ROCKY GULLY ROAD, COOMINYA QUARRY
ENVIRONMENTAL ASSESSMENT REPORT

Prepared for:
Zanows’ Concrete and Quarries Pty Ltd

Date:
May 2017

Reference:
1361_520_001
Document Control

Project/ Report Details

<table>
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<tr>
<th>Document Title:</th>
<th>Rocky Gully Road, Coominya Quarry, Environmental Assessment Report</th>
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<tbody>
<tr>
<td>Principal Author:</td>
<td>Y. Dowling</td>
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<tr>
<td>Client:</td>
<td>Zanows’ Concrete and Quarries Pty Ltd</td>
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<tr>
<td>Ref. No.</td>
<td>2004_620_001</td>
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Document Status

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<th>Description</th>
<th>Date</th>
<th>Author</th>
<th>Reviewer</th>
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<td>0</td>
<td>Environmental Assessment Report</td>
<td>May 2017</td>
<td>Y. Dowling</td>
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Distribution Record

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<td>1 x Electronic</td>
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<td>Somerset Regional Council</td>
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## DRAWINGS

Site Layout Plan (Drawing No. Z2004-004r1)  
Schematic Cross Sect. - Wet and Dry Extraction (Drawing No. Z2004-002r1)  
Site Layout Plan with Remnant Vegetation (Drawing No. Z2004-001A)  
Final Rehabilitation and Land Use Plan (Drawing No. Z2004-005r1)

## ATTACHMENTS

Attachment 1 Integrated Environmental Management System  
Attachment 2 Ecological Assessment Advice  
Attachment 3 EMR / CLR Search Results  
Attachment 4 Flood Study  
Attachment 5 Groundwater Impact Assessment  
Attachment 6 Noise Assessment Report  
Attachment 7 Dust Assessment Report  
Attachment 8 Stormwater Management Plan
1. Introduction

1.1 Background

Groundwork Plus Pty Ltd (Groundwork Plus) has been commissioned by Zanows’ Concrete and Quarries Pty Ltd (Zanows) to prepare this Environmental Assessment Report (EAR) for the proposed extractive industry activity referred to as the Rocky Gully Road, Coominya Quarry on land on Rock Gully Road and Banffs Lane, Coominya, Queensland, refer to the Site Layout Plan (Drg number Z2004-004r1).

The activity proposed is a sand, gravel, soil and associated material extractive industry activity, which will be situated off-stream from the adjacent watercourse of Buaraba Creek. The proposed activity is located wholly within the Key Resource Areas number 159 (Banff Terrace) under the State Planning Policy and the Somerset Region Planning Scheme.

Zanows are currently seeking a Development Permit for a Material Change of Use with the Somerset Regional Council (Council) and an associated Environmental Authority (EA) for the Environmentally Relevant Activities (ERA) with the Department of Environment and Heritage Protection (EHP).

The proposed activity will comprise the following Prescribed ERA thresholds in accordance with the Environmental Protection Regulation 2008 (EP Reg):

- ERA 16 Threshold (2)(b) - Extracting, other than by dredging, in a year, more than 100,000t but not more than 1,000,000t.
- ERA 16 Threshold (3)(b) - Screening, in a year, more than 100,000t but not more than 1,000,000t.

1.2 Purpose of the Environmental Assessment Report

The application requirements for site-specific EA applications for Prescribed ERAs are outlined in Section 125 of the Environmental Protection Act (EP Act) and must include:

- an assessment of the likely impact of the proposed activity on the Environmental Values (EVs), including:
  - a description of the EVs likely to be affected by the activity.
  - details of any emissions or releases likely to be generated by the activity.
  - a description of the risk and likely magnitude of impacts on the EVs.
  - details of the management practices proposed to be implemented to prevent or minimise adverse impacts.
  - details of how the land the subject of the application will be rehabilitated after each relevant activity ceases.
- a description of the proposed measures for minimising and managing waste generated by each relevant activity.
- details of any site management plan that relates to the land the subject of the application or any other document relating to the application prescribed under a regulation.

The purpose of this Environmental Assessment Report (EAR) is to support the site-specific EA application by providing the abovementioned information to assist the Department of Environment and Heritage Protection (EHP) in the assessment process.

This EAR is not intended to form an operational document for the site once the activity is approved and commences. The Zanows Integrated Environmental Management System (IEMS) is anticipated to provide the primary environmental management document for the site moving forward. A copy of the IEMS is included as Attachment 1 – Integrated Environmental Management System.
1.3 Eligibility Criteria and Standard Conditions

Zanows seeks approval to undertake ERA 16 thresholds (2)(b) and (3)(b) to allow extraction and screening of more than 100,000 tonnes but not more than 1,000,000 tonnes per annum.

Considering, EHP have not prepared eligibility criteria or standard conditions for ERA 16 threshold (2)(b), no further assessment of eligibility criteria or standard conditions has occurred for the extraction component of this request.

With regards to ERA 16 threshold (3)(b), the proposal does not achieve the eligibility criteria outlined in the Eligibility criteria and standard conditions for screening (more than 100,000 tonnes but not more than 1 million tonnes of material in a year) (ERA 16) (Department of Environment and Heritage Protection, 2016) as the proposed activities will occur within 1,000 metres of a dwelling.

Applicants who are not able meet the eligibility criteria prescribed by the administering authority are required to make a site-specific EA application. As the eligibility criteria for ERA 16(3)(b) are not able to be met, assessment of the proposed activities against the standard conditions is not required and a site-specific EA is applied for, subject to the Model operating conditions—ERA 16—Extractive and screening activities (Model Operating Conditions) (Department of Environment and Heritage Protection, 2016b).

Review of the Model Operating Conditions has confirmed that the proposed activity (ERA 16 thresholds (2)(b) and (3)(c)) are capable of complying with the conditions with the addition of Conditions E2 to E9 of Section 6.5 Additional model operating conditions—extraction, other than dredging.
2. Activity Description

2.1 Site Details

The activity will be carried out at the existing site location which is summarised below:

**Location:** Rocky Gully Road and Banffs Lane, Coominya, Queensland (refer Site Layout Plan (Drawing No. Z2004-004r1))

**Real Property Description:**
- Lot 220 on SP250792
- Lot 225 on CA31641
- Lot 226 on CA31641
- Lot 236 on SP260138
- Lot 246 on CA31773

**Access:** Via Rock Gully Road

**Local Government Area:** Somerset Regional Council

**Zoning:** Rural Zone

**Site Area:**
- Lot 220 on SP250792 44.28 ha
- Lot 225 on CA31641 64.75 ha
- Lot 226 on CA31641 64.75 ha
- Lot 236 on SP260138 84.01 ha
- Lot 246 on CA31773 64.851 ha

Total site 322.641 ha

**Tenure:** Freehold

2.2 Extraction Methodology

Site operations will use standard dry sand and gravel extraction and screening methods (illustrated in Schematic Cross Sect. - Wet and Dry Extraction (Drawing No. Z2004-002r1)) comprising the following basic elements:

- Stripping of topsoil progressively using an excavator and stockpiling for incorporation into the site rehabilitation works, or use in constructing perimeter banks.
- Extracting raw materials in one pass using an excavator working on the leading edge of the extraction pit.
- Stockpiling extracted material within the pit prior to being transported to the screening plant via front end loader. The location of the stockpiling and screening plant will change from time-to-time depending on the stage of extraction and may be located within the pit at times.
- Screening of raw material using a mobile screening plant.
- Stockpiling the final products using a front end loader within a designated area until required to be loaded into road trucks for transportation off-site.
- Rehabilitating disturbed areas progressively once the terminal quarry benches have been established.

