



ARDGLEN QUARRY


2021 Annual Environmental Management Report (AEMR)



PROJECT APPROVAL MP 06_0264

TITLE BLOCK

Table 1: Ardglen Quarry – Title block

Name of operation	Ardglen Quarry
Name of operator	Buttai Gravel Pty Ltd (Daracon Quarries)
Development consent / project approval #	Project Approval MP 06_0624 MOD 2
Name of holder of development consent / project approval	Buttai Gravel Pty Ltd (Daracon Quarries)
Annual Review start date	1 st January 2021
Annual Review end date	31 st December 2021
<p>I, Luke Robinson, certify that this audit report is a true and accurate record of the compliance status of Ardglen Quarry for the period 1st January 2021 to 31st December 2021 and that I am authorised to make this statement on behalf of Buttai Gravel Pty Ltd.</p> <p><i>Note.</i></p> <p><i>a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p><i>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of authorised reporting officer	Luke Robinson
Title of authorised reporting officer	Systems Manager – Construction Materials
Signature of authorised reporting officer	
Date	25 th March 2022

STATEMENT OF COMPLIANCE

Table 2: Ardglan Quarry – Statement of compliance

Were all of the conditions of the relevant approval complied with?	No
--	----

SUMMARY OF NON-COMPLIANCES

Table 3: Ardglan Quarry – Summary of non-compliances

Condition #	Condition / description	Compliance status – refer legend below	Comment	Where addressed in AEMR
Sch. 3 Cl. 26; SoC 8	Daracon has not provided long term security for the off-set areas as per the stipulated timeframe.		2018 IEA NC3 – As previously advised, Daracon is progressing with the Conservation Agreement (CA) including ongoing consultation with the Biodiversity Conservation Trust (BCT). At the time of the AEMR submission, we’ve received a DRAFT of the CA from BCT and continue to liaise with them to finalise and ratify once agreed. Please also note that Mod 2 altered the wording associated the security of the offsets and it no longer prescribes a date, but rather now states that it must be implemented ‘prior to undertaking any works in the extension area’. This therefore means that we’re no longer ‘non-compliant’ with Schedule 3, Condition 26 and SoC clause 8 from the Mod 2 approval date of the 16 th March 2021. In order to demonstrate the fact that we were non-compliant for a part of this reporting period, we’ve altered the ‘status’ of this non-compliance to ‘Administrative’ rather than ‘Low’.	Section 2.12
SoC 8	Daracon has not provided long term security for the off-set areas as per the stipulated timeframe.		2018 IEA NC7 – Refer to 2018 IEA NC3 above	Section 2.12

<p>Sch. 3 Cl. 19</p>	<p>Prior to commencing work in the Extension Area: (1) It is recommended that the retention volume of the final sedimentation basin necessary to capture surface waters (to ensure compliance with the EPL) be calculated. The calculation should take into account the area of dirty water catchment from the existing quarry and the extension area. (2) It is recommended that final sediment basin be surveyed to determine if it has sufficient volume to meet the volume requirements determined in (1) above. (3) It is recommended, that if the volume of the final sediment basin is not sufficient, that the ballast dumped in the basin, be removed to increase the basin volume to the required amount.</p>		<p>2018 IEA NTR1 - An assessment of basin volumes is included as part of the revised Site Water Management Plan (SWMP) to be developed for the site prior to commencing work in the Extension Area. Procedures to manage unforeseen water quality impacts are included in the revised SWMP. This will be enacted prior to commencing work in the Extension Area.</p>	<p>Section 2.8</p>
<p>Sch. 3 Cl. 21</p>	<p>The Water Management Plan needs to be updated to include an assessment of the reliability of the water supply to the operation. This should be completed prior to the commencement of works in the Extension Area.</p>		<p>2018 IEA NTR2 - An assessment of the reliability of the water supply to the operation is included in the revised SWMP. This will be enacted prior to commencing work in the Extension Area.</p>	<p>Section 2.8</p>
<p>Sch. 3 Cl. 22</p>	<p>Operational and maintenance activities on site that could cause soil erosion and sediment generation should be identified and described for in the plan.</p>		<p>2018 IEA NTR3 - Operational and maintenance activities that could cause soil erosion and sediment generation are identified and described in the revised SWMP. This will be enacted prior to commencing work in the Extension Area.</p>	<p>Section 2.8</p>

<p>Sch. 3 Cl. 23</p>	<p>The water monitoring plan should be revised to include detailed protocol for investigation, notification and mitigation of water quality exceedances.</p> <p>Details for procedures to manage unforeseen water quality impacts should be included in the site water management plan.</p>		<p>2018 IEA NTR4 - Procedures to manage unforeseen water quality impacts are included in the revised SWMP. This will be enacted prior to commencing work in the Extension Area.</p>	<p>Section 2.8</p>
<p>Sch. 3 Cl. 44</p>	<p>Daracon should implement all practicable measures to mitigate impacts from off-site lighting upon recommencement of operations. Daracon should ensure that all external lighting associated with the project complies with Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting and have the satisfaction of the Director-General on record upon recommencement of operations.</p>		<p>2018 IEA NTR6 - There is currently no external lighting associated with the operation of Ardglen Quarry, however if this was to change in the future, then Daracon would ensure compliance with Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting to the satisfaction of the Director-General.</p>	<p>Section 2.7</p>
<p>Sch. 3 Cl. 11</p>	<p>Blast SWMS should be updated to ensure that appropriate communications and fly rock protection are in place for blasting a within 500 m of adjacent land. It would be wise to make this a standard provision for all blasts since much of the quarry is within 500 m of adjacent land.</p>		<p>2013 IEA 1 - No blasting has occurred during the audit period and there are no current plans for the recommencement of blasting. The SWMS will be reviewed and updated prior to blasting and/or entering the extension area.</p>	<p>Section 2.2</p>
<p>Sch. 3 Cl. 20</p>	<p>It is recommended that surface water quality monitoring is implemented regardless of the operational status of the quarry.</p>		<p>2013 IEA 2 – The revised SWMP includes surface water quality monitoring and will be enacted prior to commencing work in the Extension Area.</p>	<p>Section 2.8</p>

Sch. 3 Cl. 26	In order to secure the offset areas a VCA or similar mechanism should be implemented as soon as practicable.		2013 IEA 3 - Refer to 2018 IEA NC3 above.	Section 2.12
Sch. 3 Cl. 44	An assessment of external lighting against AS4282 (INT) 1995 is required to be submitted to the DG.		2013 IEA 4 - There is currently no external lighting associated with the operation of Ardglen Quarry, however if this was to change in the future, then Daracon would ensure compliance with Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting to the satisfaction of the Director-General.	Section 2.7
SoC 8	A VCA, or similar mechanism should be implemented as soon as practicable.		2013 IEA 8 - Refer to 2018 IEA NC3 above.	Section 2.12
SoC 9	Blast SWMS should be updated to ensure that appropriate communications and fly rock protection are in place for blasting a within 500 m of adjacent land. It would be wise to make this a standard provision for all blasts since much of the quarry is within 500 m of adjacent land.		2013 IEA 9 - No blasting has occurred during the audit period and there are no current plans for the commencement of blasting. The SWMS will be reviewed and updated prior to blasting and/or entering the extension area.	Section 2.2

COMPLIANCE STATUS LEGEND

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> potential for serious environmental consequences, but is unlikely to occur; or potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: <ul style="list-style-type: none"> potential for moderate environmental consequences, but is unlikely to occur; or potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

TABLE OF CONTENTS

1. INTRODUCTION	10
1.1 Scope	10
1.2 Standards and Performance Measures	11
1.3 Site Management And Responsibilities	12
1.4 Document Preparation.....	12
2. OPERATIONS DURING THE REPORTING PERIOD	14
2.1 Introduction	14
2.2 Extraction And Clearing Operations	14
2.3 Production and Processing Operations	15
2.4 Overburden and Silt Management.....	15
2.5 Waste Management.....	15
2.6 Emissions	15
2.7 Site Infrastructure And Services	16
2.8 Water Management	16
2.9 Bushfire Management.....	17
2.10 Hazardous Materials Management	18
2.11 Product Transportation	19
2.12 Rehabilitation	19
2.13 Closure.....	22
3. COMMUNITY RELATIONS	23
3.1 Surrounding Communities.....	23
3.2 Community Consultative Committee Meetings.....	23
3.3 Environmental Complaints.....	24
3.4 Community Involvement	24
4. ENVIRONMENTAL MONITORING.....	24
4.1 Water Quality	24
4.1.1 Introduction	24
4.1.2 Conclusion.....	24

4.2	Noise and Blasting.....	24
4.2.1	Introduction	24
4.2.2	Noise Criteria	26
4.2.3	Noise Monitoring Results	26
4.2.4	Blasting Criteria.....	28
4.2.5	Blasting Monitoring Results.....	28
4.2.6	Analysis of Results	28
4.2.7	Conclusion.....	28
4.3	Air Quality	28
4.3.1	Introduction	28
4.3.2	Meteorological Station.....	28
4.3.3	Air Quality Monitoring Locations and Frequency	28
4.3.4	Air Quality Criteria.....	29
4.3.5	Air Quality Monitoring Results.....	31
4.3.5.1	Depositional Dust Gauges	31
4.3.5.2	HVAS Unit 1 (PM10-1).....	31
4.3.5.3	HVAS Unit 2 (PM10-2).....	33
4.3.5.4	TSP Unit 1.....	35
4.3.6	Analysis of Results	36
4.3.6.1	Depositional Dust Gauges.....	36
4.3.6.2	HVAS PM-10 Unit 1 and 2.....	37
4.3.6.3	TSP Unit 1.....	38
4.3.7	Discussion	38
4.3.8	Conclusion.....	39
4.4	Flora and Fauna Habitat	39
4.4.1	Introduction	39
4.4.2	Fauna Management.....	39
4.4.3	Nest Box Usage	39
4.4.4	Biodiversity offset and rehabilitation areas.....	39
4.5	Analysis of monitoring results against those predicted in the EA	43
4.5.1	Water Quality	43
4.5.2	Noise and Blast	43
4.5.3	Air Quality	43
4.6	Trends of monitoring over the life of the project.....	44
4.6.1	Water Quality	44
4.6.2	Noise and Blast	44
4.6.3	Air Quality	44
5.	COMPLIANCE ASSESSMENT.....	47
5.1	Environmental Protection Licence	47
5.2	Discrepancies With Predicted And Actual Quarry Operations.....	47
5.3	Independent Audit.....	47
5.4	Summary of Incidents and Non-Compliances.....	48
6.	ACTIVITIES PROPOSED DURING THE NEXT REPORTING PERIOD.....	48
6.1	Introduction	48
6.2	Extraction Operations.....	48
6.3	Processing.....	48

6.4	Overburden And Silt Management	48
6.5	Waste Management.....	49
6.6	Site Infrastructure And Services	49
6.7	Water Management	49
6.8	Bushfire Management.....	49
6.9	Hazardous Materials Management	49
6.10	Product Transportation	49
6.11	Rehabilitation and landscape management	49
7.	REFERENCES.....	49
8.	APPENDICES	50
Appendix 1	Project Approval MP 06_0264 (Mod 2).....	50
Appendix 2	Noise monitoring reports.....	51
Appendix 3	2020 Community Consultative Committee Meeting Minutes.....	52
Appendix 4	2020 Community Complaints Register	53
Appendix 5	Rubicon (formerly TREES) Erosion & Sediment Control Inspection Report	54
Appendix 6	Rehabilitation and nesting inspection report - Ardglen Quarry	55
Appendix 7	Waste Register.....	56
Appendix 8	Road Safety Audit.....	57

1. INTRODUCTION

1.1 Scope

This report has been prepared by Daracon Quarries, in accordance with Schedule 5 Condition 4 of the Project Approval MP 06_0264 to record the activities and environmental monitoring undertaken within and surrounding Ardglen Quarry during the period 1st January 2021 to 31st December 2021 (the reporting period).

Figure 1 and Figure 2 below, show the location and details of the quarry site.



Figure 1: Quarry Location

On 2nd December 2008 Daracon was granted approval (Project Approval MP 06_0264) under part 3A of the Environmental Planning & Assessment Act 1979 to extend the existing quarry operations in a westerly direction into Lot 218 (DP 751028). In December 2010, Modification 1 (Mod 1) for Project Approval MP 06_0264 was implemented whilst in March 2021 Modification 2 (Mod 2) was approved.

Daracon ceased quarrying operations at Ardglen Quarry in February 2012 and the site was placed into "care and maintenance" at that time.

In August 2018, Ardglen quarry was taken out of "care and maintenance" due to the need for material at the Scone Bypass Project (SBP). This was communicated to the community and relevant regulatory authorities as part of the recommencement process. The export of material from Ardglen quarry to the SBP was completed in early 2020.

