Our ref: DOC26/185695-11

7 May 2026

Jess Watson
Department of Planning, Housing and Infrastructure

Via email: jess.watson@dpie.nsw.gov.au

EPA Advice on Environmental Impact Statement – Lake Lyell Pumped Hydro Energy Storage – SSI-77018220

Dear Jess

I am writing in response to your request for the NSW Environment Protection Authority (EPA) to review the Environmental Impact Statement (EIS) for the proposed Lake Lyell Pumped Hydro Energy Storage (SSI-77018220) located 5km west from the city of Lithgow.

The EPA has reviewed the following documents:

- *Lake Lyell Pumped Hydro Energy Storage* – EMM Consulting & Energy Australia – 25 February 2026.
- *Appendix F - Surface water assessment* (Version 4) – EMM Consulting – 27 November 2025.
- *Appendix G – Groundwater impact assessment* (Version 4) - EMM Consulting – 24 November 2025.
- *Appendix I – Excavated rock management strategy* (Version 4) – EMM Consulting – 28 November 2025.
- *Appendix R – Noise and vibration impact assessment* (Version 4) – EMM Consulting – 21 November 2025.
- *Appendix Y – Waste Management assessment* (Versions 3) – EMM Consulting – 19 November 2025.

The EPA understands the proposal is for the construction and operations of a pumped hydro energy storage system consisting of:

- The construction of an upper reservoir and dam with storage volume of 5.3 GL.
- Pumped hydro generation components including a single vertical inlet/outlet shaft structure 7 metres in diameter and 170m deep, underground powerhouse located in an underground cavern containing two reversible pump-turbines, generators and control valves.
- Construction of underground tunnels and portals that include the main access tunnel approximately 7.5 metres wide and 8.2 metres tall and about 600 metres long, emergency cable and ventilation tunnel.
- Construction of workers accommodation camp and other ancillary facilities, upgrade to roads, access tracks and other associated infrastructure.

Based on the information provided, the proposal will require an environment protection licence under sections 43 of the *Protection of the Environment Operations Act 1997* (POEO Act) for Electricity Generation clause 17 of Schedule 1 of the POEO Act.

The EPA has reviewed the EIS and notes that it does not provide the information required to allow us to complete our assessment. The EPA has the following comments and recommendations:

1. Matters to be addressed prior to determination

a. Surface Water

A range of issues, inconsistencies and risks were identified during the EPA's review of surface water impacts. The EPA has outlined seven different categories that require further information for the EPA to complete its assessment. These are addressed in Attachment A.

2. Matters to be addressed with conditions

a. Noise

The Noise and Vibration Impact Assessment (NVIA) predicts significant impacts from construction noise, construction vibration and construction traffic that will require careful management through the construction phase which the EIS indicates will be approximately 4.5 years in duration.

All feasible and reasonable mitigation measures and work practices should be identified and implemented throughout the construction program, particularly during any out of hours works and during the night-time period. Noise-intensive works should be limited to less sensitive times where possible. Effective community engagement and consultation will also be a key aspect in managing construction noise, vibration and blasting impacts.

The EPA recommends the Department of Planning, Housing and Infrastructure (DPHI) consider conditions addressing noise in Attachment B. Additional conditions may be provided following review of the additional information requested in Attachment A for Surface water.

If you have any questions about this request, please contact Nick Vlasoff via email at environmentprotection.planning@epa.nsw.gov.au.

Yours sincerely

Christie Jackson
Unit Head – Industry Assessments
NSW Environment Protection Authority

ATTACHMENT A – MATTERS TO BE ADDRESSED PRIOR TO DETERMINATION

The EPA recommends the following issues identified for surface water are addressed prior to determination of the application and provision of recommended conditions.

SITE CHARACTERISATION

Surface water risks from extracted rock are likely underestimated

To predict potential water quality risks from excavated rock, the Excavated Rock Management Strategy (ERMS) includes a draft Geochemistry Characterisation Report (GCR) in Annexure A. The assessment involved sampling and analysis of material from the project footprint, including analysis of 175 core and chip samples from 24 boreholes. Analysis was undertaken in two stages:

- Stage 1 focused on screening (pH, EC, acid-base accounting (ABA) and whole-rock geochemistry)
- Stage 2 targeted samples with elevated sulphur or trace element enrichment and included net acid generation (NAG), sequential NAG, sulphur speciation, acid buffering characteristic curves (ABCC), leachate testing, nutrient analysis and asbestos screening.

The assessment classified 80% of the analysed samples as non-acid forming (NAF), 12% as uncertain, and 8% as potentially acid forming (PAF). Leachability testing included deionised (DI) water leach testing (24 samples) and acetate-buffered (pH 5.0) leaching (12 samples) for pH, EC, major ions, metals and metalloids.

Risk to receiving waters was assessed primarily by comparing leachability testing results with measured groundwater and surface water, which returned variable results and conclusions.

This approach is inconsistent with the National Water Quality Guidelines (ANZG, 2018), the Protection of the Environment Operations (POEO) Act and EPA policy as:

- Groundwater data is not representative of surface water or the water quality required to support the environmental values of the receiving waters.
- Surface water data is not representative of the water quality required to support the environmental values of the receiving waters.

All practical and reasonable measures should be implemented to contribute to restoring environmental values that are not currently being achieved. It is not acceptable to allow poor environmental management or water pollution simply because a waterway is currently degraded. Regardless of the current condition of the waterway, Section 45 of the *Protection of the Environment Operations Act* 1997 requires consideration of the practical measures that could be taken to prevent, control, abate or mitigate pollution.

Pollutant concentrations ranges shown in Figures 4.24 and 4.25 of the Geochemical Characterisation Report substantially exceed guideline values for the environmental values of the receiving waters, for example (note exact values not included in figures):

- PH (DI leachate) generally ranged from 8 to 10, falling outside the ANZECC (2000) physical and chemical stressor guideline value range for freshwater lakes and reservoirs (6.5 – 8.0).
- EC (DI leachate) generally ranged up to approximately 200 uS/cm with some values up to approximately 1000 uS/cm, exceeding the ANZECC (2000) physical and chemical stressor guideline value range for lakes and reservoirs (20 – 30 uS/cm).
- Arsenic (DI leachate) generally ranged up to approximately 0.05 mg/L with two values of 0.316 mg/L and 0.266 mg/L, exceeding the ANZG (2018) 95% level of species protection (LoSP) default guideline value (DGV) for AsV in freshwater (0.013 mg/L).
- Chromium (acetate leachate) ranged up to approximately 0.08 mg/L, exceeding the ANZG (2018) 95% LoSP DGV for CrVI in freshwater (0.001 mg/L). These concentrations have the potential to cause acutely toxic impacts.