A range of quarry products will be produced on-site for markets such as the road building, infrastructure and development industry. Unsealed internal access roads will be utilised to facilitate the movement of personnel, plant, equipment, and light vehicles into and out of the site. Unauthorised vehicle access will be prevented by the use of a wire perimeter fence, or equivalent barrier and clearly displayed signage at the access road entrance and also at regular intervals around the perimeter of the site.
3. **Description of Existing Environment**

3.1 **Land Use**

The current land use for the site is rural use, being turf farming, broad acre cropping and cattle grazing. **Table 1 – Adjacent Land Uses** provides a summary of the land uses surrounding the site. An illustration of the local land uses is provided in the **Site Layout Plan** (Drg number Z2004-004r1).

<table>
<thead>
<tr>
<th>Direction</th>
<th>Land Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Rural / agricultural (grazing)</td>
</tr>
<tr>
<td>East</td>
<td>Rural / agricultural (poultry farming)</td>
</tr>
<tr>
<td>South</td>
<td>Watercourse (Buaraba Creek) and agricultural (grazing)</td>
</tr>
<tr>
<td>West</td>
<td>Extractive industry activities and turf farming</td>
</tr>
</tbody>
</table>

3.2 **Ecological Values**

3.2.1 **General Ecological Values**

Ecological values are discussed in the Ecological Assessment Advice (BAAM Pty Ltd, 2017) included as **Attachment 2 – Ecological Assessment Advice**.

3.2.2 **Matters of State Environmental Significance and Environmentally Sensitive Areas**

A search of the EHP Matters of State Environmental Significance (MSES) report has confirmed that the site is overlain by a number of mapped MSES value as follows:

- MSES – Regulated vegetation (intersecting a watercourse)
- MSES – Regulated vegetation.
- MSES – Wildlife habitat.

The EHP Environmentally Sensitive Areas (ESAs) mapping also categorises the site as containing a portion of Category B ESA – Endangered Regional Ecosystem (Biodiversity Status).

All areas mapped as MSES or ESA are proposed to be excluded from the operational areas of the activity, refer to the figure titled **Site Layout Plan with Remnant Vegetation** (Drg number Z2004-001A) for an illustration.

MSES and other matters ecological interest are discussed in the Ecological Assessment Advice (BAAM Pty Ltd, 2017) included as **Attachment 2 – Ecological Assessment Advice**.

3.3 **Environmental Nuisance Sensitive Receptors**

The nearest sensitive receptors to the site activities are illustrated in the **Site Layout Plan** (Drg number Z2004-004r1). Within the site boundary, there is two residences to the south of the south-western pit.

The closest residence is approximately 234 metres from the edge of the south-eastern pit (Lot 230 SP145222).

Further discussion and consideration of the nearby sensitive receptors is included in the relevant environmental assessments for noise and dust emissions. Refer to **Section 4. - Potential Environmental Impacts and Risks** for details.
3.4 Regional Climate

The region is subject to a seasonally dry, subhumid tropical to subtropical climate. Most rainfall in the region occurs between December and February, with the driest month being August. The annual mean rainfall for the region is 823.0 mm.

Review of the annual 9am wind direction versus wind speed for the nearest Bureau of Meteorology (BoM) climate station, being the University of Queensland Gatton Station 40082, shows that winds are generally from the west with wind speeds \( \geq 0 \text{km/hr and < 10km/hr} \).

A summary of the regional climatic statistics is shown in Table 2 – Regional Climatic Statistics.

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rainfall (mm)</strong></td>
<td>119.3</td>
<td>111.5</td>
<td>82.0</td>
<td>58.9</td>
<td>48.7</td>
<td>45.3</td>
<td>40.2</td>
<td>27.4</td>
<td>35.5</td>
<td>63.1</td>
<td>77.6</td>
<td>103.3</td>
<td>823.0</td>
</tr>
<tr>
<td><strong>Temperature (°C)</strong></td>
<td>Mean min.</td>
<td>19.1</td>
<td>19.0</td>
<td>17.3</td>
<td>13.7</td>
<td>10.2</td>
<td>7.6</td>
<td>6.3</td>
<td>6.7</td>
<td>9.5</td>
<td>13.1</td>
<td>16.0</td>
<td>18.1</td>
</tr>
<tr>
<td></td>
<td>Mean max.</td>
<td>31.6</td>
<td>30.8</td>
<td>29.6</td>
<td>27.2</td>
<td>23.8</td>
<td>21.1</td>
<td>20.7</td>
<td>22.4</td>
<td>25.5</td>
<td>28.2</td>
<td>30.2</td>
<td>31.3</td>
</tr>
<tr>
<td><strong>Wind Speed (km/h)</strong></td>
<td>Mean 9am wind speed</td>
<td>10.2</td>
<td>9.9</td>
<td>9.6</td>
<td>8.9</td>
<td>10.0</td>
<td>11.7</td>
<td>11.6</td>
<td>11.0</td>
<td>10.3</td>
<td>10.8</td>
<td>10.9</td>
<td>10.4</td>
</tr>
</tbody>
</table>

Source: Rainfall data from the Bureau of Meteorology (BoM) Coominya Post Office Station No. 40056; Temperature and wind data from the BoM University of Queensland Gatton Station 40082; Wind data is sourced from the BoM University of Queensland Gatton Station 40082.

3.5 Topography, Geology and Soils

3.5.1 Topography

The region is characterised by a varied landscape with low lying areas with low relief, contrast with the more mountainous areas. The site is situated on low lying floodplain with elevations ranging from 59 metres Australian Height Datum (m AHD) in the south-eastern and south western corners of the site, and 89 mAHD in the north-eastern corner of the site.

3.5.2 Geology

The site is dominated by two different geological rock units. The southern rock unit Pleistocene aged alluvium, consisting mainly of Clay, silt, sand and gravel; flood-plain alluvium on high terraces. The northernmost rock unit is identified as Late Tertiary – Quaternary aged colluvium, containing clay, silt, sand, gravel and soil; colluvial and residual deposits (generally on older land surfaces).

3.5.3 Soils

In accordance with the Soils and irrigated land suitability of the Lockyer Valley alluvial plains, South-East Queensland (Powell, Bernie, Loi, J, Christianos, N. G., 2002) the site comprises two mapped soil units. The northern portion of the site contains soils identified as Stockyard (SY) (100%). This soil is described by Powell et. al (2002) as “Hardsetting texture contrast soil with dark to grey brown loam surface soil, with variable A2 horizon development to 0.15 to 0.35m over grey brown, yellow brown or brown neutral to alkaline clay subsoil to 0.7m. Gravel and sediment layers occur below 0.7”. This soil is classed as a Sodosol and may be more dispersive than the southern soil unit. This soil has a
Suitability Class of 4 - (agriculture) irrigated, which is marginal land that is presently considered unsuitable for agricultural purposes due to severe limitations.

