

Calga Sand Quarry

Air Quality Monitoring Program

incorporating an

Air Monitoring Protocol

Approved

Prepared by:



R. W. CORKERY & CO. PTY. LIMITED

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1 INTRODUCTION

It is recognised that the operation of the Calga Sand Quarry ("the quarry") has the potential to impact on the air quality environment beyond the boundaries of the site. To manage the potential impact on the local air quality, and in compliance with *Condition 3(9)* of Development Consent DA 94-4-2004 ("the Consent")¹ the following Air Quality Monitoring Program (AQMP) has been prepared.

The AQMP includes an Air Monitoring Protocol (AMPr) to evaluate compliance with the air quality criteria identified by the Consent (see Section 2). Section 3 presents the specific features of the NMP including monitoring locations, parameters measured and frequency of monitoring.

2 CONSENT REQUIREMENTS

The Consent for the quarry incorporates two conditions relating to air quality, air quality management and air quality monitoring. These conditions are presented in full in Box 1. It is noted that these conditions arose from the DEC's recommendations to the DoP and as such will be consistent with the condition of the EPL 11295.

3 AIR QUALITY MONITORING PROTOCOL

3.1 Introduction

An environmental impact assessment was undertaken for the proposed extension to the quarry prior to the granting of the Consent and this AMPr has been designed to be consistent with commitments made as part of this assessment, including an EIS dated May 2004 (RWC, 2004) and a subsequent Amendment Report dated June 2005 (RWC, 2005). The AMPr has been prepared with reference to relevant legislation and guidelines to address the following matters relevant to the management of air pollutants produced by the quarry.

- Air quality compliance criteria (see Section 3.2).
- Air quality controls and mitigation measures (see Section 3.3).
- Community consultation (see Section 3.4).
- Management of complaints (see Section 3.5).
- Monitoring methods and programs (see Section 3.6).
- Response to air quality compliance criteria exceedance (see Section 3.7)

¹ Hereafter all identified conditions refer to DA 94-4-2004, the Consent.



Schedule 3
Impact Assessment Criteria

8. The Applicant shall ensure that dust generated by the development does not cause additional exceedances of the criteria listed in Tables 3 to 5 at any residence on, or on more than 25 percent of, any privately-owned land.

Table 3: Long term impact assessment criteria for particulate matter

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	30 µg/m ³

Table 4: Short term impact assessment criteria for particulate matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³

Table 5: Long term impact assessment criteria for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method

Air Quality Monitoring Program

9. Prior to carrying out any development, the Applicant shall prepare, and subsequently implement, an Air Quality Monitoring Program for the development, in consultation with DEC, and to the satisfaction of the Director-General. This program must include an air monitoring protocol for evaluating compliance with the air quality impact assessment criteria in this consent.

Note: Initially, this program should concentrate on monitoring the dust deposition impacts of the development. However, in time, it may be expanded to include other pollutants.

Box 1
Air Quality Related Consent Conditions

3.2 Air Quality Compliance Criteria

Air quality compliance criteria for the operation of the quarry, as incorporated in *Condition 3(8)*, have been established using relevant DEC guidelines. Rocla will ensure that dust generated by the development does not cause additional exceedances of the criteria listed in **Table 3.1** at any residence on, or on more than 25 percent of, any privately-owned land.



Table 3.1
Air Quality Impact Assessment Criteria

Pollutant	Criterion		Averaging Period
Total suspended particulate matter (TSP)	90 $\mu\text{g}/\text{m}^3$		Annual mean
Particulate matter <10 μm (PM ₁₀)	50 $\mu\text{g}/\text{m}^3$		24-hour maximum
	30 $\mu\text{g}/\text{m}^3$		Annual mean
Deposited dust	Maximum increase in deposited dust level	Maximum total deposited dust level	
	2 g/m ² /month	3.7 g/m ² /mont ²	Annual mean
Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.			
Source: Modified after DA 94-4-2004 – Tables 3 – 5.			

