseline studies, Project design and Native Title negotiation processes. Gold Road will continue the stakeholder consultation program and effectively engage with key stakeholders throughout the life of the Gruyere Gold Project.

Gold Road believes that potential adverse environmental impacts associated with construction and implementation of the Gruyere Gold Project are limited due to well thought-out environmental and engineering project designs. Potential impacts not able to be fully avoided through project design will be able to be effectively managed and minimised using best practice mining industry management and mitigation measures.

Key environmental factors that have potential to be impacted through project implementation have been identified for each development envelope (Table 14). No key environmental factors are applicable to the Access Corridor development envelope. Three key environmental factors have been identified for the Mine Site development envelope (flora and vegetation, terrestrial fauna and rehabilitation and decommissioning). Two key environmental factors have been identified for the Yeo Palaeochannel development envelope (subterranean fauna, flora and vegetation).

After application of best practice management and mitigation measures, Gold Road believe the EPA objectives for these key environmental factors can be met (Figure 20). Fundamental to achieving this will be careful and detailed design of the process water borefield in the north and western parts of the Yeo Palaeochannel where a number of stygofauna species thought to be restricted to this palaeochannel have been identified. Developing the borefield design that minimises groundwater drawdown in this area has been a critical component of the Feasibility Studies currently being undertaken by Gold Road. Groundwater drawdown modelling work undertaken by Pennington Scott towards this has demonstrated that engineering design options can be implemented to ensure Gold Road meets the EPA objective for subterranean fauna of maintaining representation, diversity, viability and ecological function at the species, population and assemblage level. Rehabilitation and decommissioning of the project will use accepted industry practices and will be managed in accordance with the Mine Closure Plan Guidelines jointly published by the EPA and DMP. Baseline studies have not identified flora or terrestrial fauna species or ecological communities of conservation significance that will be affected by the project.

Gold Road does not believe that formal assessment of the Gruyere Gold Project including associated borefield areas is required under Part IV of the *EP Act*. Gold Road believes that environmental impacts can be adequately assessed and implementation monitored through provisions of the *Mining Act* and Part V provisions of the *EP Act*.

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APPENDICES