The southern portion of the site contains soils mapped as Redbank (Rb) (100%), which are identified by Powell et. al (2002) as “Brown loamy sand to sandy clay loam over red brown or yellow brown sandy loam, sandy clay loam to sandy clay acid or neutral subsoil. A red-yellow D-horizon of coarse sand is common”. This soil has a Suitability Class of 3 - (agriculture) irrigated, which is suitable land with moderate limitations for agricultural purposes.

Both of the soil units present on-site are classed as having an agricultural land class of A1 - Crop Land - Broadacre and Horticulture.

3.5.4 Erosion Risk Based on Rainfall

Erosion risk for the region based on monthly average rainfall depth in accordance with the Best Practice Erosion and Sediment Control Book 1 (IECA, 2008) is shown in Table 3 – Erosion Risk Based on Mean Rainfall.

<table>
<thead>
<tr>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>H</td>
<td>H</td>
<td>H</td>
<td>H</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

Notes: E = Extreme, H = High, M = Moderate, L = Low, VL = Very Low.

3.5.5 Contaminated Land

A review of search results of the Environmental Management Register (EMR) and Contaminated Land Register (CLR) has confirmed that the site is not currently listed on the EMR or CLR. Copies of the relevant search results are included as Attachment 3 – EMR / CLR Search Results.

3.5.6 Acid Sulphate Soil

Review of Acid Sulfate Soils (ASS) mapping has confirmed that the site is not located at, or near, an area where ASS have previously been identified or within a prospective land zone containing ASS. As elevations are generally above 59m AHD, presence of ASS is considered unlikely.

3.6 Waterways and Flooding

3.6.1 Watercourses

Buaraba Creek is situated adjacent to the southern boundary of the site and flows generally in a west to east. This creek is defined as a watercourse under the Water Act 2000. The site contains a drainage feature as defined by the Water Act, identified as “UT Buaraba Creek”. This drainage feature traverses from the north-western corner of site to the south-eastern corner. Smaller features identified as “Yet to be Mapped” under the Water Act are also mapped adjacent to Buaraba Creek.

In addition, Buaraba Creek is mapped as a stream order 5 under the Vegetation Management Act 1999 (VMA), whilst a portion of the drainage feature mapped on lot 236 SP260138 is mapped as a stream order 2.

Watercourses are shown on the figure titled Site Layout Plan with Remnant Vegetation (Drg number Z2004-001A).

3.6.2 Environmental Values and Water Quality Objectives

The site is located within an area identified as Lowland Freshwaters within the Buaraba Creek Catchment and the Environmental Values (EVs) have been sourced from the Environmental Protection (Water) Policy 2009 Lockyer Creek environmental values and water quality objectives Basin No 143 (part) including all tributaries of the creek (EHP, 2010).
The EVs identified for these catchment waters are: Aquatic Ecosystem; Irrigation; Farm Supply, Stock Water; Aquaculture, Human Consumer; Primary Recreation; Secondary Recreation, Visual Recreation; Drinking Water; Industrial Use and Cultural and Spiritual Values.

The Water Quality Objectives (WQOs) for the Lowland Freshwaters are summarised in Table 4 – Water Quality Objectives for Buaraba Creek Catchment (Moderately Disturbed Systems).

Table 4 – WQOs for Lowland Freshwaters of the Buaraba Creek Catchment (Moderately Disturbed Systems)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbidity</td>
<td>&lt;6 NTU</td>
</tr>
<tr>
<td>Suspended Solids (mg/L)</td>
<td>&lt;6 mg/L</td>
</tr>
<tr>
<td>Chlorophyll a</td>
<td>&lt;5 µg/L</td>
</tr>
<tr>
<td>Total Nitrogen (N)</td>
<td>&lt;500 µg/L</td>
</tr>
<tr>
<td>Oxidised N (µg/L)</td>
<td>&lt;60 µg/L</td>
</tr>
<tr>
<td>Ammonia as N (µg/L)</td>
<td>&lt;20 µg/L</td>
</tr>
<tr>
<td>Organic N (µg/L)</td>
<td>&lt;420 µg/L</td>
</tr>
<tr>
<td>Total Phosphorus (µg/L)</td>
<td>&lt;50 µg/L</td>
</tr>
<tr>
<td>Filterable Reactive Phosphorus (FRP)</td>
<td>&lt;20 µg/L</td>
</tr>
<tr>
<td>Dissolved Oxygen</td>
<td>85 to 110 % saturation</td>
</tr>
<tr>
<td>pH</td>
<td>6.5 to 8.0</td>
</tr>
<tr>
<td>Electrical Conductivity ²</td>
<td>1,570 ²</td>
</tr>
</tbody>
</table>

Notes:
1. All parameters have been sourced from the EPP (Water) (EHP, 2010).
2. Sourced from the 90th percentile value for the Southern Divide Zone of Appendix G: Salinity guidelines (expressed in conductivity units) for Queensland freshwaters, contained in the Queensland Water Quality Guidelines 2009.

3.6.3 Flooding

The site is mapped as containing floodplain areas in accordance with the Queensland Floodplain Assessment Overlay (QFAO), supported by the Qld Globe Flood Event interactive mapping tool. The QFAO mapping illustrates a floodplain area that are potentially at risk of inundation by flooding.

To determine potential impacts of the site activities on the flooding associated with flows in Buaraba Creek and the unnamed tributary that traverses the site, a 1% Annual Exceedance Probability (AEP) event has been modelled for the site and the quarry footprint. Details of the flood assessment are included as Attachment 4 – Flood Study.

3.7 Groundwater

Local groundwater information has been sourced from the Qld Globe interactive mapping system (supported by Google Earth). Summary data for nearby registered groundwater bores is included as Table 5 – Registered Bore Groundwater Data Summary.

Table 5 – Registered Bore Groundwater Data Summary

<table>
<thead>
<tr>
<th>Reg Number</th>
<th>Lot on Plan</th>
<th>Lat / Long</th>
<th>Location from Site Boundary (direction / distance)</th>
<th>SWL / Date</th>
<th>Groundwater Depth (mAHĐ)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN154972</td>
<td>226/CA31641</td>
<td>-27.4136111/152.45972222</td>
<td>On-site</td>
<td>-3.70m, 19/11/2015</td>
<td>55.3mAHĐ</td>
</tr>
<tr>
<td>RN154971</td>
<td>226/CA31641</td>
<td>-27.4136111/152.460</td>
<td>On-site</td>
<td>-8.40m, 11/11/15</td>
<td>50.6mAHĐ</td>
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<tr>
<td>RN129864</td>
<td>226/CA31641</td>
<td>-27.41315370/152.46130790</td>
<td>On-site</td>
<td>nr</td>
<td>nr</td>
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<tr>
<td>RN129865</td>
<td>226/CA31641</td>
<td>-27.41318620/152.46121020</td>
<td>On-site</td>
<td>nr</td>
<td>nr</td>
</tr>
</tbody>
</table>
To understand groundwater at the site, hydrogeologists were engaged to review the impacts to groundwater, refer to **Attachment 5 – Groundwater Impact Assessment**. The report findings conclude that groundwater quality in the region are generally alkaline with a pH range of 7.6 to 8.2, and groundwater within the Gatton Sandstone is moderately saline, whilst groundwater within the Buaraba Creek alluvium and the Woogaroo Sub-group is brackish (Australasian Groundwater and Environmental Consultants Pty Ltd, 2017, p.18).