It is noted that while general criteria for <10 μm particulate matter (PM₁₀) have been nominated in the consent, the previous performance of Rocla in controlling dust and other air pollutants at the Calga Sand Quarry has been such that the consent does not require specific monitoring of this size particulate matter. Continued compliance with deposited dust criteria will be considered sufficient management of PM₁₀ with specific additional monitoring for PM₁₀ required only in the event of sustained exceedances of deposited dust criteria.

3.3 Air Quality Controls and Management Procedures

Rocla will incorporate a range of design and operational safeguards, and operational procedures for the quarry to ensure that the effectiveness of the air quality controls are optimised throughout all stages of the project. The controls have been selected largely based on their proven effectiveness for the previous operations of the Calga Sand Quarry and were previously presented in RWC (2004) for the quarry extension.

1. A 10 000 litre water truck will be used to regularly moisten the active internal unsealed roads. Based on experience, watering of the unsealed roads will occur at least 5 times per day with an application of at least 1.5L/m² per application.
2. Topsoil stockpiles, acoustic bund walls and areas where landform preparation is complete will be seeded with either native or pasture species to assist in stabilising the exposed surface.
3. A wheel-wash facility will be operated within the site to minimise the tracking of mud onto Peats Ridge Road which in turn could generate dust.
4. The raw feed material delivered to the wash plant and mortar sand plant will have a degree of inherent moisture that will contribute to the overall control of dust.
5. All trucks will be required to have their load covered prior to exiting the site.

² The consent specifies a maximum total deposited dust level of 4g/m²/month, however, given a background of 1.7g/m²/month was established in the EIS and the criteria for maximum increase in deposited dust level being 2g/m²/month, the criteria of 3.7g/m²/month is more appropriate.



The controls and management procedures will be reviewed in response to complaints or comments identified through Rocla's consultation effort and any changes made noted as part of annual environmental reporting (in the form of an Annual Environmental Management Report (AEMR)).

3.4 Community Consultation

Rocla is keen to maintain a positive dialogue with all members of the local community to avoid any adverse impacts and/or misunderstandings arising from its activities. Consultation will be undertaken in one of two ways.

1. Direct contact with those members of the local community with the greatest potential to be impacted by the quarry.
2. Establishment and involvement in a Community Consultative Committee (CCC) as required by *Condition 5(8)* of DA 94-4-2004. The CCC is comprised of:
 - two Rocla representatives, including the person responsible for environmental management of the quarry;
 - one representative from Gosford City Council; and
 - at least two representatives from the local community.

The appointment of the nominated representatives will be approved by the Director-General in consultation with Gosford City Council.

The CCC will be chaired by an independent chairperson, whose appointment has also been endorsed by the Director-General, meet at least twice a year, and review the environmental performance of the development.

Rocla will ensure that the CCC is provided with the most up-to-date information on the environmental performance of the quarry and respond to any comments made by representatives of the CCC.

3.5 Management of Complaints (Complaints Management Protocol)

Whilst all endeavours will be made by Rocla to avoid adverse impacts on the local environment and to local residents, it is acknowledged that from time to time such impacts may occur. To ensure an appropriate and consistent level of reporting, response and follow-up to any complaints is adopted by Rocla, the following complaints management protocol will be followed.

- Each complaint received will be recorded on a Complaints Register. The Register will include the details of the complainant, type of complaint (eg. excessive dust generation), and the date and time received.



- The Quarry Manager is responsible for addressing the complaint as well as the necessary measures required to address the complaint.
- Once the identified measures are undertaken, the Quarry Manager will sign off on the relevant Complaints Register.
- If necessary, follow-up monitoring will take place to confirm the source of the complaint is adequately mitigated.
- A copy of the Complaints Register will be kept by Rocla and made available to the CCC and the complainant (on request). A summary of complaints received (if any exist) will be presented to each CCC meeting and reporting in the relevant AEMR.
- A copy of the Complaints Register will be submitted in the Environmental Protection License Annual Return to DEC (EPA).

Based on the nature of the complaint, specific contingency measures will be implemented to the (reasonable) satisfaction of the complainant. The Quarry Manager retains ultimate responsibility to ensure that complaints received are properly recorded and addressed appropriately.

