Department of Planning and Environment

Our ref: OUT22/21353

Iwan Davies
Planning and Assessment Group
NSW Department of Planning and Environment

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8 December 2022

Subject: **Shoalhaven Hydro Expansion Project – Main Works (SSI-10033) – Environmental Impact Statement (EIS)**

Dear Iwan Davies

I refer to your request for advice sent on 8 November 2022 to the Department of Planning and Environment (DPE) Water about the above matter.

The proposal includes the construction and operation of a new pumped hydroelectric power station involving water transfer between two existing reservoirs. The scope includes an underground power station, tunnels and supporting surface infrastructure.

DPE Water advises that there is not enough information in the EIS on risks and impacts to groundwater and recommends the following key aspects be addressed prior to approval:

- provide estimates of maximum annual groundwater take during construction and operation.
- update the groundwater modelling to include a sensitivity and uncertainty analysis and to separate the construction and operation phase dewatering impacts.
- provide further information to improve confidence in the groundwater modelling outputs. This includes an independent peer review and more detail to address the department's guideline, "Minimum Groundwater Modelling Requirements for SSD/SSI Projects" and the modelling requirements of the NSW Aquifer Interference Policy.
- review the adequacy of the proposed mitigating measures for groundwater impacts after groundwater modelling updates have been completed.

DPE Water recommends that additional groundwater monitoring is included as a post approval recommendation to address inadequacies in the current monitoring framework. This needs to be supported by baseline data collection prior to construction which is critical to understand the groundwater system and for setting appropriate trigger levels.

Please see Attachment A for more detail. Should you have any further queries please do not hesitate to contact DPE Water Assessments water.assessments@dpie.nsw.gov.au or to the following coordinating officer within DPE Water:

Tim Baker – Senior Project Officer
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Yours sincerely

Mitchell Isaacs
Chief Knowledge Officer, Knowledge Division
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Attachment A

Detailed advice to DPE Planning & Assessment regarding the Shoalhaven Hydro Power Station (SSI-10033) – EIS

1.0 Water Take and Licencing

1.1 Recommendation – Prior to Determination

The proponent should quantify the maximum annual volume of water take during construction and operation of the project and demonstrate sufficient water entitlements can be obtained unless an exemption applies.

1.2 Explanation

Insufficient information has been provided to confirm the maximum groundwater take due to aquifer interference associated with construction and operation. The presented water volumes are averages or are only presented for the duration of construction which is inadequate. Maximum water take volumes per water year and the ability to account for this water take needs to be clearly understood, including agreements with third parties if proposed.

1.3 Recommendation – Post Approval

The proponent completes works within waterfront land in accordance with the Guidelines for Controlled Activities on Waterfront Land (DPE 2022).

1.4 Explanation

The project includes construction and operation of works within waterfront land. This includes building infrastructure over, under and adjacent to watercourses. The *Guidelines for Controlled Activities on Waterfront Land* (DPE 2022) provides relevant guidance to mitigate impacts on waterfront land.

2.0 Groundwater Modelling and Monitoring

2.1 Recommendation – Prior to Determination

That the proponent updates the groundwater modelling and accompanying reports to include the following:

- a sensitivity and uncertainty assessment
- separation of construction and operation phase dewatering effects and include individual and cumulative activity impacts
- updated mitigating measures to avoid, reduce, eliminate or remediate any adverse effects of the development following the model updates.

2.2 Explanation

A sensitivity and uncertainty assessment are required to provide confidence in the model predictions. This is referred to in the Australian Groundwater Modelling Guidelines (2012) which needs to be addressed under the modelling requirements of the NSW Aquifer Interference Policy. The department's guideline, *Minimum Groundwater Modelling Requirements for SSD/SSI Projects* (Jan 2022) also sets out the requirement for sensitivity and uncertainty assessments.

The presentation of dewatering impacts was inadequate to clearly understand impacts at different stages and to enable an understanding of impacts from both individual activities and the cumulative project impacts.

2.3 Recommendation – Prior to Determination

That the proponent provides further information to justify how the groundwater model is consistent with DPE Water's guideline, *Minimum Groundwater Modelling Requirements for SSD/SSI Projects* (Jan 2022) and the NSW Aquifer Interference Policy. Key information includes:

- specific detail of how the model approaches were applied to the individual elements of the project
- further detail on the hydrogeological conceptualisation of the sensitive escarpment groundwater systems
- further detail on the relationship between the dewatering locations and elevations, and the identified receptors
- specifics of the period of record and scope of monitoring data relied on to support the modelling
- demonstration that individual formations have been appropriately modelled having regard to the different groundwater system characterisations of each unit
- an independent peer review.

2.4 Explanation

Insufficient information was provided to support the modelling approaches used and to adequately explain the models, which raises uncertainty in the predicted effects, associated risk and adequacy of mitigating measures.

2.5 Recommendation – Post Approval

That the proponent develops a groundwater monitoring strategy including timing, locations and target aquifers, and collects baseline data prior to construction. The monitoring strategy needs to include the following:

- three purpose-built multiple pipe installations in each of the upper and lower scheme areas that avoids the use of vibrating wire piezometers for ongoing monitoring
- individual monitoring pipes ('standpipe piezometers') that are capable of monitoring individual formations (Hawkesbury Sandstone, Narrabeen Group, Illawarra Coal Measures, Broughton Formation, Budgong Sandstone, Berry Siltstone) in isolation (upper scheme area)
- individual monitoring pipes ('standpipe piezometers') that are capable of monitoring individual formations (Nowra Sandstone, Wandrawandian Formation, Snapper Point Formation) in isolation (lower scheme area)

2.6 Explanation

The existing groundwater monitoring system is inadequate to demonstrate actual effects of the project and to assess against the minimal impact considerations of the NSW Aquifer Interference Policy. This represents a risk to managing groundwater impacts from the project and the above recommended monitoring locations are proposed to assist in addressing this.

A minimum of 2 years of baseline monitoring is recommended to capture climatic variation at the site. This is consistent with the department's *Guidelines for Groundwater Documentation for SSD/SSI Projects – Technical Guideline* (Jan 2022).

2.7 Recommendation – Post approval

That the proponent prepares a Groundwater Management Plan that will include but not be limited to:

- monitoring and reporting of groundwater levels from the individual monitoring pipes (‘standpipe piezometers’) for the life of the project
- monitoring, measurement and reporting of any groundwater inflow to the drained structure components of the project

End Attachment A