Australasian Groundwater and Environmental Consultants Pty Ltd (2017, p16) have equated that the groundwater flow rate in the aquifer is approximately 150 m3/day or 1.7 L/s or 54.8 ML/year and detailed groundwater flow direction mapping is included in Attachment 5 – Groundwater Impact Assessment.

The **Water Act 2000** (Water Act), in conjunction with other State legislation, regulates the taking and interfering with water in Queensland. Pursuant to Section 26 of the Water Act, “All right to the use, flow and control of all water in Queensland are vested in the State”. Therefore, any water is a ‘State Resource’. Pursuant to Section 27 of the Water Act, a person may take or interfere with overland flow water, provided they comply with the provisions of Section 972C:

**972C Offence to take or interfere with water if development permit required**

1. This section applies if -
   (a) a person is authorised or required to be authorised under this Act to take or interfere with water; and
   (b) under the Planning Act, a development permit is required for works associated with the taking or interfering.

   2. The person must not take or interfere with the water, unless the person has obtained the development permit.

Pursuant of Section 97 of the Water Act, a person may take overland flow water that is not more than the volume necessary to satisfy the requirements of an EA under the EP Act.

It is anticipated that this development application and associated permits will provide the necessary authorisation to take, or interfere with overland flow water, as proposed.

The site is contained within the **Water Plan (Moreton) 2007** and the **Water Plan (Greater Artesian Basin) 2006**, within the Clarence Moreton Groundwater Management Area (AP12108).
The Water Plan (Moreton) 2007 (Chapter 2, section 9) applies to the following water:

1. This plan applies to the following water (surface water) in the plan area -
   (a) water in a watercourse or lake;
   (b) water in a spring not connected to groundwater.

2. This plan also applies to groundwater in the plan area.
   (a) Groundwater, other than groundwater to which the Water Resource (Great Artesian Basin) Plan 2006 applies;
   (b) Overland flow water, other than water in springs connected to groundwater.

Water Plan (Greater Artesian Basin) 2006 (Chapter 2, section 7) applies to the following water:

1. This plan applies to the following water in or from management units in the plan area –
   (a) Underground water;
   (b) Water in springs.

As such, water within Buaraba Creek (a watercourse) and overland flow water is regulated by the WPM, while groundwater, or underground water, depending on the aquifer properties and depth is regulated by the WPM and the WPGAB.

In relation to overland flow water, Section 85 states that:

1. A person may not take overland flow water other than –
   (e) overland flow water of not more than the amount necessary to satisfy the requirements of -
      (i) an environmental authority issued under the Environmental Protection Act 1994; or
      (ii) a development permit for carrying out an environmentally relevant activity, other than a mining or petroleum activity, under the Environmental Protection Act 1994.

Typical of most extractive industry operations, overland flow (clean water) will be diverted away from the quarry workings by the natural topography and where necessary by the installation of perimeter bunding. All overland flow that falls within the quarry footprint will be collected, treated and re-used in accordance with the measures proposed in the SMP. In this regard, the proposed operations will have an impact on overland flow water. The Water Act contains provisions (as outlined above) that allow the taking of overland flow water, where such action accords with an EA. It is noted that the application for an ERA and subsequent EA is contemplated by this application.

Schedule 2 of the WPGAB identifies the site within Management Area 25 – Clarence Moreton. Within the Clarence Moreton area, a person must not take or interfere with underground water other than (Section 11(2)):

(a) For stock or domestic purposes; or
(b) Under a water entitlement or other authorisation held before the commencement of the plan; or
(c) Under an authorisation mentioned in section 10(3).

### 3.8 Vegetation

#### 3.8.1 Remnant Vegetation

A comprehensive assessment of site vegetation, including ground truthing, is included in the Ecological Assessment Advice (BAAM Pty Ltd, 2017) included as Attachment 2 – Ecological Assessment Advice.

In general, review of the Regulated Vegetation Management data has confirmed that site contains Category B remnant vegetation. The Regional Ecosystem (RE) on the site is mapped as follows:
12.3.7 (100%) – Least concern RE described as *Eucalyptus tereticornis*, *Casuarina cunninghamiana* subsp. *cunninghamiana* +/- *Melaleuca* spp. fringing woodland.

12.3.3 (100%) – Endangered RE described as *Eucalyptus tereticornis* woodland on Quaternary alluvium.

The RE 12.3.7 is mapped as essential habitat and an essential habitat species record is mapped within the site boundary for the *Geophaps scripta scripta* (Squatter Pigeon (southern subsp.)). The balance of the site is mapped as containing Category X vegetation, which is vegetation that is not regulated under the VMA. Remnant vegetation mapping for the site is illustrated on the figure titled *Site Layout Plan with Remnant Vegetation* (Drg number Z2004-001A).

### 3.8.2 Wetlands

The site is not mapped as containing any wetland protection areas under the EP Reg, however the southern portion of the site adjacent to Buaraba Creek is mapped as containing General Ecological Significance (GES) wetlands. The absence of wetlands is further confirmed in the Ecological Assessment Advice (BAAM Pty Ltd, 2017) included as Attachment 2 – Ecological Assessment Advice.

### 3.9 Noise

The *Environmental Protection (Noise) Policy 2008* (EPP (Noise)) prescribes the environmental values that are to be protected or enhanced, which are:

(a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and

(b) the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following—

(i) sleep;

(ii) study or learn;

(iii) be involved in recreation, including relaxation and conversation; and

(c) the qualities of the acoustic environment that are conducive to protecting the amenity of the community.

The noise levels in the local area are expected to be consistent with the adjacent extractive industry activities. A baseline assessment has been conducted and is included in *Attachment 6 – Noise Assessment Report*. This assessment also includes management strategies to mitigate noise impacts from the site activities.

### 3.10 Air Quality

The *Environmental Protection (Air) Policy 2008* (EPP (Air)) prescribes the EVs for air quality that are to be protected or enhanced, which are:

(a) the qualities of the air environment that are conducive to protecting the health and biodiversity of ecosystems; and

(b) the qualities of the air environment that are conducive to human health and wellbeing; and

(c) the qualities of the air environment that are conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures and other property; and

(d) the qualities of the air environment that are conducive to protecting agricultural use of the environment.

An assessment of air quality has been undertaken for the site to model potential air quality impacts from the proposed activity, refer to *Attachment 7 – Dust Assessment Report* for details. This report also includes management measures to mitigate potential impacts from the activity.
3.11 Visual Amenity

The proposed quarry, once operational, will be screened at ground level from views along Rock Gully Road and the northern boundary of adjacent Lot 14 on CA311223 through retention of a 25m wide vegetation buffer (to be supplemented through natural regeneration) along the property boundaries, refer to the Site Layout Plan (Org number Z2004-004r1) for the location of the buffer.
4. Potential Environmental Impacts and Risks

4.1 Purpose of Assessment

The purpose of this assessment is to determine the extent to which the proposed site activities will achieve the environmental objective and performance outcomes nominated in Schedule 5, Part 3 of the EP Reg. A risk based approach has been utilised, with the source activities and potential impacts to environmental values utilised to determine the management strategies, if required, to mitigate these impacts to ensure the performance outcomes can be achieved.

