### Document Name
Peppertree Quarry Water Management Plan

### Document Filename
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### Document Location
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### Change History

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<th>Date</th>
<th>Change Description</th>
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<th>Version</th>
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<td>Original Final</td>
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<th>Explanation</th>
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<tbody>
<tr>
<td>ADWG</td>
<td>Australian Drinking Water Guideline</td>
</tr>
<tr>
<td>AEMR</td>
<td>Annual Environmental Management Report</td>
</tr>
<tr>
<td>ANZECC Guides</td>
<td>Australian and New Zealand Environment Conservation Council Guidelines 2000</td>
</tr>
<tr>
<td>CEMP</td>
<td>Construction Environmental Management Plan</td>
</tr>
<tr>
<td>CoA</td>
<td>Condition of Approval</td>
</tr>
<tr>
<td>DO</td>
<td>Dissolved Oxygen</td>
</tr>
<tr>
<td>DP&amp;E</td>
<td>Department of Planning &amp; Environment</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
</tr>
<tr>
<td>EC</td>
<td>Electrical Conductivity</td>
</tr>
<tr>
<td>EPA</td>
<td>Environment Protection Authority</td>
</tr>
<tr>
<td>EP&amp;A Act</td>
<td>Environmental Planning and Assessment Act, 1979</td>
</tr>
<tr>
<td>EPL</td>
<td>Environment Protection Licence</td>
</tr>
<tr>
<td>HSEQMS</td>
<td>Health, Safety, Environment and Quality Management System</td>
</tr>
<tr>
<td>MHRDC</td>
<td>Maximum Harvestable Right Dam Capacity</td>
</tr>
<tr>
<td>NHRMC</td>
<td>National Health and Medical Research Council</td>
</tr>
<tr>
<td>NorBE</td>
<td>Neutral or Beneficial Effect</td>
</tr>
<tr>
<td>NTU</td>
<td>Non Turbidity Units</td>
</tr>
<tr>
<td>OEMP</td>
<td>Operational Environmental Management Plan</td>
</tr>
<tr>
<td>PAH</td>
<td>Polycyclic Aromatic Hydrocarbons</td>
</tr>
<tr>
<td>PoEO Act</td>
<td>Protection of Environment Operations Act 1997</td>
</tr>
<tr>
<td>SEPP</td>
<td>State Environmental Planning Policy</td>
</tr>
<tr>
<td>SWA</td>
<td>Surface Water Assessment</td>
</tr>
<tr>
<td>SWMOP</td>
<td>State Water Management Outcomes Plan</td>
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<tr>
<td>TDS</td>
<td>Total Dissolved Solids</td>
</tr>
<tr>
<td>TN</td>
<td>Total Nitrogen</td>
</tr>
<tr>
<td>TP</td>
<td>Total Phosphorus</td>
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<td>Total Petroleum Hydrocarbons</td>
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<tr>
<td>TSS</td>
<td>Total Suspended Solids</td>
</tr>
<tr>
<td>WMP</td>
<td>Water Management Plan</td>
</tr>
<tr>
<td>WM Act</td>
<td>Water Management Act 2000</td>
</tr>
<tr>
<td>WQO</td>
<td>Water Quality Objectives</td>
</tr>
<tr>
<td>WSP</td>
<td>Water Sharing Plan</td>
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INTRODUCTION

1.1 BACKGROUND

Boral Resources (NSW) Pty Ltd (Boral) was granted Project Approval (06_0074) to establish and operate the Peppertree Quarry (a granodiorite hard rock quarry, formerly called the Marulan South Quarry) including all in-pit quarrying activities and supporting infrastructure such as a rail siding and loading facility, processing plant and water supply dams under Part 3A of the Environmental Planning and Assessment Act, 1979 (EP&A Act) in February 2007.

The 2007 Project Approval required the preparation and implementation of a number of management plans to guide the environmental management of the quarry throughout its operational life. In accordance with the Project Approval, a Water Management Plan (WMP) was first prepared by ERM for Boral in 2011.

In August 2016, the Project Approval was modified under Section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act), to allow an extension of in-pit operating hours and the establishment of a new overburden emplacement area (Modification No. 4).