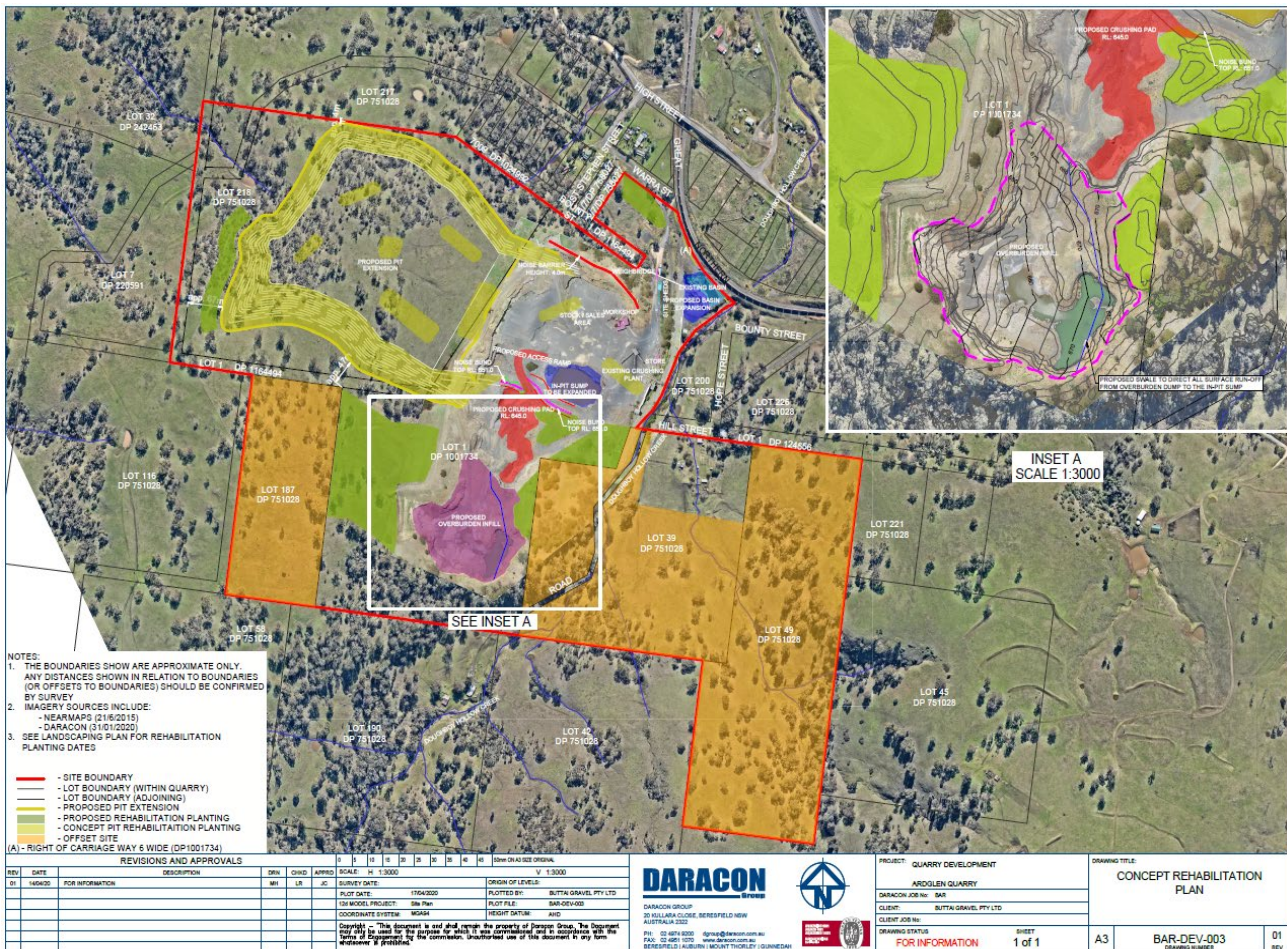


Figure 2: Quarry boundary, disturbance area and offset areas (taken from Appendix 2 of Mod 2)

This document provides an overview of activities and environmental monitoring that occurred within the reporting period and also activities and environmental monitoring planned for 2022. This Annual Environmental Management Report (AEMR) contains the following:

- A description of activities that were carried out in 2021;
- A review of the environmental monitoring results that were carried out in 2021;
- Results of the Independent Environmental Audit that was carried out in 2018;
- A description of measures that will be implemented throughout 2022 to maintain and/or improve the environmental performance of the Quarry;

1.2 Standards and Performance Measures

The owner and operator of Ardglan Quarry, Daracon Quarries (Trading as Buttai Gravel Pty Ltd) is required to operate the approved activities within the Quarry site in accordance with MP 06_0624 MOD 2 and licences listed in Table 4.

Table 4: Ardglan Quarry - Consents and Licences

Approval/Licence	Issue Date	Expiry Date
Project Approval MP 06_0624 MOD 2	March 2021	31 August 2038
Environment Protection Licence No.1115	N/A	1 January (anniversary date)

Relevant conditions with Project Approval MP 06_0624 which nominate specific environmental criteria are as follows:

- Schedule 3 Condition 1: Hours of Operation
- Schedule 3 Condition 2: Noise
- Schedule 3 Condition 7: Blasting and Vibration
- Schedule 3 Condition 15: Air Quality

- *Schedule 3 Condition 18: Meteorological Monitoring*
- *Schedule 3 Conditions 18A – 18F, plus others:: Surface and Ground Water*
- *Schedule 3 Conditions 24 - 32: Rehabilitation and Landscape Management*
-

In addition to the specific environmental criteria, the following conditions within MP 06_0624 specifically request further information be included in each AEMR:

- *Schedule 3 Conditions 33 - 43: Product Transport*
- *Schedule 3 Condition 46: Greenhouse Gas*
- *Schedule 3 Condition 47: Waste Minimisation*

1.3 Site Management and Responsibilities

The overall management of Ardglen Quarry is the responsibility of Daracon's Quarries Manager, Mr Paul Walker. While the Quarry was in "care and maintenance", environmental monitoring is arranged by Mr Luke Robinson (Systems Manager). Site supervision is also ably assisted by Daniel Smith (Supervisor). Other companies involved with quarry related documentation and monitoring data include:

- RCA Aust. Pty Ltd Laboratories;
- Rubicon Enviro Pty Ltd;

1.4 Document Preparation

The following information and data for this report has been drawn from documents commissioned or held by Daracon.

- Environmental Management Strategy Ardglen Quarry Extension - Major Project 06/0264, September 2010, Orogen Pty Ltd;
- Ardglen Quarry Environmental Monitoring records;

This document has been prepared by Mr Luke Robinson of Daracon Quarries.

In response to enquiries received from DPIE during the reporting period, **Table 5** below includes the details of specific requests for additional information as well as the relevant action taken.

Table 5: DPIE requests for additional information

DPIE requests	Action taken
<p>1. Section 1 Introduction – please include the following information on the quarry location figure:</p> <ul style="list-style-type: none"> a. Development consent boundary b. Current operational disturbance footprint c. Offset areas 	<p>An image showing the items requested is now included in this report within Section 1.1, described as Figure 2. It is also included in Appendix 2 of the Mod 2 Approval.</p>
<p>2. Section 2 Operations during the reporting period – please include an operations summary as per Table 4 of the Department's <i>Annual Review Guideline</i> (October 2015)</p>	<p>A new table has been included in this report within Section 2.3, described as Table 9.</p>
<p>3. Outcomes of previous AEMR reviews – please include a table that identified actions required as an outcome of previous AEMRs, as per Table 5 of the Department's <i>Annual Review Guideline</i> (October 2015)</p>	<p>A new table has been included in this report within Section 1.4, described as Table 6.</p>

<p>4. Water management – please include water taken in the previous ‘water year’ (1 July to 30 June) as per Table 7 of the Department’s <i>Annual Review Guideline</i> (October 2015)</p>	<p>A new table has been included in this report within Section 2.8, described as Table 10.</p>
<p>5. Section 3.3 Environmental Complaints – please include a comparison of complaints received in the reporting period to complaints received in the previous five reporting periods.</p>	<p>A comparison of complaints received in this reporting period to complaints received in the previous five reporting periods is now included in Section 3.3 below.</p>

In response to enquiries received from DPIE, Table 6 below includes the details of specific actions resulting from previous AEMR’s.

Table 6: Specific Actions from previous AEMR’s

Actions from previous AEMR’s	Requested by	Action taken	Where discussed in AEMR
<p>Long term security of the Biodiversity Offset areas</p>	<p>Daracon</p>	<p>As previously advised, Daracon is progressing with the Conservation Agreement (CA) including ongoing consultation with the Biodiversity Conservation Trust (BCT). At the time of the AEMR submission, we’ve received a DRAFT of the CA from BCT and continue to liaise with them to finalise and ratify once agreed.</p>	<p>Section 2.12</p>
<p>The Site Water Management Plan requires review and update</p>	<p>Daracon</p>	<p>The SWMP was reviewed and revised following the approval of Mod 2. This was uploaded to the DPIE Major Projects Portal in January 2022 and will be enacted prior to commencing work in the Extension Area.</p>	<p>Section 2.8</p>
<p>Daracon applied for a modification to the consent (Mod 2) and during 2020 it was under review by DPIE</p>	<p>DPIE</p>	<p>DPIE approved Mod 2 in March 2021.</p>	<p>Section 1.1</p>
<p>Following the approval of Mod 2, a variation to the EPL will be required</p>	<p>Daracon</p>	<p>Following the approval of Mod 2 by DPIE, Daracon have applied to the EPA for a variation to the EPL.</p>	<p>Section 2.8</p>

The Landscape Management Plan (LMP) requires review and update	Daracon	As previously advised, the revised LMP was uploaded to the DPIE Major Projects Portal in April 2020 with no further instruction or response received from DPIE until the approval of Mod 2 in March 2021. Following this, the LMP was reviewed, updated and uploaded to the DPIE Major Projects Portal in December 2021.	Section 2.12
--	---------	--	--------------

2. OPERATIONS DURING THE REPORTING PERIOD

2.1 Introduction

Prior to August 2018, Ardglen quarry remained in “care and maintenance”. Ardglen quarry was taken out of "care and maintenance" during the latter part of 2018 due to the need for material at the Scone Bypass Project (SBP).

Table 7 lists the activities that did occur at Ardglen Quarry throughout 2021. Additionally, Mod 2 of the Consent was approved by DPIE in March 2021, the details of which are included in various parts of this report as applicable.

Table 7: Operations during the Reporting Period

January	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required.
February	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required.
March	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required.
April	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required.
May	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required.
June	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required.
July	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required. Installation of groundwater monitoring wells.
August	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required. Installation of groundwater monitoring wells.
September	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required. Installation of groundwater monitoring wells.
October	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required. Installation of groundwater monitoring wells.
November	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required.
December	Weekly Site Inspections and maintenance of rehabilitation areas including weed spraying as required.

2.2 Extraction And Clearing Operations

Table 8 displays the monthly/annual sales of various products exported from Ardglen Quarry during 2021.

Table 8: Ardglen Quarry Sales (tonnes)

Month - 2021	Aggregates	Road Pavements	Other	Total
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0

April	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Total	0	0	0	0
Source: Ardglan tracking records				

No blasting, quarrying or extraction operations took place during the reporting period.

At the time of this report, we're unsure if the status of blasting, quarrying and extraction operations will change during 2022, but we'll ensure DPIE and the CCC will be informed if quarrying operations are likely to recommence on site.

2.3 Production and Processing Operations

Nil processing or production operations took place during 2021 as shown in Table 9.

Table 9: Ardglan Quarry Production (tonnes)

Materials	Approved limits	Previous reporting period	This reporting period	Next reporting period (forecast)
Saleable product	The maximum amount allowed to be extracted and processed is 500,000T per year	0	0	Unknown
Other materials		0	0	Unknown
Total	0	0	0	Unknown
Source: Ardglan tracking records				

2.4 Overburden and Silt Management

Nil overburden was removed during 2021.
Nil silt removal occurred during 2021.

2.5 Waste Management

No production took place during 2021 which also meant there was no production waste generated as follows:

- General Demolition Waste – Nil;
- Recyclable Concrete – Nil;
- Paper & Cardboard – Nil;
- Scrap Steel – Nil;
- Recyclables – Nil;
- Waste Oil – Nil;
- Waste Oil Filters – Nil;
- Empty Drums – Nil;
- Grease – Nil;
- Oily Water – Nil;
- Batteries – Nil;
- Asbestos Containing Material – Nil;

2.6 Emissions

Daracon is committed to ongoing emission reduction strategies as part of the operation of Ardglan Quarry. The mitigation measures currently employed on site to ensure particulate matter emissions are minimised include:

- Sealing the haul road to the wheel wash / weighbridge;
- Limiting the speed limit on unpaved surfaces to 15 km/hr;
- High level watering of unpaved road surfaces (greater than 2L/m²/hr);
- Covering all loads leaving the site;
- Wet suppression of static stockpiles;

Additionally, the proposed mitigation measures to ensure particulate matter emissions are minimised include:

- Revegetation of exposed surfaces where available;
- Regular inspection and fault reporting for mobile plant and equipment;
- Prompt rectification of reported faults associated with mobile plant and equipment;
- As part of the forward planning for site, considering the use of renewable energy sources including solar, wind and battery storage for example;
- Analysing the regular NGRS / NPI reports for trends and potential avenues for emission reductions;
- Re-install a wheel wash at the end of the unpaved section of the haul road before export by road haulage can recommence from the site;
- Minimise energy consumption on site by:
 - Shutting down plant and equipment when not used;
 - Regular servicing of plant and equipment;
 - Walking in preference to vehicular use where possible;

2.7 Site Infrastructure And Services

During the reporting period the following things occurred:

- Following the approval of Mod 2 and after consulting with Tim Baker from the NRAR, four groundwater monitoring wells were installed, and the groundwater monitoring programme commenced soon thereafter (Figure 4 shows the locations of the groundwater monitoring wells);
- Following the decommissioning of the electrical substation, there is currently no external lighting associated with the operation of Ardglen Quarry, however if this was to change in the future, then Daracon would ensure compliance with Australian Standard AS4282 (INT) 1995;

2.8 Water Management

Figure 3 displays the current surface water management system in place at Ardglen Quarry. During the reporting period there was some minor maintenance to the various drainage and sedimentation control structures on site.

The Site Water Management Plan (SWMP), including the following, has recently been reviewed and uploaded to the DPIE Major Projects Portal. Subject to approval of DPIE, this will be enacted prior to commencing work in the Extension Area. The SWMP includes:

- An assessment of basin volumes is included as part of the revised SWMP;
- An assessment of the reliability of the water supply to the operation is included as part of the SWMP;
- Operational and maintenance activities that could cause soil erosion and sediment generation are identified and described in the SWMP;
- Procedures to manage unforeseen water quality impacts;
- Water treatment processes to enable discharge as required (subject to the approval of a variation to the site EPL);
- The proposed strategy to monitor and subsequently manage any groundwater interactions on site;
- A variation to the EPL has been submitted and, at the time of this report, the EPA and Daracon are currently reviewing this application;



Figure 3: Surface Water Management

Figure 4 below shows the indicative locations of the groundwater monitoring wells installed during the reporting period. Ongoing monitoring of the various groundwater parameters has commenced and will be ongoing for the foreseeable future.

In accordance with Mod 2, once we've obtained sufficient data relating to the various groundwater parameters, we will analyse the data collected and further develop the Groundwater study. This may require us to update the SWMP to include any subsequent management actions required to adequately address the findings of the groundwater study.



Figure 4: Ground Water Monitoring Network

Additionally, Table 10 below summarises the various Water Access Licences (WAL's) and the quantity of water obtained during the previous water year (1 July to 30 June). It should be noted that the 'Works Approval' associated with the WAL's nominated in Table 10 was amended in November 2021 to make work authorised under the water supply work approval **inactive** in accordance with s.95 of the Water Management Act 2000. This will remain inactive until further notice.

Table 10: Summary of Water Access Licences and water take

Water Licence #	Water sharing plan, source and mngt zone	Entitlement (units)	Passive take / inflows	Active pumping	Total
6242	Namoi and Peel unregulated rivers water sources 2012	1.00	Nil	Nil	Nil
6243	Namoi and Peel unregulated rivers water sources 2012	4.00	Nil	Nil	Nil

2.9 Bushfire Management

Minimal bushfire prevention activities occurred during this reporting period apart from selective weed spraying on site.

2.10 Hazardous Materials Management

Hazardous materials within the Quarry site are appropriately managed with incidental quantities of fuels and oils located in an appropriately bunded area. During this reporting period there was no bulk diesel fuel stored onsite. Incidental quantities of aerosols and weed poison are also stored within the appropriately bunded area.