Where the performance outcomes nominated in the EP Reg cannot be achieved, or are not relevant, alternative measures for the activity have been proposed. Table 6 – Environmental Objectives and Performance Outcomes provides a summary of the Environmental Objectives and Performance Outcomes nominated for the proposed ERA.

As per the administering authority’s guideline titled Assessment requirements for making a decision for an environmental authority for an environmentally relevant activity (EHP), 2015), an application for an EA for a prescribed activity will only require an operational assessment (Table 1, Part 3 of Schedule 5), which is included in Sections 5.3 to 5.9.

Table 6 – Environmental Objectives and Performance Outcomes

<table>
<thead>
<tr>
<th>Environmental Aspect</th>
<th>Environmental Objective</th>
<th>Performance Outcomes</th>
</tr>
</thead>
</table>
| Air                  | The activity will be operated in a way that protects the EVs of air. | (a) Fugitive emissions of contaminants from storage, handling and processing of materials and transporting materials within the site are prevented or minimised.  
(b) Contingency measures will prevent or minimise adverse effects on the environment from unplanned emissions and shut down and start up emissions of contaminants to air.  
(c) Releases of contaminants to the atmosphere for dispersion will be managed to prevent or minimise adverse effects on environmental values. |
| Water                | The activity will be operated in a way that protects the EVs of water. | All of the following—  
(a) the storage and handling of contaminants will include effective means of secondary containment to prevent or minimise releases to the environment from spillage or leaks;  
(b) contingency measures will prevent or minimise adverse effects on the environment due to unplanned releases or discharges of contaminants to water;  
(c) the activity will be managed so that stormwater contaminated by the activity that may cause an adverse effect on an environmental value will not leave the site without prior treatment;  
(d) the disturbance of any acid sulfate soil, or potential acid sulfate soil, will be managed to prevent or minimise adverse effects on environmental values;  
(e) any discharge to water or a watercourse or wetland will be managed so that there will be no adverse |
<table>
<thead>
<tr>
<th>Environmental Aspect</th>
<th>Environmental Objective</th>
<th>Performance Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetlands</td>
<td>The activity will be operated in a way that protects the environmental values of wetlands.</td>
<td>The activity will be managed in a way that prevents or minimises adverse effects on wetlands.</td>
</tr>
<tr>
<td>Groundwater</td>
<td>The activity will be operated in a way that protects the environmental values of groundwater and any associated surface ecological systems.</td>
<td>The activity will be managed to prevent or minimise adverse effects on groundwater or any associated surface ecological systems.</td>
</tr>
<tr>
<td>Noise</td>
<td>The activity will be operated in a way that protects the EVs of the acoustic environment.</td>
<td>The release of sound to the environment from the activity is managed so that adverse effects on EVs including health and wellbeing and sensitive ecosystems are prevented or minimised.</td>
</tr>
</tbody>
</table>
| Waste                | Any waste generated, transported, or received as part of carrying out the activity is managed in a way that protects all environmental values. | Both of the following apply—  
(a) waste generated, transported or received is managed in accordance with the waste and resource management hierarchy in the *Waste Reduction and Recycling Act 2011*;  
(b) if waste is disposed of, it is disposed of in a way that prevents or minimises adverse effects on environmental values. |
| Land                 | The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna. | All of the following—  
(a) activities that disturb land, soils, subsoils, landforms and associated flora and fauna will be managed in a way that prevents or minimises adverse effects on the EVs of land;  
(b) areas disturbed will be rehabilitated or restored to achieve sites that are—  
(i) safe to humans and wildlife; and  
(ii) non-polluting; and  
(iii) stable; and  
(iv) able to sustain an appropriate land use after rehabilitation or restoration;  
(c) the activity will be managed to prevent or minimise adverse effects on the environmental values of land due to unplanned releases or discharges, including spills and leaks of contaminants;  
(d) the application of water or waste to the land is sustainable and is managed to prevent or minimise adverse effects on the composition or structure of soils and subsoils. |
4.2 Integrated Environmental Management System

The operator will be responsible for ensuring that Conditions of the EA are complied with at all times. To assist with achieving compliance, the operator has prepared a company-wide Integrated Environmental Management System (IEMS), which includes the Rocky Gully Road, Coominya Quarry activities.

In addition to the overarching IEMS, a number of technical assessments developed specifically for the Rocky Gully Road, Coominya Quarry are attached to this report and these contain management measures to assist in the prevent and / or minimisation of potential impacts to the environmental values of the site. These include the following documents:

- Ecological Assessment Advice (BAAM Pty Ltd, 2017).
- Flood Study (WRM Water & Environment Pty Ltd, 2017).
- Stormwater Management Plan (Groundwork Plus Pty Ltd, 2017).

The relevant attachments are reference in the assessment of risk included in 4.4 – Inherent and Residual Environmental Risk Assessment.

4.3 Risk Assessment Methodology

A risk assessment has been adopted to qualitatively determine risk based on the likelihood of an environmental impact or event occurring (Table 7 – Definitions of Likelihood), and the consequences of the occurrence (Table 8 – Definitions of Consequence).

Table 7 – Definitions of Likelihood

<table>
<thead>
<tr>
<th>Rating</th>
<th>Descriptor</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare</td>
<td>May occur only in exceptional circumstances</td>
<td>1</td>
</tr>
<tr>
<td>Unlikely</td>
<td>Could occur but doubtful</td>
<td>2</td>
</tr>
<tr>
<td>Possible</td>
<td>Might occur at some time in the future</td>
<td>3</td>
</tr>
<tr>
<td>Likely</td>
<td>Will probably occur</td>
<td>4</td>
</tr>
<tr>
<td>Almost Certain</td>
<td>Is expected to occur in most circumstances</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 8 – Definitions of Consequence

<table>
<thead>
<tr>
<th>Rating</th>
<th>Descriptor</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible</td>
<td>Impacts not requiring any treatment or management action</td>
<td>1</td>
</tr>
<tr>
<td>Minor</td>
<td>Nuisance or insignificant environmental harm requiring minor management action</td>
<td>2</td>
</tr>
<tr>
<td>Moderate</td>
<td>Serious environmental impacts, readily manageable at low cost</td>
<td>3</td>
</tr>
<tr>
<td>Major</td>
<td>Substantial environmental impacts, manageable but at considerable cost and some disruption</td>
<td>4</td>
</tr>
<tr>
<td>Catastrophic</td>
<td>Severe environmental impacts with major consequent disruption and heavy cost</td>
<td>5</td>
</tr>
</tbody>
</table>
The consequence and likelihood scores are plotted on the risk vs consequence matrix (Table 9 – Risk Assessment Matrix) and the final risk level assigned is a product of the likelihood and consequence scores, which equals the magnitude of the impacts. The higher the risk score, the higher the priority is for management.