This document updates the 2011 WMP to incorporate changes associated with Modification No. 4 and to reflect management of surface and groundwater associated with current quarry activities. In accordance with the requirements of CoA 26(a), this updated WMP will be submitted to the Secretary of the Department of Planning & Environment (DP&E) for approval prior to the commencement of construction of the Modification 4 overburden emplacement area.

The WMP is a dynamic document which will be updated over the life of quarry operations until the Project Approval end date of December 2038.

1.2 OVERVIEW OF OPERATIONS

The Quarry is located in Marulan South, 10 km south-east of Marulan, 35 km east of Goulburn and approximately 175 km south-west of Sydney, within the Goulburn Mulwaree Local Government Area (LGA) in the Southern Tablelands of NSW.

Peppertree Quarry has an identified resource area of approximately 250 million tonnes which, depending on extraction rates, would allow quarrying for 70 years or more over an area of approximately 104 ha, within a 650 ha parcel of land owned by Boral.

Figure 1.1 shows the site layout. The 2007 Project Approval was issued for an initial operation period of 30 years. Operations commenced in the northern portion of the resource area with an area of approximately 70 ha. This area is bordered by a densely vegetated area to the east, which flanks a steep gorge that extends into Morton National Park. A rail spur runs adjacent to the western site boundary and there are a small number of rural properties located to the north and west of the quarry. The nearest residences are located approximately 1.5 km from the quarry to the west in Marulan South and to the east on Long Point Road. The Boral Cement limestone mine is located immediately south of the quarry.

Quarry construction commenced in 2011 and operations commenced in early 2014. In 2014 and 2015 the quarry produced around 257,173 tonnes and 1,645,517 tonnes of aggregate respectively. The anticipated production for 2016 -17 is 2 million tonnes, however rates are dependent on market demand and production levels at other Boral hardrock quarries.
Typical quarrying operations involve the stripping of overburden and the extraction of hard rock using open-cut drill and blast techniques. Overburden is stripped by dozer, loaded onto trucks using excavators and/or front end loaders and transported to the overburden emplacement areas, where it is spread and shaped by dozer.

Traditional drill and blast methods are then used to break up the hard rock. A drill rig stationed on top of each production bench drills a series of holes that are later charged with explosives, detonators and delays. Boral apply a standard practice of limiting the maximum instantaneous charge to stay within the relevant noise and vibration criteria.

Blasted rock is then processed on-site using various crushers and screens to obtain the desired product. Material is initially crushed in a primary mobile crusher located within the pit, which is currently fed by an excavator, front end loaders and trucks. In the future in-pit works will avoid the use of trucks, with blasted rock fed directly into the primary mobile crusher by excavator.

After passing through the primary crusher, the crushed material is taken from the pit along a series of conveyors to the first set of screens located to the northwest of the pit and material is stockpiled in a surge pile. Material in the surge pile is reclaimed and conveyed to the main processing area where it undergoes further crushing, screening and shaping. Product material is stored in the various covered storage bins prior to being dispatched off-site by train.

Modification 4 was approved by the Minister for Planning in August 2016, allowing an increase of in-pit operating hours by 6 hours per day, 7 days a week in order to meet annual production volumes up to the approved limit of 3.5 million tonnes per annum. The modification also incorporated the Southern Overburden Emplacement. The Southern Overburden Emplacement is an extension to the existing Eastern Overburden Emplacement and is located within both Boral owned land and the Quarry’s development consent boundary. Overburden stripped from the pit will be transported to the Southern Overburden Emplacement where it will be spread and shaped by dozer. Overburden will be initially placed in the southern section of the overburden emplacement area and will progressively move northward toward the existing Eastern Overburden Emplacement.

Modification No. 4 involves the construction of sediment basins at the locations on the eastern side of the emplacement where runoff would drain to Barbers Creek (refer Section 5.3). All sediment basins associated with the modification will be constructed and operated for the purposes of sediment control and are therefore excluded from the requirements of the harvestable rights order and do not require licensing under the Water Management Act 2000 (refer Section 2.1.3).
1.3 **WMP Scope and Objectives**

The primary objective of this Water Management Plan (WMP) is to provide guidance and direction for the management and reuse of water through the operation of the Peppertree Quarry.

