OUT19/12287

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Dear Ms Clémentine

McPhillamys Gold Project (SSD 9505)
EIS Exhibition

I refer to your email of 10 September 2019 to the Department of Planning, Industry and Environment (DPIE) – Water about the above matter.

DPIE - Water and the Natural Resources Access Regulator (NRAR) have a number of significant recommendations and concerns related to the proposal, including:

- Water supply for the project – there is limited availability and lack of water entitlement(s), which remains a risk for this project.
- The impact of production bores proposed to supply water to the project.
- Management of watercourse crossings in the construction of the proposed 90km pipeline.
- Upgrades to the Groundwater Model.
- The potential impacts to Groundwater Dependent Ecosystems.
- Predictions for leachate flow and potential seepage monitoring for the Tailings Storage Facility.
- Reductions in storage volumes and reliability of Carcoar Dam.

Please note detailed advice on all of the concerns is provided in **Attachment A**.

Any further referrals to DPIE – Lands, Water and DPI can be sent by email to: landuse.enquiries@dpi.nsw.gov.au.

Yours sincerely

Jim Bentley
CEO (Deputy Secretary) Water
Department of Planning, Industry and Environment - Water
20 December 2019

Attachment A

Detailed advice to DPIE Planning & Assessment regarding the McPhillamys Gold Project

DPIE - Water has significant concerns at the limited availability of surface water entitlement which remains a risk for this project. In particular, a number of runoff capture structures are located on 3rd order and higher streams and so will require entitlement. The possible impact of the project on regulated water supply downstream of the project is also an issue. DPIE - Water requires more information to improve understanding of likely reductions in storage volumes and reliability of Carcoar Dam and proposed mitigation options. It is also critical that the proponent ensures bed and bank stability is maintained as part of construction of the crossings impacted by the pipeline from Angus Place colliery to the project site.

1.0 Required entitlement

Insufficient entitlement is held as a result of the sizing and location of runoff capture structures and predicted water take. The limitations of surface water entitlement(s) remains a risk for this project.

1.1 Explanation

Sizing and location of runoff capture structures

Significant uncertainty exists in the ability of the proposed sizing and location of runoff capture structures to meet the requirements of the water regulatory framework.

A number of structures are proposed on third order and higher order streams, however the proponent has not advised that it holds entitlement for the water to be taken. Third order and higher watercourses will need to hold licensed entitlement and be assessed for impacts. For example, the Tailings Storage Facility (TSF) is located on a fifth order stream but captures water from 1st to 5th order streams.

The project seeks to divert water captured upstream around the site, however these diversions require capture and pumping. As this water is still being captured on third order or higher watercourses, licensing is required.

In this situation our view is:

- As the TSF is on a fifth order, the water take that occurs within the footprint of the TSF needs to be accounted for.
- Any dams on the third order streams upstream of the TSF need to be licensed for the volume to be taken even though this water is to be later pumped and piped to the downstream watercourse. This is due to the dams being on a third order and the return flow provisions of the *Water Management Act 2000* not enacted to allow recrediting of water entitlements.

This means that the proponent will need to hold more surface water entitlement for the project. Limited available entitlement for purchase represents a risk to the project. Key structures of concern to the Department include the Tailings Storage Facility, the Clean Water Diversion network and the Secondary Water Management Facility. This aspect is critical for this project to be compliant with water legislation.

A review of the water balance modelling should be completed if the proponent reviews the runoff capture structures. This is because the water availability for the project is based partly on the current location and sizing of water capture structures which is integrated into the water balance.

Water Take

The EIS identifies three existing WALs in the unregulated surface water source of the project area. These include WAL31475 (192 units), WAL36818 (22 units) and WAL31476 (50 units). The WALs total 264 units which will not adequately account for the potential take in the structures

constructed on third order or higher streams, or for the dams on minor streams sized larger than the harvestable rights and not meeting an exclusion.

