



Teralba Quarry

2019 Annual Review

Project Approval PA10_0183



Prepared by:



R.W. CORKERY & CO. PTY. LIMITED

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Teralba Quarry

2019 Annual Review

Project Approval PA10_0183

Period: 1 January 2019 to 31 December 2019

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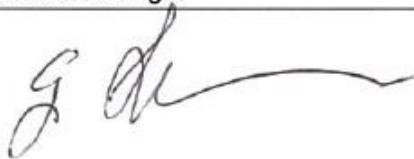
Ref No. 559/62

March 2020



R.W. CORKERY & CO. PTY. LIMITED

Table 1
Title Block

Name of operation	Teralba Quarry
Name of operator	Metromix Pty Ltd
Development consent / project approval #	PA10_0183
Name of holder of development consent / project approval	Metromix Pty Ltd
Mining Lease #	Not applicable
Name of holder of mining lease	Not applicable
Water licence #	Water Access Licence 40303
Name of holder of water licence	Metromix Pty Ltd
MOP/RMP start date	Not applicable
MOP/RMP end date	Not applicable
Annual Review start date	1 January 2019
Annual Review end date	31 December 2019
<p>I, Glenn Simpkin, certify that this audit report is a true and accurate record of the compliance status of the Teralba Quarry for the period 1 January 2019 to 31 December 2019 and that I am authorised to make this statement of behalf of Metromix Pty Ltd.</p> <p><i>Note.</i></p> <p>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.</p> <p>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); Section 307A, 307B and 307C (false or misleading application/information/documents – maximum penalty 2 years imprisonment or \$22,000, or both).</p>	
Name of authorised reporting officer	Mr Glenn Simpkin
Title of authorised reporting officer	General Manager
Signature of authorised reporting officer	
Date	27/3/20

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COMMONLY USED ACRONYMS

AHD	Australian Height Datum
ANZECC	Australia and New Zealand Environment and Conservation Council
DPE	Department of Planning and Environment (formerly DP&I)
DP&I	Department of Planning and Infrastructure
DRE	Division of Resources and Energy (within the Department of Industry)
DRG	Division of Resources and Geoscience (within DPE)
EA	Environmental Assessment
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environment Protection Authority
EPL	Environment Protection Licence
LMCC	Lake Macquarie City Council
PA	Project Approval
POEO Act	Protection of the Environment Operations Act 1997
RWC	R.W. Corkery and Co. Pty Limited

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1. STATEMENT OF COMPLIANCE

Table 2
Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	Yes / No
Project Approval PA 10_0183	No
EPL 536	No

Table 3
Non-compliances

Relevant Approval	Condition #	Condition Description (summary)	Compliance Status	Comment	Where Addressed in Annual Review
PA 10_0183	2(2)	Compliance	Administrative non-compliance	Based on the number of non-compliant items the Project is non-compliant to the requirement of Condition 2(a) of Schedule 2.	12
PA 10_0183 EPL 536	3(19) M2.2	Deposited Dust Monitoring	Low Risk non-compliance	Dust deposition monitoring result was not available for site EPL04 in January 2019.	6.4
PA 10_0183	3(61)	Rehabilitation Bond	Administrative non-compliance	The revised rehabilitation bond had not been lodged within six months of approval of the Biodiversity and Rehabilitation Management Plan.	12
PA 10_0183	5(5)	Management Plans	Administrative non-compliance	All management plans had not been submitted to the Secretary within 3 months of modification of the conditions of approval.	12
EPL 536	M5.2	Complaints Register	Administrative non-compliance	The complaints register did not include the information as required by EPL 0536 M5.2. There were no complaints during the reporting period.	9.3
EPL 536	R4.2	Noise Monitoring Reports	Administrative non-compliance	Noise assessment reports were not submitted to the EPA within 30 days of the completion of the bi-annual noise monitoring.	6.2

Compliance Status Key

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).

2. INTRODUCTION

2.1 SCOPE AND FORMAT

This Annual Review has been prepared by R.W. Corkery & Co. Pty Limited (RWC) on behalf of Metromix Pty Ltd (Metromix) and in accordance with *Condition 5(4)* of Project Approval PA10_0183 (PA10_0183). The Annual Review records the activities and environmental monitoring undertaken within and surrounding the Teralba Quarry (“the Quarry”) during the period 1 January 2019 to 31 December 2019 (the “reporting period”). This document also outlines the activities and environmental monitoring planned to be undertaken by Metromix within and surrounding the Quarry in 2020. This *Annual Review* has been prepared based upon the approval and licencing requirements applicable for the reporting period, however, the report generally follows the format and content requirements identified in the *Annual Review Guideline* dated October 2015.

The Quarry is situated upon Lots 1 and 2 DP 224037 and was initially established in 1964, with the operation purchased by Metromix in 1986. The Teralba Quarry Extension Project was approved in February 2013 under PA10_0183. A modification (MOD 1) to PA 10_0183 was approved on 16 April 2018. **Figure 1** displays the location of the Quarry in the local context and **Figure 2** displays the layout of the Quarry.

The approved Quarry activities comprise the following.

- Conglomerate extraction (blasting and excavation).
- Processing operations (size reduction, screening and blending).
- On-site load and haul operations involving off-road trucks on the internal road network conveying primary-crushed rock to the processing plant.
- Off-site transportation of products.
- Vehicle/equipment maintenance and ancillary activities and stores.
- Administration and product despatch.
- Progressive rehabilitation and maintenance.

2.2 KEY PERSONNEL CONTACT DETAILS

During the reporting period, the management of the Teralba Quarry, to ensure all conditional requirements were satisfied, was the responsibility of the Quarry Manager Mr Mo Yunusa.

The Quarry Manager, or his delegate, is responsible for day to day operations, data collection, deposited dust and water sample collection, daily checks and compilation of quarry-related documentation and monitoring data.

Personnel from Carbon Based Environmental Pty Ltd assist with management of the on-site meteorological station, air quality analyses and calibration of air quality monitoring equipment.

The key personnel contact names, position and phone numbers are as follows.

Name	Position	24 Hour Contact
Glenn Simpkin	General Manager	0429 791 430
Mo Yunusa	Quarry Supervisor	0423 832 077



Y:\Jobs 531 to 1000\559\Post April 2004\Reports\55958 Annual Review 2018\CAD\559Base\GA56.dwg_1.2 Approved Quarry Layout-02.03.2020-2:15 PM

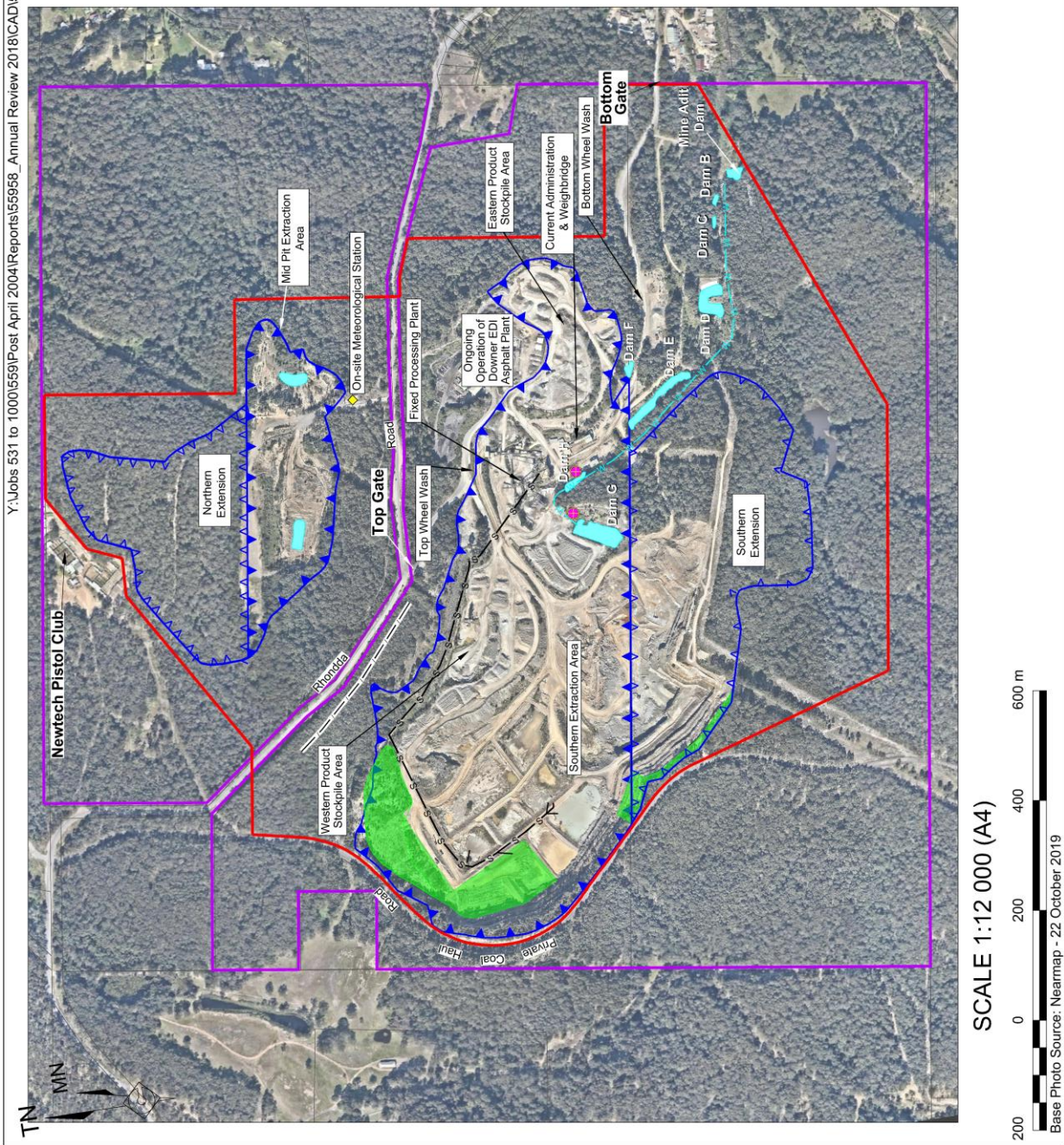


Figure 2
QUARRY SITE LAYOUT



3. APPROVALS

The operator of the Teralba Quarry, Metromix Pty Ltd (Metromix) is required to operate the approved activities within the Quarry Site in accordance with PA10_0183 and licences listed in **Table 4**.

Table 4
Teralba Quarry – Approvals and Licences

Approval/Licence	Original Issue Date	Current Version Issue Date	Expiry Date	Scheduled Activities
Project Approval PA10_0183	22 February 2013	16 April 2018 (Modification 1)	31 December 2038	Extracting, processing product despatch and ancillary activities
Environment Protection Licence No 536	25 September 2000	5 April 2018	01 June*	Crushing, grinding or separating; Extractive activities
Environment Protection Licence No 13015	17 July 2015	18 March 2019	17 July*	Resource recovery; Waste storage
Water Access Licence No. 40303	12 October 2012 (as Bore Licence 20BL173206)	1 July 2016	No Expiry	Recovery and use of water from Dam A
* Licence Anniversary Date				

Condition 5(4) requires the preparation of an Annual Review that contains the following.

- A description of the activities (including preparatory activities, extraction, processing and rehabilitation) that were carried out during the reporting period (see Section 4), and the activities that are proposed to be carried out during the next reporting period (see Section 13).
- A comprehensive review of the environmental monitoring results and complaints recorded during the reporting period (see Section 6, 7, 8, 9 and 10), including a comparison of these results against:
 - the relevant statutory requirements, limits or performance measures/criteria;
 - the monitoring results of previous years;
 - the identification of any trends in the monitoring data; and
 - the relevant predictions in the EA documents for the extension application and Modification 1.
- An assessment of compliance during the reporting period with the conditional requirements of PA10_0183, and a description of what actions were (or are) being taken to ensure compliance, where necessary (see Section 12).
- Identification of any trends in the monitoring data over the life of the Quarry (see Section 6).

- A list of discrepancies between the predicted and actual impacts of the Quarry's operations, and an analysis of the potential cause of any significant discrepancies (see Section 6 and Section 7).
- A description of the measures that will be implemented throughout 2020 to improve the environmental performance of the Quarry (see Section 13).

Relevant conditions within PA 10_0183 which nominate specific environmental criteria are as follows, with **Appendix 1** providing the complete records of all monitoring results.

- *Condition 3(5):* noise emissions (day shoulder, day, evening and night).

Each of the relevant noise criteria and frequencies are presented in Section 6.2.

- *Condition 3(9):* blasting overpressure and ground vibration emissions.

Each of the relevant blasting criteria are presented in Section 6.3 in conjunction with the assembled monitoring results.

- *Condition 3(17):* air quality emissions (deposited dust and particulate matter).

Each of the relevant air quality criteria are presented in Section 6.4 in conjunction with the assembled monitoring results.

- *Condition 3(23):* all surface water discharges from the site comply with the discharge limits in any EPL which regulates water discharges from the site.

Each of the relevant water criteria are presented in Section 7.2 in conjunction with the assembled monitoring results.

In addition to the specific environmental criteria, the following conditions within PA10_0183 specifically request further information be included in each Annual Review.

- *Condition 2(20b): Production Data – the Proponent shall include a copy of this data in the Annual Review* (see Section 4.2 and **Appendix 1**).
- *Condition 5(11a): Access to Information – the Proponent shall make copies of the annual review available on its website (over the last five years).*
- *PA10_0183 Appendix 3 – Action 6.6 – Ensure all groundwater monitoring data is incorporated into each Annual Review for the Teralba Quarry* (see Section 7).
- *PA10_0183 Appendix 3 – Action 12.5 – Include annual photographs of the progressive rehabilitation of quarry benches in each Annual Review. (see Section 4).*

In addition, *Condition 3(21)* of PA10_0183 requires Metromix to ensure a suitable meteorological station is operational in the vicinity of the Quarry, complying with the requirements outlined in *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (DECCW, 2007) and is capable of continuous real-time measurements in accordance with the *NSW Industrial Noise Policy* (EPA, 2000), or as otherwise approved by EPA. Metromix operates a comprehensive meteorological station in an elevated area adjacent to the Mid Pit Extraction Area. A summary of meteorological monitoring is provided in in Section 6.1.

The Quarry operates in accordance with the following management plans and strategies.

- Environmental Management Strategy.
- Biodiversity and Rehabilitation Management Plan
- Aboriginal Heritage Management Plan
- Air Quality Management Plan
- Blast Management Plan
- Lower Level Management Plan
- Noise Management Plan
- Waste Management Plan
- Water Management Plan
- Transport Management Plan

Each of these plans has been reviewed and approved by the Department of Industry, Planning and Environment (DPIE).

4. OPERATIONS SUMMARY

4.1 INTRODUCTION

Operational areas within the Teralba Quarry are referred to in the same manner as described in the 2011 *Environmental Assessment* (RWC, 2011) i.e. Northern Extension, Mid Pit Extraction Area, Southern Extraction Area and Southern Extension.

Figure 3 presents the location(s) of the activities described, including activities shown within **Plates 1 to 9**.