- Zinc (DI leachate) generally ranged up to approximately 0.2 mg/L with one result of 0.878 mg/L, exceeding the ANZG (2018) 95% LoSP DGV for zinc in freshwater (0.008 mg/L). These concentrations have the potential to cause acutely toxic impacts.
- Maganese (acetate leachate) ranged up to approximately 8 mg/L, exceeding the ANZG (2018) 95% LoSP DGV for manganese in freshwater (1.9 mg/L). These concentrations have the potential to cause acutely toxic impacts.
- Aluminium (DI leachate) ranged up to approximately 8 mg/L, exceeding the ANZG (2018) 95% LoSP DGV for aluminium (pH > 6.5) in freshwater (0.055 mg/L). These concentrations have the potential to cause acutely toxic impacts.
- Iron (acetate leachate) ranged up to 23.7 mg/L, exceeding the ANZG (2018) 95% LoSP DGV for iron (total) in freshwater (0.280 mg/L). These concentrations have the potential to cause acutely toxic impacts.

It is also noted that numerous other metals were considered in the wider assessment but not included in Figure 4.25. Based on geochemical abundance indices, the GCR states "*these results show that arsenic, bismuth, cobalt, copper, molybdenum, sulphur, antimony, selenium and tin are naturally enriched in some of the samples and therefore may be at risk of leaching if acidification occurs*". However, leachability testing results for many of these pollutants are not included in Figure 4.25 or discussed.

Surface Water risks from soils are unclear

The pollutants identified in the GCR have the potential to be present in residual soils and extremely weathered rock that are likely to be exposed in disturbed areas during the project (e.g. by clearing, excavation, earthworks and construction). Accordingly, stormwater (i.e. runoff from disturbed areas, as defined in the SWA) has the potential to pose elevated risks to receiving waters relative to other earthworks projects. Given the proposal to manage 'stormwater' and 'potentially contaminated water' separately with treated stormwater discharges, potential risks from stormwater discharges should be predicted.

Surface water risks from groundwater are unclear

Excavations including tunnelling are expected to intercept groundwater, creating an additional and potentially accelerated pathway to surface waters. The Groundwater Impact Assessment involved collection and analysis of groundwater samples for physico-chemical properties, major ions, inorganics, hydrocarbons, nutrients and metals (total and dissolved). However, the majority of these results do not appear to have been provided, except for a very limited suite of pollutants discussed in Section 6.5.

For the pollutants that are provided, a comparison with guideline values indicates a potential surface water risk from intercepted groundwater if not managed appropriately. For example, in Figures 6.5 and 6.6 of the Groundwater Impact Assessment (note exact values not included in figures):

- pH in deep groundwater is variable and ranges from below 6 to almost 9, with some values falling outside the ANZECC (2000) physical and chemical stressor guideline value range for freshwater lakes and reservoirs (6.5 – 8.0).
- EC ranged up to approximately 1000 uS/cm in shallow groundwater and approximately 800 uS/cm in deep groundwater, exceeding the ANZECC (2000) physical and chemical stressor guideline value range for lakes and reservoirs (20 – 30 uS/cm).
- Arsenic (filtered) in shallow and deep groundwater both ranged up to approximately 0.03 mg/L, exceeding the ANZG (2018) 95% LoSP DGV for AsV in freshwater (0.013 mg/L).
- Copper (filtered) ranged up to approximately 0.008 mg/L in shallow groundwater and 0.004 in deep groundwater, exceeding the ANZG (2018) 95% LoSP DGV for copper in freshwater (0.0014 mg/L).

- Iron (filtered) ranged up to approximately 90 mg/L in deep groundwater, exceeding the ANZG (2018) 95% LoSP DGV for iron (total) in freshwater (0.280 mg/L). These concentrations have the potential to cause acutely toxic impacts.
- Nickel (filtered) ranged up to over 0.04 mg/L in shallow groundwater and 0.015 mg/L in deep groundwater, exceeding the ANZG (2018) 95% LoSP DGV for nickel in freshwater (0.011 mg/L).
- Zinc (filtered) ranged up to over 0.03 mg/L in shallow groundwater and almost 0.015 mg/L in deep groundwater, exceeding the ANZG (2018) 95% LoSP DGV for zinc in freshwater (0.008 mg/L).

Given that groundwater quality results do not appear to have been provided, there is also a potential for other pollutants to be present in groundwater at non-trivial levels.

Surface water quality characterisation contains errors and omissions

The Surface Water Impact Assessment (SWA) indicates that Energy Australia currently implement a water and algae monitoring program for surface waters around the project area, including in Lake Lyell, Lake Wallace, Thompsons Creek Reservoir, the Coxs River and Farmers Creek. The program includes algae monitoring to inform algae alert levels in Lake Lyell, water quality monitoring and profile (water column) data at the Lake Lyell and Thompson Creek Reservoir outlet towers.

This data would represent baseline water quality and conditions for the project. The following errors and omissions are noted with respect to characterising receiving waters and other surface waters around the project area:

- Environmental values: The SWA does not appear to identify the environmental values of the receiving waters or other surface waters around the project area.
- Analytical suite: The analytical suite varies by sample location and it is unclear whether the program has included all pollutants that have the potential to be elevated in surface waters or impacted by the project. For example, in some or all locations, monitoring does not appear to have included nitrate (separately from nitrite), chlorophyll-a, some metals identified at non-trivial levels in the GCR, and hardness (which could be used to derive hardness-adjusted guideline values for some metals).
- Guideline values: The SWA refers to ANZG (2018) toxicant DGVs and ANZECC (2000) physical and chemical stressor guideline values for protection of aquatic ecosystems. The following issues were identified with the adopted guideline values:
    - Section 4.4.2 of the SWA states “to simplify the results presentation and given that the water quality in Lake Lyell is influenced by and connected to the Coxs River and other watercourses, all water quality results are described relative to the DGVs for an upland river”. It is not uncommon for rivers to flow into and out of lakes and reservoirs. The appropriate ecosystem type for Lake Lyell is ‘freshwater lakes & reservoirs’, noting that some guideline values are lower than for ‘upland rivers’.
    - DO (lakes and reservoirs) – the ANZECC (2000) guideline value range is 90% - 110%.
    - Silver – the ANZG (2018) 95% LoSP DGV for silver in freshwater is 0.00005 mg/L.
    - Lead – the ANZG (2018) 95% LoSP DGV for lead in freshwater is 0.0034 mg/L.
    - Some guideline values were not included in Annexure A, for example, fluoride and iron.