Table 9 – Risk Assessment Matrix

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Consequence</th>
<th>Negligible</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
<th>Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Almost Certain</td>
<td>5</td>
<td>5</td>
<td>Medium</td>
<td>High</td>
<td>Extreme</td>
<td>Extreme</td>
</tr>
<tr>
<td>Likely</td>
<td>4</td>
<td>4</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Possible</td>
<td>3</td>
<td>3</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Unlikely</td>
<td>2</td>
<td>2</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Rare</td>
<td>1</td>
<td>1</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Table 10 – Indicative Management Option for Each Risk Assessment Rating describes the possible actions required for each risk assessment rating.

Table 10 – Indicative Management Option for Each Risk Assessment Rating

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Risk Rating Scores</th>
<th>Indicative Management Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme</td>
<td>17 – 25</td>
<td>Manage by implementing site management and emergency procedures, plant design controls and regular monitoring.</td>
</tr>
<tr>
<td>High</td>
<td>10 – 16</td>
<td>Manage by implementing site management procedures, specific monitoring and may require some operation/plant design controls.</td>
</tr>
<tr>
<td>Medium</td>
<td>5 – 9</td>
<td>Manage by implementing specific monitoring or response procedures.</td>
</tr>
<tr>
<td>Low</td>
<td>1 – 4</td>
<td>Manage by routine procedures, unlikely to need specific application of resources.</td>
</tr>
</tbody>
</table>
### 4.4 Inherent and Residual Environmental Risk Assessment

Activities associated with the ERA which have the potential to cause environmental harm and/or nuisance and the potential impacts have been identified and tabulated. The inherent risk of the impacts occurring, and the residual risk following the implementation of management strategies has then been assessed. Refer to Table 11 – Assessment of Environmental Risk for the assessment. Any reference to environmental objective and performance outcomes is a reference to those included in Table 6 – Environmental Objectives and Performance Outcomes, which have been extracted from the EP Reg.

#### Table 11 – Assessment of Environmental Risk

<table>
<thead>
<tr>
<th>Environmental Aspect</th>
<th>Source Activity</th>
<th>Potential Impact</th>
<th>Inherent Risk Rating</th>
<th>Control / Management Measures</th>
<th>Residual Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>Clearing of remnant vegetation ahead of the extraction activity.</td>
<td>Emission of dust to air impacting nearby sensitive receptors.</td>
<td>3 x 3 = 9 (Medium)</td>
<td>The Dust Assessment Report (Noise Measurement Services Pty Ltd, 2017) (refer to Attachment 7 – Dust Assessment Report) at Dust Mitigation Strategies (Section 4.3) and an Indicative Dust Management Plan (Appendix D). Mitigation measures included in the reporting include an earth barrier, or equivalent, and implementation of a watering program. Provided the operator formalises a Dust Management Plan and implements the measures outlined in the report, the environmental objective and performance outcomes will be achieved. Residual risk is reduced to a lower level through implementation of these measures.</td>
<td>3 x 2 = 6 (Medium)</td>
</tr>
<tr>
<td>Stripping and stockpiling of topsoil and overburden.</td>
<td>Emission of dust to air impacting nearby sensitive receptors.</td>
<td>3 x 3 = 9 (Medium)</td>
<td>The Dust Assessment Report (Noise Measurement Services Pty Ltd, 2017) (refer to Attachment 7 – Dust Assessment Report) at Dust Mitigation Strategies (Section 4.3) and an Indicative Dust Management Plan (Appendix D). Mitigation measures included in the reporting include an earth barrier, or equivalent, and implementation of a watering program. Provided the operator formalises a Dust Management Plan and implements the measures outlined in the report, the environmental objective and performance outcomes will be achieved. Residual risk is reduced to a lower level through implementation of these measures.</td>
<td>3 x 2 = 6 (Medium)</td>
<td></td>
</tr>
<tr>
<td>Extraction and handling of materials (e.g., transfer of materials, processing materials, stockpiling of materials).</td>
<td>Emission of dust to air impacting nearby sensitive receptors.</td>
<td>3 x 3 = 9 (Medium)</td>
<td>The Dust Assessment Report (Noise Measurement Services Pty Ltd, 2017) (refer to Attachment 7 – Dust Assessment Report) at Dust Mitigation Strategies (Section 4.3) and an Indicative Dust Management Plan (Appendix D). Mitigation measures included in the reporting include an earth barrier, or equivalent, and implementation of a watering program. Provided the operator formalises a Dust Management Plan and implements the measures outlined in the report, the environmental objective and performance outcomes will be achieved. Residual risk is reduced to a lower level through implementation of these measures.</td>
<td>3 x 2 = 6 (Medium)</td>
<td></td>
</tr>
<tr>
<td>Vehicle movements on unsealed roads and access tracks.</td>
<td>Emission of dust to air impacting nearby sensitive receptors.</td>
<td>3 x 2 = 6 (Medium)</td>
<td>The Dust Assessment Report (Noise Measurement Services Pty Ltd, 2017) (refer to Attachment 7 – Dust Assessment Report) at Dust Mitigation Strategies (Section 4.3) and an Indicative Dust Management Plan (Appendix D). Mitigation measures included in the reporting include an earth barrier, or equivalent, and implementation of a watering program.</td>
<td>3 x 2 = 6 (Medium)</td>
<td></td>
</tr>
<tr>
<td>Environmental Aspect</td>
<td>Source Activity</td>
<td>Potential Impact</td>
<td>Inherent Risk Rating</td>
<td>Control / Management Measures</td>
<td>Residual Risk Rating</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
<td>------------------</td>
<td>---------------------</td>
<td>------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Extraction and handling of materials (e.g. transfer of materials, processing materials, stockpiling of materials).</td>
<td>Release of contaminants to groundwater.</td>
<td>3 x 4 = 12 (High)</td>
<td>The Groundwater Impact Assessment (Australasian Groundwater and Environmental Consultants Pty Ltd, 2017), included as Attachment 5 – Groundwater Impact Assessment, contains detail in relation to the environmental objective and performance outcomes will be achieved. Residual risk is not reduced by implementation of the management measures; however, the risk rating is considered to be an acceptable risk level, similar to that resulting from dust generated by adjacent pre-existing activities.</td>
<td>3 x 3 = 9 (Medium)</td>
</tr>
<tr>
<td>Wetlands</td>
<td>Extraction and handling of materials (e.g. transfer of materials, processing materials, stockpiling of materials).</td>
<td>Release of contaminants to, or physical damage of, nearby wetlands.</td>
<td>3 x 4 = 12 (High)</td>
<td>The risk of release of potential contaminants to, or physical damage to, the adjacent wetlands will be reduced with the implementation of the SMP (refer to Attachment 8 – Stormwater Management Plan). Provided the operator implements the recommendations of the SMP, the environmental objective and performance outcomes will be achieved. Residual risk is reduced to a lower level based on the absence of wetlands on the site and through implementation of the SMP.</td>
<td>3 x 3 = 9 (Medium)</td>
</tr>
<tr>
<td>Water</td>
<td>Extraction and handling of materials (e.g. transfer of materials, processing materials, stockpiling of materials).</td>
<td>Release of potentially contaminated water to the receiving environment.</td>
<td>3 x 4 = 12 (High)</td>
<td>The risk of release of potential contaminants to the receiving environment will be reduced with the implementation of the SMP (refer to Attachment 8 – Stormwater Management Plan). Under the SMP, basins have been designed to accord with the Stormwater Guideline – Environmentally Relevant Activities (ERA) (EHP 2014). In order to determine flood risks, flood modelling for the site and the quarry footprint has been undertaken and is included as Attachment 4 – Flood Study. Section 6.3 Flood Impact of the Proposed Quarry contained in the Flood Study (refer to Attachment 4 – Flood Study) also contains details in relation to the potential impacts associated with the site activities and modelled flood events. There are generally no predicted increases in peak flood levels and velocities along the unnamed tributary outside of the site boundary for all modelled events. Therefore, provided the operator implements the recommendations of the SMP, the environmental objective and performance outcomes are likely to be achieved. Residual risk is reduced to a lower level through implementation of the SMP.</td>
<td>3 x 3 = 9 (Medium)</td>
</tr>
</tbody>
</table>

