

Mining Management Exploration Activities

Northern Territory of Australia – Mining Management Act 2001

It is recommended that the Mining Management Plan (MMP) is completed in conjunction with the user guide available on the [Northern Territory Government website](#).

Section 1 – Project Details

Project Name Provide new or existing project name	Southern Lease Drilling Program (2021)
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Authorisation Number Insert existing authorisation number, where applicable	0887-01 (Southern Lease Project)
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Operator Name Use ASIC-ABR registered name (if a company), or name of the applicant	Groote Eylandt Mining Company Proprietary Limited (GEMCO)
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Operator ABN and ACN numbers	ACN: 004 618 491 ABN: 26 004 618 491
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Location and Access Details Include brief description of the location, access details, and distance to nearest town or community	<p>The Southern Lease drilling program is located in the south-western part of Groote Eylandt in the Northern Territory, within Exploration Licence EL2455 (termed the Southern Lease). It is adjacent and to the south of the existing GEMCO mine.</p> <p>The Southern Lease is accessed from the existing mine via the Emerald River Road, an unsealed public road.</p> <p>The closest permanent residential community is the township of Angurugu, located approximately 11 km from the northern boundary of the Southern Lease.</p> <p>See Section 2.2.2 of the Notice of Intent for the Stage 2 Exploration Program (Attachment D) for further details.</p>
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Target Commodity Details Include target mineral commodities (i.e. gold, copper etc.)	Manganese
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Mining Management Exploration Activities

<p>Mining Activities Summarise the mining activities (exploration) to be the subject of the proposed Authorisation or Variation.</p> <p>Drilling programs over a maximum of four years are supported and encouraged and can be staged. Please refer to the guidelines for further information.</p>	<p>The Southern Lease drilling program comprises the following activities in areas on the western side of the Southern Lease:</p> <ul style="list-style-type: none"> • Stage 2 Exploration Drilling (2021): <ul style="list-style-type: none"> ○ Reverse Circulation (RC) infill drilling; and ○ Diamond drilling. • Geotechnical Drilling: <ul style="list-style-type: none"> ○ Test pits; and ○ Boreholes. • Groundwater Drilling: <ul style="list-style-type: none"> ○ Groundwater monitoring bores; and ○ Groundwater production bores.
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<p>Proposed Schedule Include start and finish dates of ground disturbing work</p>	<p>The Southern Lease drilling program is scheduled to commence in the second half of 2021 and is proposed to be completed in 2022. The exact timing will depend on the timing for grant of approvals and weather conditions.</p>
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Mining Interest and Land Ownership

List the mining interests (titles), the title holder name/s, the title expiry date and the Property name/Land holder (e.g. pastoralist or Aboriginal land trust) for each title.

Title Number	Title Holder	Expiry Date	Underlying Property Name or Land Holder
EL2455	Groote Eylandt Mining Company Proprietary Limited	11/10/2022	Southern Lease

Organisational Structure

Position Title	Name
Vice President Operations (GEMCO)	Mark Filtness
Technical Services Manager (GEMCO)	Michael Smith
Exploration Superintendent (GEMCO)	Ken Pegg
Senior Geologist (GEMCO)	Craig Winter
Principal Resource Geology (South32)	Josh Harvey
Project Study and Approvals Manager (GEMCO)	Mike Chapman

Section 2 – Operator Self-Assessment of the Environmental Risk

The purpose of this self-assessment is to ensure Operators complete a project risk assessment of potential environmental impacts and are aware of other legislative obligations from various Agencies. As a result of this self-assessment, further information may be required in the form of a management plan to enable full assessment of the MMP. If you have any queries please contact a Mining Officer prior to submitting the MMP. Useful resources to assist with this self-assessment are provided in the User Guide.

