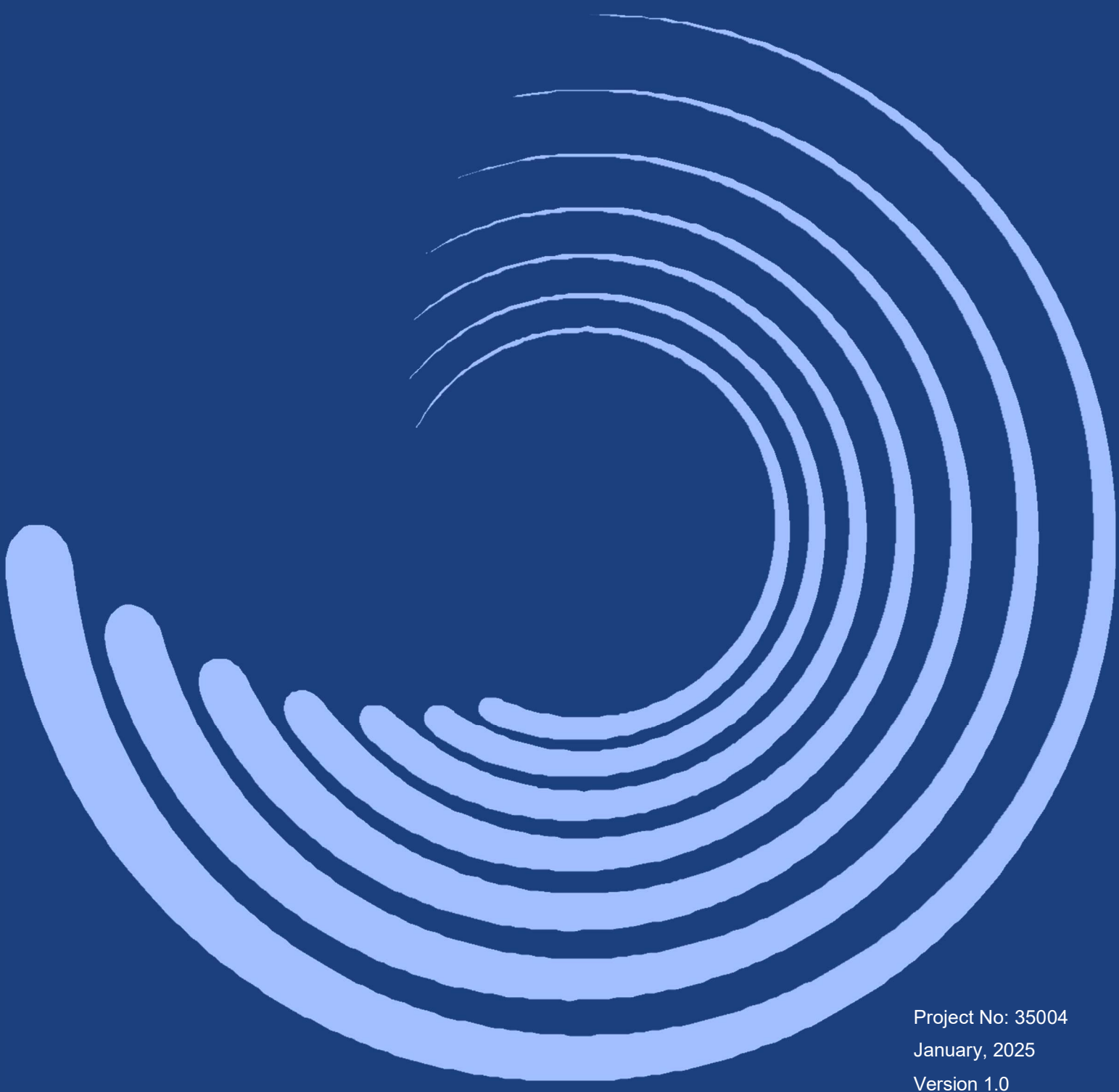




DARTMOUTH  
CONSULTING

# Yannathan Quarry Environmental Management Plan

Prepared for Heidelberg Materials Australia



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Version 1.0

**Customer:** Heidelberg Materials Australia

**Customer reference:**  
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## Glossary

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Acronym	Definition
<b>AHD</b>	Australian Height Datum
<b>DFP</b>	Development Facilitation Program
<b>DO</b>	Dissolved oxygen concentration
<b>DTP</b>	Department of Transport and Planning
<b>EC</b>	Electrical conductivity
<b>EMP</b>	Environmental Management Plan
<b>EPA</b>	Environmental Protection Agency
<b>ERR</b>	Earth Resource Regulator
<b>ERS</b>	Environment Reference Standard
<b>HMA</b>	Heidelberg Materials Australia
<b>IWRG</b>	Industrial Waste Resource Guideline
<b>mbgl</b>	Metres below ground level
<b>QA/QC</b>	Quality Assurance / Quality Control
<b>PPE</b>	Personal Protective Equipment
<b>RWL</b>	Reduced Water Level
<b>SEMP</b>	Site Environmental Management Plan
<b>SWL</b>	Standing Water Level
<b>SRW</b>	Southern Rural Water
<b>TDS</b>	Total Dissolved Solids
<b>TOC</b>	Top of Casing
<b>TSP</b>	Total Suspended Particles
<b>TRH</b>	Total Recoverable Hydrocarbons
<b>YSQ</b>	Yannathan Sand Quarry

# 1. BACKGROUND

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## 1.1 INTRODUCTION AND OBJECTIVES

Dartmouth Consulting Pty Ltd has been engaged by Heidelberg Materials Australia (HMA) (formerly Hanson Construction Materials) to prepare this Environmental Management Plan for Yannathan Sand Quarry (YSQ).

The subject site is currently used for sand extraction and operates under Planning Permit T140140, an expansion to the extraction area permitted under this permit is proposed. Planning permissions for this expanded area are currently being sought via the Department of Transport and Planning's (DTP) Development Facilitation Program (DFP), under planning permit application PA2403369. The current planning permit application seeks to encompass the current and future extractive industry (sand extraction) activities (refer **Figure 1-1**).

Pursuant to Condition 45 of Planning Permit T140140, a Site Environment Management Plan was prepared.

This document collates information from various internal and previously approved documents into one document. This refreshed Environmental Management Plan has been prepared to consider and support the quarry expansion sought under planning permit application PA2403369.

This EMP has been prepared to outline how HMA and any person they engage will comply with the environmental management requirements of the Permit and other regulatory requirements during all stages of the YSQ operations. It presents the framework for the environmental management of the YSQ and outlines various requirements, controls, and procedures that must be adhered to. It is applicable to all staff and contractors associated with the YSQ and its effective implementation will ensure that regulatory requirements are met in a systematic manner. This EMP:

- Describes the Project, including activities to be undertaken
- States obligations, objectives and targets for issues that are important to the environmental performance of the Project
- Identifies the approvals that relate to the Project
- Describes the strategic framework for environmental management of the Project
- Describes the environmental management related roles and responsibilities of personnel
- Outlines training and induction requirements for employees, contractors and subcontractors, in relation to environmental and compliance obligations
- Includes protocols for managing and reporting incidents and non-compliances with applicable policies, approvals, licences, permits, consultation agreements and legislation
- Outlines a monitoring regime and inspection program to check the adequacy of controls as they are implemented.

This EMP is the overarching document in the environmental management system for the YSQ.

