NORTHERN TERRITORY GOVERNMENT
Department of
ENVIRONMENT, PARKS
AND WATER SECURITY

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Our ref: DEPWS2021/0132
Your ref:

Ms Kylie Fitzpatrick
Department of Environment, Parks and Water Security
PO Box 3675
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Dear Ms Fitzpatrick

**Re: draft EIS - PNX Metals Limited Fountain Head Gold Project**

The Department of Environment, Parks and Water Security has assessed the information contained in the above EIS supplement and provides the following comments:

## Environment Division

### Environmental Authorisations Unit

The proponent has indicated in the draft EIS that PNX does not intend to discharge wastewater offsite and therefore do not plan on obtaining a waste discharge licence (WDL). All wastewater is planned to either be recycled e.g., through the process plant or retained on site within water storage areas such as the evaporation pond. Runoff (ANZECC/ARMCANZ (2000) compliant) from sediment dams around bunded hardstand areas and the IWL will be diverted to the Fountain Head Lake catchment or the evaporation pond catchment prior to release offsite.

Should the proponent change plans and require waste discharge then a WDL will be required. The proponent should allow sufficient time for the application to be assessed and approved by the Controller of Water Resources. Assessment and application timeframes can be up to 60 business days and are dependent on the adequacy of the information provided.

### Environmental Operations Unit

| Section of referral or terms of reference | Theme / issue | Comment |
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| Air Quality Appendix 1 and Evaporator Emissions Study Appendix 27 | Air | The proponent's air quality assessment for the development was conducted by estimating emissions of key pollutants from the development and comparing these to the emission rates and air dispersion modelling results for a mining operation at Mount Todd gold mine (100km south east). |

| Section of referral or terms of reference | Theme / issue | Comment |
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| | | This approach is not acceptable and, as the proponent noted, the spatial distribution of emission sources at the Mount Todd Gold Mine will differ from the development, which may impact offsite concentrations of pollutants.<br><br>The proponent must assess the likely air quality impacts of the development, including cumulative impacts where relevant, in accordance with the Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW (NSW Approved Modelling Methods). A Level 2 impact assessment should be conducted taking into consideration the characteristics of the receiving environment (including topology and meteorology).<br><br>All processes that could result in air emissions must be identified and emissions modelled. Emission sources to be considered should include, but not be limited to:<br>• fugitive sources of particulate matter, such as material handling and processing activities, movement of mobile plant and equipment, and wind erosion of exposed surfaces;<br>• fugitive releases from the ore processing circuit and surface of the Tailings Storage Facility (TSF);<br>• combustion sources, such as exhaust emissions from site equipment fleet, emergency generator and processing plant and blasting operations; and<br>• emissions from any mine vents, furnaces, or kilns or storage vessels used at the facility.<br><br>In addition to modelling the concentrations of TSP, PM10, PM2.5, and hydrogen cyanide, the following parameters must be modelled if emitted at the facility: NO2, SO2, CO, VOCs, metals and metalloids.<br><br>Results must be presented as a table and as contours against impact assessment criteria, including the 1-hour hydrogen cyanide assessment criterion.<br><br>The proponent must demonstrate that source emissions at the development comply with relevant concentration limits specified in the Protection of the Environment Operations (Clean Air) Regulation 2010 (NSW).<br><br>In addition to dust mitigation measures presented in the assessment, the proponent must provide detailed emission control techniques and practices that will be employed for other pollutants.<br><br><u>Electric Evaporators</u><br>Three electric evaporators (Minetek Evaporating Systems) will be used for dewatering operations and the proponent has employed a Gaussian Diffusion and Sedimentation (GDS) model to show that |