According to the base case modelling scenario during mining, the water take from the open cut mine is predicted to peak at a maximum of 890ML/yr from groundwater inflows, 14.6ML/yr from reduced baseflows to the surface water source, and 24ML/yr due to leakage from the surface water source. Modelling for the worst case scenario significantly increases this predicted take to 2670ML/yr from groundwater inflows. Sufficient license entitlement will need to be held to account for the predicted take from the relevant water sources. If aquifer interception occurs as part of the pipeline construction sufficient entitlement will need to be held for this water take. We understand sufficient market depth exists in the groundwater source to acquire the entitlement, however limitations in surface water entitlement represents a risk to the project.

Accounting for impacts to regulated users during the life and post operations of the mine
The Belubula River below Carcoar dam represents a reliable supply to numerous regulated river water users. Following further assessment as requested under s2 of this advice, Regis Resources may need to account for the reduction of regulated river flows as a result of mining disturbance which has reduced the reporting catchment to Carcoar Dam during the life of the mine and post mining.

Primary water supply

The primary water supply for the project is to be sourced from an external licensed source via a pipeline. The proponent will need to ensure adequate arrangements are in place to secure the relevant term access to this water and that there are no restrictions on the water licence or the planning approval held by the water supplier that may impact this supply.

1.2 Recommendations – Prior to Determination

The proponent should:

- Complete a review of the proposed dams/structures that will capture runoff. Key principles in completing this review include the following:
    - The dam capacity of dams/structures on minor streams (first and second order streams) need to be considered for whether they are within the Maximum Harvestable Rights Dam Capacity (MHRDC) or satisfy an exclusion. To meet an exclusion they need to be sized consistent with best practice for the purpose of the dam eg. a dam to capture runoff from an upstream disturbed area needs to be sized according to industry standards. Where a dam is capturing runoff from an undisturbed catchment it will not meet an exclusion.
    - Water holding structures on minor streams that are sized larger than the industry standards for the runoff capture need to be either 1) constructed to prevent runoff capture such as a turkeys nest dam , 2) need to be considered within the MHRDC or 3) considered for licensing.
    - Dams/structures constructed on third order or higher order streams are subject to licensing requirements for the water take (not the dam size). Where water is captured in these dams licensing needs to be considered whether or not it is later pumped out and back into the system.
    - Diversions of watercourses around structures may remove the need for licensing provided they can divert all the volume downstream that previously passed the location of the proposed structure. Where this cannot be implemented the structure will need to be considered for licensing.
- Due to the recognised limitations on water entitlement in the surface water source, confirmation is required of the ability to obtain the necessary surface water entitlement to account for runoff capture structures, water take and impacts to regulated water supply. The proponent should consider an alternate project design to reduce the need for surface water entitlement.

- Confirmation be provided that there are no existing or likely future water licence or planning approval restrictions that may limit the supply via the pipeline.

2.0 Surface water impacts

The risk of an impact to regulated storage reliability is of concern. DPIE - Water requires more information to improve understanding of the likely reductions in storage volumes and reliability of Carcoar Dam and proposed mitigation options. DPIE Water believes that the analysis in the EIS does not reflect the realities of inflows into Carcoar dam and how regulated flows are managed.

2.1 Explanation

Surface water model

Regis Resources has developed a runoff-flow model, using the Australian Water Balance Model platform to derive site water balance, catchment runoff and river flow outputs. This includes a modelled flow input graph for Carcoar Dam, which differs significantly to recorded storage volumes at recession limb and low storage level conditions, such as during the Millennium Drought. The divergence between modelled storage volumes to monitored storage volumes is shown in Attachment B (Figure 35, Attachment J of the EIS).

An explanation about this divergence is not given in the EIS. DPIE Water is concerned that the modelled flow input is not effectively simulating actual inflow situations. Given the small size of Carcoar Dam it is important that further work is undertaken on the surface water model so that predicted impacts and mitigation options are better understood.