## 1.2 PROJECT DESCRIPTION

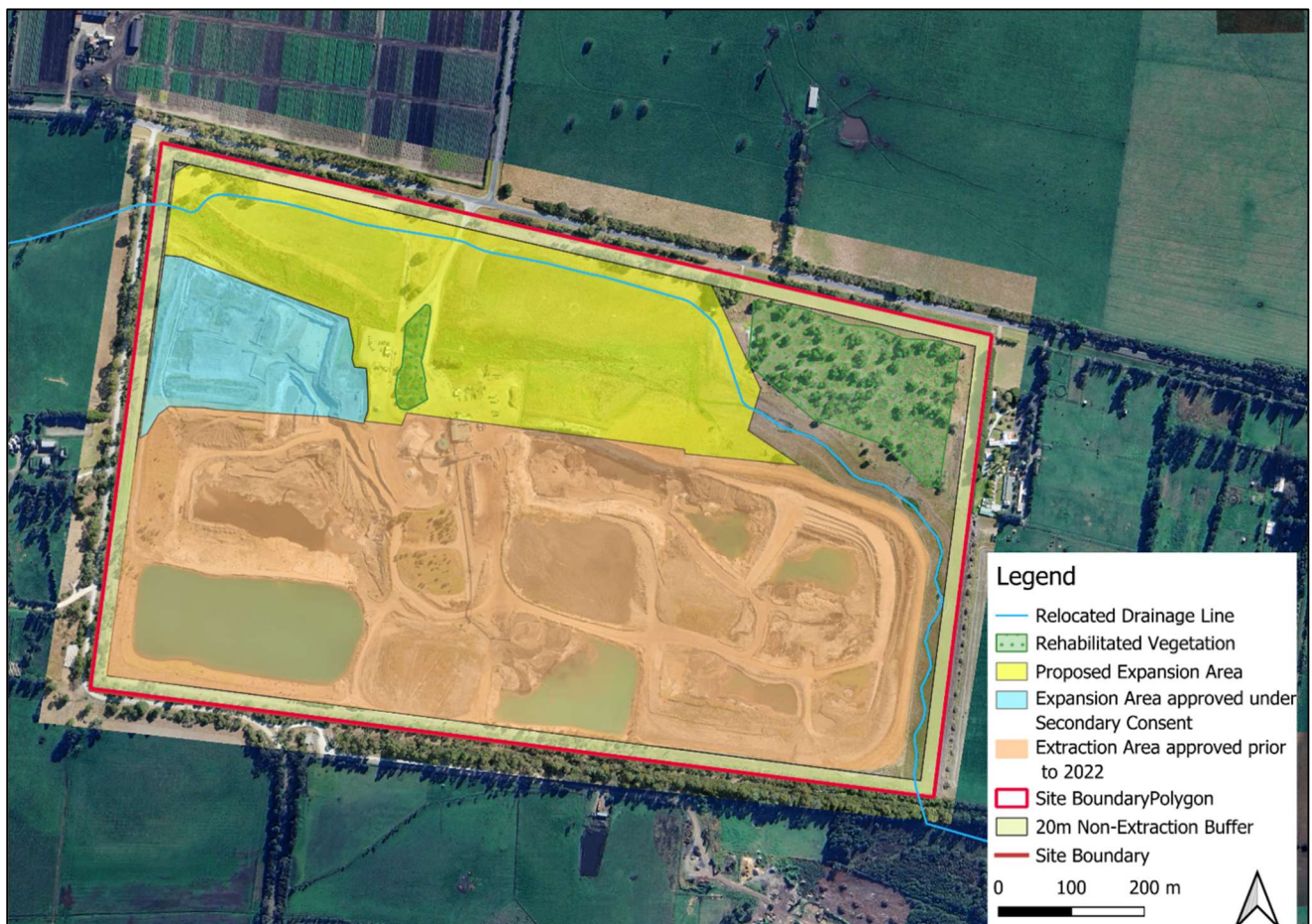
Key operational details are as follows

- **Primary Use:** Sand extraction and on-site processing.
- **Processing:** Conducted via a fixed three-stage processing plant:
  - Initial feed and screening
  - Sand production
  - Treatment of reject clay and silt
- **Extraction Depth:** Limited to RL -9mAHD.
- **Slope:**
  - Current batter slopes are 1V:2H.
  - Proposed terminal slopes:



- From surface to 16-18 mbgl – 1V:2.5H.
  - Bench at least 38m wide at 16-18mbgl.
  - 1V:2H below bench.
- Proposed rehabilitated slopes – upper slope buttressed with clay at 1V:3H.
- **Production Volume:** Approximately 400,000 tonnes of quarry product transported annually.
- **Staffing and Facilities:**
  - Maximum of 15 staff on-site at any given time. Car park with 25 spaces located west of the office.
- **Access and Traffic:**
  - Ingress and egress limited to Westernport Road. In the final stages of extraction, access will occur via Milner’s Road.
- **Mobile Plant Equipment:** Includes:
  - Front-end wheel loaders.
  - Dump trucks.
  - Excavator.
  - Water truck.

Figure 1-1 Site approval areas



### 1.2.1 Operating Hours

Operational hours are as follows:

Table 1-1 Operating Hours

Information for upload	Monday – Friday		Saturday		Sunday		Work on Public Holiday
	Start	Finish	Start	Finish	Start	Finish	
Above ground	6.00	18.00	6.00	18.00	None	None	Yes
Sales	6.00	18.00	6.00	18.00	None	None	Yes
Processing	6.00	22.00	6.00	22.00	None	None	Yes
Operating Hours Clarification	No work on Christmas Day, Boxing Day or Good Friday, maintenance may be conducted outside these hours						

### 1.3 ENVIRONMENTAL POLICY

HMA’s Environmental Policy is detailed below

**Purpose**

*Heidelberg Materials Australia (HMA) is engaged in the production and supply of Quarry and Concrete Materials. HMA seeks to manage its operations to the highest environmental standards. Proactive environmental management is integral to the sustainable operation of the business. We are widely recognised for successful resource recovery through innovation and persistence*

**Principles**

*HMA accepts the responsibility for environmental protection which is integral to the conduct of its commercial operations. HMA is committed to:*

- Operating practices which seek to minimise impacts, atmospheric emissions and noises; pollution and minimise the likelihood of environmental harm through work and management practices, continual improvement, training and the use of innovation and new technology.
- Ensuring employees at all levels, including contractors, are aware of their environmental responsibilities and have adequate authority, training and resources to discharge them.
- Compliance with all applicable environmental laws and regulations and Codes of Practice in existing operations, new developments and upgrades.
- Management review of environmental aspects, policies, procedures, objectives, targets and performance indicators.
- Waste management to minimise wastes, develop viable recycling opportunities, and ensure proper handling and disposal methods through the implementation of the hierarchy of waste.
- Product development which seeks to combine commercial viability and efficient use and conservation of resources.
- Environmental assessment of new projects, asset purchases, sales and existing operations.
- Purchasing goods where practical, that have a lower impact on the environment.
- Environmental Incident Response – contingency plans to minimise health, safety and environmental risks
- Rehabilitate areas affected by business operations through consistent application of reclamation standards.
- Implement biodiversity management plans where operations are in close proximity to nature reserves.
- Communication of the HMA environmental policy internally and made available to the public.
- Striving to meet Community Expectations through consultation within HMA and with other relevant bodies, community groups and neighbours about environmental matters of common concern.
- Water Management, which is integral to achieving sustainability, balancing today’s needs with those of the future (refer to Water Policy for more information).