This WMP applies to all activities undertaken by Peppertree Quarry including quarrying, crushing, screening, stockpiling and transportation of quarries products, maintenance activities; and associated service and support functions.

The WMP provides the framework and guidance for quarry activities to be conducted in a manner that:

- complies with regulatory requirements including water licences, the Project Approval and the EPA Environment Protection Licence (EPL);
- meets the obligations and commitments identified in the Environmental Assessment (ERM, 2006) and the Modification 4 Environmental Assessment (Boral, 2016);
- ensures compliance with relevant environmental legislation;
- minimises dirty water generation by implementation of appropriate erosion and sediment controls;
- maintains water balances for sustainable use and provision of environmental flows to Tangarang Creek;
- protects surface and groundwater quality and availability;
- ensures appropriate water control systems are planned and established prior to commencement of any new quarrying activities with potential to impact water;
- ensures appropriate and representative monitoring is conducted for verification that the WMP is effectively implemented and meeting its objectives; and
- ensures appropriate contingencies and resources for mitigating adverse impacts to surface and groundwater from quarrying activities.

The performance criteria to be used to assess the success of the management actions are identified in Table 1.1.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance criteria</th>
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<tr>
<td>Compliance with regulatory requirements including water licences, Project Approval and EPA Environment Protection Licence</td>
<td>No non compliances</td>
</tr>
<tr>
<td>Minimisation of dirty water generation by implementation of appropriate erosion and sediment controls</td>
<td>Erosion and sediment controls in place</td>
</tr>
<tr>
<td>Maintain water balances for sustainable use and provision of environmental flows to Tangarang Creek;</td>
<td>10% environmental flow to Tangarang creek achieved 100% of the time.</td>
</tr>
<tr>
<td>Protection of surface and groundwater quality and availability</td>
<td>Controls as outlined in this WMP in place</td>
</tr>
<tr>
<td>Ensure appropriate water control systems are planned and established prior to commencement of any new quarrying activities with potential to impact water</td>
<td>Controls in place</td>
</tr>
<tr>
<td>Conduct appropriate and representative monitoring for verification that WMP is effectively implemented and meeing its objectives</td>
<td>Undertake monitoring as outlined in WMP</td>
</tr>
<tr>
<td>Having contingencies and resources for mitigating adverse impacts to surface and groundwater from quarrying activities.</td>
<td>Protocol as outlined in WMP to be in place and trained</td>
</tr>
</tbody>
</table>
1.4 Boral Commitments to Water Management

The Quarry operates under a Boral integrated Health, Safety, Environment and Quality Management System (HSEQMS). The HSEQMS has commitments to the Boral Environmental Policy through established standards and procedures which require internal conformance to high levels of environmental performance with continual improvement objectives.

The HSEQMS Water Standard (GRP-HSEQ-8-02) requires each Boral operation quarry to ensure that Activities that may impact on water resources are considered with measures put in place to comply with water usage and discharges on all internal and external requirements.

1.5 Alignment with Other Plans

A Biodiversity and Rehabilitation Management Plan (2017) including land stabilisation, fencing, planting and weed control has been prepared for the quarry. Water management outcomes included in this WMP have been developed to complement the rehabilitation objectives for the quarry.

This WMP incorporates the recommendations of the *Marulan South Environmental Assessment Report* (ERM, 2006) and the Surface Water Assessment (SWA) (Advisian, 2016) that was prepared as part of the Modification 4 application to assess potential impacts on drainage systems downstream of the Southern Overburden Emplacement.

1.6 Consultation

In accordance with the requirements of CoA 26(b), this WMP has been prepared in consultation with the DPI Water, EPA and WaterNSW.

A meeting was held with the EPA on 19 December 2016 to outline the approach to the plan. Email correspondence containing comments on the plan was received on 31 January 2017 (refer Appendix A).

Water NSW have not had an opportunity to visit the site, however they have reviewed and provided comment on the plan. This was via email on 1 March 2017.

DPI Water was contacted late last year with an invitation to review the drafted WMP. Due to the Christmas period, it was agreed that comments would be forthcoming in the new year. Comments were received in July.