Lake Lyell has an elevated risk of eutrophication

The SWA identifies algae as a key water quality issue for Lake Lyell and discusses stratification and algal blooms. Algae levels in the system are currently managed with a destratification system in the lake and algae total biovolume monitoring in various locations. It also notes various exceedances in surface water quality data, including general trends of elevated EC entering Lake Lyell via the Coxs River and elevated nutrients via Farmers Creek.

Algae alert data is summarised and discussed in Section 4.4.3, which shows the frequency and duration of green, amber and red alerts over time and discusses seasonal, climatic and spatial trends.

Given the already elevated risk of algal blooms in the receiving waters, their potential impacts on aquatic ecosystems and other environmental values, and that nutrients (ammonium, nitrate, etc.) are key pollutants of concern associated with the proposal, Lake Lyell should be considered sensitive to additional nutrient inputs and it should be demonstrated that these elevated risks can be managed appropriately.

Recommendation:

The EPA recommends the following information is provided for review:

a. The applicant should establish a water quality risk assessment approach consistent with the National Water Quality Guidelines (ANZG, 2018), including but not necessarily limited to:
    i. identification of the environmental values of the receiving waters
    ii. identification of water quality indicators relevant to those environmental values and potential impacts from the project
    iii. identification of, and assessment against, relevant guideline values.
b. reviews and provide existing data and, if required, undertakes further work to adequately characterise rock, soil, groundwater and surface water relevant to the project and associated water pollution risks, including but not necessarily limited to:
    i. identification and characterisation of all pollutants in rock, soil and groundwater that would have the potential to cause non-trivial impacts to receiving waters
    ii. baseline characterisation of rock, soil and groundwater for all other pollutants that would have the potential to be introduced during construction or operations (e.g. nitrate, hydrocarbons), to enable assessment of cumulative risks from natural conditions and the project
    iii. baseline characterisation of surface waters for all water quality indicators (including pollutant concentrations) that have the potential to be impacted by the project. Baseline surface water quality characterisation should include monitoring locations informed by physical features of the receiving waters and project layout, and over a temporal range and frequency appropriate to capture potential impacts and typical variability in environmental conditions.
c. Considers the risk of eutrophication to Lake Lyell as a key site-specific risk factor in assessing water quality risks from the project.

EXCAVATED ROCK MANAGEMENT PLAN

The proposal identifies drill and blast (D&B) activities and the placement of excavated rock within permanent spoil emplacements (PSEs) as a key source of nitrogen to the environment. However, the assessment does not adequately demonstrate that nitrogen generation, mobilisation, and downstream impacts can be effectively managed. Approximately 6.92 million bank cubic metres (BCM) of drill and blast material is proposed to be reused representing a substantial and long-term source of potential nitrate leaching.

Nitrogen contamination may arise from explosives residue (e.g. ANFO), undetonated product, blasting by-products bound to rock, washout water, and leaching from placed material. While mitigation measures are proposed, they are not supported by sufficient data, design detail, or contingency planning to demonstrate that risks to surface water and groundwater (including Lake Lyell) would be acceptable.

<u>Project-specific risks of blasting are unclear</u>

It is unclear whether expected nitrogen generation and resultant concentrations in leachate have been adequately characterised. The SWA indicates that on other similar projects, nitrate in leachate from D&B material typically has concentrations between 5 and 20 mg/L. However, the EPA's experience and available evidence from comparable projects indicate that nitrate concentrations in D&B-affected water can reach ~150 mg/L, particularly where leachate is concentrated within collection systems. These concentrations are substantially above guideline values and would present non-trivial risks to the downstream receiving environment.

Nitrogen concentrations and leaching behaviour are influenced by a range of site-specific factors that have not been adequately considered, including:

- type and formulation of explosives (e.g. ANFO vs emulsion)
- blasting efficiency and proportion of undetonated product
- blast hole loading practices and overbreak
- exposure time of blasted rock prior to placement
- rainfall intensity and frequency
- degree of saturation and water-rock interaction
- particle size and surface area of excavated rock
- placement configuration and compaction within PSEs
- frequency of wetting and drying cycles (particularly for in-reservoir PSEs).

The absence of a project-specific nitrogen mass balance and leachability testing limits confidence in predicted nitrogen loads and the capacity of mitigation measures to manage these risks.

Stockpiling and *ex situ* testing of excavated material does not appear to have been considered

The Excavated Rock Management Strategy (ERMS) generally focuses on the proposed PSEs and provides limited information on intermediate processes such as stockpiling and ex situ testing of excavated material. For example, it is unclear:

- how excavated materials would be handled, stockpiled or treated
- how water pollution risks from excavated material stockpiles would be mitigated
- what ex situ testing would be required, including the frequency, analytical suite or any criteria for treatment or placement suitability
- whether any contingency measures would be required for unexpected laboratory results or impacts.

The Proposal relies on unsupported mitigation measures

The proposal relies on pre-placement washing and post-placement irrigation of D&B material to reduce nitrogen loads in excavated rock. However:

- water volumes required for effective nitrogen removal are not quantified
- the duration of washing/irrigation required to achieve acceptable leachate quality is unknown
- the extent to which nitrogen remains bound within rock following washing is uncertain
- the ability to capture and treat nitrogen-rich wash water is not demonstrated.

It is also noted that this would only be done for some 'Type 1' material (i.e. rock excavated with D&B) and would not be done for 'Type 2' material (i.e. rock excavated without D&B) despite the potential for other pollutants at non-trivial levels such as pH, salinity, metals and fines.

Validation of the method is proposed during construction, with no defined contingency measures in the event nitrogen removal is ineffective, limited or unfeasible. This approach introduces a risk that nitrogen mobilisation may exceed available storage and treatment capacity with no alternative construction methods available.

<u>Permanent spoil emplacement design lacks key standard mitigation measures</u>

Most of the excavated rock would be used to construct the PSEs, including both washed and unwashed D&B rock. However, the design information provided does not demonstrate that PSEs would function as effective containment systems for nitrogen and other pollutants.