Note: The table above outlines the potential impacts associated with various activities at the quarry, the inherent risk rating, and the control measures implemented to reduce residual risk.
### Environmental Aspect

<table>
<thead>
<tr>
<th>Source Activity</th>
<th>Potential Impact</th>
<th>Inherent Risk Rating</th>
<th>Control / Management Measures</th>
<th>Residual Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraction and handling of materials (e.g. transfer of materials, processing materials, stockpiling of materials).</td>
<td>Drawdown impacts from site activities.</td>
<td>3 x 4 = 12 (High)</td>
<td>The Groundwater Impact Assessment (Australasian Groundwater and Environmental Consultants Pty Ltd, 2017), included as Attachment 5 – Groundwater Impact Assessment, includes management measures, licencing requirements and discussion on impacts associated with the site activities and groundwater. The following extract from the Groundwater Impact Assessment (Australasian Groundwater and Environmental Consultants Pty Ltd, 2017) provides a general overview in relation to potential drawdown impacts and mitigation measures.</td>
<td>3 x 3 = 9 (Medium)</td>
</tr>
</tbody>
</table>

*The northern extraction pit will intersect sandstone material not associated with the Quaternary alluvium. The quarry will not intersect groundwater at this location and as such, no impacts are predicted for the Woogaroo Sub-group.*

Excavation and dewatering of the two southern pits will lower the elevation of the water table of the Quaternary alluvial aquifer, forming a "cone of depression" around the pit. The cone of depression in the water table is predicted to extend some distance from the resource areas. However, the calculations conservatively assume the pits are at maximum depth and fully dewatered at all times.

The pits will be backfilled with clay fines as extraction progresses, and therefore the extent and magnitude of impacts from the active quarrying area on the groundwater environment will be significantly less than is presented in this assessment.

Furthermore, the main recharge mechanism to the Quaternary alluvium is from Buaraba Creek which has not been accounted for in the analytical equation. Any streambed recharge through the bed of Buaraba Creek will act to buffer the extent of drawdown in the Quaternary alluvium.

"Within the proposed sand extraction area, lateral flow into the creek is considered to be a minor component of groundwater flow, compared to that which flows downstream." (p.16)

Section 5 Inflows and drawdown contained in the Groundwater Impact Assessment (Australasian Groundwater and Environmental Consultants Pty Ltd, 2017) includes a water balance for the site in order to determine groundwater licensing requirements. The report concludes that, during the operational phase, a cone of depression is anticipated to be created through excavation and dewatering of the pit of the southern pits (p. 32). Groundwater inflows into the pits have been calculated in the report, assuming full dewatering and maximum depth of pits (Australasian Groundwater and Environmental Consultants Pty Ltd, 2017, p. 32). In addition, implementation of the SMP and the IEMS to manage other sources contaminant release to groundwater will aid in mitigating potential impacts to groundwater quality.

Based on the findings of the Groundwater Impact Assessment and the implementation of the management strategies included in the Groundwater Impact Assessment, SMP, and IEMS, the residual risk has been reduced.

Groundwater flow directions experienced at the site. Australasian Groundwater and Environmental Consultants Pty Ltd (2017) state that:
<table>
<thead>
<tr>
<th>Environmental Aspect</th>
<th>Source Activity</th>
<th>Potential Impact</th>
<th>Inherent Risk Rating</th>
<th>Control / Management Measures</th>
<th>Residual Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Drawdown impacts at Burns Bore are likely to be greatest when the pit is approaching, and in close proximity to the bore. As the active extraction area moves away from the property boundary the impacts will reduce. The final voids will be located within the central portion of the site, away from the Burns Bore or the site boundaries.</strong> (p. 32).** The Groundwater Impact Assessment (Australasian Groundwater and Environmental Consultants Pty Ltd, 2017) has quantified potential impacts and recommended strategies for managing these impacts. Therefore, provided the recommendations of the report are implemented by the operator, the residual risk associated with groundwater drawdown resulting from the activities is reduced and the environmental objective for groundwater provided in Table 6 – Environmental Objectives and Performance Outcomes may be achieved.**</td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>Clearing of remnant vegetation ahead of the extraction activity.</td>
<td>Noise nuisance for nearby sensitive receptors.</td>
<td>3 x 3 = 9 (Medium)</td>
<td><strong>The Noise Assessment Report (Noise Measurement Services Pty Ltd, 2017), included as Attachment 6 – Noise Assessment Report, proposes to mitigate noise impacts through installation of temporary barriers 4.5m in height where necessary to act as a screen for sensitive receptors (Noise Measurement Services Pty Ltd, 2017, p.20). The excavation of materials through the progression of the extractive industry activities are also expected to create barriers of equal or greater height in some places Noise Measurement Services Pty Ltd, 2017, p.20). The noise modelling for the activity identifies that the general compliance of the site activities will be increased when the earthen barrier, or equivalent, is constructed in some locations, refer to Attachment 6 – Noise Assessment Report for details.</strong> The Noise Assessment Report (Noise Measurement Services Pty Ltd, 2017) includes further recommendations, including set hours of operation, to ensure noise impacts are mitigated. Provided the recommendations of the report are implemented by the operator, residual risk associated with noise impacts on nearby sensitive receptors can be reduced and the environmental objective outlined in Table 6 – Environmental Objectives and Performance Outcomes can be achieved.</td>
<td>3 x 2 = 6 (Medium)</td>
</tr>
<tr>
<td>Waste</td>
<td>Storage and disposal of residual waste (i.e. general and regulated waste).</td>
<td>Improper disposal of wastes (general and regulated waste).</td>
<td>3 x 4 = 12 (High)</td>
<td><strong>The IEMS developed as the overarching environmental management document for the Zanows sites contains Section 5.1.5 - Waste, which includes objective / target, management measures, monitoring and maintenance, and records and reporting for managing waste at the site.</strong> Provided the operator establishes and implements waste management measures through the IEMS, the residual risk of associated with waste management and disposal will be reduced and the objectives outlined in Table 6 – Environmental Objectives and Performance Outcomes will be achieved.</td>
<td>3 x 2 = 6 (Medium)</td>
</tr>
<tr>
<td>Land</td>
<td>Clearing of vegetation ahead of the extraction activity.</td>
<td>Unauthorised impacts to the flora and fauna as a result of site activities.</td>
<td>3 x 4 = 12 (High)</td>
<td><strong>No operational activities are proposed within areas of significance such as MSEs or ESAs as illustrated in figure titled Site Layout Plan with Remnant Vegetation (Drg number Z2004-501A). Furthermore, review of the findings of the Ecological Assessment Advice (BAAM Pty Ltd, 2017) included as Attachment 2 – Ecological Assessment Advice, confirms that:</strong></td>
<td>3 x 2 = 6 (Medium)</td>
</tr>
</tbody>
</table>
### Environmental Aspect