All feedback from the EPA, NSW Water and DPI Water have been included in the revision of this WMP.
1.7 **DOCUMENT STRUCTURE**

The structure of the Management plan is outlined in Table 1.2

<table>
<thead>
<tr>
<th>Section</th>
<th>Content</th>
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<tbody>
<tr>
<td>1</td>
<td>Provides an overview of the project, and objectives of the plan</td>
</tr>
<tr>
<td>2</td>
<td>Details the statutory requirements as outlined in the conditions of consent dated August 2016</td>
</tr>
<tr>
<td>3</td>
<td>Describes the existing environment of the site</td>
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<tr>
<td>4</td>
<td>Describes the baseline water quality</td>
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<tr>
<td>5</td>
<td>Describes the water management actions in place and to be implemented in the operation of the quarry</td>
</tr>
<tr>
<td>6</td>
<td>Erosion and sediment controls – design, management and maintenance</td>
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<tr>
<td>7</td>
<td>Water quality monitoring protocols</td>
</tr>
<tr>
<td>8</td>
<td>Outlines incident planning and responses</td>
</tr>
<tr>
<td>9</td>
<td>Financial provisions for the work required</td>
</tr>
<tr>
<td>10</td>
<td>Specifies training requirements</td>
</tr>
<tr>
<td>11</td>
<td>Outlines the reporting and review requirements</td>
</tr>
<tr>
<td>12</td>
<td>Summarizes the management actions to be undertaken</td>
</tr>
<tr>
<td>13</td>
<td>Lists references used in the plan preparation</td>
</tr>
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</table>
2 STATUTORY REQUIREMENTS AND GUIDELINES

2.1 NSW LEGISLATION

2.1.1 Environmental Planning and Assessment Act 1979

The project was declared a ‘major development’ under the provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) and State Environmental Planning Policy (Major Development) 2005. Since Project Approval was granted in 2007, there have been four approved modifications:

1. **Modification 1 (2009)** approved for exploratory blasting and test pitting in order to verify the design of the processing plant.
2. **Modification 2 (2011)** approved for the construction of a new rail line rather than use the existing rail facilities to the Limestone Mine.
3. **Modification 3 (2012)** approved the construction of a high voltage power line from an existing substation to the processing plant and to provide a rail siding near the junction with the Main Southern Railway Line.

(Note that the coloured font represents the corresponding modification in Table 2.1.)

The quarrying operations will continue to be subject to the provisions of the EP&A Act for any subsequent changes or modifications to the operations. The operations will need to be able to demonstrate compliance against consolidated Project Approval issued under the provisions of the EP&A Act.

Table 2.1 summarises the Conditions of Approval (CoA) relevant to this WMP and a cross-reference to the location within this WMP where the requirement is addressed.

**Table 2.1: Consolidated Surface Water and Groundwater related Conditions of Approval**

<table>
<thead>
<tr>
<th>CoA</th>
<th>Condition of Project Approval</th>
<th>Referenced in WMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Supply</td>
<td>Prior to the commencement of construction, the Proponent must obtain the necessary approvals for the project under the Water Act 1912. <strong>Note:</strong> The Water Management Act 2000 may apply to the project. The Proponent must consult with DPI Water on the relevant approvals at the time the application is made.</td>
<td>2.1.3</td>
</tr>
<tr>
<td>Discharges</td>
<td>Except as may be expressly provided for by an EPL, the Proponent must not discharge any dirty water from the quarry or ancillary operational areas.</td>
<td>2.1.2, 5</td>
</tr>
<tr>
<td>23A</td>
<td>The Proponent must prepare an onsite wastewater report for the proposed effluent management system consistent with the requirements of WaterNSW – “Developments in Sydney’s Drinking Water Catchment” – Water Quality Information Requirements, 2011. The effluent management system must be designed and constructed to be in accordance with this onsite wastewater report and its design must be approved by Council prior to construction.</td>
<td>5.2.6, Appendix A</td>
</tr>
</tbody>
</table>
### CoA Condition of Project Approval