2.11 Product Transportation

The transportation of products, both imported and exported is identified in Schedule 3 Condition 33. Condition 33 states the following including Daracon responses in red - *The Proponent shall*:

(a) *keep records of the:*

- amount of quarry materials imported onto the site each year – Refer to commentary below;
- amount of product transported from the site each year – Refer to Table 8;
- number of truck movements generated by the project, on a weekly basis - Refer to table 11;
- number of train movements generated by the project, on a weekly basis - Refer to commentary below;
- date and time of each train movement generated by the project - Refer to commentary below;

(b) *provide annual production data to the DPI using the standard form for that purpose – Completed via separate submission to the DPI; and*

(c) *include these records in the AEMR – Included here.*

During the reporting period there was no material imported to site or material exported by rail transport. Details of truck movements generated by the project during the reporting period are shown in Table 11.

Table 11: Truck movements generated by the project

Dates	Maximum loaded truck movements per day during period	Average loaded truck movements for the period
For the entire duration of 2021 calendar year	0	0
For entire reporting period	0	0
Source: Ardglan tracking records		

Additionally, the Road Safety Audit (RSA) completed during 2018 is included in Appendix 8. Work on the proposed agreed remedial actions commenced during early 2019 and are mostly complete apart from those detailed and explained in the attachment shown in Appendix 8.

Finally, as part of the approved Mod 2, we need to resolve all aspects of the 2018 RSA (amongst other things) before we can increase the laden vehicle movements from site. In order to resolve the remaining items from the 2018 RSA and address various updated Conditions of the Mod 2 Approval pertaining to road transport, we’ve been liaising with Liverpool Plains Shire Council (LPSC) and are well progressed with a road design to satisfy their particular requirements. This process was ongoing at the time of this report.

2.12 Rehabilitation

Significant rehabilitation work occurred during the reporting period as detailed in the revised Landscape Management Plan (LMP) and Umwelt Ardglan Annual Biodiversity Monitoring report included as Appendix 6.

With respect to the specific aspects of the actual rehabilitation and landscape activities that occurred during the reporting period, we provide the following status updates:

- The Offset Strategy (S3_C25) – Further to our previous advice, Daracon continues to liaise with the Biodiversity Conservation Trust NSW (BCT) regarding the implementation of the “Conservation Agreement” (CA) to secure the Biodiversity Offset Areas (BOA’s). BCT provided a draft CA for review and comment in late 2021 which was ongoing at the time of reporting. Please also note that Mod 2 altered the wording associated the security of the offsets and it no longer prescribes a date, but rather now states that it must be implemented ‘prior to undertaking any works in the extension area’. This therefore means that we are no longer ‘non-compliant’ with Schedule 3, Condition 26 and SoC clause 8 from the Mod 2 approval date of the 16th March 2021. In order to demonstrate

this fact, we've chosen to alter the 'status' of this non-compliance to 'Administrative' rather than 'Low' as shown in Table 3;

- The Landscape Management Plan (S3_C27) – Following the approval of Mod 2, the Landscape Management Plan (LMP) was updated and resubmitted to the DPIE in December 2021. This update included additional information obtained as part of the Umwelt rehabilitation inspection reports and the revised conditions associated with Mod 2;
- The Doughboy Hollow Creek Rehabilitation Strategy (S3_C28) – As part of the Umwelt Ardglen Annual Biodiversity Monitoring report included in Appendix 6, Umwelt Ecologists undertook an inspection of Doughboy Hollow creek to progress this matter. Additionally, a hydrological analysis of the Doughboy Hollow Creek is in progress which, along with the Ecological assessment, will form the basis of the Doughboy Hollow Creek rehabilitation strategy. Due to the fact that this particular strategy “shall commence prior to the start of quarry operations into the approved extension area”, this strategy remains incomplete at this stage, however this will be finalised and submitted for consultation and approval prior to entering the extension area;
- The Rehabilitation and Biodiversity Offset Management Plan (S3_C29) – The Rehabilitation and Biodiversity Offset Management Plan forms an integral component of the revised LMP which was reviewed and resubmitted to the DPIE in December 2021. As previously advised, substantial rehabilitation and offset planting has occurred on site over the last 3 years, and we continue to monitor and manage this as described in the Umwelt Ardglen Annual Biodiversity Monitoring report included as Appendix 6. Figure 5 shows the areas where rehabilitation and offset planting has occurred;

Also refer to Table 3 for a summary of the non-compliances arising from the Independent Environmental Audit undertaken by Pitt and Sherry in 2018.

During the reporting period, approximately 450 saplings were planted in the BOAs as described below and shown in Figure 5:

- Offset A – Two planting events occurred during the reporting period with the first occurring during April/May 2021 (shown as pink hatched area in Figure 5) and the second occurring during October 2021 (shown as blue hatched area in Figure 5);
- Offset B - Two planting events occurred during the reporting period with the first occurring during April/May 2021 (shown as pink hatched area in Figure 5) and the second occurring during October 2021 (shown as blue hatched area in Figure 5). Also see Photo 1 for an example of such;

Please also refer to Section 4.4.4 for further details regarding the rehabilitation progress and suggested actions.



Figure 5: Rehabilitation planting areas



Photo 1: Rehabilitation planting in Offset B

2.13 Closure

The revised LMP includes information regarding the proposed closure arrangements.

3. COMMUNITY RELATIONS

3.1 Surrounding Communities

Figure 6 displays the land ownership and residence surrounding the quarry. During the reporting period, it is understood that there were no changes to the land ownership within the area. Informal discussions have occurred with a number of residents in the area during the reporting period.

Residents of Ardglan



Figure 6: Land Ownership and Residents

Table 12: Land Owners and Residents

Land Owners and Residents	
Mingay Property	Ms P Purtell & Mr S Harnes
The State of New South Wales	Mr W E & Mrs E A Avery
County Property Group	Ms Penny Dalton
Land and Property Management Authority	Ms A Bojba-Lis
Mr and Mrs R McGhie	Ms C M Thompson
Mr D J Bates	Ms E Russell
Mr D J Burraston	Ms M Taylor
Mr G B Smith & Ms N E Ryder	Mr G N & Mrs M A Lewins

3.2 Community Consultative Committee Meetings

In mid-2015 Daracon sought approval for an Independent Community Consultative Committee Chairperson. Approval was granted for PEP Consulting (Shay Riley-Lewis) to undertake the Independent Chairperson position. Following the appointment, PEP Consulting engaged with the community to re-establish a Community Consultative Committee (CCC) and nominate community representatives. This process was resolved in July 2016 with the first CCC meeting held 23rd August 2016. Refer to Section 3.4 for more information.

During the latter part of 2021, Shay Riley Lewis advised the CCC members (including DPIE) that she was resigning from her role as the independent CCC facilitator. Following Shay's resignation, Daracon liaised with the relevant DPIE representative, and Michael Silver was subsequently appointed the role of Ardglan quarry CCC independent facilitator. At the time of this report, Michael

Silver was familiarising himself with the quarry operations and will facilitate the first meeting of 2022 shortly.

3.3 Environmental Complaints

Daracon received no pollution or environmental complaints during the reporting period. Due to the fact there were no complaints received during this reporting period, the main difference between the complaints received during 2021 and previous reporting periods is to say that there were less received during 2021. This is most likely due to the fact that there was no material export occurring 2021 whereas the previous three reporting periods did have some export of material occurring. Additionally, the CCC and it's membership also appears to have been resolved with no further complaints received.

3.4 Community Involvement

Firstly, it's worth noting that due to the presence of COVID-19 and subsequent restrictions imposed by the government, all Community Consultative Committee (CCC) meetings that occurred during 2021 were undertaken remotely without a face-to-face interaction. Additionally, there was no site visit completed in 2021 for the same reason.

Regardless of the COVID-19 limitations, the Ardglan Quarry CCC held two meetings during 2021 with the first during May 2021 and the second during October 2021. The meeting minutes are attached in Appendix 3.

Furthermore, Daracon circulated a community newsletter in early 2021 to provide additional information to the local residents regarding the CCC and planned activities associated with the operation of Ardglan Quarry.

Daracon also updated the CCC presentation to include compliance criteria level to make it simpler for the community to understand the information presented.

4. ENVIRONMENTAL MONITORING

4.1 Water Quality

4.1.1 Introduction

Ardglan Quarry operates under an approved Site Water Management Plan (SWMP) as described in Section 2.8 above. The purpose of this plan is to ensure that Ardglan Quarry does not pollute any water.

Ardglan Quarry has two sediment basins onsite, the in-pit sump which is approximately 30ML and a tertiary sediment basin which is approximately 3ML. Currently, all water from the disturbed area is directed towards the in-pit sump and when this becomes full, water is then directed to the smaller (3ML) tertiary sediment basin for storage and re-use.

The alterations proposed as part of Mod 2 allow us to make a number of critical improvements to the water management processes on site and to permit the appropriate discharge of water.

At the time of this report, a variation to the EPL has been sought and is currently under review by the EPA and Daracon. Additionally, the revised SWMP was submitted to DPIE in January 2022 as described in Table 6.

4.1.2 Conclusion

During the reporting period, nil water was discharged over the tertiary basin spillway.

4.2 Noise and Blasting

4.2.1 Introduction

Ardglan Quarry operates under an approved Noise Monitoring Program and Blast Monitoring program. These programs outline the measures which will mitigate the environmental effects of noise and blasting of the quarry activities on our neighbours; proposes noise monitoring programs to assess and report the levels of impact, in compliance with Schedule 3 of the Project Approval and provides a mechanism whereby any noise complaints can be dealt with quickly and effectively.

The Blast Monitoring program requires monitoring to take place at specified locations as shown in **Figure 7**. The Noise Monitoring Plan calls for quarterly attended noise monitoring to be completed and take place at specified noise monitoring locations as shown in **Figure 8**.



Figure 7: Blast Monitoring Locations



Figure 8: Noise Monitoring Locations

4.2.2 Noise Criteria

Table 13: Noise Criteria

NOISE IMPACT ASSESSMENT CRITERIA dB(A)				
Land	Day LAeq (15 min)	Evening LAeq (15 min)	Night	
			LAeq (15 min)	LA1 (1 min)
4	44	35	35	45
5 and 6	45	35	35	45
9	37	35	35	45
10	38	35	35	45
12 and 14	36	35	35	45
15	43	35	35	45
16	40	35	35	45
All other privately owned land	35	35	35	45

4.2.3 Noise Monitoring Results

Due to the fact that Ardglen quarry was non-operational, limited noise monitoring was undertaken prior to 2018. During 2021, quarterly noise monitoring of the site occurred, and the results are summarised in Table 14, Table 15, Table 16 and Table 17.

Table 14: Noise monitoring 24th February 2021

Ardglen Quarry noise monitoring results – 24 th February 2021 (day)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	3:40 pm	45	2.0 m/s SSE	Traffic (45), birds (28), AQ inaudible
13. McGhie	4:20 pm	45	2.5 m/s SSE	Traffic (45), birds (30), AQ inaudible
14. Purtell	4:05 pm	41	2.0 m/s SSE	Traffic (40), birds (33), AQ inaudible
16. Bojba	4:40 pm	50	2.5 m/s SSE	Traffic (50), birds & insects (40), AQ inaudible

Table 15: Noise monitoring 19th May 2021

Ardglen Quarry noise monitoring results – 19 th May 2021 (day)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	9:40 am	41	Calm	Traffic (39), birds (37), AQ inaudible
13. McGhie	10:25 am	38	0.5 m/s SE	Traffic (37), birds (31), AQ inaudible
14. Purtell	10:08 am	44	0.5 m/s E	Traffic (42), birds (40), AQ inaudible
16. Bojba	10:45 am	51	1.0 m/s SE	Traffic (51), birds (40), AQ inaudible

 Table 16: Noise monitoring 23rd August 2021

Ardglen Quarry noise monitoring results – 23 rd August 2021 (day)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	9:40 am	44	1.0 m/s NW	Traffic (44), birds (32), AQ inaudible
13. McGhie	10:10 am	36	2.0 m/s NW	Birds (35), traffic (30) AQ faintly audible
14. Purtell	10:30 am	46	2.0 m/s NW	Traffic (44), birds (40), AQ inaudible
16. Bojba	10:50 am	44	2.5 m/s NW	Traffic (42), birds (38), frogs (25), AQ faintly audible

 Table 17: Noise monitoring 17th November 2021

Ardglen Quarry noise monitoring results – 17 th November 2021 (day)				
Location	Time	dB(A),Leq	Wind speed/ direction	Identified Noise Sources
4. Thompson	10:30 am	37	2.0 m/s SE	Traffic (36), birds (30), AQ inaudible
13. McGhie	11:10 am	40	2.2 m/s SE	Traffic (38), birds & insects (32), AQ inaudible
14. Purtell	10:50 am	44	2.0 m/s SE	Traffic (43), birds & insects (35), AQ inaudible
16. Bojba	11:30 am	48	2.5 m/s S	Traffic (48), birds (35), frogs (30), AQ faintly audible

4.2.4 Blasting Criteria

Table 18: Blasting Criteria

Airblast overpressure level (dB(Lin Peak))	Allowable exceedance
115	<i>5% of the total number of blasts over a period of 12 months</i>
120	<i>0%</i>
Peak Particle Velocity (mm/s)	Allowable exceedance
5	<i>5% of the total number of blasts over a period of 12 months</i>
10	<i>0%</i>

4.2.5 Blasting Monitoring Results

No blasts were carried out during the reporting period.

4.2.6 Analysis of Results

The results of the noise monitoring undertaken in February, May, August and November 2021 are included in Appendix 2. These results were all below the specified criteria.

No blasting occurred during the reporting period, so therefore no blast monitoring was completed.

4.2.7 Conclusion

The noise monitoring results were within the specified limits and when operations recommence blast monitoring will then recommence.

Additionally, as part of the proposed MOD 2 actions currently in progress, we plan to make a number of critical improvements to the noise mitigation measures to enable the appropriate handling and processing of material on site.

4.3 Air Quality

4.3.1 Introduction

Ardglen Quarry operates under an approved Air Quality Management Plan. The objectives of this plan is to comply with all statutory requirements, minimise air quality impacts on surrounding residents and properties, maintain reasonable levels of amenity for surrounding residents, to keep the local community and regulators informed and to respond quickly and effectively to issues and complaints and to ensure that air quality is measured according to best practice and results are presented in a timely and transparent manner to stakeholders.

4.3.2 Meteorological Station

Condition 18 of the Approval requires that a meteorological station to operate in the vicinity of the project site for the life of the project. Daracon has installed a meteorological station (Figure 9), ensuring that the meteorological station complies with the requirements in the “Approved Methods for Sampling of Air Pollutants in New South Wales Guideline”.

The meteorological station currently monitors the following parameters as per EPL 1115:

- Rainfall;
- Wind Speed and Direction;
- Temperature (at 2m and 10m above ground level);
- Sigma theta;
- Solar Radiation;

4.3.3 Air Quality Monitoring Locations and Frequency

The current air quality monitoring network consists of three deposited dust gauges (DDG), two HVAS units and one TSP unit (see **Figure 9**). A PM2.5 unit will also be installed as detailed in the revised AQMP approved by DPIE in December 2021.