- Energy management which is integral to managing greenhouse gas emissions from our operations and thus abating the impact of our business on the climate (refer to Energy Management Policy for more information).
- Ensuring that environmental considerations are an integral part of our decision making, management and culture.

*HMA will foster and respect the environment and will emphasise every employee's responsibility for environmental performance*

## 2. ENVIRONMENTAL MANAGEMENT

### 2.1 ENVIRONMENTAL MANAGEMENT STRUCTURE AND RESPONSIBILITY

Table 2-1 Environmental management responsibilities

Position	Responsibility
Heidelberg Materials Environmental representative	<ul style="list-style-type: none"> <li>Undertake annual compliance audits.</li> <li>Aid in relation to environmental monitoring as required.</li> </ul>
Quarry Manager	<ul style="list-style-type: none"> <li>Day to day implementation of the EMP.</li> <li>Ensuring site personnel have undertaken appropriate environmental awareness training and are observing all necessary management requirements.</li> <li>Ensure all required environmental auditing is undertaken.</li> </ul>
All staff (including sub-contractors)	<ul style="list-style-type: none"> <li>Comply with the relevant requirements of the EMP, or other environmental management guidance as instructed by a member of Site management.</li> <li>Participate in any Project/Site induction program(s) as required.</li> <li>Report any environmental incidents to the Quarry Manager immediately or as soon as practicable if reasonable steps can be adopted to control the incident.</li> <li>Undertake remedial action as required to ensure environmental controls are maintained in good working order.</li> <li>Stop activities where there is an actual or immediate risk of harm to the environment or human health and advise the Project Manager or Site Manager.</li> </ul>

### 2.2 APPROVALS AND REGULATORY REQUIREMENTS

The quarry expansion requires the following approvals:

- An approved Work Authority under the *Mineral Resources (Sustainable Development) Act 1990 (MRSDA)*. WA127 was originally granted by the Department of Natural Resources and Environment to H.A & K.I Bulach in 1989.
  - A variation to WA127 was submitted and approved in 2013 extending the limit of extraction to an adjacent property which had been purchased.
- A Planning Permit is required under the *Planning and Environment Act 1987*. The site now operates under planning permit T140140-1 which was issued by Cardinia Shire Council on 1 October 2014 allowing for 'Use and development of the land for extractive industry (sand quarry) and alterations to a road zone category 1, generally in accordance with the approved plans. The following amendments to plans/permit have been approved since:
  - The permit was amended via Section 72 of the Planning and Environment Act 1987 in 2015 which saw several conditions deleted
  - A Section 72 amendment was approved in 2020, allowing for the construction of a noise bund along the eastern property boundary
  - The endorsed plans were amended via Secondary Consent in early 2023 allowing the eastern pit to be extended northwards by approximately 100 metres
  - Cardinia City Council have approved six (6) Secondary Consent applications to temporarily extend the processing operating hours to 6 am – 10 pm Monday to Saturday. These extensions were submitted and approved on a half-yearly basis, with the Work Plan Variation needing to be approved before these hours could be formalised within the permit via a Section 72 amendment

Table 2-2-2 Relevant legislation

Environmental Aspect	Regulatory Requirement
General	<i>Environment Protection Act 2017</i>
	<i>Planning and Environment Act 1987</i>
	AS/NZS 14001:2016 Environmental Management Systems
	<i>Mineral Resources (Sustainable Development) Act 1990 (MRSDA).</i>
Soil and Water	<i>Catchment and Land Protection Act 1994</i>
	<i>Water Act 1989</i>
	Environmental Reference Standard, 2021
Biodiversity	<i>Flora and Fauna Guarantee Act 1988</i>
	<i>Fisheries Act 1995</i>
	<a href="#"><i>Environment Protection and Biodiversity Conservation Act 1999</i></a>
	AS 4970:2009 Protection of trees on development sites
Chemical Storage	AS 1940:2017 The storage and handling of flammable and combustible liquids
	<i>Occupational Health and Safety Act 2004</i>
Noise and Vibration	Environment Protection Regulations 2021
	Environmental Reference Standard, 2021
	AS 2436-2010 Guide to noise and vibration control construction, demolition and maintenance sites
Air Quality	Environment Protection Regulations 2021
	Environment Reference Standard, 2021
Land	<i>Environment Protection Act 2017</i>
	Environmental Reference Standard, 2021
Cultural Heritage	<i>Aboriginal Heritage Act 2006</i>

## 2.3 ENVIRONMENTAL TRAINING

The level of environmental awareness required of workers and contractors/suppliers who enter and undertake work at the site should include:

- Site induction that covers both the environmental and safety requirements of the site
- Environmental awareness in relation to safe work practices, safe work method statements and any other instructions where environmental management is required
- Environmental awareness through regular onsite prestart meetings, toolbox talks and safety alerts
- Emergency response preparedness
- Familiarity with the EMP
- Familiarity with all legislations' guidelines relevant to service being provided.

## 2.4 EMERGENCY CONTACTS AND RESPONSE

Emergency contact details for key Project personnel and emergency services are listed in **Table 2-3**

Table 2-3 Emergency Contacts

Name / Organisation	Contact
Quarry Manager	Gunther Benedek, 03 5997 8109
Project Environment Manager	TBD
HMA 24-Hour Emergency Contact	1800 882 478
Emergency (Police, Fire, Ambulance)	000
VIC SES	132 500
EPA Victoria	1300 372 842
Wildlife Victoria	1300 094 535
Cardinia Shire Council	1300 787 624

## 2.5 EMP REVIEW AND IMPROVEMENT

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

Only the Quarry Manager or Environmental Representative (or delegate) has the authority to change any of the environmental management documentation.

The EMP will be reviewed by the Quarry Manager for relevancy every 24 months during the lifetime of the Project.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure

The Quarry Manager will coordinate the preparation, review and distribution, as appropriate, copies of the EMP as well as the conditions of approval and environmental assessment documents. During the Project, the environmental documents will be available electronically at the main site compound or in hard copy on request.

## 3. POTENTIAL ENVIRONMENTAL IMPACTS, RISKS AND MANAGEMENT

The potential for the projects impacts on the environment will depend on various factors. Primarily, impacts will be dependent on the nature, extent and magnitude of activities and their interaction with the natural environment.

The following section identifies the risks associated with these potential impacts, and discuss control measures and monitoring and reporting details.

A Risk Assessment, including an assessment of potential environmental quarrying hazards, has been prepared by Dartmouth Consulting and has been endorsed under the Work Plan.

Monitoring and reporting for requirements are discussed within **Section 4**.