Environmental considerations

ASSESSMENT ASPECT	YES or NO	ACTIONS REQUIRED (if answered YES)	APPENDED INFORMATION (e.g. evidence of consultation with DEPWS and/or management plan where required).
<p>Step 1: Are there any threatened flora and fauna species or habitats of significance that may occur in the proposed work area?</p>	<p>YES</p>	<p>As part of the Notice of Intent for the Stage 2 Exploration Program, an assessment of the baseline terrestrial ecology of the Southern Lease was conducted (Baseline Terrestrial Ecology Report). The assessment concluded a number of threatened and migratory fauna species are either present or assessed to have a moderate or high likelihood of occurring in the exploration program area. Therefore, a Significant Impact Assessment was undertaken (Assessment of Impacts on Listed Species Report). This included an assessment of the direct and indirect impacts of clearing required for drill pads and access tracks. The assessment specifically considered measures to avoid and mitigate impacts, including the pre-clearance survey and permit to clear process, rehabilitation activities, and environmental controls to prevent the introduction of weeds or Cane Toads. It was concluded that, given the measures to avoid and minimise impacts, the exploration program will not give rise to significant impacts on listed species. Since the submission of the Notice of Intent for the Stage 2 Exploration Program, the exploration program has been revised to reflect GEMCO's understanding of the mineralisation in the Southern Lease following the last drilling season, and to incorporate a geotechnical and groundwater drilling program. Adjustments made to the Southern Lease drilling program do not give rise to an</p>	<p>The Notice of Intent for the Stage 2 Exploration Program has been appended as Attachment D, which includes two technical ecology reports:</p> <ul style="list-style-type: none"> • Appendix A - Baseline Terrestrial Ecology; and • Appendix B - Assessment of Impacts on Listed Species.

Mining Management Exploration Activities

ASSESSMENT ASPECT	YES or NO	ACTIONS REQUIRED (if answered YES)	APPENDED INFORMATION (e.g. evidence of consultation with DEPWS and/or management plan where required).
		overall increase in the disturbance footprint. Further, the geotechnical and groundwater drilling programs have been purposely designed to utilise previously disturbed drill pads and access tracks, where possible. For these areas, GEMCO's pre-clearance survey and permit to clear process will again be undertaken to ensure that any clearing and maintenance works do not give rise to significant impacts. Based on the findings of the Significant Impact Assessment undertaken for the Stage 2 Exploration Program, the nature and location of the exploration, geotechnical and groundwater drilling programs, and the measures to avoid and mitigate impacts, the Southern Lease drilling program for 2021 is not predicted to have a significant impact on listed species.	
Step 2: Are there any known declared weeds within the proposed work area?	NO	The Southern Lease is currently unaffected by weed species. No declared weeds were recorded within the Southern Lease during terrestrial ecology field surveys undertaken for the Notice of Intent or during pre-clearance surveys undertaken as part of the permit to clear process. Section 6 of the Notice of Intent describes the measures that will be adopted to prevent the introduction of weeds. These measures will also be adopted for the geotechnical and groundwater drilling programs.	Refer to the Notice of Intent (Attachment D) - Appendix A (Baseline Terrestrial Ecology) for further details.
Step 3: Will you be using water from bores or other sources for the operation?	NO	Pump testing of four groundwater production bores is proposed at the conclusion of the groundwater drilling program to provide data on yield and hydraulic conductivity and the permeability of the aquitards and aquifer connectivity. For the purpose of undertaking drilling activities, water will be obtained from the existing GEMCO mine and no water will be extracted from bores or waterways. No changes to water licencing are required.	Refer to the Notice of Intent (Attachment D) for further details.

