



Lauren Clear  
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Department of Planning, Housing and Infrastructure

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Dear Lauren

**Input into Secretary's Environmental Assessment Requirements – Muswellbrook Pumped Hydro Energy Storage Project (SSD-65797725)**

I refer to your Major Projects Portal request on 13 December 2023 seeking input into the Secretary's Environmental Assessment Requirements (SEARs) Muswellbrook Pumped Hydro Energy Storage Project, located 4 kilometres (k)m northeast of Muswellbrook within the Muswellbrook local government area.

The Biodiversity and Conservation Division (BCD) of the Department of Climate Change, Energy, the Environment and Water understands that the Muswellbrook Pumped Hydro Energy Storage Project would include the development of a 500 megawatt pumped hydro power station, upper and lower reservoirs, grid connection and ancillary infrastructure. BCD understands that the proposal is State Significant Development (SSD-60598738) under the *Environmental Planning and Assessment Act 1979*.

BCD has reviewed the *Scoping Report – Muswellbrook Pumped Hydro Energy Storage Project* - prepared by Muswellbrook Pumped Hydro Pty Ltd dated December 2023 and recommends the incorporation of the Standard SEARs presented in **Attachment A**.

There are also project-specific SEARs provided for this project which are listed in **Attachment B**. In preparing the EIS, the proponent should refer to the relevant guidance material provided in **Attachment C**.

If you have any further questions about this issue, please contact Giorginna Xu, Senior Conservation Planning Officer, on 4927 3185 or at [huntercentralcoast@environment.nsw.gov.au](mailto:huntercentralcoast@environment.nsw.gov.au)

Yours sincerely

Joe Thompson  
**Director, Hunter Central Coast Branch**  
**Biodiversity and Conservation Division**  
15 January 2024

Enclosure: Attachments A, B, C

## Attachment A – Standard Environmental Assessment Requirements

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### Biodiversity

1. Biodiversity impacts related to the proposed development (SSD-65797725) are to be assessed in accordance with the [Biodiversity Assessment Method 2020](#) and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the *Biodiversity Conservation Act 2016* (s6.12), *Biodiversity Conservation Regulation 2017* (s6.8) and [Biodiversity Assessment Method 2020](#).
2. The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the [Biodiversity Assessment Method 2020](#).
3. The BDAR must include details of the measures proposed to address the offset obligation as follows;
  - The total number and classes of biodiversity credits required to be retired for the development/project;
  - The number and classes of like-for-like biodiversity credits proposed to be retired;
  - The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules;
  - Any proposal to fund a biodiversity conservation action;
  - Any proposal to conduct ecological rehabilitation (if a mining project);
  - Any proposal to make a payment to the Biodiversity Conservation Fund.

If seeking approval to use the variation rules, the BDAR must contain details of the [reasonable steps](#) that have been taken to obtain requisite like-for-like biodiversity credits.

4. The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the *Biodiversity Conservation Act 2016*.

### Water and soils

5. The EIS must map the following features relevant to water and soils including:
  - a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).
  - b. Rivers, streams, wetlands, estuaries (as described in s4.2 of the Biodiversity Assessment Method).
  - c. Wetlands as described in s4.2 of the Biodiversity Assessment Method.
  - d. Groundwater.
  - e. Groundwater dependent ecosystems.
  - f. Proposed intake and discharge locations.

<p>6. The EIS must describe background conditions for any water resource likely to be affected by the development, including:</p> <ol style="list-style-type: none"> <li>a. Existing surface and groundwater.</li> <li>b. Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations.</li> <li>c. Water Quality Objectives (as endorsed by the NSW Government <a href="http://www.environment.nsw.gov.au/ieo/index.htm">www.environment.nsw.gov.au/ieo/index.htm</a>) including groundwater as appropriate that represent the community's uses and values for the receiving waters.</li> <li>d. Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the <a href="#">ANZECC (2000) Guidelines for Fresh and Marine Water Quality</a> and/or local objectives, criteria or targets endorsed by the NSW Government.</li> </ol>
<p>7. The EIS must assess the impacts of the development on water quality, including:</p> <ol style="list-style-type: none"> <li>a. The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction.</li> <li>b. Identification of proposed monitoring of water quality.</li> </ol>
<p>8. The EIS must assess the impact of the development on hydrology, including:</p> <ol style="list-style-type: none"> <li>a. Water balance including quantity, quality and source.</li> <li>b. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.</li> <li>c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.</li> <li>d. Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches).</li> <li>e. Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water.</li> <li>f. Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options.</li> <li>g. Identification of proposed monitoring of hydrological attributes.</li> </ol>
<p><b>Flooding and coastal erosion</b></p>
<p>9. The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005 (NSW Government 2005) including:</p> <ol style="list-style-type: none"> <li>a. Flood prone land.</li> <li>b. Flood planning area, the area below the flood planning level.</li> <li>c. Hydraulic categorisation (floodways and flood storage areas).</li> </ol>