Further information is required including:

- a comparison of the outputs from the AWBM model and DPIE Water's Belubula River Source code model.
- Model sensitivity to its inputs
- Explanation about the difference in storage volumes at recession to dry period drawdowns including the Millennium Drought (2002-11).
- Difference in storage volume (modelled and actual)
- consideration of river types and sub-catchment surface to groundwater connectivity relationships

Impacts to regulated flows

The EIS states that the mine will occupy 4.1% of the Carcoar Dam catchment, and will reduce catchment runoff and river flows that report to Carcoar Dam. It predicts a decrease in catchment inflows to range from between 60 – 2400 Ml per annum depending on the annualised climate conditions.

The analysis in the EIS (note s4.1.1 Appendix J):

- Calculates the modelled inflows when the project is operating by excising the catchment area of the project (964 Ha or 4.1% of the total catchment area)
- Compares the modelled inflows with or without the operating mine and highlights a 4.1% reduction in the median modelled flow (50% of time that flow is greater than modelled). This 4.1% reduction is then applied to all flow ranges.

The analysis and conclusions proceed to focus on impacts to low to median inflows with the conclusion that the project will have only minor impact to Carcoar Dam inflows and water availability. For example, the EIS states that:

- at very low flows (95%ile) the modelled project inflow is reduced by 61 ML/yr which is only 1.6% of the average annual water usage from the Belubula Regulated water source (2013-2019), and
- median flows are expected to be reduced by 242 ML/annum during the operation of the mine and so will not significantly reduce water available for other users (s8.3.2 in main report of the EIS).

- The proponent proposes to use 242 ML as the mitigating volume to offset annual flow loss (Attachment C - Table 25 of Appendix J).

This analysis is overly simplified and does not adequately reflect the complexities of flows into Carcoar Dam or how its storage is managed for regulated water users. We believe that the consequential impacts of changes to inflows to storage volume and reliability of Carcoar dam require further in-depth analysis.

The use of median or average dam inflows to guide the proponent's estimation of predicted impacts does not account for Carcoar Dam's reliance on high to flood flows to maintain adequate storage levels. These storage levels provide reliable water releases to supply high security licences and environmental flow requirements in the Belubula River downstream of the Dam. We require further analysis which better accounts for high to flood flows.

The loss of reporting catchment area to Carcoar Dam requires a risk assessment to quantify increased storage vulnerability and lower storage reliability due to reduced discharge entering Carcoar Dam and take of rainfall/runoff and stream flows downstream of the Vittoria State Forest.

DPIE Water requires further information to better understand the potential impacts to storage inflows, storage reliability and dam releases. This includes a detailed quantified analysis of existing river flows, runoff interception and consequential impacts to downstream river flow characteristics and storage volume and reliability. The analysis should explore river flow characteristics such as flow persistence and changes in catchment flow contributions to base and minimum flows, high flows and flood flows

This additional information will inform whether accounting measures discussed in s1 are required to account for flow reduction into Carcoar Dam throughout the life of the mine including post mining.

Geomorphic impacts and river rehabilitation

The reaches in the Belubula River and its tributaries are incised and largely degraded. Several tributaries, such as Tributary A, are protected from incision migrating upstream from the Belubula River by on-line dams, such as the Landcare Dam. These tributaries contain highly fragile river forms that would be destroyed if existing channel degradation intersects those forms.

Surface to ground water connectivity is ranked as high. The geomorphic river types upstream of the McPhillamys mine site rely on closely connected surface to ground water regimes. Habitat quality and ecological tolerances are matched to low profile riverine forms, where large volumes of sediment are trapped and discontinuous channel types form local habitats. The degraded condition of the majority of watercourses within and downstream of the McPhillamys site reduces habitat availability and quality markedly.

The rehabilitation strategy presented in Appendix U of the Environmental Impact Statement does not address loss of available aquatic habitat, or propose any replacement habitat or rehabilitation of rivers on the McPhillamys mine site that will not be mined or buried. The approach to managing watercourses, and remediation strategy for impacted watercourses located on the McPhillamys mine site and on land under Regis Resources control requires improvement.

