



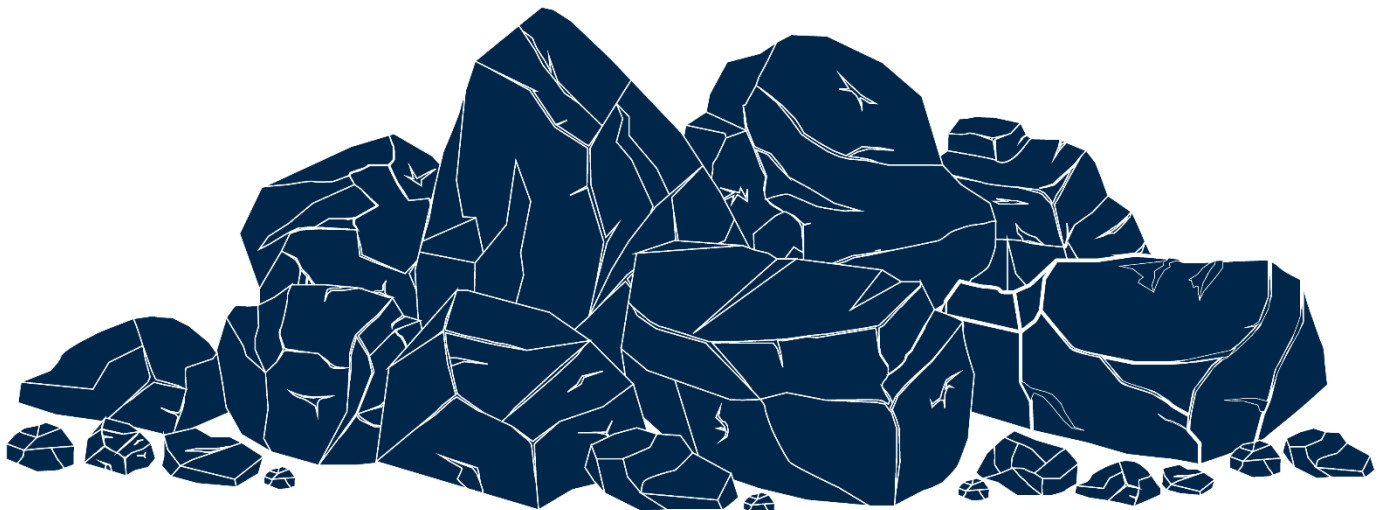
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Karuah East Quarry

Environmental Monitoring Report

March 2024



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1.0 Introduction

This report has been completed to meet the requirements of Section 66(6) of the *Protection of the Environment Operations Act 1997* and the NSW Environmental Protection Authority’s (EPA) Requirements for Publishing Pollution Monitoring Data (EPA, 2013). This report summarises the required monitoring data under Environmental Protection Licence 20611 (the EPL) and Project Approval MP09_0175 (the Consent) for the Karuah East Quarry (the Quarry) as summarised by **Table 1** and **Table 2** respectively.

Table 1 Summary of Environment Protection Licence, EPL 20611

| | |
|---|--|
| EPL Number: | EPL 20611 |
| Licensee’s Name: | Karuah East Quarry Pty Limited |
| Licensee’s Address: | Karuah East Quarry PO Box 3284, Thornton NSW 2322 Blue Rock Close, Karuah NSW 2324 |
| Link to Full Licence on the EPA website: | EPL 20611 |

Table 2 Summary of Project Approval, MP09_0175

| | |
|---|--|
| Project Approval: | MP09_0175 |
| Applicant: | Karuah East Quarry Pty Limited |
| Consent Authority: | NSW Planning Assessment Commission |
| Link to Full Project Approval on the NSW Planning website: | Project Approval MP09_0175 |

A summary of the environmental monitoring data for the March 2024 reporting period (the Reporting Period) is covered in this report. Tables throughout this report provide key monitoring information from the EPL and the Consent, including:

- location of monitoring;
- pollutant;
- unit of measurement; and
- monitoring frequency required.

Monitoring locations are illustrated by the site plan provided by **Appendix 1**.

2.0 Air Quality Monitoring

Dust emissions generated by the Quarry operation must not cause additional exceedances of ambient air quality criterion outlined in Schedule 3, Condition 13 of the Consent and summarised by **Table 3**, **Table 4** and **Table 5**.

