OUT20/10904

Mandana Mazaheri, PhD
Energy, Resources & Compliance Division
Planning and Assessment Group
Department of Planning, Industry and Environment

Mandana.Mazaheri@planning.nsw.gov.au

Dear Dr Mazaheri

McPhillamys Gold Project (SSD 9505) -
Response to Submissions (RTS), Amendment Report & Additional Information

I refer to your letter of 8 September 2020 and Regis Resource's letter of 11 November 2020 to the Department of Planning, Industry and Environment (DPIE) – Water and the Natural Resources Access Regulator (NRAR) about the above matter.

DPIE – Water and NRAR have reviewed the RTS and Amendment Report & additional information provided. We continue to have significant concerns regarding limited availability of surface water entitlement in the unregulated water source. This is a major risk for the project. The Department does not agree with the proponent's interpretation of the stream order (which informs the water entitlement requirements) applicable to the dams and structures proposed for the project.

Regis Resources has recently been in contact seeking advice on options to address this issue. We are considering their request separate to this advice.

I note as well that downstream impacts have been quantified for your consideration of the significance of these impacts, and consideration of any mitigation that may be required.

Please note our more detailed advice is in **Attachment A**.

DPIE – Water and NRAR welcome any further opportunity for consultation regarding this proposal, and as such any correspondence can be sent by email to: landuse.enquiries@dpie.nsw.gov.au.

Yours sincerely

Mitchell Isaacs
Chief Knowledge Officer,
Water - Knowledge
10 February 2021

ATTACHMENT A

Advice to DPIE - Planning & Assessment regarding the McPhillamys Gold Project (SSD 9505) – RTS, Amendment Report & Additional Information

1. Water Take and Entitlement

1.1 Explanation

Water Entitlement Requirements

The proponent would need to ensure sufficient entitlement is held prior to all water take. Based on the Department's assessment of stream order for the project site the dams/structures located on third order and higher order watercourses where entitlement needs to be held for water take include CWF1a, CWF1b, MWMF, RWMF, WMF6 and the TSF. Based on Annexure C and Annexure D of the additional information provided by Regis Resources on 11 November 2020, the figures provided for runoff captured for the 80th%tile for relevant structures are MWMF (178ML), RWMF (50.3ML), WMF6 (93.3ML), TSF (1103ML) and CWF1 (658ML) which total 2082.6ML. It is recognised the 80th %tile assessment was for a wet year at maximum disturbance, however there is the potential for wetter events to occur.

There is not sufficient water entitlement available in the Belubula River upstream Carcoar Dam Unregulated River Water Source to account for the water take requirements of this project. The project is therefore at this stage unable to meet the regulatory requirements of the *Water Management Act 2000*, noting that we continue to explore additional information provided by the proponent.

Excluded Works, Stream Orders and Diversion

We do not support the interpretation of excluded works by the proponent. The Department's view of how to identify a minor stream to enable the interpretation of the excluded work provisions under Schedule 1 of the *Water Management (General) Regulation (2018)* does not align with the information presented by the proponent. There is no ability to vary a stream order based on an on-ground assessment or future modifications that may occur to a watercourse. Determining stream order to enable interpretation of a "minor stream" for the purpose of the excluded work provisions is based on the definition in the *Water Management (General) Regulation (2018)* which relies on the hydro line spatial data published on the Department's website (https://www.industry.nsw.gov.au/water/licensing-trade/hydroline-spatial-data).

The ability for a diversion to replace an existing watercourse with the aim of avoiding the need for an entitlement for the structure is a possibility for projects where adequate diversion of the original watercourse and its associated flow can occur. This is not considered possible for this project based on the size and location of the proposed structures which are not able to adequately divert the original watercourse's flow.

Other Water Take / Entitlement Considerations

The amended project predicted leakage from the Belubula River and Tributary A to increase to a maximum of 24ML/year during mining and up to 28ML/year post mining. This water take would also need to be accounted for in the surface water source.

The commitment to return water captured in clean water dams on third order and higher order watercourses to the downstream environment is supported. The regulatory requirement however remains to hold entitlement for water take from these dams. This is due to no active return flow provisions under water legislation at this time.

On the understanding CWF2 and CWF3 are to capture clean runoff and are on a minor stream for the purpose of harvestable rights, these dams need to be considered within the Maximum Harvestable Right Dam Capacity (MHRDC) for the property and/or the need to hold entitlement if the MHRDC is exceeded. The excluded work provisions do not apply.

