
New Intercity Fleet Maintenance Facility – Kangy Angy NSW

Operational Groundwater Management Plan

Transport for NSW

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Document History

Document Version	Release Date	Author	Comment
3	June 2021	B. Pitt & P. Hendy	Plan revised to contain results from construction monitoring period and outline operational requirements as recommended by specialist.

Glossary and Abbreviations

Term	Meaning
Cl	Chlorine
DAWE	Federal Department of Agriculture, Water and the Environment
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GDE	Groundwater dependent ecosystem
GWDMP	Groundwater and dewatering management plan
LNAPL	Light non-aqueous phase liquid
Mariyung	New fleet of intercity trains
OEMP	Operational Environmental Management Plan
pH	A measure of how acidic/basic water is
PO4	Phosphate
RailConnect	Consortia manufacturing and maintaining the Mariyung fleet
REF	Review of Environmental Factors
TfNSW	Transport for NSW

1. Introduction

Transport for NSW (TfNSW) is the NSW Government's lead public transport agency that ensures planning and policy is fully integrated across all modes of transport in NSW. It manages a multi-billion dollar budget allocation for rail, bus, ferry and taxi services and related infrastructure in NSW.

TfNSW is delivering the Mariyung fleet to replace trains carrying customers from Sydney to the NSW Central Coast, Newcastle, Blue Mountains, South Coast and the Illawarra.

A purpose-built maintenance facility has been constructed to service and maintain the Mariyung fleet at Kangy Angy on the NSW Central Coast.

2. Conditions of Approval

A Review of Environmental Factors (REF) assessing the construction and operation of the maintenance facility at Kangy Angy was determined in 2017. The approved project includes infrastructure such as a fleet maintenance building, approximately 6 kilometres of electrified railway, auxiliary workshops, material storage, wheel lathe, automatic train wash and site access roads. The maintenance facility is operated by UGL.

To support the project determination, approval was sought and received under Section 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The New Intercity Fleet Maintenance Facility, Kangy Angy, NSW (EPBC 2016/7681) approval requires a Groundwater Management Plan to be prepared and implemented for the Project (EPBC Condition No. 2) as described in Section 7.10.4 of the Review of Environmental Factors (REF), which requires the following:

- Preparation of a construction groundwater management plan
- Hazardous material procedures including procedures for managing spills and refuelling.

A construction Groundwater and Dewatering Management Plan (GWDMP) was prepared in accordance with the requirements outlined in Section 7.10.4 of the REF and approved by the Department of Agriculture, Water and the Environment (DAWE) in 2018. The GWDMP was implemented throughout construction. The construction of the maintenance facility concluded in late 2020, with a transition to full operation to occur in 2021.

3. Document Purpose and Scope

This groundwater management plan is limited to operation of the maintenance facility, and aims to:

- Describe the results of the construction groundwater monitoring program
- Describe the management of potential groundwater impacts during operation of the maintenance facility; and
- Comply with statutory and legislative requirements during operation.

4. Construction Groundwater Monitoring Program Summary

Groundwater specialists Cardno (NSW/ACT) Pty Ltd (Cardno) were commissioned to undertake groundwater monitoring for maintenance facility construction works. Baseline monitoring commenced in 2018 and monitoring continued throughout construction, including one year post completion of groundwater dewatering activities.

The following summarises Cardno's findings from the groundwater monitoring program conducted during construction (Refer to Appendix 1 for the Cardno Annual Monitoring Report 2020 for further details):

- Light non-aqueous phase liquid (LNAPL) was not observed in any monitoring wells on site for the entire project timeline.
- Groundwater levels within the gauged wells did not fall below the adopted Low-Level Values for the entire project timeline.
- Over the course of the monitoring timeline, there were a small number of exceedances (namely pH, PO₄ and Cl), however they were assessed and determined to not be attributed to the project.

Cardno reported the following in relation to ecological monitoring of groundwater dependent ecosystems (GDE):

- Generally, during construction the GDE vegetation was in good condition with no indication that the dewatering activity had a measurable impact. Observed changes in native flora species composition within the quadrats were likely due to the seasonal variation in detectability rather than actual change in species diversity;
- Weeds were present in various amounts, however these were managed accordingly during construction to ensure compliance to the *Biosecurity Act 2015*. However, Cardno recommends continued management of weed populations across the site where appropriate. In particular, the targeted weed management of Blackberry and Lantana should be conducted on at least a 12 month interval;
- On some occasions, there were temporary minor impacts to vegetation caused by discharging water, Erosion and Sediment controls and extreme weather events (i.e. frost, floods, high temperatures), however these were temporary in nature and vegetation was observed to regenerate; and
- Vegetation condition/GDE assessments did not identify any measurable impact caused by groundwater extraction in any of the monitoring periods following the completion of groundwater extraction activities in June 2019.

