

# Gerroa Sand Resource

## Air Quality Management Plan

### Appendix D of Quarry Environmental Management Plan

Version 1 | Revision 4

Issued – November 2022



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## Document Control

Version	Date	Reason	Reviewed	Approved
V1r1	20/6/22	Draft plan for Agency review	M Hammond	
V1r2	26/8/22	Updated plan for submission to DPE	M Hammond	
V1r3	11/11/22	Updated plan following DPE review	M Hammond	
V1r4	29/11/22	Updated plan following DPE review	M Hammond	DPE 5/12/22

## 1. Introduction

This Air Quality Management Plan (AQMP) forms part of the Quarry Environmental Management Plan (QEMP) for the Gerroa Sand Resource (Project). The AQMP has been prepared to meet the requirements of the Consolidated Approval for Project 05/0099, as modified and approved by the Minister for Planning on 10 June 2022 (the Consent). The AQMP sets out the management measures and strategies that will be employed on the Project to minimise impacts to local and regional air quality and to meet the requirements of the Consent and Cleary Bros commits to implement this AQMP as approved by the Planning Secretary.

## 2. Purpose and Objectives

The purpose of this AQMP is to describe how the Project will be operated to minimise impacts to the air quality of the local airshed and demonstrate compliance with the Air Quality Criteria. Specifically, the AQMP has been prepared to address conditions 5 – 8 of Schedule 3 of the Consent.

The key objectives of the AQMP is to ensure that impacts to air quality are minimised and to meet the Air Quality Criteria of the Consent.

## 3. Requirements

This Air Quality Management Plan has been prepared to ensure compliance of the Project with Modification 1 of Development Consent 05/0099. A summary of the requirements of the Consent addressed by this plan are described in this section, along with a link to the management measures that address these requirements.

**Table 1 – Air Quality Management Requirements**

Requirement	Link to Air Quality Management Plan
<b>Sch 3 Cond 5 – Air Quality Criteria</b>	Section 5 – Existing Environment and Air Quality Criteria; Section 7 – Air Quality Monitoring Program; Section 8 – Review, Improvement and Reporting
<b>Sch 3 Cond 6 – Landowner agreements</b>	Section 5 – Existing Environment and Air Quality Criteria
<b>Sch 3 Cond 7 – Air Quality Management Measures</b>	Section 6 – Air Quality Mitigation Measures
<b>Sch 3 Cond 8 – Air Quality Management Plan</b>	This Plan

A number of common requirements of the Development Consent are addressed in the QEMP, and are not directly reproduced in this AQMP. Table 2 lists these requirements and where they are addressed in the QEMP.

**Table 2 – Common Development Consent Requirements**

Reference	Requirement	Link to QEMP
<b>Schedule 4 Cond 1</b>	Notification of Landowners	Section 10.3

Reference	Requirement	Link to QEMP
<b>Cond 2 - 5</b>	Independent Review	Section 10.4
<b>Schedule 5 Cond 1</b>	Environmental Management Plan	All sections
<b>Cond 2</b>	Environmental Monitoring Program	Section 6; also see Section 7 of AQMP
<b>Cond 2A</b>	Nominated Environmental Officer	Section 3; also see Section 8.1 of AQMP
<b>Cond 2B</b>	Revision of Strategies, Plans & Programs	Section 1.3.3; also see Section 8.5 of AQMP
<b>Cond 3 &amp; 3A</b>	Incident Notification	Section 9.3.2
<b>Cond 3B</b>	Regular Reporting	Section 9.3.3
<b>Cond 4</b>	Annual Review	Section 9.3.1; also see Section 8.2 of AQMP
<b>Cond 5 - 6</b>	Independent Environmental Audit	Section 9.1; also Section 8.3 of AQMP
<b>Cond 7</b>	Independent Environmental Audit	Section 9.1; also Sections 1.3.3 & 6.9.4
<b>Cond 8 - 9</b>	Community Consultative Committee	Section 10.1
<b>Cond 10 – 11</b>	Access to Information	Section 9.3.3

#### 4. Plan Development and Consultation

The Air Quality Management Plan has been prepared by Mark Hammond, an experienced environmental professional with over 10 years practical experience developing air quality mitigation strategies and implementing air quality management plans on mine and quarry sites, and who has been endorsed by the Planning Secretary as a suitably qualified and experienced person for the preparation of this plan (Department Reference: DA264/01-PA-11).