Key limitations include:

- <u>Infiltration control:</u> PSE surfaces include a polyvinyl chloride (PVC) geomembrane liner (upstream face of PSE 1), free draining rip rap (downstream face of PSE 1, banks of PSEs 2 and 3), hardstand (PSEs 2, 3 and 6) and soil and haul roads (PSEs 4 and 5). The ERMS also states "No specific requirements to minimise infiltration are proposed given that the water quality risks associated with excavated rock will be managed by the construction approach". Given the potential for high concentrations of nitrate and other pollutants in leachate, it is unclear whether having uncapped PSEs would present an unacceptable risk to groundwater or generate unmanageable quantities of leachate to be captured by the contaminated water system. It is also unclear what type of hardstand would be used for PSEs 2, 3 and 6 and their associated permeability.
- <u>Lining and containment:</u> The proposed PSEs do not include lining to prevent seepage to groundwater. For some PSEs, the ERMS indicates that the underlying bedrock is low permeability and fractures would be grouted where identified, however it is unclear what the resultant permeability would be. Unlined or partially lined systems present a direct pathway for nitrate and other pollutants to migrate to groundwater and surface water.
- <u>Material segregation:</u> For in-reservoir PSEs (PSEs 2 and 3), the use of washed material below FSL and unwashed material above FSL is proposed, however separation layers (e.g. geofabric or low-permeability layers) are not clearly defined or demonstrated to effectively separate waste types or mitigate pollution risks.
- <u>Seepage collection:</u> For land-based PSEs (PSEs 4, 5 and 6) collection systems (e.g. subsurface drains) are described conceptually, but their efficiency and ability to intercept all contaminated flows is not demonstrated. This system is also not proposed for PSE 1. It is also unclear whether drainage layers are proposed between natural and placed rock to allow leachate to reach the subsurface drains.

In-reservoir PSEs would be reconnected hydraulically to Lake Lyell post-construction. Key potential risks include:

- direct leaching of residual nitrogen and other pollutants to the lake
- enhanced leaching due to fluctuating water levels (wetting/drying cycles)
- no contingency measures if nitrogen or other pollutants are released at non-trivial rates or for extended durations.

Land-based PSE risks include runoff mobilisation, infiltration to groundwater, and reliance on unsupported assumptions regarding evapotranspiration and water retention.

Recommendation:

The EPA recommends the following information is provided for review:

a. The applicant should characterise water pollution risks associated with spoil from excavations, including Type 1 (washed and unwashed) and Type 2 rock, soil, and any other type of spoil likely to be generated during excavation. This should be informed by:
   i. *in situ* characterisation of rock and soil predicted to be encountered
   ii. identification of all pollutants likely to be introduced into spoil during its extraction (e.g. nitrogen, hydrocarbons)
   iii. estimation of concentrations of those pollutants, based on proposed extraction techniques and procedures, including likely and worst-case scenarios

   iv. available information from comparable projects on possible pollutant concentrations in residues and leachate
   v. trial testing (e.g. leachability testing from trial blasting or other projects) if uncertainties remain (if feasible).
b. Identifies all practical mitigation measures to minimise the level of pollutants in spoil prior to placement, including:
   i. Minimising pollutants introduced into spoil, for example, blasting strategy and design, explosive type and formulation, and washout water management
   ii. treating spoil to reduce pollutant concentrations, for example, rock washing or liming
   iii. demonstrating the feasibility and effectiveness of any proposed measures including washing and irrigation
   iv. demonstrate that the volume of water to wash and/or irrigate D&B spoil until nitrogen concentrations reduce has been considered and that appropriate treatment/storage/disposal requirements of washdown water have been allowed for
   v. contingency measures if mitigation is ineffective.
c. Propose spoil handling and management procedures to mitigate water pollution risks between extraction and permanent emplacement, including but not necessarily limited to:
   i. Transport and stockpiling procedures
   ii. treatment processes, if proposed
   iii. ex situ testing requirements, including frequency, analytical suite and any criteria for treatment or placement suitability
   iv. contingency measures for excavated material not suitable for placement
   v. placement procedures relevant to water pollution mitigation, for example, compaction or installation of separation layers.
d. Design the permanent spoil emplacements so that associated water pollution risks can be appropriately managed and provides sufficient information to demonstrate this, including but not necessarily limited to:
   i. Capping and infiltration control
   ii. lining systems and seepage barriers
   iii. seepage collection and drainage systems
   iv. clean water diversions
   v. justification of material segregation strategies
   vi. demonstration that the PSEs are designed to minimise contaminant release.
e. Demonstrates that water pollution risks from the permanent spoil emplacements would be appropriately managed. For in-reservoir PSEs (i.e. PSEs 2 and 3) where seepage collection is unlikely to be feasible, pollutant release modelling would likely be required to demonstrate adequate containment.
f. confirms that spoil would not be used for other purposes outside of the permanent spoil emplacements (i.e. PSEs 1 to 6)
g. develops a project-specific nitrogen mass balance to estimate the movement of nitrogen through the project and nitrogen loads to Lake Lyell and assess eutrophication risks
h. develops contingency measures to manage unexpected impacts from the permanent spoil emplacements.

CONTAMINATED WATER MANAGEMENT

The proposed construction phase water management approach is outlined in Section 5 of the SWA and includes a construction water system made up of a contaminated water system, stormwater system and construction water supply system. Potable water supply and wastewater (i.e. sewage) are also included but managed separately.

<u>The ‘minimal harm criteria’ approach is inconsistent with the National Water Quality Guidelines, NSW Government and EPA policy and the POEO Act</u>

Section 5.2 of the SWA proposes ‘minimal harm criteria’ in Table 5.1 by comparing ambient water quality in Farmers Creek and guideline values for protection of aquatic ecosystems (slightly to moderately disturbed, freshwater, upland river) for a limited suite of pollutants, then selecting the less stringent value on a pollutant-by-pollutant basis. It is argued that “any discharge from the construction water system that meets the minimal harm criteria would not result in a material water quality impact as the discharge water quality would be similar to the water quality of Farmers Creek inflows into Lake Lyell”.