<table>
<thead>
<tr>
<th>CoA</th>
<th>Condition of Project Approval</th>
<th>Referenced in WMP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tangarang Creek Environmental Flow</strong></td>
<td></td>
<td>5.4, 7.2.1, 7.2.2</td>
</tr>
<tr>
<td>24</td>
<td>An environmental flow equivalent to 10% of average daily flows must be provided to Tangarang Creek. Details of the management of these environmental flows must be included in the Site Water Balance for the project.</td>
<td></td>
</tr>
<tr>
<td><strong>Sediment Dams</strong></td>
<td></td>
<td>5.4, 5.2.3, 6.3</td>
</tr>
</tbody>
</table>
| 25 | The Proponent must ensure that:  
   (e) critical structures such as “dirty water” dams are designed, constructed and maintained to accommodate a 1 in 100 year ARI 24-hour event; and  
   (f) other dams and water management structures are designed, constructed and maintained to accommodate a 1 in 20 year ARI 24-hour event. | |
| **Water Management Plan** | | This WMP |
| 26 | A Water Management Plan must be prepared for the project to the satisfaction of the Secretary. This plan must  
   (a) be submitted to the Secretary for approval prior to the commencement of construction;  
   (b) be prepared in consultation with the DPI Water, EPA and WaterNSW; and  
   (c) include a:  
   - Site Water Balance;  
   - Erosion and Sediment Control Plan;  
   - Surface Water Monitoring Program;  
   - Ground Water Monitoring Program; and  
   - Surface and Ground Water Response Plan to address any potential adverse impacts associated with the project. | |
| | The Proponent must implement the approved management plan as approved from time to time by the Secretary. | |
| **Site Water Balance** | | 5.4, 6.4 |
| 27 | The Site Water Balance must:  
   (a) include details of all water extracted (including make-up water), dewatered, transferred, used and/or discharged by the project; and  
   (b) describe measures to minimise water use by the project. | |
| **Erosion and Sediment Control** | | 6.4, App C |
| 28 | The Erosion and Sediment Control Plan must:  
   (a) be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004* (Landcom);  
   (b) identify activities that could cause soil erosion and generate sediment;  
   (c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;  
   (d) describe the location, function, and capacity of erosion and sediment control structures; and  
   (e) describe what measures would be implemented to maintain (and if necessary decommission) the structures over time. | |
The Surface Water Monitoring Program must include:

(a) detailed baseline data on surface water flows and quality in Tangarang Creek and Barbers Creek;
(b) surface water impact assessment criteria;
(c) a program to monitor surface water flows and quality;
(d) a protocol for the investigation of identified exceedances of the surface water impact assessment criteria; and
(e) a program to monitor the effectiveness of the Erosion and Sediment Control Plan.

The Ground Water Monitoring Program must include:

(a) detailed baseline data on ground water levels, flows, and quality, based on statistical analysis;
(b) groundwater impact assessment criteria for monitoring bores;
(c) a program to monitor regional ground water levels and quality; and
(d) a protocol for the investigation of identified exceedances of the ground water impact assessment criteria.

In constructing and operating the Southern Overburden Emplacement Area, the Proponent must ensure that:

(a) the surface water management system is constructed in accordance with the plan shown on the figure in Appendix 4; and
(b) the surface water management system includes appropriate scour protection at discharge points to ensure the potential for erosion and transport of sediment to downstream waters is minimised.

On completing the construction of the surface water management system for the Southern Overburden Emplacement Area, the Proponent must commission an audit by a suitably qualified, experienced and independent person, approved by the Secretary, to determine whether the system has been constructed in accordance with this approval. A copy of the audit report and the Proponent’s response to its recommendations must be provided to the Secretary and WaterNSW within 12 weeks of its commissioning.

The Marulan South Environmental Assessment Report (ERM, 2006) recommended a range of measures to avoid, manage, mitigate, offset and/or monitor the environmental impacts of the project, as set out in the Statement of Commitments. The commitments that relate to water management and a cross-reference to the location within this WMP where the commitment is addressed are set out in Table 2.2 below.