A copy of the draft Air Quality Management Plan was provided to the Environment Protection Agency for their input prior to finalisation. The EPA advised that they are not in a position to review or approve the management plan, and that further advice in regards to EPA guidelines could be found on the EPA website.

#### 5. Existing Environment and Air Quality Criteria

The Cleary Bros Gerroa Sand Quarry extracts and processes sand for inclusion in Cleary Bros concrete products produced at their Illawarra based concrete plants. The site has an extensive history of operation as a sand quarry, with the quarry in operation for over 60 years under a succession of development approvals. The current approval permits the site to export 80,000 tonnes per annum of sand and related products.

The Gerroa sand quarry is situated within the coastal region and is in close proximity to other rural activities as well as traffic from the surrounding roads. Background particulate matter generated from sea spray, pollination, natural phenomenon such as bushfires and strong transporting winds, exhaust fumes and from surrounding agricultural activities impacts on the local and regional airshed. The main air quality considerations within the Gerroa Sand Quarry include particulate matter generated by wind and equipment operations as well as fumes from plant equipment.

Sources of possible air pollution from the operation of the Gerroa Sand Quarry include topsoil stripping, product loading, vehicle movement, landform shaping (bund construction, shoreline profiling) and the effects of wind on stockpiles and other exposed dry surfaces. The sand extraction, piping and separation are all wet processes that under regular conditions will produce negligible dust. Due to the nature and scale of operations, exhaust fumes are not considered to have a significant impact on the surrounding environment.

The typical equipment used on the site includes:

- Sand Dredge
- Wet Sorter (Processing Plant)
- Rubber Tyred Loader and Excavator 30 tonne (Cat 330B)
- Water Cart
- Articulated Dump Trucks
- Dozer (Cat D6H)
- Road-going trucks (for offsite transport, site deliveries, and maintenance)

Dust deposition has been monitored at the existing Gerroa Sand Quarry over a number of years. Three permanent monitoring sites are established as follows:

- 1A located adjacent to the site entrance
- 2A located on the eastern side of the dredge pond near the Crooked River Road
- 3A located to the north of the site – formerly in the revegetation area near the Crooked River Road, however due to ongoing sabotage at this highly visible site it was relocated in 2017 to the other side of Blue Angle Creek (within the CP area of the modification dredge pond)

An automatic weather station is also located on the site, which has been established to monitor temperature, humidity, wind speed and direction, rainfall, barometric pressure, and solar radiation. The weather station has operated continuously on its current site on the hill adjacent to the modification area since 2016. Prior to this, a weather station was located on the floodplain closer to the processing area and had been in operation since prior to 2008.

The locations of all historical air quality monitoring sites are shown in Figure 1.

The Development Consent includes criteria for Deposited Dust as total and incremental impact as listed in Table 3. Deposited dust is to be assessed as insoluble solids as defined by *AS/NZS3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method*. Specific air quality monitoring requirements are not specified in the existing EPL 4146.

