ENVIRONMENTAL MANAGEMENT STRATEGY

Stage 3 Tomago Industrial Estate

Prepared for
NORTHBANK ENTERPRISE HUB
June 2025

URBIS

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Urbis acknowledges the important contribution that Aboriginal and Torres Strait Islander people make in creating a strong and vibrant Australian society.

We acknowledge, in each of our offices, the Traditional Owners on whose land we stand.

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ABBREVIATIONS

ACHA	Aboriginal Cultural Heritage Assessment
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soils Management Plan
CEMP	Construction Environmental Management Plan
DP	Deposited Plan
DPHI	Department of Planning, Housing and Infrastructure (NSW)
EA	Environmental Assessment
EHS	Environment, Health & Safety
EMS	Environmental Management Strategy
EPA	Environment Protection Authority (NSW)
EPA 1979	Environmental Planning and Assessment Act 1979
EPBC	Environment Protection and Biodiversity Conservation Act
GMP	Groundwater Monitoring Program
LED	Light-emitting Diode
LGA	Local Government Area
NATA	National Association of Testing Authorities
NEH	Northbank Enterprise Hub
NPWS	National Parks and Wildlife Service (NSW)
NSW	New South Wales
PASS	Potential Acid Sulfate Soils
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
SEPP	State Environmental Planning Policy
SWMP	Stormwater Management Plan
TIA	Transport Impact Assessment
WMP	Waste Management Plan

1. PROJECT DESCRIPTION

1.1. PROJECT OVERVIEW

The following Environmental Management Strategy (**EMS**) has been prepared for the Stage 3 development by Urbis Ltd on behalf of Northbank Enterprise Hub Pty Limited (**NEH**), formerly known as Redlake Enterprises Pty Ltd. NEH was issued the approval of MP07_0086 (**Project Approval**) on 7 August 2009.

MP07_0086 established a framework for the staged development of a business and industrial estate (**the estate**) at Tomago Road, Tomago. The scope of this approval is summarised as follows:

- Stage 1 (now complete): Contains the completed 'WesTrac Facility', which became operational in July 2012. Stage 1 contains the State headquarters for WesTrac, which is an industrial machinery supplier. This EMS does not relate to Stage 1.
- Stage 2: Contained within a residual allotment known as Lot 211 and is not owned by NEH. It is understood that Lot 211 has been acquired by an unaffiliated owning entity. This EMS does not apply to Stage 2.
- Stage 3: Contained within a separate residual allotment known as Lot 210. This EMS relates exclusively to development occurring within Stage 3 in accordance with the revised subdivision plan that was submitted to satisfy Condition 1 in Schedule 3 of the Consolidated Consent for MP07_0086.

1.2. PROJECT APPROVAL

1.2.1. Condition 42 of Schedule 4

This EMS has been prepared to satisfy Condition 42 of Schedule 4 to the Consolidated Consent for MP07_0086 as it relates to Stage 3. Condition 42 of Schedule 4 reads as follows:

Condition	**Section of EMS**
1. The Applicant must prepare and implement an Environmental Management Strategy for the development to the satisfaction of the Planning Secretary. This strategy must be submitted to the Planning Secretary prior to carrying out any development on site, and: *(a) provide the strategic context for environmental management of the development;*	**2.2**
(b) identify the statutory requirements that apply to the development;	**2.1**
(c) describe in general how the environmental performance of the development would be monitored and manage;	**5**
(d) describe the procedures that would be implemented to: • *keep the local community and relevant agencies informed about the operation and environmental performance of the development;* • *receive, handle, respond to, and record complaints;* • *resolve any disputes that may arise during the course of the development;* • *respond to any non-compliance;* • *manage cumulative impacts; and* • *respond to emergencies; and*	**3.3** & **4**
(e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the development; and	**3**
(f) includes an Environmental Monitoring Program which consolidates the various monitoring requirements in schedule 3 and of this approval into a single document.	**4.2** & **5**

1.3. SCOPE OF ENVIRONMENTAL MANAGEMENT STRATEGY

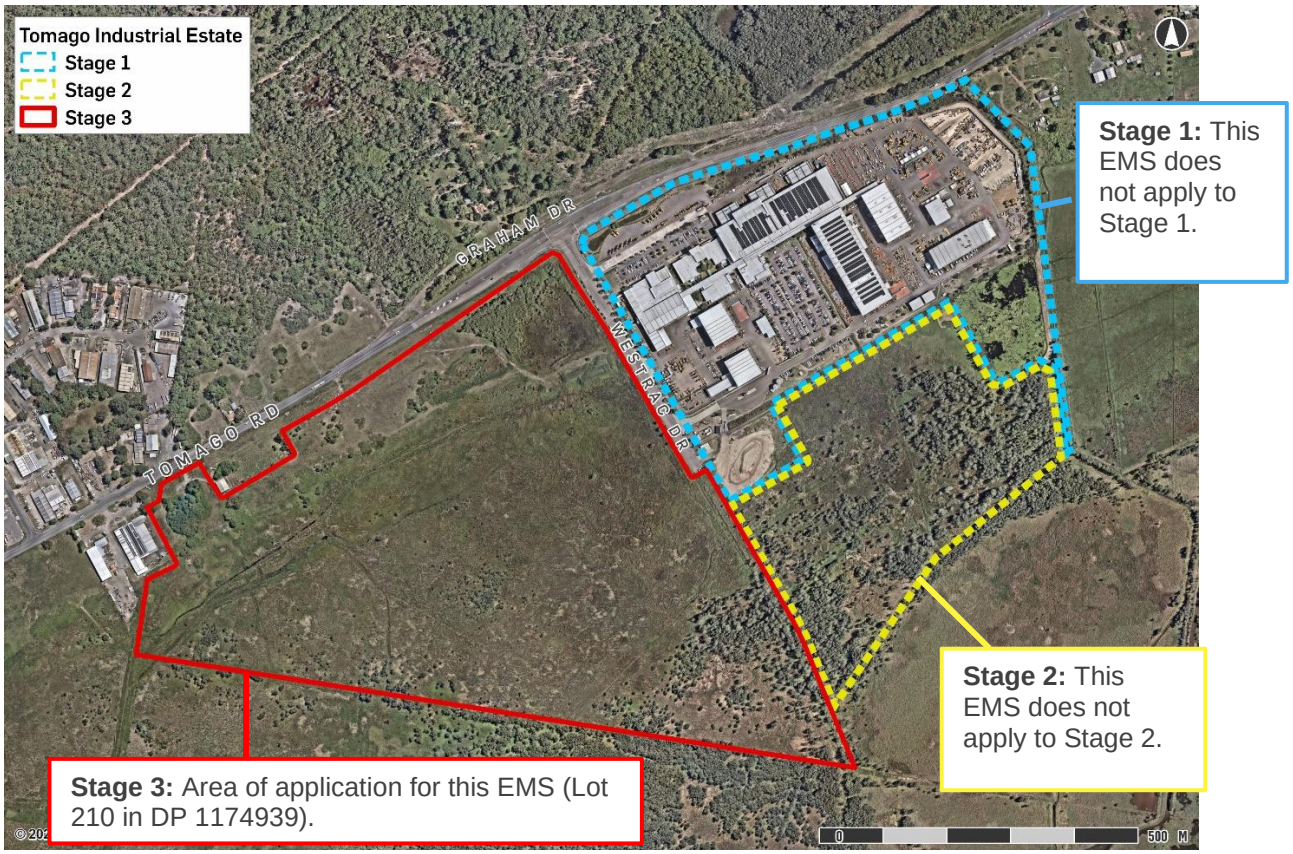
1.3.1. Subject site

The project is located along Tomago Road between Williamtown and Hexham, north of Newcastle, within the Port Stephens local government area (**LGA**). The completed WesTrac facility, also known as Stage 1, became operational in July 2012 and is adjacent to the Stage 3 development. The total area of Lot 210 is 50 hectares.

1.3.2. Application of EMS

This EMS only applies to development within Lot 210 in DP 1174939, which is the site of Stage 3 of the Project Approval of MP07_0086. The area of application for this EMS is shown at Figure 1.

Figure 1 Area of application (Lot 210 in DP 1174939 or Stage 3)



Source: Urbis

1.3.3. Purpose of EMS

The purpose of the EMS is to provide strategy for successful delivery of Stage 3 of Project Approval MP07_0086 civil works including approved bulk earthworks, roads, drainage and services infrastructure for industrial development.