The following issues are noted with this approach:

- ‘Aquatic ecosystems’ are the only environmental value considered in Table 5.1. Consistent with the national water quality guidelines, there are various other environmental values that apply to the receiving waters that should be considered.
- Table 5.1 includes a limited suite of pollutants and excludes various pollutants that could pose a risk to receiving waters, including those identified in rock, groundwater, or those that would be introduced during construction.
- The primary receiving waters for the project are Lake Lyell and the appropriate ecosystem type for the physical and chemical stressor guideline values in Lake Lyell is ‘freshwater lakes & reservoirs’, not ‘upland rivers’.
- The Farmers Creek catchment is not representative of ‘reference conditions’ as it receives urban runoff from Lithgow as well as discharges from Lithgow WWTP. Where data is not available on field/laboratory biological-effects or local reference sites, the national water quality guidelines recommend the use of default guideline values to assess potential risk.

All practical and reasonable measures should be implemented to contribute to restoring environmental values that are not currently being achieved. It is not acceptable to allow poor environmental management or water pollution simply because a waterway is currently degraded. Regardless of the current condition of the waterway, Section 45 of the POEO Act requires consideration of the practical measures that could be taken to prevent, control, abate or mitigate pollution.

<u>Contaminated water has not been characterised which limits management strategies</u>

Key water types to be managed by the construction phase water management system include clean water, stormwater (i.e. sediment laden water from disturbed areas as defined in the SWA) and contaminated water. The SWA (Section 5.5.2) identifies the following potential sources of contaminated water:

- “*runoff (during construction) and seepage (during and after construction) from permanent spoil emplacements (PSEs), Water pumped from subsurface excavations during construction, surface water runoff from high intensity construction areas”.*

Wastewater from the concrete batching plant is also identified elsewhere as another potential source. It is unclear whether all potential pollutants from these sources have been adequately considered (e.g. natural and introduced pollutants from spoil, hydrocarbon spills and concrete/grouting impacts from excavations and high intensity construction areas).

Additionally, other sources and activities have the potential to produce contaminated water streams requiring management. Such as from groundwater ingress (into tunnels, caverns and other excavations) which is also likely to contain naturally occurring pollutants at concentrations that would pose a non-trivial risk to Laky Lyell and stormwater and potential spills from the prosed switchyard.

Different sources of contaminated water are likely to have substantially different pollutant profiles which have not been characterised. Rather, the proposed contaminated water system relies on characterising potentially contaminated water once collected via a ‘water categorisation procedure’.

Characterising contaminated water would be key to informing appropriate management strategies, for example:

- Segregation of contaminated water from clean water and stormwater. Where these are not segregated, there is a risk of substantially increasing the volume of water requiring treatment, reducing the water treatment system efficiency and increasing the likelihood of uncontrolled discharges from water management storages.
- Whether the proposed transfers of potentially contaminated water into the stormwater system would be appropriate.
- considering whether different types of contaminated water would be more effectively managed separately or mixed. For example, dedicated collection systems for D&B impacted water (including washout water generated during the priming of bulk emulsion) may reduce the extent of cross-contamination with other contaminated water types.
- storage capacity, which depends on expected quantity of contaminated water, whether different types of contaminated water are segregated, and other factors (e.g. rainwater ingress).
- treatment options.

Additionally, overreliance on water characterisation during construction would inhibit contaminated water management and increase environmental and operational risks associated with having contaminated water stored while laboratory analysis is pending, particularly during wet weather.

The proposed contaminated water system approach is not confirmed

The SWA proposes to adopt one of two distinct options for the contaminated water system:
- Option 1 (source control approach) - applies a combination of targeted management of nitrogen laden water, beneficial reuse, controlled irrigation and water treatment to manage contaminated water.
- Option 2 (centralised approach) - applies fewer source controls and relies on beneficial reuse, controlled irrigation and water treatment to manage contaminated water.

The SWA also states that "the preferred water management system approach for each phase of construction will be established at detailed design in consultation with regulators and will be documented in a Construction Water Management Plan that will be prepared post approval in accordance with relevant consent conditions".

It is noted that different water treatment processes involve substantially different footprints, operating requirements and waste streams, and deferring this decision and conceptual design to post-approval could cause some options (e.g. biological treatment) to become unfeasible.

Given the approach outlined above, the level of detail provided is also conceptual and high-level. This would introduce a substantial amount of uncertainty into how contaminated water would be managed during the project and also limits the EPA's ability to assess the proposal.

Risks from treated water discharges have not been assessed

Contaminated water is proposed to be treated and discharged to Lake Lyell either through a dedicated treatment plant or via the stormwater system.

Given the issues identified with the project's 'minimal harm criteria' and contaminated water characterisation, and various uncertainties around proposed contaminated water management and treatment, it is unclear what impact these discharges would have to Lake Lyell.

Treated discharges of contaminated water and stormwater may require licensing, which would require a water pollution discharge impact assessment (WPDIA) to be completed.

Waste from water treatment has not been considered

Given the uncertainty around water treatment options outlined above, there is consequent uncertainty regarding associated waste requiring disposal.

Water treatment processes (e.g. sediment removal, biological treatment, reverse osmosis) would generate diverse waste streams such as sediment, sludge, filter cakes or brine (depending on the treatment method) and contain concentrated contaminants. Waste streams from water treatment are not discussed in the Waste Management Assessment (WMA; Appendix Y) and the proposal does not adequately address:

- Type, composition and expected quantity of treatment by-products/waste
- Storage, handling, and classification of these materials
- disposal pathways and whether disposal would occur at licensed facilities
- risks associated with potential placing of treatment wastes within PSEs or on-site.

Recommendation:

The EPA recommends the following information is provided for review:

a. identify and characterise the volume and quality of all types of water expected to require management within the contaminated water system, including but not necessarily limited to:
    i. runoff (during construction) and seepage (during and after construction) collected from the permanent spoil emplacements
    ii. water pumped from subsurface excavations during construction, which may have a range of contamination sources including from groundwater, blasting, spills and grouting/concreting
    iii. runoff from high intensity construction areas
    iv. water associated with the proposed rock washing strategy
    v. wastewater from the concrete batching plant
    vi. stormwater and potential spills from the switchyard
    vii. any sewage that would not be disposed offsite (e.g. treated sewage from the main construction site proposed for dust suppression)
    viii. uncontaminated water (e.g. clean water runoff or rainfall into the system).
b. The applicant should propose a contaminated water system based on contaminated water characterisation, the water balance, and project requirements. The contaminated water system should be designed in consideration of:
    i. The quantity and pollutant profile of each type of water in the system, and which of these should be managed separately or combined
    ii. justification of separation and/or combination of different types of water within the contaminated water system
    iii. likely different management strategies for some or all types of water within the system
    iv. capacity, freeboard and lining requirements for contaminated water storages to prevent overflows and seepage to groundwater
    v. contaminated water treatment, including selection of suitable treatment methods for the pollutant profile of the water to be treated, treatment plant lead times, treatment agents, waste management (storage, handling, disposal, etc.), and operating requirements.
c. Develop a site-wide water balance that includes all types of water for the project including the contaminated water system
d. Undertake a water pollution discharge impact assessment (WPDIA) for any proposed discharges from the contaminated water system into Lake Lyell or other receiving waters. The EPA's guidance on WPDIAs can be found at https://www.epa.nsw.gov.au/Your-environment/Water/managing-water-pollution-in-nsw/environment-protection-licensing/Water-pollution-discharge-assessments.