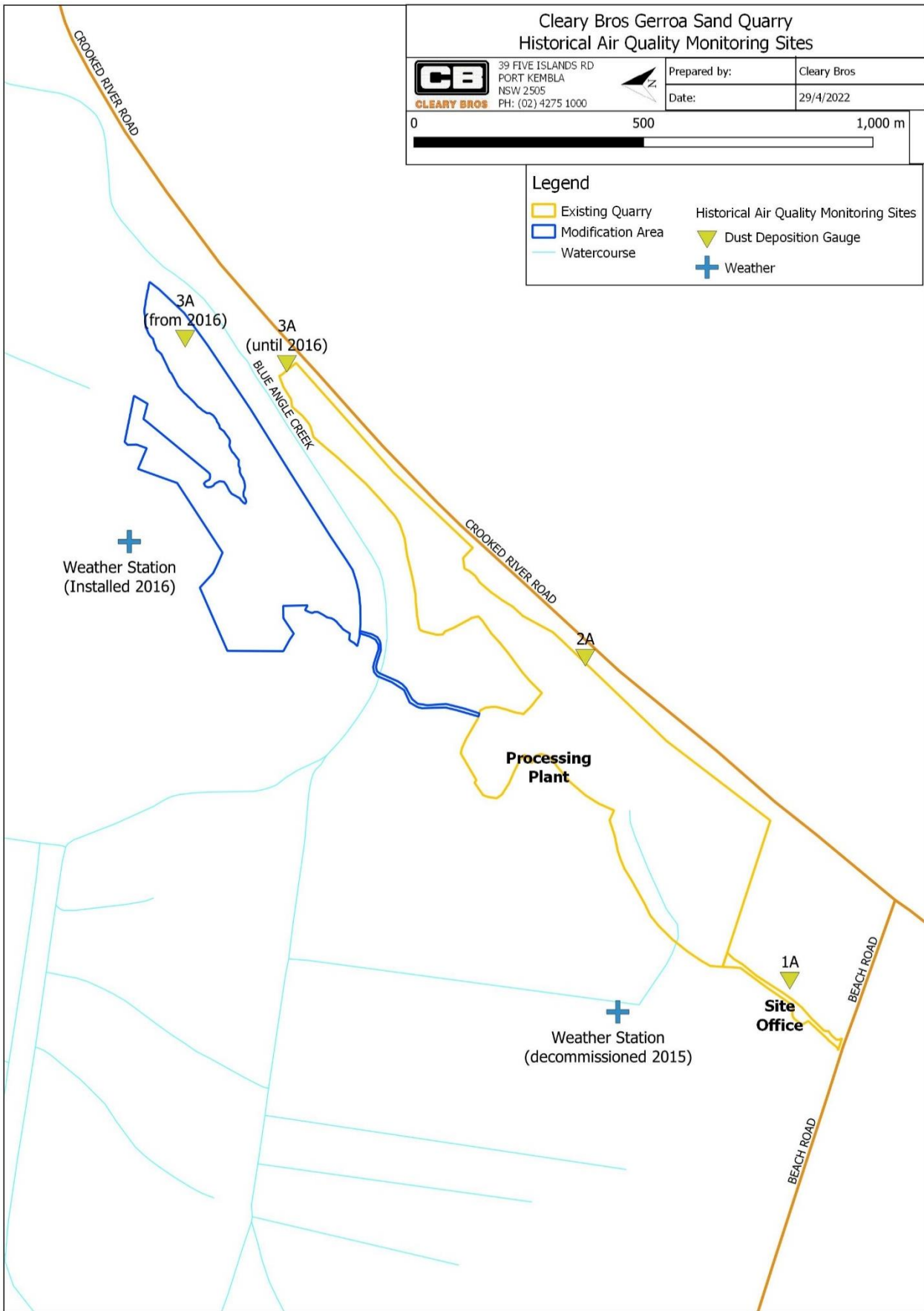


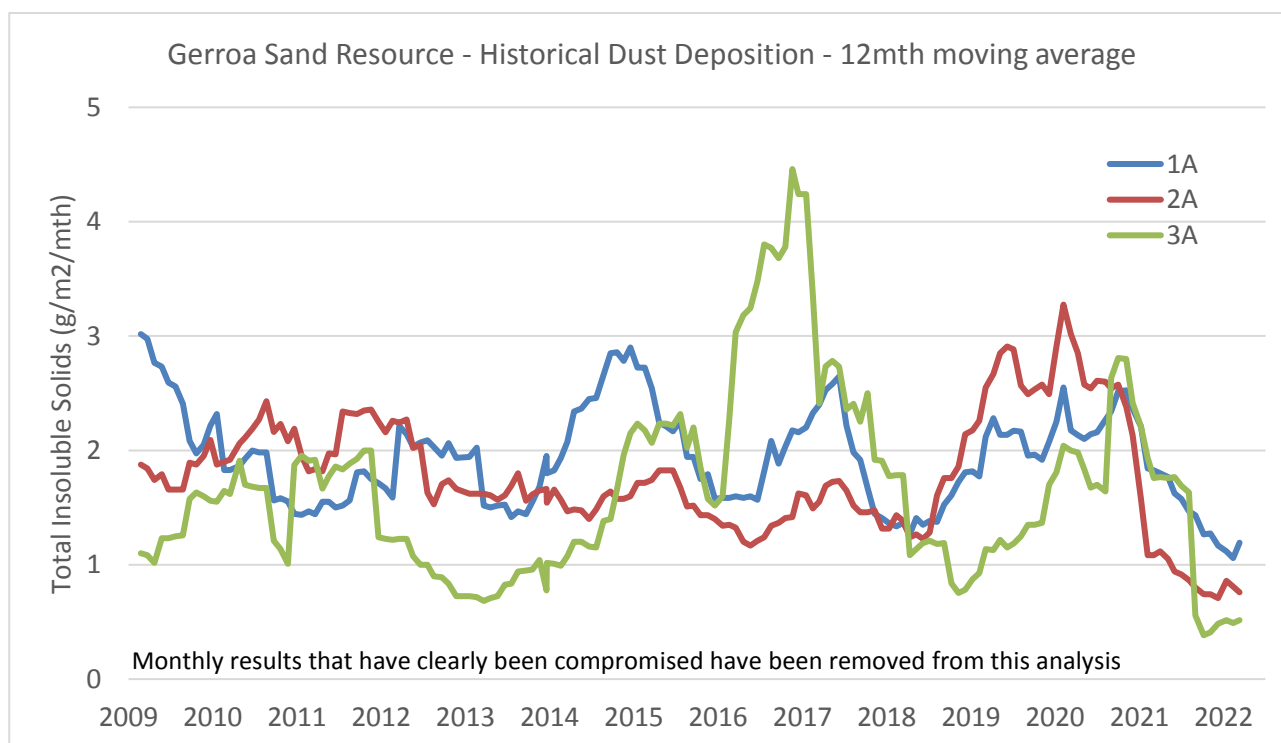
Figure 1 – Historical Air Quality Monitoring Sites

**Table 3 – Air Quality Criteria**

Pollutant	Averaging period	Total impact criteria	Incremental impact criteria
Deposited dust	Annual	2 g/m <sup>2</sup> /month	4 g/m <sup>2</sup> /month

The monitoring results from the three dust gauges indicate that total insoluble solids collected at those locations are typically well below the total impact criteria of the development consent as shown in Figure 2. The average annual dust deposition at Dust Depositional Gauge 3A experienced a short period in 2016 above 4 g/m<sup>2</sup>/month, however this was largely associated with contamination from external sources, given its location in a paddock next to the main road lent itself to sabotage. Dust Gauge 2A, while located close to the main road, is situated within the retained forest, such that it is not very visible from the main road, and hence has not seen similar instances of presumed sabotage. The monitor was relocated to an alternate site further from the road in 2016 to minimise the likelihood of sabotage, with monthly dust deposition returning to typical concentrations following the move. Other than this presumed sabotage, average dust deposition concentrations have recently followed climate drivers, with higher levels across 2019 and 2020 associated with an extended drought, while concentrations since mid-2020 showing a steady decline due to improved rainfall conditions.

Also of note is that the dust deposition gauges are located inside the site boundary and do not represent deposition at residential receptors. It is expected that dust contribution at all sensitive receivers from site operations are expected to be lower owing to the greater distance from the workings. Previous external audits have further found the Gerroa Sand Quarry to be within its existing consent in terms of air quality.



**Figure 2 – Historical Dust Deposition – Total Insoluble Solids**

The Environmental Assessment for the modification area predicted the main source of air pollution to be attributed to plant equipment and machinery during operation of the site. However due to the size and scale of the site, the impacts from exhaust fumes can be considered negligible. The Environmental

Assessment considered dust creation to be the main source of concern, however, if best practice mitigation procedures are followed the impacts of this can be considered negligible.