Environmental assessment and cultural considerations

ASSESSMENT ASPECT	YES or NO	MANAGEMENT REQUIREMENTS
<p>Step 4: Is your project likely to have a significant impact on the environment?</p>	NO	<p>The Notice of Intent for the Stage 2 Exploration Program includes a detailed assessment of potential impacts and was prepared in accordance with the NT EPA Environmental Factors and Objectives Guideline. The Notice of Intent concluded that the exploration program is not predicted to have a significant impact on the environment. For the reasons outlined in Step 1, the revised Southern Lease drilling program for 2021 is also not predicted to have a significant impact on the environment. There is a high level of confidence in this conclusion because of the large amount of baseline environmental work that has been undertaken, including large scale field programs. In addition, the proposed activities are very similar in scope to other exploration programs previously undertaken by the proponent in the Southern Lease and in its other tenements on Groote Eylandt. The potential impacts from drilling activities are therefore well understood and the management measures are well established.</p> <p>See Section 4 of the Notice of Intent (Attachment D) for further details.</p>
<p>Step 5: Are there Aboriginal sacred sites in the Project area?</p>	YES	<p>Although Aboriginal sacred sites occur in the Southern Lease, GEMCO has been working with the Anindilyakwa Land Council (ALC) to identify areas which have cultural significance to ensure that drilling activities do not give rise to any impacts on sacred sites. GEMCO has developed a potential exploration area that takes account of environmental and cultural constraints, including the culturally sensitive areas identified by the ALC. Restricting drilling activities to this area (unless otherwise agreed with the ALC) is a key mechanism for ensuring that no exploration is undertaken in areas that have been identified as culturally sensitive. Furthermore, GEMCO has a permit to clear process that is followed before any areas are disturbed. This includes flagging of areas proposed to be cleared and then submission of proposed clearing plans to the ALC for endorsement. As part of this process, the ALC invites cultural monitors (i.e. Traditional Owners acknowledged as being able to speak on behalf of the country) to inspect areas proposed to be cleared. See Section 5 of the Notice of Intent (Attachment D) for further details.</p>
<p>Step 6: Are there archaeological and heritage sites in the Project area?</p>	YES	<p>Although archaeological and heritage sites occur in the Southern Lease, the Southern Lease drilling program has been designed to avoid these areas, and no impacts on archaeological and heritage sites are therefore predicted. See Section 5 of the Notice of Intent (Attachment D) for further details.</p>

Section 3 – Amendments

As per Section 41(3) of the *Mining Management Act*, an MMP reviewed and amended under Section 41(1)(a) is to have amendments made since the previous MMP submission clearly identified.

Section	Amendment
Section 1	<ul style="list-style-type: none"> • 'Mining Activities' updated to include geotechnical and groundwater drilling. • 'Organisational Structure' updated to include the new GEMCO Vice President Operations.
Section 2	<ul style="list-style-type: none"> • Operator Self-Assessment updated to take into consideration the environmental and cultural impacts of the revised exploration program and geotechnical and groundwater drilling programs.
Section 4	<ul style="list-style-type: none"> • Previously planned exploration holes and tracks removed from the program. • New exploration holes and tracks added to the program. • Geotechnical drilling added to the program. • Groundwater drilling added to the program.
Section 5	<ul style="list-style-type: none"> • 'Disturbance Tracking' spreadsheet completed to provide an updated status of disturbance and rehabilitation.

Section 4 – Activities Proposed for this MMP only

Mining Interests (i.e. titles)	EL2455
Number and type of proposed drill holes	Exploration Drilling: <ul style="list-style-type: none"> • 291 RC Drill Holes • 21 Diamond Drill Holes Geotechnical Drilling: <ul style="list-style-type: none"> • 23 Test Pits • 15 Boreholes Groundwater Drilling: <ul style="list-style-type: none"> • 44 Monitoring Bores (at 22 locations) • 4 Production Bores
Maximum depth of proposed holes (m)	Exploration Drilling: <ul style="list-style-type: none"> • 291 RC Drill Holes – 60 m • 21 Diamond Drill Holes – 60 m Geotechnical Drilling: <ul style="list-style-type: none"> • 23 Test Pits – 3 m • 15 Boreholes <ul style="list-style-type: none"> ○ Water Storage Dam – 8 m ○ Mine Cut Stability – 40 m Groundwater Drilling: <ul style="list-style-type: none"> • 44 Monitoring Bores – 70 m • 4 Production Bores – 50 m
Number and size of drill pads to be cleared (Length: m x Width: m)	Exploration Drilling: <ul style="list-style-type: none"> • 291 RC Drill Pads – 18 m x 10 m • 21 Diamond Drill Pads – 20 m x 15 m Geotechnical Drilling: <ul style="list-style-type: none"> • 23 Test Pits – No pad required • 15 Borehole Pads – 20 m x 15 m Groundwater Drilling: <ul style="list-style-type: none"> • 21 Monitoring Bore Pads – 20 m x 25 m • 4 Production Bore Pads – 20 m x 25 m
Total area of drill pads to be cleared (ha)	6.44 ha ¹
Number of proposed water bores	48 Groundwater Bores: <ul style="list-style-type: none"> • 44 Monitoring Bores • 4 Production Bores

¹ This includes 0.24 ha for diamond drill pads, 5.24 ha for RC drill pads, 0.17 ha for geotechnical borehole pads and 0.79 ha for groundwater bore pads. All diamond drill holes, geotechnical boreholes and groundwater bores (except 2) will be located on existing RC drill pads. Therefore, only the portion of drill pad not on an existing RC drill pad has been included in the calculation.