EROSION AND SEDIMENT CONTROL

<u>Erosion and sediment control measures contain limited detail</u>

Section 5.6 and Table 5.9 of the SWA outline commitments regarding the 'stormwater system', which would manage runoff from disturbed areas, and proposes that details would be included in an Erosion and Sediment Control Plan (ESCP) for each disturbance area as part of a Construction Water Management Plan.

The level of detail provided does not demonstrate that erosion and sediment control risks would be effectively managed. For example, it is unclear:

- Whether site-specific risk factors have been considered, including steep terrain, local geochemistry and soil characteristics, and the environmental values and sensitivity of Lake Lyell.
- how much clean water would be diverted around disturbed areas (i.e. what is considered practical in Section 5.4) and how much need to be managed by the stormwater system, noting that Figure 5.3 shows a limited extent of clean water diversions.
- which potential sources of contaminated water would be excluded from the stormwater system. Some sources (e.g. PSE seepage, concrete batching plant) are discussed in various sections, however the assessment would benefit from a summary of which sources would be excluded and how this would be achieved.
- whether the proposed sediment basin sizing (90th percentile, 5-day rainfall event) would have sufficient capacity to mitigate water pollution risks, noting the site-specific risk factors identified above, that an unknown quantity of additional undiverted clean water would report to the basins, and that transfers from the contaminated water system would contribute additional volume and potential pollutants to the stormwater system.
- which specific standard or enhanced erosion and sediment control techniques would be implemented.
- which works in particular would be classified as 'minor works', which mitigation measures are not proposed for these works, and which of these works would be located inside or outside of sediment basin catchment areas.
- how water captured by the stormwater system would be treated prior to discharge.

Recommendations:

The EPA recommends the following information is provided for review:

a. Further details on proposed erosion and sediment control measures for the project, including but not necessarily limited to:
    i. Consideration of site-specific risk factors, including steep terrain, local geochemistry and soil characteristics, and the environmental values and sensitivity of Lake Lyell
    ii. identification of all areas of disturbance for the project, including 'minor works' areas and roads
    iii. proposed standard and enhanced erosion and sediment control techniques to be used for each disturbance area
    iv. staging of works
    v. clarification of which works would be classified as 'minor works' and which mitigation measures are not proposed for these works
    vi. clarification of which works would be located inside or outside of the stormwater system (i.e. sediment basin catchment areas)
b. provide further information on the stormwater system, including but not necessarily limited to:
    i. identification and characterisation of all types of water that would be managed by the stormwater system, for example, clean water not diverted around disturbed catchments, sediment laden water from within disturbed catchments, and transfers from the contaminated water system.

ii. which potential sources of contaminated water would be excluded from the stormwater system and how this would be achieved
iii. assessment of appropriate sizing for the proposed sediment basin(s) to account for site-specific risk factors and sensitivities, and additional clean water inputs and transfers from the contaminated water system
iv. the proposed treatment strategy for water captured by the stormwater system.

c. The applicant should undertake a water pollution discharge impact assessment (WPDIA) for any proposed discharges of treated water from the stormwater system into Lake Lyell or other receiving waters. The EPA's guidance on WPDIAs can be found at https://www.epa.nsw.gov.au/Your-environment/Water/managing-water-pollution-in-nsw/environment-protection-licensing/Water-pollution-discharge-assessments.

IN LAKE CONSTRUCTION

Key construction works within Lake Lyell would include:

- Diverting a section of the Farmers Creek arm of Lake Lyell to avoid the area where the inlet/outlet structure and PSE 2 are proposed. Coffer dams would be used at each end of the diversion during construction.
- construction of two coffer dams to drain the bypassed section of the Farmers Creek arm to allow construction of the inlet/outlet structure and PSE 2
- construction of PSE 3.

Other construction works (potentially in-water) appear to include bridge construction, works to the Lilyvale Dam fusegate(s) and a jetty.

The SWA also states "during the initial construction period, lake levels will be reduced to and maintained at around 772 mAHD to enable construction of the coffer dam and other in lake works. Once these initial works are completed the lake levels will be allowed to rise to the construction phase FSL [782.3 m AHD]".

<u>It is unclear which construction works would be in-water works</u>

Figure 5.8 of the ERMS and accompanying text indicate that PSE 3 would be constructed above the lake level while it is temporarily lowered to around 772 m AHD. However, for other in-lake construction works, it is unclear whether they would be in-water works or if lowering the lake level avoid this. For example:

- Which (if any) coffer dams would be constructed in-water
- how bridges and the jetty would be constructed and if these would require in-water works
- works required in relation to the Lilyvale Dam fusegate(s)
- any other in-water works.

<u>It is unclear whether water pollution risks from the coffer dams would be mitigated</u>

Section 5.9.3 of the SWA indicates that once the coffer dams are installed, any remaining lake water behind the coffer dams would be pumped into the lake once any turbidity from disturbance has cleared.
It is unclear whether turbid water within the coffer dams would clear over time, whether this water would be suitable to transfer into the remainder of Lake Lyell, or whether this approach would appropriately mitigate water pollution risks. Given the potential for water quality impacts from coffer dam transfers (particularly when lower water levels are reached and pollutants like suspended solids could be concentrated), it may be more appropriate to use alternative mitigation measures such as managing the water through the contaminated water or stormwater systems.