The 5 air quality impacts are expected as a result of the modification, and that the existing controls implemented to date would be suitable to minimise any adverse impact on local air quality. The Environmental Assessment recommended relocation of the northern dust deposition gauge (formerly 3A) to the north of the modification dredge pond.

No dust or similar complaints have been received in at least the past 15 years of operation at the site.

Cleary Bros has not entered into an agreement with any other landowner with regard to acceptable air quality criteria for their property, and as such the Air Quality Criteria as listed in the Consent apply.

## 6. Air Quality Mitigation Measures

Cleary Bros commits to undertaking all reasonable steps to minimise air quality emissions (including odour, fume, and dust) from construction and operational activities on the site, as detailed below.

The following design features have been incorporated into the Project to minimise air quality impacts to the local airshed:

- Siting the processing plant and truck loading area in the central part of the site, away from the rural residential receivers.
- The first 200 metres of the access road within the site has been sealed to limit dust generation closest to the rural residential area to the south.
- The intersection of the access road with Beach Road has been upgraded with sealed shoulders.
- Equipment utilised on the Project has been specifically selected to be fit for purpose.

Other operational controls implemented to minimise air quality impacts include:

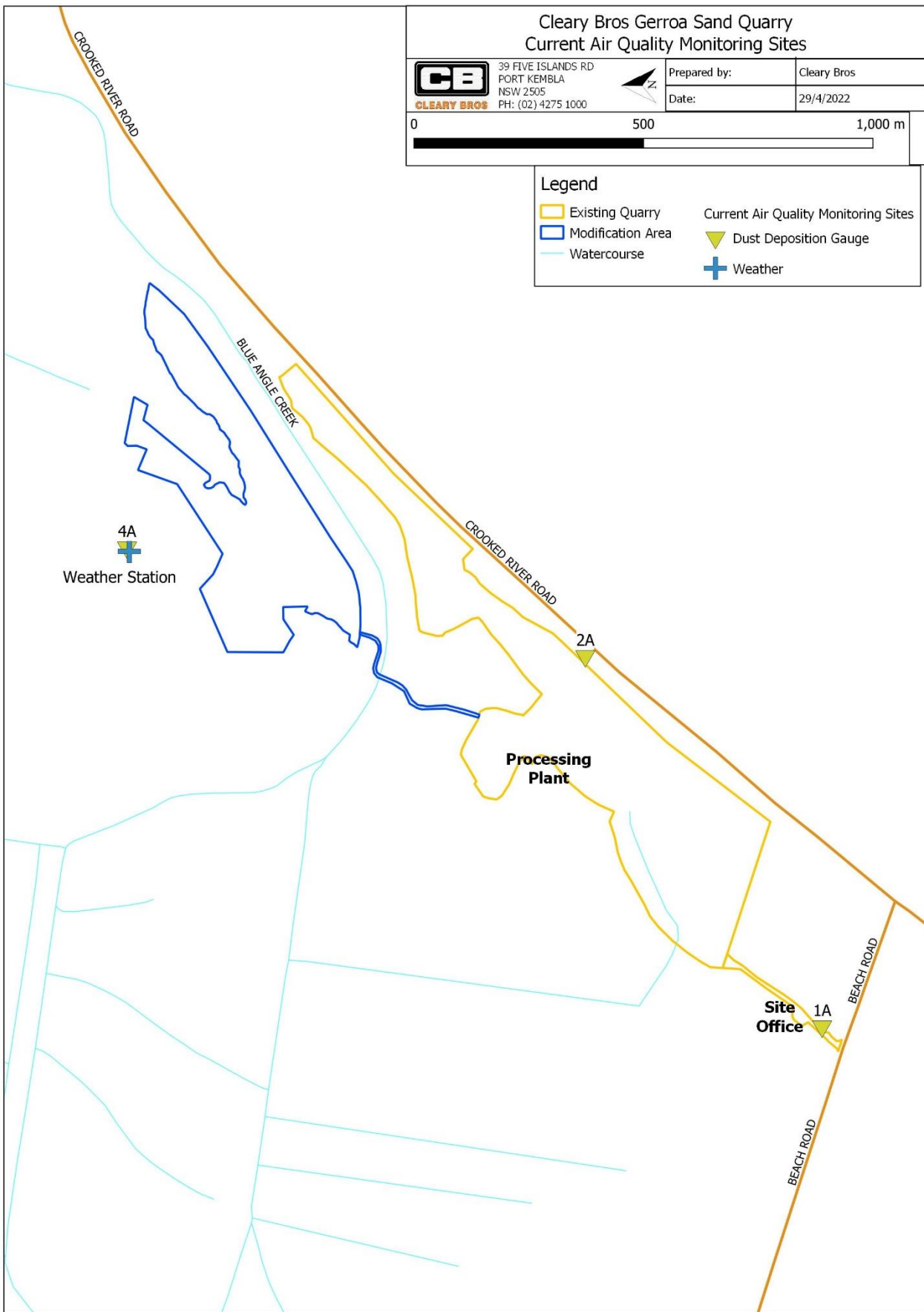
- Keep to a minimum the area of land disturbed for operational purposes at any one time. When a disturbed area is no longer to be used, revegetate it as soon as practicable.
- Restrict the speed of vehicles operating within the site to 20km/h to minimise wheel-generated dust.
- Cover the loads of all loaded vehicles carrying materials to or from the site.
- Keep unsealed internal roads and loading areas moist when in use to minimise vehicle-generated dust.
- Regulate sand production to avoid excessive product stockpiling.
- Monitor weather forecasts on a regular basis (minimum twice weekly) to enable proactive measures to be planned, such as increased haul road watering, altering certain activities, or cease loading and transport on the site.
- Continually watch for any visible air pollution and if necessary, minimise dust generation by modifying operations, such as closing the site for loading and transport in extreme weather conditions.
- Maintain plant and equipment to manufacturers' specifications.
- Ensure all truck drivers leaving the site are familiar with and adhere to the requirements of Cleary Bros Drivers Code of Conduct, which includes driver behaviour training relating to turning off truck engines when parked or waiting for an extended period of time.
- Implement an air quality monitoring program to ensure compliance with the air quality criteria.
- Advertise the contact number at the front of the site, to provide community members with a contact point should they wish to raise concerns regarding dust generation.
- Cleary Bros complaints management process (refer to QEMP) ensure all community complaints are investigated and followed up as relevant to each complaint.