3.6 Monitoring Methods and Programs

Section 4 presents the air quality monitoring methods and procedures including details on monitoring locations, methods, frequency, parameters and reporting.

3.7 Response to Air Quality Compliance Criteria Exceedance

On identification of an exceedance of the dust deposition compliance criteria presented in Section 3.2, the following protocol is to be followed.

1. Confirmation of Exceedance

- (a) The analysing laboratory will be contacted to ensure no error has been made in storing, analysing or recording the sample or result. Should this investigation conclude the treatment, analysis and result recording for the sample are satisfactory, Rocla will proceed to response point 2.
- (b) It should be noted that the criteria for dust deposition is an annual average value and therefore a dust deposition value of $>3.7\text{g/m}^2$ for any given month is not strictly an exceedance, rather an indication that should there be no change to dust generating or suppression activities the probability of an exceedance once the annual average is calculated is high.

2. Notification (of exceedance)

Monthly exceedance of 3.7g/m^2 : The Quarry Manager will be notified who, at his/her discretion, may notify operation management at Rocla's Guildford office.



Annual Average exceedance of 3.7g/m²/month: In the event that the annual average dust deposition recorded at any site exceeds 3.7g/m²/month, the Quarry Manager will be informed who will, within 7 days, notify the affected land owner, the Director-General of the Department of Planning and the DEC as to the nature of the exceedance(s). Exceedance of an annual average of 3.7g/m²/month will require the preparation of a corrective action plan.

The land owner, the Director-General of the Department of Planning and the DEC will be provided with detailed information as to the proposed corrective actions to be taken (see response step 3). If requested by the Director-General of the Department of Planning, Rocla will commission an independent consultant to undertake an independent review of the operations and noise related impact with any recommendations incorporated into the corrective action plan (see response step 3).

3. Corrective Action

Rocla will prepare an action plan to reduce dust deposition around the site and return the operation to compliance. Preparation of the action plan may require the assistance of a specialist air quality consultant. Details on preparation of the action plan, will be included in the relevant AEMR and Environment Protection Licence Annual Return, and to the DEC prior to implementation if requested.

4. Ongoing Consultation, Reassessment and Negotiated Agreement Development

During and following the implementation of the corrective action plan, the Quarry Manager will consult regularly with the affected land owner / resident to determine its relative success.

Compliance with the criteria for dust deposition will be automatically reassessed the month following the identification of an exceedance of annual average dust deposition as this value can be recalculated monthly based on the proceeding 12 months. Rocla will provide the ongoing quarterly monitoring results to the affected land owner / resident (and the DEC) until such time as the results illustrate a return to compliance.

Rocla notes that given the nature of calculating an average, the operation may not automatically return to compliance despite a reduction in the proceeding months' dust deposition. However, if the corrective action plan is successful the magnitude of the exceedance will decrease, eventually returning to compliance once sufficient monthly results of <3.7g/m² are obtained. In the event that the annual average does not decrease over the proceeding 3-6 months (or monthly deposition figures remain >3.7g/m²), Rocla will consult with the affected land owner and the DEC in relation to preparing a revised corrective action plan (of Step 3), this time with the input of a specialist air quality consultant. Alternatively, Rocla will attempt to develop a negotiated agreement with the land owner whereby, compensatory measures are offered to the land owner in return for signed acceptance of the exceedance of dust deposition criteria. The agreement will generally specify a non-compliant deposition level, above which the agreement becomes null and void.

5. Additional Monitoring

In the event of continued exceedances of dust deposition compliance criteria, Rocla will, in consultation with the DEC, establish a monitoring site for PM₁₀. Should this site be



established, management of exceedances would follow a similar protocol to that presented here.

6. Notification (of compliance / negotiated agreement)

Rocla will notify the DEC and other relevant government agency(ies) and local stakeholder(s) of the return to compliance following the successful implementation of the corrective action plan, or the establishment of a negotiated agreement between Rocla and the affected land owner(s).