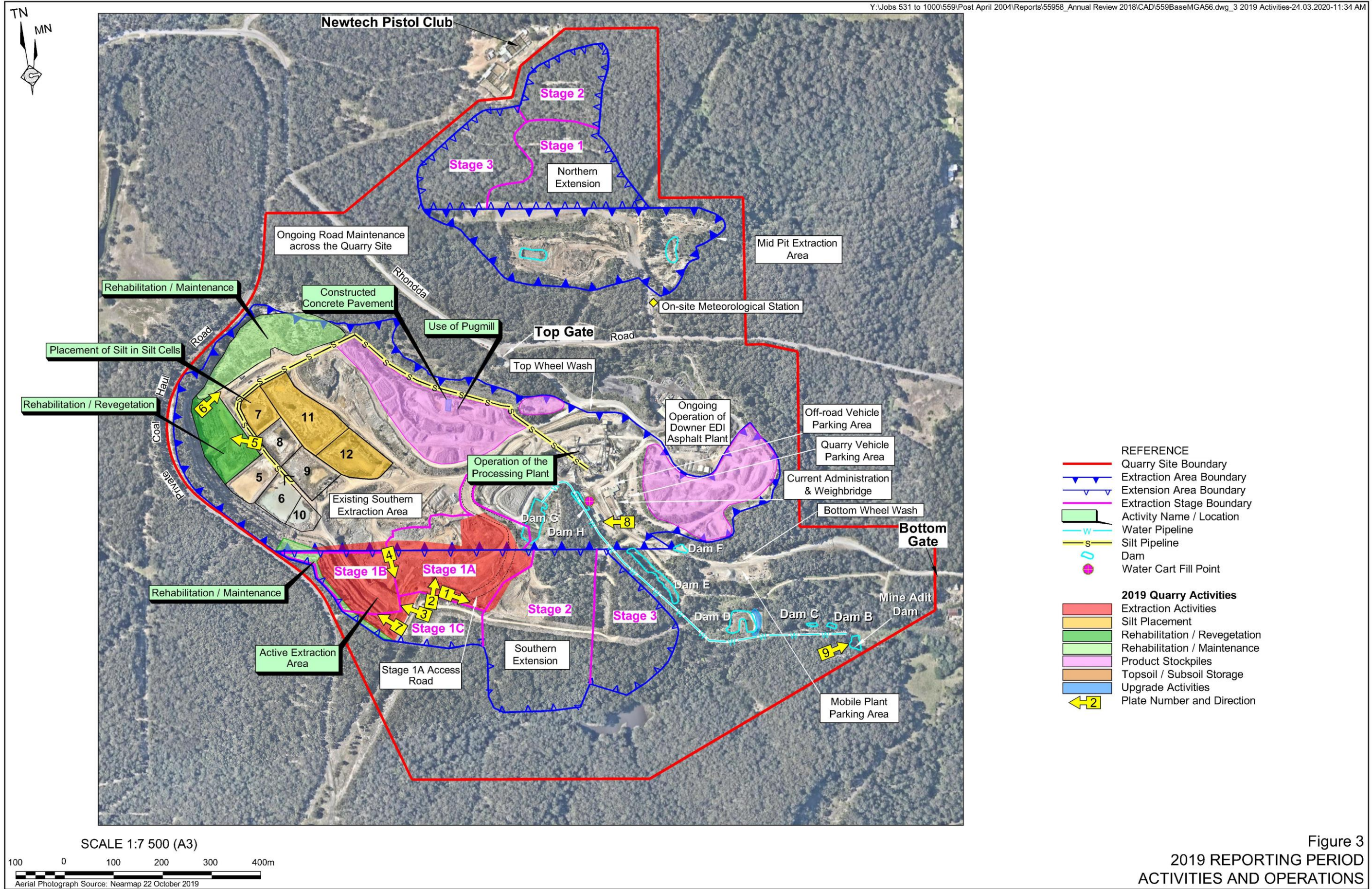
4.2 EXTRACTION OPERATIONS

Extraction operations continued within Stages 1A and Stage 1B of the Southern Extension in 2019, as displayed on **Figure 3**. A total of 17 blasts were initiated in 2019. **Plate 1** displays a view of the active extraction faces within the Southern Extension. Vegetation with a section of Stage 2 was cleared during the reporting period and the land prepared for extraction. Extraction in Stage 2 did not commence during the reporting period.

It is estimated that approximately 511 204t of material was extracted during the reporting period. Total product sales (products despatched from the Quarry) during the reporting period was 479 439t. This is higher than total sales in 2018 (471 8940t) and within the approved limit of 1 million tonnes per annum. **Table 5** records the monthly/annual sales of the various products produced at the Quarry during 2019. This data is drawn from Quarry records and is provided to the Division of Resources & Geoscience (DRG) of the Department of Planning, Industry and Environment in accordance with the requirements of Condition 2(20) of PA10_0183. A copy of the annual return for extractive materials to DRG for 2018/2019 is included within **Appendix 1**. It is anticipated that total sales in the next reporting period would be consistent with the current reporting period.

Table 5
Teralba Quarry Sales – 2019

2019 (Month)	Washed Products (t)	Road Pavement (t)	Other (t)	Total (t)
January	18312	6512	94	24918
February	27129	7810	374	35313
March	37043	6366	196	43605
April	34984	9990	296	45271
May	45635	13905	801	60341
June	26674	13790	182	40646
July	36714	9632	154	46500
August	34714	6205	18	40937
September	26845	7544	0	34388
October	31147	8219	39	39404
November	33454	7706	516	41677
December	22131	4262	48	26440
Total	374 781	101 941	2 714	479 439
Source: Metromix				



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Plate 1
View to the east of active
extraction (Stage 2)
(E559AJ_026)

Plate 2
A view to the northwest
towards the Pugmill and
pugmill stockpile area
(E559AJ_015)



Plate 3
A view to the northwest
across all silt cells
(E559AJ_016)



Plate 4
View to the south of
Stage 1B safety barrier
(E559AJ_045)

Plate 5
Rehabilitation progress
on former Silt Cell 4
(E559AJ_036)



Plate 6
Rehabilitation of former
Silt Cells 1 and 2
(E559AJ_038)



Plate 7
A view along the upper
extraction bench in
Stage 1B.
(E559AJ_013)

Plate 8
A view of the vehicle
refuelling area
(E559AJ_047)



**Plate 9 View of the Mine
Adit Dam and pump
infrastructure**
(E559AH_005)

4.3 PROCESSING OPERATIONS

Processing operations occurred throughout the reporting period, producing washed products and road pavement products. Fill materials were not processed through the processing plant.

The only change during the reporting period was that the processing plant operated in the “wet” mode for approximately 78% of sales, compared to approximately 74% in 2018. The remaining 22% of the total products comprised of road pavement products (21%) and fill materials (1%) respectively.

4.4 RECYCLING OPERATIONS

Of the recycled concrete that had been previously crushed and stockpiled, approximately 27 335t of crushed concrete were despatched/sold during 2019.

A total of 8 098t of concrete washout were imported to the pugmill area (the application area for EPL 13015) during the reporting period and 6068t of concrete washout was processed into recycled concrete roadbase product. These levels remain consistent with approved operations.

4.5 OVERBURDEN AND SILT MANAGEMENT

In 2019, approximately 745 346t of overburden was removed within the existing Southern Extraction Area and Southern Extension, all of which was used for either capping Silt Cell 4 and 5 or for landform construction.

All silt produced from the processing plant was pumped to Silt Cells 4, 5 and 6.

4.6 WASTE MANAGEMENT

Silt produced as a result of processing within the processing plant is placed in the silt cells within the Southern Extraction Area as part of the Quarry final landform construction program and is consequently not classified as production waste. No other wastes produced at the Quarry are classified as production wastes.

The following non-production wastes (and quantities) were produced at the Quarry during the reporting period.

- general waste (8 x 20m³ bin)
- waste oil (980L)
- co-mingled recyclables (2 x 240L bins per fortnight)
- paper and cardboard (17 x 3m³ bins)
- batteries (minor)

All waste produced at the Quarry was removed by licenced contractors. All general waste (putrescible) was disposed of at the Awaba Waste Facility, the closest licenced facility, with the remaining industrial waste (not defined as general (putrescible)), was removed and disposed of by contractors at appropriately licenced facilities.

4.7 SITE INFRASTRUCTURE AND SERVICES

During the reporting period, a self-bunded portable oil storage container was used on site to temporarily store oil that was delivered to the Quarry. Oil is stored in this container until needed.

4.8 BUSH FIRE MANAGEMENT

In 2018, the *Bush Fire Management Plan* was discussed with and reviewed by the Deputy Captain of the local Teralba Fire Service and a 20m Asset Protection Zone (APZ) was established around the fuel and oil storage areas.

During the reporting period there was no change to the Bushfire Management Plan.

4.9 HAZARDOUS MATERIAL MANAGEMENT

Hazardous materials within the Quarry Site are appropriately managed with diesel fuel stored in above ground tanks with roofing and appropriate bunding (110% of the total diesel tank capacity) (see **Plate 8**).

Aerosols and paints continued to be stored within the designated hazardous material cabinets within the workshop area.

Hazardous waste materials such as batteries, oily rags and oil filters were stored as outlined within Metromix's waste management procedure and removed by a licenced contractor and disposed of at an appropriately licenced facility.

4.10 PRODUCT TRANSPORTATION

The transportation of products from the Quarry is limited under *Condition 2(8)* and *2(9)* of PA10_0183 to include the following transportation limits.

Condition 2(8) - The Proponent must not:

- a) *transport more than 1 million tonnes of quarry products from the site in any calendar year; or*
- b) *dispatch more than 326 laden trucks from the site on any day; or*
- c) *dispatch more than 241 laden trucks per day or 20 per hour westwards along Rhondda Road;*
- d) *dispatch more than 85 laden trucks per day or 8 per hour eastwards through Teralba;*
- e) *dispatch laden trucks for travel through Teralba between 6 pm and 6 am; and*
- f) *receive unladen trucks via the railway street entrance between 6 pm and 7 am.*

Condition 2(9) - The Proponent must limit the total hourly truck dispatch rates from the site to the levels shown in Table 1.



Table 1 – Truck Dispatch Hours

Dispatch Period	Maximum Hourly Dispatch Rate
6:00 am – 7:00 am	Up to 28 loaded trucks
7:00 am – 6:00 pm	Up to 20 loaded trucks
6:00 pm – 5:00 am	Up to 6 loaded trucks
5:00 am – 6:00 am	Up to 12 loaded trucks

The approved transport corridors are displayed on **Figure 4** and summarised below.

Route 1 – Northwestern Corridor:

Westwards along Rhondda Rd, and then northwards along Wakefield Rd and Northville Rd to George Booth Drive.

Route 2 – Southwestern Corridor:

Westwards along Rhondda Rd, and then southwards along Wakefield Rd to the M1 Freeway.

Route 3 – Northeastern Corridor:

Northeast along Railway St Teralba, crossing the railway line, then southwards along York St Teralba, then north-easterly along Five Islands Road to either The Esplanade (to the east) or Lake Road (to the north).

Route 4 – Southeastern Corridor:

Northeast along Railway St Teralba, crossing the railway line, then southwards along York St Teralba and Toronto Road.

The monitoring records of truck movements between January 2019 and December 2019 are collated in **Appendix 1. Table 6** provides a summary of transportation and limit compliance during the reporting period. The maximum daily average for each conditional requirement is well below the approved limits in *Conditions 2(8)* and *2(9)*. There were no identified non-compliance issues with the Teralba Quarry Driver's Code of Conduct during the reporting period.

4.11 VENM/ENM IMPORTATION MANAGEMENT

No Virgin Excavated Natural Material (VENM) was imported to the Quarry Site for fill purposes during the reporting period.

4.12 SUBSIDENCE

On 27 August 2019, Quarry personnel arrived at the Quarry and identified a small crevice had opened as a result of a recent blast exposing the underground workings at the base of Bench 5 in the vicinity of Stage 1B. All operations in this location ceased immediately and an 10m exclusion zone was cordoned off to restrict access. Following consultation with the Resources Regulator a large mound of overburden material was placed adjacent to the opening and a protective barrier established (see **Plate 4**). It is proposed that operations in this location would not recommence until a strategy for safe operation is developed in consultation with the Resources Regulator.

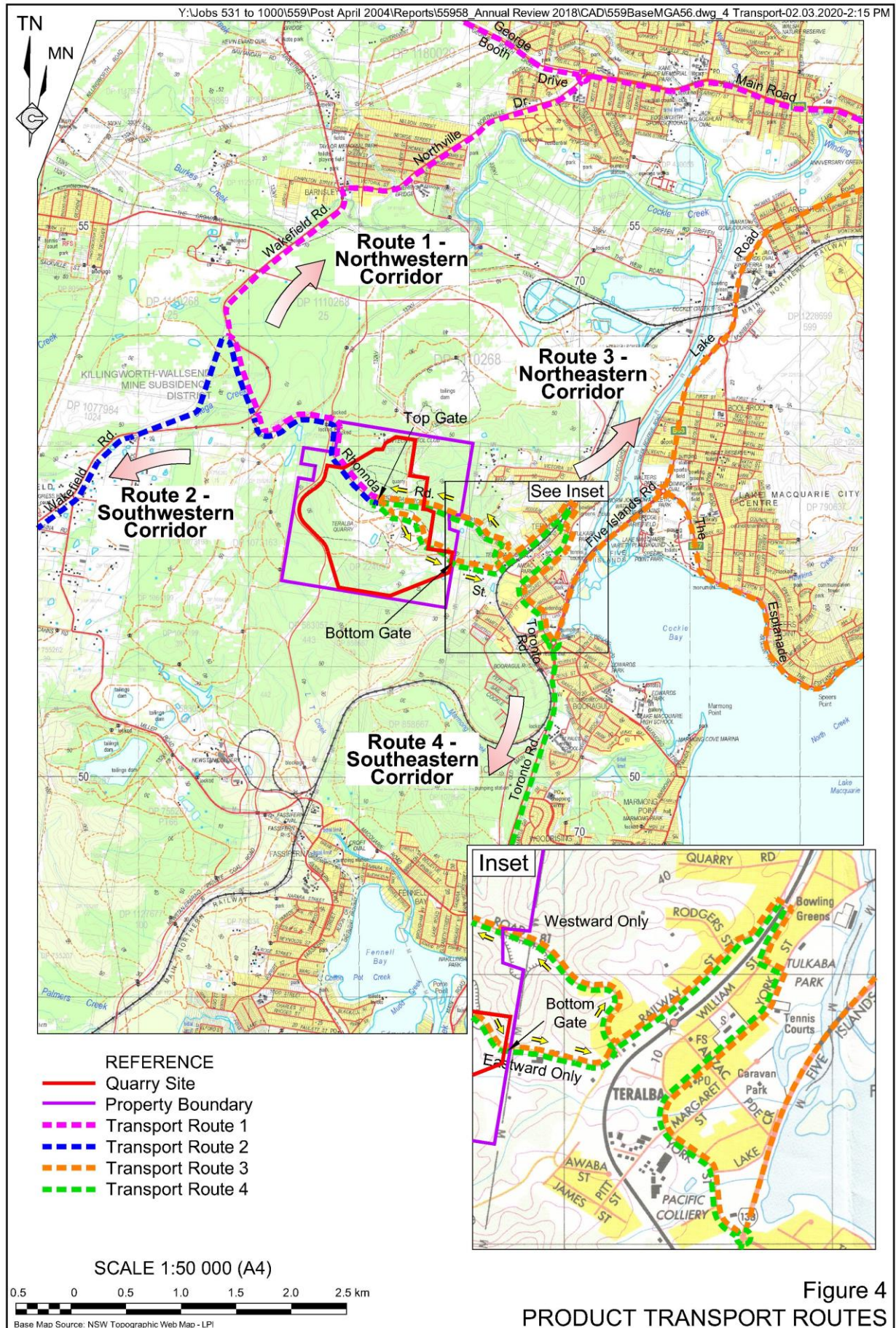


Table 6
Summary of Transportation Limit Compliance – 2019

Condition Description			Maximum Record for 2019											
Time Period	Condition	Approved Limits	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Annual	Annual Product Despatch	1 million tonnes												
Daily	Total trucks per day	326 trucks/day												
Daily	Westwards trucks per day	241 trucks/day												
Daily	Eastwards trucks per day	85 trucks/day												
6:00am to 7:00am	Cumulative Max Hourly	28 trucks/hour												
7:00am to 6:00pm	Cumulative Max Hourly	20 trucks/hour												
6:00am to 7:00am	Westwards Max Hourly	28 trucks/hour												
7:00am to 6:00pm	Westwards Max Hourly	20 trucks/hour												
6:00am to 6:00pm*	Eastwards Max Hourly	8 trucks/hour												
6:00pm to 5:00am	Westwards Max Hourly	6 trucks/hour												
5:00am to 6:00am	Westwards Max Hourly	12 trucks/hour												
	Compliance with approved limits													
	Exceedance of approved limits													
* Transport eastwards is not permitted between the hours of 6:00pm and 6:00am														
Source: Metromix														

4.13 NON-METROMIX OPERATIONS

The two non-Quarry-related commercial operations located within the Quarry Site boundary, namely the Newtech Pistol Club and the Downer EDI asphalt plant, continued to operate independently of all quarry-related operations. A pugmill previously operated by Civilake is now the responsibility of Metromix. A view of the pugmill and pugmill stockpile area is displayed on **Plate 2**.