The proponent needs to demonstrate a strategic approach to riverine reconstruction which mimics pre-disturbance geomorphic processes and river types. This should generally follow the strategy outlined in *A Rehabilitation Manual for Australian Streams* by Rutherford, Jerie and Marsh Cooperative Centre for catchment Hydrology, LWRRDC Canberra 2000.

We require further information about site rehabilitation such as

- the reconstruction of watercourses crossing the post-mine landform
- explanation about the application of the mining landform models such as SIBERIA mentioned in the EIS,

- drainage density or conveyance of flow south west from Vittoria State Forest to the undisturbed Belubula River

The procedures proposed for environmental monitoring of watercourses, flow alterations and geomorphic risks also require more explanation. The EIS (Appendix J ss 5.2-5.4) lacks any details as to timing, frequency, locations and justification for monitoring watercourse condition. Inspection and response to water management and erosion control structures on the site requires a longer term monitoring, maintenance and rehabilitation period than the two year period nominated by the applicant. Monitoring and maintenance periods should extend until vegetation is established and sediment transfer and channel geomorphic features are functioning. This usually requires a minimum ten year period commitment.

2.2 Recommendations – Prior to Determination

- Provide DPIE Water with the input data to the AWBM model and model sensitivity runs to see if specific input variables are sensitive to outputs and comparisons between the AWMB model and DPIE Water's Source model for the Belubula River.
- Remodel the impacts on flow transmission downstream of the mining disturbance zone to Carcoar Dam to include sensitivity analyses of input variables to the AWBM model used for water balance and flow response through all stages of mining development and post-mine landform and drainage formation.
- Revise the flow reduction predictions to Carcoar Dam based on sensitivity analyses of river flow impacts to Carcoar Dam.
- Provide a full account for flow interruptions and/or flow reductions contributing to Carcoar dam based on annual flow levels to all flow year scenarios included in the AWBM model based on the maximum 5% interception of catchment runoff contribution to river flows into Carcoar Dam, using 2016-17 as a wet year sensitivity run and 2017-18 as dry year.
- Compare the adequacy of the site AWBM model to the Source model developed by DPIE – Water to form the accounting basis for storage reliability and flow release into the regulated Belubula River water source.

Further recommendations may be required depending on review of this information.

2.3 Recommendations – Post Determination

As part of the Water Management Plan, the proponent should:

- 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.

3.0 Impact of production bores

Insufficient information has been provided to assess the impact of production bores proposed to supply water to the project.

3.1 Explanation

The bore locations, proposed extraction rates, potential impacts on neighbouring water users and the ability to comply with the relevant water sharing plan and trading rules has not been provided.

3.2 Recommendation – Prior to Determination

The proponent should:

- Arrange an impact assessment of the construction and operation of proposed production bores to supply water for the project as soon as possible. This is to meet the requirements of the relevant water sharing plan and demonstrate the ability to trade the necessary entitlement to the bores.

4.0 Pipeline Impacts

The proposed 90km pipeline between Angus Place Colliery and the project site requires a significant number of watercourse crossings. The need to ensure bed and bank stability is maintained as part of construction of these crossings both in the short term and long term is critical.

4.1 Explanation

The pipeline is proposed to cross 112 watercourses between Angus Place Colliery and the mine site. Nine of these crossings are identified as perennial watercourses with the remainder as ephemeral. Two of the crossings are proposed to be constructed with directional drilling and the remainder to use open trenching methods. The individual assessments of each will be critical in understanding the risks to bed and bank stability and whether additional directional drilling sites will be required or specific mitigation measures. This will need to be addressed as part of the Construction Management Plan (CMP) development. The risk of bed incision exposing the pipeline has been raised in the EIS hence this needs to be mitigated in the detailed design and management stage.

These works need to be constructed in accordance with the "Guidelines for Controlled Activities on Waterfront Land (NRAR 2018)". Where there is an identified risk to bed and bank stability appropriate construction and rehabilitation measures will need to be applied to mitigate this risk. Minimising impact to downstream water users and the environment will be critical. Where there is the requirement to utilise coffer dams during construction, the flow downstream should be maintained via adequate diversions.