<p>10. The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 1 in 10 year, 1 in 100 year flood levels and the probable maximum flood, or an equivalent extreme event.</p>
<p>11. The EIS must model the effect of the proposed development (including fill) on the flood behaviour under the following scenarios:</p> <ol style="list-style-type: none"> <li>a. Current flood behaviour for a range of design events as identified in 11 above. This includes the 1 in 200 and 1 in 500 year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.</li> </ol>
<p>12. Modelling in the EIS must consider and document:</p> <ol style="list-style-type: none"> <li>a. The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood.</li> <li>b. Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazards and hydraulic categories.</li> <li>c. Relevant provisions of the <i>NSW Flood Risk Management Manual 2023</i>.</li> </ol>
<p>13. The EIS must assess the impacts on the proposed development on flood behaviour, including:</p> <ol style="list-style-type: none"> <li>a. Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure.</li> <li>b. Consistency with Council floodplain risk management plans.</li> <li>c. Compatibility with the flood hazard of the land.</li> <li>d. Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land.</li> <li>e. Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.</li> <li>f. Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.</li> <li>g. Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the SES and Council.</li> <li>h. Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the SES and Council.</li> <li>i. Emergency management, evacuation and access, and contingency measures for the development considering the full range of flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the SES.</li> <li>j. Any impacts the development may have on the social and economic costs to the community as consequence of flooding.</li> </ol>
<p>14. The [EIS] must describe the potential effects of coastal processes and hazards (within the meaning of the <i>Coastal Management Act 2016</i>), including sea level rise and climate change:</p>

- a. On the proposed development
- b. Arising from the proposed development.

15. The [EIS] must consider have regard to any certified Coastal Management Program (or Coastal Zone Management Plan) and be consistent with the management objectives described in the Coastal Management Act and development controls for coastal management areas mapped under the *State Environmental Planning Policy (Resilience and Hazards) 2021*.

## Attachment B – Project specific environmental assessment requirements

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### **Biodiversity**

In addition to the matters outlined in Attachment A, the EIS must also address the following park-specific issues:

- the proponent should consider and assess the likely impact to all existing and proposed biodiversity offset sites within or adjacent to the proposed Muswellbrook Pumped Hydro Energy Storage Project footprint.
- there are several existing and future major projects in the vicinity of the proposal. The proponent should consider and assess the potential cumulative impacts of the proposed Muswellbrook Pumped Hydro Energy Storage Project.