Through the implementation of the EMS, a strategic environmental management framework (Figure 2) is established that guides environmental assessment, management and monitoring outcomes together with a strategy for managing community information and responses on environmental performance during construction of Stage 3. NEH will ensure all reasonable and feasible measures are implemented to prevent and/or minimise any material harm to the environment that may result from the works of the development.

Figure 2 Strategic Environmental Management Framework for Stage 3

In summary, the objectives of this EMS are to:

- Ensure all related commitments made for this development are met;
- Ensure all requirements of project approval are met;
- Describe management and monitoring strategies for the environmental performance of the development;
- Manage the environmental hazards and risks associated with the development;
- Minimise the potential for environmental harm;
- Provide a mechanism for communicating, implementing, and monitoring performance indicators of site environmental policy; and
- To provide a process for review and continual improvement of project environmental management.

Specific targets and objectives relating to key environmental indicators will be addressed in Section 5.2 of the environmental management sub-plans.

The structure of this EMS would be as follows:

- Statutory Requirements;
- Strategic Context;
- Management Structure and Responsibility;
- Environmental Management. Monitoring, Consultation and Notification; and
- Environmental Risk Management.

This EMS and accompanying management plans and controls address the conditions of MP07_0086. Table 1 Identifies the conditions of the Approval.

Table 1 Responses to Approval conditions as per Schedule 3

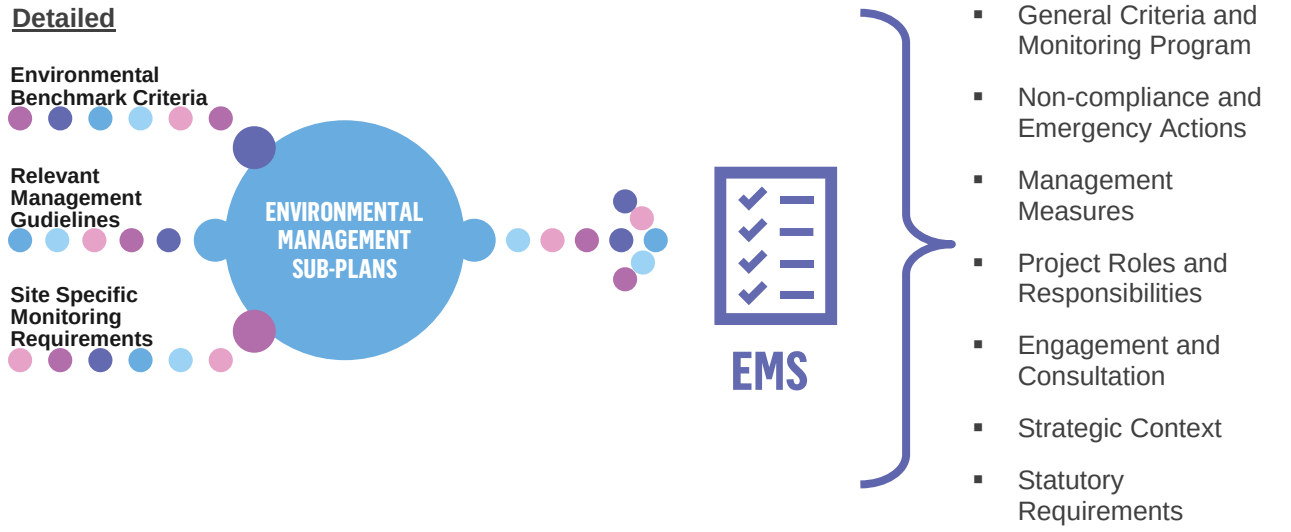
Task	Condition ID	Section of EMS
Design Guidelines	2	5.2.3.1
Site Water Balance	9	5.2.1
Erosion and Sediment Control	10	5.2.2
Stormwater	12, 12A	5.2.3
Groundwater	13	5.2.4
Acid Sulfate Soils	11	5.2.5
Traffic and Transport	24	5.2.6
Noise and Vibration	25, 30	5.2.7
Aboriginal and Cultural Heritage	31	5.2.8
Air Quality	32, 33	5.2.9
Landscape	36	5.2.10
Energy Efficiency	40	5.2.11

Task	Condition ID	Section of EMS
Waste Management	41	5.2.12

The purpose of the EMS is to describe general performance and general monitoring and management, in accordance with condition 42 (c) of the consolidated approval. Consistent with the approval, the EMS provides a framework that describes procedures that would be implemented to manage engagement, non-compliance, and cumulative impacts, in accordance with the respective technical assessments.

This EMS does not go into structural detail about benchmark criteria for assessing compliance, as that is not considered the purpose established in Condition 42. Rather, the EMS identifies general objectives, management measures, responsibilities, and general courses of action to follow, while all other technical details and benchmark criteria are clearly defined in each Environmental Management Plan (**Figure 3**). This avoids information duplication and assists in the expedition of the holistic Environmental Risk Management of the works proposed for Stage 3.

Figure 3 Environmental Management Strategy: purpose, structure, and content



2. LEGISLATIVE REQUIREMENTS

2.1. STATUTORY REQUIREMENTS

Table 2 summarises the statutory requirements underlying for the provisions contained within this EMS.

Table 2 Statutory requirements relevant to Stage 3.

Legislation	Details
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act - Cwlth)	EPBC Approval for works to progress in accordance with water quality requirements to avoid impacts on Ramsar Wetlands and other Matters of National Environmental Significance (MNES). Southern-most part of the Project Approval area was dedicated with Stage 1, 22ha for the required Conservation Area. Stage 3, which is contained to Lot 210 in DP 1174939 is to progress in accordance with the approved Conditions of Consent. Condition 2 of EPBC Approval 2007-3343 requires Groundwater and Stormwater Management Plan approval by the Minister for each Stage. The Minister approved Stage 3 plans 12 July 2024.
Environmental Planning and Assessment Act 1979 (EP&A Act)	The EP&A Act is the main planning legislation in NSW. Under Part 3A of the EP&A Act, approval of MP07_0086 was received. In accordance with the EP&A Act, approvals for Condition 2 (Design Guidelines), 12 (Stormwater Management Plan), 30 (Traffic Acoustic Management Plan) and 36 (Landscape Management Plan) were received on 14 March 2025.
National Parks and Wildlife Act 1974 (NPW Act)	The NPW Act details procedures on works regarding Aboriginal Heritage findings and stop of works if needed. Stage 3 is to progress in accordance with the Aboriginal Cultural Heritage Management Plan and Chance Finds procedures recovered during any site work.
Biodiversity Conservation Act 2016 (BC Act) Note. This approval was assessed under the *Threatened Species Conversation Act 1995*	The BC Act sets conservation requirements for the native biodiversity communities and protection levels accordingly. Although not a condition of approval, consideration of native flora and fauna as per the Statement of Commitments is provided.
Roads Act 1993 (Roads Act)	The Roads Act provides a framework detailing provisions for road widening, levels and other required works needed for traffic controls. A transport verification study has been carried out as a Condition of Consent for Stage 3.

Legislation	Details
State Environmental Planning Policy (Precincts – Regional) 2021	Stage 3 is sited within the Tomago Industrial Site, which is identified as a State Significant Precinct. It provides built form and land use controls that apply to development across Stage 3. Development is permitted with consent in the IN1 General Industrial Zone. Objective (d) for the IN1 General Industrial Zone has reinforced the intent for development within the IN1 General Industrial Zone to *"minimise any adverse effect of industry on other land uses and the environment"*. This objective underpins the purpose of this EMS.
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO Act establishes a regulatory framework for environmental protection and works. The EMS is prepared in accordance with the POEO Act for environmental controls, monitoring, compliance and consultation process.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act)	The WARR Act ensures that the consumption and disposal of waste follows ecologically sustainable development principles and outlines waste strategies. The Waste Management Plan outlined in this EMS is prepared in accordance with the WARR Act.
Energy Efficiency Scheme 2023 (under the NSW Electricity Supply Act 1995)	Provides a set of measures to ensure an energy efficiency workflow is in place within Stage 3.
Water Management Act 2000 (WM Act)	The WM Act establishes the sustainable and integrated management of water resources in NSW. The WM Act underpins the purpose of the Groundwater and Stormwater Strategies for Stage 3.

2.2. STRATEGIC CONTEXT

The strategic planning framework for Stage 3 of the Tomago Industrial Estate is underpinned by the *Port Stephens Local Strategic Planning Statement*, the *Hunter Regional Plan 2041*, and the *Greater Newcastle Metropolitan Plan 2036*. Key objectives and strategic directions from these documents that are relevant to the scope of this EMS are summarised below in list form.

