

Calga Sand Quarry

Air Quality Monitoring Program

incorporating an

Air Monitoring Protocol

Prepared by:



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Air Quality Monitoring Program *incorporating an* *Air Monitoring Protocol*

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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")^a an Air Quality Monitoring Program (AQMP) was prepared and approved by the Director-General of the Department of Planning in December 2005. Since the approval of the original AQMP, Rocla has increased the number of locations included in the monitoring program and upgraded the Air Monitoring Protocol ("the Protocol") to evaluate compliance with the air quality criteria identified by the Consent (see Section 5).

This AQMP includes the updated information on monitoring locations and the Protocol and replaces the original AQMP of December 2005.

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**.

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.			
<i>Table 3: Long term impact assessment criteria for particulate matter</i>			
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	
<i>Table 4: Short term impact assessment criteria for particulate matter</i>			
Pollutant	Averaging period	Criterion	
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³	
<i>Table 5: Long term impact assessment criteria for deposited dust</i>			
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
<i>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</i>			
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.			
<i>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.</i>			
			Box 1
Air Quality Related Consent Conditions			

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



As specified by *Condition 3(8)*, Rocla will ensure that dust generated by the operation of the Calga Sand Quarry does not result in an increase in monthly dust deposition of greater than $2\text{g}/\text{m}^2/\text{month}$, nor result in PM_{10} concentrations of greater than $30\mu\text{g}/\text{m}^3$ (annual average) and $50\mu\text{g}/\text{m}^3$ (24 hour maximum) at any residence, or on more than 25 percent of, any privately-owned land^b. Section 3 provides a summary of the mitigation measures currently undertaken at the Calga Sand Quarry to reduce the generation and emission of dust and particulate matter.

3 AIR QUALITY CONTROLS AND MANAGEMENT PROCEDURES

Rocla will continue to 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 ongoing operations of the quarry.

1. A water truck (12 000 litre) 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 $1.5\text{L}/\text{m}^2$ 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.

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)).

4 MONITORING AND REPORTING

4.1 Introduction

Rocla will undertake sufficient monitoring to establish that pollutants generated by its activities are 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 2. To date, regular monitoring has been restricted to dust deposition at selected

^b Based on the generally accepted proportion of PM_{10} material within Total Suspended Particulate matter (TSP), satisfaction of the PM_{10} criteria infers compliance with the TSP criteria. TSP is therefore not considered in this AQMP.



locations surrounding the quarry as modelling undertaken to predict concentrations of PM₁₀ at residential locations surrounding the quarry has predicted daily and annual PM₁₀ concentrations well below the nominated criteria (see Section 2 and **Box 1**).

Since the approval of the original AQMP, Rocla has undertaken monitoring of PM₁₀ on a campaign basis at locations to the east and south of the quarry as follows.

- At the residence on the quarry site to the immediate northeast of the sand processing plant (CD-1) between 4 and 28 February 2007.
- At the Australia Wildlife Walkabout Park (CD-4) between 16 May and 1 June 2007.
- At the Australia Wildlife Walkabout Park (CD-4) between 3 and 27 August 2007.

The results of the three campaign PM₁₀ monitoring is presented in **Table 4.1** and confirms that PM₁₀ emissions from the quarry are low, supporting the exclusion of regular PM₁₀ monitoring from the AQMP.

Table.4.1
PM₁₀ Monitoring Results

Date	PM ₁₀ 24-hour average concentration (µg/m ³)	Date	PM ₁₀ 24-hour average concentration (µg/m ³)
February 2007 – Location CD-1			
04/02/07	14	19/02/07	20
07/02/07	15	22/02/07	17
10/02/07	12	25/02/07	12
13/02/07	10	28/02/07	13
16/02/07	13		
		Average	14
May/June 2007 – Location CD-4 (Australia Wildlife Walkabout Park)			
16/5/07	24	25/05/07	7
17/05/07	64	26/05/07	19
18/05/07	10	27/05/07	21
19/05/07	1	28/05/07	15
20/05/07	3	29/05/07	12
21/05/07	3	30/05/07	5
22/05/07	4	31/05/07	10
23/05/07	2	01/06/07	9
24/05/07	3		
		Average	12.5
August 2007 – Location CD-4 (Australia Wildlife Walkabout Park)			
03/08/07	1	21/08/07	5
09/08/07	1	27/08/07	8
15/08/07	4		
		Average	3.8

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.