Mining Management Exploration Activities

Mining Interests (i.e. titles)	EL2455
Is drilling likely to encounter groundwater in multiple or confined aquifers? (Y, N, unsure) If answering yes, please provide the number of exploration holes where this is likely to occur	Yes. The number of holes where this is likely to occur is unknown.
Number of costeans	N/A
Volume to backfill costeans (Length: m x Width: m x Depth: m)	N/A
Number of bulk sample pits	N/A
Volume to backfill bulk sample pits (Length: m x Width: m x Depth: m)	N/A
Bulk sample pits approved under <i>Mineral Titles Act</i> ? (Y or N). If Yes provide approval	N/A
Line/track clearing: (length m x width m)	6.65 ha ²
Area of proposed line/track clearing (ha)	
Camp area to be cleared (ha)	N/A
Camp Infrastructure (i.e. demountable, tents) Please provide a complete list with measurements as required in the security calculation	N/A
Other	N/A
Total proposed area of disturbance (ha)	13.09 ha

² This includes 5.42 ha for the exploration program, 0.02 ha for the geotechnical program and 1.21 ha for the groundwater program. All drill pads will be located on access tracks, reducing the need for additional clearing. Therefore, this value is equal to the total track clearing, less the portion of track located within each adjacent drill pad.

Section 5 – Previous Disturbance (for existing Authorisations only)

Refer to Attachment B - Disturbance Tracking Spreadsheet.

Section 6 – Environmental Management

By checking these shaded boxes, you are agreeing to implement the following minimum environmental management standards on the project area. Where boxes have been left unchecked, justification is required.

6.1	✓	Blade-up approach for clearing will be used (i.e. no windrows, leave root stock and topsoil)
6.2	✓	Significant vegetation will be avoided during clearing (i.e. large trees, specimens providing habitat or food sources, riparian vegetation, and threatened species)
6.3	✓	Vegetation clearing during, and immediately after rainfall events, will be avoided
6.4	✓	Vegetation clearing will be kept to the minimum required to safely traverse vehicles and drill rigs along tracks and drill pads
6.5	✓	Where blade-up techniques cannot be employed, topsoil and vegetation will be stockpiled appropriately for rehabilitation purposes
6.6	✓	All employees and contractors will be trained and inducted in relation to the management of environmental risks in the work area, including weeds, waterways, threatened species, soil erosion, sacred sites and heritage areas
6.7	✓	Sumps will be lined or tanks of appropriate size to contain water, sediment and drilling fluids encountered during drilling, will be used
6.8	✓	Sumps, drill holes, and fuel stores will be located away from environmentally significant areas and water courses
6.9	✓	Excavations (sumps, costeans and pits) will be appropriately ramped to allow fauna egress
6.10	✓	Drill holes will be securely capped immediately after drilling
6.11	✓	Vehicle hygiene measures will be employed to prevent the introduction and spread of invasive species and pathogens when mobilising vehicles and equipment from one location to another
6.12	✓	Hydrocarbon spills will be minimised using liners and drip trays under machinery, and appropriately sized spill-kits available in the event of a spill
6.13	✓	Hazardous substances (including hydrocarbons) will be stored and handled in accordance with relevant Australian Standards
6.14	✓	Hydrocarbons will be stored in lined and bunded areas
6.15	✓	Waste will be stored securely while on-site to minimise windblown rubbish and access by feral animals
6.16	✓	Waste will be removed off-site and disposed of at an appropriate waste management facility
6.17	✓	All environmental incidents will be reported to the Department in accordance with Section 29 of the <i>Mining Management Act</i> .
6.18	✓	Acid and Metalliferous Drainage (AMD) and Potentially Acid Forming (PAF) material derived from drilling cuts will be managed to avoid AMD and PAF related issues on site.

Mining Management Exploration Activities

6.19	N/A	Radioactive/NORM drill cuttings will be managed to avoid radiation related issues on site.
6.20	✓	Dust management will be implemented on site.