- Conduct regular Community Consultative Committee meetings to ensure dissemination of project information and to provide a forum for community members to raise any concerns regarding air quality.

## 7. Air Quality Monitoring Program

Source	The project approval requires the implementation of air quality monitoring procedures (schedule 3, condition 8(c)). This section presents the air quality monitoring program.
Location	<p>Air quality monitoring locations are shown on Figure 3 and are as follows:</p> <ul style="list-style-type: none"> <li>• Dust Deposition Gauge 1A adjacent to the site entrance;</li> <li>• Dust Deposition Gauge 2A on the site boundary east of the processing plant;</li> <li>• Dust Deposition Gauge 4A to the north of the modification dredge pond; and</li> <li>• Automatic Weather Station situated co-located with Gauge 4A.</li> </ul>
Frequency	<p>The sample bottles within the dust gauges will be collected as near as possible to the same day each month.</p> <p>The weather station operates continuously, recording data every 10 minutes.</p>
Method	<p>Deposited dust will be analysed for Total Insoluble Solids in accordance with <i>AS3580.10.1-2003 – Methods for Sampling and Analysis of Ambient Air – Determination of Particulates - Deposited Matter - Gravimetric Method</i>. The monthly results will be averaged over the 12-month reporting period to assess compliance with the air quality criteria.</p> <p>The weather station is sited general in accordance with <i>AS/NZS3580.1.1 Method for sampling and analysis of ambient air: Guide to siting air monitoring equipment</i>.</p> <p>The weather station records the following parameters:</p> <ul style="list-style-type: none"> <li>• Temperature (°C) at 2 metres</li> <li>• Temperature (°C) and relative humidity (%) at 10 metres</li> <li>• Mean Wind speed (m/s) and direction (°) at 10 metres</li> <li>• Barometric pressure (hPa)</li> <li>• Solar radiation (W/m<sup>2</sup>)</li> <li>• Rainfall (mm)</li> </ul> <p>The weather station also derives wind gust speed (m/s) and direction (°), and wind direction standard deviation (sigma-theta; °).</p>
Performance targets	The performance targets are as per the criteria listed in Table 3.