### 3.1 GROUNDWATER

#### 3.1.1 Description

Potential impact to groundwater include:

- Water management activities lowering the watertable beyond the reach of plant roots
- Water management activities creating increased groundwater drawdown
- Water management activities impacting on the watertable and increasing salinity which affects groundwater conditions
- Water management activities impacting on the watertable and increasing salinity which affects plant growth
- Contamination of groundwater and ecosystems from chemical spills
- Greater groundwater inflow than anticipated necessitating off-site discharge
- Leaking septic tank contaminating groundwater

#### 3.1.2 Potential Receptors

The sensitive receptors associated with water include:

- Ecology
- Ecosystems
- Groundwater
- Vegetation

#### 3.1.3 Control Measures

Table 3-1 Control Measures - Ground Water

Control Description	Responsibility
Ensure an appropriate "Works on Waterways" permit is obtained from a CMA/water authority as required.	Quarry Manager
Develop and implement an inspection and maintenance program for sediment and erosion control features.	Quarry Manager
Monitor groundwater levels	Quarry Manager
Monitor vegetation health	Quarry Manager
Provide supplementary watering as required	Quarry Manager
Monitor groundwater quality	Quarry Manager
Installation of clay lining on perimeter bunds	Quarry Manager

Control Description	Responsibility
Ensure that refueling and maintenance activities are conducted away from groundwater-sensitive areas.	All staff
Limit the volume of hazardous substances stored onsite to the minimum required for the activity.	Quarry Manager

## 3.2 SURFACE WATER

### 3.2.1 Description

Potential impact to surface water include:

- Increased sedimentation in water bodies, leading to reduced water quality and harm to aquatic habitats.
- Accidental spills of fuels, lubricants, or other hazardous materials can enter surface water
- Water contamination from improper disposal of quarry waste and by-products.
- Increased risk of flooding due to altered water flow and quarry pit operations.
- Chemical usage impacting land and surface waters during operations
- Wastewater from washing vehicles and machines flowing to surface water bodies

### 3.2.2 Potential Receptors

The sensitive receptors associated with water include:

- Ecology
- Ecosystems
- Vegetation
- Waterways

### 3.2.3 Control Measures

Table 3-2 Control Measures - Surface Water

Control Description	Responsibility
Ensure an appropriate "Works on Waterways" permit is obtained from a CMA/water authority as required.	Quarry Manager
Develop and implement an inspection and maintenance program for sediment and erosion control features.	Quarry Manager
Monitor vegetation health	Quarry Manager
Provide supplementary watering as required	Quarry Manager
Monitoring of water quality in waterway	Quarry Manager
Monitor water quality in ponds	Quarry Manager
Installation of clay lining on perimeter bunds	Quarry Manager
Encourage staff to report any signs of contamination or environmental hazards they observe	All staff
Train personnel on proper spill response procedures and provide spill kits in key areas	Quarry Manager
Conduct regular inspections and maintenance of equipment to prevent leaks and spills	Quarry Manager
Regularly inspect and maintain drainage systems to ensure they are functioning effectively during heavy rainfall	Quarry Manager
Limit the volume of hazardous substances stored onsite to the minimum required for the activity.	Quarry Manager



Control Description	Responsibility
Provide impervious secondary containment for all HazSub storage areas, and protect from rainfall and stormwater ingress.	Quarry Manager
Label all containers of hazardous substances (including decanted substances and wastes) with the name of the material and the correct hazard symbol.	All staff
Provide and maintain spill kits at all HazSub storage and handling areas.	Quarry Manager
Remediate and report spills of hazardous substances as soon as they are identified.	All Staff
Inspect and maintain spill control equipment, (e.g. bunds, oil water interceptors, sediment traps, ponds etc) to ensure sufficient capacity is available to contain contaminated run-off.	Quarry Manager
Provide spill protection around areas used for onsite refuelling and/or maintenance.	Quarry Manager
Field personnel provided with information and training on spill control measures to prevent the discharge of contaminants from the site.	Quarry Manager
Document and report to EPA any spill of hazardous or flammable substances stored or used on site.	Quarry Manager

### 3.3 DUST AND AIR QUALITY

#### 3.3.1 Description

Potential project impacts caused by dust include:

- Dust impacting neighbours from equipment and trucks
- Dust impacting vegetation from equipment and trucks
- Dust impacting neighbours from stockpiles
- Dust impacting neighbours from product excavation and transport onsite
- Uncontrolled dust during handling of filter cake impacting neighbours
- Dust impacting neighbours from screening during processing

#### 3.3.2 Potential Receptors

The sensitive receptors associated with dust include:

- Vegetation
- Neighbours
- General Public

#### 3.3.3 Control Measures

Table 3-3 Control Measures - Dust and Air Quality

Control Description	Responsibility
Locate the operational area of the site (including active stockpiles) at least 100 m from any sensitive receptor.	Quarry Manager
Seal/gravel onsite roads located within 250 m of a sensitive receptor to minimise dust generation.	Quarry Manager
Establish, signpost and enforce speed limits to minimise dust generation from vehicles on unsealed roads.	Quarry Manager
Limit vehicle movements to sealed / watered areas or stop vehicle movements during windy conditions.	Quarry Manager

Control Description	Responsibility
Cover vehicles carrying dusty materials (soil, sand, rocks etc) when transferring material to/from the site.	All staff
Install and use wheel wash and/or rumble grids at vehicle exit points.	Quarry Manager
Develop and implement a dust monitoring program where there are dust-sensitive receptors located within 1 km of the Work Authority area.	Third-party
Availability onsite of at least 2,000 L of water per hectare of disturbed land for dust control.	Quarry Manager
Water unpaved site roads to control dust emissions.	All staff
Provide field personnel with information and training on the measures used to prevent dust generation and emissions at the site.	Quarry Manager
Maintain existing vegetation (outside of the minimum cleared area required for an activity) in its original condition to act as a dust screen.	All staff
Plan and construct the final landform to minimise dust generation.	All staff and Third Party
Maintain active soil and overburden stockpiles with stable slopes to minimise surface dust and erosion.	All staff
Physically mark out the boundaries of the work area to identify permitted / prohibited areas of soil disturbance, vegetation clearing etc	All staff
Promptly vegetate rehabilitated areas	Quarry Manager
Use water sprays where needed in operational areas	All staff
Spray and extraction systems are maintained in an operable condition	All staff
Install vegetated bunds on perimeter near receptors	All staff
Increased monitoring frequency on hot, dry or windy days	Quarry Manager
Turn machinery and vehicles off when not in use.	All staff
Maintain all vehicles and construction equipment in good working order to prevent excessive exhaust emissions in accordance with the manufacturer's specification to comply with all relevant legislation	All staff
Ensure storage/workshop areas are well ventilated	Quarry Manager

### 3.3.4 Procedures

The SEMP for dust, detailing procedures, is contained as an appendix to the Air Quality Assessment.

## 3.4 NOISE

### 3.4.1 Description

Potential noise impacts include:

- Noise impacting neighbours from equipment and trucks during construction works
- Noise impacting neighbours from equipment during land clearing / topsoil removal
- Pumps from dewatering creating noise beyond the site boundary
- Noise impacting neighbours from product excavation and transport
- Noise impacting neighbours from screening during processing

### 3.4.2 Potential Receptors

Potential receptors include:

- Neighbours 200m west of West Pit and 190m north-east of East Pit
- Staff

### 3.4.3 Control Measures

Table 3-4 Control Measures - Noise

Control Description	Responsibility
Locate noise generating plant and equipment away from noise sensitive receptors or land uses.	Quarry Manager
Plan the site layout to screen operational areas from noise sensitive receptors.	Quarry Manager
Maintain (active) site roads in good condition.	Quarry Manager
Fit internal combustion engines with suitable mufflers and maintain equipment in good repair.	Third Party
Fit mobile noise generating equipment with noise attenuation devices (e.g. enclosures, baffles, silencers etc) and maintain equipment in good repair.	Third Party
Limit offsite materials haulage activities to standard operating hours.	All staff
Turn off plant, equipment and vehicles when not in use.	All staff
Installed security alarms will be the silent type connected to a security service.	Quarry Manager
Develop and implement noise monitoring program where there are noise-sensitive receptors located within 500 m of the Work Authority area.	Third Party
Extraction in the northern areas between 0600-0700 to be below 6 mbgl, or below 3 mbgl with a 3m high bund between pit and receptor	All staff
Maintain noise generating equipment (e.g. crushers, earth moving equipment) in good working order and accordance with the manufacturer's specifications.	Third Party
Noise bund 3m high on western side of haul route to west pit	Quarry Manager
Provide personnel with information and training on the site's noise mitigation measures.	Quarry Manager
Specify low noise generating equipment when selecting equipment for use onsite.	Quarry Manager
Locate working areas, loading areas and stockpiles to minimise the need for vehicles (with reversing alarms) to reverse onsite.	Quarry Manager