7. Continued Non-Compliance and Land Acquisition

In the event of a continued exceedance of dust deposition criteria and where Rocla is unable to obtain a negotiated agreement with the affected landowner, Rocla will either:

- a. refer the situation to the Director-General of Department of Planning and an Independent Dispute Resolution Process is commenced as noted in *Condition 4(4)* (see **Box 2**);
- b. commence land acquisition proceedings with the affected landowner as identified in *Conditions 4(8-10)*.

8. Reporting

The recorded exceedance, corrective actions and reassessment will be reported to the CCC and included in each relevant AEMR.

3.8 Responsibilities and Accountabilities

Throughout the operational life of the quarry, the Quarry Manager will have overall responsibility for ensuring contractors, employees and service providers comply with all laws, regulations, licences, approvals and conditions of the consent.

All persons undertaking any form of work on the site will be required to attend a site-specific induction, at which they will be instructed in the environmental rules, procedures and processes applicable to their activities whilst they are on the site.

4 MONITORING AND REPORTING

4.1 Introduction

Rocla will undertake sufficient monitoring to establish that pollutants generated by its activities is not of concern to the surrounding residents of the quarry and that the measured air quality pollutant levels are compliant with the air quality compliance criteria established and provided in Section 3.2. **Table 4.1** tabulates all relevant information for the Air Quality monitoring program.