- **Port Stephens Local Strategic Planning Statement (PSLSPS):**

  that is consistent with the PSLSPS, including the following priorities:

  Priority 1: *"Support the growth of strategic centres and major employment areas"*

  The PSLSPS has identified Tomago as a 'Catalyst Area' that is expected to be a focal point for employment and public and private infrastructure investment over the next 20 years. This EMS will facilitate the orderly and economic use of land consistent with the PSLSPS, including measures regarding traffic of goods and people and associated noise levels.

  Priority 7: *"Conserve biodiversity values and corridors"*

  The importance of minimising adverse impacts on the natural environment is a recurring strategic theme in the PSLSPS, including Priority 7 of the document. This EMS will facilitate the orderly

development of the site with appropriate management measures consistent with conserving biodiversity values.

- **Hunter Regional Plan 2041 (HRP):**

  The HRP identifies the Tomago Industrial Site within a 'Significant Employment Land Cluster'. The HRP also identifies the opportunity for the Tomago Industrial Site to support the growth of emerging industries. The plan also places great emphasis on the protection of sensitive environmental values. The following objectives from the HRP are noted in this regard:

  Objective 6: ***"Conserve heritage, landscapes, environmentally sensitive areas, waterways and drinking water catchments"***

  This EMS will support development outcomes that support the maintenance of environmental values that are associated with the local context for Stage 3.

  Objective 7: ***"Reach net zero and increase resilience and sustainable infrastructure"***

  This EMS forms part of a broader management framework for Stage 3 that promotes sustainable design outcomes on individual allotments.

- **Greater Newcastle Metropolitan Plan 2036 (GNMP):**

  The GNMP reinforces the following desired outcomes for the Tomago Industrial Site:

  "Promote the staged delivery of industrial lands and supporting infrastructure"

  This is relevant to the staged development of the Tomago Industrial Estate, inclusive of Stage 3.

  "Protect surrounding Ramsar-listed wetlands and regional biodiversity corridors"

  This is relevant to the relative proximity of Stage 3 to the Tomago Wetlands.

  This EMS will support the achievement of development outcomes that are consistent with the GNMP as it relates to the Tomago Industrial Site.

  Furthermore, the Tomago Industrial Site is a Major Employment Zone and the GNMP identifies that a minimum 700 additional jobs are expected in the precinct by 2036. Therefore, this development clearly aligns with this strategy and vision for regional growth, enhancing long-term diversification of the local economy and providing employment opportunities for the community. This economic and population growth can add environmental pressure on the regional area if unmanaged; this EMS will help implement measures that avoid wider impacts into the local environment.

3. PROJECT ROLES AND CONTACTS

3.1. MANAGEMENT STRUCTURE AND RESPONSIBILITY

Figure 4 outlines the structure of responsibility of key positions in relation to environmental management. The responsibilities of each position are outlined below.

Figure 4 Structure of Environmental Responsibility

3.1.1. Project Director

The Project Director has overall responsibility and accountability for environmental performance on the project. The Projector Director is responsible for ensuring consistency with the relevant legislative standards of Australia, including the applicable Australian Standards, along with contractual obligations. The Project Director also has further responsibility to procure provision of appropriate resources to ensure the effective implementation of this EMS.

3.1.2. Site Manager

Reporting to the Project Director, the Site Manager is accountable for the construction project team and contractors in respect to environmental performance on site through:

- Maintain a working knowledge of the management system and environmental management plans and monitor compliance for the requirements of this EMS.
- Coordinate incident response, including ensuring incident investigation is undertaken and corrective actions carried out.
- Ensure relevant training and qualifications are completed by personnel and maintain induction records.
- Ensure that communication and reporting systems are established and maintained for implementation of this EMS.

- Ensure that complaints are received, registered, and responded to in a proper manner as per the Community Notification Strategy.
- Participate in environmental auditing and implement recommendations and corrective actions.

3.1.3. EHS Advisor

The Project EHS (**Environmental Health and Safety**) Advisor reports to the Site Manager. The EHS Advisor performs a key role in the implementation, maintenance, and monitoring of compliance to this EMS, of categorical importance for the health and safety of the employees on site during the project lifecycle. Their main responsibilities are:

- Maintain a working knowledge of the environmental management system, environmental management plans, and be aware of all environmental legislative requirements.
- Maintain working knowledge of environmental risks and impacts of the development and measures required to be put in place.
- Undertake a HSE Risk Assessment for the development.
- Carry out site inspections and maintain monitoring of environmental performance.
- Liaise with DPHI via site manager or director as necessary and provide subsequent incident reporting depending on the severity of the incident.
- Develop a Corrective Action Register.
- Maintain records of compliance with the development consent and management plans.
- Maintain Complaints Register and respond to complaints or nominate a delegate to respond.
- Monitor the Complaints Register weekly to identify any trends in complaints.
- Investigate incidents and identify preventative actions.
- Prepare incident report and implement corrective actions.
- Review contractors' environmental management plans as required.
- Review contractors' incident report.
- Participate in Independent Environmental Audits and implement recommendations.

3.1.4. Environmental Management Representative

The Environmental Management Representative (**EMR**) provides independent auditing and advice to ensure environmental compliance of the Project with legislative requirements. The EMR will have responsibility for:

- Considering and advising on matters specified within the Project Approval and Statement of Commitments and compliance with these matters.
- Certifying all site activities not specified in the project approval and not constituting construction as likely to be of minor environmental and/or community impacts or ensure that such activities receive appropriate approval prior to commencement.
- Periodically monitoring project environmental activities to evaluate the implementation, effectiveness and level of compliance of on-site construction activities with the EMS and associated plans and procedures, including carrying out site inspections at least fortnightly.
- Recording and providing a written report to the Site Manager on non-conformances with the EMS and the requirements of NEH for undertaking environmental mitigation measures including identification of required changes to the EMS.

- Directing project managers, contractors and subcontractors to stop work immediately if, in the view of the EMR, an unacceptable environmental impact is occurring, is likely to occur or require other reasonable steps to be taken to avoid or minimise any adverse impacts.
- Reviewing corrective and preventative actions to ensure the adequate implementation of recommendations from audits and site inspections.
- Reviewing the EMS.
- Certifying that minor revisions to the EMS are consistent with the approved version of the EMS.
- Providing regular (or as required by the Project Director) reports to the Project Director on matters relevant to carrying out the EMR role, including the notification of any stop work recommendations.
- The EMR will immediately advise NEH and the Project Director of any incidents relevant to the Project Approval and Statement of Commitments resulting from construction that are not dealt with expediently or adequately.

3.1.5. Construction Managers/ Superintendent

The project Construction Managers (or Superintendent) reporting to the Site Manager have direct day to day responsibility for managing the activities of contractors under their control and for monitoring and ensuring compliance by contractors with the relevant environmental guidelines established for the Project. These responsibilities include:

- Ensuring contractors submit EMSs appropriately covering the regulations and environmental aspects, impacts and control strategies associated with their particular scope of work.
- Ensuring contractors develop and implement environmental surveillance and audit programs under this monitor compliance with this EMS and relevant legislation.
- Ensuring that all Contractor personnel under their control are aware of their responsibilities for employee induction and awareness training including their environmental responsibilities, environmental concerns and the control measures applying to their scope of work.
- Conducting routine monitoring of environmental performance and compliance with the Project and contractors EMSs and, when requested, assist the Project EHS Advisor to conduct scheduled environmental audits.
- Ensuring any required corrective or preventative actions are implemented and completed as required.
- Ensure that the weekly and monthly EMS reports and checklists from each Contractor are completed to schedule and reviewed for accuracy prior to signing off and forwarding to the Project EHS Advisor.
- Ensure that all environmental incidents, issues, or concerns are reported immediately to the Project EHS Advisor and that appropriate and timely action is taken.
- Ensure that all documentation required by this EMS is complete and timely.
- Ensure that all environmental complaints are handled in a prompt and courteous manner and in accordance with the procedures of this EMS.

3.1.6. Project Contractors/Project Managers

All site contractors and their subcontractors are to fulfil their environmental responsibilities for the Project in particular:

- The submission of an EMS for their work which complies with federal, state, and local authority regulations, and the contents of this Project EMS.
- Nomination of an environmental representative for their work area prior to commencing on site and maintain regular direct communication with the EMR.
- The preparing and implementing of specific environmental control plans as deemed necessary by the Site Manager or his nominee to correct identified deficiencies or to enhance overall environmental performance and compliance of the Project.