## 3.5 NATIVE VEGETATION

### 3.5.1 Description

Potential impacts to native vegetation include:

- Impacts to unexpected, threatened flora and fauna
- Introduction of invasive plant species through machinery

### 3.5.2 Potential Receptors

Potential receptors include:

- Retained native vegetation located within the north east corner of the site
- Vegetation buffer

### 3.5.3 Control Measures

Table 3-5 Control Measures - Native Vegetation

Control Description	Responsibility
Access to vegetation protection zones will be at the discretion of the Quarry Environment Manager. Permitted activities within these zones will include	Quarry Manager

Control Description	Responsibility
weed, pest and pathogen management, as well as groundcover management (if required)..	
Vehicle access is to be restricted to the approved internal road network	All staff
All vehicles to be kept away from native vegetation areas	All staff

## 4. MONITORING AND REPORTING

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The potential impacts of the extraction operations will be monitored. The Environmental Management Plan has identified several aspects that will require monitoring during the life of the quarry. Monitoring is undertaken via either:

- Routine daily site inspections undertaken by site staff; or
- Periodic targeted monitoring of aspects by technical professionals

### 4.1 SITE INSPECTIONS

The following aspects will be monitored during weekly site inspections:

- Responses to complaints and incident reports – any aspect.
- Geotechnical stability of batters.
- Dust:
  - Effectiveness of mitigation measures
  - Wind direction and speed.
  - Visible dust associated with vehicle movements.
  - Dust from stockpiles or exposed areas.
  - Dust on vegetation and adjacent to access routes and active areas.
  - Volumes of water available for dust mitigation;
- Traffic management:
  - Road condition.
  - Compliance with site speed limits and other traffic management requirements; and
  - Frequency and timing of vehicle movements.
- Surface drainage:
  - Sediment traps.
  - Water diversion drains.
  - Stockpiles.
  - Receiving waterways; and
  - Records of maintenance works.

The following aspects will be monitored during monthly site inspections:

- Noise:
  - Location of plant and equipment relative to receptors.
  - Noise levels at receptors;
  - Vehicle/equipment service records (monthly).
- Visual impact:
  - Vegetation in perimeter buffer areas;
- Waste and litter:
  - Perimeter fences for litter.
  - Bin security and capacity;
  - Evidence of the presence of vermin.
- Contamination:
  - Security of chemical storage areas.
  - Update of hazardous materials inventory.
  - Replenish spill kits (if required).
  - Evidence of spills;
  - Check sump/interceptor.
  - Maintain and review register of hazardous and flammable substances held on site.



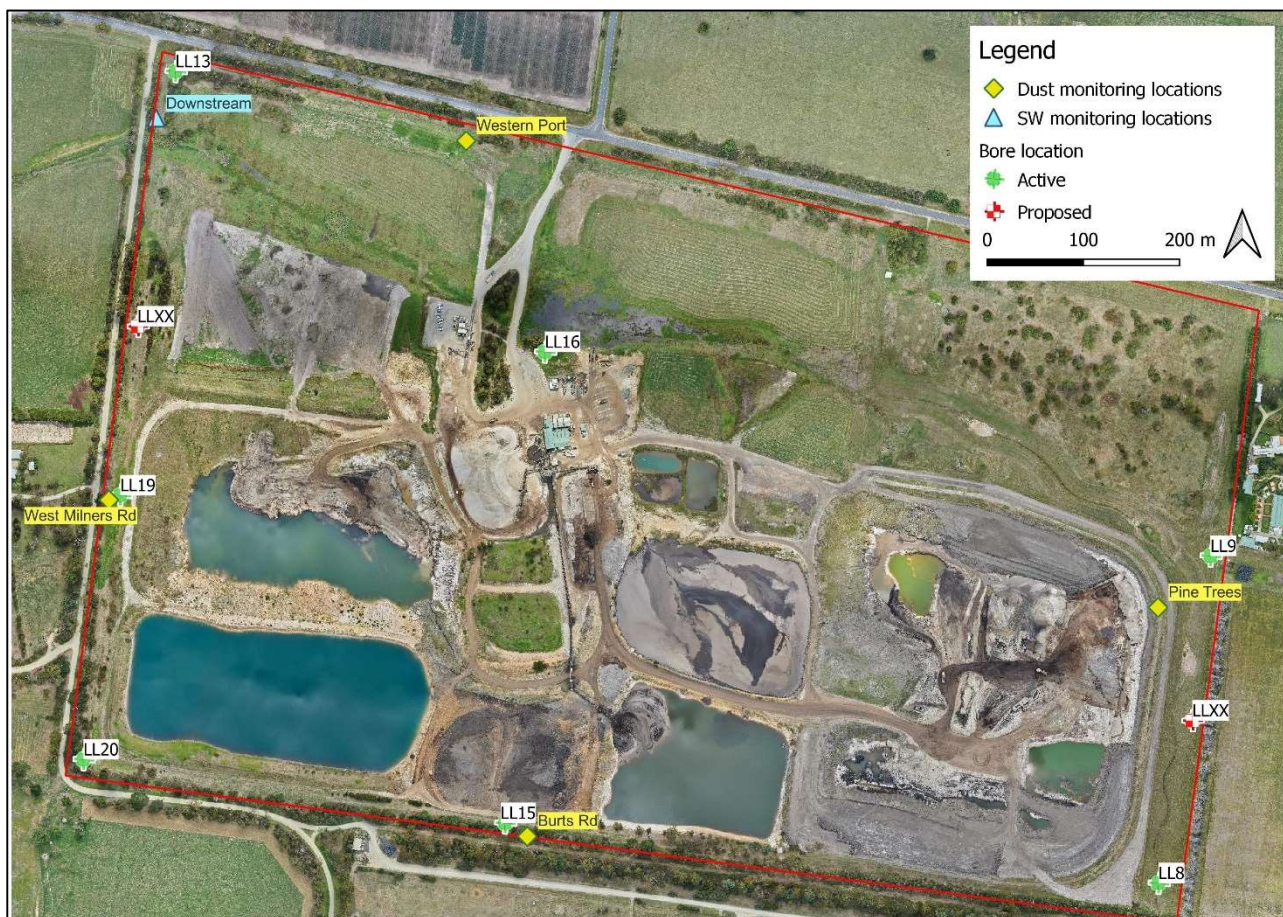
An environmental checklist is to be undertaken alongside weekly/monthly site inspections.

## 4.2 PERIODIC MONITORING - SUMMARY

The sites risk management plan includes dust monitoring, groundwater monitoring and surface water monitoring, these monitoring procedures have been included within Appendix A. A summary follows:

Monitoring locations relevant to quarrying operations are presented in **Figure 4-1**.