The location of the air quality monitoring equipment (primarily to the North-East and East of the Quarry) was deduced from the location of the surrounding residences.



Figure 9: Air Quality Monitoring and Weather Station Locations

4.3.4 Air Quality Criteria

The air quality criteria for the quarry, as outlined with condition 15 (10) of the approval are provided in the below table.

Table 19: Air Quality Criteria

Parameter	Frequency	Locations	Limit/Guideline	Sampling Method
Deposited dust	Monthly.	DG-1 located at Receptor 2 (EPL point 2). DG-2 located at Receptor 5 (EPL point 3). DG-3 located at Receptor 6 (EPL point 4).	Deposition Rate* Maximum total deposited dust level: 4 g/m ² .month - as an annual average	AM-19 AS3580.10.1 – 2003

Parameter	Frequency	Locations	Limit/Guideline	Sampling Method
Total suspended particulate (TSP) matter	24 hours every 6 days for 12 months.	TSP-1 located at Receptor 2. Removed after 12 months.	Concentration 90 µg/m ³ - as an annual average	AM-15 AS3580.9.3 – 2003
Particulate matter < 10 µm (PM ₁₀)	24 hours every 6 days.	PM10-1 located at Receptor 2. PM10-2 located at Receptor 6.	Concentration 50 µg/m ³ - as a 24 hour average 25 µg/m ³ - as an annual average	AM-16 AS3580.9.6 - 2003
Particulate matter < 2.5 µm (PM _{2.5}) – Monitoring to commence in 2022	24 hours every 6 days.	PM2.5 located at Receptor 6.	Concentration 25 µg/m ³ - as a 24 hour average 8 µg/m ³ - as an annual average	
Visible air pollution	Weekly. In response to any visible emissions complaint.	Weekly site inspection. At the location of any reported emission.	Project Approval Schedule 3, Condition 16	No required sampling methodology apart from described above. Actions required if visual impact is suspected or confirmed.
Meteorological station	Continuous.	On site near the weighbridge.	Project Approval Schedule 3, Condition 18	AM-1 to AM-4 USEPA (2000) EPA 454/R-99-005
Greenhouse gases (electricity and fuel consumption)	Upon purchase of electricity or fuel.	Entire site.	Project Approval Schedule 3, Condition 46(a) The proponent shall monitor the greenhouse gas emissions generated by the project.	No required sampling methodology. Records of purchase and storage used to determine consumption.

4.3.5 Air Quality Monitoring Results

The following information presents the results of the Dust Deposition Gauges (DDG), High Volume Air Sampler (HVAS) and Total Suspended Particulate (TSP) monitoring program.

4.3.5.1 Depositional Dust Gauges

Table 20: Depositional Dust Gauge Results

	Insoluble Solids (g/m ² .month)			Insoluble Solids Annual Average (g/m ² .month)		
	EPA2	EPA3	EPA4	EPA2	EPA3	EPA4
4/01/21 to 2/2/21	0.6	0.4	0.3	0.7	0.6	0.6
2/2/21 to 2/3/21	0.4	0.4	0.2	0.6	0.6	0.5
2/3/21 to 1/4/21	0.3	0.3	0.3	0.6	0.5	0.5
1/4/21 to 3/5/21	0.2	0.4	0.3	0.5	0.5	0.4
3/5/21 to 4/6/21	0.3	0.2	0.2	0.5	0.5	0.4
4/6/21 to 6/7/21	0.3	0.2	0.2	0.6	0.5	0.4
6/7/21 to 4/8/21	0.4	0.5	0.5	0.6	0.5	0.4
4/8/21 to 1/9/21	0.4	0.5	0.4	0.6	0.5	0.5
1/9/21 to 1/10/21	0.2	1.2	0.5	0.6	0.6	0.4
1/10/21 to 1/11/21	0.7	1.2	0.8	0.6	0.6	0.4
1/11/21 to 3/12/21	1.5	1	0.9	0.6	0.6	0.4
3/12/21 to 4/1/22	0.6	0.7	0.7	0.5	0.6	0.4

4.3.5.2 HVAS Unit 1 (PM10-1)

Table 21: HVAS Unit 1 Results

	Sample #	Run Date	PM10	Filter #	Date Off	Time Off	Tech	Hrs	
Jan-21	PM ₁₀₋₁	1219733002	3/01/2021	6	9829956	4/01/2021	8:36	Client	24
	PM ₁₀₋₁	1219733015	9/01/2021	4	9829968	12/01/2021	12:20	Client	24.01
	PM ₁₀₋₁	1219733018	15/01/2021	14	9829939	20/01/2021	11:10	Client	24.05
	PM ₁₀₋₁	1219733021	21/01/2021	7	9829936	25/01/2021	6:35	Client	24.01
	PM ₁₀₋₁	1219733024	27/01/2021	11	9853024	1/02/2021	10:05	Client	23.98
Feb-21	PM ₁₀₋₁	2219733012	2/02/2021	3	9829933	5/02/2021	9:05	Client	24.02
	PM ₁₀₋₁	2219733015	8/02/2021	8	9829930	12/02/2021	6:40	Client	24.03
	PM ₁₀₋₁	2219733018	14/02/2021	8	9829927	16/02/2021	7:11	Client	24.04
	PM ₁₀₋₁	2219733021	20/02/2021	5	9853058	24/02/2021	9:38	Client	24.02
	PM ₁₀₋₁	2219733024	26/02/2021	8	9853061	2/03/2021	10:09	Client	24.14

Mar-21	PM ₁₀₋₁	3219733012	4/03/2021	7	9853064	9/03/2021	9:05	Client	24
	PM ₁₀₋₁	3219733015	10/03/2021	8	9853067	12/03/2021	9:12	Client	24.02
	PM ₁₀₋₁	3219733018	16/03/2021	5	9853070	17/03/2021	10:08	Client	24.02
	PM ₁₀₋₁	3219733021	22/03/2021	3	9853073	26/03/2021	8:30	Client	24.03
	PM ₁₀₋₁	3219733024	28/03/2021	4	9845940	31/03/2021	9:36	Client	24.11
Apr-21	PM ₁₀₋₁	4219733012	3/04/2021	4	9845943	7/04/2021	11:07	Client	24.02
	PM ₁₀₋₁	4219733015	9/04/2021	5	9845946	13/04/2021	10:02	Client	24.03
	PM ₁₀₋₁	4219733018	15/04/2021	8	9845949	19/04/2021	10:31	Client	24.03
	PM ₁₀₋₁	4219733021	21/04/2021	4	9845952	23/04/2021	9:57	Client	24.02
	PM ₁₀₋₁	4219733024	27/04/2021	7	9845955	29/04/2021	10:03	Client	24.03
May-21	PM ₁₀₋₁	5219733012	3/05/2021	1	9845958	6/05/2021	10:01	Client	24.01
	PM ₁₀₋₁	5219733015	9/05/2021	3	9845961	12/05/2021	10:29	Client	24.02
	PM ₁₀₋₁	5219733018	15/05/2021	1	9845964	20/05/2021	10:19	Client	24.03
	PM ₁₀₋₁	5219733021	21/05/2021	3	9845967	26/05/2021	11:12	Client	24.02
	PM ₁₀₋₁	5219733024	27/05/2021	0	9845970	1/06/2021	10:39	Client	24.03
June-21	PM ₁₀₋₁	6219733012	2/06/2021	4	9928864	4/06/2021	9:59	Client	24.03
	PM ₁₀₋₁	6219733015	8/06/2021	5	9928866	10/06/2021	9:18	Client	24.03
	PM ₁₀₋₁	6219733018	14/06/2021	1	9928869	17/06/2021	9:23	Client	24.03
	PM ₁₀₋₁	6219733021	20/06/2021	6	9928872	22/06/2021	9:16	Client	24.04
	PM ₁₀₋₁	6219733024	26/06/2021	2	9928875	1/07/2021	8:06	Client	24.03
July-21	PM ₁₀₋₁	7219733012	2/07/2021	1	9933935	7/07/2021	10:44	Client	24.14
	PM ₁₀₋₁	7219733015	8/07/2021	3	9933938	12/07/2021	10:06	Client	24.05
	PM ₁₀₋₁	7219733018	14/07/2021	3	9933941	15/07/2021	9:16	Client	24.04
	PM ₁₀₋₁	7219733021	20/07/2021	1	9933944	22/07/2021	11:59	Client	24.02
	PM ₁₀₋₁	7219733024	26/07/2021	2	9933947	27/07/2021	12:10	Client	24.03
Aug-21	PM ₁₀₋₁	8219733012	1/08/2021	4	9933950	5/08/2021	11:11	Client	24.03
	PM ₁₀₋₁	8219733015	7/08/2021	1	9933953	12/08/2021	12:29	Client	24.03
	PM ₁₀₋₁	8219733018	13/08/2021	4	9933998	18/08/2021	10:21	Client	24.03
	PM ₁₀₋₁	8219733021	19/08/2021	7	9925901	24/08/2021	10:20	Client	24.03
	PM ₁₀₋₁	8219733024	25/08/2021	2	9925904	27/08/2021	9:17	Client	24.02
	PM ₁₀₋₁	8219733027	31/08/2021	4	9925907	2/09/2021	10:39	Client	24.22
Sep-21	PM ₁₀₋₁	9219733012	6/09/2021	2	9925910	8/09/2021	9:48	Client	24.05
	PM ₁₀₋₁	9219733015	12/09/2021	10	9925913	15/09/2021	10:03	Client	24.03
	PM ₁₀₋₁	9219733018	18/09/2021	12	9925916	22/09/2021	10:55	Client	24.03
	PM ₁₀₋₁	9219733021	24/09/2021	7	9925919	29/09/2021	7:17	Client	24.03
	PM ₁₀₋₁	9219733024	30/09/2021	4	9934416	1/10/2021	9:48	Client	24.2

Oct-21	PM ₁₀₋₁	10219733012	6/10/2021	7	9934419	8/10/2021	8:44	Client	24.03
	PM ₁₀₋₁	10219733015	12/10/2021	2	9934422	15/10/2021	9:39	Client	24.03
	PM ₁₀₋₁	10219733018	18/10/2021	4	9934425	21/10/2021	12:04	Client	24.03
	PM ₁₀₋₁	10219733021	24/10/2021	6	9934428	29/10/2021	11:05	Client	24.03
	PM ₁₀₋₁	10219733024	30/10/2021	8	9934431	2/11/2021	12:15	Client	24.02
Nov-21	PM ₁₀₋₁	11219733012	5/11/2021	3	9925959	10/11/2021	11:27	Client	24.03
	PM ₁₀₋₁	11219733015	11/11/2021	3	9925952	16/11/2021	10:35	Client	24.03
	PM ₁₀₋₁	11219733018	17/11/2021	6	9925944	19/11/2021	8:58	Client	24.03
	PM ₁₀₋₁	11219733021	23/11/2021	2	9825290	25/11/2021	8:27	Client	24.03
	PM ₁₀₋₁	11219733024	29/11/2021	5	9845979	30/11/2021	11:19	Client	24.03
Dec-21	PM ₁₀₋₁	12219733012	5/12/2021	7	9964701	7/12/2021	11:08	Client	24.15
	PM ₁₀₋₁	12219733015	11/12/2021	4	9964704	15/12/2021	12:33	Client	24.07
	PM ₁₀₋₁	12219733018	17/12/2021	9	9964710	21/12/2021	11:26	Client	24.03
	PM ₁₀₋₁	12219733021	23/12/2021	10	9964713	28/12/2021	6:52	Client	24.03
	PM ₁₀₋₁	12219733024	29/12/2021	3	9964716	1/01/2022	8:40	Client	24.03

4.3.5.3 HVAS Unit 2 (PM10-2)

Table 22: HVAS Unit 2 Results

		Sample #	Run Date	PM10	Filter #	Date Off	Time Off	Tech	Hrs
Jan-21	PM ₁₀₋₂	1219733003	3/01/2021	6	9829958	4/01/2021	9:40	Client	24
	PM ₁₀₋₂	1219733016	9/01/2021	2	9829969	12/01/2021	12:40	Client	23.98
	PM ₁₀₋₂	1219733019	15/01/2021	13	9829938	20/01/2021	11:30	Client	24.03
	PM ₁₀₋₂	1219733022	21/01/2021	9	9829937	25/01/2021	6:50	Client	24.03
	PM ₁₀₋₂	1219733025	27/01/2021	11	9853025	1/02/2021	10:21	Client	23.98
Feb-21	PM ₁₀₋₂	2219733013	2/02/2021	3	9829934	5/02/2021	9:13	Client	24.04
	PM ₁₀₋₂	2219733016	8/02/2021	7	9829931	12/02/2021	6:55	Client	24.04
	PM ₁₀₋₂	2219733019	14/02/2021	7	9829928	16/02/2021	7:38	Client	24.04
	PM ₁₀₋₂	2219733022	20/02/2021	3	9853059	24/02/2021	9:50	Client	24.04
	PM ₁₀₋₂	2219733025	26/02/2021	7	9853062	2/03/2021	10:31	Client	24.2
Mar-21	PM ₁₀₋₂	3219733013	4/03/2021	7	9853065	9/03/2021	9:20	Client	24.04
	PM ₁₀₋₂	3219733016	10/03/2021	7	9853068	12/03/2021	9:21	Client	24.02
	PM ₁₀₋₂	3219733019	16/03/2021	3	9853071	17/03/2021	10:18	Client	24.04
	PM ₁₀₋₂	3219733022	22/03/2021	2	9853074	26/03/2021	8:47	Client	24.02
	PM ₁₀₋₂	3219733025	28/03/2021	6	9845941	31/03/2021	9:45	Client	24.02
Apr-21	PM ₁₀₋₂	4219733013	3/04/2021	4	9845944	7/04/2021	11:23	Client	24.1
	PM ₁₀₋₂	4219733016	9/04/2021	7	9845947	13/04/2021	10:23	Client	24.04