- Taking all necessary precautions and actions for activities conducted on the Project with the potential to cause environmental harm.
- Complying with this Project EMS and relevant regulations including the development and implementation of an environmental monitoring program.
- Providing environmental awareness training including induction training for all new employees detailing each person's individual environmental responsibilities, key aspects of the Project EMS and matters specific to their individual work scope on the Project.
- The immediate verbal reporting to the responsible Site Manager – or in their absence, the Project EHS Advisor, of all environmental incidents, non-conformances, or concerns.
- The timely implementation of corrective actions or remediation strategies to control or ameliorate the extent of environmental harm.
- The submission of environmental incident reports and weekly /monthly inspection and compliance reports to the Site Manager – or in their absence, the Project EHS Advisor, in a timely manner to assist in the compilation of the weekly /monthly EHS reports.
- Ensure that all environmental complaints are handled in a prompt and courteous manner and in compliance with the guidelines contained in this EMS.

3.2. ENVIRONMENTAL AWARENESS TRAINING

Project Managers and Project Contractors shall be responsible for ensuring that all Project personnel under their control receive both initial and ongoing environmental awareness training to ensure they are familiar with their environmental responsibilities under the Project EMS.

Project induction will provide all new site employees with an overview of the Project environmental management system and key aspects of the Project EMS prior to allowing access to the worksite. In addition, each individual contractor shall be required to provide all new employees with environmental induction training which addresses their own EMS and which at a minimum detail:

- Individual responsibilities under the plan.
- Risk management strategies for assessing potential environmental impacts and for developing appropriate management or control strategies for any activity perceived to pose an environmental risk.
- Key environmental concerns and associated control strategies.
- How hazardous or dangerous goods will be handled.
- Waste minimisation, recycling, and disposal guidelines.
- Incident and emergency response actions including reporting and recording guidelines.
- Complaint handling procedures.
- Cultural awareness training.

The Cultural Heritage Induction Training program will be provided to the Environmental Management Representative for adequacy review prior to inductions taking place.

Project managers, contractors, the EHS Advisor and environmental representative shall conduct ongoing environmental awareness training for key issues throughout the Project using targeted presentations at daily job pre-starts, toolbox meetings etc, and the use of targeted literature.

Project managers and contractors shall maintain a register of all environmental training provided which records the nature of the training, dates, the names of persons trained, and trainer details as well as any refresher training that may be required.

3.3. EMERGENCY CONTACTS AND RESPONSE

Table 3 identifies the key personnel contact details for emergency responses in relation to environmental management on Stage 3.

Table 3 Environmental Responsibility Contacts

Role	Contact	Address	Telephone
Project Director			
Site Manager			
EHS Advisor			
Construction Manager			
Environmental Management Representative			

Table 3 is to be populated by NEH following contract award and project resourcing prior to construction commencing on Stage 3 and notification will be issued to DPHI and all relevant parties.

4. CONSULTATION AND MONITORING

4.1. COMMUNITY CONSULTATION, NOTIFICATION STRATEGY AND RESPONDING TO COMPLAINTS

Keeping the local community and relevant agencies informed about the operation and environmental performance of the development is required by Condition 42(d) of the Project Approval. Maintaining channels of communication with the community and local agencies will assist in maintaining necessary mitigation and management measures during development.

NEH will keep direct neighbours, stakeholders and the community informed of the pre-construction, construction, and monitoring phases by:

- Actively engaging as necessary with the community to provide updates about the project, its impacts, and the construction process. This may include notifications in relevant local communication channels about the nature of upcoming works, traffic disruptions and irregular work practices, if any.
- Establishing a website and communications channel enabling the community to seek clarification about the project through two-way communication channels or for the community to provide feedback on any environmental concerns raised regarding construction or operational phases. It would also include links to approval documents, relevant authorities involved, publicly available reports and plans, contact detail of communications staff and work updates and schedules.
- All received complaints will be recorded to analyse possible non-compliance and will be responded, as possible, with mitigation actions to address any possible environmental and/or community impact. The project EHS Advisor will report all complaints to the Site Manager, who is responsible for reporting complaints to NEH and/or to the relevant authority according to the relevant condition of consent.
- Only the Site Manager and Project Director will be authorised to respond to the media in any form. Contacts for media enquiries will be displayed on the website and all media enquiries will be notified to NEH to manage media communication channels.

4.2. MONITORING AND AUDITING

A system of daily walkthrough inspections formulated for the Project will be undertaken by the responsible person from each contractor. The Site Manager would also participate routinely in walkthrough inspections, at least weekly. This shall ensure daily visual inspections of all construction activities and work areas are conducted to monitor compliance with this EMS regarding operations, emergency, and risk management.

Environmental monitoring requirements are to be established prior to and during construction to include:

- Acoustic assessment to comply with Condition 26 of the Approval. Additional monitoring may be required in response to complaints or changes in operation procedures.
- Cultural heritage protocols.
- Dust generation monitoring to comply with Conditions 32 and 33 of the Approval.
- Water quality monitoring to comply with Conditions 12A and 13 of the Approval.
- Any other matters identified in this EMS.

4.3. INCIDENT REPORTING

All employees are required to report environmental incidents to their supervisor. A computerised database is used for the reporting and recording of these incidents. All employees have access to the system either directly or through their supervisor. The report covers what happened, what was done immediately to rectify or control the situation, and corrective actions to be undertaken to prevent the recurrence of the incident.

All environmental incidents are investigated to determine the cause and the actions to be taken. Investigations are undertaken as per the procedure, and environmental incidents and corrective actions are reviewed at team meetings.

Throughout the lifecycle of the project, the Site Manager is responsible for reporting any incident which causes or threatens to cause direct environmental harm or through the cumulative impacts and its interaction with previous existing conditions to the local authorities or the DPHI.

Any recorded non-compliance will be promptly investigated by the Site Manager and EHS Advisor who will design and implement suitable mitigation measures and urgent corrective actions.

4.4. ANNUAL REPORTING

Annual Environmental Management Reporting commenced with Stage 1 in accordance with Schedule 4, Condition 44 of the Project Approval. Fourteen annual environmental management reports have been completed since commencement.

Reporting will continue include activities on Lot 210 with commencement of Stage 3 and address the matters required by the project approval plus the matters identified below.

The annual report will continue to include Stage 3 and will address Condition 44 requirements as listed below:

- Identify the standards and performance measures that apply to the project.
- Describe the works carried out in the last twelve months.
- Describe the works that will be carried out in the next twelve months.
- Include a summary of the complaints received during the past year and compare this to the complaints received in previous years.
- Include a summary of the monitoring results for the project during the past year.
- Include an analysis of these monitoring results against the relevant:
  - Impact assessment criteria/limits.
  - Monitoring results from previous years.
  - Predictions in the Environmental Assessment Report.
- Identify any trends in the monitoring results over the life of the project.
- Identify any non-compliance during the previous year.
- Describe what actions were or are being, taken to ensure compliance.

5. ENVIRONMENTAL STRATEGY

5.1. RISK ASSESSMENT

Potential environmental risks associated with the Project were identified during the preparation of the Environmental Assessment and updated in the Stage 3 Management Plan production process completed by technical experts including consultation with relevant government agencies. The risks identified for each Environmental Indicator were assessed and mitigation measures proposed and recommended for the project's lifecycle. Summaries of these mitigation measures are included in each Environmental Management sub-Plan (Section 5.2) to be applied to the Project site.

Unforeseen risk associated to unplanned activities during the project will be identified as per NEH EHS Management Plan and appropriate controls implemented prior to the commencement of the activity.

5.2. ENVIRONMENTAL MANAGEMENT PLANS

5.2.1. Site Water Balance

Objectives

A site water balance and proposed Water Re-use Strategy has been proposed by WRM Water & Environment Pty Ltd (**Appendix A**). Its main objectives are to identify sources and security of the water supply for the site, provide a strategy to minimise usage of potable water and maximise rainwater usage for the on-site operations and provide reporting procedures on the matter.

Management Strategy and Controls

To minimise use of potable water from the Hunter Water's regional supply system it is suggested that rainwater tanks will be provided at the individual industrial lots for stormwater capture and re-use. Since future land uses are unknown at this stage, estimates based on Stage 1 development are used to determine that the total rainwater tank storage volume per 100m^2 of building would be approximately 5KL.