In line with the commercial agreements with Metromix to operate within the Quarry Site, regular meetings, particularly with Downer EDI, were held to discuss the ongoing operation of the Quarry and to limit interactions between the two operations. During the reporting period, a number of informal meetings were held between Metromix and Downer EDI with no follow-up actions arising from these meetings. The Downer EDI asphalt plant was upgraded to improve the facilities available in this location. This upgrade was completed in the first half of 2019.

Metromix maintains an open-door policy with the Newtech Pistol Club with no formal discussions taking place during the reporting period.

No coal was hauled on the Coal Haul Road to Eraring during 2019.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Correspondence from the Department of Planning, Industry and Environment regarding the 2018 Annual Review was provided in May 2019. The correspondence requested graphs to demonstrate trends in monitoring data of the life of the Quarry. Long term trend analysis using graphs has been presented for deposited dust and particulate matter monitoring. Noise and water monitoring does not provide consistent results that benefit from long term analysis (noise is mostly inaudible and water monitoring occurs only during discharge).

6. ENVIRONMENTAL PERFORMANCE

6.1 METEOROLOGICAL MONITORING

Condition 3(21) requires that a meteorological station operate in the vicinity of the Quarry Site for the life of the Project. Metromix has installed a meteorological station (location shown on **Figure 3**), ensuring that the meteorological station complies with the requirements in the *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales* guideline.

The requirement for the meteorological station to measure the continuous real-time measurement of temperature lapse rate is not warranted given the Quarry's close proximity to the coast and Lake Macquarie.

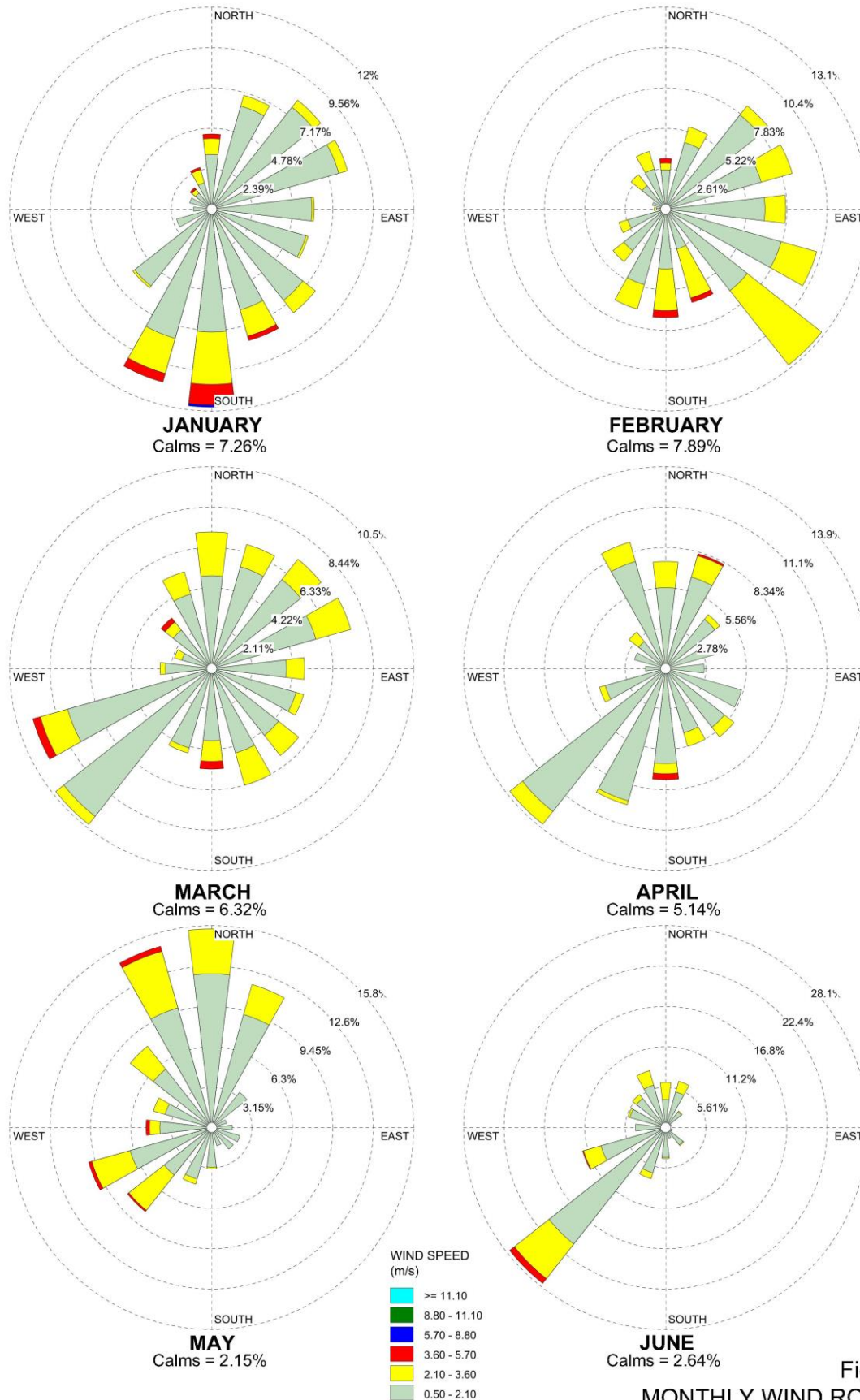
The meteorological station currently monitors the following parameters.

- Temperature (at 2m and 10m above ground level)
- Wind Speed and Direction
- Rainfall
- Humidity
- Solar Radiation
- Barometric Pressure
- Fire Danger Index
- Sigma Theta

Figures 5 and **6** provide monthly wind speed and direction data recorded at the Quarry during the reporting period. The wind rose data indicates that during cooler months (May to September) winds were generally from the west, southwest and northwest with warmer months featuring winds from the east (December to February) through spring and autumn winds had less defined prevailing wind patterns, with wind coming from all directions.

Table 7 presents a summary of the continuous monitoring recorded during the reporting period for meteorological parameters that are required to be monitored under EPL 536.

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Source: Teralba AWS, 2020

Figure 5
MONTHLY WIND ROSES -
JANUARY TO JUNE 2019



Figure 6
MONTHLY WIND ROSES -
JULY TO DECEMBER 2019

Table 7
Meteorological Data Summary – 2019

Monitored Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total Rainfall (mm)	39.2	65.4	203.8	36.6	17.0	134.8	30.4	180.6	86.6	24.8	25.4	0.2	844.8
Average Minimum Temperature (°C) at 2m	20.1	20.4	16.2	16.2	11.3	8.94	10.7	9.21	12.1	13.1	16.3	19.5	-
Average Maximum Temperature (°C) at 2m	30.7	29.4	26.4	26.8	20.4	19.6	17.0	17.3	20.9	28.3	26.5	31.8	-
Average Minimum Temperature (°C) at 10m	19.7	20.2	16.4	16.5	11.6	9.4	11.0	9.36	12.2	13.2	16.0	19.3	-
Average Maximum Temperature (°C) at 10m	30.3	29.4	26.3	26.9	20.5	19.9	17.5	17.6	21.0	28.1	26.2	31.2	-
Average Sigma Theta	34.2	32.9	32.7	29.6	28.9	28.3	31.9	31.7	30.3	30.7	31.7	32.5	-
Average Solar Radiation (W/m ²)	35.7	32.4	16.4	8.0	3.9	3.8	3.7	41.7	180.9	233.9	259.4	235.7	-
Average Relative Humidity (%)	72.3	66.3	71.5	71.5	61.8	72.3	60.0	56.1	62.4	59.9	55.6	59.7	-
Average Maximum Barometric (hPa)	1010	1017	996	1019	1000	1025	1025	1021	1020	1021	1008	1011	-
Average Minimum Barometric (hPa)	998	991	1015	1004	1020	1004	1004	994	996	997	994	988	-

6.2 NOISE

6.2.1 Introduction

The *Noise Management Plan*, prepared in accordance with *Condition 3(8)* of PA10_0183 and approved on 16 January 2014, details the locations and frequency of noise monitoring that is required to be undertaken within and surrounding the Quarry. In addition, PA 10_0183 – Appendix 3 (Statement of Commitments) details Metromix's commitment to undertake noise monitoring within three months of operations beginning in the Southern and Northern Extensions. Noise monitoring surveys were undertaken in August 2019 and November 2019 by Spectrum Acoustics (Spectrum, 2019a and 2019b) and have been included in **Appendix 1**.

Table 8 lists the address and coordinates of each noise monitoring location and **Figure 7** displays the noise monitoring locations relative to local land holdings.

Table 8
Noise Monitoring Locations

Noise Monitoring Locations*	Address	Easting	Northing
EPL-A	Awaba Street, Teralba	369080	3651470
EPL-B	Rhondda Road, Teralba	369250	6351915
EPL-C ¹	Rhondda Road, Teralba	369205	6352015
EPL-D	Rhondda Road, Teralba	369150	6352135
EPL-E	Victoria Avenue, Teralba	369060	6352620
EPL-F ¹	Victoria Avenue, Teralba	369130	6352945
EPL-H	School Road, Wakefield	366210	6352520
* See Figure 7 .			
¹ Metromix has obtained permission for this monitoring location to be omitted as other monitoring locations are nearby and closer to quarry related noise			

Independent monitoring at the nominated locations was required to be undertaken twice annually during the first 2 years of operations and then revert to annual monitoring after this time. The Noise Management Plan includes annual monitoring only. However, it is noted that EPL 536 still requires bi-annual monitoring. Monitoring will be undertaken in August and September of 2020 until the outcomes of an EPL variation have been resolved.

One additional tipper truck and dog was added to the fleet of equipment based at the quarry for product transport. As all equipment is not used at the same time, noise sources remain consistent with the assessment for the Teralba Quarry Extension Project.

6.2.2 Noise Criteria

Table 9 presents the noise criteria for the Quarry during the specific time periods as nominated in *Condition 3(5)* of PA10_0183.

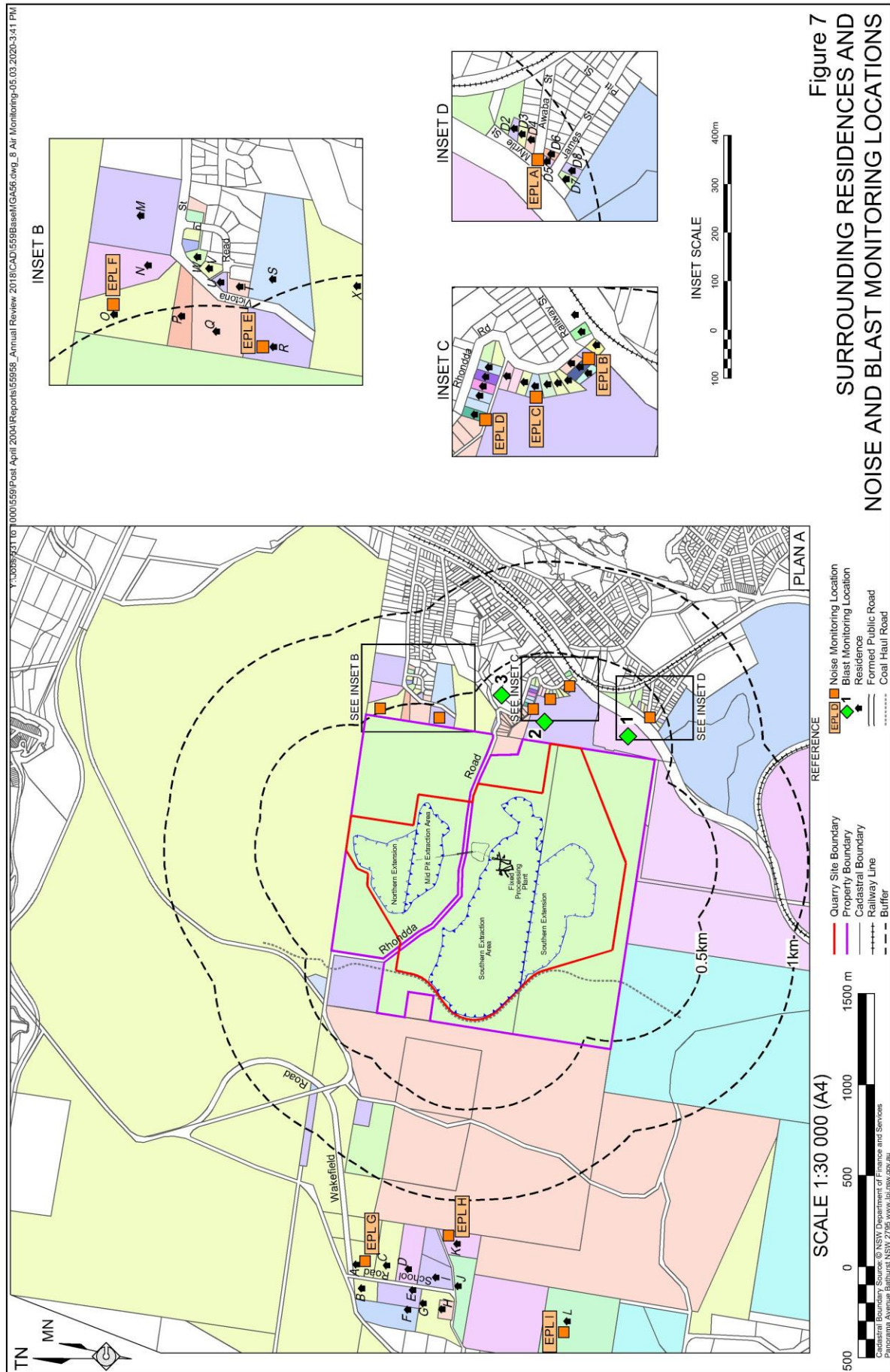


Table 9
Teralba Quarry – Noise Criteria

Residence*	Time Period				
	6:00am-7:00am	7:00am-6:00pm	6:00pm-10:00pm	10:00pm-6:00am	
Residence A					
Criterion	LAeq(15 min)				LA(1 min)
	38	38	37	35	45
Residence B					
Criterion	LAeq(15 min)				LA(1 min)
	42	46	36	35	45
Residence C					
Criterion	LAeq(15 min)				LA(1 min)
	42	42	35	35	45
Residence D, E, G, H, I					
Criterion	LAeq(15 min)				LA(1 min)
	35	35	35	35	45
Residence F					
Criterion	LAeq(15 min)				LA(1 min)
	37	38	38	35	45
* See Figure 7					

6.2.3 Noise Monitoring Results and Discussion

Attended noise monitoring was conducted during daytime, evening, shoulder and night periods between 14 August 2019 and 16 August 2019 and the program repeated between 26 November 2019 and 28 November 2019 at monitoring locations EPL-A, B, D, E and H by Spectrum Acoustics Pty Ltd (Spectrum).