Justification and alternative management measures:

6.19. Not required as radioactive/NORM drill cuttings are not likely to be encountered during the proposed drilling program.

Section 7 – Rehabilitation and Closure

By checking these shaded boxes, you are agreeing to implement the following minimum rehabilitation standards on the project area. Where boxes have been left unchecked, justification is required.

A refund of security related to completed rehabilitation on site requires the submission of a rehabilitation report including photographs, an updated security calculation and updated disturbance tracking spreadsheet to the Department.

7.1	✓	Drill holes will be plugged below ground level at a minimum depth of 0.4 metres and soil mounded to prevent subsidence, within 6 months of completion of drilling.
7.2	✓	Drill holes encountering multiple or confined aquifers will be grouted with concrete.
7.3	✓	Drill samples/spoil will be returned down drill holes, buried in sumps, or removed from site.
7.4	✓	All drill hole and access markers including flagging tape, wooden markers and star pickets will be removed from site.
7.5	N/A	Cut and fill drill pads will be re-contoured to be consistent with the surrounding terrain.
7.6	N/A	Drill pads and compacted areas along the contour (on sloping ground) will be ripped/scarified and tracks will be cross-ripped (zig-zag).
7.7	✓	Tracks will be rehabilitated, including pushing in all windrows, unless otherwise agreed in writing by the land holder or appropriate third party.
7.8	✓	Appropriate erosion and sediment controls will be installed where erosion is evident or likely to occur.
7.10	N/A	Access through watercourses will be removed and banks restored.
7.11	✓	All previously disturbed areas will be stable, with no evidence of active soil erosion.
7.12	✓	All excavations will be backfilled within 6 months of their completion.
7.13	✓	All water bores will be decommissioned unless otherwise agreed in writing by the land holder or appropriate third party.
7.14	✓	All rubbish and infrastructure will be removed from site.
7.15	✓	Topsoil will be replaced and vegetation re-established.
7.16	✓	Contaminated soils (e.g. hydrocarbon or hazardous chemicals) will be rehabilitated or removed from site.
7.17	✓	Monitoring will be undertaken following the wet season or a significant rainfall event.

Justification and alternative management measures:

7.5. Not required as the proposed drilling program is located on flat terrain.
7.6. Not required as the proposed drilling program is located on flat terrain.
7.10. Not required as the proposed drilling program is not located within watercourses.

Section 8 – Required Attachments

8.1	Initial Application for Authorisation or variation of Authorisation (only if details on the form have subsequently changed).	Refer to the Application for Authorisation submitted with this MMP.
8.2	Nomination of Operator Form, where required	Not applicable
8.3	Security Calculation Spreadsheet	Refer to Attachment A
8.4	Evidence of Land Access Agreement if operating on an Exploration Licence (EL) on Pastoral Lease (e.g. two-ways exchange of email)	No applicable
8.5	Disturbance tracking spreadsheet (for existing Authorisations)	Refer to Attachment B
8.6	Spreadsheet with coordinates of proposed drill holes or polygons of target areas	Refer to Attachment C which provides shapefiles showing the location of proposed drill pads and access tracks
8.7	KML/shape files/track logs of proposed tracks, camp sites and proposed drill holes or polygons of target areas	Refer to Attachment C which provides shapefiles showing the location of proposed drill pads and access tracks
8.8	Map(s) of the work area(s) showing:	Refer to Attachment D (Notice of Intent), Figure 1-2
	1. title boundaries and title numbers	
	2. current and proposed drill holes, or polygons of target areas	Refer to Attachment E
	3. current and proposed tracks	Refer to Attachment E
	4. rehabilitated areas	Refer to Attachment F
	5. camp sites	Not applicable
	6. heritage sites or significant environmental areas	Refer to Attachment D (Notice of Intent), Figure 5-1.
	7. environmental constraints	Refer to Attachment D (Notice of Intent), Figure 2-7. The areas within the potential mineralised area that have been excluded from the potential exploration area are those with environmental or cultural constraints.
8.10	Radiation Management Plan (if applicable)	Not applicable
8.12	Document(s) being appended in relation to Section 2 (if any): - Notice of Intent	Refer to Attachment D (Notice of Intent)