<table>
<thead>
<tr>
<th>Statement of Commitment</th>
<th>XRef in WMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water resources will be managed through a management system designed to target 100% self-sufficiency in water supply, provide environmental flows equivalent to 10% of average daily flows, optimise recycling within the quarry operations and minimise impacts to receiving waters.</td>
<td>5</td>
</tr>
<tr>
<td>Boral will monitor the potential impacts of the project on surface and groundwater quality, to ensure water is suitable for intended use and that operations are not impacting on receiving waters.</td>
<td>0</td>
</tr>
</tbody>
</table>
### Statement of Commitment

<table>
<thead>
<tr>
<th>Statement</th>
<th>XRef in WMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water quantity will also be monitored to manage water supply balances and assess groundwater drawdown impacts from the project</td>
<td>5.4, 0</td>
</tr>
<tr>
<td><strong>The water management system will include:</strong></td>
<td>0, 6, App A, App C</td>
</tr>
<tr>
<td>- installation of a permanent drainage network to divert clean and dirty water flows to appropriate storages. These diversions will have capacity to convey critical flows of at least a 1 in 20 year average recurrence interval (ARI) storm event, and up to a 1 in 100 year ARI event in critical locations;</td>
<td></td>
</tr>
<tr>
<td>- installation of erosion control devices including sediment traps, check dams, spreaders, dissipaters, lined or vegetated drains, and the limitation of longitudinal gradients of drains to 1%;</td>
<td></td>
</tr>
<tr>
<td>- diversion of all dirty water from haul roads, disturbed areas and overflow from dirty water storages to in-pit dirty water storages. All dirty water is to be filtered or treated prior to release;</td>
<td></td>
</tr>
<tr>
<td>- package treatment unit for potable water supply to treat rainwater runoff to drinking water standards. This will store at least 20 kL (six days supply) of treated water;</td>
<td></td>
</tr>
<tr>
<td>- package treatment plant with capacity to treat 3 kL/day of sewage to secondary standard with disinfection prior to release;</td>
<td></td>
</tr>
<tr>
<td>- filtration of all excess pit water through a constructed wetland prior to release into Dam 1;</td>
<td></td>
</tr>
<tr>
<td>- provision of bunding and spill kits, and the locating of any activities with potential for spills within the pit drainage area; and</td>
<td></td>
</tr>
<tr>
<td>- release of environmental flows to Barbers Creek equivalent to 10% of average daily flows.</td>
<td></td>
</tr>
</tbody>
</table>

**A water quality monitoring program will be implemented including:**

- monitoring of surface water quality in supply dams and downstream of Tangarang Creek to ensure water is suitable for intended use and that operations are not impacting on receiving waters. Baseline monitoring will be followed by quarterly monitoring with additional sampling following rainfall events and/or known discharges from the site. Results will be compared to ANZECC 2000 guidelines;
- monitoring of supply quantity and quarry use to manage water supply balances;
- recording of environmental flows and flood spills to Tangarang Creek;
- at least annual inspection and cleaning of water quality devices;
- monitoring of water in pit storage and Dam 1 to ensure water meet secondary contact criteria;
- monitoring of storage dams for algal blooms;
- baseline and quarterly monitoring of groundwater around the quarry boundary to assess local drawdown impacts; and
- annual groundwater quality monitoring.

### 2.1.2 Protection of Environment Operations Act 1997

The objectives of the *Protection of Environment Operations Act 1997* (PoEO Act) are to protect, restore and enhance the quality of the environment. Some of the mechanisms that can be applied, under the PoEO Act to achieve these objectives include reduction of pollution at source, monitoring and reporting of environmental quality.

Based on annual production volumes, Peppertree Quarry has been determined to be a ‘Scheduled Activity’ under Schedule 1 of the POEO Act which requires site operations to be the subject of an Environmental Protection Licence (EPL No. 13088).

Section 120 of the POEO Act and Condition L1.1 of the EPL deem it an offence to pollute waters. Pollution is defined as a change in water quality. A key objective of the WMP is that quarrying operations are undertaken with appropriate controls and monitoring so that water quality meets statutory requirements.
2.1.3 Water Management Act 2000

Water Sharing Plan

The Water Management Act 2000 (WM Act) is intended to ensure that water resources are conserved and properly managed for sustainable use, benefiting both present and future generations. Water sharing plans (WSP) prepared in accordance with the WM Act include rules for protecting the environment and administrating water licencing and trading.