**Water and soils** - nil

**Flooding and coastal erosion** - nil

## Attachment C – Guidance material

Title	Web address
<b>Relevant legislation</b>	
<i>Biodiversity Conservation Act 2016</i>	<a href="http://www.legislation.nsw.gov.au/#/view/act/2016/63/full">www.legislation.nsw.gov.au/#/view/act/2016/63/full</a>
<i>Coastal Management Act 2016</i>	<a href="http://www.legislation.nsw.gov.au/#/view/act/2016/20/full">www.legislation.nsw.gov.au/#/view/act/2016/20/full</a>
<i>SEPP (Resilience and Hazards) 2021</i>	<a href="https://legislation.nsw.gov.au/view/whole/html/inforce/current/epi-2021-0730">https://legislation.nsw.gov.au/view/whole/html/inforce/current/epi-2021-0730</a>
<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>	<a href="http://www.legislation.gov.au/Series/C2004A00485">www.legislation.gov.au/Series/C2004A00485</a>
<i>Environmental Planning and Assessment Act 1979</i>	<a href="https://legislation.nsw.gov.au/view/html/inforce/current/act-1979-203">https://legislation.nsw.gov.au/view/html/inforce/current/act-1979-203</a>
<i>Fisheries Management Act 1994</i>	<a href="https://legislation.nsw.gov.au/view/html/inforce/current/act-1979-203">https://legislation.nsw.gov.au/view/html/inforce/current/act-1979-203</a>
<i>Marine Estate Management Act 2014</i>	<a href="https://legislation.nsw.gov.au/view/html/inforce/current/act-2014-072">https://legislation.nsw.gov.au/view/html/inforce/current/act-2014-072</a>
<i>National Parks and Wildlife Act 1974</i>	<a href="https://legislation.nsw.gov.au/view/html/inforce/current/act-1974-080">https://legislation.nsw.gov.au/view/html/inforce/current/act-1974-080</a>
<i>Protection of the Environment Operations Act 1997</i>	<a href="https://legislation.nsw.gov.au/view/html/inforce/current/act-1997-156">https://legislation.nsw.gov.au/view/html/inforce/current/act-1997-156</a>
<i>Water Management Act 2000</i>	<a href="https://legislation.nsw.gov.au/view/html/inforce/current/act-2000-092">https://legislation.nsw.gov.au/view/html/inforce/current/act-2000-092</a>
<i>Wilderness Act 1987</i>	<a href="https://legislation.nsw.gov.au/view/html/inforce/current/act-1987-196">https://legislation.nsw.gov.au/view/html/inforce/current/act-1987-196</a>
<b>Biodiversity</b>	
Biodiversity Assessment Method 2020 & assessor resources (including legislation, manuals, BDAR templates, survey guidelines, registers and databases)	<a href="http://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020">www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020</a>  <a href="http://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/accredited-assessors/assessor-resources">www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/accredited-assessors/assessor-resources</a>
Guidance to assist a decision maker to determine a serious and irreversible impact	<a href="http://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/guidance-decision-makers-determine-serious-irreversible-impact-190511.pdf">www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/guidance-decision-makers-determine-serious-irreversible-impact-190511.pdf</a>
Policy and guidelines for fish habitat conservation and management	<a href="https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/fish-habitat-conservation">https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/fish-habitat-conservation</a>
SEED Data Portal (access to online spatial & environmental data)	<a href="http://seed.nsw.gov.au/">http://seed.nsw.gov.au/</a>
List of national parks	<a href="http://www.environment.nsw.gov.au/NationalParks/parksearchatoz.aspx">http://www.environment.nsw.gov.au/NationalParks/parksearchatoz.aspx</a>
Guidelines for developments adjacent to national parks and other reserves	<a href="https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/development-guidelines">https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/development-guidelines</a>
<b>Water</b>	
Water Quality Objectives	<a href="http://www.environment.nsw.gov.au/ieo/index.htm">www.environment.nsw.gov.au/ieo/index.htm</a>