Deposited dust and TSP/PM10 monitoring is undertaken at the locations listed in **Table 6**, in accordance with the Approved Methods of Sampling and Analysis of Air Pollutants in NSW (EPA, 2022).

Table 3 Long-term Assessment Criteria for Deposited Dust (MP09-0175).

| Pollutant | Averaging Period | Maximum Increase in Deposited Dust Level ¹ | Maximum Total Deposited Dust Level ¹ |
|----------------|------------------|---|---|
| Deposited Dust | Annual | 2 g/m ² /month | 4 g/m ² /month |

¹ Deposited dust is assessed as insoluble solids as defined by AS 3580.10.1-2003.

Table 4 Long-term Assessment Criteria for Particulate Matter (MP09-0175).

| Pollutant | Averaging Period | Criterion |
|-----------------------------------|------------------|----------------------|
| Total Suspended Particulates | Annual | 90 µg/m ³ |
| Particulate Matter < 10 µm (PM10) | Annual | 30 µg/m ³ |

Table 5 Short-term Assessment Criteria for Particulate Matter (MP09-0175).

| Pollutant | Averaging Period | Criterion |
|-----------------------------------|------------------|----------------------|
| Particulate Matter < 10 µm (PM10) | 24-hour | 50 µg/m ³ |

Table 6 Air Quality Monitoring Locations (EPL 20611).

| Site Monitoring Point ID | EPL Monitoring Point ID | Location | Address | Coordinates |
|--------------------------|-------------------------|----------------------------------|---|-----------------------------------|
| DDG 1 | 4 | South-West of Karuah East Quarry | 54 Mill Hill Close, Karuah NSW 2324 | 32°38'04"S 151°59'58"E |
| DDG 2 | 5 | South-West of Karuah East Quarry | 64 Mill Hill Close, Karuah NSW 2324 | 32°38'02"S 152°00'09"E |
| DDG 3 | 6 | South-West of Karuah East Quarry | Lot 251 DP1092111, Karuah NSW 2324 | 32°37'57"S 151°59'41"E |
| DDG 4 | 7 | East of Karuah East Quarry | 21 Halloran Road, North Arm Cove NSW 2324 | 32° 37' 30.87"S 152°01'10.18"E |
| DDG 5 | 8 | South-West of Karuah East Quarry | Lot 21 DP1024341, Karuah NSW 2324 | 32° 37' 55.33"S 152°00'2.74"E |
| HVAS | 9 | South-West of Karuah East Quarry | 64 Mill Hill Close, Karuah NSW 2324 | 32°38'03"S 152°00'09"E |

2.1 Deposited Dust Monitoring

Deposited dust results for the 12-months prior-to and including March 2024 are summarised by **Table 7**.

Table 7 *Deposited dust monitoring results.*

| Reporting Period | Start Date | End Date | Days | DDG 1 EPL ID 4 | DDG 2 EPL ID 5 | DDG 3 EPL ID 6 | DDG 4 EPL ID 7 | DDG 5 EPL ID 8 |
|-----------------------------------|------------|------------|------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Apr-23 | 05/04/2023 | 04/05/2023 | 29 | 0.3 | 0.5 | 0.3 | 0.2 | 1.2 |
| May-23 | 04/05/2023 | 05/06/2023 | 32 | 0.2 | 0.3 | 0.3 | 0.4 | 0.4 |
| Jun-23 | 06/06/2023 | 04/07/2023 | 28 | 0.6 | 2.5 | 1.8 | – | – |
| Jul-23 | 04/07/2023 | 03/08/2023 | 30 | 0.4 | 0.9 | 1.2 | 1.1 | 0.3 |
| Aug-23 | 03/08/2023 | 04/09/2023 | 32 | 0.7 | 0.3 | 0.5 | 0.5 | 0.2 |
| Sep-23 | 04/09/2023 | 04/10/2023 | 30 | 1.5 | 2.6 | 1.4 | 1.4 | 2.0 |
| Oct-23 | 04/10/2023 | 02/11/2023 | 31 | 1.4 | 2.4 | 2.2 | 1.6 | 2.5 |
| Nov-23 | 02/11/2023 | 30/11/2023 | 28 | 1.6 | – | 1.4 | 1.0 | 2.0 |
| Dec-23 | 30/11/2023 | 28/12/2023 | 28 | 1.1 | 1.0 | 1.3 | 1.3 | 1.7 |
| Jan-24 | 28/12/2023 | 25/01/2024 | 28 | 1.4 | 1.2 | 1.0 | 1.2 | 1.7 |
| Feb-24 | 25/01/2024 | 26/01/2024 | 32 | 1.1 | 0.8 | 1.3 | 1.3 | 1.3 |
| Mar-24 | 26/02/2024 | 28/03/2024 | 31 | 0.8 | 0.9 | 1.8 | 0.6 | 1.8 |
| Progressive Annual Average | | | | 0.9 | 1.2 | 1.2 | 1.0 | 1.4 |