Peppertree Quarry is located within the area of the Greater Metropolitan Region Unregulated Area WSP, and three surface water sources within the WSP as follows:

- Bungonia Creek Management Zone (commenced July 2011);
- Barbers Creek Management Zone (commenced July 2011); and
- Shoalhaven River Gorge Management Zone (commenced July 2011).

Peppertree Quarry is located within the Barbers Creek Management Zone and has a Water Access Licence (WAL 25291) issued under the WM Act to extract up to 145 megalitres of surface water from Tangarang Creek per year. The licence relates to extraction of water from a 110ML dam on Tangarang Creek (authorised by Work Approval 10WA102701).

In addition, a water bore licence (10WA116000) was transferred to the quarry allowing an annual extraction of up to 15 ML from groundwater in the Goulburn Fractured Rock Groundwater (GFR) Source.

A Water Access License will need to be obtained to account for groundwater entering the pit void and therefore available for harvest. The expected amount of seepage will be confirmed and the license sought.

Harvestable Rights

The WM Act provides formal means for the protection and enhancement of the environmental qualities of waterways and their in-stream uses as well as to provide for the protection of catchment conditions. Chapter 3, Part 1 identifies basic landholder rights including harvestable water rights and when access licences are required. The harvestable water right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC). Any capacity of the total of all dams on the property greater than the MHRDC may require a licence.

Schedule 1 of the Water Management (General) Regulation 2004 (WM Regulation) identifies classes of dam which are exempt from licensing requirements. Dams solely for the capture, containment and recirculation of drainage and/or effluent, consistent with best management practice or required by a public authority to prevent the contamination of a water source, provided such dams are located on a minor stream referred to in section 53 (3)(b) of the Act. Based on the NSW Department of Water & Energy, Farm Dams – Do you need a licence (2008): “Minor streams are defined by the Strahler stream ordering method as 1st and 2nd order streams that do not have permanent river flow”.

As the on-site pits (dams) receive water from intermittent overland and through flow as opposed to a permanent river flow, the water source for the pits can be classed as minor stream. Therefore, the provisions of Schedule 1 (3) of the WM Regulation are satisfied and the pits (dams) are exempt from the need to obtain a licence under the WM Act.

2.1.4 SEPP (Sydney Drinking Water Catchment) 2011

The Project is located within the Sydney Drinking Water Catchment. The State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 (SEPP) aims to provide for healthy water catchments, delivering high quality water while permitting development that is compatible with that
goal. The Policy also aims to support the maintenance or achievement of the water quality objectives for the Sydney drinking water catchment and requires developments to demonstrate a neutral or beneficial effect (NorBE) on water quality.

The sediment control basins that will collect runoff from the eastern side of the proposed Southern Overburden Emplacement (which will discharge to Barbers Creek) will be constructed and operated in accordance with the requirements for discharge to ‘sensitive environments’ as set out in Managing Urban Stormwater: Soils & Construction, Volume 2E – Mines and Quarries (DECC, 2008). Following construction the emplacement will be revegetated to a standard that minimises erosion. These management actions will ensure that the Project complies with the requirements of SEPP (Sydney Drinking Water Catchment).

2.2 STRATEGIES, POLICIES AND PLANS

2.2.1 National Water Quality Management Strategy

The National Water Quality Management Strategy (NWQMS) is a joint national approach to improving water quality in Australian and New Zealand waterways. It was originally endorsed by the former Agriculture and Resources Management Council of Australia and New Zealand (ARMCANZ) and the former Australian and New Zealand Environment and Conservation Council (ANZECC). Since 1992 the NWQMS has been developed by the Australian and New Zealand Governments in cooperation with state and territory governments.

The NWQMS aims to protect the nation’s water resources by improving water quality while supporting the businesses, industry, environment and communities that depend on water for their continued development. The main mechanism for promoting this aim has been the publication of a number of water quality guidelines, including the NSW Water Quality and River Flow Objectives and the ANZECC Guidelines. However, in the case of the Shoalhaven River catchment, the specific requirements of the Independent Inquiry to Shoalhaven River System (Healthy Rivers Commission, 1999) take precedence (refer Section 2.2.3 below).