**Figure 3 – Current Air Quality Monitoring Sites**

## 8. Review, Improvement and Reporting

Regular reviews of environmental monitoring data and management strategies will be undertaken to ensure the Air Quality Management Plan meets its objectives. This will include formal and informal checks as follows:

- Internal review of dust deposition data each month by the Environmental Officer.
- Annual Review completed by the Environmental Officer following the end of each financial year (reporting period).
- Independent Environmental Audits conducted on a three-yearly basis.

### 8.1 Internal Review

The Environmental Officer will review all air quality monitoring data each month. This will include a review of monitoring data against the air quality criteria, and to informally assess any unexpected results.

### 8.2 Annual Review

The Annual Review will be prepared by the Environmental Officer within two months of the end of the reporting year (July to June) and will:

- describe the activities associated with the project that were carried out in the previous financial year, and the activities that are proposed to be carried out over the current financial year;
- include a comprehensive review of the air quality monitoring results and complaints for the reporting period, which includes a comparison of these results against :
  - the air quality criteria;
  - monitoring results from previous years;
  - requirements of this Air Quality Management Plan; and
  - predictions in the environmental assessment (EA);
- identify any non-compliance or incident which occurred during the previous year and describe what actions were (or are being) taken to rectify the non-compliance and avoid recurrence;
- identify any trends in the monitoring data over the life of the Project;
- identify any discrepancies between the predicted and actual impacts of the Project, and analyse the potential cause of any significant discrepancies;
- describe what measures will be implemented over the next year to improve the environmental performance of the project; and
- review the suitability of the Air Quality Management Plan.

An electronic copy of the Annual Review will be provided to the Department and members of the Community Consultative Committee, as well as uploaded to the Cleary Bros website.

### 8.3 Independent Environmental Audit

Every three years, Cleary Bros will engage a suitable qualified, experienced, and independent person(s) to undertake an independent environmental audit. The audit will be conducted in accordance with Schedule 5 Condition 5 of the Development Consent, with the auditor approved by the Planning Secretary.

### 8.4 Corrective Actions and Improvement Measures

In the event the air quality criteria are exceeded or a dust complaint is received, corrective actions will be considered as summarised below. Within 7 days of becoming aware of a non-compliance of the air quality criteria, Cleary Bros will notify the Planning Secretary (via the Major Projects Portal) and EPA (via Environmental Line), providing the condition of this approval that the project is non-compliant with, why it

does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

The actions implemented will depend on the nature of the issue following an investigation into the source of the event. Potential corrective actions that may be considered in response to an incident:

- Where issue relates to once off event, modify or stop operations to avoid similar event.
- Review existing mitigation measures.
- Modify or stop operations during specific weather events (eg. extreme winds).
- Service or otherwise maintain affected equipment.
- Implement additional control measures specific to the source.
- Follow up monitoring to confirm validity of any suspect results or to verify the effectiveness of corrective action(s).

### 8.5 Air Quality Management Plan Review

The Air Quality Management Plan will be reviewed annually as part of the Annual Review process, as well as within three months of an Independent Environmental Audit or approval of a modification to the Development Consent. The Plan will also be reviewed following an incident related to air quality such as an exceedance of the air quality criteria. In the event the review identifies that changes are required to the AQMP, these will be undertaken within 6 weeks of the review and submitted to the Planning Secretary for approval.