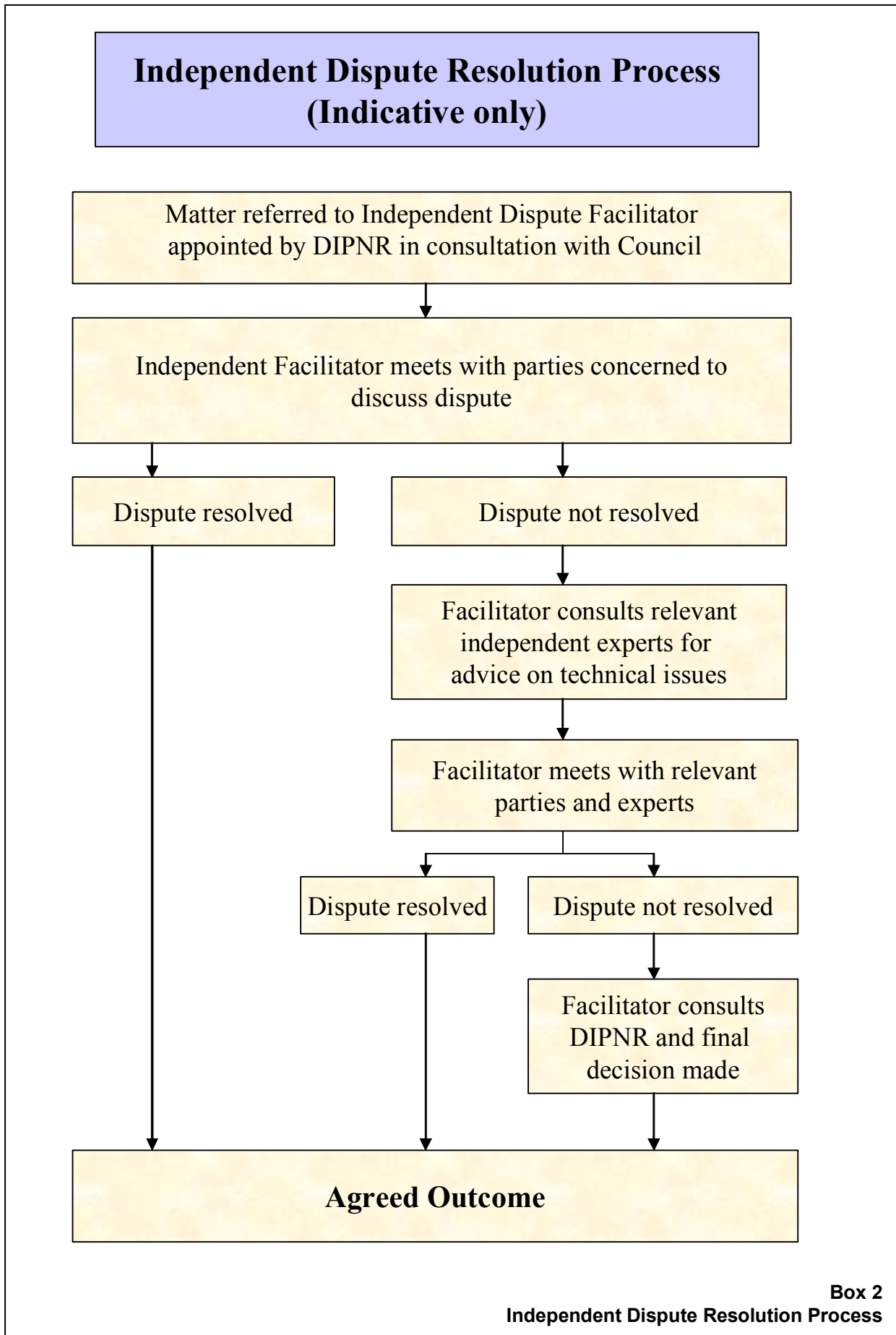


Table.4.1
Air Quality Monitoring Program and Criteria

Purpose	Location ^{*#}	Parameter to be Analysed	Criteria (Annual Average)	Frequency / Timing of Monitoring
Air Quality Compliance Monitoring	CD-1, CD-2(a), CD-2(b), and CD-3	Dust Deposition (g/m ² /month)	3.7g/m ² /month	Monthly.

* See **Figure 4.1** for air quality monitoring site locations.
Prior to commencement of development, the dust monitoring gauge located with the extraction area of Stage 3/5 will be relocated to a point external to the quarry extraction area.

4.2 Monitoring Locations

The following air quality monitoring sites have been established for the measurement of dust deposition at representative locations surrounding the quarry (see **Figure 4.1**). **Table 4.2** presents a summary of these locations.

Table 4.2
Air Quality Monitoring Locations

Ref:	Location		
	Easting	Northing	Description
CD-1	334530	6301700	Located on the boundary of Lot 1, DP559892, of F. & G. Rozmanec, on the eastern side of Peats Ridge Road.
CD-2(a)	334100	6301790	Located within Lot 2, DP229889, of J. Voutos, adjacent to the northern limit of extraction of Stage 3/5.
CD-2(b)	334030	630860	Relocation of CD-2(a) to a position adjacent to the boundary between Lot 188, DP755221 of B. Kashouli and Lot 121, DP755221 of F. & J. Gazzana
CD-3	334300	6301240	Adjacent to the southern boundary of the quarry site on Lot 1, DP805359.