Discharges from the developed site would be managed and treated in estate wide controls - in Basins 2 and 3 as per the Design Guidelines further discharge runoff would convey to Lot 1001. Due to topography and developed drainage, this would eventually discharge west to the Hunter River and, therefore, the Ramsar Wetlands would not be impacted.

Monitoring and Compliance

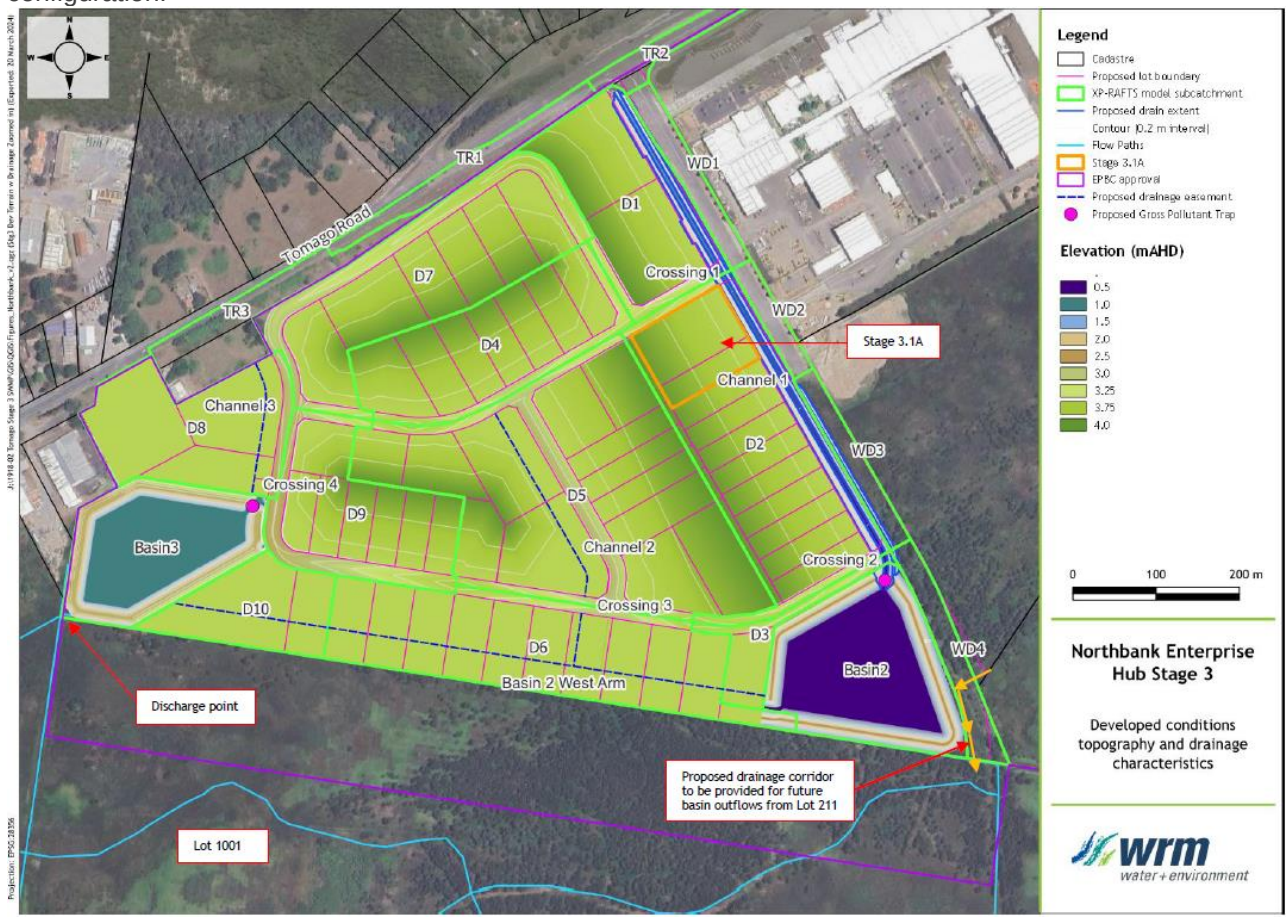
Annual reporting will compare the monitored results to the modelled site water balance conditions for the development scenario:

Development conditions	
Rainfall (mm/yr)	1125.5
Rainfall volume (ML/yr)	610.3
Catchment evapotranspiration loss (ML/yr)	167.3
Flow generated on-site (ML/yr)	443.1
External groundwater inflow (ML/yr)	140.0
Evapotranspiration loss from wetlands (ML/yr)	70.0
Outflows from Basins 1	374.0
Total outflow from site (ML/yr)	514.0

Source: Appendix A – Table 8.2 page 53

A drainage corridor will be provided along the southern boundary of Lot 210 for the drainage of stormwater outflows from Basins 2 and 3. Stormwater outflows from Basin 2 will drain west within this drainage corridor and then combine with outflows from Basin 3, before discharging at a single discharge point at the southwestern corner of Lot 210 to an existing drain within Lot 1001. For this purpose, extensive developed sub-catchments will be accommodated in a configuration following, in a way that Basin 2 will capture runoff from approximately 67% of the developed site and Basin 3 will captured runoff from approximately 33% of the developed site.

Figure 5 Proposed development site layout, earthworks plan, development catchment and drainage configuration.



Source: Water+Environment, 2024

Surface water quantity levels will be monitored at the outlets of Basins 2 and 3. Groundwater levels will be monitored at the existing well MW04 as well as at least five wells part of the new monitoring network. Refer to approved plans.

DPHI noted that groundwater levels will fluctuate with variations in climatic conditions and therefore comparison will need to be made with the background fluctuations as well as with climatic conditions. The ongoing results of monitoring will be reviewed on an annual basis for variations in groundwater levels for any inconsistency with rainfall trends (measured at Williamtown Meteorological Station) and/or outside the range of measured background fluctuations.

The Trigger Action and Response Plan is the same for both Groundwater and Stormwater and describes commitments and compliance thresholds for each trigger level on water levels. Please refer to approved plans for a summary of the levels of action, their trigger values based on described monitoring, actions to follow to mitigate impacts within each level and response to non-compliance.

5.2.2. Erosion and Sediment Control

Objectives

An Erosion and Sediment Control Plan has been provided by WRM Water & Environment Pty Ltd (**Appendix A**). Its main objectives are to identify potential sources of erosion, propose sediment control measures and recommendations and provide a monitoring program to ensure the success of the plan to prevent unacceptable

levels of sediments and contaminates from leaving the development site and entering the surface water downstream. Individual Erosion and Sediment Control Plans will be prepared for each smaller stage of works to provide more environmental resilience and avoid any possible cumulative erosion impacts.

Management Strategy and Controls

To minimise erosion and sediment flows offsite the following mitigation measures are proposed in the plan:

- Install sediment fencing and cut drains as per the requirements of the SWMP.
- Waste collection bins shall be installed adjacent to the site office.
- Construction of sediment basins either as interim basins or within the footprint of Basins 2 and 3 with a rate per hectare as outlined in the SWMP.
- Install risers and two pegs in the basin floors and mark them to show the top of the sediment storage zone.
- Ensure the basin is cleared of sediment once the design capacity is reached.
- Redirect clean water around the construction site.
- Install sediment control protection measures, such as sediment traps, at natural and man-made drainage structures as per the requirements of the SWMP and maintain them until the disturbed areas are stabilised.
- Clear and strip work areas as per geotechnical advice.
- Disturbed areas except lot grading areas must be covered with site topsoil within seven days of clearing. Lot re-grading areas must be covered with bitumen emulsion as specified.
- After finalising works, apply permanent stabilisation to site through revegetation and landscaping.

Monitoring and Compliance

Monitoring would be undertaken by the site manager at least weekly and following:

- Prior to expected rainfall events.
- Post rainfall events.
- For sediment control structures (e.g. sediment dams), check for sediment deposition and assess the requirement for its removal.
- Waste bins to be emptied at least weekly and refuse to be disposed in accordance with the Site Manager's recommendations.

The inspection and monitoring regime should collect and record the following key information:

- The previous condition of the infrastructure and any recommendations or works actioned since the last inspection.
- The current condition of the Erosion Control infrastructure.
- The Erosion controls currently in place, and their condition.
- Recommendations on remedial measures or additional ESC controls.