<table>
<thead>
<tr>
<th>Source Activity</th>
<th>Potential Impact</th>
<th>Inherent Risk Rating</th>
<th>Control / Management Measures</th>
<th>Residual Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progressive and/or post-closure implementation and management of the site rehabilitation.</td>
<td>“The majority of the site is relatively unconstrained and avoidance of those areas which are mapped as holding remnant vegetation or waterways removes any specific interest by the State Government in respect to ecological impacts from proposed actions.” (BAAM Pty Ltd, 2017, p. 12) Provided the operator adheres to the approved site layout plans, avoiding areas of ecological value, the environmental objective and performance outcomes will be achieved. Residual risk is reduced to a lower level based on avoidance of these areas.</td>
<td>3 x 4 = 12 (High)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weed control.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spills of hydrocarbons and fuels.</td>
<td>3 x 4 = 12 (High)</td>
<td>It is understood that the IEMS developed as the overarching environmental management document for the Zanows sites contains Section 5.0 - Part A – Operations &amp; Environmental Management, which includes contain procedures for the management of spill incidents at the site to prevent and or mitigate impacts to land (refer Section 5.2.3 of the IEMS) and water (refer Section 5.2.2 of the IEMS). Provided the operator establishes and implements appropriate spill management and response procedures and clear reporting requirements through the IEMS, the residual risk of associated with spills will be reduced and the objectives outlined in Table 6 – Environmental Objectives and Performance Outcomes will be achieved.</td>
<td></td>
<td>3 x 2 = 6 (Medium)</td>
</tr>
<tr>
<td>Failure of progressive and/or final rehabilitated landforms.</td>
<td>3 x 4 = 12 (High)</td>
<td>A Final Landform Plan has been prepared which designates the final landform / land use that is proposed for the site at cessation of the ERA. Refer to Final Rehabilitation and Land Use Plan (Org number Z2004-005f1). Provided the operator implements this plan and complies with Model Operating Conditions L2 and L3 (if applied to this site), the environmental objective and performance outcomes will be achieved. Residual risk is reduced on the assumption that the final landform plan is adhered to.</td>
<td></td>
<td>3 x 2 = 6 (Medium)</td>
</tr>
</tbody>
</table>
5. **Concluding Remarks**

The EAR has been prepared to address the site-specific EA application requirements as outlined in Section 125 of the EP Act.

The EAR has determined that the potential environmental risks resulting from the activity are able to be effectively reduced through the application of the administering authority’s Model Operating Conditions for ERA 16, and through the implementation of the various specific management strategies, monitoring procedures and critical designs, developed to avoid potential environmental impacts. The highest level of residual risk is medium, predominantly associated with water and groundwater. Ongoing management of the site will be required to ensure that the potential risk associated with environmental impacts identified is reduced to as low as reasonably possible.
Reference List


Schematic Cross Section of Extraction during Wet Years

- Natural Ground Level
- Overburden - to be used for rehabilitation
- Dredge
- Water Table during wet years
- Sand and Gravel Matrix
- Bedrock (Sandstone)
- Rehabilitated Land utilized for cropping or other appropriate use
- Overburden stripping ahead of extraction
- Dredge Extraction
- Depth already extracted by dredge
- Front End Loader or similar equipment to extract at depth
- Sand and Gravel Matrix
- Water Table during dry years
- Bedrock (Sandstone)

Legend:
- Scale: Not to scale
- Date: 24/04/2017
- Drawing Number: Z2004-002r1
- Project: Rocky Gully Road, Coominya
- Title: Schematic Cross Sect. - Wet and Dry Extraction
Attachment 1

Integrated Environmental Management System

(Refer to Attachment N of the Assessment Report (Diane Kerr & Associates, 2017))
Attachment 2

Ecological Assessment Advice

(Refer to Attachment L of the Assessment Report (Diane Kerr & Associates, 2017))
Attachment 3

EMR / CLR Search Results
SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
PO Box 1779
Milton QLD 4064

Transaction ID: 50374984
Cheque Number:
Client Reference:

This response relates to a search request received for the site:
Lot: 220
Plan: SP250792
BANFFS Lane
COOMINYA

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:
1. land which is contaminated land (or a complete list of contamination) if EHP has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities)
   if EHP has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Administering Authority
SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
PO Box 1779
Milton QLD 4064

Transaction ID: 50374983  
Cheque Number: 
Client Reference:

This response relates to a search request received for the site:
Lot: 225  
Plan: CA31641
202 BANFFS Lane
COOMINYA

EMR RESULT
The above site is NOT included on the Environmental Management Register.

CLR RESULT
The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE
All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-
1. land which is contaminated land (or a complete list of contamination) if EHP has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities)
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If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Administering Authority
SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
PO Box 1779
Milton QLD 4064

Transaction ID: 50374982  EMR Site Id: 03 May 2017
Cheque Number:  
Client Reference:

This response relates to a search request received for the site:
Lot: 226  Plan: CA31641
BANFFS Lane
COOMINYA

EMR RESULT
The above site is NOT included on the Environmental Management Register.

CLR RESULT
The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE
All search responses include particulars of land listed in the EMR/CLR when the search was generated.
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If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Administering Authority
SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
PO Box 1779
Milton QLD 4064

Transaction ID: 50374981
Cheque Number: 
Client Reference: 

This response relates to a search request received for the site:
Lot: 236 Plan: SP260138
ROCKY GULLY Road
COOMINYA

EMR RESULT
The above site is NOT included on the Environmental Management Register.

CLR RESULT
The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE
All search responses include particulars of land listed in the EMR/CLR when the search was generated. The EMR/CLR does NOT include:-
1. land which is contaminated land (or a complete list of contamination) if EHP has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if EHP has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Administering Authority
SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

David Doolan
PO Box 1779
Milton QLD 4064

Transaction ID: 50374980     EMR Site Id: 03 May 2017
Cheque Number:                Client Reference:

This response relates to a search request received for the site:

Lot: 246 Plan: CA31773
BANFFS Lane
COOMINYA

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated. The EMR/CLR does NOT include:

1. land which is contaminated land (or a complete list of contamination) if EHP has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if EHP has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Administering Authority
Attachment 4

Flood Study

(Refer to Attachment I of the Assessment Report (Diane Kerr & Associates, 2017))
Attachment 5

Groundwater Impact Assessment

(Refer to Attachment J of the Assessment Report (Diane Kerr & Associates, 2017))
Attachment 6

Noise Assessment Report

(Refer to Attachment F of the Assessment Report (Diane Kerr & Associates, 2017))
Attachment 7
Dust Assessment Report

(Refer to Attachment G of the Assessment Report (Diane Kerr & Associates, 2017))
Attachment 8

Stormwater Management Plan

(Refer to Attachment K of the Assessment Report (Diane Kerr & Associates, 2017))