Figure 4-1 Monitoring locations



### 4.2.1 Groundwater

The groundwater monitoring program includes seven groundwater monitoring wells. In accordance with SRW requirements an additional two monitoring bore's indicative locations are shown in **Figure 4-1** to the lower shallow aquifer below the carbonaceous layer. The sampling requirements (including sampling techniques and quality assurance/quality control (QA/QC)) samples are included in **Appendix A**.

The objectives of the monitoring is to:

- Increase the understanding of the site conceptual model
- Provide groundwater level information for ongoing site management and tracking of groundwater levels
- Provide groundwater quality data to identify potential impacts on the environmental values of groundwater
- Identify the development of potentially hazardous geotechnical conditions around the pit

The groundwater monitoring program prior to closure includes the following:



- Groundwater level – quarterly readings recorded as Standing Water Level (SWL) which is the depth of water table below monitoring point. Reduced levels (RWL) are to be calculated from the SWL and the surveyed elevation of the monitoring point at top of casing (TOC)
- Field parameters to be recorded during sampling and purging of bores includes pH, electrical conductivity (EC), dissolved oxygen concentration (DO), temperature and redox potential (Eh)
- Groundwater quality – Groundwater samples are to be collected annually in accordance with Groundwater Sampling Guidelines (EPA Publication 669.1)
- Laboratory analysis for Total Dissolved Solids (TDS), major cations (Ca, Mg, Na, K), major anions (Cl, SO<sub>4</sub> alkalinity), and the following metals: (total and soluble) Fe, Mn, Cu, Pb, Zn, Al and As
- Data quality samples including duplicates, field blanks and rinsates are to be analysed for the same analyte suite as the samples.

Following rehabilitation the frequency of groundwater level monitoring shall reduce to annual. Groundwater quality sampling as outlined above will be undertaken biennially (every 2 years). Reporting will be undertaken biennially also. Monitoring will continue for ten years or as deemed necessary by regulators.

A report will be prepared annually (year) presenting:

- New collected since the previous annual report
- An assessment of the data quality for new data
- Additional data from neighbouring sites, if available
- An assessment of water level trends
- Identification of water quality trends
- Evaluation of impacts to environmental values of groundwater

The report will be provided to regulatory agencies upon request.

#### 4.2.1.1 Management Response

The following table summarises the response required from Hanson management team in the event that unacceptable impacts are identified by the groundwater monitoring program.

Table 4-1 Groundwater management responses

Parameter	Trigger	Actions
Groundwater level	Unacceptable groundwater level decline	Placement of additional clay on pit batters. Additional monitoring at receptor bores
Groundwater chemistry	Impacts on environmental values are confirmed	Additional monitoring at receptor bores Investigations to identify source and extent of contamination Address/rectify source of contamination Investigate options and need for remedial actions. Investigate using alternative chemical products

#### 4.2.2 Surface water

Two monitoring locations are identified on **Figure 4-1**.

The locations include an Upstream and Downstream location at the entry and exit points of the watercourse respectively. Monitoring is to be undertaken when the drainage line is flowing. The following parameters will be recorded in the field:

- pH.
- Electrical Conductivity (EC); and
- Visual appearance.

Samples collected annually and will be analysed for the following:

- Turbidity (Lab).
- Major cations and anions.
- Total Recoverable Hydrocarbons (TRH).
- Nutrients – ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total phosphorus.

#### 4.2.3 Dust

The SEMP for dust is contained as an appendix to the Air Quality Assessment. This section provides an overview of the dust monitoring requirements.

Dust monitoring is to be undertaken in three forms:

- Visual observations – monitoring is described in **Section 4.1**
- Gravimetric sampling – ambient (deposition) sampling of total suspended particles (TSP)
- Real time sampling

Parameters to be monitored include dust deposition, and real time monitoring for PM<sub>10</sub> and PM<sub>2.5</sub>. Heidelberg Materials are currently exploring options for the real time sampling and until this is operational depositional dust monitoring will continue at the existing dust monitoring locations shown on **Figure 4-1**. on a quarterly basis.

Table 4-2 Dust acceptance criteria (real time monitoring)

Pollutant	Air Quality Criterion	Allowable exceedances	Source
PM <sub>10</sub>	165 µg/m <sup>3</sup> (10 minute average)	0	Guideline for Assessing and Minimising Air Pollution in Victoria (for air pollution managers and specialists). EPA Publication 1961 February 2022
	150 µg/m <sup>3</sup> (15 minute average)	0	
	120 µg/m <sup>3</sup> (30 minute average)	0	
	80 µg/m <sup>3</sup> (1 hour average)	0	
	50 µg/m <sup>3</sup> (1 day average)	0	
	20 µg/m <sup>3</sup> (1 year average)	0	
PM <sub>2.5</sub>	25 µg/m <sup>3</sup> (1 day average)	0	Environment Reference Standard (ERS)
	8 µg/m <sup>3</sup> (1 year average)	0	

Hanson will install a continuous real-time dust monitor on the northern site boundary. Hanson is currently evaluating equipment options.

#### 4.2.4 Reporting

The annual monitoring report documents the monitoring undertaken, results and their interpretation. The report includes:

- In-depth review of the monitoring program.
- Summary of the data analysis.
- Data interpretation.
- Identification of opportunities for improvement; and
- Development of a plan for the next subsequent year.

## 4.3 INCIDENT REPORTING

### Responsibilities of Workers

All workers, including employees and contractors, are responsible for ensuring the timely and effective internal reporting of any incidents they are involved in or witness.

### Environmental Incident Reporting

Environmental incident reports must include:

1. Lessons learned from the incident.
2. Proposed measures to prevent similar incidents in the future.

Immediate actions will be taken to minimise and mitigate the impacts of incidents, and appropriate controls will be implemented. All incidents must be resolved and closed out as quickly as possible, with necessary actions taken to address each environmental issue.

### Reporting Notifiable Incidents

The Heidelberg Materials Environmental representative or Quarry Manager is responsible for notifying the EPA as soon as practicable after becoming aware of any notifiable incident or pollution incident that causes or threatens to cause “material harm” to human health or the environment.

### Definition of a Notifiable Incident

Section 32 of the Environment Protection Act 2017 defines a notifiable incident as:

1. Adversely affects human health or the environment.
2. Impacts an area of high conservation value or special significance.
3. Requires cleanup, management, or restoration costs of \$10,000 or more.

### Notification Process

1. Initial Notification: Notify the EPA immediately upon awareness of the incident.
2. Follow-Up Form: Following the initial notification, the EPA will provide a notification form via email. This form must be completed and returned within five business days. The notification process is not considered complete until the form is submitted.

### Commitment to Incident Management

All efforts will be made to avoid and reduce the impacts of incidents through immediate action and the implementation of effective controls. The lessons learned from each incident will be used to strengthen preventive measures and enhance environmental protection practices.