When undertaking these weekly inspections, the site manager will ensure compliance by:

- Ensuring that all drains are operating effectively and shall make any necessary repairs.
- Removing any spilled material from area subject to runoff or concentrated flow.
- Removing trapped sediment where the capacity of the trapping device falls below 60%.
- Inspecting the sediment basins after each rainfall event and/or weekly. Ensuring that all sediment is removed once the sediment storage zone is full. Ensuring that outlet and emergency spillway works are maintained in a fully operational condition at all times.
- Ensuring rehabilitated lands have effectively reduced the erosion hazard and initiate upgrading or repair as appropriate.

- Constructing additional erosion or sediment control works as may be appropriate to ensure the sediment basins are the final measure, not the only measure.
- Maintaining erosion and sediment control measures in a fully functioning condition at all times until the site is rehabilitated.
- Ensuring that the revegetation scheme is adhered to and that grass covers are kept healthy, including watering and mowing.
- Removing temporary soil conservation structures as the last activity in the rehabilitation program.

5.2.3. Stormwater

Objectives

A Stormwater Management Plan has been provided by WRM Water & Environment Pty Ltd (**Appendix A**). Its main objectives are to estimate discharge pre- and post-development, calculate stormwater detention requirements, predict stormwater runoff and propose water quality mitigation measures and monitoring strategy to comply with water quality objectives outlined.

Management Strategy and Controls:

To minimise overflowing risk and comply with water quality objectives the following mitigation measures are proposed in the plan:

- A drainage corridor will be provided along the southern boundary of Lot 210 for the drainage of stormwater outflows from Basins 2 and 3. Stormwater outflows from Basin 2 will drain west within this drainage corridor and then combine with outflows from Basin 3, before discharging at a single discharge point at the southwestern corner of Lot 210 to an existing drain which runs from north to south within Lot 1001 and is within an existing drainage easement, referred to in the Stormwater Management Plan as the “Existing Drainage Channel”.
- Cross drainage beneath Tomago Road will be maintained via the existing 0.6 m diameter pipe at the northeastern corner of the site (which conveys runoff from Tomago Road) discharging into the proposed Channel 1.
- Basin 2 will capture runoff from approximately 67% of the developed site.
- Basin 3 will capture runoff from approximately 33% of the developed site.
- Basins 2 and 3 will mitigate the impact of the proposed development on the total peak discharges at the boundary with lot 1001
- Two constructed wetlands within Basins 2 and 3 to treat stormwater runoff from the proposed development, as well as parts of Tomago Road and WesTrac Drive before discharging to Lot 1001 with a combined total surface area of 5.65 hectares and a peak detention volume of 79,483m3 (79.5ML)
- Vegetated Channels 1, 2 and 3 are to be installed to provide additional treatment from their upstream catchments. Drainage corridors will be provided for the construction of the proposed open channels.
- Gross pollutant traps will be installed at the roadside stormwater inlet pits. Each industrial lot will have a GPT for primary stormwater treatment at source, prior to discharge to the trunk stormwater drainage system in the estate.
- Trash rack and GPTs will also be installed at the inlets to Basins 2 and 3.
- Rainwater tanks to be installed at each of the future industrial lots, with a total capacity of approximately 5,000L (5KL) per 100m^2 of roof area.
- Individual sub stages of development may have interim basin storages sized and constructed to meet the same design objectives per the SWMP in place of final, permanent Basins 2&3.

Monitoring and Compliance and any interim basins in accordance with the approved stormwater management plan.

Surface water quality will be monitored at the outlets of Basins 2 and 3. Refer to approved plans.

Monitoring requirements for the different phases of development pre-construction, construction and operations are specified in the approved plans. This includes both field and lab test results and their frequency for inclusion in reporting.

The SWMP contains a Trigger Action Response Plan (TARP #3) that has been prepared in consultation with the relevant authorities and includes the detailed management of any adverse monitoring results.

As per condition 4B Schedule 3 of the Approval, the TARP agreed with government agencies is to respond to any adverse impacts on the vegetation of the NPWS Reserve Area as defined by the thresholds outlined in the condition.

An exceedance would be determined by a suitably qualified water quality professional.

5.2.3.1. Design Guidelines – Stormwater Management

The approved stormwater design includes a system of open drains that traverse Stage 3. The Design Guidelines provide stormwater management controls to support the efficient and sustainable operation of the conditioned Stormwater Management Scheme for Stage 3. Development on individual lots should satisfy the following site-specific controls:

- Stormwater design outcomes and management practices should be consistent with the relevant controls of Section B4 of the PSDCP 2014.
- Development that, in the opinion of the Consent Authority, has the potential to significantly adversely affect the water quality of the drinking water catchment will be referred to Hunter Water under section 51 of the *Hunter Water Act 1991*.
- The final stormwater design should be constructed to the relevant stormwater design specifications that have been published by Port Stephens Council under the **E**ngineering Standards and Infrastructure Specifications.

5.2.4. Groundwater

Objectives

A Groundwater Monitoring Program (**GMP**) has been provided by Douglas Partners Pty Ltd (**Appendix B**). Its main objectives are to identify groundwater flow, quality and variability within site, comply with statutory requirements to avoid potential impacts into the water supply and the Hunter wetlands and provide a monitoring strategy and network to address contingency measures when threshold parameters are met.

Management Strategies and Controls

To minimise impacts on the groundwater quality parameters, the following monitoring program and contingency measures are proposed in the plan for works beyond Stage 3.1A:

- If a consistent trend in variations in groundwater level are recorded, then the potential implications of the long-term variation should be assessed.
- It is considered that the UCL95-mean values could be used to indicate when monitored values are above average background levels, prompting review and closer scrutiny if levels are consistently above average/mean. Exceedance of the adopted trigger levels would prompt further assessment.

Monitoring and Compliance

As required by the Groundwater Monitoring Plan and the frequency and parameters depend on the phase of during or post construction.

A review of the GMP should be undertaken in the following situations:

- If there are additional monitoring requirements as a result of detailed design.
- Following completion of significant project work stages.
- Following significant environmental incidents.
- When improvements to performance have been recommended by the consultant in annual reports or as directed by the environmental authority.

- When new stages of construction are proposed and have the potential to impact the site;

Otherwise, every 3 years by a suitably qualified groundwater consultant to:

  – Review changes in land uses within the site and for adjacent sites which may increase potential contaminants of concern (given the development is staged and future use is unknown).

  – Analyse trends in groundwater levels and quality.

  – Assess effectiveness of existing monitoring program.

  – Review trigger levels and update, if warranted.

  – Recommend any changes to provide an efficient and effective monitoring program.

Parameters which have been established to be of minimal concern from the results of monitoring may be dropped from the program and others may be added if warranted.

5.2.5. Acid Sulfate Soils

Objectives

An Acid Sulfate Soil Management Plan (**ASSMP**) has been provided by Douglas Partners Pty Ltd. Its main objectives are to identify Potential Acid Sulfate Soils (**PASS**) within site, comply with statutory requirements to avoid potential oxidising of Acid Sulfate Soils (**ASS**) and pH decrease by minimisation of ASS disturbance and provide treatment strategies and monitoring procedures.

Management Strategies and Controls

To minimise impacts on the environment from potential oxidation risk of ASS, the following management strategies are proposed in the plan:

- Containment of excavated soil within a suitably bunded area and keep moist to minimise oxidation, prior to treatment with lime.
- Treat the base of the excavation and the stockpiled soil for neutralisation as soon as practicable following lime rates within the ASSMP.
- Neutralising agent and ASS to be thoroughly mixed and aerated and treated as per the ASSMP guidelines. Additional lime will be required if monitoring results indicate that appropriate neutralisation has not been achieved, and lime rate may be decreased if monitoring results indicate that over liming is occurring.
- Upon verification of treatment, neutralised ASS will be either progressively reused on site or disposed of at a licensed landfill following confirmation of the waste classification by a qualified consultant as per current EPA guidelines. If reused on site, consideration should be given to placement away from sensitive areas and surface water flows.

Monitoring and Compliance

Acid Soil Management will be monitored based on:

- Daily inspection undertaken by the Site Manager or EMR of liming operations during initial excavation.
- Sampling and testing at a frequency of at least one sample per $20m^3$ to verify neutralisation treatment. A lower frequency of testing could be considered subject to review as treatment progresses.
- Analysis of soil samples for chromium suite analysis by a NATA accredited laboratory to confirm appropriate neutralisation with sampling density in stockpiles as per the ASSMP.
- All required neutralisations will be monitored as outlined in the ASSMP.