Based upon the location of active quarrying activities (i.e. only within the existing Southern Extraction Area and Southern Extension), it was determined that the nominated locations identified above would only be monitored. Locations EPL-C and EPL-F were omitted from the monitoring program as compliance at these locations may be inferred from other nearby monitoring locations.

During the monitoring period in 2017, the landowner at Residence B (EPL-B) requested that the monitoring not take place in front of their house. Since that time the monitoring location has been moved 30m to the south of this location so that operators could still distinguish Quarry vehicles from other noise sources and record noise levels.

Monitoring location EPL-B is situated close to the corner of Rhondda Road and Railway Street. This monitoring location is included predominantly to measure Quarry noise from trucks exiting the Quarry along the private section of the access road (through the Teralba Business Park). It was noted that at the time of noise measurements being undertaken, monitoring at EPL-B did not require a spotter to determine the number of quarry-related trucks from the overall truck movements, as it was possible for Spectrum staff to identify those trucks associated with Quarry activities from this monitoring location. Noise emissions at EPL-B were indistinguishable from industrial noise and other traffic noise at this location.

The results of the attended noise monitoring surveys identified that noise from the Quarry was generally inaudible in the local setting. Noise emissions did not exceed the relevant criterion at any monitoring location during any part of the surveyed time period.

Monitoring of $L_{A(1min)}$ was undertaken to assess potential sleep disturbance during the period from 10:00pm to 7:00am. Night-time monitoring of $L_{A(1min)}$ was within the criteria of 45 dB(A) at all monitoring locations.

It is noted that the results of operational noise monitoring during 2019 are consistent with results recorded in 2015, 2016, 2017 and 2018, indicating that the Quarry remains generally inaudible in the local setting. The monitored noise levels are lower than those predicted in the EA for the Teralba Extension Project, however, it should be noted that the predictions in the EA related to worst-case scenario operations that included operations in the later stages of the Southern Extension and operations in the Northern Extension. Operations in these areas are yet to commence.

6.3 BLASTING

6.3.1 Blasting Activities

All blasting during the reporting period occurred in Stage 1B of the Southern Extension. Blast monitoring was undertaken for each blast initiated at the Quarry throughout 2019.

The *Blast Management Plan* prepared in accordance with *Condition 3(16)* of PA10_0183 details the locations and frequency of blast monitoring that is required to be undertaken during blasts at the Quarry.

Blast monitoring continues to be undertaken at the locations nominated on **Figure 7** for each blast, i.e. at Locations 1 and 2 for blasts initiated south of Rhondda Road and Locations 2 and 3 for blasts initiated north of Rhondda Road. No blasts were initiated north of Rhonda Road during the reporting period.

6.3.2 Blasting Criteria

Table 10 presents the blasting criteria for the Quarry provided in PA10_0183 with all blasts required to occur between 10:00am to 4:00pm, Monday to Friday only, public holidays excluded.

Table 10
Teralba Quarry – Blasting Criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Any residence on privately owned land, or any public infrastructure	120	10	0%
	115	5	5% of the total number of blasts over a 12 month period

6.3.3 Blast Monitoring Results

Table 11 presents the results of blast monitoring undertaken throughout 2019 against the criteria for the Quarry. Airblast overpressure and ground vibration were not monitored at Location 3 throughout 2019 as no blasting was undertaken north of Rhondda Road during the reporting period.

Table 11
Blast Monitoring Results – 2019

Blast Date	Blast Time	Location 1 ¹		Location 2 ¹		Location 3 ^{1,2}	
		Airblast Over pressure (dB(L))	Ground Vibration (mm/s)	Airblast Over pressure (dB(L))	Ground Vibration (mm/s)	Airblast Over pressure (dB(L))	Ground Vibration (mm/s)
January	No Blasting	-	-	-	-	-	-
11 February	2:40pm	106	0.2092	NT	NT	NM	NM
5 March	2:31pm	102	0.5609	NT	NT	NM	NM
3 April	3:05pm	105	0.1899	NT	NT	NM	NM
8 May	12:13pm	NT	NT	105	0.2145	NM	NM
20 May	1:22pm	104	0.6546	NT	NT	NM	NM
21 June	3:59pm	110	0.09801	NT	NT	NM	NM
4 July	1:09pm	NT	NT	NT	NT	NM	NM
17 July	2:18pm	NT	NT	108	0.1926	NM	NM
7 August	11:17am	105	1.072	NT	NT	NM	NM
16 August	12:18pm	NT	NT	NT	NT	NM	NM
3 September	11:19am	110.4	0.2164	NT	NT	NM	NM
27 September	1:12pm	NT	NT	NT	NT	NM	NM
2 October	10:22am	113.1	0.1299	NT	NT	NM	NM
21 October	11:44am	110.3	0.1206	NT	NT	NM	NM
31 October	11:09am	NT	NT	105	0.70	NM	NM
15 November	1:42pm	NT	NT	NT	NT	NM	NM
22 November	12:24pm	NT	NT	NT	NT	NM	NM
December	No Blasting	-	-	-	-	-	-

Note: NT – Not Triggered, NM – Not Measured

¹ See **Figure 7**.

² Monitoring only undertaken at Location 3 when blasting is conducted in the Mid Pit or Northern Extraction Area.

As shown in **Table 11**, the majority of blasts during 2019 did not trigger the blast monitor. The blast monitor trigger level is generally set to 100dB for airblast overpressure and between 0.1mm/s and 1.0mm/s for ground vibration therefore it is inferred that no blasts exceeded these levels at the monitoring locations. The maximum airblast overpressure recorded throughout 2019 was 113.1dB and the maximum ground vibration was 1.072mm/s, which is below the adopted criteria presented in **Table 11**.

All blasting was undertaken between 10:22am and 3:59pm, i.e. within of the prescribed hours for blasting.

Metromix complied with all blasting criteria for all blasts monitored during the reporting period.

In terms of historic trend analysis, during 2015 and 2016, it was rare for the blasting activities to trigger the blast monitor, whereas the majority of blast events triggered the monitors in 2017. Only four blasts during 2018 triggered the blast monitor. This is considered most likely due to the blasting size and locations during 2017 compared to other years. Between 2015 and 2010 there have been no instances where the criteria presented in **Table 11** were exceeded and all blasting results are consistent with those predicted in the EA.

Both airblast overpressure and ground vibration results are below the predictions made in the EA for the Teralba Extensions Project. However, it is noted that the assessment was based on modelling of worst-case scenarios and blast MIC of up to 60kg.

6.4 AIR QUALITY

6.4.1 Introduction

Air quality monitoring is required to be undertaken in accordance with *Condition 3(17)* and the approved *Air Quality Management Plan* required under *Condition 3(20)* of PA10_0183.

Air quality monitoring at the Quarry has historically been undertaken for deposited dust, however, *Condition (3)17* requires that Total Suspended Particulates (TSP) and PM₁₀ also be monitored through the ongoing use of a High Volume Air Sampler (HVAS). Following discussions with the EPA in 2013, it was determined that TSP was not required to be monitored as it is recognised that the concentration of PM₁₀ particles is of greater importance given its nexus with potential health issues and background deposited dust levels (<4g/m²/month). This is reflected in the current version of EPL 536 dated 5 April 2018. TSP was not monitored by Metromix during 2019 but compliance and an estimated annual average level has been inferred from PM₁₀ monitoring results.

The HVAS required to monitor for PM₁₀ is located at EPA Point 3, at the same location as the Rodgers Street deposited dust gauge.

6.4.2 Air Quality Monitoring Locations and Frequency

The current air quality monitoring network consists of five deposited dust gauges and the HVAS (see **Figure 8**). **Table 12** provides the coordinates of each location and the date established / sampling frequency respectively. The HVAS was installed in April 2014. In January 2019, the landowners at the Margaret Street location notified Metromix that they no longer granted access to the property for dust monitoring. The dust gauge was subsequently moved to a location on York Street and monitoring in this location commenced from 1 February 2019. As a result, one month (January 2019) of deposited dust monitoring was not able to be completed in the vicinity of York Street and Margaret Street.



Table 12
Locations of Air Quality Monitoring Equipment

Monitoring Location*	Easting	Northing	Date Established	Sampling Frequency
DDG – Hillside	369422	6352680	June 2004	Monthly
DDG – Margaret	369622	6351763	April 2011 – Dec 2018	Ceased
DDG - York	369777	6352013	1 Feb 2019	Monthly
DDG – Myrtle	369071	6351492	June 2004	Monthly
DDG – Rhondda	369240	6351972	June 2004	Monthly
DDG – Rodgers	369467	6352369	April 2011	Monthly
Weather Station	368413	6352751	March 2013	Continuous
HVAS	369467	6352369	April 2014	6 days
* See Figure 8			DDG = Deposited Dust Gauge	

6.4.3 Air Quality Criteria

The air quality criteria for the Quarry, as outlined within *Condition 3(17)* of PA10_0183, are provided in **Table 13**.

Table 13
Air Quality Criteria

Pollutant	Criterion ^d	Averaging Period
Total suspended particulate matter (TSP)	90µg/m ³ ^a	Annual average
Particulate matter <10µm (PM ₁₀)	50µg/m ³	24-hour maximum
	30µg/m ³ ^a	Annual average
Deposited dust ^c	4 g/m ² /month ^a	Annual average
	2 g/m ² /month ^b	Maximum Incremental Increase
^a No longer required under Condition M2.2 EPL 536; ^b Incremental impact (i.e.: incremental increase in concentrations due to the project on its own); ^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580010.1.2003: Methods for Sampling and Analysing Air-Determination of Particulate Matter – Deposited Matter – Gravimetric Method. ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with EPA.		

6.4.4 Air Quality Monitoring Results

Table 14 presents the results of the deposited dust monitoring program for 2019 and **Figure 9** presents the long term deposited dust monitoring results. **Table 15** presents the results of the PM₁₀ monitoring during the reporting period and **Figure 10** presents the long term PM₁₀ monitoring results.

It is generally recognised that PM₁₀ constitutes approximately 40% of Total Suspended Particulates (TSP) and that compliance with TSP criteria may be demonstrated by dividing the recorded PM₁₀ by 0.4. This is a common and accepted practice in low risk situations.

Based on this approach, the annual average TSP for the Quarry is estimated to be 67.3µg/m³. This is well within the assessment criteria of 90.0µg/m³.

Table 14
Deposited Dust Monitoring Results – 2019

	Deposited Dust Levels (g/m ² /month)					
Residence ID	Rhondda ¹	Myrtle ¹	Hillside ¹	Rodgers ²	Margaret ²	York ³
Criterion	4	4	4	4	4	4
Pre - 2019 Average*	1.0	1.2	1.5	1.2	1.1	-
Results 2019						
January	2.7	1.6	3.5	3.4	2.1	-
February	1.0	0.7	2.8	1.2	-	-
March	1.5	1.1	4.0	2.0	-	1.3
April	1.6	1.1	7.1	1.3	-	1.6
May	0.7	0.6	1.4	0.2	-	0.7
June	1.2	0.8	1.7	0.7	-	1.3
July	0.6	0.2	1.6	0.6	-	0.8
August	0.3	0.2	0.7	0.4	-	0.7
September	1.4	0.9	1.1	0.8	-	0.9
October	0.9	0.5	0.6	0.5	-	1.0
November	0.5	0.3	0.8	0.9	-	0.7
December	3.3	2.6	3.0	7.8	-	2.9
Average	1.3	0.9	2.4	1.7	2.1	1.2
* Based upon available results for deposited dust collected prior to the reporting period.						
¹ Installed and operated since 2004 ² Installed and operated since 2011 ³ Installed and operated since 2019						

Table 15
PM₁₀ Air Quality Monitoring Results – 2019

Month	Samples (Run Dates) (Number)	Monthly Average Result (µg/m ³)	Daily 24hr PM ₁₀ Exceedance	Annual Average (µg/m ³)
Criteria		50	50	30
January	5	34.2	1	
February	5	35.0	1	
March	5	18.2	0	
April	5	16.6	0	
May	5	12.0	0	
June	5	10.0	0	
July	6	10.7	0	
August	5	17.0	0	
September	5	14.6	0	
October	5	19.2	0	
November	5	46.0	2	
December	5	92.2	4	
Annual Average	-			26.9