Monitoring results for the Reporting Period at all five DDG monitoring sites are within the long-term annual deposited dust limit of 4 g/m²/month.

It should be noted that DDG 4 and DDG 5 samples in the June 2023 reporting period, and DDG 2 sample in the November 2023 reporting period become contaminated with vegetation matter and are therefore discounted from averaging. These two ‘failure to monitor events’; was reported to the NSW Department of Planning, Housing & Infrastructure (NSW Planning), the NSW EPA and surrounding landholders in accordance with the relevant conditions of the Consent and EPL.

2.2 High Volume Air Sampling

TSP and PM10 results for the Reporting Period are summarised by **Table 8** and illustrated respectively by **Figure 1** and **Figure 2**.

Table 8 *HVAS TSP and PM10 monitoring results for the Reporting Period.*

| Run Date | Total Suspended Particulates, TSP (µg/m ³) | Particulate Matter < 10 µm, PM10 (µg/m ³) |
|------------------------|---|--|
| 06/03/2024 | 40 | 14 |
| 12/03/2024 | 41 | 17 |
| 18/03/2024 | 12 | 4 |
| 24/03/2024 | 10 | 4 |
| 30/03/2024 | 8 | 3 |
| Monthly Average | 22.2 | 8.4 |

Monitoring results for the five HVAS run days within the Reporting Period were compliant with the long-term limits for TSP and PM10 and short-term limits for PM10.