## 5. REFERENCES

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## Appendix A Monitoring procedures

### Periodic Monitoring Program: Dust

#### Depositional Dust Monitoring Procedure

Item	Description
Purpose	This procedure describes the operating principles, installation, operation, and maintenance of the dust monitoring devices.
Standards / relevant legislation	AS/NZS 3580.10.1:2016 <i>Methods for sampling and analysis of ambient air – Method 10.1: Determination of particulate matter – Deposited matter – Gravimetric method.</i>
Definitions	NATA – National Association of Testing Authorities, Australia
Procedure	Depositional dust samples should be collected in accordance with AS/NZS 3580.10.1. Key steps from the standard are identified below.
Location	Sampling locations are shown in <b>Figure 4-1</b>
Gauge Positioning	The gauge will be positioned 2 +/- 0.2m above the ground where possible. Factors such as tampering need to be considered when positioning.
Period of exposure	Exposure times for the samples will be 90 +/- 2 days.
Procedure for collecting	<ol style="list-style-type: none"> <li>1. Clean bottles are sourced from a NATA accredited laboratory. Bottles should be carefully stored to prevent breakage.</li> <li>2. At the collection interval wash and brush any matter on the funnel into the gauge using a minimum quantity of distilled water and a small clean brush.</li> <li>3. Remove the funnel and seal with a cap. Label the bottle with location, date and time information and send to the laboratory within 30 days of collection.</li> <li>4. Replace the gauge with a new bottle and clean funnel.</li> </ol>
Analysis	Analysis of dust concentration should be performed by a NATA accredited laboratory. Hanson will engage the current monitoring contractor to undertake the laboratory analysis and interpretation of the results.
Recording	Hanson's current monitoring contractor will produce a report with the results from the analysis

## Periodic Monitoring Program: Groundwater

### Groundwater Monitoring Procedure

Item	Description
Purpose	This procedure describes the operating principles, installation, operation, and maintenance of the groundwater monitoring devices.
Standards relevant legislation	EPA Victoria <i>Sampling and Analysis of Waters, wastewaters, soils, and wastes</i> IWRG701 EPA Victoria <i>Groundwater Sampling Guidelines</i> EPA Publication 669.1
Preparations	<ul style="list-style-type: none"> <li>• Field instruments are to be calibrated prior to travel to site with calibration records kept with field records.</li> <li>• Prepare / review Health and Safety Plan for the task.</li> <li>• Ensure appropriate PPE is worn, use clean nitrile gloves while sampling.</li> <li>• Document weather conditions prior to commencement of monitoring.</li> <li>• On arrival at site hold ‘toolbox’ meeting and review and sign Health and Safety Plan</li> </ul>
Personal Protective Equipment	<ul style="list-style-type: none"> <li>• Nitrile gloves.</li> <li>• Steel cap footwear.</li> <li>• Long sleeves and trousers.</li> <li>• Safety glasses.</li> <li>• Sun hat and sunscreen.</li> <li>• First aid kit.</li> <li>• Charged mobile phone.</li> </ul>
Decontamination	<p>Equipment:</p> <ul style="list-style-type: none"> <li>• Phosphate free detergent (Decon 90, or equivalent).</li> <li>• De-ionised water.</li> <li>• Tap water.</li> </ul> <p>Method:</p> <p>Equipment will be decontaminated as follows:</p> <ul style="list-style-type: none"> <li>• Washing thoroughly in a bucket with phosphate free detergent (e.g., Extran/Decon90).</li> <li>• Rinsing thoroughly in a second bucket using potable water; and</li> <li>• Rinsing thoroughly with de-ionised water.</li> </ul>
Sampling procedure	<p>Preparations</p> <p>Method</p> <ul style="list-style-type: none"> <li>• Document weather conditions time of sampling</li> <li>• Locate bores on map. Ensure bore numbers are clearly identified and samples are taken accordingly.</li> <li>• Plan sampling route such that the bores most likely to be contaminated are sampled last.</li> <li>• Decontaminate and rinse all sampling equipment prior to collection of each sample using a 3% solution of phosphate free detergent (Decon 90 or Extran) and distilled water, respectively.</li> <li>• Open well and clear any foreign material as required.</li> <li>• Using an electronic water level meter measure and record the total depth and depth to water.</li> </ul>



Item	Description
	<ul style="list-style-type: none"> <li>• If the bore is to be sampled by means other than low flow sampling the stagnant water in the well will need to be removed (at least 3 bore volumes) so that water representative of the groundwater can be sampled.</li> <li>• Calculate the volume of water in the well for purging using the following formula: <div data-bbox="620 376 1147 797" style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Bore Volume = casing volume + filter pack volume  <math display="block">= \pi h_1 d_2^2 / 4 + n(\pi h_1 d_1^2 / 4 - \pi h_2 d_2^2 / 4)</math></p> <p>Where: <math>\pi = 3.14</math></p> <p><math>n</math> = porosity (0.3 for most filter pack material)</p> <p><math>h_1</math> = height of water column  <math>d_1</math> = diameter of annulus  <math>h_2</math> = length of filter pack  <math>d_2</math> = diameter of casing</p> </div> </li> </ul> <p><b>Sampling using bailers or pump</b></p> <p>Equipment</p> <ul style="list-style-type: none"> <li>• Stainless steel or disposable bailers or pump.</li> <li>• Water level meter.</li> <li>• Water quality meter.</li> <li>• Filters.</li> <li>• Sample bottles.</li> <li>• Bucket.</li> <li>• Ice and container.</li> <li>• Twine / cord (venetian blind cord is recommended); and</li> <li>• Field data forms.</li> </ul> <p>Method</p> <ul style="list-style-type: none"> <li>• Document weather conditions time of sampling as well as colour, turbidity and odour of the waters being tested.</li> <li>• If using a bailer: <ul style="list-style-type: none"> <li>○ Attach clean strong string to a bailer which is long enough to submerge the bailer into the water with a sturdy knot so as not to lose bailer down the well.</li> <li>○ Tie the other end of string to firm object (e.g., monument bore cover).</li> <li>○ Lower the bailer into the well at least 100mm below the surface of the water to obtain a sample.</li> </ul> </li> <li>• If using a pump: <ul style="list-style-type: none"> <li>○ Check equipment is correctly assembled so you don't lose components down bore.</li> <li>○ Lower submersible pump / hosepipe into bore.</li> <li>○ Set at the appropriate depth based on well construction and depth to water.</li> </ul> </li> <li>• Purge/remove 3-5 bore volumes to completely refresh the well.</li> <li>• After each bore volume pour a quantity of water into the bucket.</li> <li>• Record field parameters (pH, EC, DO, Eh, temperature) on field data forms.</li> <li>• Empty bucket.</li> <li>• Dispose of purged water away from immediate work area.</li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>• Monitor the following parameters which may be considered stable when three consecutive readings are within:                             <ul style="list-style-type: none"> <li>○ ± 10% for dissolved oxygen.</li> <li>○ ± 3% for electrical conductivity.</li> <li>○ ± 0.05 for pH; and</li> <li>○ ± 10mv for redox potential.</li> </ul> </li> <li>• When parameters have stabilised collect the sample (the same bailer maybe used).</li> <li>• If the bore bails/pumps dry before 3 bore volumes are removed, then record details on field data form and allow bore to recover before collecting samples.</li> <li>• Sample for metals analysis should be filtered:                             <ul style="list-style-type: none"> <li>○ Samples for metals require filtering via a 0.45µm filter.</li> <li>○ Sampled must be transferred from the decontaminated collection vessel or bailer through the filter and directly into a laboratory supplied nitric acid preserved sample bottle for metals.</li> </ul> </li> <li>• Fill sample bottles to the line.</li> <li>• Transfer samples into laboratory-prepared sample bottles/containers.</li> <li>• Label with Date, Location, Sample ID, time, and Sampler name.</li> <li>• New cord is to be used for each bore.</li> <li>• If a stainless-steel bailer was used, it must be decontaminated before moving to another bore.</li> <li>• Remove sampling equipment from the well.</li> <li>• Record post sampling depth to water; and</li> <li>• Replace lid and lock well.</li> </ul> <p><b>Micro purge / Low flow sampling</b></p> <p>Equipment</p> <ul style="list-style-type: none"> <li>• Micro Purge Pump - including 12V compressor, controller.</li> <li>• Flow through cell.</li> <li>• Water level meter.</li> <li>• Water quality meter.</li> <li>• Filters.</li> <li>• Sample bottles.</li> <li>• Ice and container; and</li> <li>• Field data forms.</li> </ul> <p>Method</p> <ul style="list-style-type: none"> <li>• Document weather conditions time of sampling as well as colour, turbidity and odour of the waters being tested.</li> <li>• Check equipment is correctly assembled so you don't lose components down bore.</li> <li>• Lower submersible pump slowly into bore to minimise disturbance of the water column.</li> <li>• Set the inlet above the middle of the screened interval at the point where the contaminant concentration is required. Placement to close to the bottom will result in atypical sediment sampling.</li> <li>• Lower water level meter into borehole.</li> <li>• Purge initially at 100mL/min if the specific rate for that bore is not known.</li> <li>• Monitor drawdown and adjust rate to minimise drawdown.</li> <li>• Attach the effluent to the flow through cell and insert water quality meter probes.</li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>• Record field parameters (pH, EC, DO, Eh, temperature) on field data forms.</li> <li>• Monitor the following parameters which may be considered stable when three consecutive readings are within:                             <ul style="list-style-type: none"> <li>○ ± 10% for dissolved oxygen.</li> <li>○ ± 3% for electrical conductivity.</li> <li>○ ± 0.05 for pH; and</li> <li>○ ± 10mv for redox potential.</li> </ul> </li> <li>• When parameters have stabilised collect the samples into laboratory-prepared sample bottles/containers directly from the sampling tube.</li> <li>• Sample for metals analysis should be filtered.                             <ul style="list-style-type: none"> <li>○ Samples for metals require filtering via a 0.45µm filter.</li> <li>○ Sampled must be transferred from the decontaminated collection vessel through the filter and directly into a laboratory supplied nitric acid preserved sample bottle for metals.</li> </ul> </li> <li>• Fill sample bottles to the line.</li> <li>• Label with Date, Location, Sample ID, time, and Sampler name.</li> <li>• New tube is to be used for each bore.</li> <li>• Remove sampling equipment from the well.</li> <li>• Record post sampling depth to water; and</li> <li>• Replace lid and lock well.</li> </ul>
QAQC	<p>Rinsate blanks</p> <ul style="list-style-type: none"> <li>• Rinsate blanks to be collected at the end of each day.</li> <li>• Taken from the final rinse of equipment after decontamination.</li> </ul> <p>Blind Duplicates</p> <ul style="list-style-type: none"> <li>• Taken in immediate succession and subjected to the same filtering, preservation, holding and analysis methods.</li> <li>• Submit to primary laboratory.</li> <li>• Label in a way that does not indicate it is a duplicate.</li> </ul>
Sample Handling	<ul style="list-style-type: none"> <li>• Immediately store samples in an ice cooled, insulated, and sealed container for transport to the laboratory for analysis within the minimum holding times.</li> <li>• Chain of custody procedures will be used to ensure transport to the laboratory is documented. Documentation will include:                             <ul style="list-style-type: none"> <li>○ The name of the person transferring the samples.</li> <li>○ The name of person receiving the samples, e.g., laboratory staff.</li> <li>○ The time and date the samples were taken.</li> <li>○ The time and date the samples were received; and</li> <li>○ The analytes to be determined, including detection limits.</li> </ul> </li> </ul>