A contingency procedure as per the ASSMP Contingency Plan should be in place to allow lime dosing and monitoring to confirm neutralisation prior to discharge to avoid non-compliance. Please refer to the ASSMP.

5.2.6. Traffic

Objectives

A transport verification study (**Appendix D**) for Stage 2 and 3 has been prepared by The Transport Planning Partnership to satisfy Condition 24 of approval MP07_0086-Mod 3 to demonstrate that the site access would accommodate traffic generated by Stages 2 and 3.

Management Strategies and Controls

The key findings of the verification study are presented below:

- Vehicle access to the development estate lots will be provided via the Tomago Road/Westrac Drive signalised intersection.
- Stage 3 is expected to generate 710vph and 791vph in the AM and PM peak respectively.
- Traffic modelling has been undertaken using SIDRA Intersection modelling software to ascertain intersection performance at Tomago Road/Westrac Drive under existing traffic and ten years traffic growth projections.
- Traffic modelling indicates that the Tomago Road/Westrac Drive signalised intersection would continue to operate acceptable at level of service (**LOS**) C or better in the AM and PM peaks with Stage 2 and 3 development traffic.
- A sensitivity analysis (based on 70 per cent heavy vehicle and 30 per cent light vehicle movements to/from the site) also confirms that the Tomago Road/Westrac Drive signalised intersection would continue to operate acceptable at LOS C or better in the AM and PM peaks with Stage 2 and 3 development traffic.
- The Tomago Road/Westrac Drive signalised intersection has been suitably designed to accommodate traffic generated by Stages 2 and 3.

Temporary direct access from Tomago Road into Lot 210/Stage 3 will be permitted for construction purposes, provided a Road Occupancy Licence is obtained from TfNSW.

The transport verification study concludes that the traffic aspects of Stages 2 and 3 would be satisfactory and that the Tomago Road/Westrac Drive site access has been suitably designed to accommodate traffic generated by Stages 2 and 3.

Condition 24 does not set monitoring requirements as per Schedule 3. Therefore, as per Condition 42 (f) this EMS does not include monitoring requirements for traffic generation, as the verification study has concluded the site access to be suitable designed.

5.2.7. Noise and Vibration

Objectives

This EMS follows guidance as per the Noise Management Plan 2009 provided by Spectrum Acoustics Pty Ltd. The main objective of this section of the EMS is to satisfy Condition 25 and 30 of the approval, manage noise and vibration during bulk earthworks, the delivery of roads, drainage and services infrastructure and

construction management strategies, controls and responses to mitigate potential impacts on adjoining dwellings.

Additionally, to minimise impacts and potential noise from construction works associated with Stage 3, hours of construction are limited to Table 4 below.

Table 4 Construction Hours

Activity	Day	Time
Construction	Monday-Friday	7:00am to 6:00pm
	Saturday	8:00am to 1:00pm
	Sundays and Public Holidays	Nil

Proponents are to ensure that noise emissions do not exceed the assessment criteria that is outlined in the table above

Notes:

- Construction activities may be conducted outside the hours in Table 1 (Table 5 in this EMS) provided that the activities are not audible at any residence beyond the boundary of the site.
- The limits for operation hours of the inventory area do not apply if the Applicant has an agreement with the relevant owner of lands within these locations to operate outside these hours and the Applicant has advised the Department in writing of the terms of this agreement.

Management Strategies and Controls

The following mitigation measures are to be implemented during the construction phase:

- To undertake all construction activities with the objective of minimising noise problems.
- To ensure there is no loss of amenity to adjoining residences due to noise emissions from site activities.
- To meet the relevant noise standards to avoid nuisance to adjoining properties during construction.
- Compliance with the relevant requirements of the Project Approval.
- Compliance with approved hours of construction.

Work best-practice methods, such as:

- Weekly reinforcement (such as at toolbox talks) of the need to minimise noise (during construction).
- Regular identification of noisy activities and adoption of improvement techniques.

Should noise non-compliance or incident occur as a result of project construction activities, one or more of the following corrective actions will be implemented as appropriate:

- Undertake an investigation to determine the cause of the problem and assess processes to identify any significant sources of emissions and if required, modify or cease activities/processes.
- Increase the use of noise control measures

5.2.8. Aboriginal and Cultural Heritage

Objectives

An Aboriginal and Cultural Heritage Management Plan (**ACHMP**) has been provided by Indigenous Outcomes Pty Ltd (**Appendix F**). Its main objectives are to provide a framework for protection of any Aboriginal Heritage on site, compliance with statutory requirements for artifacts findings to satisfy Condition 31 and to provide procedures to be followed in the case that any archaeological deposits are encountered during development.

Management Strategies and Controls

To ensure any Aboriginal cultural heritage is properly managed on site, the following control measures are proposed:

- Cultural awareness training for all site contractors and subcontractors.
- Attendance of Worimi site officers at all initial ground disturbing works.

- Collection of Aboriginal objects as determined appropriate by Worimi site officers.
- Reburial of Aboriginal objects as determined appropriate by Worimi site officers.
- Should skeletal remains be uncovered, work at the site will cease and the NSW Department of Planning, Housing and Infrastructure (**DPHI**) and NSW Police Force notified.

Monitoring and Compliance

Monitoring would be undertaken by Worimi site officers at all initial ground disturbances. The EHS advisor will monitor inductions to ensure adequacy of cultural awareness training. Should an incident in relation to matters covered by the ACHMP occur, one or more of the following corrective actions shall be implemented as considered appropriate:

- Investigation and reporting of the incident to Worimi site officers and DPHI as appropriate.
- Modification or cessation of protocols as appropriate or as dictated by the EHS advisor following recommendations from Worimi site officers.

5.2.9. Air Quality

Objectives

This EMS follows guidance as per the Air Quality Management Plan 2009 provided by Arup Group Limited. The main objectives are to:

- comply with air quality criteria as per commitments;
- as per statutory requirements as per the POEO (Clean Air) Regulation 2022;
- to satisfy Conditions 32 and 33 of the Approval; and
- to perform the development in a manner that minimises dust generation and prevent dust affecting adjoining dwellings.

It should be noted that Condition 34, relating to the emission of any offensive odour from the site as defined per the POEO Act 1997), is no longer relevant to the site. As per the Air Quality Management Plan, the Department of Planning confirmed in 2009 that odour concerns were only related to the onsite sewage treatment facility located to the south of the Wes Trac Facility on the western boundary of the Stage 1 site.

This facility no longer exists, as the site was connected to the sewerage system in 2021. This EMS does not apply in any form to the Stage 1 environmental management nor is associated with it. Having regard to any possible cumulative impact, the proposed scope of works within this EMS cannot possibly produce *offensive odour* as defined by the POEO Act 1997.

Management Strategies and Controls

To minimise impacts and potential emissions from vehicles, equipment or dust generation from work, the following mitigation measures are proposed:

- All equipment is to comply with the POEO (Clean Air) Regulation Standards of Concentration.
- All machinery is to be maintained and be in good working order.
- Vehicles and equipment are to be inspected prior to use daily.
- Vehicles are to be limited to 20km/h on any unsealed areas.
- Unsealed roads are to be sealed or at a minimum covered with gravel, as soon as practicable.
- Truck loads are to be covered upon entering and exiting the site.
- Water tankers are to be used to control dust.
- Rehabilitation and stabilisation through vegetation of surfaces left unsealed after the completion of works.
- Truck wheel washes or other dust removal measures to be adopted.
- Stockpiles to be covered or grass seeded if left unused for an extended period.

Monitoring and Compliance

Monitoring would be undertaken by visual observations where construction activities could generate fugitive dust emissions such as stockpiles, unsealed roads and any excavation and filling activities. The requirement for dust monitoring may be reviewed if complaints are received. If complaints are received and non-compliance has been assessed to happened by the EHS advisor, the following corrective actions are to be undertaken:

- Undertake site investigation to determine cause of the problem.
- Modify activities/processes as assessed by the Site Manager or EHS advisor.
- Increase the use of active dust control measures, such as watering in areas where non-compliance was recorded.
- Intensify monitoring as needed.

5.2.10. Landscaping

The Stage 3 Landscape Masterplan presents an estate-wide landscaping scheme that is supported by the finer-grain guidelines within this section, which have been peer reviewed by an AILA-accredited Landscape Architect. The landscape design outcomes should reference the general dimensional guidance in Table 5 below. The dimensional guidelines should be applied flexibly on merit to satisfy Condition 2 of the Approval.