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| | | arsenic emissions from the Minetek evaporators will be within compliance limits at three receptor sites. Arsenic was modelled as the drift of droplets that evaporate to dryness as PM10 and PM2.5.<br><br>This is not a standard model to be used for compliance assessment. The proponent must explain why models specified in the NSW Approved Modelling Methods could not be used to assess emissions from the evaporators.<br><br>The proponent should also note that impact assessment criteria (IAC) of principal toxic air pollutants such as hydrogen cyanide and arsenic (listed in the NSW Approved Modelling Methods) are applied at and beyond the boundary of the facility. This is in contrast to IAC of other pollutants such as criteria pollutants, which are applied at selected offsite receptors.<br><br>The proponent should either (i) employ the services of an independent third party to review the use of the GDS model for assessing the emissions from the evaporators, or (ii) include the evaporator emissions as stationary point sources and model all emissions from the development using an approved air dispersion model. |
| Greenhouse Gas Assessment Appendix 1 | Atmospheric processes | The proponent has shown that the facility will have National Greenhouse and Energy Reporting (NGER) scheme reporting obligations associated with the development, nominally commencing in Year 1 of the project schedule.<br><br>The proponent should also note the facility is likely to trigger National Pollutant Inventory (NPI) reporting. |
| Environmental Noise Assessment Appendix 2 | Human health | The proponent has appropriately assessed the likely operational noise impact of the development (including construction noise) in accordance with the NT Noise Management Framework Guideline.<br><br>The assessment model included the road noise impact of the development and the blasting impacts of the development, having regard to the relevant ANZECC guidelines.<br><br>The proponent must verify that noise emitted from the evaporating units has been included in the model. |

**Water Resources Division**

**Groundwater**

Section: 9 Environmental Management, Monitoring and Reporting (Table 9-2)

Issue: The proponent has advised that their intended monitoring procedure for groundwater drawdown and mounding will be based on complaints from existing users and no surface expression of groundwater or waterlogging of soils respectively. These indicators, if they were to occur, suggest that that the

proponent's modelling has failed significantly and that they have failed to mitigate potential impacts. Rather than relying on impacts being reported or observed at the surface, the proponent should actively align their monitoring program to assess whether their modelled scenarios are occurring as predicted. If significant deviation from modelled scenarios occur, re-evaluation of the model (i.e., re-calibrated with observational data and hydraulic parameters changed accordingly) should be prompted.

Recommendation: The proponent should propose a monitoring plan for groundwater quantity that does not rely on complaints from existing users or visual signs of impact. Instead they should base the monitoring plan on ensuring that the minimal impact suggested by their modelling progresses as predicted. An example would be to set drawdown and mounding triggers (based on the modelling results) for monitoring bores located at varying distances (e.g. 500m and 1km, or as appropriate) down-gradient of the likely propagation of drawdown and mounding impacts, and propose a plan for if those triggers are breached (i.e. review of modelling, re-evaluation of risk assessment). The Water Management Plan indicates that a series of bores around the project area are planned to be monitored biannually for standing water level, so the suggestion above should not be too onerous to include in their monitoring plan.

**Mining and Petroleum**

Mine pit and evaporation pond water - Extraction

The draft EIS indicates that surface water will be extracted from an existing pit (Fountain Head Pit) and evaporation ponds for construction and process water for mining operations. The EIS states that advice was provided by DEPWS in June 2019 that a surface water extraction licence would not be required for dewatering of the mine pit. It is the current position of DEPWS at the time of this review of the EIS that extraction of water from the mine pit and evaporation pond does trigger licence requirements under section 45 of the *Water Act 1992*.

Recommendation: Extraction of surface water from mine pits or onsite dams requires a surface water extraction licence (SWEL) under section 45 of the *Water Act 1992*. The proponent must apply for a SWEL prior to commencement of extraction from the mine pit or evaporation pond. In applying for a SWEL the proponent must document the estimated water use in mega litres (ML) per month for each beneficial use and extraction point. An application for a SWEL should be lodged at least three to four months prior to commencing extraction for the SWEL to be processed by DEPWS.

Fountain Head Lake - extraction

The EIS documents that potable water may be sourced from the historical 'Fountain Head Lake' (a manmade surface water feature comprised a void space remaining from historical alluvial mining with downstream haulage road acting as a dam). Based on information provided in the EIS, DEPWS considers that Fountain Head Lake meets the definition of a waterway under section 4 of the *Water Act 1992*. The proponent will therefore require a SWEL to take water from Fountain Head Lake under section 45 of the Act.

Recommendation: Should the proponent choose to extract water from Fountain Head Lake, an application for a SWEL must be lodged. The proponent should allow at least three to four months for the SWEL to be determined by the Controller of Water Resources.

Fountain Head Lake - interference with a waterway

The EIS identifies that Fountain Head Lake has been created by damming of the unnamed stream by an historical haulage road to the north. While the existing disruption to the waterway does not require authorisation under the *Water Act 1992*, any future modification to site infrastructure which alters the current water regime may trigger a requirement for a permit to interfere with a waterway under section 41 of the *Water Act 1992*.