2.2.2 ANZECC Guidelines

The Australian and New Zealand Environment Conservation Council Guidelines 2000 (ANZECC Guidelines) identify water quality criteria to support water use objectives and inform investigation thresholds for receiving waters.

The ANZECC guidelines have been considered in this WMP on the basis of current uses of receiving waters to inform water quality criteria through performance and trigger values for on and off site uses. These uses include:

- Stock and Domestic (off site)
- Industrial (on site)
- Aquatic ecosystems (off site).

Application of water use objectives are used to inform the most sensitive water use for the site, and thereby focus on maintaining water quality to enable continued use for all objectives.

2.2.3 Healthy Rivers Commission

Barbers Creek is a sub-catchment of the Shoalhaven River. The Healthy Rivers Commission’s (HRC) Independent Inquiry into the Shoalhaven River System (HRC, 1999) endorsed the following environmental values for the Shoalhaven River and its tributaries:

- Healthy waters – protection of aquatic ecosystems;
- Recreation – protection of primary and secondary recreation and visual amenity;
• Water supplies – protection of livestock, irrigation and farmstead water; and
• Protection of drinking water to be treated with coarse screening and disinfection, within sections of stream where water is extracted for use in urban water supply.

HRC (1999) recommended that the water quality criteria specified in the prevailing water quality guidelines published by NHMRC/ ARCANZ/ANZECC for primary and secondary contact recreation and for drinking water supplies should be adopted as water quality objectives (WQOs) throughout the Shoalhaven catchment. The ANZECC Guidelines provide the technical guidance to assess the water quality needed to protect the WQOs.

2.2.4 State Water Management Outcomes Plan

The Water Management Act 2000 provides for the establishment of the State Water Management Outcomes Plan (SWMOP) to set out the over-arching policy context, targets and strategic outcomes for the development, conservation, management and control of the State's water sources.

The SWMOP promotes the objects of the WMA and its water management principles and seeks to give effect to the NSW Government's salinity management strategies. The SWMOP provides for the protection and enhancement of the environmental services provided by aquatic ecosystems while delivering a framework for the use of water to meet human needs, including more secure access licences. The SWMOP details the Government's commitment to manage the linkages between environment, human health, communities and industries.

This WMP is consistent with the objectives of the SWMOP, both within the site and on downstream users, as avoidance and mitigation measures would be implemented to minimise potential impacts on the creeks and rivers associated with release of treated water.

2.2.5 Southern Rivers Catchment Action Plan

The Southern Rivers Catchment Action Plan (CAP) 2013–2023 is an overarching 10-year plan that has been developed to guide the implementation of natural resource management in the Southern Rivers region, in collaboration with a range of partners.

The Southern Rivers CAP 2023 lists a number of objectives and targets for the Southern Rivers region, which includes the Shoalhaven River catchment. This includes the following objectives pertaining to surface water:

• Private and public land and water managers make well-informed decisions about use and care of natural resources;
• Private and public land and water managers effectively respond and adapt to change;
• Diverse, healthy, connected and productive natural environments;
• Health and integrity of natural habitat supports people and the environment; and
• Fresh water, estuarine and marine assets support people and the environment.

The Southern Rivers CAP 2023 Paper – Water describes the desired state of rivers within the region that support water quality, quantity and movement:

• Good geomorphic condition, close to reference condition for the particular Riverstyle;
• Natural hydraulic function—balance for surface and base flows;
• Functional connectivity within stream, to adjacent floodplains, between surface and groundwater;
• Healthy and diverse native aquatic fauna;
• Water quality supports community uses and values suitable for human consumption that meet ANZECC guidelines 100% of the time; and
- Sufficient riparian buffers to manage pollution sources.

2.2.6 NSW State Groundwater Protection Policy and Framework

The NSW State Groundwater Quality Protection Policy provides a comprehensive set of policy principles for groundwater quality protection. It also provides guidance on groundwater quality protection to resource managers. The protection framework involves the identification of the specific beneficial uses of every major aquifer, with strategies which can be applied to protect those beneficial uses. Management of sub surface waters on the site will be in accordance with guideline documents.