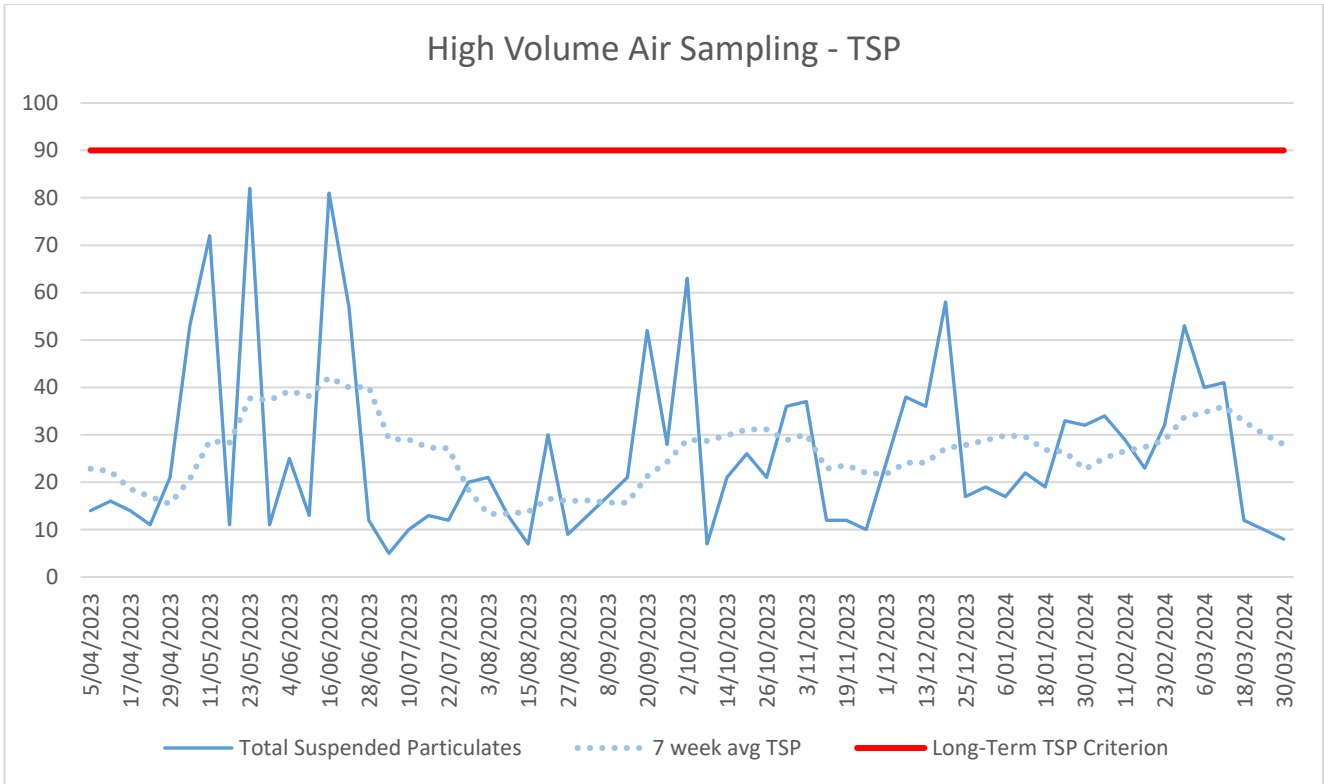


Figure 1 Long-term TSP monitoring trends.

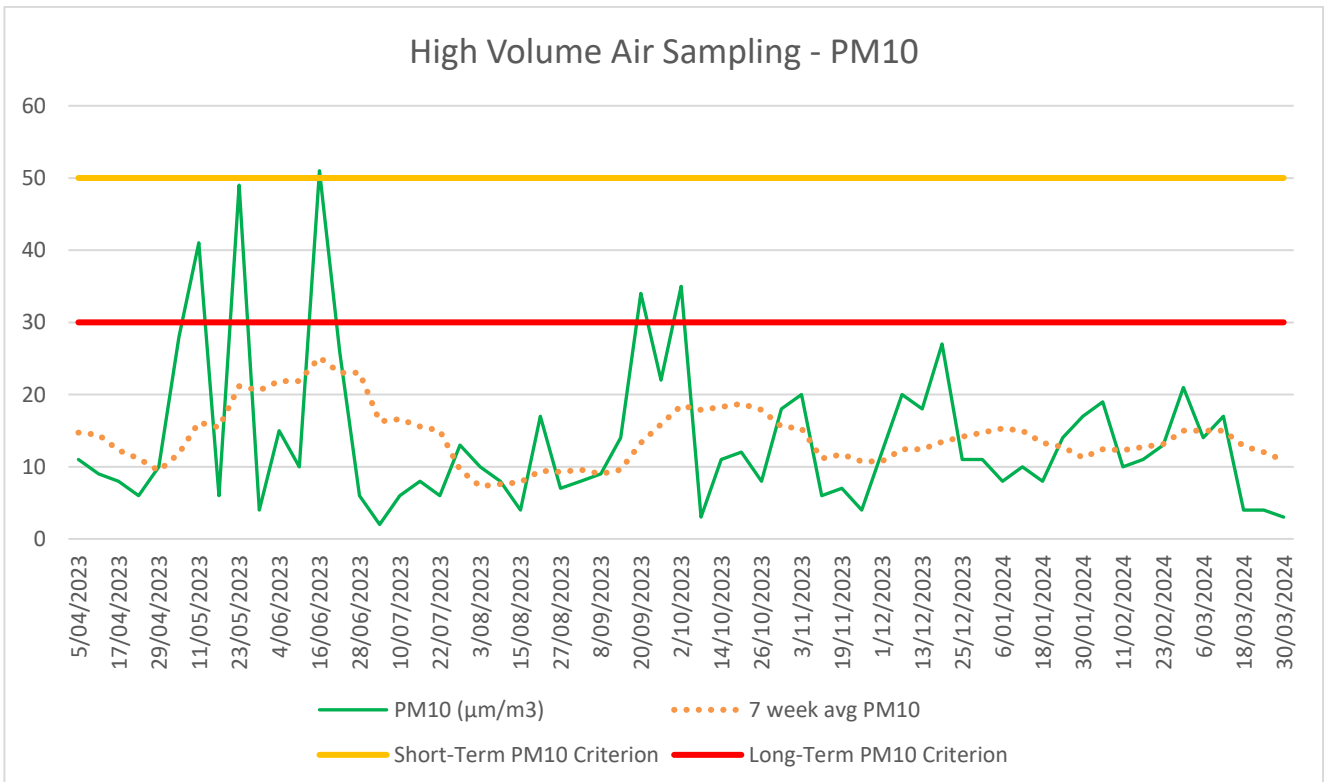


Figure 2 Long-term PM10 monitoring trends.