	PM ₁₀₋₂	4219733019	15/04/2021	10	9845950	19/04/2021	10:39	Client	24.04
	PM ₁₀₋₂	4219733022	21/04/2021	6	9845953	23/04/2021	10:06	Client	24.04
	PM ₁₀₋₂	4219733025	27/04/2021	8	9845956	29/04/2021	10:12	Client	24.03
May-21	PM ₁₀₋₂	5219733013	3/05/2021	1	9845959	6/05/2021	10:12	Client	23.8
	PM ₁₀₋₂	5219733016	9/05/2021	3	9845962	12/05/2021	10:45	Client	24.03
	PM ₁₀₋₂	5219733019	15/05/2021	1	9845965	20/05/2021	10:34	Client	24.05
	PM ₁₀₋₂	5219733022	21/05/2021	2	9845968	26/05/2021	11:23	Client	24.03
	PM ₁₀₋₂	5219733025	27/05/2021	0	9845971	1/06/2021	10:24	Client	24.05
June-21	PM ₁₀₋₂	6219733013	2/06/2021	6	9928865	4/06/2021	10:12	Client	24.04
	PM ₁₀₋₂	6219733016	8/06/2021	4	9928867	10/06/2021	9:49	Client	24.04
	PM ₁₀₋₂	6219733019	14/06/2021	3	9928870	17/06/2021	9:38	Client	24.05
	PM ₁₀₋₂	6219733022	20/06/2021	6	9928873	22/06/2021	9:28	Client	23.78
	PM ₁₀₋₂	6219733025	26/06/2021	2	9928876	1/07/2021	8:26	Client	24.02
July-21	PM ₁₀₋₂	7219733013	2/07/2021	1	9933936	7/07/2021	10:56	Client	24.02
	PM ₁₀₋₂	7219733016	8/07/2021	4	9933939	12/07/2021	10:14	Client	24.04
	PM ₁₀₋₂	7219733019	14/07/2021	4	9933942	15/07/2021	9:26	Client	24.03
	PM ₁₀₋₂	7219733022	20/07/2021	1	9933945	22/07/2021	12:05	Client	24.03
	PM ₁₀₋₂	7219733025	26/07/2021	3	9933948	27/07/2021	12:18	Client	24.03
Aug-21	PM ₁₀₋₂	8219733013	1/08/2021	7	9933951	5/08/2021	11:35	Client	24.04
	PM ₁₀₋₂	8219733016	7/08/2021	1	9933954	12/08/2021	12:36	Client	24.05
	PM ₁₀₋₂	8219733019	13/08/2021	4	9933999	18/08/2021	10:58	Client	24.03
	PM ₁₀₋₂	8219733022	19/08/2021	10	9925902	24/08/2021	10:30	Client	24.03
	PM ₁₀₋₂	8219733025	25/08/2021	3	9925905	27/08/2021	9:28	Client	24.03
	PM ₁₀₋₂	8219733028	31/08/2021	6	9925908	2/09/2021	11:05	Client	24.42
Sep-21	PM ₁₀₋₂	9219733013	6/09/2021	2	9925911	8/09/2021	10:12	Client	24.04
	PM ₁₀₋₂	9219733016	12/09/2021	10	9925914	15/09/2021	10:27	Client	24
	PM ₁₀₋₂	9219733019	18/09/2021	10	9925917	22/09/2021	11:14	Client	24.04
	PM ₁₀₋₂	9219733022	24/09/2021	9	9925920	29/09/2021	7:26	Client	24.04
	PM ₁₀₋₂	9219733025	30/09/2021	2	9934417	1/10/2021	9:56	Client	24.15
Oct-21	PM ₁₀₋₂	10219733013	6/10/2021	8	9934420	8/10/2021	8:53	Client	24.03
	PM ₁₀₋₂	10219733016	12/10/2021	1	9934423	15/10/2021	9:47	Client	24.04
	PM ₁₀₋₂	10219733019	18/10/2021	4	9934426	21/10/2021	12:20	Client	24.04
	PM ₁₀₋₂	10219733022	24/10/2021	5	9934429	29/10/2021	11:11	Client	24.04
	PM ₁₀₋₂	10219733025	30/10/2021	9	9934432	2/11/2021	12:28	Client	23.6
Nov-21	PM ₁₀₋₂	11219733013	5/11/2021	2	9925943	10/11/2021	11:40	Client	24.01
	PM ₁₀₋₂	11219733016	11/11/2021	1	9933919	16/11/2021	10:44	Client	24

	PM ₁₀₋₂	11219733019	17/11/2021	8	9928855	19/11/2021	9:07	Client	24.04
	PM ₁₀₋₂	11219733022	23/11/2021	2	9933991	25/11/2021	8:42	Client	24.03
	PM ₁₀₋₂	11219733025	29/11/2021	6	9829966	30/11/2021	11:29	Client	24.04
Dec-21	PM ₁₀₋₂	12219733013	5/12/2021	7	9964702	7/12/2021	12:02	Client	24.22
	PM ₁₀₋₂	12219733016	11/12/2021	5	9964705	15/12/2021	12:54	Client	24.04
	PM ₁₀₋₂	12219733019	17/12/2021	10	9964711	21/12/2021	11:44	Client	24.03
	PM ₁₀₋₂	12219733022	23/12/2021	7	9964714	28/12/2021	7:05	Client	24.04
	PM ₁₀₋₂	12219733025	29/12/2021	1	9964717	1/01/2022	8:55	Client	24.04

4.3.5.4 TSP Unit 1

Table 23: TSP Unit 1 Results

		Sample #	Run Date	TSP	Filter #	Date Off	Time Off	Tech	Hrs
Jan-21	TSP	1219733001	3/01/2021	16	9829957	4/01/2021	8:06	Client	24
	TSP	1219733014	9/01/2021	8	9829967	12/01/2021	12:12	Client	24
	TSP	1219733017	15/01/2021	31	9829940	20/01/2021	10:56	Client	24.04
	TSP	1219733020	21/01/2021	14	9829935	25/01/2021	6:30	Client	24.04
	TSP	1219733023	27/01/2021	25	9853023	1/02/2021	9:57	Client	23.98
Feb-21	TSP	2219733011	2/02/2021	8	9829932	5/02/2021	8:57	Client	24.04
	TSP	2219733014	8/02/2021	14	9829929	12/02/2021	6:30	Client	24.04
	TSP	2219733017	14/02/2021	15	9829926	16/02/2021	7:03	Client	24.04
	TSP	2219733020	20/02/2021	4	9825251	24/02/2021	9:32	Client	24.04
	TSP	2219733023	26/02/2021	15	9853060	2/03/2021	9:59	Client	24.28
Mar-21	TSP	3219733011	4/03/2021	2	9853063	9/03/2021	8:58	Client	24.04
	TSP	3219733014	10/03/2021	14	9853066	12/03/2021	9:06	Client	24.04
	TSP	3219733017	16/03/2021	10	9853069	17/03/2021	10:01	Client	24.04
	TSP	3219733020	22/03/2021	6	9853072	26/03/2021	8:23	Client	24.04
	TSP	3219733023	28/03/2021	8	9853075	31/03/2021	9:28	Client	24.04
Apr-21	TSP	4219733011	3/04/2021	7	9845942	7/04/2021	11:03	Client	23.85
	TSP	4219733014	9/04/2021	12	9845945	13/04/2021	9:57	Client	24.04
	TSP	4219733017	15/04/2021	15	9845948	19/04/2021	10:24	Client	24.05
	TSP	4219733020	21/04/2021	9	9845951	23/04/2021	9:52	Client	24.05
	TSP	4219733023	27/04/2021	12	9845954	29/04/2021	9:58	Client	24.03
May-21	TSP	5219733011	3/05/2021	3	9845957	6/05/2021	9:56	Client	24.02
	TSP	5219733014	9/05/2021	7	9845960	12/05/2021	10:23	Client	24.04
	TSP	5219733017	15/05/2021	3	9845963	20/05/2021	10:14	Client	24.04
	TSP	5219733020	21/05/2021	6	9845966	26/05/2021	11:07	Client	24.04
	TSP	5219733001	27/05/2021	1	9845969	1/06/2021	10:34	Client	24.04
June-21	TSP	6219733011	2/06/2021	3	9845972	4/06/2021	9:55	Client	24.04
	TSP	6219733014	8/06/2021	9	9928863	10/06/2021	9:12	Client	24.04
	TSP	6219733017	14/06/2021	2	9928868	17/06/2021	9:18	Client	24.04
	TSP	6219733020	20/06/2021	12	9928871	22/06/2021	9:10	Client	24.05

	TSP	6219733023	26/06/2021	4	9928874	1/07/2021	8:00	Client	24.02
July-21	TSP	7219733011	2/07/2021	3	9928877	7/07/2021	10:37	Client	24.36
	TSP	7219733014	8/07/2021	6	9933937	12/07/2021	10:02	Client	24.04
	TSP	7219733017	14/07/2021	8	9933940	15/07/2021	9:11	Client	24.04
	TSP	7219733020	20/07/2021	3	9933943	22/07/2021	11:53	Client	24.05
	TSP	7219733023	26/07/2021	5	9933946	27/07/2021	12:06	Client	24.03
Aug-21	TSP	8219733011	1/08/2021	11	9933949	5/08/2021	11:06	Client	24.05
	TSP	8219733014	7/08/2021	4	9933952	12/08/2021	12:24	Client	24.05
	TSP	8219733017	13/08/2021	8	9933955	18/08/2021	10:17	Client	24.04
	TSP	8219733020	19/08/2021	14	9934000	24/08/2021	10:14	Client	24.04
	TSP	8219733023	25/08/2021	4	9925903	27/08/2021	9:13	Client	24.03
	TSP	8219733026	31/08/2021	10	9925906	2/09/2021	10:35	Client	24.26
Sep-21	TSP	9219733011	6/09/2021	5	9925909	8/09/2021	9:43	Client	24.04
	TSP	9219733014	12/09/2021	21	9925912	15/09/2021	9:59	Client	24.05
	TSP	9219733017	18/09/2021	28	9925915	22/09/2021	10:49	Client	24.04
	TSP	9219733020	24/09/2021	14	9925918	29/09/2021	7:09	Client	24.04
	TSP	9219733023	30/09/2021	7	9934415	1/10/2021	9:42	Client	24.23
Oct-21	TSP	10219733011	6/10/2021	13	9934418	8/10/2021	8:38	Client	24.05
	TSP	10219733014	12/10/2021	3	9934421	15/10/2021	9:35	Client	24.04
	TSP	10219733017	18/10/2021	8	9934424	21/10/2021	12:01	Client	24.04
	TSP	10219733020	24/10/2021	15	9934427	29/10/2021	11:00	Client	24.04
	TSP	10219733023	30/10/2021	23	9934430	2/11/2021	12:11	Client	24.05
Nov-21	TSP	11219733011	5/11/2021	7	9925921	10/11/2021	11:24	Client	24.04
	TSP	11219733014	11/11/2021	14	9925951	16/11/2021	10:31	Client	24.05
	TSP	11219733017	17/11/2021	23	9925926	19/11/2021	8:55	Client	24.04
	TSP	11219733020	23/11/2021	12	9933972	25/11/2021	8:24	Client	24.05
	TSP	11219733023	29/11/2021	11	9845994	30/11/2021	11:15	Client	24.05
Dec-21	TSP	12219733011	5/12/2021	11	9933971	7/12/2021	11:04	Client	24.25
	TSP	12219733014	11/12/2021	14	9964703	15/12/2021	13:30	Client	24
	TSP	12219733017	17/12/2021	20	9964706	21/12/2021	12:23	Client	24.02
	TSP	12219733020	23/12/2021	16	9964712	28/12/2021	6:40	Client	24.02
	TSP	12219733023	29/12/2021	7	9964715	1/01/2022	8:30	Client	24.03

4.3.6 Analysis of Results

Please refer to sections 4.3.6.1 to 4.3.6.3 for a breakdown of the air quality monitoring data.