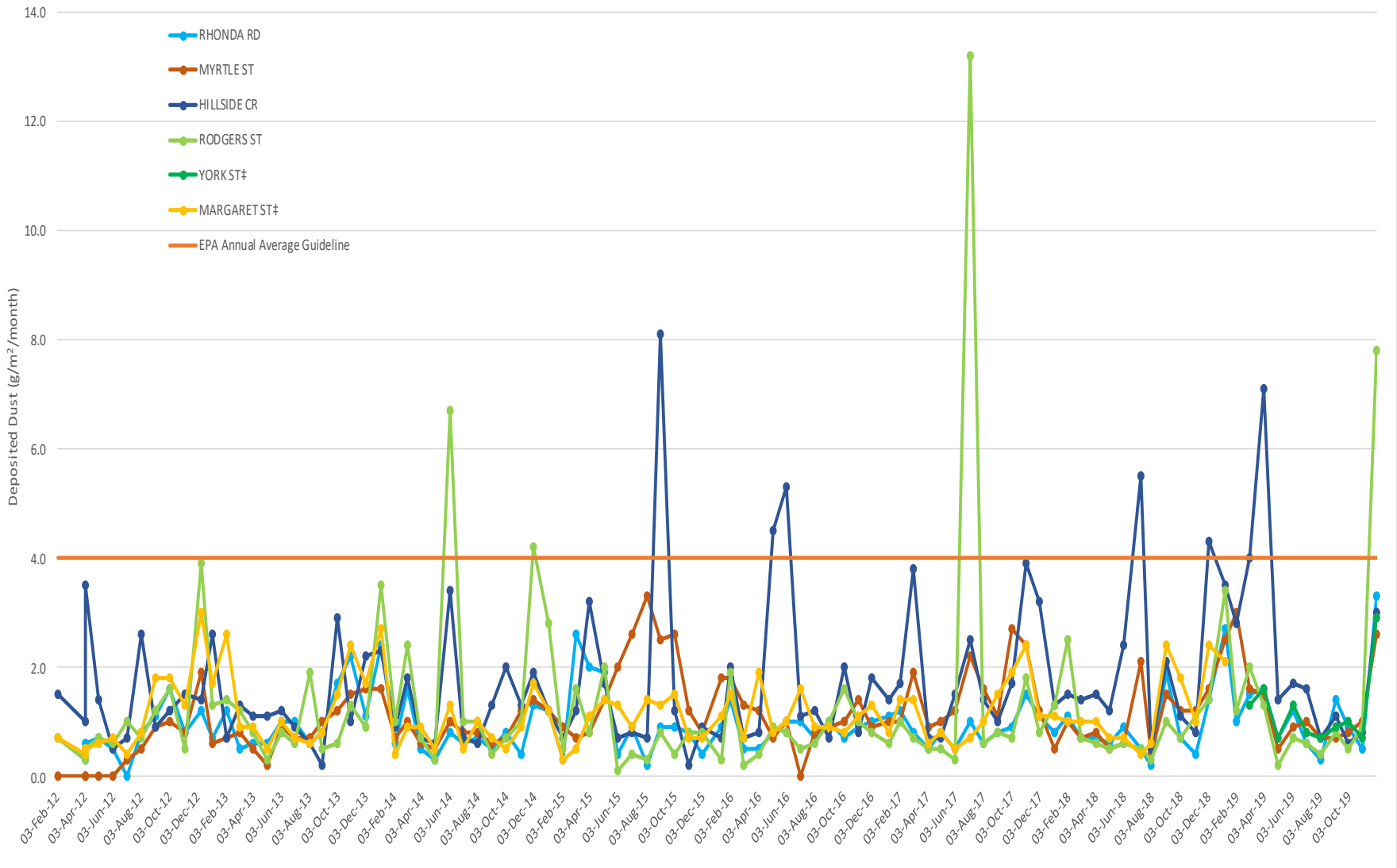


Figure 9 Long Term Deposited Dust Monitoring Results

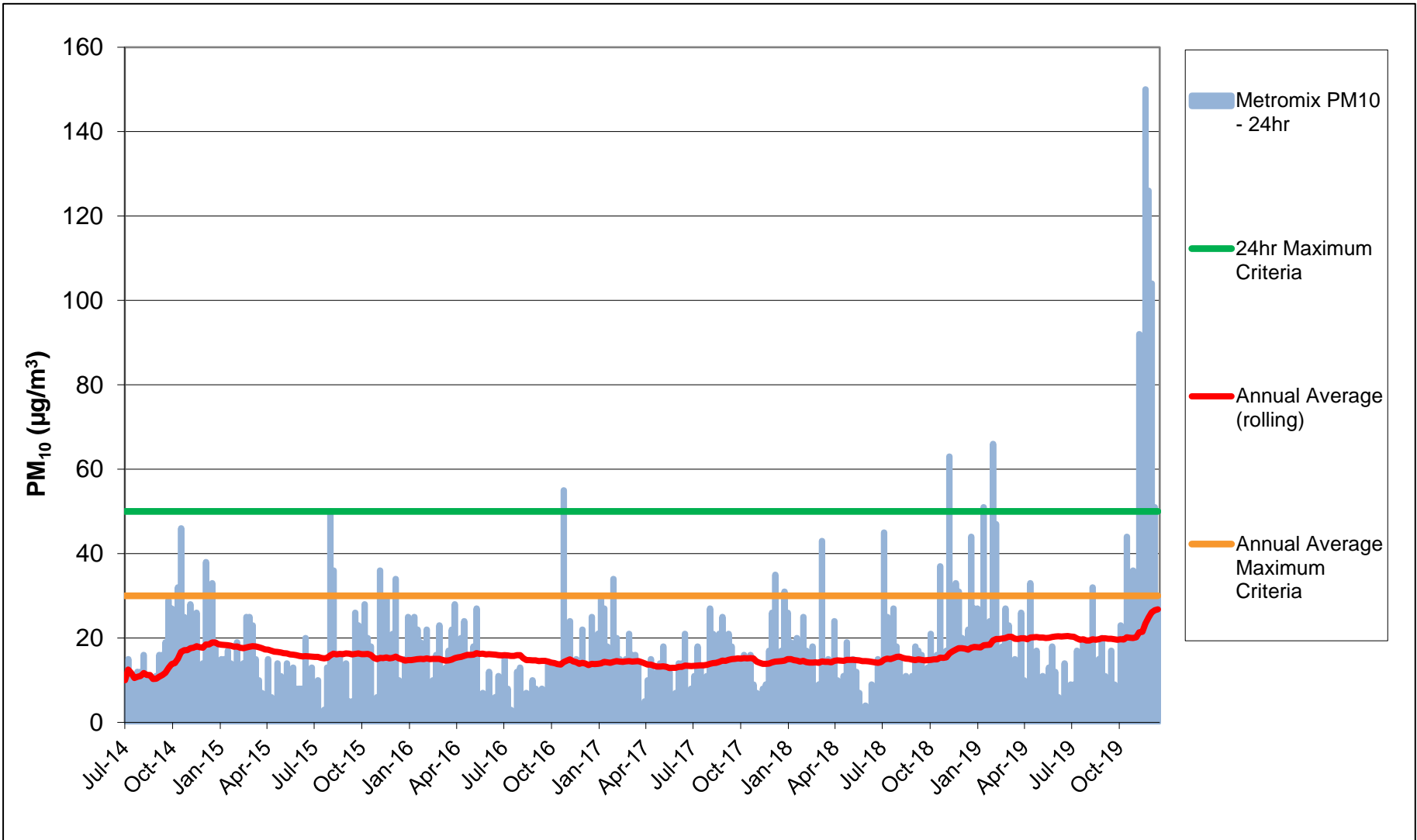


Figure 10 Long Term PM₁₀ Monitoring Results

6.4.5 Analysis of Results

The annual average deposited dust levels were compliant throughout 2019. However, two monthly exceedances of the $4\text{g/m}^2/\text{month}$ were recorded at the Hillside Street gauge in March and April 2019 (4.0 and $7.1\text{g/m}^2/\text{month}$ respectively) and one exceedance was recorded at the Rodgers Street gauge in December 2019 of $7.8\text{g/m}^2/\text{month}$. Monitoring throughout the remainder of the reporting period at these locations was between $0.2\text{g/m}^2/\text{month}$ and $3.5\text{g/m}^2/\text{month}$. As a result, no further actions were required by Metromix to reduce dust levels at these monitoring locations, particularly given no complaints were submitted by the community. It is noted that the results of deposited dust monitoring from the 2019 reporting period are generally consistent with average results from preceding historic averages and those predicted in the EA for the Quarry.

During the 2019 reporting period, there were 8 exceedances of the maximum average 24-hour PM_{10} criteria ($50\mu\text{g/m}^3$) on during January, February, November and December (51 - $150\mu\text{g/m}^3$). The cause of the monitored exceedance on 26 January 2019 is unknown, the Quarry was not operating on that day due to a public holiday (Australia Day) and it is therefore assumed that the dust was generated by residential activities. The February exceedance is attributed to a regional bushfire that occurred at this time. The November-December exceedances are attributed to the bush fires that occurred throughout large areas of NSW at this time, in particular the Kerry Ridge fire may have impacted on the air quality monitoring results recorded at the Quarry. There was no recorded exceedance of the annual average PM_{10} criteria during the reporting period.

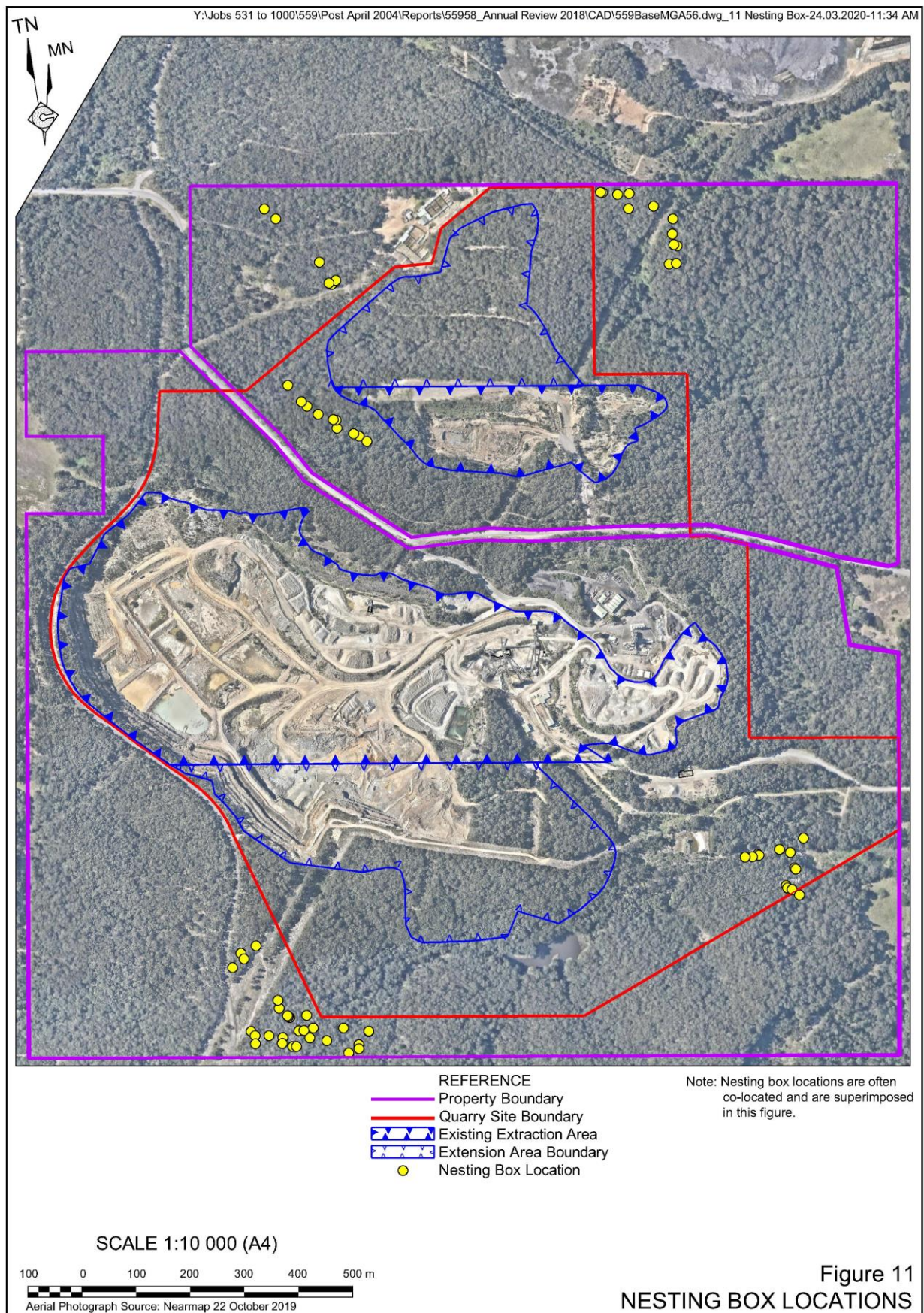
The high levels recorded during the reporting period due to regional bush fires have contributed to annual average PM_{10} levels generally rising on average over the reporting period compared to historic results. Overall, the monitored particulate matter levels are lower than those predicted in the EA for the Teralba Extension Project, however, it should be noted that the predictions in the EA related to worst-case scenario operations including operations in the Northern Extension and Mid Pit area. Operations in these areas are yet to (re)commence and existing operations remain consistent with these predictions (i.e. no exceedances of the relevant criteria)

6.5 FAUNA HABITAT

6.5.1 Introduction

In order to mitigate against the impact of removal of hollow-bearing trees, nesting boxes have been installed to provide for replacement nesting sites for the targeted species. The installation of nesting boxes for the following species as outlined within *Condition 3(50)* was completed in April and September 2014 with their locations shown in **Figure 11**.

- 20 microbat nesting boxes.
- 20 Little lorikeet nesting boxes.
- 30 Squirrel glider nesting boxes.



These boxes have been monitored and where necessary relocated since their installation. During October and November 2017, a total of 18 nesting boxes were installed to replace those that had previously been damaged or destroyed due to theft or bushfire. The location of the boxes was chosen to avoid the areas previously damaged by bushfire. Five additional nest boxes for each of the target species are stored at the Quarry so that replacements can be installed quickly if damage is recorded.

6.5.2 Nesting Box Usage

The nesting boxes were inspected on 31 October 2019 by Echo Ecology and Surveying. The 2019 Nest Box Monitoring Report is provided as **Appendix 2** and provides coordinates for all nesting box locations and an update on box usage during the reporting period. In summary:

- none of the target species (Squirrel Gliders, Little Lorikeets or microbats) were observed using the nest boxes during the inspection;
- four of the nest boxes were recorded as being occupied by Sugar Gliders;
- a further 18 nesting boxes contained leaves with depressions like those created by Sugar Gliders, indicating that these boxes are used by Sugar Gliders for sheltering;
- 14 boxes had leaves present (but no defined nest) indicating that animals had visited the nesting boxes;
- 21 of the nest boxes showed no sign of occupation (the majority of these being microbat boxes);
- Ants were found in one of the boxes;
- no feral honey bees were observed.

The Nesting Box Monitoring Report comments that while none of the nest boxes have been used by the target species, the boxes are being used by native fauna species (e.g. Sugar Gliders). The usage by Sugar Gliders increased progressively from 2015 to 2018 but showed a decrease in this reporting period. Echo Ecology and Surveying surmised that the reduced occupancy was likely due to the drought conditions experienced in NSW during 2019.

Although none of the nesting boxes show evidence of use by the target species over the past 12 months, removing and relocating the nesting boxes would impact use of these boxes by Sugar Gliders. The Report recommends that the boxes continue to be maintained and monitored and only relocated if not used within 10 years of installation. At this time a review of the effectiveness of the nest boxes for the target species would be suitable.

6.6 VISIBILITY

It has been acknowledged in previous reporting that the upper benches of the Southern Extension Extraction Area (Stage 1B) are visible from some parts of the residential areas in the vicinity of Speers Point. The upper benches that are visible represent only minor impacts, as Speers Point is more than 4.3km from the Quarry.

Plate 10 displays the area visible from Speers Point.

In order to mitigate visual impacts from these locations, Metromix prioritised revegetation activities on the two upper benches within Stage 1B with tubestock and placed logs, etc. (**Plate 7**) and trialled bitumen emulsion applications on the visible faces. While the bitumen emulsion trials were considered successful, it is recognised that tree screening will be important to provide a vegetated view consistent with the surrounding landscape.

During the reporting period, rehabilitation activities on these benches was enhanced through watering and maintenance. Vegetation condition would continue to be monitored in this area.



Plate 10 View of the Quarry from Speers Point

7. WATER MANAGEMENT

7.1 INTRODUCTION

The most recent version of the *Water Management Plan* for the Teralba Quarry was approved by DPIE on 2 October 2018.

The surface water management system of the Quarry comprising Dams A to G continued to operate efficiently. The practice of pumping from Dam H to Dam G continued to reduce the quantity of water reporting to Dam D.

All water pumped or transferred around the Quarry was measured throughout the reporting period with a series of flow meters. No other changes to water management infrastructure occurred during 2019.

Metromix was not required to supply water to any users whose water supply was affected by the Quarry operation. The nearest bore that is located down-gradient of the Quarry is stock/domestic well GW080494 in Fassifern Road, Fassifern, approximately 2.6km to the south. It is considered unlikely that Quarry activities will impact this bore.

7.2 WATER QUALITY

7.2.1 Introduction

Monitoring of surface water was undertaken on a monthly basis throughout the reporting period in accordance with the *Water Management Plan* for the Quarry.

It should be noted that the water monitoring program relates principally to surface water, although monitoring of water in Dam A (hereafter referred to as “Mine Adit Dam”) effectively relates to groundwater, as this water reaches the surface via a former mine adit associated with historic underground coal workings beneath the Quarry (see **Plate 9**). No other groundwater monitoring is undertaken at the Quarry and based upon this, all water monitoring within this document relates only to surface water monitoring.

7.2.2 Water Quality Location, Sampling and Frequency

Water quality monitoring is required to be undertaken at EPA Point 4 (Mine Adit Dam overflow – **Plate 9**), EPA Point 5 (Discharge off site from Dam B), EPA Point 6 (Northwestern boundary into unnamed creek) and EPA Point 7 (Northeastern boundary to unnamed creek) with these locations shown on **Figure 12**.

Table 16 presents the required frequency and method of monitoring to be undertaken at the nominated EPA points, i.e. in the event water is flowing at the nominated locations.