3.0 Blast Monitoring

Blast monitoring is undertaken for all blasts at the Quarry at the nearest residential location (EPL Monitoring Point 11) to ensure that air blast overpressure and ground vibration remain within the compliance limits, as summarised by **Table 9**; with the monitoring results summarised by **Table 10**.

There was one blast within the Reporting Period and was observed to be within compliance limits.

Table 9 Blasting Airblast Overpressure and Ground Vibration Criteria (MP09-0175 & EPL 20611).

| Location | Airblast Overpressure (dB(L)) | Ground Vibration (mm/s) | Allowable Exceedance |
|----------------------------|-------------------------------|-------------------------|------------------------------------|
| Private Residence B | 120 | 10 | 0% |
| EPL Monitoring Point ID 11 | 115 | 5 | 5% over 12-month reporting period. |

Table 10 Blasting Monitoring Results.

| Date | Time | Location | Airblast Overpressure (dB(L)) | Ground Vibration (mm/s) |
|------------|-------|----------|-------------------------------|-------------------------|
| 11/03/2024 | 13:57 | RL 105 | 112.4 | 0.60 |

*Not triggered = n/t
 Ground Vibration < 0.5 mm/s
 Overpressure < 108 dB(L)

4.0 Noise Monitoring

Noise monitoring is undertaken in accordance with the EPL and NSW Planning approved Noise Management Plan, which requires attended noise monitoring to be conducted on a quarterly basis.

During the Reporting Period, no noise monitoring was completed.

5.0 Surface Water Monitoring

Water monitoring is undertaken in accordance with the EPL and NSW Planning approved Water Management Plan, with daily monitoring of surface water being discharged from the Quarry via the licenced discharge points in accordance with Condition L2 and M2 of the EPL.

Discharge events that occurred during the Reporting Period are summarised by **Table 11**.

Table 11 Discharge Water Monitoring Results.

| Date | pH | Turbidity (NTU) | Total Suspended Solids, TSS (mg/L) | Oil and Grease | Discharge Type |
|----------------------|-----|-----------------|------------------------------------|----------------|----------------|
| LDP 1 – Dam 1 | | | | | |
| - | - | | - | - | - |
| LDP 2 – Dam 2 | | | | | |
| 05/03/2024 | 7.8 | 5.8 | 5 | NV | Controlled |
| 18/03/2024 | 7.6 | 27 | 26 | NV | Controlled |
| 25/03/2024 | 8.8 | 5.2 | 9 | NV | Controlled |
| LDP 3 – Dam 3 | | | | | |
| 04/03/2024 | 7.2 | 5.6 | <5 | NV | Controlled |
| 05/03/2024 | 7.3 | 4.1 | <5 | NV | Controlled |
| 18/03/2024 | 7.3 | 7.0 | 7 | NV | Controlled |
| 19/03/2024 | 7.7 | 5.1 | 5 | NV | Controlled |
| 28/03/2024 | 7.7 | 12 | 8 | NV | Controlled |
| 29/03/2024 | 8.6 | 4.9 | 6 | NV | Controlled |

6.0 Weather Station Monitoring

The Quarry operates and maintains a permanent meteorological monitoring station to record weather parameters including temperature, wind speed and direction, solar radiation and rainfall. **Figure 1** below outlines the weather records for the Reporting Period.