Recommendation:

The EPA recommends the following information is provided for review:

a. The applicant should identify and summarise all proposed construction works within Lake Lyell (i.e. when the lake is at typical operating levels) and clarifies which of these would be:
    i. in-water works
    ii. out of water works, for example, due to lake levels being lowered for early construction works.
b. Identify water pollution risks associated with these works and proposes mitigation measures to appropriately manage these risks
c. Assesses potential risks associated with coffer dam transfers (particularly potentially turbid transfers when coffer dam levels are low) and proposes suitable mitigation measures or alternative management strategies to mitigate those risks.

OPERATIONAL WATER POLLUTION RISK

Water pollution risks from tunnel and cavern surfaces have not been discussed

It is unclear how much of the tunnel and cavern surfaces would be lined. Where surfaces are not lined, this would create a potential pathway for hydraulic connection with groundwater and leaching from exposed rock directly into lake water.

The detailed project description (Appendix B1) states "*to protect the structure of the tunnels under pressure and limit groundwater inflows during operation, the waterways will typically be reinforced concrete lined with a combination of steel and concrete at higher pressure areas*". However, the extent of proposed lining remains unclear and residual risks are not discussed.

It is unclear whether all measures to mitigate risks of scour have been considered

Given the proposed changes to Lake Lyell's flow regime and the rate of transfers, there is a potential for transfers to cause lakebed scour and elevated suspended solids. The SWA acknowledges that scour impacts are likely to reduce over time as sediments are redistributed within the lake, however, the risk from initial transfers is unclear and further potential mitigation measures should be considered. For example:

- Proposed lakebed surface around the inlet/outlet following construction is unclear (i.e. which areas would be excavated rock and where sediments would be left in place)
- Whether additional sediment removal (e.g. from within the coffer dams) would mitigate scour risks.

Operational phase sewage management is not proposed

Construction phase sewage from the accommodation camp and construction complex amenities is proposed to be treated and disposed off-site. However, regarding operational phase sewage management, Table 6.4 of the SWA states "an on-site wastewater system will be established to manage wastewater (i.e. sewage) produced from site amenities".

Given potential site-specific risks relating to nutrients at Lake Lyell and the potential for additional nutrient inputs the PSEs, options and potential risks associated with sewage management from site amenities during operation should be considered.

Key factors relevant to potential sewage management during operations would include expected quality and quantity of wastewater and availability of off-site disposal options.

Recommendation:

The EPA recommends the following information is provided for review:

a. The applicant should clarify the extent to which tunnel and cavern surfaces would be lined and for unlined sections, assesses the potential risk of groundwater ingress and rock leaching on tunnel water quality.
b. assesses the risk of scour to Lake Lyell water quality and identifies mitigation measures to mitigate those risks.
c. proposes a sewage management strategy for the operational phase of the project.

MONITORING AND TRIGGER ACTION RESPONSE PLAN

Existing baseline monitoring data is unlikely to be adequate

As discussed in the Site Characterisation section of this response, the analytical suite used in historical water quality monitoring varies by sample location and it is unclear whether the program has included all pollutants that have the potential to be elevated in surface waters or impacted by the project.

The closest existing monitoring locations upstream and downstream of key project features are COX6 and COX8F, respectively. Based on the data provided in Annexure A of the SWA, it is unlikely that there is sufficient existing data to measure potential impacts from the project:

- COX6 contains a limited suite of analytes compared with other locations. Baseline monitoring at this location would likely benefit from nitrate (separately from nitrite), chlorophyll-a, some metals identified at non-trivial levels in the GCR, and hardness (which could be used to derive hardness-adjusted guideline values for some metals).
- COX8F does not have any associated water quality data. Other downstream monitoring locations are substantially further away from the project and many of these also do not have any data provided in Annexure A.

Additionally, given the risks and uncertainties identified above, and the generally conceptual and unconfirmed nature of the proposal, it is unclear where baseline monitoring would be most appropriate and whether existing locations would be suitable for this purpose.

A water quality monitoring program has not been proposed

A water quality monitoring program is not proposed for construction or operational phases of the project. Water quality monitoring is essential for measuring potential impacts, is a key risk mitigation measure, and is required in the Secretary Environmental Assessment Requirements.

A trigger action response plan has not been proposed

A trigger action response plan (TARP) has not been proposed. A TARP details how the project would interpret and respond to water quality monitoring results and is a key measure used to mitigate the impacts of unforeseen water quality impacts.

Recommendation:

The EPA recommends the following information is provided for review:

a. The Applicant should prepare a surface water monitoring program for the project, including but not necessarily limited to:
    i. Baseline, construction and operational phases
    ii. Identification of environmental values, protection level, pollutants of potential concern, water quality indicators and guideline values relevant to the program
    iii. suitable monitoring locations to support baseline characterisation and measure potential impacts from all potential pollution sources during construction and operational phases

iv. suitable monitoring frequency and duration to capture typical variability in environmental conditions
v. development of a trigger action response plan (TARP) or series of TARPs to detail how water quality monitoring results would be interpreted and, if unforeseen impacts are recorded, responded to.

ATTACHMENT B – RECOMMENDED CONDITOINS

The EPA recommends that DPHI consider the following conditions as part of their determination of the application, should the project be approved.

Noise Limits

L1.1

Location	Noise Limits in dB(A)			
	Day	Evening	Night	Night
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	L_{AFmax}
Any residential receiver	40	35	35	52

L1.2 For the purposes of condition L1.1:

a) Day means the period from 7am to 6pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays.
b) Evening means the period from 6pm to 10pm.
c) Night means the period from 10pm to 7am Monday to Saturday and the period from 10pm to 8am Sunday and public holidays.

L1.3 Noise-enhancing meteorological conditions

a) The noise limits set out in condition L1.1 apply under the following meteorological conditions:

Assessment Period	Meteorological Conditions
Day	Stability Categories A, B, C and D with wind speeds up to and including 3m/s at 10m above ground level.
Evening	Stability Categories A, B, C and D with wind speeds up to and including 3m/s at 10m above ground level.
Night	Stability Categories A, B, C and D with wind speeds up to and including 3m/s at 10m above ground level; or Stability category E and F with wind speeds up to and including 2m/s at 10m above ground level.

b) For those meteorological conditions not referred to in condition L1.3(a), the noise limits that apply are the noise limits in condition L1.1 plus 5dB

Construction Noise

Hours of Construction

- All construction work at the premises must be conducted between 7am and 6pm Monday to Friday and between 8am and 1pm Saturdays and at no time on Sundays and public holidays**.**

Exceptions to Construction hours

The following activities may be carried out outside the recommended construction hours:

a) Construction that causes $L_{Aeq(15minute)}$ noise levels that are:
    i. No more than 5dB above Rating Background Level at any residence in accordance with the *Interim Construction Noise Guidelines* (DECC 2009).
    ii. No more than the Noise Management Levels specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009)
b) For the delivery of materials required by the police or other authorities for safety reasons
c) Where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.
d) As approved through the process outlined in "Variation of construction hours" of this approval.