Trenching for the pipeline construction is not predicted to intercept the regional groundwater system, however shallow groundwater may be intercepted. At these sites management and mitigation measures will be used to protect water levels and water quality with no proposal to take groundwater as part of the pipeline construction. The management aspects will need to be addressed within a relevant management plan. The proponent will need to hold entitlement for any water take from aquifer interception as part of the pipeline construction. Appendix B of Appendix X provides a geomorphic assessment of the pipeline crossings for the project.

4.2 Recommendation – Prior to Determination

The proponent should:

- Consult with DPIE Water to confirm fragile river reaches consistent with the River Styles framework that require remediation before and following pipeline installation to protect those rivers from degradation.

4.3 Recommendations – Post Determination

As part of the Construction Management Plan, the proponent should:

- Addresses bed and bank stability.
- Devise a remediation and reconstruction strategy for watercourses of 3rd order and greater located within a two reach distance from the disturbance zone for pipeline crossings. 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 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.

5.0 Groundwater Model - Class 2 or Class 3 Upgrade

The model is fit for purpose. However we wish to confirm the commitment to improve the model as new data becomes available. The proponent should aim for a Class 2 or Class 3 groundwater model.

5.1 Explanation

The numerical groundwater model (herein the model) reported in the EIS for making impact predictions was constructed and calibrated in steady state with transient verification. The proponent has provided a 'Class 1' model confidence classification which is appropriate for the model presented in its current form. It has been adequately peer reviewed following the Australian Groundwater Modelling Guidelines (2012), with the review confirming the model class given, but suggesting many of the model's elements can be considered "Class 2".

The model Class 1 strictly complies with the requirements of the AIP as the directly impacted water source is not classified as a "reliable water supply". However due to potential risk to adjacent groundwater and downstream surface water users it is considered that the model utilised to make predictions of surface water/groundwater take and impacts is not commensurate with the risk posed.

The proponent has committed to upgrading the model as new data becomes available. They should aim for a Class 2 or Class 3 groundwater model as defined by Australian Groundwater Modelling Guidelines (2012). A number of refinements to the model are required before the model would be considered by DPIE - Water as 'fit for purpose' for the degree of risk posed. Recommendations are given below to improve the robustness of the model predictive capacity.

The groundwater model predicts significantly higher volumes of seepage from the TSF (peak of 700 ML/year) than estimated in the TSF " Definitive Feasibility Study" (Appendix D to the EIS; peak of 117 ML/year). Because of this uncertainty, a model upgrade plan should include a commitment to improve the reliability of seepage estimates and include geochemical modelling (such as PHREEQC/MT3D) to refine estimates of leachate concentrations. Further, consideration should be given to incorporating the operation of the proposed back-up interception bores in a revised model.

5.2 Recommendation – Prior to Determination

The proponent should:

- Review the current model limitations and provide a model upgrade plan. The model upgrade plan is required to take into account all baseline data and develop a fully functional transient model.

5.3 Recommendations – Post Determination

The proponent should:

- Hold to its commitment to updating the model to incorporate the increasing period of baseline data in order to undertake a transient calibration of the model. The model should be sufficiently improved to a Class 2 classification as a minimum within 3 years of approval.
- Include in the model upgrade plan a commitment to improve the reliability of seepage estimates from the TSF and include geochemical modelling (such as PHREEQC/MT3D) to refine estimates of leachate concentrations. Further, consideration should be given to incorporating the operation of the proposed back-up interception bores in a revised model.

6.0 Groundwater Model – Impacts to 3rd parties and Groundwater Dependent Ecosystems & Refinement of Predictions

It is unlikely that 3rd party bores will experience significant impact. However more information is required to understand impacts on Groundwater Dependent Ecosystems (GDEs) and improvements are suggested to further refine predictions made for leachate flow down gradient of the TSF.