Recommendation: Prior to commencement of construction works which may alter the flow regime of Fountain Head Lake, project specific advice about permit requirements should be sought from the Water Resources Division. Further information on permit requirements for interference with a waterway is available in the DEPWS fact sheet Mining and Petroleum Activities: Interfering with a Waterway.

**Planning and Engagement**
The proposed development is not within a water control district and is not subject to a water allocation plan.

The mine is in the Mary River Beneficial uses area (NT Gazette G6, 13 February 2022). The beneficial uses are environment, riparian and cultural for surface water and environment, riparian and agriculture for groundwater. The EIS should demonstrate how the water quality objectives are being met and the risks are being managed. The EIS and Appendix 16 Water Management Plan do not specifically identify how the beneficial use and water quality objectives are going to be met.

**Flora and Fauna Division**

| Section of EIS | Theme / issue | Comment |
|---|---|---|
| Section 4.7 of the EIS<br>Appendix 8 (Flora and Fauna Survey Report) | Terrestrial Ecosystems | The mine is a legacy site with most of the site disturbed historically and with limited habitat for threatened species. The Flora and Fauna Division has reviewed the results of terrestrial flora and fauna surveys provided with the EIS and is satisfied that the risk to threatened species and biodiversity is low. |
| | | While the risks are considered low, the Division acknowledges the recommendation in Appendix 8 to undertake a site walkover to identify any *Acacia praetermissa* and *Stylidium ensatum*. Appropriate survey times for *Stylidium ensatum* are during the mid-late Dry season when the plant is flowering/fruiting. *Acacia praetermissa* can be surveyed at any time of year. |
| Appendix 9 (Aquatic Baseline Characterisation Report) | Aquatic Ecosystems | The EIS presents data from three of the seven sites reported in Appendix 9. If the data in the EIS is to characterise the baseline state, why weren't all sites from Appendix 9 included? In addition, the EIS has not provided any reason or rationale for the selection of the sites beyond that they are relevant to the project area and the objectives of the sampling program are unclear. |
| | | The study objectives (page 1-2 of Appendix 9) include (i) baseline characterisation, and (ii) identification of sensitive habitats and fauna species.<br><br>An adequate baseline characterisation requires greater sampling effort across environmental gradients, including the types of stream habitats and across the degree of exposure to impacts from previous mining.<br><br>Seven sites is likely minimally sufficient to achieve this objective, and three sites falls well short of achieving the objective. An adequate baseline characterisation would also require a level of taxonomic resolution (ideally to species-level) that is not provided here. |

| | | |
|---|---|---|
| | | Surveys of fish, decapod crustaceans and macroinvertebrates were undertaken in April 2019 at sites on intermittent streams. While the timing of sampling may be adequate to detect most fish species, it is probably not adequate to detect many aquatic invertebrate species which may have been present in the preceding months of the Wet season, and it is most likely that invertebrate sampling during April will reveal a fauna characteristic of declining water quality, dominated by air-breathing water beetles and water bugs.<br><br>The fish sampling was undertaken using a variety of methods and revealed a set of species common and widespread in streams of northern Australia. Sampling effort per site appears to be high. |
| Section 4.8.4 of the EIS | | The analysis of macroinvertebrate assemblages appears to be limited. The EIS (page 4-80) reports an analysis of 202 individuals across three sites. It should be noted that standardised AUSRIVAS sampling specifies 200 randomly selected individuals per sample.<br><br>Although the data is not presented in the EIS, most taxa seem to have been identified to family level only ('A total of 202 individuals from at least 11 orders, 22 families and 26 taxa were identified'). The results of the baseline characterisation appear to underrepresent the aquatic biodiversity of these streams. For example, streams in the Darwin area contain about 100 species of Chironomidae, >70 species of Trichoptera, at least 10 species of Ephemeroptera. (In this EIS, taxa richness values per site were reported as 9, 13 and 15). |
| Section 4.8.4.1 of the EIS | | The decapod section (4.8.4.1) includes discussion of a freshwater crab species (*Varana litterata*). Staff in the Division are not familiar with this species and suspect it may be a misidentification. |

It is recommended that:

- More information is required on the rationale for site selection for the baseline characterisation, and justification of why data from only three sites is adequate to meet stated objective for both fish and macroinvertebrates
- Biological monitoring, if undertaken in the future, will require more sites, and an hypothesis-testing framework that is structured to detect impact on or declines in aquatic health.