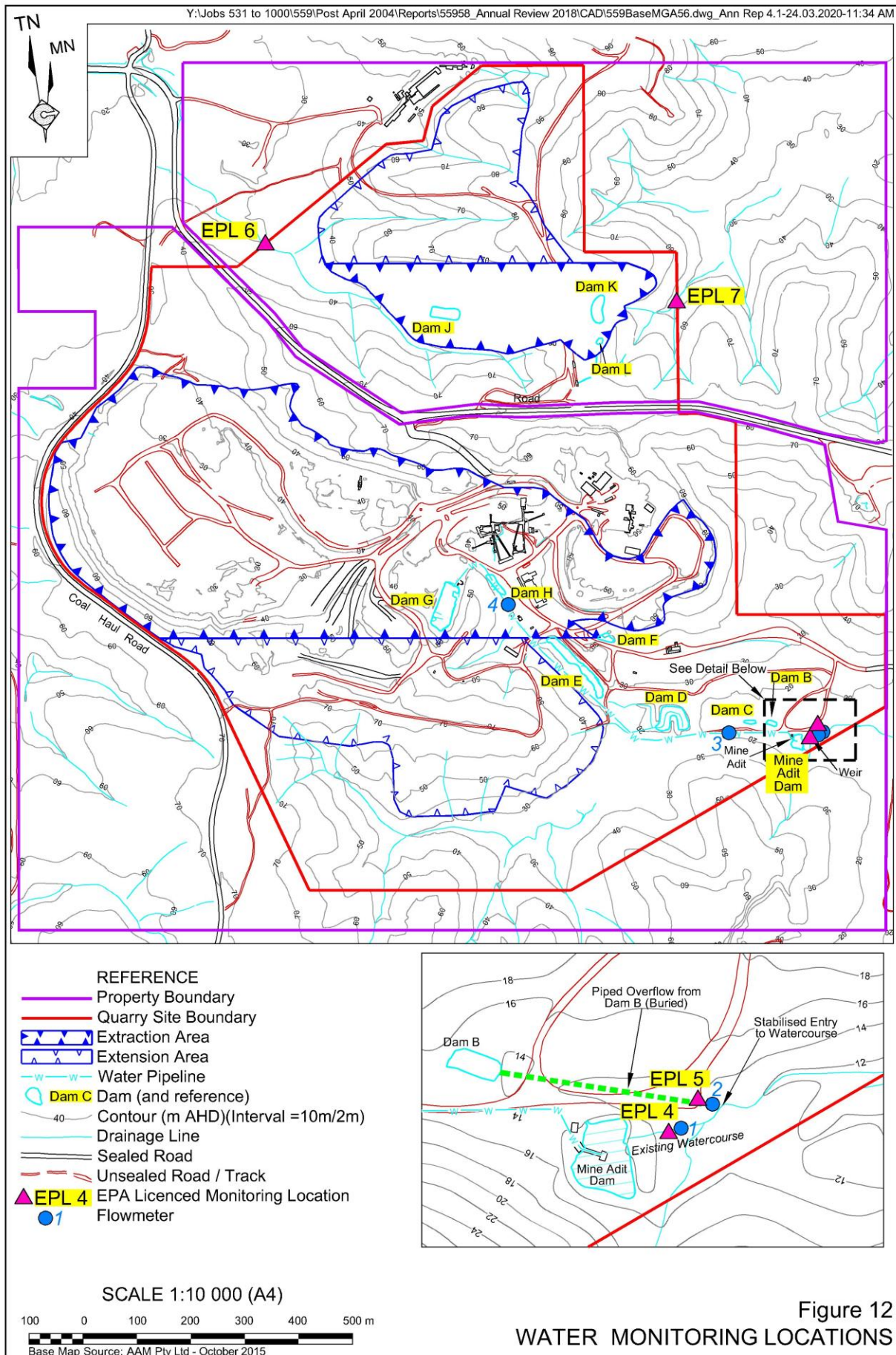


Table 16
Surface Water Monitoring Requirements

EPA Point	Frequency	Monitoring for:	Method
4	Monthly	pH, Total suspended solids (TSS), Electrical Conductivity (EC), oil and grease	Grab sample
5	Daily during discharge	pH, TSS, EC, oil and grease	Grab sample
6 and 7	Within 8 hours of discharge and weekly during discharge	pH, EC, TSS	Grab sample
4 and 5	Continuous (during discharge from monitoring point 4 – Dam B)	Flow	Flow meter/ continuous logger

7.2.3 Water Quality Assessment Criteria and Results

Water quality is required to be monitored at all nominated locations for pH and total suspended solids (TSS) with Electrical Conductivity (EC) monitoring also required at EPA Points 6 and 7 in the event of water discharge from these locations. There is no requirement within EPL 536 to monitor for oil and grease, however, if oil and grease is observed during sampling on two successive monthly sampling events, a full hydrocarbon sampling suite will be conducted on the samples collected during the following monthly period. **Table 17** presents a summary of the results of the surface water quality monitoring program during the reporting period. The results of the entire surface water monitoring program are provided in full in **Appendix 1**.

Although the Quarry does not discharge water to the Mine Adit Dam, this dam naturally discharges to the downstream watercourse on a regular basis and, as it is located within the area of management for the Quarry, Metromix has committed to monitor the water quality and discharge volumes.

7.2.4 Water Use

Water Access Licence 40303 permits the extraction and use of water from the Mine Adit Dam with an allocation of 1 407 shares (currently 1ML per share).

Reporting is currently only required for water pumped from the Mine Adit Dam to Dam G under licence as this represents groundwater intercepted from the Mine Adit (see **Plate 9**). **Table 18** displays the water flow measurements monitored between the Mine Adit Dam to Dam G during the reporting period.

The use of 1060.8ML during the reporting period is consistent with historic use (923.6ML in 2018 and 1 077ML in 2017). Water use is closely tied to the requirements of the washing processes used for product preparation and dust suppression.

Table 17
Surface Water Monitoring Results – 2019

Page 1 of 2

	pH	EC	TSS	Comments	Method
Units	pH Units	µS/cm	mg/L		-
EPL Criterion*	6.5-8.5	NA	<50	None	-
ANZECC Water Quality Limits	6.5-8.5	125-2200	<50	None	-
EPA Discharge Point 4 – Mine Adit Dam (Monthly)					
January	7.12	2130	8	None	Grab Sample
February	7.45	2140	<5	None	
March	7.18	2310	<5	None	
April	7.82	2020	<5	None	
May	7.05	2170	11	None	
June	7.37	779	105	None	
July	7.33	2340	11	None	
August	7.31	2280	<5	None	
September	6.99	1990	<5	None	
October	7.31	2220	<5	None	
November	7.21	2060	<5	None	
December	7.38	2120	10	None	
EPA Discharge Point 5 – Dam B (Daily during Discharge)					
January	7.26	1110	6	None	Grab Sample
February	No Discharge				
March					
April					
May					
June					
July					
August					
4/09/2019	7.22	1050	<5	None	Grab Sample
5/09/2019	6.52	816	13	None	
9/09/2019	6.78	1230	<5	None	
11/09/2019	7.40	1190	11	None	
12/09/2019	6.90	1180	<5	None	
13/09/2019	6.82	1140	<5	None	
16/09/2019	6.82	1140	<5	None	
17/09/2019	7.01	1150	6	None	
18/09/2019	7.12	914	<5	None	
19/09/2019	6.92	1020	<5	None	
20/09/2019	6.86	1090	<5	None	
23/09/2019	6.83	1120	<5	None	
24/09/2019	6.86	1240	<5	None	
25/09/2019	7.60	1170	<5	None	

Table 17 (Cont'd)
Surface Water Monitoring Results – 2019

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	pH	EC	TSS	Comments	Method
EPA Discharge Point 5 – Dam B (Daily during Discharge)					
26/09/2019	6.84	1210	<5	None	
27/09/2019	6.82	1070	<5	None	
30/09/2019	6.84	1250	<5	None	
1/10/2019	6.87	1090	<5	None	
2/10/2019	6.85	1080	<5	None	
3/10/2019	6.97	1200	<5	None	
4/10/2019	7.00	1170	<5	None	
8/10/2019	7.05	1040	<5	None	
9/10/2019	7.07	1200	<5	None	
14/10/2019	7.28	1180	<5	None	
15/10/2019	7.28	1120	<5	None	
16/10/2019	7.24	1120	<5	None	
17/10/2019	8.26	1220	<5	None	
18/10/2019	7.35	1270	<5	None	
21/10/2019	7.33	1360	<5	None	
22/10/2019	7.33	1350	<5	None	
November	No Discharge				
December					
EPA Discharge Point 6 – Northwestern Boundary to Creek (During and Following Discharge)					
There were no instances of water discharged from EPA Point 6 during the reporting period					
EPA Discharge Point 7 – Northeastern Boundary to Creek (During and Following Discharge)					
There were no instances of water discharged from EPA Point 7 during the reporting period					
* EPL 536 <i>Condition L1.1</i> nominates the licensee must comply with Section 120 of the Protection of the Environment Operations Act 1997. As such, the ANZECC water quality guidelines have been adopted.					
NA = Not Applicable		ND = Not Determined			NS = Not Sampled
BOLD – Exceedance of Criteria					

Table 18
Surface Water Flow Measurements – Mine Adit Dam to Dam G – 2019

Month	Flow Meter Readings	Usage (ML)
January	3376070	47.1
February	3457120	81.1
March	3541198	84.1
April	3660277	119.1
May	3752940	92.7
June	3863642	110.7
July	3951673	88.0
August	4040964	89.3
September	4130069	89.1
October	4210415	80.3
November	4298407	88.0
December	4400420	102.0
Total		1071.5

7.2.5 Discussion of Results

In considering water quality limits nominated in **Table 17**, the following comments are relevant.

1. pH values within the Mine Adit Dam varied from 6.99 to 7.82 with an average pH of 7.29.
2. Discharge from Dam B occurred January, September and October during the reporting period, with the pH values neutral on average (7.16) which is within the EPL and ANZECC criterion of 6.5 to 8.5. All water samples during discharge were within criteria levels.
3. EC values were monitored within the Mine Adit Dam and recorded a range between 779 μ S/cm and 2 340 μ S/cm and an average value of 2 046 μ S/cm, which is below the ANZECC guideline level. For records of EC at the Mine Adit Dam were above the ANZECC criteria. However, it is noted that Quarry operators do not influence these results. EC values recorded during discharge from Dam B was almost half that recorded at Adit Dam.
4. TSS values were generally within the EPL criterion and ANZECC guideline level of 20mg/L, with one sample from June 2019 returning levels at 105mg/L. This is attributed to the water sample being taken after a rain event whilst the Mine Adit Dam was still settling.

Flow measurements indicate that a total of 1070.5ML of water was pumped from the Mine Adit Dam to Dam G during the 2019 reporting period. This is within the licence allocation of 1 407ML held by Metromix under Water Access Licence 40303.

7.2.6 Conclusion

Water monitoring at Metromix's Teralba Quarry has demonstrated that the Quarry operations have not adversely impacted the water quality in the surrounding and downstream areas of the Quarry. This is consistent with the water monitoring results from previous reporting periods (2015 to 2018) and indicates that the Quarry continues to operate with negligible impact to the quality of water in Lake Macquarie.

8. REHABILITATION

8.1 REHABILITATION PERFORMANCE DURING THE REPORTING PERIOD

The status of land under rehabilitation within former Silt Cell 4 is displayed in **Plate 5** and the older and more developed rehabilitation of former Silt Cell 1 and Silt Cell 2 is displayed in **Plates 6**. T.E.N.T.A.C.L.E. Inc. prepared a progress report of the regeneration works undertaken during 2019 on behalf of Metromix, summarising the aims, methods and results of the rehabilitation works. A copy of the progress report by T.E.N.T.A.C.L.E Inc. is reproduced in **Appendix 3**.

Rehabilitation works during the reporting period included three key activities.

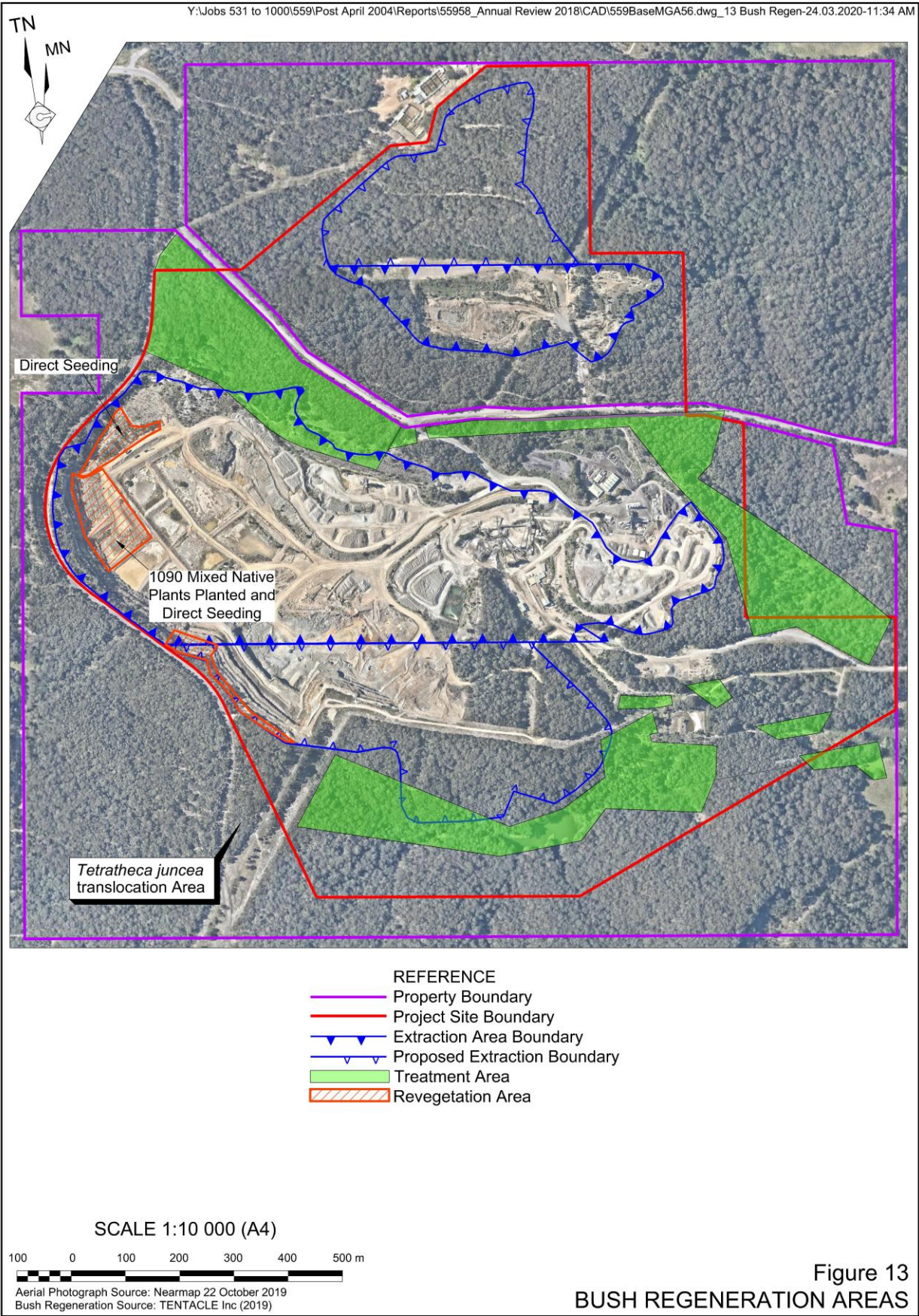
- Revegetation of rehabilitated and silt cells.
- Weeding within active areas of the Quarry and in the undisturbed non-operational areas of the property.
- Weeding and maintenance of previously rehabilitated areas included the location of translocated *Tetradlea juncea*.