6.1 Explanation

The project is located within the Lachlan Foldbelt NSW MDB Fractured Rock Groundwater Source. The water source is classified as a “less productive” aquifer, hence under the terms of the AIP is not a “reliable water supply”. However, this portion of the Lachlan Fold Belt is host to significant existing licenced works used for drinking water and stock water supply.

The predicted 100-year 2 m drawdown contour is entirely within lands owned by the proponent (and mine lease) therefore satisfies AIP requirements for impacts on adjacent licenced water users. Uncertainty analysis presented in Section 6.4.3 (a) for drawdown related impacts indicate that it is unlikely even under ‘worst case’ scenario that third party bores will experience groundwater drawdown greater than 2 m.

The EIS provides information on GDEs within the mine area and concludes that the predicted impacts on these GDEs will be minimal. Water table declines are predicted to encroach upon GDE communities. A community of Mountain/Manna Gum trees are expected to have reduced access to groundwater during periods of low rainfall when soil moisture is low. The material effects of those impacts have not been described. The quantum of water table decline has also not been reported.

The proponent outlines a summary of all potential impacts to sensitive receptors and details response management measures. An adequate detail of potential impacts and proposed management measures have been included.

6.2 Recommendation – Prior to Determination

The proponent should:

- Provide more details on the potential water table drawdown and any material impacts this might have on GDE communities.

6.3 Recommendation – Post Determination

- Improve the sensitivity and uncertainty assessment by undertaking a closer investigation of the parameters associated with the TSF and river/creek features (including adjacent Belubula River) in accordance with recommendation made in the Peer Review (Appendix H).
- Separate the river fluxes from TSF fluxes for the 10 and 100 year post mining model balance so that volumes may be accurately and individually accounted.
- Include the extraction from the identified site production bores in the model.
- Considers undertaking aquifer stress tests to measure aquifer parameters to better constrain model calibration.
- Incorporate climate change scenarios into the predictive modelling given the 100 year horizon shows the greatest impacts of the activity.

7.0 Groundwater Monitoring

Information about the location of monitoring bores to provide early warning of potential seepage from the TSF is required.

7.1 Explanation

The baseline monitoring network includes 23 project specific monitoring bores and 10 existing (third party) bores. Groundwater monitoring (levels and quality) has been conducted since May 2014 in accordance with NSW government requirements. A Groundwater Monitoring and Modelling Plan was presented to DPIE for review in mid-2017 with a number of recommendations made including the requirement to have 2 years of baseline data for assessment.

Baseline monitoring is adequately described in the EIS with exception of the monitoring bores to be installed around the TSF as an ‘early warning of potential seepage’. We require further inormation on the location of these bores.

7.2 Recommendation – Prior to Determination

The proponent should:

- Detail the monitoring including bore locations proposed around the TSF to provide early warning of potential seepage.

Attachment B

Modelled inflows to Carcoar Dam

Source Figure 35 of Appendix J of the McPhillamys gold mine Environmental Impact Statement