Groundwater Take

The peak groundwater inflow to the pit for the base case has reduced from 890ML/yr in the EIS to 580ML/yr. A worst case scenario associated with a high inflow case (which was quoted in the EIS as a peak of 2670ML/yr) could not be identified in the RTS or Amendment Report. The proponent appears to be relying on a base case modelling scenario to inform the groundwater take. This is likely to inadequately inform water take requirements for wetter years. As entitlement needs to be held for all water take, irrespective of climatic conditions, it is the proponent's responsibility to ensure sufficient entitlement is held. This may represent a risk to the project.

The proposal by the proponent to use an existing 400 unit WAL and a 200 unit WAL which is to be acquired via the Controlled Allocation process is sufficient to meet the water take requirements for the base case scenario. Additional entitlement will be required if this is to be exceeded. Comprehensive monitoring, metering and modelling is required to inform future requirements and to verify actual water take.

Additionally, the calculation of peak groundwater inflow to the pit is described as "net" of evaporation of groundwater from the sides of the open cut. The Department is uncertain of the total groundwater take from the open cut that needs to be accounted. This evaporated groundwater volume must be included in the calculations of entitlement requirements as it is a component of the water take. It is recommended the current modelled take figure of 580ML/yr be reviewed to ensure this water take component is included. Where additional entitlement is required the proponent will need to demonstrate this can be obtained.

Baseflow reduction to the Belubula River upstream of the Trib A confluence is to peak at 10.22ML/year at end of mining in the amended report compared to 10.59ML/year in the EIS. Baseflow reduction to Trib A is predicted to be a max of 4.75ML/year for the amended project compared to 5.11ML/yr in the EIS. Baseflow reductions are to be accounted for by entitlements in the groundwater source.

Water transfer from Centennial Coal

We note that further assessments under the *Environmental Planning and Assessment Act 1979* are required by Centennial Coal to enable the transfer of water between the two coal mines and the project site. As the transfer of this water is critical to the project, the additional approvals represent significant uncertainty and a risk to the project.

1.2 Pre-approval Recommendations

- The proponent is required to confirm that it is able to obtain the necessary surface water entitlement to account for runoff capture structures and water take.
- The proponent should review the volume of groundwater take from the open cut pit to ensure it includes the volume evaporated from the pit walls and that it considers a range of climatic conditions. Where additional entitlement is required the ability to acquire this needs to be demonstrated.
- Baseflow reductions should be accounted for by entitlements in the groundwater source.

1.3 Post Approval Recommendations

- The proponent will need to ensure adequate entitlement is held in a Water Access Licence for the relevant water sources prior to all water take, and complies with the rules of the relevant Water Sharing Plans and the NSW Non-Urban Water Metering Policy.
- The proponent should ensure the necessary approvals to transfer water from the Centennial Coal mines are in place prior to the commencement of any activities for the project.
- The proponent must ensure that relevant nomination of work dealing applications for Water Access Licences proposed to account for water take by the project have been completed prior to the water take occurring.

2. Surface Water – Modelling and Impacts

2.1 Explanation

Comments on Water Balance Modelling for Upstream of Carcoar Dam

The revised calibration of Rainfall-runoff model has improved with the use of additional data provided by DPIE Water and showed better performance in simulating Carcoar dam storage volume for historical periods particularly in dry periods. The Water Balance model has been setup with sufficient details of storages for surface water assessment for the project.

The peak groundwater inflow to the pit for the base case has reduced from 890ML/yr to 580ML/yr. This reduction of groundwater inflow needs to be incorporated in the water balance modelling and resultant impact on daily flows to Carcoar in the post-mining scenario needs to be explained.

Potential changes in runoff characteristics of catchment excision area before and post mining are not considered.

Currently no entitlement is defined in the water balance model to capture runoff. Considering some of the storages are located on higher than 2nd order streams, such consideration is required in modelling.

The daily time series of inflows (for current and post-mining) provided by Regis Resources shows 4% constant reduction of daily inflow into the Carcoar storage post mining compared to current, which is calculated based on the reduction in median annual inflow for the maximum project extend. That linear scaling ignores the attenuation of daily flows due to capture of runoff in various storages and doesn't reflect the effect on initial conditions of the storages on daily inflows. The impact of that on daily inflows to Carcoar dam and the resultant impact on the downstream of Carcoar dam under the existing regulations need to be assessed under those conditions of attenuations of daily during low flow periods.