4.3.6.1 Depositional Dust Gauges

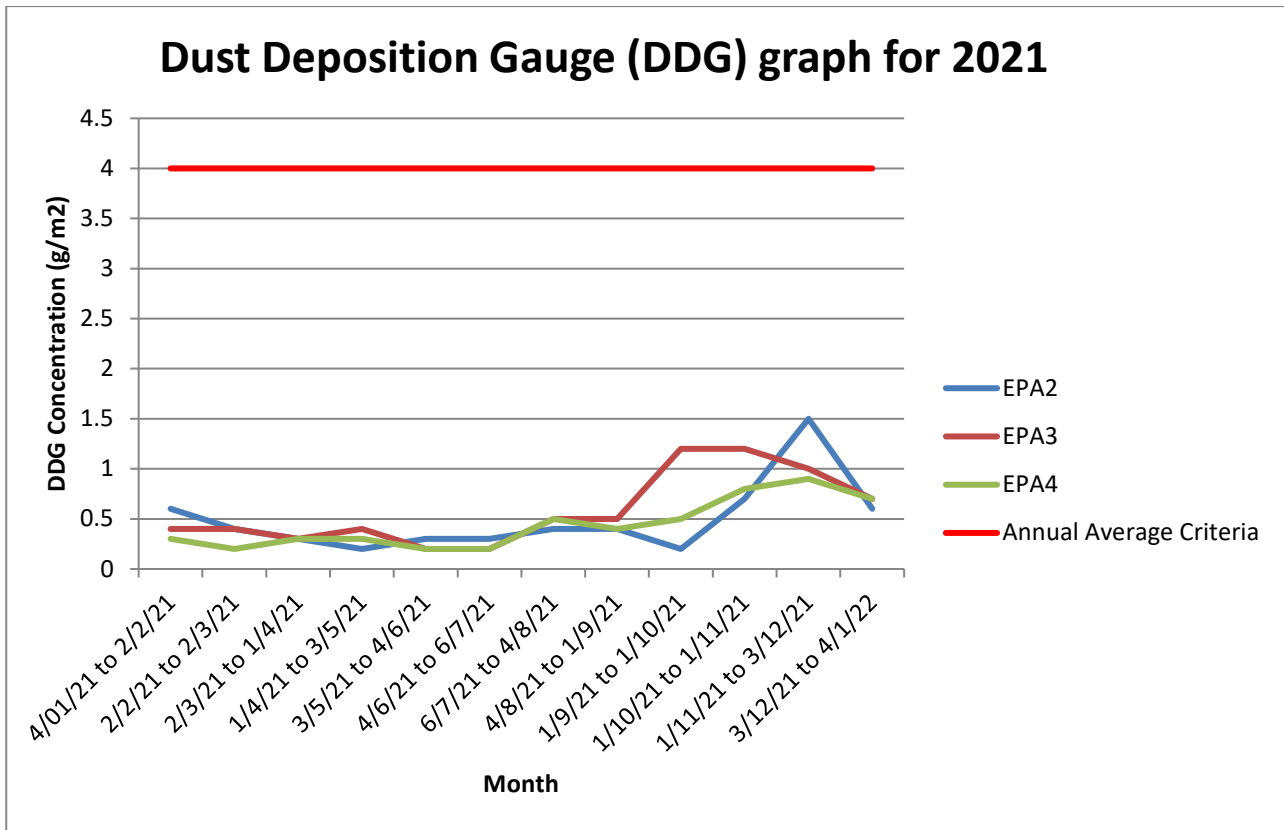


Figure 10: DDG results for the reporting period

4.3.6.2 HVAS PM-10 Unit 1 and 2

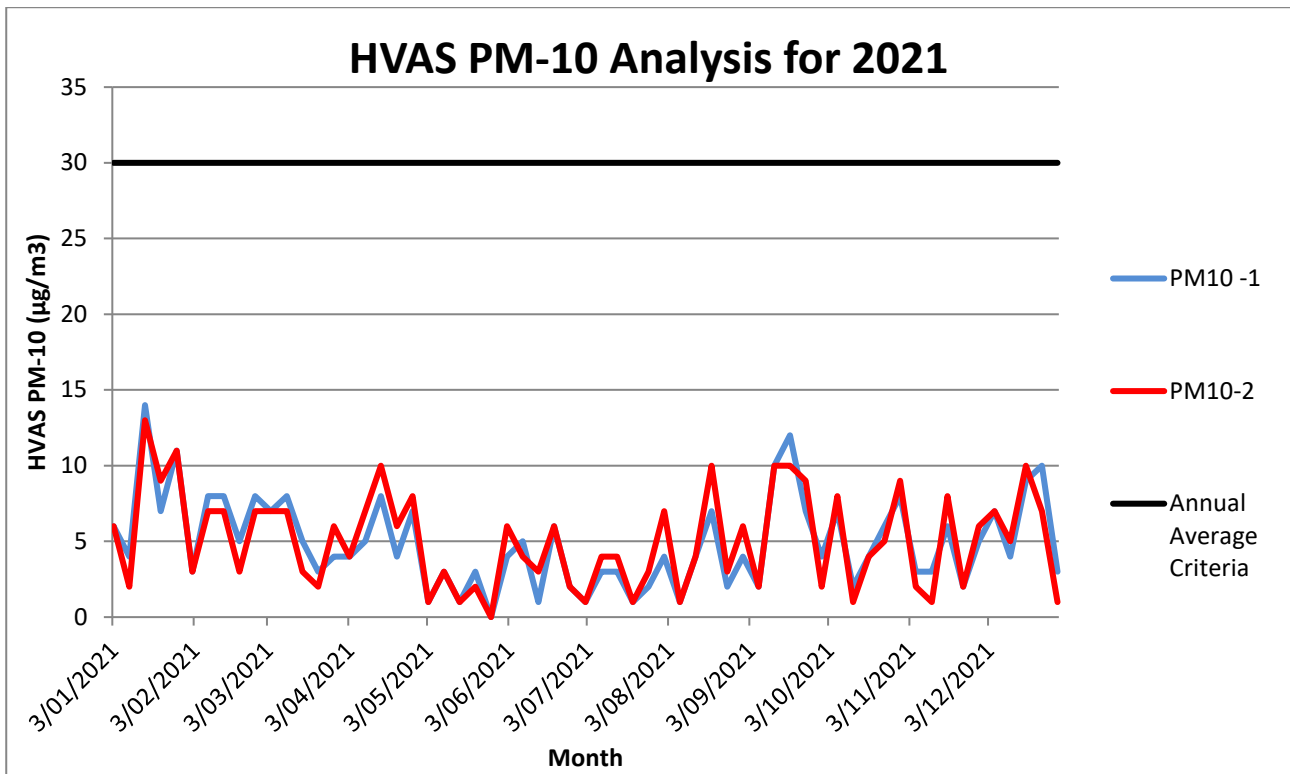


Figure 11: HVAS (PM-10) results for the reporting period

*The HVAS PM10 24-hour criterion of 25µg/m3 is based on the short term impact assessment criterion for particulate matter. The annual average is the long term impact assessment criteria for deposited dust as shown in Condition 15 of the Approval.

Table 24: PM10 and TSP annual average results for the reporting period

Unit	Ardglen HVAS Annual Average	24 hour Criterion (Short Term)	Annual Average Criterion (Long Term)
PM10-1	4.9	50	25
PM10-2	5.1	50	25
TSP	10.5	N/A	90
PM2.5	N/A	25	8

4.3.6.3 TSP Unit 1

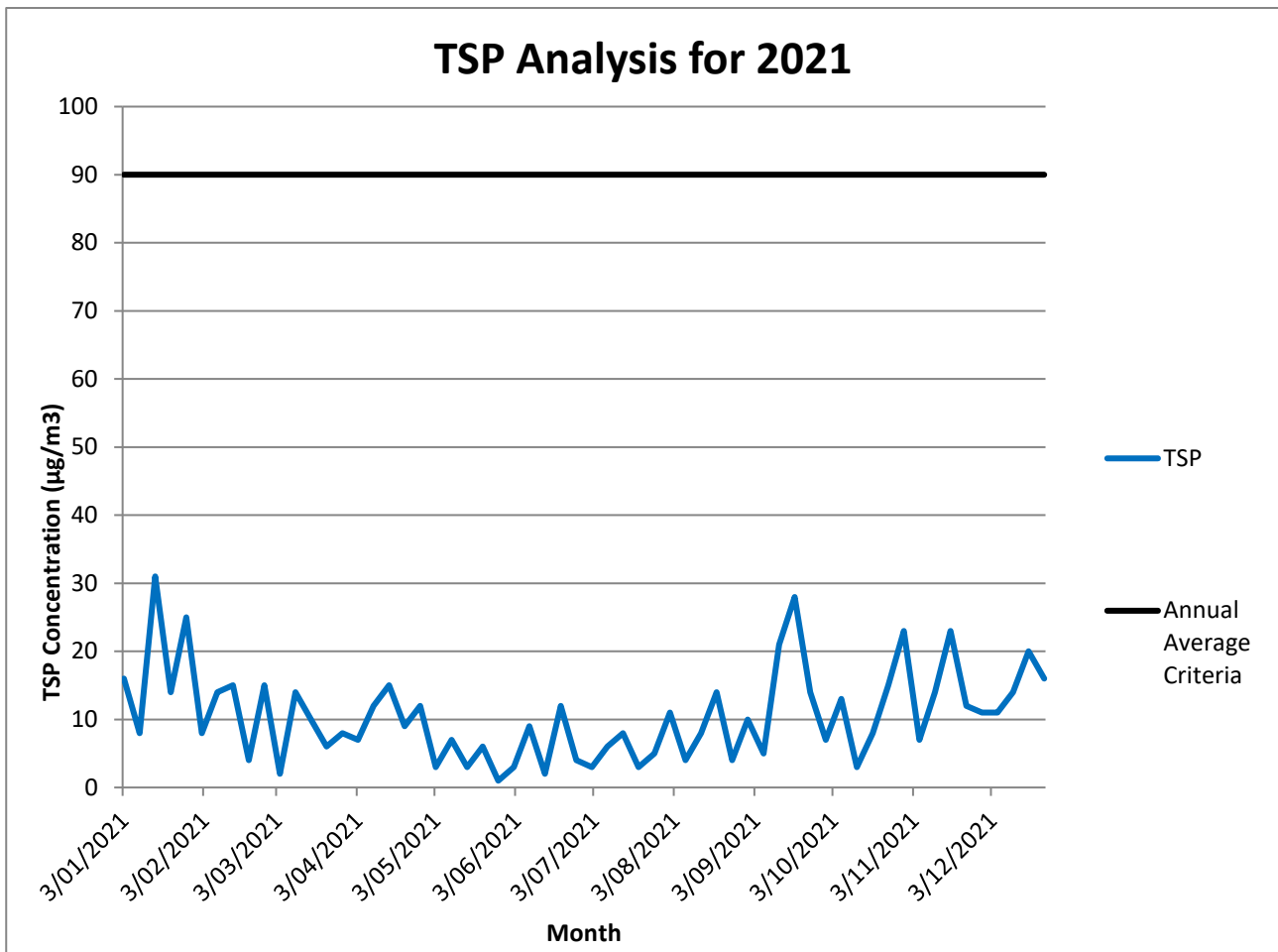


Figure 12: HVAS (TSP) results for the reporting period

4.3.7 Discussion

Commentary on the various air monitoring data is below:

DDG

All DDG's were compliant based on the annual average and individual results achieved during the reporting period.

HVAS (PM10, TSP and PM2.5)

The PM10 and TSP units operated as required for the entire duration of the reporting period. The PM2.5 unit was not installed until after the end of the reporting period and therefore show no results for the period 1st January to 31st December 2021.

All HVAS's were compliant based on the annual average and 24 hour results achieved during the reporting period.

4.3.8 Conclusion

All DDG, PM-10 and TSP results obtained during the reporting period were compliant. It is also worth noting that the PM2.5 unit will be installed in early 2022.

4.4 Flora and Fauna Habitat**4.4.1 Introduction**

As part of the current consent, the three BOA's have been established as described in the off-set strategy. Please refer to Section 2.12 for further details of this ongoing process.

From a fauna perspective, nesting boxes were installed in April 2012 on Lot 187 DP 751028 as identified in the sites Landscape Management Plan. It is a requirement of the plan that annual inspections of the nesting boxes are conducted for the life of the quarry, and this occurred again in early 2022 (Covid delayed the original scheduled date in late 2021). Please refer to Appendix 6 for a copy of the 2021 Ardglen Annual Biodiversity Monitoring report.

4.4.2 Fauna Management

Appropriate feral animal control is an important aspect of the correct management of the site. Feral animal control is therefore ongoing and completed on the site (including offset areas) as required. Once again, this occurred for the entire duration of the reporting period with records kept of feral animals controlled during that time;

4.4.3 Nest Box Usage

The report associated with the annual inspections of the nesting boxes is attached in **Appendix 6**. Photo 3 below also demonstrates nest box usage as detailed within the 2021 Rehabilitation and nesting inspection report.

4.4.4 Biodiversity offset and rehabilitation areas

The full report associated with the 2021 Rehabilitation and nesting inspection report is attached in **Appendix 6**. A summary of this report is shown below.

- BOA inspection (and offset planting)

Four permanent monitoring plots (Q01, Q02, Q03 and Q04) were established within each of the four vegetation zones in the BOAs identified by Orogen (2010). These vegetation zones have been assigned a Plant Community Type (PCT) in order to be comparable with PCT benchmarks and track condition and progress over time. These PCTs have been described using floristic data, broad-scale vegetation mapping (DPIE 2020) and using knowledge of the local topography and landscape.

Table 25 shows the vegetation zones and corresponding PCT associated with each of the four monitoring plots used.

Table 25: Vegetation Zones and Corresponding PCT and Plot Information

Plot Name	Easting	Northing	Zone	Vegetation Zone (Orogen 2010)	PCT Name
Q01	290019	6485647	56	Blakelys Red Gum (+/- Yellow Box) Dry Sclerophyll Grassy Woodlands/Open Woodland	PCT 496 - Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion
Q02	289747	6486167	56	River Oak (<i>Casuarina cunninghamiana</i>) Dry Sclerophyll Woodland	PCT 485 - River Oak riparian grassy tall woodland of the western Hunter Valley (Brigalow Belt South Bioregion and Sydney Basin Bioregion)
Q03	289761	6485921	56	White Box (<i>Eucalyptus albens</i>) and Rough barked Apple (<i>Angophora floribunda</i>) Dry Sclerophyll Grassy Woodland	PCT 433 - White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
Q04	289144	6486073	56	Derived Native Grassland	PCT 796 - Derived grassland of the NSW South Western Slopes

A comparison of the data collected at each of the monitoring sites to the previous years results and their corresponding PCT benchmarks is outlined below:

Q01 - PCT 496 - Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion. Since 2019, native species richness dropped from 78% to 48% of the benchmark, however this number is up 3% since 2020. Overstorey foliage cover has stayed approximately stable at 57% of the benchmark. There is development in the mid storey foliage cover, which is up 14% for the first time since monitoring began. Native grass cover was at 93% of the benchmark, which is a very slight decrease since last year. Exotic species cover was very high at 94%. This is likely because the ground cover has increased so much in general following a sustained period of increased rainfall. Native forbs and 'other' species saw an increase this year at over 60% of the benchmark. Fallen log cover was higher this year than last year, but still lower than 2019, however it is likely that the logs were not as visible due to the dense groundcover, and still persist below the thick coverage. Regeneration of canopy species was evident in this plot.

Q02 - PCT 485 - River Oak riparian grassy tall woodland of the western Hunter Valley (Brigalow Belt South Bioregion and Sydney Basin Bioregion). Native species richness was lower than the results seen in 2019 and 2020, with 2021 results reaching 14% of the benchmark. Overstorey foliage cover has increased significantly at 53% of the benchmark, and mid storey foliage cover remained low at 10% of the benchmark. Native grass cover was absent, with most of the grass cover in this area made up of exotics, however native forbs and 'other' species exceeded the benchmark at 125%. Fallen logs were low this year at 6% of the benchmark but given the low canopy cover and very tall obscuring grass cover, this is a reasonable result. Exotic cover was extremely high at 96%. It is likely that given the position of this plot in the landscape, exotic seeds have culminated at the low point of the topography in the riparian area and flourished after consecutive rainfall flushes.

Q03 - PCT 433 - White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, Brigalow Belt South Bioregion. Native species richness increased by 16% between 2020 and 2021, meeting 58% of the benchmark. Overstorey foliage cover has increased slightly since 2020 and is now at 91% of the benchmark. In 2019, dieback was evident from prolonged drought, but the canopy cover appeared to increase in 2020 and continued to increase in 2021. There is development in the midstorey, with cover at 25% of the benchmark. Native grass cover

again exceeded the benchmark at 147%, which is an excellent result. As with all vegetation zones, exotic cover was very high at 94%. There has been an increase in native forbs and 'other' species, with these exceeding the benchmark at 214%. Overstorey regeneration was present in this zone, while fallen logs remained absent.

Q04 - PCT 796 - Derived grassland of the NSW Southwestern Slopes. Native species richness was higher than the results seen in 2020, but slightly lower than baseline results, reaching 62% of the benchmark. Native overstorey and mid-storey cover were appropriately absent, as were fallen logs. Exotic species cover was very high at 94%. Native grass cover score was the highest it has been, at 68% of the benchmark. Native forbs and 'other' species exceeded the benchmark at 116%, which is also the highest it has been at this site.

Approximately 447 tubestock were planted within Offset A and Offset B in 2021 in the indicative planting areas shown in Figure 5. Older offset supplementary plantings were made in Autumn 2021, with recent plantings made in Spring 2021. Though most species could not be identified due to their young age, the species mix appeared to be a satisfactory mix of representative canopy and mid-storey species for the area. Heights ranged from approximately 0.2 – 1.1m. Condition and survivorship of these plantings was good, with approximately 75% of older plantings and approximately 90% of recent plantings surviving. Most of the losses encountered appeared to have been contributed to by destructive behaviour by feral pigs and deer, which has also resulted in damage to tree guards.

- Rehabilitation planting inspection

Approximately 500 saplings were planted in the two rehabilitation areas outside of the BOAs and identified in the indicative planting areas in Figure 5. The two areas planted outside the BOA's were the western rehabilitation plantings (undertaken in September 2019) and the lower/eastern plantings in the various rehabilitation areas (the top/western portion of this area was planted in March/April 2020).