**Rangelands Division**

**Weeds Management Branch**

An assessment of the NT Weeds Database for the site, surrounding areas and adjoining roads revealed historic data records of the following declared weed species:

| Common Name | Botanical Name | Declared |
|---|---|---|
| chinee apple | *Ziziphus mauritiana* | Class A |
| Devil's claw | *Martynia annua* | Class A |
| gamba grass | *Andropogon gayanus* | Class B |
| grader grass | *Themeda quadrivalvis* | Class B |
| hyptis | *Hyptis suaveolens* | Class B |

| Common Name | Botanical Name | Declared |
|---|---|---|
| mimosa | *Mimosa pigra* | Class B |
| physic nut | *Jatropha curcas* | Class B |
| mission grass - perennial | *Cenchrus polystachios* | Class B |
| senna - candle bush | *Senna alata* | Class B |
| senna - coffee | *Senna occidentalis* | Class B |
| senna - sicklepod | *Senna obtusifolia* | Class B |
| sida - flannel weed | *Sida cordifolia* | Class B |
| sida - spiny head | *Sida acuta* | Class B |
| snake weed sp | *Stachytarpheta sp* | Class B |

The *Weeds Management Act 2001* (the Act) enables the following weed declarations: Class A (to be eradicated); Class B (growth and spread to be controlled); and Class C (not to be introduced into the NT).All Class A and B weeds are also Class C.

All land in the Northern Territory is subject to the Act. Section 9 of the Act states that the owner and occupier of land must (a) take all reasonable measures to prevent the land being infested with a declared weed; and (b) take all reasonable measures to prevent a declared weed or potential weed on the land spreading to other land.

Of the listed species, gamba grass and grader grass are noted to occur on the lease area and are both subject to Statutory Weed Management Plans. Gamba grass and mission grass is identified as part of the listed key threatening process 'Invasion of northern Australia by Gamba Grass and other introduced grasses'.

Previous extractive operations on the site have introduced and exacerbated the spread of declared weed species within the property. These weeds continue to have an impact on the landscape and production values of the surrounding pastoral leases.

The following matters should be addressed in the EIS

- *Andropogon gayanus, Cenchrus polystachios, Cenchrus pedicellatus* are identified as components of the Key Threatening Process 'Invasion of northern Australia by Gamba Grass and other introduced grasses' listed under the *Environment Protection and Biodiversity Conservation Act 1999*.
- There is a high likelihood of mission grasses (*Cenchrus polystachios* and *Cenchrus pedicellatus*) will be detected on the site due to known close proximity to the site.
- There is a widely recognised link between gamba grass density and the (in)ability to control wildfire and mitigate fire impacts. Other high biomass tropical grasses, including grader grass and mission grass also increase fuel loads.
- Tropical grasses identified in the Key Threatening Process 'Invasion of northern Australia by Gamba Grass and other introduced grasses' will present challenges to mitigation strategies offered for rehabilitation failure, terrestrial ecology impact, and uncontrolled fire. An adequate strategy to overcome those challenges with existing levels of gamba grass is not described in the draft EIS.
- There is a general obligation under the *Weeds Management Act 2001* to control weeds on land, this would extend to reasonable steps to contain or control seed production and spread from densely infested areas.

<u>Recommendations</u>

In addition to measures identified in the EIS, the following items should be addressed to demonstrate how existing dense gamba grass on the site will be controlled/managed:

- The Weed Management Plan and the Bushfire Management Plan should be integrated to address fuel load problems associated with existing dense gamba grass.

- The Weed Management Plan should include measures to reduce seed spread from existing dense gamba grass stands, particularly the implementation of buffers to reduce spread offsite, or into rehabilitation areas and stockpiles.
- There are requirements for landholders of the underlying tenure (NT Portion 695) under the statutory management plan. These requirements should be considered as part of the Weed Management Plan. It is recommended that Section 8 of the EIS (Ecologically Sustainable Development) include the requirements of the Statutory Weed Management Plan for gamba grass. It would also be beneficial to consider the Key Threatening Process 'Invasion of northern Australia by Gamba Grass and other introduced grasses' in as part of the Weed Management Plan.

Further information about management requirements and copies of the Weed Management Plans for gamba grass, grader grass, mimosa and neem are available at: https://nt.gov.au/environment/weeds/weed-management-planning. Alternatively contact the Weed Management Branch for further advice on (08) 8999 4567.

Should you have any further queries regarding these comments, please contact Maria Wauchope by email maria.wauchope@nt.gov.au or phone (08) 8999 3692.

Yours sincerely

Luis Da Rocha
Executive Director, Rangelands

6 August 2021