Monthly Weather Summary

Site: **Karuah Quarry Complex**
 Month: **March 2024**

| Date | Day | Temperature @ 2m | | | Temperature @ 10m | | | Winds | | | Solar Radiation | | Rain ² mm |
|---|-----|------------------|------------------|------------------|-------------------|------------------|------------------|-----------------------|------------------------|----------------------|------------------|---------------------|-------------------------|
| | | Max ¹ | Min ² | Ave ¹ | Max ¹ | Min ² | Ave ¹ | Max Gust ¹ | Ave Speed ¹ | Dir Ave ¹ | Max ¹ | Ave ¹ | |
| | | °C | °C | °C | °C | °C | °C | km/h | km/h | deg | W/m ² | W/m ² | |
| 1 | Fri | 40 | 22.3 | 28.9 | 38.7 | 23.3 | 28.9 | 32.3 | 5.8 | 227.5 | 792.5 | 227 | 6.6 |
| 2 | Sat | 32.8 | 23.7 | 26.9 | 30.3 | 24 | 26.5 | 18.4 | 3.8 | 171.6 | 845.8 | 179.5 | 0 |
| 3 | Sun | 32.2 | 19.6 | 23.1 | 31.8 | 19.7 | 23 | 21.3 | 4.1 | 207.1 | 760.7 | 82.5 | 15.8 |
| 4 | Mon | 30.8 | 19.8 | 24.4 | 28.9 | 20.1 | 24.1 | 24.6 | 6.3 | 162.2 | 1081.6 | 183.2 | 0 |
| 5 | Tue | 27 | 13.6 | 20.1 | 24.1 | 14.1 | 19.9 | 21.4 | 5.9 | 177.7 | 990.8 | 134 | 0 |
| 6 | Wed | 27.8 | 14.9 | 20.7 | 25.4 | 15.6 | 20.7 | 18.9 | 4.2 | 154.4 | 933.2 | 162.4 | 0.2 |
| 7 | Thu | 32.6 | 17.2 | 23.7 | 30.4 | 18.1 | 23.5 | 14 | 3.5 | 160.8 | 818.3 | 227.8 | 0 |
| 8 | Fri | 33.7 | 17.5 | 24 | 30.5 | 18 | 23.6 | 19.3 | 3.9 | 162.5 | 792.5 | 225.4 | 0 |
| 9 | Sat | 31.3 | 16.3 | 22.9 | 28.5 | 17.1 | 22.9 | 20.4 | 3.7 | 170 | 965.7 | 192.5 | 0 |
| 10 | Sun | 30.3 | 16.2 | 22.6 | 27.9 | 16.7 | 22.4 | 22.9 | 4.3 | 170.8 | 907.4 | 207.4 | 0 |
| 11 | Mon | 30.9 | 16.1 | 22.7 | 28.5 | 16.9 | 22.7 | 23.5 | 4.2 | 150.8 | 1039.2 | 185.2 | 0 |
| 12 | Tue | 31.5 | 15.3 | 22.5 | 29.4 | 16.5 | 22.5 | 20.2 | 4.5 | 163.7 | 953.3 | 199.2 | 0 |
| 13 | Wed | 34.6 | 14.1 | 22.8 | 32.2 | 14.9 | 22.7 | 13.7 | 3 | 188.1 | 799.2 | 233.9 | 0 |
| 14 | Thu | 30.5 | 16 | 22.1 | 27.8 | 16.6 | 22.1 | 23 | 4.4 | 168.3 | 1034.2 | 176.3 | 0 |
| 15 | Fri | 36.2 | 19.5 | 25.5 | 34.2 | 19.6 | 25.1 | 23.2 | 7.4 | 186.7 | 747.5 | 205 | 4 |