Analysis of Impact on the Regulated Belubula System due to change of Inflow to Carcoar Dam

Regis Resources provided two daily time series of simulated inflows to Carcoar dam for the period of 1889-2020 for the current and post-mining scenarios. DPIE Water's Belubula Source model (current condition scenario) was used to assess the impacts of reduced inflow to Carcoar storage using the two sets of daily inflow time series provided by Regis Resources. The results are summarised below.

Table 1: Impact on Carcoar Storage volume

Period (1895-2017)	% of time		
Period (1895-2017)	Current situation	Regis: mining	Difference
Flow below dead storage (<300 ML)	9.1%	10.3%	1.2%
Flow below 21,000 ML (threshold for uncontrolled flow access)	70.0%	72.0%	2.0%

Table 2: Impact on average annual extractions

Total extraction (1895-2007)	Current situation	Regis: mining	Difference (ML/yr)	Difference in %
General Security (irrigation) (ML/yr)	986	967	-18	-1.8%
General Security (mining) (ML/yr)	432	413	-20	-4.6%
High Security (irrigation) (ML/yr)	901	895	-6	-0.7%
Stock and Domestic (ML/yr)	143	141	-1	-1.0%
Supplementary (mining) (ML/yr)	1,079	1,094	16	1.5%

Impact on Streamflow

Table 3: at Carcoar (downstream of Carcoar dam)

Period (1895-2017)	% of time		
Period (1895-2017)	Current situation	Regis: mining	Difference
Flow below 2 ML/d (% of time) (Basic Landholder Rights)	17.2%	17.5%	0.4%

Table 4: at Helensholme (End of the System (EoS))

	% of time		
Period (1895-2017)	Current situation	Regis: mining	Difference
Cease to flow (% of time)	14.2%	14.5%	0.3%
% of time flow below 10 ML/d	25.9%	26.2%	0.3%

The daily time series of inflow provided by Regis Resources shows 4% constant reduction of daily inflow into the Carcoar storage post mining compared to current. The reduction of inflow has caused varied impacts on the regulated system. Some of the key impacts based on the DPIE Water Source Modelling are summarised below.

- The Carcoar dam will sit below the dead storage for a 1.2% longer period.
- The Carcoar dam volume will sit below 21,000 ML (threshold for accessing uncontrolled flow) for a 2.0% longer period.
- Long-term annual extraction for General Security diversion for irrigation will be reduced by 1.8%.
- Long-term annual extraction for General Security diversion for mining will be reduced by 4.6%.
- Flow at Carcoar will be below 2 ML/d (related to Basic Landholder Rights) for 0.4% time longer.
- Flow at the Helensholme (EoS) will be below 10 ML/d (EoS minimum flow requirement) for 0.3% time longer.
- Flow at Helensholme (EoS) will cease for 0.3% time longer.

The above analysis is based on constant reduction of daily inflow to Carcoar whilst the mine is operational. The initial conditions of storages, operational rules and entitlement arrangement will affect daily inflows to different degrees in different flow ranges and hence, the likely effect of that on EoS flow during low flows will be higher than due to the constant reduction of inflows to storage.

2.1 Pre Approval Recommendations

- That DPIE P&A consider the significance of the project's impact on Carcoar Dam and downstream flows and consider any mitigation that may be warranted.

2.2 Post Approval Recommendations

- That the surface water model be improved to: include entitlement which captures runoff, to account for attenuation of daily flows due to runoff capture, and include changes to groundwater peak inflow into the pit.

3. Groundwater Model

3.1 Explanation

Although a model upgrade plan has been provided, the proponent has not explicitly committed to improve the model in order to meet Australian Modelling Guidelines 'Class 2' classification within three years of approval. Dr Bell (DPIE P&A consultant engaged to conduct a technical review of the groundwater model) similarly argues for the model classification upgrade as recommended in DPIE Water submissions. The proponent maintains that model improvements already made to include predictive uncertainty analysis and additional scenarios render the model demonstrably fit-for-purpose. DPIE - Water accepts that conclusion, recognising that reaching a "Class 2" status is not a requirement in itself to be fit-for-purpose. Validation of the model remains to be achieved.

3.2 Post Approval Recommendation

- The groundwater model verification/review and a model upgrade plan be included as conditions of consent for project approval.