Variation of Construction hours

The hours of construction activities specified under "Exceptions to construction hours" d) of this approval may be varied with the prior written approval of the Secretary. Any request to alter the hours of construction shall be:

a) Considered on a case-by-case or activity-specific basis.
b) Accompanied by details of the nature and justification for activities to be conducted during the varied construction hours.
c) accompanied by written evidence that appropriate consultation with potentially affected sensitive receivers and notification of relevant Council(s) (and other relevant agencies) has been and will be undertaken
d) all feasible and reasonable noise mitigation measures have been put in place
e) accompanied by a noise impact assessment consistent with the requirements of the Interim Construction Noise Guideline (DECCW, 2009).

Construction Ground-borne Noise

<u>Construction ground-borne noise and vibration limits</u>

C1. Reasonable and feasible noise mitigation measures shall be applied to construction activities when the following residential ground-borne noise levels are exceeded;

- Evening (6pm to 10pm – Internal $L_{Aeq(15min)}$ 40dB(A)
- Night-time (10pm to 7am) – Internal $L_{Aeq(15min)}$ 40dB(A)

The mitigation measures shall be included in the Construction Noise and Vibration Management Plan.

C2. Any work generating high noise impact (e.g. rock hammering) must only be undertaken:

(a) between the hours of 8:00am and 6:00pm Monday to Friday;
(b) between the hours of 8:00am and 1:00pm Saturday; and
(c) in continuous blocks of no more than 3 hours, with at least a 1 hour respite between each block of work generating high noise impact, where the location of the work is likely to impact the same receivers;

For the purposes of this condition 'continuous' includes any period during which there is less than a 1 hour respite between ceasing and recommencing any of the work the subject of this condition.

<u>Blasting</u>

Blasting limits

B1. The airblast overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time at any noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

B1.2 The airblast overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) at any noise sensitive locations for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

B1.3 Ground vibration peak particle velocity from the blasting operation at the premises must no exceed 10mm/sec at any time at any noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

B1.4 Ground vibration particle velocity from the blasting operations at the premises must not exceed 5mm/sec at any noise sensitive locations for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

Blast Monitoring

B1.5 To determine compliance with Conditions B1.1 to B1.4:

(a) Airblast overpressure and ground vibration levels must be measured and electronically recorded in accordance with the ANZECC guidelines for all production blasts carried out in or on the premises; and

(b) The written record must include:

i. The time and date of each blast
ii. The station(s) at which the noise was measured
iii. The ground vibration for each blast
iv. The airblast overpressure for each blast
v. Evidence that during the past 12 month period, a calibration check had been carried out on each blast monitor to ensure accuracy of the reported data
vi. The waveform for the ground vibration and overpressure for each blast that exceeds a ground vibration of 5mm/sec (peak particle velocity) or an airblast overpressure of 115dB(L)

(c) Instrumentation used to measure the airblast overpressure and ground vibration levels must meet the requirements of Australian Standard 2187.2 of 2006.

Blast Management Plan

B1.6 A Blasting/Vibration Management Protocol is to be prepared by the Applicant prior to blasting to demonstrate the protocol to comply with conditions set in B1. The Protocol shall include details about:

- Compliance standards
- Measures to ensure compliance with licence limits
- Remedial and reporting action plan
- Monitoring methods and program
- Notification of procedures for neighbours prior to detonation of each blast.

<u>Noise Management and Traffic Management</u>

Noise Management Plan

M.1 The applicant must prepare and implement a Noise Management Plan that covers all premises-based activities and transport operations. The plan must include but need not be limited to:

a) all measures necessary to satisfy the limits in Table **L1.1** at all times.

b) a system that allows for periodic assessment of Best Management Practice (BMP) and Best Available Technology Economically Achievable (BETA) that has the potential to minimise noise levels from the facility.
c) Effective implementation of identified BMP and BETA measures, where considered feasible and reasonable.
d) Measures to monitor noise performance and respond to complaints
e) Measures for community consultation including site contact details
f) Noise monitoring and reporting procedures.

M1.2 The proponent must prepare and implement a detailed Construction Noise and Vibration Management Plan (CNVMP), prior to commencement of construction activities, that includes but is not necessarily limited to;

a) Identification of each work area, site compound and access route (both private and public)
b) Identification of the specific activities that will be carried out and associated noise sources at the premises and access routes
c) Identification of all potentially affected sensitive receivers
d) The construction noise and vibration objectives identified in the Environmental Assessment
e) Assessment of potential noise and vibration from the proposed construction methods (including noise from construction traffic) against the objectives identified in the Environmental Assessment,
f) Where the objectives are predicted to be exceeded an analysis of feasible and reasonable noise mitigation measures that can be implemented to reduce construction noise impacts
g) Description of management methods and procedures and specific noise mitigation treatments that will be implemented to control noise and vibration during construction, including the early erection of any operational noise control barriers
h) Procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity
i) Measures to monitor noise performance and respond to complaints

Traffic Noise Management Strategy

A traffic Noise Management Strategy (TNMS) should be developed by the applicant, prior to commencement of construction and operation activities, to ensure that feasible and reasonable noise management strategies for vehicle movements associated with the facility are identified and applied, that include but are not necessarily limited to the following:

- Driver training to ensure that noisy practices such as the use of compression engine brakes are not unnecessarily used near sensitive receivers.
- Best noise practice in the selection and maintenance of vehicle fleets.
- Movement scheduling where practicable to reduce impacts during sensitive times of the day.
- Communication and management strategies for non licensee/proponent owned and operated vehicles to ensure the provision of the TNMS are implemented.
- A system of audited management practices that identifies non conformances, initiates and monitors corrective and preventative action (including disciplinary action for breaches of noise minimisation procedures) and assesses the implementation and improvement of the TNMS.
- Specific procedures for drivers to minimise impacts at identified sensitive receivers.
- Clauses in conditions of employment, or in contracts, of drivers that require adherence to the noise minimisation procedures and facilitate effective implementation of the disciplinary actions for breaches of the procedures.