## Periodic Monitoring Program: Surface Water

### Surface Water Monitoring Procedure

Item	Description
Purpose	This procedure describes the operating principles, installation, operation, and maintenance of the groundwater monitoring devices.
Standards relevant legislation	EPA Victoria <i>Sampling and Analysis of Waters, wastewaters, soils, and wastes</i> IWRG701
Preparations	<ul style="list-style-type: none"> <li>• Field instruments are to be calibrated prior to travel to site with calibration records kept with field records.</li> <li>• Prepare / review Health and Safety Plan for the task.</li> <li>• Ensure appropriate PPE is worn, use clean nitrile gloves while sampling.</li> <li>• Document weather conditions prior to commencement of monitoring.</li> <li>• On arrival at site hold 'toolbox' meeting and review and sign Health and Safety Plan</li> </ul>
Personal Protective Equipment	<ul style="list-style-type: none"> <li>• Nitrile gloves.</li> <li>• Steel cap footwear.</li> <li>• Long sleeves and trousers.</li> <li>• Safety glasses.</li> <li>• Sun hat and sunscreen.</li> <li>• First aid kit.</li> <li>• Charged mobile phone.</li> </ul>
Decontamination	<p>Equipment:</p> <ul style="list-style-type: none"> <li>• Phosphate free detergent (Decon 90, or equivalent).</li> <li>• De-ionised water.</li> <li>• Tap water.</li> </ul> <p>Method:</p> <p>Equipment will be decontaminated as follows:</p> <ul style="list-style-type: none"> <li>• Washing thoroughly in a bucket with phosphate free detergent (e.g., Extran/Decon90).</li> <li>• Rinsing thoroughly in a second bucket using potable water; and</li> <li>• Rinsing thoroughly with de-ionised water.</li> </ul>
Sampling procedure	<p>Equipment:</p> <ul style="list-style-type: none"> <li>• Telescopic sampler with sample cup or stainless-steel bucket.</li> <li>• Water quality meter.</li> <li>• Ice and container.</li> <li>• Sample bottles containing preservatives.</li> </ul> <p>Method:</p> <ul style="list-style-type: none"> <li>• Identify an appropriate sampling point providing safe access. Document any access issue which may affect ongoing monitoring.</li> <li>• Sampling to be conducted by using either a stainless-steel bucket or collect water directly into laboratory supplied containers, telescopic sampler, or other sampling device.</li> <li>• Submerge the sampling equipment in the surface water being careful not to disturb dam/creek sediment.</li> <li>• Measure and record field parameters including pH, EC,</li> <li>• Collect sample.</li> </ul>

Item	Description
	<ul style="list-style-type: none"> <li>• Sample for metals analysis should not be filtered.</li> <li>• Transfer samples into laboratory-prepared sample bottles/containers; and</li> <li>• Label with Date, Location, Sample ID, time, and Sampler name.</li> </ul>
QAQC	<p>Rinsate blanks</p> <ul style="list-style-type: none"> <li>• Rinsate blanks to be collected at the end of each day.</li> <li>• Taken from the final rinse of equipment after decontamination.</li> </ul> <p>Blind Duplicates</p> <ul style="list-style-type: none"> <li>• Taken in immediate succession and subjected to the same filtering, preservation, holding and analysis methods.</li> <li>• Submit to primary laboratory.</li> <li>• Label in a way that does not indicate it is a duplicate.</li> </ul>
Sample Handling	<ul style="list-style-type: none"> <li>• Immediately store samples in an ice cooled, insulated, and sealed container for transport to the laboratory for analysis within the minimum holding times.</li> <li>• Chain of custody procedures will be used to ensure transport to the laboratory is documented. Documentation will include:                         <ul style="list-style-type: none"> <li>○ The name of the person transferring the samples.</li> <li>○ The name of person receiving the samples, e.g., laboratory staff.</li> <li>○ The time and date the samples were taken.</li> <li>○ The time and date the samples were received; and</li> <li>○ The analytes to be determined, including detection limits.</li> </ul> </li> </ul>



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