Cardno concluded the following after completion of the construction groundwater monitoring program:

- Based on the gauging conducted during the construction phase, it is unlikely that the project groundwater extraction activities impacted the groundwater levels at the Maintenance Facility. Cardno recommends that the monthly groundwater gauging is not required during the operational phase as there will be no groundwater extraction activities.
- Based on the monitoring conducted during construction, it's unlikely that activities conducted during the construction phase of the project had any significant impact on groundwater quality. It's understood that during the operational phase of the project, there will be no activities conducted likely to impact the groundwater, therefore recommending that quarterly groundwater monitoring is not required after construction is complete.
- Based on the GDE monitoring conducted, GDE monitoring under the GWDMP is not required going forward as there were no indications that dewatering activities had any impact on GDE vegetation. Any additional monitoring conducted throughout the operational phase should be in accordance with the Operational Environmental Management Plan.

5. Operational Risks

No groundwater dewatering is required during operation of the maintenance facility. Small quantities of chemicals and hydrocarbons will be stored at the maintenance facility during operation, including but not limited to the following:

- Fuels
- Oils
- Lubricants
- Degreasers and solvents
- Sealants
- Cleaning products
- Hydrogen Peroxide
- Acetone
- Acids

As shown in Figure 1, all chemicals and fuels used at the facility are stored in designated chemical storage (bunded) units in accordance with Australian Standards and NSW Environment Protection Authority Guidelines.

Figure 1 – designated chemical storage room containing bunded chemical and fuel storage containers within maintenance building



The trains that operate within the maintenance facility are an electric fleet, and do not require refuelling.

The operational risks to groundwater are associated with contamination from potential chemical, fuel or effluent spills. However, this risk is considered low for the following reasons:

- Maintenance activities undertaken at the facility are almost entirely on sealed surfaces e.g. concrete or asphalt
- Small quantities of chemicals and hydrocarbons will be stored within bunded storage areas
- Mariyung trains are an electric fleet
- Implementation of operational mitigation measures, including appropriate chemical storage, maintenance procedures and spill response guidelines reduces the risk of groundwater contamination.

6. Operational Mitigation Measures

Risks to groundwater will be mitigated primarily through implementation of the Operational Environmental Management Plan (OEMP), which includes the Spill Response and Remediation Procedure (Appendix 3). The OEMP mitigation measures relating to groundwater

are detailed in Table 1. Implementation of these measures will reduce the risk of spill and results in low risk to groundwater during operation of the maintenance facility (refer to Appendix 2).

Table 1: Operational mitigation measures that minimise potential groundwater impacts (OEMP).

Reference	Mitigation Measure
7.1.10	If trade waste is discharged into the sewer, ensure that each connection on each site has a current trade waste permit or agreement under approval of the supply authority or from the local council that operates the sewer
7.1.12	Do not risk harming the environment by wilfully or negligently causing any substance to leak, spill or otherwise escape (whether from a container)
7.1.17	Refuelling of plant and equipment to be completed in designated areas with sufficient bunding
7.8.6	All workers will be trained regarding appropriate work practices and emergency response procedures as part of their site induction.
7.8.8	Ensure that dangerous goods are transported by road or rail in a safe manner and are not likely to endanger persons, property or the environment.
7.8.9	Do not locate tanks containing incompatible substances in the same spill containment facility.
7.8.10	Spill kits will be provided throughout the property to eliminate the risk from any spill or leak of solid or liquid dangerous goods, and be contain within the premises
7.8.11	In the event of a spill or leak of dangerous goods, take immediate action to reduce any risk associated with the spill or leak, and clean up, dispose of and otherwise make safe the dangerous goods and any resulting effluent as soon as reasonably possible
7.8.12	Safety data sheets (SDS) must be provided and complied with for all chemicals on site.
7.8.13	Ensure that containers holding hazardous substances are appropriately labelled to identify the hazardous substances and provide basic health and safety information (including facilitating environmentally appropriate disposal of waste or left-over product).
7.8.15	All fuels, chemicals and hazardous liquids would be stored within an impervious bunded area in accordance with Australian standards and EPA Guidelines.
7.8.16	Should any signs of contamination be identified during work within the site, the material would be tested against the National Environment Protection Council's National Environment Protection (Assessment of Site Contamination) Measure 1999, and managed accordingly.

7.8.18	All staff to be made aware of incident emergency procedures and the location of emergency spill kits.
7.8.19	Operational hazards to be managed through TfNSW's standard procedures for hazard and risk that are currently in place across the entire rail network.
7.8.20	Maintenance activities and procurement of materials would comply with the requirements and guidance of the UNIFE <i>'Manual Railway Industry Substance List'</i> .

7. Monitoring and Reporting

No groundwater monitoring is proposed during operation of the maintenance facility as recommended by Cardno (refer to Section 4).

Weed management activities will be undertaken on site in accordance with the OEMP and weed management strategy.

8. Review and Update

This Operational Groundwater Management Plan will be reviewed and updated as required.