Figure 13 identifies the location of rehabilitation activities undertaken throughout the reporting period.

A variety of weed control methods were used including the removal of target weed species through both manual and chemical controls such as cut/scrape and paint or splatter gun application of herbicide, hand removal or seed head removal. Weed management activity focussed upon the following weeds during the reporting period.

- Lantana (*Lantana camara*)
- Crofton weed (*Ageratina adenophora*)
- Asparagus Fern (*Asparagus aethiopicus*)
- Pampas grass (*Cortaderia selloana*)
- Wild tobacco (*Solanum mauritianum*)
- Cassia (*Senna pendula* var. *glabrata*)
- Small Leaf Privet (*Ligustrum sinense*)
- Castor oil plant (*Ricinus communis*)
- Paspalum (*Paspalum dilatatum*)
- Blackberry (*Rubus fruticosus*)
- Green cestrum (*Cestrum parqui*)
- Chinese Tallow Tree (*Triadica sebifera*)
- Coastal Morning Glory (*Ipomoea cairica*)
- Fireweed (*Senecio madagascariensis*)

A total of 878.5 hours were worked by T.E.N.T.A.C.L.E. staff performing environmental restoration and bush regeneration activities during 2019.



In 2015, 40 endangered *Tetratheca juncea* were translocated from the active areas of the Quarry to a location to the south, with a survival rate of 80% being reported four months after translocation. Officers of T.E.N.T.A.C.L.E. Inc. revisited the translocation area during 2019 and reported that the *Tetratheca* continued to be healthy with no new reported deaths within the site and that some lantana seedlings were hand removed from the area.

During 2019 a total of 1 090 native trees, shrubs and grasses were planted in the western portion of the Quarry along completed benches and completed silt cells. The planting consisted of the following.

- 50 Spotted Gum – *Corymbia maculate*;
- 50 White Mahogany – *Eucalyptus asmenoides*;
- 50 Grey Ironbark – *Eucalyptus paniculate*;
- 50 Broad-leaved White Mahogany – *Eucalyptus umbra*;
- 50 Smooth-Barked Apple – *Angophora costata*;
- 120 Hickory Wattle – *Acacia implexa*;
- 120 Prickly Moses – *Acacia ulicifolia*;
- 120 Prickly Shaggy Pea – *Podolobium ilicifolium*;
- 120 Wattle Mat-rush – *Lomandra filiformis*;
- 120 Wiry Panic – *Entolasia stricta*;
- 120 Cogon Grass – *Imperata cylindrical*; and
- 120 Kangaroo Grass – *Themeda australis*.

Prior to planting, a seed mix was spread across the site that consisted of native plant seeds, fertiliser and non-germinating oats. Observations throughout the year found that a considerable amount of the seedlings had emerged.

At the time this document was finalised, the survival rate for all plants associated with the rehabilitation program is 85%. It has been identified that planting in autumn provides the greatest opportunity of planting success.

8.2 BIODIVERSITY OFFSET

A modification to PA 10_0183 was approved on 16 April 2018 that removed the approved biodiversity offset area from the consent and replaced this with biodiversity credits. A revised biodiversity offset strategy was subsequently approved in July 2018 that describes Metromix's intention to retire credits following purchase on the open market.

The staged biodiversity offsetting obligations are described in Conditions 3(54) to 3(56) of PA 10_0183. The staged obligations are aligned with the staged development of the Quarry such that Metromix cannot proceed to the next stage of development of the Quarry until the biodiversity offset obligations for that stage have been satisfied. **Table 19** summarises the biodiversity offset strategy for the Quarry.

Table 19
Offsetting Stages, Timing and Credits

Development Stage	Credit Required	Number of Credits	Timing
Stage 1 and Stage 2 in Southern Extension	PCT1589 or equivalent	670	31 December 2018
Stage 1 and Stage 2 in Southern Extension	Black-eyed Susan (<i>Tetradlea juncea</i>)	1 103	31 December 2018
Stage 3 in Southern Extension	PCT1589 or equivalent	171	2027 (indicative)
Stage 1, Stage 2 and Stage 3 in Northern Extension	PCT1589 or equivalent	502	2034 (indicative)

The biodiversity credits for Stage 1 and Stage 2 in the Southern Extension were retired on 21 December 2018.

8.3 DISCUSSION

Progressive rehabilitation activities have been reviewed in relation to the rehabilitation objectives described in Condition 58 of Schedule 3 of PA 10_0183 and presented in **Table 20**.

Table 20
PA10_0183 Condition 3(58) Rehabilitation Objectives

Page 1 of 2

Feature	Objectives	Comments
Site (as a whole)	<ul style="list-style-type: none"> Safe Hydraulically and geotechnically stable Non-polluting Fit for the intended post-mining land use(s) Final landform integrated with surrounding natural landforms as far as is reasonable and feasible Minimising visual impacts when viewed from surrounding land. 	Areas subject to progressive rehabilitation satisfy this objective. Backfilling of silt cells is occurring progressively to ensure these areas are stable and suitable for revegetation activities.
Surface Infrastructure	<ul style="list-style-type: none"> To be decommissioned and removed, unless otherwise agreed by the Secretary. 	No areas have required decommissioning of infrastructure to date.
Benched Quarry Walls	<ul style="list-style-type: none"> Landscaped and revegetated utilising native tree and understorey species, ensuring that the tree canopy is restored and integrated with the surrounding canopy to minimise visual impacts. 	Revegetation activities on the two upper benches within Stage 1B applied a selection of native tree flora species in accordance with the species described in the Biodiversity and Rehabilitation Management Plan. A success rate of 85% has been reported by T.E.N.T.A.C.L.E. Inc.

Table 20 (Cont'd)
PA10_0183 Condition 3(55) Rehabilitation Objectives

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Feature	Objectives	Comments
Quarry Pit Floors and Silt Ponds	<ul style="list-style-type: none"> Landscaped and revegetated utilising native flora species and felled trees from clearing. Revegetation not required for existing and proposed industrial areas. 	Revegetation activities on the Quarry floor areas to the west of the Southern Extraction Area (see Figure 11) applied available mulch and leaf litter material and a selection of native tree flora species in accordance with the species described in the Biodiversity and Rehabilitation Management Plan. A success rate of 85% was reported by T.E.N.T.A.C.L.E. Inc.
Other land affected by the Project	<p>Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of:</p> <ul style="list-style-type: none"> native endemic species: and a landform consistent with Figure 8 (Appendix 6 of PA 10_0183) and the surrounding environment. 	Progressive rehabilitation has applied native endemic species described in the approved Biodiversity and Rehabilitation Management Plan. Progressive final landform development is considered to be consistent with Appendix 6 of PA 10_0183.

Progressive rehabilitation activities have continued generally in accordance with the planned progress for rehabilitation described in the approved Biodiversity and Rehabilitation Management Plan and similar to that undertaken in previous years.

8.4 REHABILITATION DURING THE NEXT REPORTING PERIOD

The subsoil, topsoil and biomass from Stage 2 will be relocated during the first half of 2020 and from Stage 1C once that stage is commenced later in the year. This material would be used for the establishment of a rehabilitation area over the remainder of Silt Cell 5. Placement of overburden and soil/biomass is also proposed on the upper terminal bench in Stage 1B.

T.E.N.T.A.C.L.E Inc. will continue to be used on site for approximately 800-man hours per year to control weeds throughout the Quarry Site as well as plant seedlings and monitoring plant health. Lantana will again be targeted in areas defined as “poor condition”.

A further planting program will be undertaken during the reporting period, principally in the vicinity of former Silt Cell 5 with maintenance in the former Silt Cell 4 should it be required. Planting will preferentially occur in Autumn due to past success at this time. The scale of planting will be determined by climatic conditions including predicted rainfall.

9. ABORIGINAL HERITAGE

9.1 INTRODUCTION

In accordance with the approved Heritage Management Plan, a monitoring campaign involving Aboriginal stakeholders was undertaken on 25 February 2019 to assess the potential presence of Aboriginal items, sites or places along the existing easement for the powerlines. The outcomes of this monitoring are outlined in the following section and a more detailed report describing the outcomes presented as **Appendix 4**.

9.2 SURVEY METHODOLOGY

The site inspection was undertaken by David Marcus of Austral Archaeology on 25 February 2019. Mr Marcus was accompanied by the following representatives of local Aboriginal stakeholder groups.

- Tracey Howie (Guringai Tribal Link Aboriginal Corporation)
- Tori Leven (Awabakal Descendants Traditional Owners Aboriginal Corporation)
- Jackson Walker (Awabakal Traditional Owners Aboriginal Corporation)
- Dylan Newman (Kawul/Wonn1 Sites)
- Ashley Sampson (Cacatua Cultural Services)
- Norm Archibald (Biriban Local Aboriginal Council)

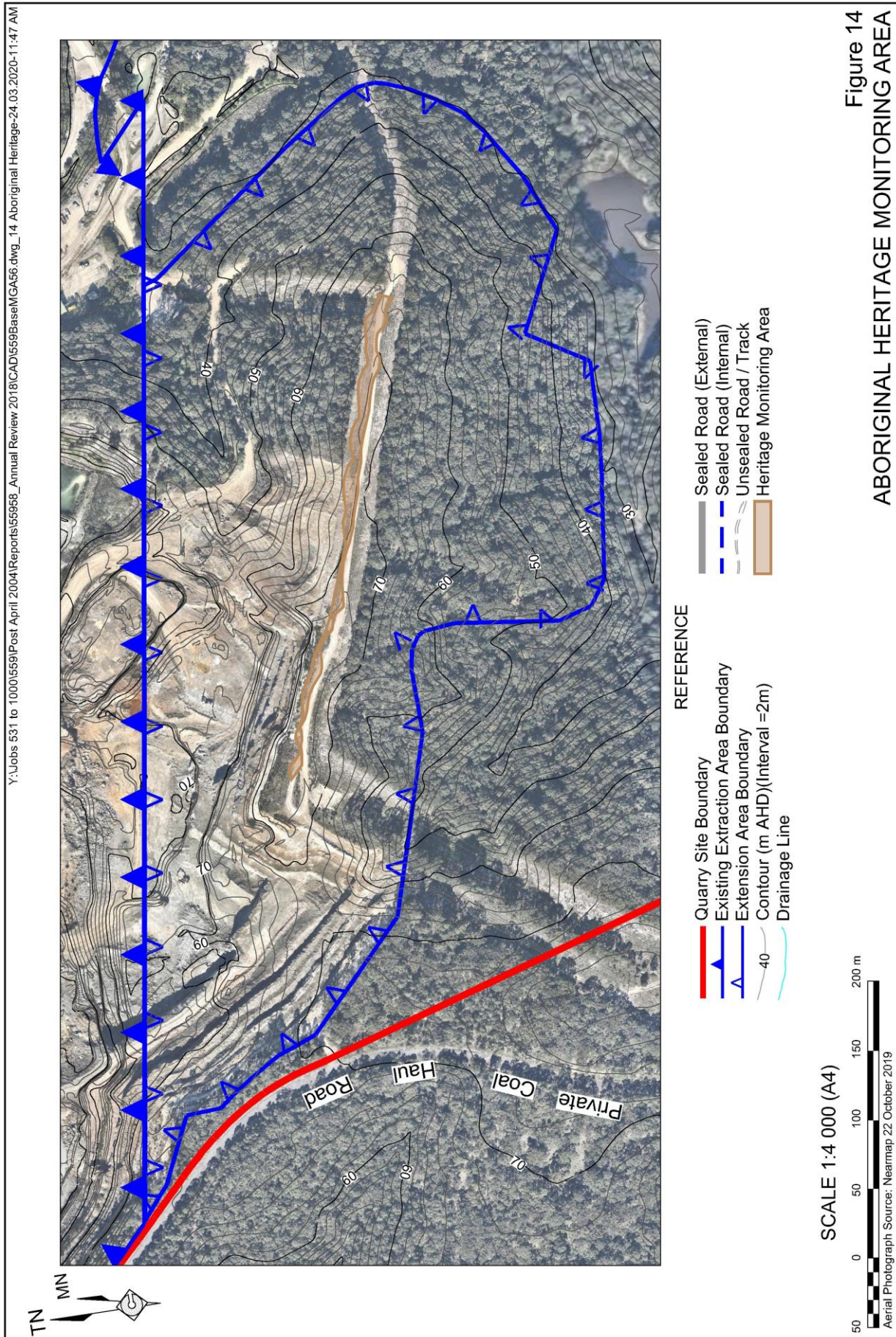
The study area was located along the crest of a narrow ridgeline, running east west, approximately 25m wide with sharp drop offs to the north and south. (**Figure 14**). The survey was conducted on foot, with participants spaced approximately 1m to 2m apart along two transects.

The land that was surveyed has been subject to significant prior impacts with an access track and support poles for powerlines installed along the ridge. It is understood that the company responsible for the powerlines conducts regular vegetation clearance within the study area.

9.3 SURVEY RESULTS

Two potential Aboriginal objects were identified during the course of the survey.

Artefact 1 was found on the western end of the transect on a thin, light grey silty soil containing frequent shale and ironstone fragments. The artefact consisted of a silcrete distal flake fragment measuring approximately 15mm in length, 14mm wide and 6 mm thick. There was no use wear or retouch present on the artefact, however it had the appearance of being heat treated.



Artefact 2 was found east of Artefact 1 on a remnant A-horizon soil consisting of light grey-brown, silty clay with frequent inclusions of shale and humic material. The artefact consisted of a possible chert core measuring 42mm in length, 29mm wide and 15mm thick. The core had two probable flake scars but had been subject to crushing, removing any actual evidence of knapping. The core showed evidence of heat shatter but blackening of the surfaces suggest that it was subject to bushfire rather than intentional heating. The small size and flake fragments along with the lack of a present cortex indicates a later stage of stone artefact manufacturing. The locations of the artefacts were recorded with a handheld GPS unit and upon verbal agreeance of all Aboriginal representatives, the artefacts were removed from the survey area and are currently being stored by Austral Archaeology.

9.4 RECOMMENDATIONS

Following completion of the survey Austral Archaeology made the following recommendations based on the requirements of the existing environmental management plan, and legislative requirements of the Quarry in accordance with the *Environmental Planning and Assessment Act 1979*.

1. The pedestrian survey identified all Aboriginal heritage values contained within the study area and no further investigative actions are required in this regard.
2. All artefacts identified during the site survey should be reburied in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).
3. Provide a copy of this letter report to the Office of Environment and Heritage, and all relevant Aboriginal stakeholders.

It is proposed that a suitable location for the artefacts will be identified in the next reporting period and burial arranged in accordance with the wishes of the Aboriginal Stakeholders involved in the monitoring.

10. COMMUNITY

10.1 SURROUNDING COMMUNITY

During the reporting period, it is understood that there were no changes to the land ownership adjacent to the Quarry. Metromix maintained contact with its closest neighbours throughout 2019 through informal discussions and involvement with the Community Consultative Committee.

10.2 COMMUNITY CONSULTATIVE COMMITTEE MEETINGS

Two meetings of the Teralba Quarry Community Consultative Committee (TQCCC) were held during the reporting period on 8 May 2019 and 23 October 2019.

The minutes of the meetings are provided as **Appendix 5**. A brief overview of the meetings is provided below.

8 May 2019 CCC Meeting

The committee was given an overview of the activities undertaken in 2018 as presented in the Annual Review and for the current year to date. The committee was updated on operations, a site inspection by the DPIE, the approved retiring of biodiversity credits for Stage 1 and 2, and ongoing rehabilitation.