Title	Web address
Australian and New Zealand Guidelines for Fresh and Marine Water Quality	<a href="http://www.waterquality.gov.au/anz-guidelines">www.waterquality.gov.au/anz-guidelines</a>
Water Quality Guidelines Mixing zones	<a href="http://www.waterquality.gov.au/anz-guidelines/resources/key-concepts/mixing-zones">www.waterquality.gov.au/anz-guidelines/resources/key-concepts/mixing-zones</a>
Approved methods for the sampling and analysis of water pollutants in NSW (2022)	<a href="http://www.epa.nsw.gov.au/licensing-and-regulation/licensing/environment-protection-licences/licensing-under-poeo-act-1997/licensing-to-regulate-water-pollution/approved-methods-for-sampling-and-analysing-water-pollutants">www.epa.nsw.gov.au/licensing-and-regulation/licensing/environment-protection-licences/licensing-under-poeo-act-1997/licensing-to-regulate-water-pollution/approved-methods-for-sampling-and-analysing-water-pollutants</a>
Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions.	<a href="http://www.environment.nsw.gov.au/research-and-publications/publications-search/risk-based-framework-for-considering-waterway-health-outcomes-in-strategic-land-use-planning">www.environment.nsw.gov.au/research-and-publications/publications-search/risk-based-framework-for-considering-waterway-health-outcomes-in-strategic-land-use-planning</a>
<b>Soils</b>	
Acid Sulfate Soils Planning Maps via Data.NSW	<a href="http://data.nsw.gov.au/data/">http://data.nsw.gov.au/data/</a>
Acid Sulfate Soils Manual (Stone et al. 1998)	<a href="http://www.environment.nsw.gov.au/resources/epa/Acid-Sulfate-Manual-1998.pdf">www.environment.nsw.gov.au/resources/epa/Acid-Sulfate-Manual-1998.pdf</a>
National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT. (Sullivan, L, Ward, N, Toppler, N and Lancaster, G. 2018a).	<a href="http://www.waterquality.gov.au/sites/default/files/documents/dewatering-acid-sulfate-soils.pdf">www.waterquality.gov.au/sites/default/files/documents/dewatering-acid-sulfate-soils.pdf</a>
National Acid Sulfate Soils guidance: National acid sulfate soils sampling and identification methods manual, Department of Agriculture and Water Resources, Canberra ACT. (Sullivan, L, Ward, N, Toppler, N and Lancaster, G. 2018b).	<a href="http://www.waterquality.gov.au/issues/acid-sulfate-soils/sampling-and-identification-methods-manual">www.waterquality.gov.au/issues/acid-sulfate-soils/sampling-and-identification-methods-manual</a>
National Acid Sulfate soils Guidance: Overview and management of monosulfidic black ooze (MBO) accumulations in waterways and wetlands, Department of Agriculture and Water Resources, Canberra ACT. (Sullivan, LA, Ward, NJ, Bush, RT, Toppler, NR, Choppala, G. 2018c)	<a href="http://www.waterquality.gov.au/issues/acid-sulfate-soils/monosulfidic-black-ooze-accumulation">www.waterquality.gov.au/issues/acid-sulfate-soils/monosulfidic-black-ooze-accumulation</a>
National Acid sulfate soils guidance: Guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management, Department of Agriculture and Water Resources, Canberra, ACT (Simpson, SL, Mosley, L, Batley, GE and Shand P. 2018).	<a href="http://www.waterquality.gov.au/sites/default/files/documents/dredging-sediments-spoil.pdf">www.waterquality.gov.au/sites/default/files/documents/dredging-sediments-spoil.pdf</a>
National Acid Sulfate Soils Guidance: Guidance for the dewatering of acid sulfate soils in shallow groundwater environments, Department of Agriculture	<a href="http://www.waterquality.gov.au/sites/default/files/documents/dewatering-acid-sulfate-soils.pdf">www.waterquality.gov.au/sites/default/files/documents/dewatering-acid-sulfate-soils.pdf</a>

Title	Web address
and Water Resources, Canberra, ACT. (Shand, P, Appleyard, S, Simpson, SL, Degens, B, Mosley, LM 2018)	
<b>Flooding and coastal hazards</b>	
Coastal management	<a href="http://www.environment.nsw.gov.au/topics/water/coasts/coastal-management">www.environment.nsw.gov.au/topics/water/coasts/coastal-management</a>
Floodplain development manual	<a href="http://www.environment.nsw.gov.au/topics/water/floodplains/floodplain-manual">www.environment.nsw.gov.au/topics/water/floodplains/floodplain-manual</a>
Coastal Management Manual	<a href="http://www.environment.nsw.gov.au/topics/water/coasts/coastal-management/manual">www.environment.nsw.gov.au/topics/water/coasts/coastal-management/manual</a>
NSW Climate Impact Profile	<a href="http://climatechange.environment.nsw.gov.au/">http://climatechange.environment.nsw.gov.au/</a>
Floodplain Risk Management Guidelines	<a href="http://www.environment.nsw.gov.au/topics/water/coasts-and-floodplains/floodplains/floodplain-guidelines">www.environment.nsw.gov.au/topics/water/coasts-and-floodplains/floodplains/floodplain-guidelines</a>
Australian Rainfall and Runoff: A Guide to Flood Estimation	<a href="http://arr.ga.gov.au/">http://arr.ga.gov.au/</a>
<b>Marine and Coastal Ecology</b>	
Marine Estate Management Strategy	<a href="http://www.marine.nsw.gov.au/marine-estate-programs/marine-estate-management-strategy">www.marine.nsw.gov.au/marine-estate-programs/marine-estate-management-strategy</a>
NSW Marine Estate Threat and Risk Assessment	<a href="http://www.marine.nsw.gov.au/marine-estate-programs/threat-and-risk-assessment">www.marine.nsw.gov.au/marine-estate-programs/threat-and-risk-assessment</a>
National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds	<a href="http://www.dcceew.gov.au/environment/biodiversity/publications/national-light-pollution-guidelines-wildlife">www.dcceew.gov.au/environment/biodiversity/publications/national-light-pollution-guidelines-wildlife</a>
NSW Marine Protected Areas	<a href="http://www.marine.nsw.gov.au/your-marine-estate/marine-protected-areas">www.marine.nsw.gov.au/your-marine-estate/marine-protected-areas</a>