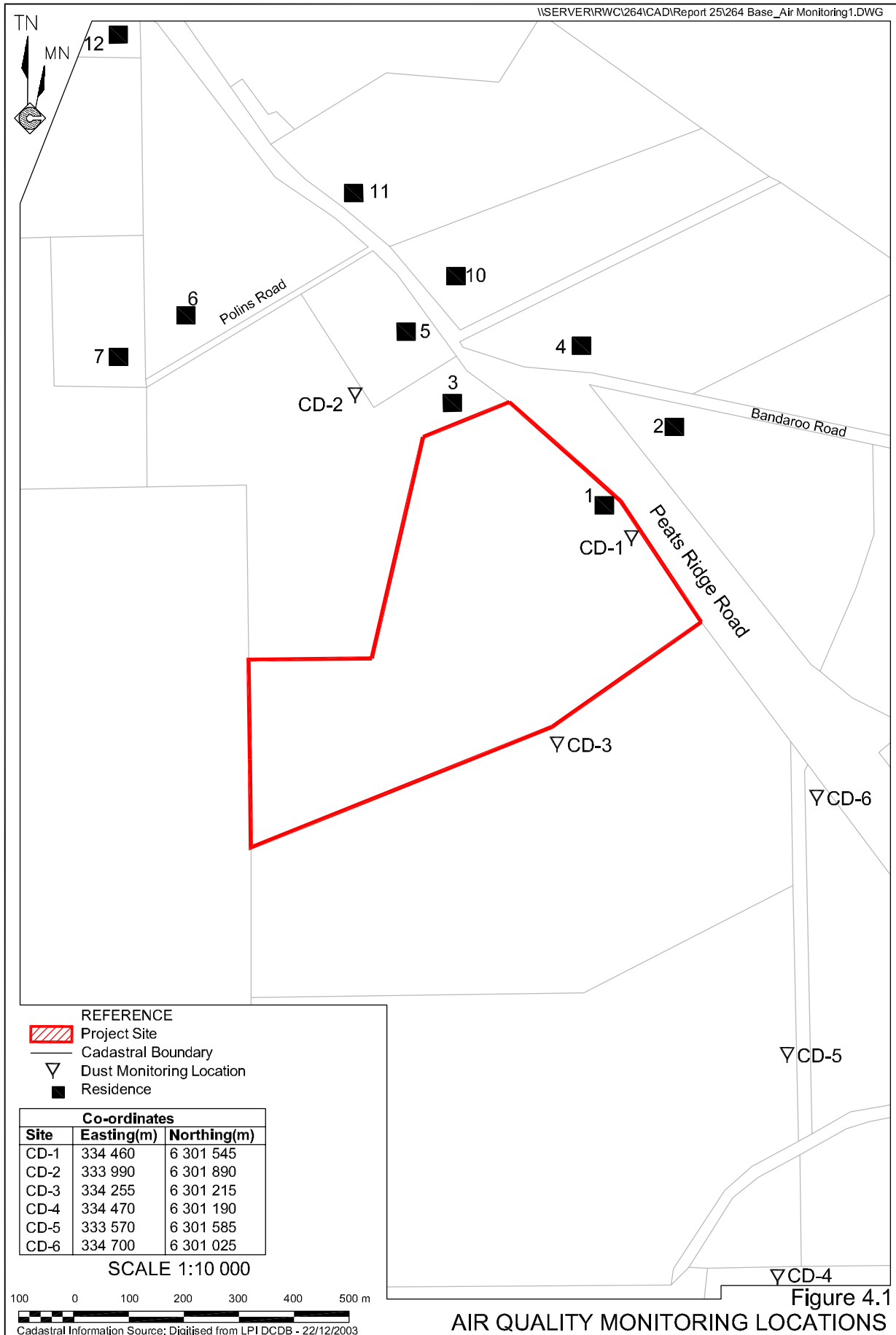


Table 4.2
Air Quality Monitoring Locations

Reference*	Location		
	Easting	Northing	Description
CD-1	334460	6301545	At the residence on Lot 2, DP229889, owned by Rocla to the immediate northeast of the quarry processing plant.
CD-2 [#]	333990	6301890	On Lot 121, DP755221 of F. & J. Gazzana, near the boundary of this property with Lot 188, DP755221 of B. Kashouli and at a northing equivalent to that at the residence on Lot 188, DP755221.
CD-3	334300	6301240	Adjacent to the southern boundary of the quarry site on Lot 1, DP805359.
CD-4	334470	6301190	At the northern boundary of Lot 235 DP822125 (Australia Wildlife Walkabout Park) with Lot 2, DP805359.
CD-5	333570	6301585	On Lot 2, DP805359, to the east of the power line easement
CD-6	334700	6301025	On cleared land on Lot 1, DP805359 to the east of the power line easement.
* See Figure 4.1			
[#] This dust gauge has been relocated from Lot 188, DP755221 due to ongoing contamination issues resultant from operations on this property.			

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.

In the event of sustained annual average dust deposition $>3.7\text{g/m}^2/\text{month}$, Rocla will consider the commencement of regular monitoring of PM_{10} .

4.4 Monitoring Frequency

Monitoring of deposited dust will be undertaken every 30 ± 2 days at the quarry.

4.5 Data Recording and Reporting

4.5.1 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.



4.5.2 Data Reporting

The results of the air quality monitoring will be reported on a monthly basis (as a component of a wider monthly monitoring report for the quarry) and the monthly monitoring report placed on Rocla's website. A summary of the monthly monitoring results will also be presented in the relevant AEMR. This will include an analysis of the monitoring results against the criteria listed in Section 2 and **Box 1**, previous monitoring results and predictions made in the EIS for the quarry. 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 Section 2 and **Box 1**, will trigger the implementation of the corrective actions described in Section 5.4 of the AMPr.

5 AIR QUALITY MONITORING PROTOCOL

5.1 Introduction

The AMPr describes the procedures to be followed related to:

- community consultation (see Section 5.2);
- evaluation of monitoring results (see Section 5.3);
- management of complaints (see Section 5.4); and
- response to air quality compliance criteria exceedance (see Section 5.5).

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.

5.2 Community Consultation

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.

5.3 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.

5.4 Evaluation of Monitoring Results

The current arrangement is for Rocla's Resource Development Manager to evaluate the monthly monitoring results and advise on issues related to compliance and environmental performance. Each month, the Resource Development Manager will:

1. obtain the results of monthly dust and meteorological monitoring;
2. identify whether the results are compliant (or not) with *Condition 3(8)* of the Consent;



3. review the results with reference to meteorological data for the month (to assist in assessment of any trends in dust deposition data);
4. assess and advise on any trends in the data, ie. increasing dust deposition levels over time, higher dust deposition levels when compared to same period the previous year, etc.; and
5. advise on measures that could be taken to further reduce dust deposition levels or commission a specialist environmental consultant to provide this advice.

In the future, Rocla may choose to use an external environmental consultant to undertake this evaluation of monitoring results.

5.5 Response to Exceedance of Criteria

If an exceedance of the dust deposition compliance criteria is identified, 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 and operational activities for that month reviewed to determine whether additional mitigation measures are required at the quarry.

Annual Average exceedance of $3.7\text{g/m}^2/\text{month}$: In the event that the annual average dust deposition recorded at any site exceeds $3.7\text{g/m}^2/\text{month}$, 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 Department of Environment, Climate Change and Water – Environment Protection and Regulation Group (Newcastle Office) (DECCW) as to the nature of the exceedance(s). Exceedance of an annual average of $3.7\text{g/m}^2/\text{month}$ will require the preparation of a corrective action plan.