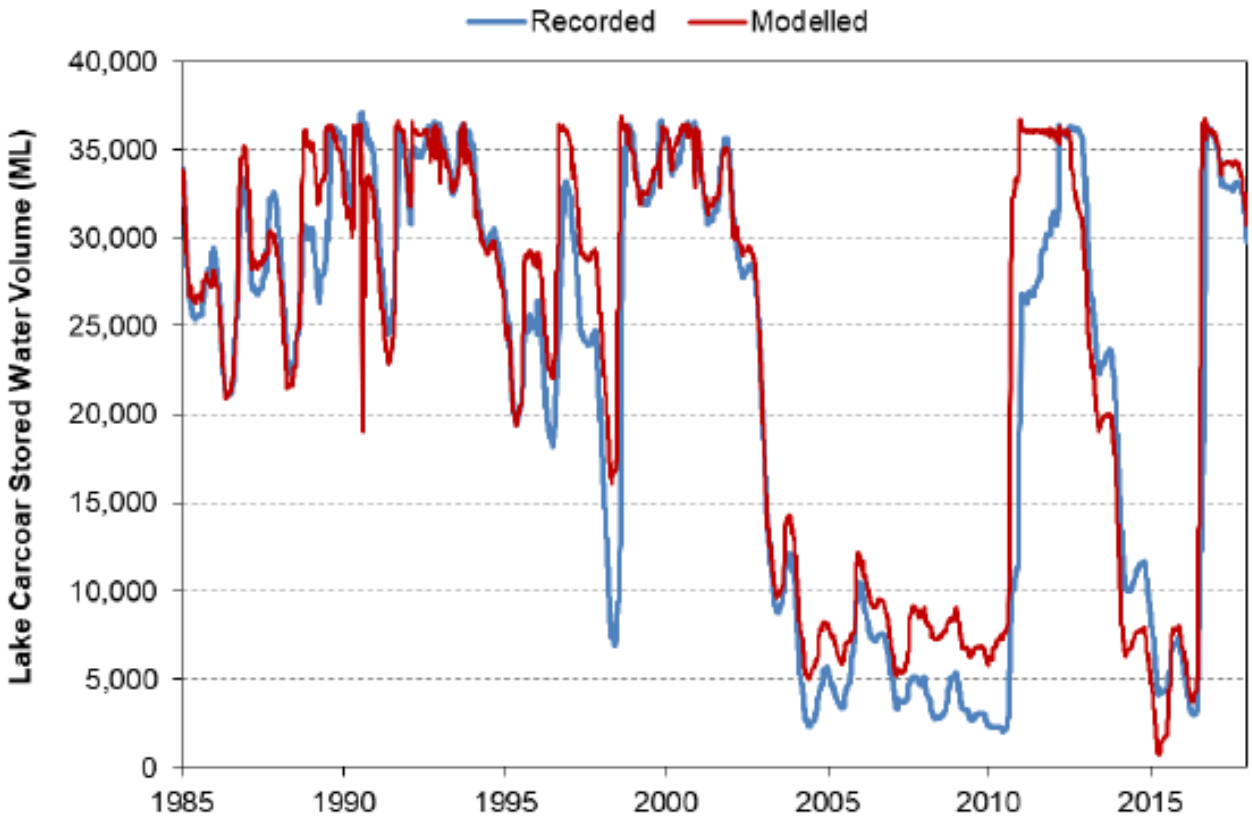

Figure 35 Comparison of Recorded and Modelled Stored Water Volume in Lake Carcoar

The base case modelled storage volume produced by the AWBM model is shown below from Figure 35 of Appendix J of the Environmental Impact Statement. The modelled inflows to storage reliability significantly diverges to both drawdown levels from 1995 onwards and storage recovery levels (eg. 2011, 2016).

Attachment C

Modelled flow reductions into Carcoar Dam resulting from land disturbance and catchment area reduction during McPhillamys gold mine operation.

Modelled annual flows to Carcoar Dam comparing existing state (no mine) to modelled mining interruption of catchment runoff and stream flows. Source: Table 25 of Appendix J of the McPhillamys gold mine Environmental Impact Statement.

% time that flow is greater than modelled	Existing modelled inflows to Carcoar (Ml/yr)	Modelled inflows with McPhillamys mine operating (Ml/yr)	Decreased modelled inflows due to maximum project extent (Ml/yr)
95	1,463	1,402	61
90	1,941	1,861	80
80	2,408	2,308	100
70	3,056	2,929	127
60	3,645	3,494	151
50	5,836	5,594	242*
40	7,917	7,590	327
30	13,975	13,397	578
20	24,995	23,961	1,034
10	42,296	40,546	1,750
5	57,984	55,585	2,399

* Shaded cell represents the mitigating volume Regis proposes to offset annual flow loss

Modelled flow reductions to Carcoar Dam have significant uncertainties, due to variations in modelled Carcoar Dam storage volumes compared to monitored volumes. The selection of a single percentile figure to account for flow reductions to Carcoar Dam has not been explained in the Environmental Impact Statement. The choice of a median flow point to a major public supply storage as an accounting mitigation measure has not been justified.