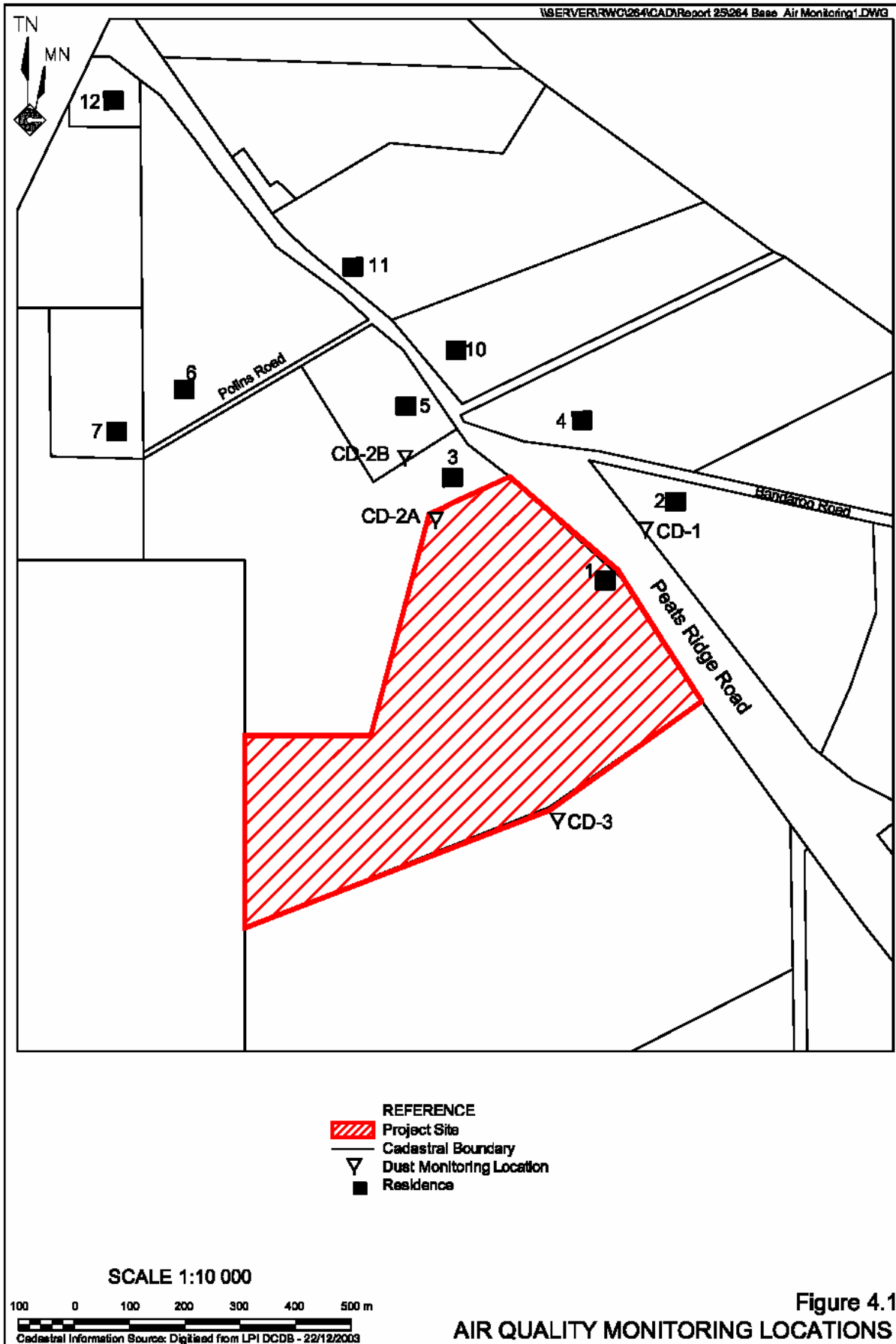
* See **Figure 4.1**

4.3 Parameters Measured

Deposited dust is measured at each of the monitoring locations surrounding the quarry where deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

As noted in the protocol for managing exceedance of dust deposition criteria, in the event of sustained annual average dust deposition >3.7g/m²/month, Rocla will consider the establishment of an additional site to monitor PM₁₀.





4.4 Monitoring Frequency

Monitoring of deposited dust will be undertaken monthly at the quarry. Should a monitoring point for PM₁₀ be established in the future, the frequency of air quality monitoring will be reviewed.

4.5 Data Recording and Reporting

Data Recording

Once each month the glass container used to capture the deposited dust will be removed, replaced and sent to a NATA accredited laboratory for analysis. The following information will be recorded at each monitoring location.

- Date and time of removal and replacement.
- Condition of the dust gauge.
- Notable ground disturbances or activities ongoing in the general activity (not associated with the quarry).
- Any other notable activities or conditions at or around the monitoring location.

Data Reporting

The results of any air quality monitoring will be presented in the relevant AEMR. This will include an analysis of the monitoring results against the criteria listed in **Table 3.1**, previous monitoring results and predictions made in the EIS. Based on these results, trends in the air quality levels will be identified and any non-compliances noted.

The recording of an exceedance of air quality criteria identified in **Table 3.1**, will trigger the implementation of contingency measures described in Section 3.7 of the AMPr.

5 REFERENCES

R.W. Corkery & Co. Pty. Limited (2004), *Environmental Impact Statement for the Proposed Calga Sand Quarry Extension*, prepared for Rocla Materials Pty Ltd.

R.W. Corkery & Co. Pty. Limited (2005), *Amendment to a Proposal Submitted as Development Application (DA 94-4-2004) for an Extension to the Calga Sand Quarry*, prepared for Rocla Pty Limited.