Table 5 Dimensional Guidelines for Plant Material and Landscaping

Landscape Matter	**Dimensional Guidance**
Soil Volumes and Key Dimensions	
Soil volume for trees and shrubs.	Between 45 litres and 200 litres.
Container / planter depth for shrubs.	Between 150mm and 200mm in depth.
Diameter of tubes for boundary screening plants.	Between 50mm and 70mm.
Height of shrubs / bushes.	Below waist level. Not to obstruct sightlines.
Height of tree canopy	Not to obstruct horizontal sightlines when standing.
Recommended General Planting Densities	
Large shrubs (>1.5m in height)	~1 shrub planting per square metre.
Small shrubs (<1.5m in height)	~2 shrub plantings per square metre.
Tubes (approx. 50mm2)	~4 plantings per square metre.
Virotube	~6 plantings per square metre.
Frontage and Swale Planting	
Street tree planting intervals.	▪ In line at ~10m intervals within frontage setbacks excluding driveways. ▪ Avoid easement corridors. Select species that will not cause an excessive maintenance burden. R
Swale planting intervals.	Variable. Avoid easement corridors. Select species that that can be periodically inundated with stormwater runoff.
Outdoor Car Parks	
Shaded area.	Approximately 30% of the car park area
Frequency of garden bays	Every 6-8 continuous car spaces
Size and design of garden bays	▪ Each ‘garden bay’ shall be roughly proportioned to the area of 1 regular car parking bay on a site specific basic.

Landscape Matter	Dimensional Guidance
	▪ Garden bays should be protected from vehicles and have appropriate edging.
Frequency of canopy trees	1 per 6 car parking bays

Entrance Landscape Guidelines

Key entrance points to individual allotments should be in accordance with the following guidelines:

- Enable visually distinguished driveway entrances to individual allotments.
- Site-specific landscape design responses should seek to visually distinguish driveway entrances to individual allotments.
- Consider the placement of canopy trees with respect to the above.
- Canopy/feature trees will be located towards the edges of the primary point of vehicle access to individual allotments to provide for a cluster of canopy trees behind the row of trees lining the street frontage.
- Maintain sightlines for ingress and egress.

Plant material and other landscape elements should not obstruct viable sightlines towards or along routes of ingress or egress. This guideline should be considered in relation to all pedestrian and vehicle movement.

Boundary Screening

Landscape design outcomes should incorporate screening to sensitive interfaces, including property boundaries. Development across Stage 3 should satisfy the following guidelines:

- Planting corridors at side and rear boundaries.
  - Spatial provision is encouraged for planting corridors that have a minimum approximate width of 3m to side and rear property boundaries.
  - Side boundaries should have single key species trees placed at 10-20m centres and smaller trees placed to form irregular groupings. Any understorey planting should generally be low shrubs and ground covers that provide visual access (for pedestrian safety) and clear passage of vehicles alongside circulation.
- Use of evergreen trees to provide a windbreak where necessary.
- Screened estate boundaries.
  - Screening of development is required to mitigate visual impacts to Tomago House. Planting is to provide screening in accordance with Drawing 01 of the appended Landscape Masterplan. The planting schedule on this drawing sheet should also be referenced.
  - Development that is not immediate to an estate boundary may benefit from site-specific screening in the same (west-facing) direction. The need for site-specific screening should be determined with regard for:
    - The temporary undeveloped state of land between Stage 3 and Tomago House and the scale of approved development.
    - Distance to Tomago House and the Chapel.
  - A maximum growth height of 4m must be maintained within the 132kV overhead powerline easement along Tomago Road.

Maintenance and Installation

- A maintenance program should be established for mulching (in accordance with AS4454), watering and weeding for the first 2 years after installation. Required checklists are to be submitted to the Principal or Principal's Representative documenting completion of the work.
- Unless the select topsoil type can be provided from recovered site material (and meets AS4419), developers should ensure imported soil meets AS4419, free of noxious weeds and from a suitable off-site source.
- Prior to importing soil, certification from a qualified geotechnical laboratory must be accepted by the Principal or Principal's representative. This certification should confirm that it meets AS 4419-2003 Soils for landscaping and garden use.
- Imported plant material shall be free from disease, weeds and insect pests. Nursery stock should be hardened off ready for planting 4 weeks before being transported from the nursery to the site for planting.
- Provision should be made for a plant establishment period of 12 weeks (defects liability period) as part of the contract for landscape works.
- Large trees should generally be staked to support healthy growth in a vertical alignment.
- Any filling should utilise VENM as a conditioned requirement of the Development Consent for MP07_0086, under which these Design Guidelines have been prepared.

Artificial Illumination

The establishment of directional and purpose lighting is expected for security and safety purposes. All lighting at the site should:

- Minimise light spill to the Hunter Wetlands National Park.
- Comply with Australian Standard 4282 – Control of the obtrusive effects of outdoor lighting.
- Consider the National Light Pollution Guidelines for Wildlife that were published by the Department of Climate Change, Energy, the Environment and Water in May 2023:
- Where necessary, support the implementation of Crime Prevention Through Environmental Design (CPTED) principles.

5.2.11. Energy Efficiency

Objectives

This EMS follows guidance as per the Energy Savings Scheme Rule 2023 and energy efficiency measures are to be implemented where possible to satisfy Condition 40 of the Approval. The aim is to minimise unnecessary energy use on the site and outline optimisation measures and monitoring during the works.

Management Strategies and Controls

The following measures are proposed to be adopted during the development:

- Using machinery with high energy efficiency rates to reduce fuel consumption. This may include in-built features such as an 'economy mode' or and 'on-demand throttle'.
- Optional use of machinery with hybrid powertrains to reduce fuel consumption if possible.
- Reduce engine idling. Equipment and vehicles onsite on average are to idle 25% and 50% respectively. Reducing engine idling below these rates can significantly decrease fuel consumption and maintenance needs.

Monitoring and Compliance

Monitoring would be undertaken by periodic assessment of fuel consumption onsite and regular inspections to ensure fuel efficiency is maintained using the machinery and vehicles. In case of fuel consumption being higher than modelled as per the procurement process, non-compliance shall be investigated at least monthly by the Project Manager, to ensure engine idling, energy efficiency in-built options of the machinery, and other equipment measures are properly handled.

5.2.12. Waste Management

Objectives

The EMS follows guidance as per the Waste Avoidance and Resource Recovery Act 2001 to ensure waste management measures are implemented in accordance with EPA Waste classification guidelines. The aim is to minimise the use of unnecessary resources on-site, reduce waste collection maintenance, improve re-use and recovery of resources on site, and dispose safely any operational waste or byproducts.

Management Strategies and Controls

The following management measures are proposed:

- Any waste material that is unable to be reused, re-processed or recycled will be disposed at a facility approved to receive that type of waste.
- Site induction to include waste management information.
- Recording of all waste by contractors.
- Use of pre-order and prefabricated material where possible.
- Waste recycling through separation and storage of recyclable and non-recyclable materials. Separate storage for putrescible, cardboard, and mixed recycling waster.
- Collection of waste by a licensed contractor.

Monitoring and Compliance

Monitoring would be undertaken by weekly assessment and recording of waste collection metrics, storage conditions and disposal procedures. EHS Advisor to conduct regular surveillance of waste minimisation and disposal activities, arranging corrective actions when necessary. In case of non-compliance such as waste spills, the following corrective actions will be undertaken:

- Notify Emergency Services if required.
- Immediately contain the spill as appropriate.
- Clean up the spill as required by EPA guidelines.
- Raise spill incident with upper management for resolution, recording and to determine if notification is required.
- Notify EPA in event of incident which has the potential to cause significant environmental harm.
- Investigation of possible sources of non-compliance and make adjustment to work practices and to this EMS as required.

6. REFERENCED AND ASSOCIATED DOCUMENTS

Information within this EMS is derived from and/or is referenced from the following documents provided as appendices:

- CEMP Stage 1 (ADW Johnson)
- Acid Sulfate Management Plan (Douglas Partners)
- Air Quality Management Plan (ADW Johnson)
- Design Guidelines (Urbis)
- Stormwater Management Plan (WRM Water & Environment)
- Groundwater Monitoring Program (Douglas Partners)
- Environmental Assessment Report (Asquith & de Witt)
- Statement of Commitments (Asquith & de Witt)
- Noise Verification Study (EMM)

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