Both areas continued to show a very high survival rate, and although the count of saplings was not exhaustive, only a small number of planted individuals appeared to have perished. Survival rate appeared to be above 80% in both areas. Though some species could not be identified due to their young age, the species mix appeared to be a satisfactory mix of representative canopy and mid-storey species for the area.

- Recommendations from the Rehabilitation and Nesting Inspection Report

Additionally, as also detailed in the 2021 Rehabilitation and nesting inspection report, the following recommendations (including proposed actions in red) are provided for consideration in the 2021 Annual Review:

- Perimeter fencing of the BOAs is adequate, but internal fences can be removed if practical. These may hinder the movement of native fauna throughout the BOAs – **Daracon does not currently propose to remove the internal fences as it is not practical or necessary to do so;**
- Daracon should continue to engage the services of a feral animal shooter for feral pest animals that frequent the BOAs (e.g., foxes and wild dogs). Daracon may liaise with Local Land Services to discuss the merits of a wild dog baiting program if considered necessary – **Daracon continues to engage the services of a feral animal shooter and will continue to do so for the foreseeable future;**
- Further and ongoing weed management works of St John's wort (*Hypericum perforatum*) in Offset A and B and blackberry (*Rubus fruticosus* agg.) in Offset A is recommended – **Daracon continues to undertake regular weed spraying across the entire site and will endeavour to focus their efforts to those noted above in the near future. There have been multiple weed spraying events on site during the reporting period, however recent and persistent rain has severely hindered the effectiveness of these events;**

- Next year's natural regeneration monitoring should incorporate monitoring of both natural and assisted regeneration outcomes for better comparison and overall picture of regeneration – **Noted;**
- Nest Box 12 should be fixed and reattached to its host tree with a sturdier attachment style as a priority – **Nest box 12 was re-attached soon after the Umwelt inspection occurred as shown in Photo 2 below;**



NB12 fallen off tree



NB 12 re-installed onto tree

Photo 2: Nest box 12 re-installed early 2022

- It is recommended that the ply stuck to the upper part of Nest Box 17 (TT158) is removed to better facilitate monitoring of the box, however this is a low priority as access to the box by animals does not appear to be impeded – **Daracon attempted to remove the small section of ply but was unsuccessful. Due to the fact that the nest box continues to operate effectively, we'll monitor this situation and remove the errant material if it impedes the use of the nest box;**
- The arrangement of cattle in the rehabilitated was intended to assist with weed control, however this appears to have been at the detriment of the rehabilitated plantings. Due to the adverse impacts to rehabilitation, alternative weed control strategies should be implemented – **It is worth clarifying that no cattle were evident in the BOA's, but they had existed in the 'extension area' as a mechanism to assist with weed control. This occurred briefly up until we noticed there was a negative impact on the rehabilitation. Upon being notified by Umwelt that the presence of cattle in the 'extension area' was detrimental to the rehabilitation, they were promptly removed;**
- Further consultation with a qualified bush regenerator is advised to develop a weed management and rehabilitation strategy for Doughboy Hollow Creek, noting that this matter is progressing with Umwelt's assistance – **Noted that Umwelt are assisting Daracon with this strategy going forward. This was in progress at the time of reporting and forms part of the overall Doughboy Hollow Rehabilitation Strategy currently being developed;**



Photo 3: Nest box usage

4.5 Analysis of monitoring results against those predicted in the EA

4.5.1 Water Quality

Due to the fact that the quarry has mostly been in “care and maintenance” for many years, the fact that the site has substantial water storage capacity on site, there have been no documented water discharge events or known water quality issues identified. This is consistent with those predicted in the EA which states “the project is unlikely to result in any significant impacts on water”.

4.5.2 Noise and Blast

Due to the fact that the quarry has mostly been in “care and maintenance” for many years and the fact that the site has not undertaken blasting or significant quarrying operations during this time, there have been no issues relating to noise or blasting identified. We are yet to fully implement all mitigation measures detailed in the EA as we have not yet entered the extension area. Upon entering the extension area, the various additional mitigation measures will be implemented and monitored in accordance with the consent.

4.5.3 Air Quality

Due to the fact that the quarry has mostly been in “care and maintenance” for many years and the fact that the site has not undertaken blasting or significant quarrying operations during this time, there have been no substantial issues relating to air quality identified. There have obviously been a few (but infrequent) air quality monitoring results that have not complied with the consent during previous reporting periods, however these have easily been discounted for reasons not specifically associated with quarry operations (regional dust storms or persistent intense drought conditions). This is consistent with

those predicted in the EA which states “air quality modelling indicates that worst case dust emissions generated by the project would comply with the DECC criteria for dust deposition, TSP and small particulate matter (PM-10) at all privately owned residences in the vicinity of the site”.

4.6 Trends of monitoring over the life of the project

4.6.1 Water Quality

Due to the fact that the quarry has mostly been in “care and maintenance” for many years, the fact that the site has substantial water storage capacity on site there have been no documented water discharge events or known water quality issues identified. It must be noted however that the Approval includes additional water management strategies to permit appropriate water discharge subject to approval of a variation to the EPL.

4.6.2 Noise and Blast

Due to the fact that the quarry has mostly been in “care and maintenance” for many years and the fact that the site has not undertaken blasting or significant quarrying operations during this time, there have been no issues relating to noise or blasting identified. It must be noted however that the Approval includes additional noise mitigation measures that will be implemented and monitored in accordance with the consent.

4.6.3 Air Quality

Due to the fact that the quarry has mostly been in “care and maintenance” for many years and the fact that the site has not undertaken blasting or significant quarrying operations during this time, there have been no substantial issues relating to air quality identified.

As shown in Figures 13, 14, 15 and 16 below, the long-term trends associated with the various air quality monitoring parameters are summarised as follows:

- Figure 13 – This shows the Dust Deposition Gauge (DDG) monitoring results from 2007 to 2021. As seen in this figure, the annual average results are all below the criterion apart from the average result for EPA #4 from 2009;
- Figure 14 – This shows the HVAS PM10 “annual average” monitoring results from 2012 to 2021. As seen in this figure, the annual average results are all below the criterion;
- Figure 15 – This shows the HVAS PM-10 “24 hour” monitoring results from 2012 to 2021. As seen in this figure, the annual average results are all below the criterion apart from the results obtained in 2012 and more recently during late 2018, late 2019 and into early 2020. For clarification regarding the prevailing weather conditions during this reporting period, please see also see below Figure 17 (taken from the biodiversity monitoring report) which demonstrates that the region surrounding Ardglan quarry was experiencing ‘non drought’ conditions for the first time since 2017;
- Figure 16 – This shows the HVAS TSP monitoring results from 2012 to 2021. As seen in this figure, the TSP results are all below the criterion apart from the results obtained during late 2018, late 2019 and into early 2020. For clarification regarding the prevailing weather conditions during this reporting period, please see also see below Figure 17 (taken from the biodiversity monitoring report) which demonstrates that the region surrounding Ardglan quarry was experiencing ‘non drought’ conditions for the first time since 2017;