The land owner, the Director-General of the Department of Planning and the DECCW 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

Under the advice of a specialist environmental consultant, Rocla will prepare an action plan to reduce dust deposition around the site and return the operation to compliance. Details on preparation of the action plan, will be included in the relevant AEMR and Environment Protection Licence Annual Return, and to the DECCW 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 DECCW) 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 $<3.7\text{g/m}^2$ are obtained. In the event that the annual average does not decrease over the proceeding 3 to 6 months (or monthly deposition figures remain $>3.7\text{g/m}^2$), Rocla will consult with a specialist air quality consultancy, the affected land owner and the DECCW in relation to preparing a revised corrective action plan (of Step 3). 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 DECCW, establish a monitoring site for PM_{10} . 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 DECCW 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

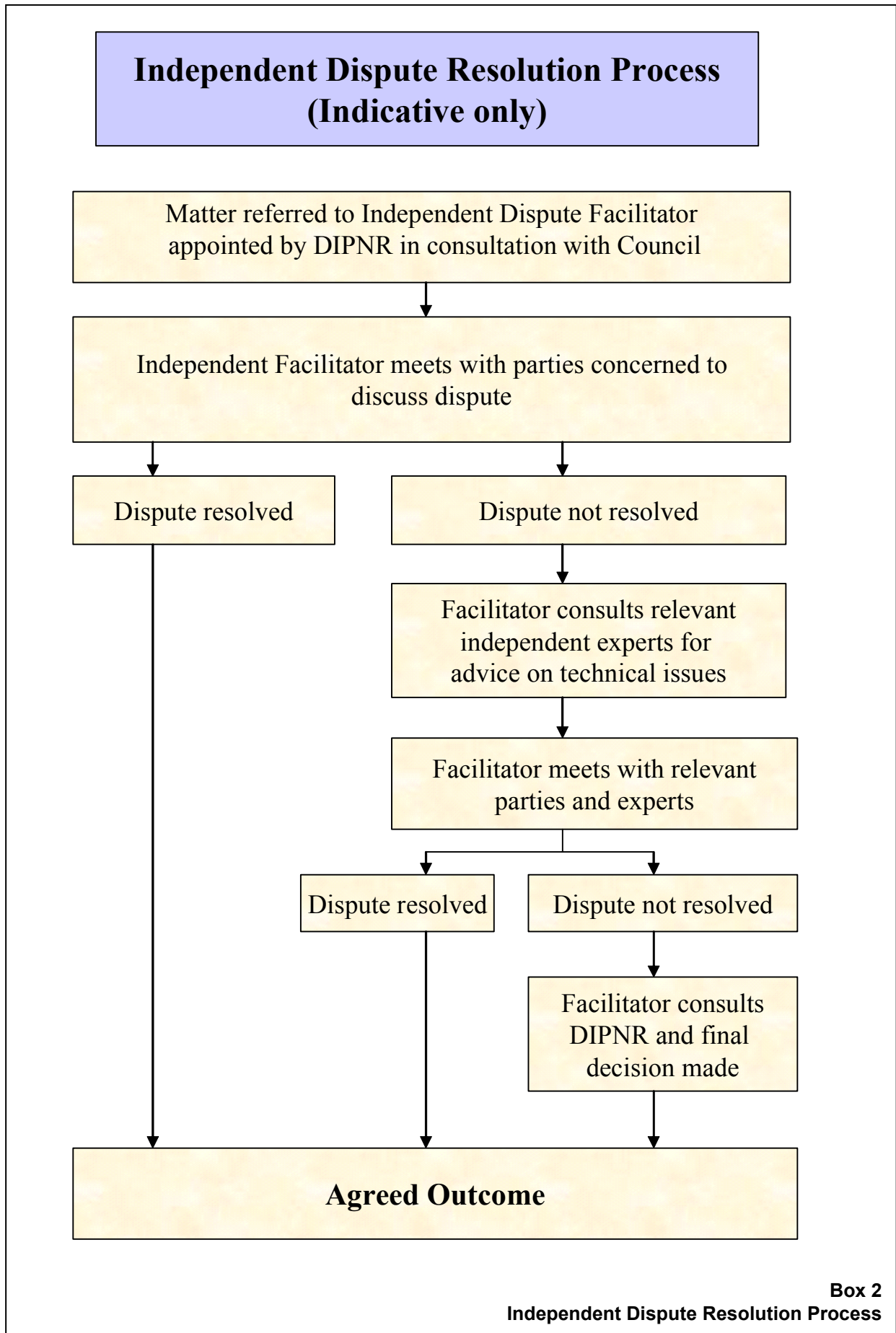
The recorded exceedance, corrective actions and reassessment will be reported to the CCC and included in each relevant AEMR.

5.6 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.





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