| 16 | Sat | 26.4 | 15 | 20.7 | 24.6 | 15.8 | 20.6 | 28.1 | 7.4 | 178.5 | 1040 | 149 | 0 |
| 17 | Sun | 24.9 | 17 | 20.7 | 23.8 | 17 | 20.6 | 18.1 | 3.6 | 164.7 | 820 | 100.1 | 7.6 |
| 18 | Mon | 24.1 | 16.3 | 18.9 | 23.4 | 16.5 | 18.8 | 15.3 | 2.8 | 170.6 | 895.7 | 96.9 | 9 |
| 19 | Tue | 24.7 | 17 | 19.7 | 23.6 | 17.3 | 19.7 | 15.6 | 3 | 172.4 | 831.7 | 82.8 | 4.8 |
| 20 | Wed | 30.4 | 18.8 | 23.7 | 28.2 | 19.6 | 23.6 | 17.2 | 4.6 | 142.8 | 923.3 | 182.6 | 0.2 |
| 21 | Thu | 26.5 | 18 | 21 | 25.6 | 18.3 | 20.9 | 26.4 | 8.3 | 172.5 | 392.5 | 46.1 | 7.2 |
| 22 | Fri | 25.1 | 15.7 | 19.3 | 22.1 | 15.5 | 18.7 | 23.5 | 5.7 | 202.6 | 1044.1 | 192.4 | 5.4 |
| 23 | Sat | 24.3 | 12.3 | 17.4 | 23 | 12.9 | 17.7 | 16 | 2.9 | 184.2 | 992.5 | 138.7 | 0.2 |
| 24 | Sun | 25.5 | 16 | 19.5 | 24.1 | 16.1 | 19.4 | 15.1 | 2.8 | 191.5 | 725.7 | 115.5 | 0 |
| 25 | Mon | 28.1 | 14 | 19.5 | 25.8 | 14.8 | 19.5 | 13.7 | 3.2 | 160.5 | 905 | 154.5 | 0.2 |
| 26 | Tue | 31.4 | 13.6 | 21.2 | 28.6 | 14.7 | 21.4 | 15.7 | 3.1 | 150.8 | 818.3 | 187.1 | 0 |
| 27 | Wed | 30.6 | 14.6 | 20.4 | 27.9 | 14.9 | 20.4 | 17.6 | 3.6 | 172 | 786.7 | 175.3 | 0.8 |
| 28 | Thu | 26.6 | 15.9 | 20 | 25.1 | 16.3 | 19.9 | 18 | 3.4 | 183.5 | 979.2 | 123 | 8.8 |
| 29 | Fri | 25.4 | 17.8 | 20.4 | 23.9 | 18 | 20 | 18.3 | 4.3 | 168.2 | 956.6 | 129.7 | 0.2 |
| 30 | Sat | 24.6 | 13.6 | 18.2 | 23.4 | 13.9 | 18.4 | 10.5 | 1.9 | 157.6 | 705 | 84.6 | 0.4 |
| 31 | Sun | 28.6 | 13.6 | 19.6 | 26.8 | 13.7 | 19.7 | 16.5 | 3.3 | 166.6 | 804.2 | 174.4 | 0.2 |
| Ave or Total | | 29.3 | 16.5 | 21.7 | 27.4 | 17.0 | 21.6 | 19.4 | 4.3 | 172.9 | 873.6 | 159.8 | 71.6 |
| High | | 40.0 | 23.7 | 28.9 | 38.7 | 24.0 | 28.9 | 32.3 | 8.3 | | 1081.6 | 233.9 | 15.8 |
| Low | | 24.1 | 12.3 | 17.4 | 22.1 | 12.9 | 17.7 | 10.5 | 1.9 | | 392.5 | 46.1 | |
| Notes: 1. Values are for the 24 hour period from 9am to 9am next day. | | | | | | | | | | | | No. rain days >1mm: | 9 |
| 2. Values are for the 24 hours to 9am. | | | | | | | | | | | | | |