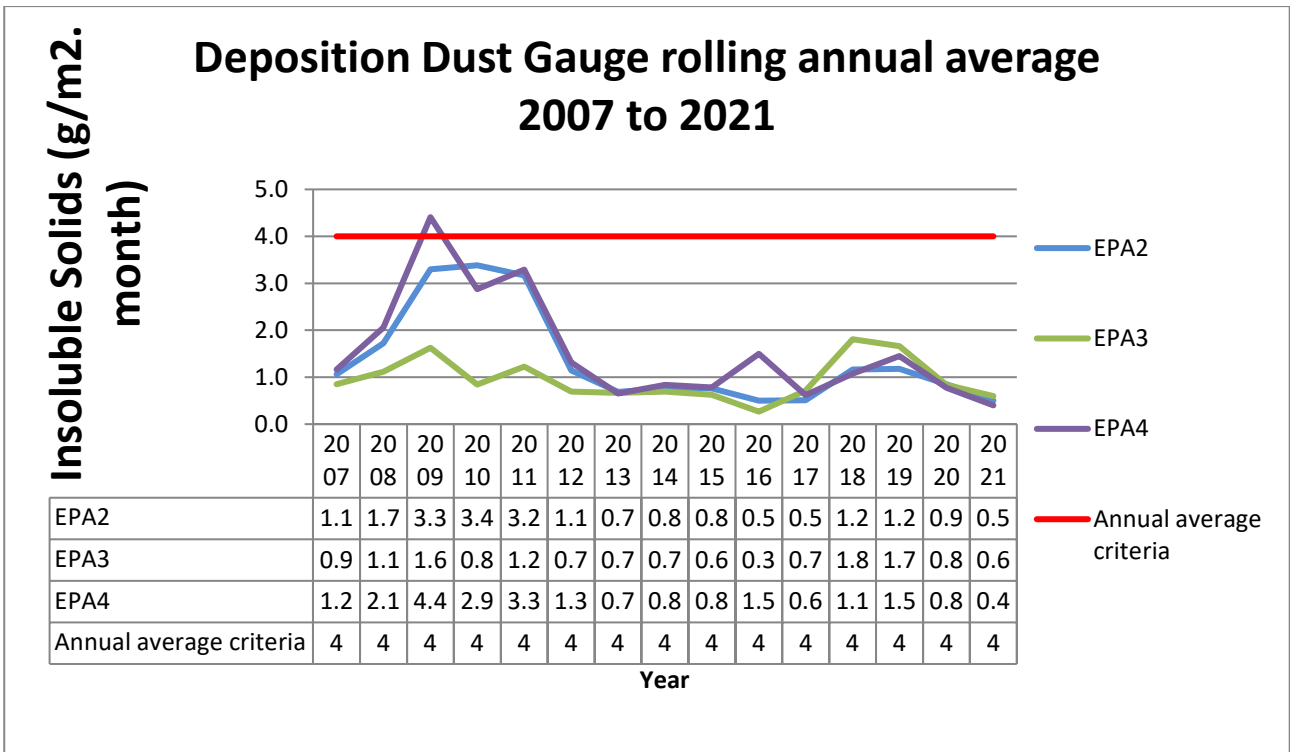


Figure 13: DDG rolling averages from 2007 to 2021

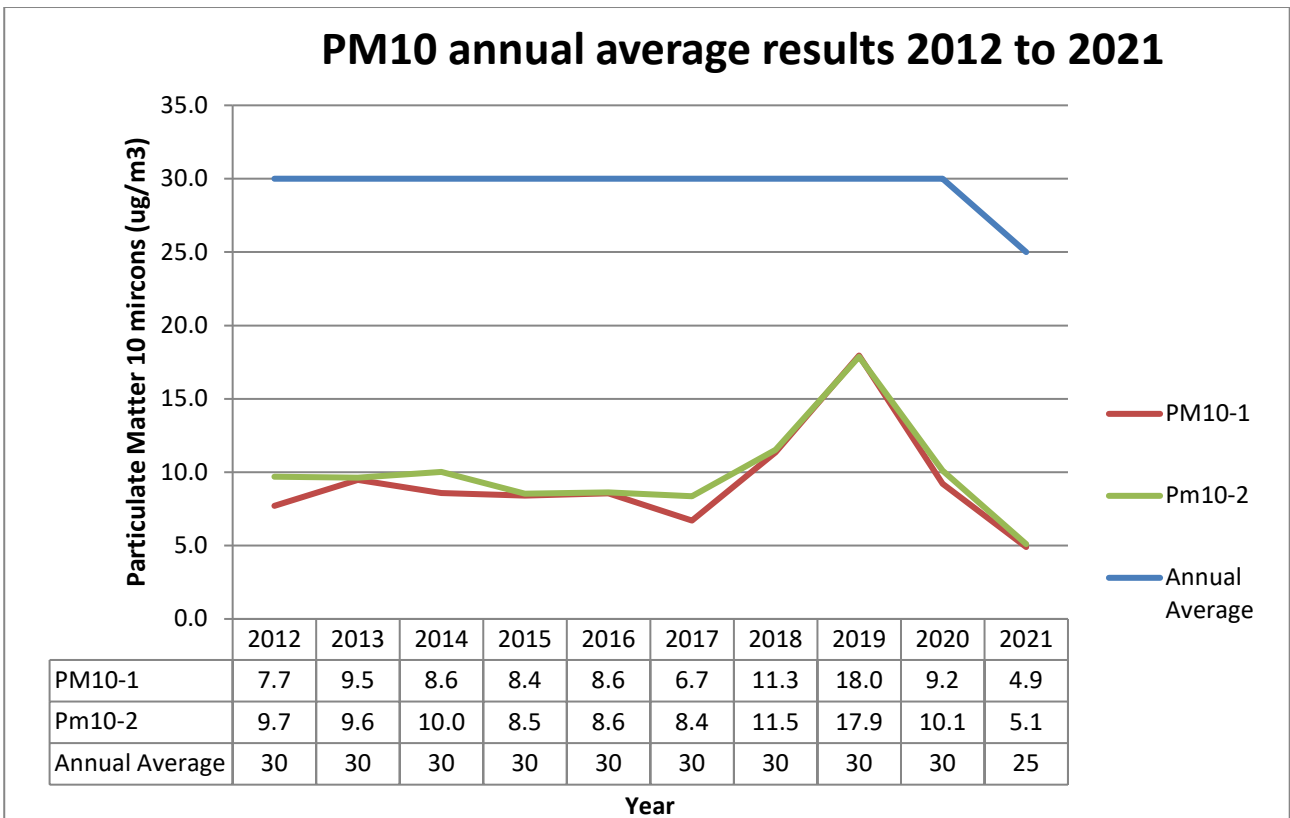


Figure 14: Annual average PM-10 results from 2012 to 2021

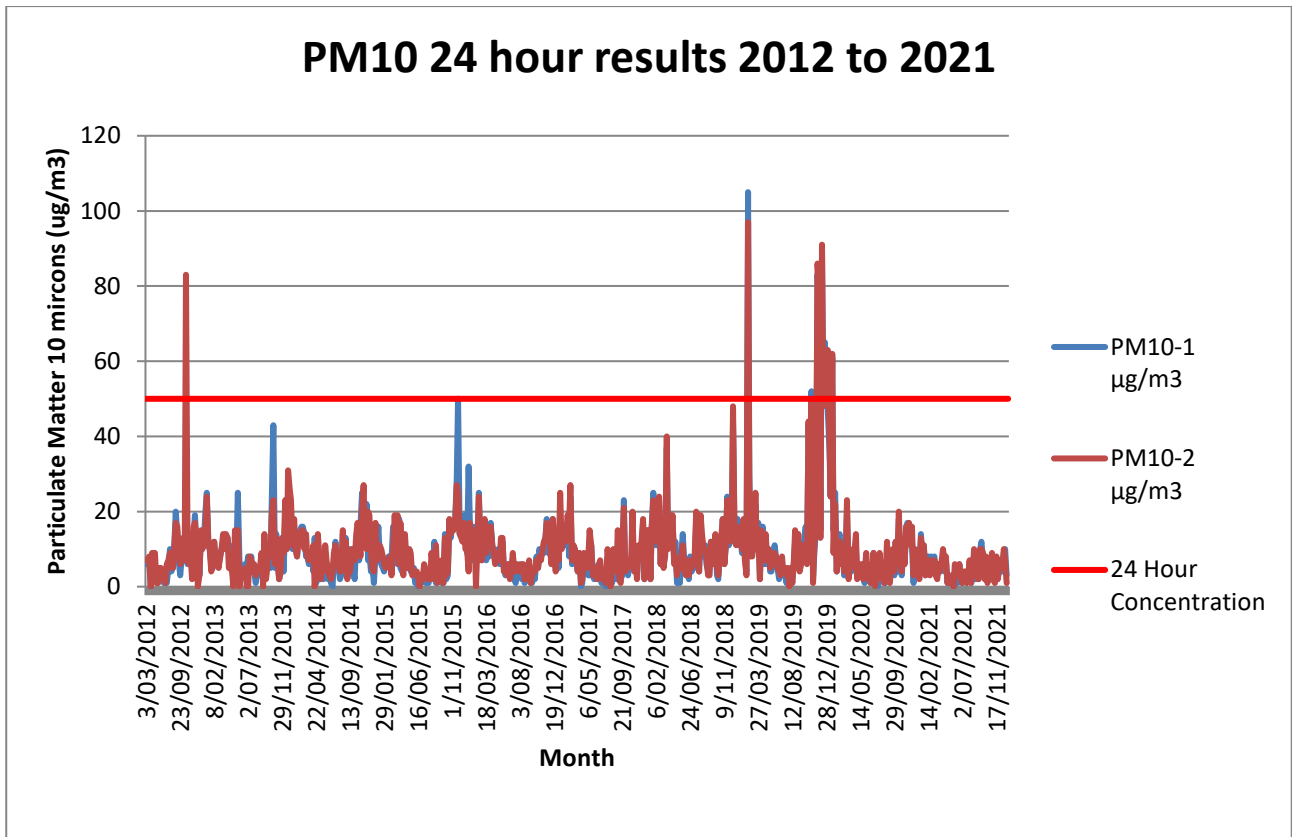


Figure 15: Twenty-four-hour concentration PM-10 results from 2012 to 2021

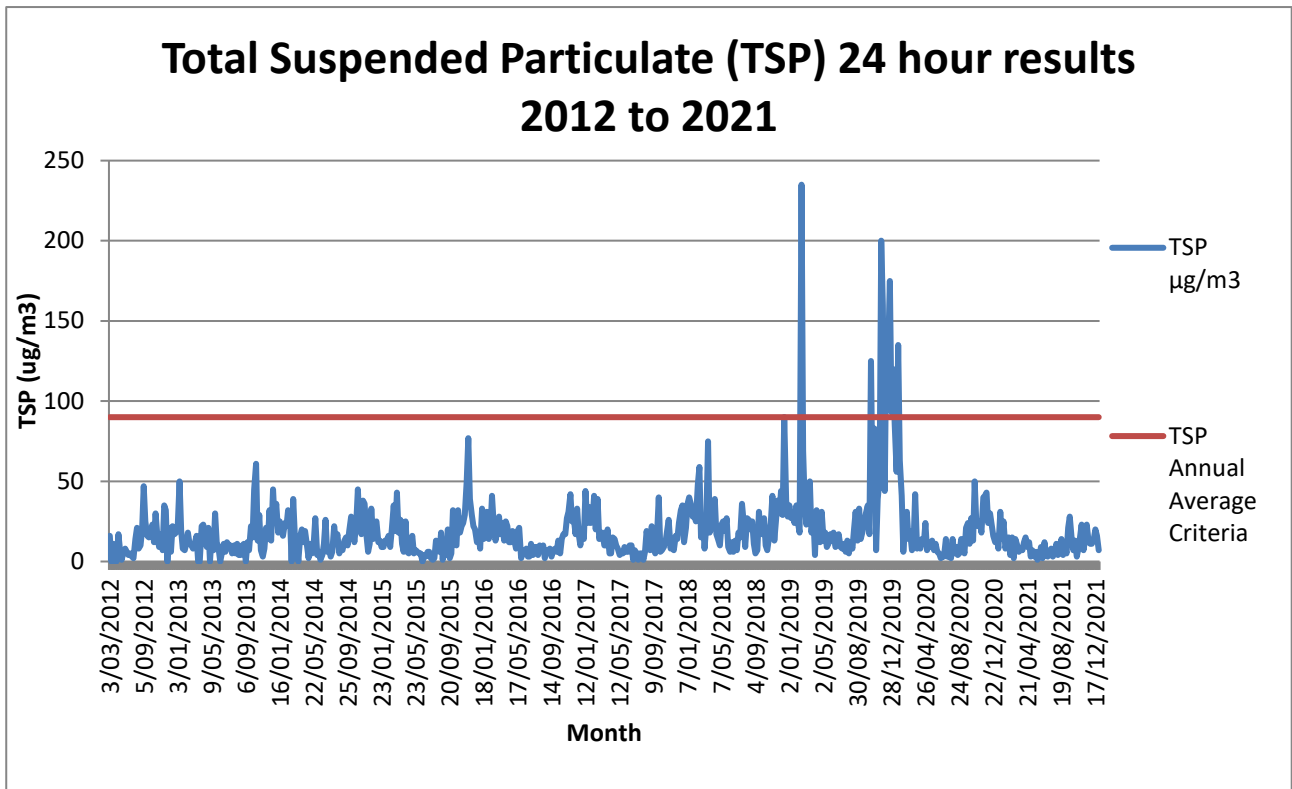


Figure 16: Annual average TSP results from 2012 to 2021

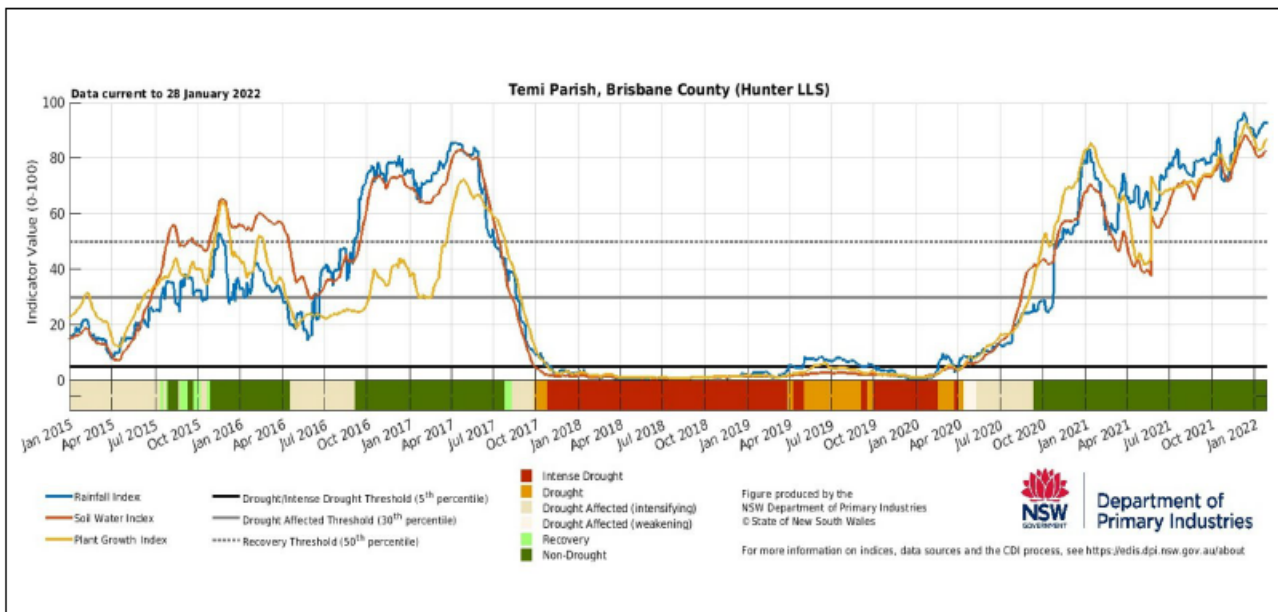


Figure 17: DPIE “Combined Drought Indicator” taken from Biodiversity monitoring report (Appendix 6)

5. COMPLIANCE ASSESSMENT

5.1 Environmental Protection Licence

Daracon hold Environmental protection Licence 1115 for a 'land based' extractive industry. The licence has an anniversary date of 1 January. The annual return covering the reporting period identified no non-compliances with the conditions of the licence and was submitted to the EPA in February 2022. The current version of the Ardglen Quarry Environment Protection Licence (EPL 1115) is available on site.

Daracon are currently progressing a variation to the EPL for the site to accommodate the requirements of Mod 2. This was progressing but incomplete at the time of this report.

5.2 Discrepancies With Predicted and Actual Quarry Operations

The previous AEMR included a list of various activities planned for the following reporting period. With regard to the actual activities undertaken on site during the reporting period, the discrepancies between those predicted and those undertaken are summarised below:

- The security of the offset areas associated with the quarry extension approval continues to take longer than expected, however we’re continuing to work closely with the Biodiversity Conservation Trust to enable the completion of a Conservation Agreement which will be resolved before entering the Extension Area in accordance with Mod 2;

5.3 Independent Audit

During 2018, Daracon engaged the services of an environmental auditor to undertake the Independent Environmental Audit (IEA) in accordance with the Project Approval MP 06_0624 MOD. A copy of the IEA report and Response to Audit Recommendations were appended to a previous AEMR including a summary of the various actions as well as the status of each. Please also refer to Table 3 for a summary of the non-compliances arising from the IEA including the current status of each.

Daracon are currently making arrangements for the next IEA to be completed during 2022. To date we’ve applied for and received approval for the audit team and at the time of this report, we’re currently making arrangements for the site visit to occur, with the formal report to follow in accordance with the Approval.

5.4 Summary of Incidents and Non-Compliances

Table 26 includes a summary of the incidents raised by Daracon during the reporting period. Please also refer to **Appendix 4** for a summary of complaints received and **Table 3** for a summary of the non-compliances arising from the IEA undertaken by Pitt and Sherry in 2018.

Table 26: Summary of incidents raised

Date occurred	Description	Outcome / action	Closed (Y / N)
N/A	NIL	NIL	

6. ACTIVITIES PROPOSED DURING THE NEXT REPORTING PERIOD

6.1 Introduction

The following section provides a brief summary of operational & non-operational activities planned throughout the 2022 reporting period. **Table 27** provides a summary of the proposed quarry activities.

Table 27: Proposed Activities for 2022

January - December 2022	<ul style="list-style-type: none"> • Ongoing review, update and submission of Management Plans; • Ongoing noise monitoring; • Regular Site Inspections; • Ongoing Air Quality Monitoring; • Undertake the next Independent Environmental Audit (IEA) in accordance with the Approval; • Addressing corrective actions identified in the Road Safety Audit (RSA) as necessary; • Attend to the revised conditions associated with Mod 2, with a view to recommencing quarrying activities (overburden removal, blasting and crushing) in due course; • Ongoing site rehabilitation work as required; • Progress the security of the BOA's with BCT; • Recommencement of quarrying activities, subject to the completion of the various tasks within the Approval that are required 'before entering the extension area';
-------------------------	---

6.2 Extraction Operations

Subject to the completion of the various tasks within the Approval that are required 'before entering the extension area', extraction operations may be undertaken during the next reporting period.

6.3 Processing

Subject to the completion of the various tasks within the Approval that are required 'before entering the extension area', processing may be undertaken during the next reporting period.

6.4 Overburden And Silt Management

Subject to the completion of the various tasks within the Approval that are required 'before entering the extension area', overburden removal may be undertaken during the next reporting period.

6.5 Waste Management

Subject to the completion of the various tasks within the Approval that are required 'before entering the extension area', additional waste management processes may be implemented during the next reporting period.

6.6 Site Infrastructure and Services

In accordance with the revised Approval and once a variation to the EPL is obtained, changes may occur to the site infrastructure and services during the next reporting period such as additional noise mitigation and water management structures. The reconnection of services to the site offices may also occur during the next reporting period.

6.7 Water Management

In accordance with the revised Approval and once a variation to the EPL is obtained, changes may be made to the current water management practices during the next reporting period.

Progression of the Groundwater study in accordance with the Approval.

6.8 Bushfire Management

Bush fire management practices will remain in place and monitored.

6.9 Hazardous Materials Management

There will be no importation or disposing of hazardous materials on site. Subject to the completion of the various tasks within the Approval that are required 'before entering the extension area', changes may be made to the management practices associated with hazardous materials during the next reporting period.

6.10 Product Transportation

Subject to the completion of the various access road and intersection improvements detailed in the Approval, we may increase truck movements in accordance with Mod 2 to export material contained within the existing stockpiles for local projects.

If this was to occur, we'd liaise with the CCC and various stakeholders prior to commencement.

6.11 Rehabilitation and landscape management

During the next reporting period it is likely that the following rehabilitation and landscape management activities will occur:

- Subject to the advice received from the BCT, Daracon may revise the Landscape Management Plan (LMP) again with assistance from Umwelt and submit to the DPE for review and approval;
- Inspection and maintenance of rehabilitation planting in areas identified in the LMP as required;
- Monitoring of BOA's will be conducted on a regular basis;
- Long term security of the off-set areas to be resolved;
- Implement the various management strategies as detailed in the consent and revised LMP prior to entering the extension area;

7. REFERENCES

1. ANZECC (2000) – Australian and New Zealand Guidelines Fresh and Marine Water Quality
2. DEC (2007) Approved Methods for Sampling of Air Pollutants in New South Wales
3. DECCW (2007) Methods for the Sampling and Analysis of Air Pollutants in New South Wales
4. EPA (2000) New South Wales Industrial Noise Policy
5. DPE (2015) Annual Review Guideline

8. APPENDICES

Appendix 1 Project Approval MP 06_0264 (Mod 2)

*Appendix 2 Noise monitoring reports*Included:

- February 2021 Noise Monitoring Report
- May 2021 Noise Monitoring Report
- August 2021 Noise Monitoring Report
- November 2021 Noise Monitoring Report

Appendix 3 2020 Community Consultative Committee Meeting Minutes

Appendix 4 2021 Community Complaints Register

<i>Date received</i>	<i>Complaint was received regarding?</i>	<i>Complaint was received from?</i>	<i>Buttai Gravel response</i>	<i>Buttai Gravel action following complaint</i>	<i>Closed out (Y/N)</i>
Nil	N/A				

Appendix 5 Rubicon (formerly TREES) Erosion & Sediment Control Inspection Report

Appendix 6 Rehabilitation and nesting inspection report - Ardglen Quarry

Appendix 7 Waste Register

No waste generated during the reporting period

Appendix 8 Road Safety Audit