4. Bore Impact Assessment

4.1 Explanation

Water levels at test production bore TB05 had recovered by 50 percent after 12 hours and 85 percent after 15 days (360 hours) following the cessation of pumping. EMM suggested that the long duration of recovery was attributed to the limited extend of the aquifer (limestone) and that since most water at this location is sourced from localised karstic storage, only partial dewatering of the primary porosity of the rock matrix likely occurred over the five day test. Therefore, a potential risk is inherent (for extended pumping periods, [e.g. nine months]) that localized karstic storage may be dewatered after which yield from construction water supply bore TB05 may be significantly reduced. Secondly, impacts at bores situated adjacent to TB05 may be greater than predicted as aquifer stress starts to radiate from local limestone into adjacent rock matrix.

4.2 Post Approval Recommendation

- The proponent should investigate the potential risk posed by the 'dewatering of local karstic storage' at test production bore TB05.

5. Borefield Assessment

5.1 Explanation

The Construction Water Supply Groundwater Investigation and Impact Assessment (Appendix D of Appendix H of the Amendment Report [Section 9.3]) concludes that there will be a water supply shortfall of 5 L/s during peak periods of demand during mine construction. Construction water supply demand totals 470 ML (during the first 9 months of construction before the planned pipeline comes online). The shortfall is proposed to be met by drilling and installing additional water supply bores within the mine development and Regis owned land.

DPIE - Water guidelines or trade criteria must be met. The borefield approval is separate from the SSD approval. The groundwater impact of this proposed additional supply has not been

assessed and the supply is yet to be proven. Any production bore would be required to follow the groundwater trade process and be assessed against the groundwater trade criteria (https://www.industry.nsw.gov.au/__data/assets/pdf_file/0008/175931/Assessing-groundwater-applications-fact-sheet.pdf). The borefield approval is separate from the SSD approval and until this process is complete the borefield is not considered a secure water supply.

5.2 Pre-approval Recommendation

- The proponent should clarify with DPIE - Water the arrangement for the proposed borefield. All water supply bores are required to be registered with WaterNSW and hold an access licence and relevant water supply works approval to extract a nominated volume of water. The approval will require an impact assessment carried out by DPIE - Water as per the groundwater trade process.

6. Other Post Approval Recommendations

- Develop the ability to accurately meter and monitor water take from surface and groundwater sources and to monitor potential impacts to water sources. This will be a key component to confirm impact predictions, the adequacy of mitigating measures and compliance for water take, and will need to incorporate ongoing review of actual versus modelled predictions.
- Report on water take at the site each year (direct and indirect) in the Annual Review. This is to include water take where a water licence is required and where an exemption applies. Where a water licence is required the water take needs to be reviewed against existing water licences.
- As raised in our EIS advice (OUT19/12287) prior to commencement of construction and operation of the project address the following issues relating to impacts to watercourses from the project and pipeline:
    - Address bed and bank stability
    - Develop a strategy for reconstruction of excavated or buried watercourses alongside a remediation and rehabilitation strategy for all watercourses lying within the mine project area. This must aim to recover pre-disturbance geomorphic processes and river forms where available.
    - Devise a remediation and reconstruction strategy for watercourses of 3rd order and greater located within the disturbance envelope. The strategy should be consistent with Rutherford, Jerie and Marsh A Rehabilitation Manual for Australian Streams Cooperative Research Centre for Catchment Hydrology, LWRRDC, Canberra 2000.
    - Develop a monitoring and response strategy that includes watercourse re-establishment, monitoring and remediation for at least ten years post-mining, to maintain responsibility for watercourse structure and integrity until riparian vegetation is established.
    - Develop a hierarchy of procedures for any excavation of watercourses to the proposed pipeline between Angus Place coal mine and the McPhillamys mine site based on the published NSW River Styles database. This must prioritise protective mechanisms to those watercourses assigned high fragility classification and recovery potential classes.
    - In addition, it is recommended that the proponent use the hierarchy of vulnerable rivers to identify the priority for protective works in any pipeline crossings that occur. The hierarchy of fragility classes is set out in the NSW River Styles database; www.trade.maps.argis/apps/webappviewer/index.html?id=425c7364e71a90c4ba353b8949f

- Use the protection requirements set out in Guidelines for laying cables in watercourses in waterfront land (NSW Office of Water 2012) as the basis to any approval to the pipeline corridor and watercourse crossings. The geomorphic assessment in Appendix X recommends industry standard guidelines such as Witheridge (2017) Erosion and Sediment Control Field Guide for Pipeline Projects, Parts 1, 2. Geomorphologic criteria should be required to prioritise those rivers and sections/reaches that are vulnerable to degradation on disturbance.

END ATTACHMENT A