Figure 1 Weather Records Summary during the Reporting Period.

7.0 Production Data

Monthly monitoring of sales and truck movements are summarised by **Table 12**.

Table 12 *Quarry Production Data.*

| Month | Truck Movements | Quarry Product Sales (t) |
|--------|-----------------|--------------------------|
| Jan-24 | 3,559 | 109,693 |
| Feb-24 | 2,649 | 82,999 |
| Mar-24 | 3,003 | 92,042 |

8.0 Reporting

8.1 Reportable Environmental Incidents

During the Reporting Period, no reportable environmental incidents occurred at the Quarry.

8.2 Reportable Non-Compliances

During the Reporting Period, no reportable non-compliances were identified at the Quarry.

8.3 Community Complaints

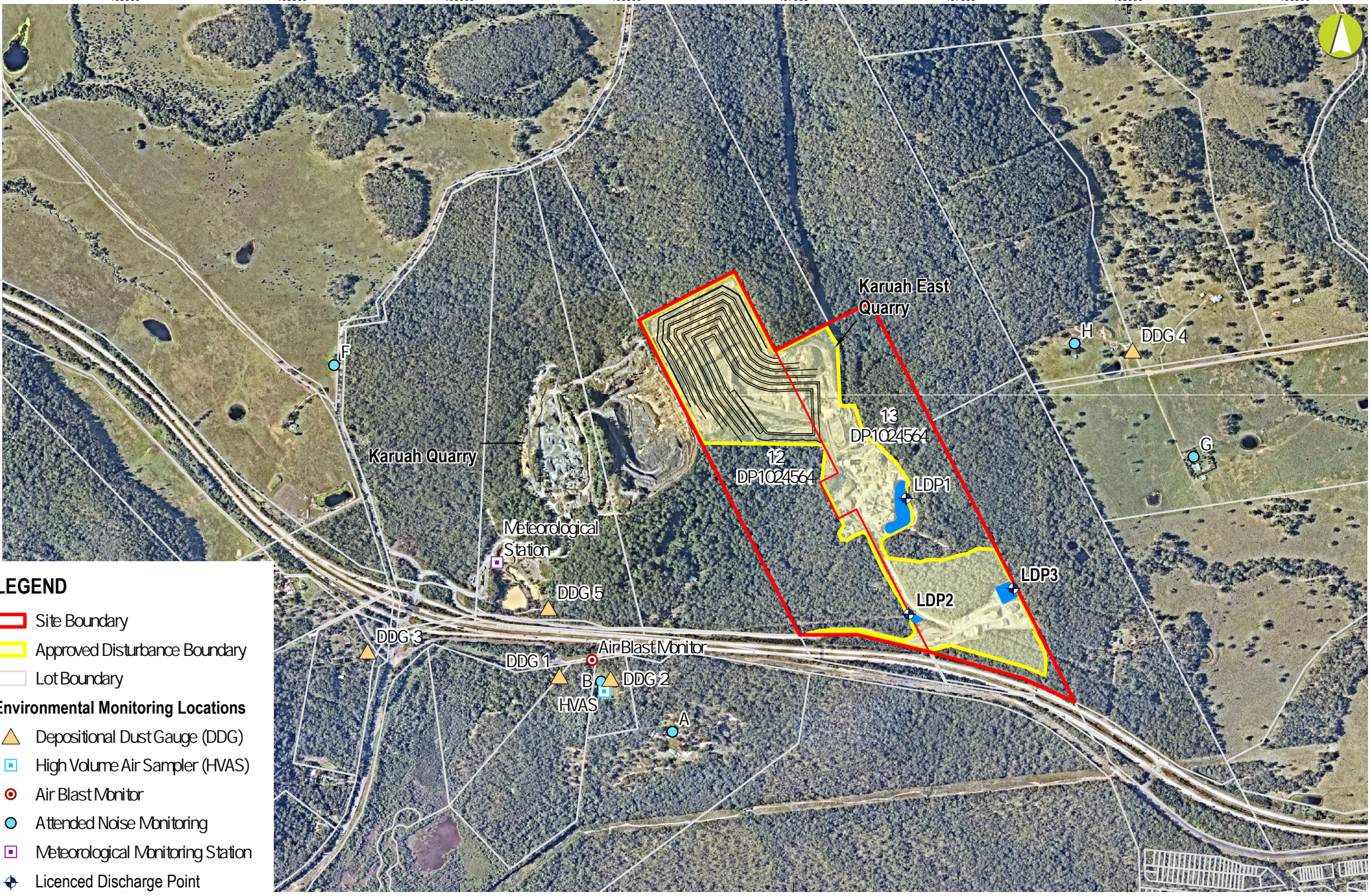
During the Reporting Period, no community complaints were reported to the Quarry.

Appendix 1 – EPL 20611 Monitoring Locations

405000 405500 406000 406500 407000 407500 408000 408500



6389500 6390000 6390500 6391000 6391500 6392000



LEGEND

- Site Boundary
- Approved Disturbance Boundary
- Lot Boundary
- Environmental Monitoring Locations**
- Depositional Dust Gauge (DDG)
- High Volume Air Sampler (HVAS)
- Air Blast Monitor
- Attended Noise Monitoring
- Meteorological Monitoring Station
- Licenced Discharge Point



GDA 1994 MGA Zone 56
8/03/2024

Karuah East Quarry