23 October 2019 CCC Meeting

The committee was updated on activities undertaken for the year to date in relation to sales, blasting, community sponsorship, complaints, monitoring and non-compliances. Photographs were presented showing the various rehabilitation works completed over the last four years. Mr Mo Yunusa addressed questions from the community representative regarding overburden, biodiversity credits and dust monitoring, who was satisfied with the response.

10.3 ENVIRONMENTAL COMPLAINTS

Metromix received no complaints as a result of its activities in 2019. A copy of the complaints record is provided in **Appendix 6**. This is consistent with the history of very few complaints at the Quarry. It should also be noted that the majority of historical complaints have related to traffic or transport matters. This demonstrates Metromix's successful management of operations during the reporting period.

10.4 COMMUNITY INVOLVEMENT

Throughout the reporting period, Metromix donated \$600 to the Teralba Bowling Club and \$12 000 to the Teralba Public School. Metromix also donated \$600 to the Mystery Box Rally supporting cancer research.

11. INDEPENDENT AUDIT

No independent audits of the operation were undertaken during the reporting period. The last Independent Environmental Audit was undertaken at the Quarry by Trevor Brown & Associates on 20 and 21 February 2017 and the Audit Report was submitted to DPE in March 2017. The nominated audit period was February 2014 to February 2017. Acceptance of the Independent Environmental Audit was provided by DPE on 17 January 2018 with the following comments.

1. DPIE requested that the next audit period include January and February 2017 (i.e. the next audit will be for the period from January 2017 to December 2019).
2. Further discussion of compliance with criterion for Total Suspended Particulates (TSP) in the next annual review including indicative calculations where appropriate.

Metromix agrees with the Department's request regarding the audit period. A more detailed discussion of compliance with assessment criteria for TSP has been included in Section 6.4.4.

It is noted that an Independent Environmental Audit was undertaken for the period between January 2017 and December 2019 on 3 and 4 February 2020. As this was outside the reporting period, it will be discussed in the Annual Review for the 2020 reporting period. However, as the audit report was completed prior to this document being finalised, the report has been used in lieu of an internal compliance review for the reporting period with the outcomes described in Section 2.

12. INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

12.1 PROJECT APPROVAL PA10_0183

An Independent Environment Audit for the period 1 January 2017 to 31 December 2019 was undertaken on 3 and 4 February 2020 by Mr James Hart of AQUAS. The audit report and response to audit recommendations was submitted to DPIE on 16 March 2020. The following non-compliance issues were identified in the audit relating to the reporting period.

- Non-compliance with Condition 2 of Schedule 2 of PA 10_0183 was noted on the basis that generally compliance was not maintained. This issue does not require specific action.
- Metromix was not compliant with Condition 19(f) of Schedule 3 of PA 10_0183 it was not able to monitor and report on compliance with deposited dust criteria for one location during January 2019. This non-compliance occurred after a landowner withdrew consent for the deposited dust gauge to be placed on their property. A new location was identified, and a complete 30 days of monitoring was possible during February 2020. It is noted that other results during 2020 indicate compliance with the criteria for deposited dust through 2020 at all locations.
- An estimate of the quantum of the rehabilitation bond for the Quarry was provided to DPIE on 17 February 2020 but is yet to be approved by DPIE. The bond was due for review within six months of approval of the Biodiversity and Rehabilitation Management Plan (approved on 18 June 2019) in accordance with Condition 61 of Schedule 3 of PA 10_0183.
- Metromix did not comply with Condition 5 of Schedule 5 of PA 10_0183 that requires review and if necessary update and approval of management plans following of the submission of an:
 - annual review;
 - incident report;
 - audit report; and
 - any modifications to the approval,
- Management plans for the operation had not been approved by DPIE within the specified timeframe. However, it is noted that all plans have now been approved and have been implemented.

12.2 ENVIRONMENT PROTECTION LICENCE

Metromix holds Environment Protection Licence (EPL) 536 for a 'land-based' extractive industry. The licence has an anniversary date of 01 June. As noted in Section 12.1 an Independent Environmental Audit of the conditions of EPL 536 has confirmed the following non-compliance issues during the reporting period.

- Compliance with condition M2.2 requiring air quality monitoring of deposited dust at the locations nominated in the licence. Monitoring at one location (EPL location 10) was not possible in January 2019 as noted above.
- During the Independent Environmental Audit it was identified that the Metromix complaints register did not include all information required under EPL Condition M5.2. It is noted that there were no complaints during 2019.
- EPL Condition R4.2 notes that noise compliance assessment reports must be submitted to the EPA within 30 days of completion of monitoring. This was not the case in for both monitoring rounds in 2019.

It is noted that each of these issues are administrative in nature and did not represent risks of environmental harm. Metromix has committed to resolving these issues for ongoing operations.

The Annual Return covering the reporting period to 1 June 2019 identified that monitoring of deposited dust did not occur in accordance with Condition M2.2 for the licence period (from July 2018 to June 2019).

EPL 13015 was transferred to Metromix in July 2015 and relates to resource recovery and storage activities associated with the operation of the pugmill. These activities are relevant to PA 10_0183 and therefore not considered in this document.

12.2.1 Discrepancies with Predicted and Actual Quarry Operations

As prescribed by *Condition 5(4)(e)*, the identification of discrepancies between the predicted and actual impacts of the Quarry are to be provided within this document with any significant discrepancies analysed to determine the potential cause and follow-up actions taken.

An analysis was undertaken as part of the review of environmental management (see Section 6 and Section 7) and it is noted that the operation of the Quarry has proceeded generally in accordance with the predictions in the Environmental Assessment for the Project, with no significant discrepancies identified. No change occurred to the operations of the Quarry throughout 2019 that would contribute to any discrepancies in impacts.

Due to the presence of powerlines in the area designated as extraction stage 1C in the Southern Extension, Metromix have commenced operations in Stage 2 prior to completing extraction in Stage 1C (see **Figure 3**). This minor deviation in schedule will not sterilise any resource nor create or exacerbate environmental or amenity impacts. Therefore it is considered that this approach is consistent with PA 10_0183. The powerlines would be relocated during the next reporting period and operations within Stage 1C would commence once the existing powerlines are removed and it is safe to proceed.

13. ACTIVITIES TO BE COMPLETED DURING THE NEXT REPORTING PERIOD

13.1 INTRODUCTION

The following section provides a brief summary of the operational activities planned throughout the 2020 reporting period. **Figure 15** presents the location(s) of the activities described.

13.2 EXTRACTION OPERATIONS

Extraction would continue in the Southern Extraction Area within Stage 1C and 2 (see **Figure 15**). Operations in Stage 1C are limited by the presence of high voltage powerlines which will be relocated prior to extraction commencing in this area. Extraction in Stage 2 before the completion of Stage 1C will not change the visibility of the operations as these will remain obscured by topographic features to the south and east.

13.3 ABORIGINAL HERITAGE

Operations would continue in accordance with the *Heritage Management Plan* in 2020 including staff training as awareness and the implementation of unexpected find protocols (should they be required).

It is anticipated that the artefacts identified during the 2019 monitoring campaign would be buried in a suitable location identified in consultation with Aboriginal Stakeholders during the next reporting period.

13.4 PROCESSING

Processing activities will continue as per the current reporting period in 2020 with approximately 70% being washed. It is forecast that approximately 500 000t of product will be despatched from the Quarry.

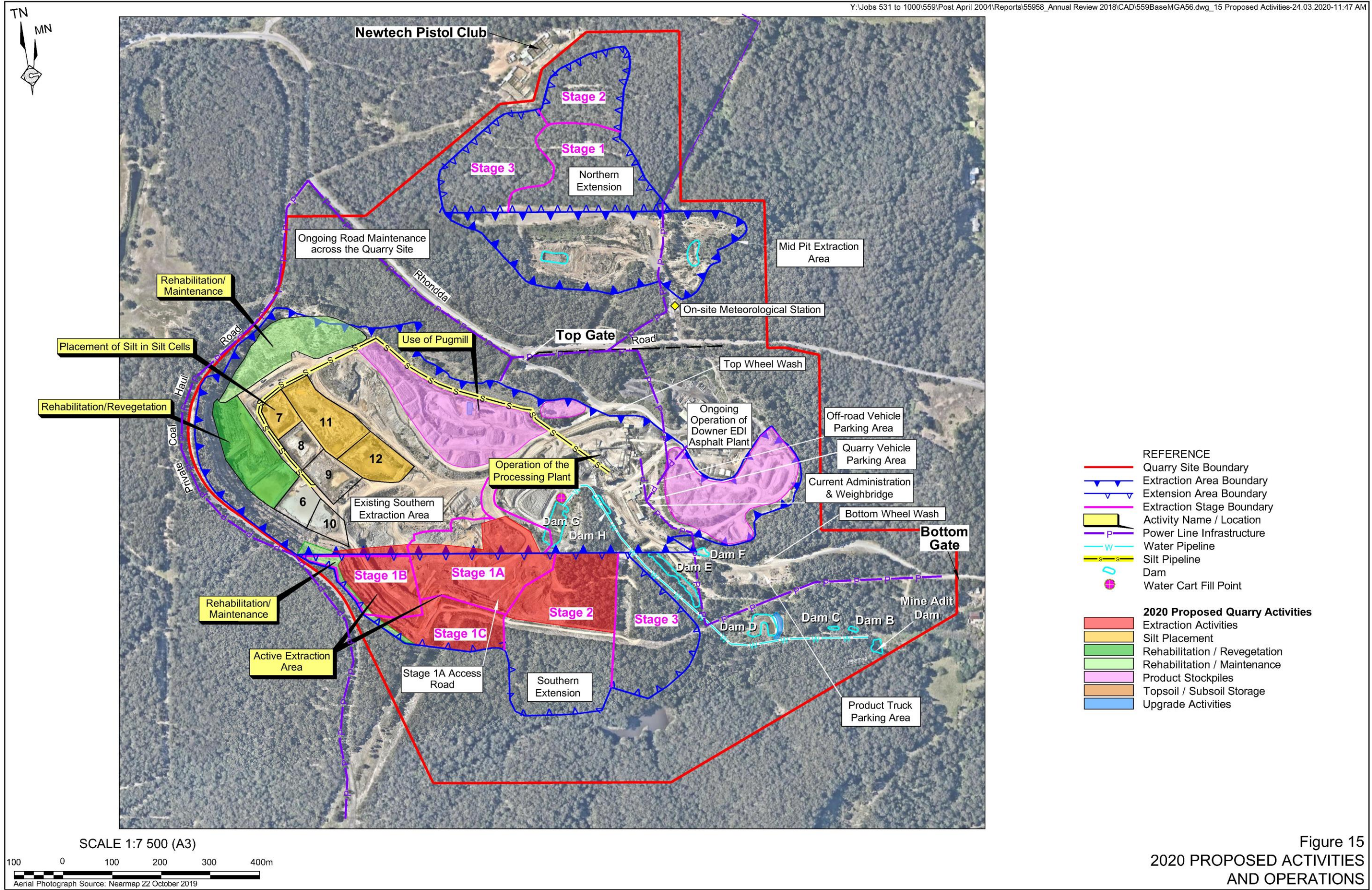
13.5 RECYCLING OPERATIONS

Sale of the remaining material previously stockpiled as part of Civilake's operations will occur in 2020. Metromix will continue to blend conglomerate and concrete washout waste to produce a saleable recyclable roadbase for the civil market.

13.6 OVERBURDEN AND SILT MANAGEMENT

Overburden will be moved in stages during the year as Stage 2 continues to be developed and Stage 1C is commenced. Approximately 80 000t of overburden will be moved to cover Silt Cell 5 and prepare this area for rehabilitation.

Silt will continue to be placed in Silt Cell 5 (until completed) as well as Silt Cells 7, 11 and 12.



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13.7 WASTE MANAGEMENT

General waste, co-mingled Council recycling, paper and cardboard, scrap steel, waste oil, oil filters, etc. will continue to be collected by licenced contractors and volumes and dates recorded.

13.8 SITE INFRASTRUCTURE AND SERVICES

Boundary fencing and gates at easement areas along Rhondda Rd will continue to be replaced/upgraded as needed (see **Figure 15**).

During the next reporting period the powerlines traverse the Quarry site will be relocated around the site.

13.9 FAUNA HABITAT

During the 2020 reporting period Metromix anticipates installing 11 additional nesting boxes to mitigate impacts from relocating the powerlines and extracting from Stage 1C.

13.10 WATER MANAGEMENT

Water management during the 2020 reporting period will continue to utilise the existing surface water management system of the Quarry comprising Dams A to G. Flow meters will also continue to be used to record water that is pumped from the Mine Adit Dam to Dam G.

13.11 BUSH FIRE MANAGEMENT

Bush fire management will continue in accordance with the *Bush Fire Management Plan* during 2020. The 20m Asset Protection Zone (APZ) around the fuel and oil storage areas will be maintained.

13.12 HAZARDOUS MATERIAL MANAGEMENT

The existing diesel tank bunding and management of aerosols and paints within the workshop area would continue as is current practice. Each of these activities would be monitored as part of Metromix's internal auditing.

13.13 PRODUCT TRANSPORTATION

Product despatch will continue in the same manner as it has during the past reporting period. Truck movements will be recorded in and out of the Quarry i.e. with respect to routes, weights and times in accordance with the *Transport Management Plan*. All efforts would be placed on avoiding any exceedance of the limitations nominated in *Conditions 2(8) and 2(9)*.

13.14 VENM/ENM IMPORTATION MANAGEMENT

It is not envisaged any VENM/ENM will be imported into the Teralba Quarry during 2020. However, should it be required for rehabilitation activities, the importation, placement and/or reprocessing of VENM/ENM would not exceed the approved limit of 100 000 tonnes of VENM/ENM per year

13.15 MONITORING

Metromix will continue to undertake and/or commission the following monitoring activities throughout 2020.

- Water Quality Monitoring – Monthly and/or event-related: EPA-4, EPA-5, EPA-6 and EPA-7.
- Flow Measurements: Mine Adit Dam to Dam G.
- Operational Noise: Residences A, B, D, E and H.
- Equipment Noise if there are changes in the equipment fleet.
- Airblast Overpressure and Ground Vibration: all blasts monitored at Locations 1 and 2.
- Meteorology: all parameters – continuously.
- Deposited Dust Monitoring: five locations.
- PM₁₀: every 6 days at Rodgers Street HVAS.
- Nesting Box Usage: 3rd quarter.

13.16 NON-METROMIX OPERATIONS

Road surfacing company Downer EDI is expected to continue business as normal producing and supplying asphalt to the local markets.

Glencore plan to trial trucking flyash along the coal haul road from March 2020.

The Newtech Pistol Club is expected to continue activities in a similar manner to previous years.

14. REFERENCES

ANZECC (2000) *Australian and New Zealand Guidelines Fresh and Marine Water Quality.*

Brown (2017) *Teralba Quarry Independent Audit*, Prepared by Trevor Brown and Associates, February 2017.

DEC (2007) *Approved Methods for Sampling of Air Pollutants in New South Wales*

DECCW (2007) *Methods for the Sampling and Analysis of Air Pollutants in NSW*

DECCW (2010) *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*

EPA (2000) *NSW Industrial Noise Policy*

Spectrum (2019a) *Teralba Quarry – Results of Attended Noise Monitoring: August 2019.*
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Spectrum (2019b) *Teralba Quarry – Results of Attended Noise Monitoring: November 2019.*
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RWC (2011) *Environmental Assessment for the Teralba Quarry Extensions – November 2011.*
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