



# Karuah East Quarry (PA 09\_0175)

## Company Report & Overview

Community Consultative Committee

3 September 2018

# 1. Progress of the Quarry



| Management Area             | Task                                    | Status  |
|-----------------------------|---|---|
| Extraction                  | General                                 | <ul style="list-style-type: none"> <li>Approximately 3.5 hectares of vegetation was cleared in the upper extraction area to expose more material.</li> <li>New benches have been formed higher in the hill.</li> </ul>  |
|                             | Blasting                                | <ul style="list-style-type: none"> <li>A total of <b>8</b> blasting events have been undertaken since the beginning of 2018 with 6 blasting events in the past 6 months.</li> </ul>   |
| Production & Sales          | Volume (tonnes)                         | The total volume of material produced and transported from the Quarry from 1 January to 31 August 2018 was 117,811 tonnes.  |
|                             | Truck Movements                         | Since the beginning of 2018, there have been approximately <b>3,800</b> laden truck movements from Karuah East Quarry. This equates to an average of <b>~15</b> laden truck movements per day.  |
| Construction                | Stage 2 of Crushing Plant               | <ul style="list-style-type: none"> <li>Construction commenced on Stage 2 of the Crushing Plant in July 2018.</li> </ul>   |
| Section 75(W) Modifications | MOD1                                    | <ul style="list-style-type: none"> <li>MOD1 of the Project Approval was granted by the DPE on 27 April 2018.</li> <li>To meet obligations under the EPBC 2014/7282 approval, the Federal Department of the Environment &amp; Energy (DotEE) requested for the Biodiversity Offset Area Management Plan and the <i>Tetratheca juncea</i> Translocation Management Plan to be updated and submitted to the DotEE for review. Both the BOAMP and the TjTMP have been submitted to the DotEE for review.</li> </ul> |
|                             | MOD2                                    | <ul style="list-style-type: none"> <li>The Environmental Assessment for MOD2 was completed and submitted to the DPE on 30 August 2018.</li> <li>MOD2 is for the increase of disturbance area of 1.133ha adjacent to the western side of internal haul road.</li> </ul>  |
| Reporting                   | 2017 Annual Review                      | <ul style="list-style-type: none"> <li>The 2017 Annual Review was completed and submitted to the DPE at the end of March 2018. The 2017 Annual Review can be downloaded and viewed from the Hunter Quarries website.</li> </ul>   |
|                             | EPBC 2014/7282 Annual Compliance Report | <ul style="list-style-type: none"> <li>The 2017/2018 EPBC ACR was completed on 26 July 2018. The ACR can be downloaded and viewed from the Hunter Quarries website.</li> </ul>  |

# 1. Progress of the Quarry (cont.)

| Management Area | Task                          | Status  |
|-----------------|-------------------------------|---|
| Biodiversity    | Bi-yearly Nest Box Monitoring | <ul style="list-style-type: none"><li>• First bi-yearly nest box inspections were carried out in June 2018. This was an inspection of the first 30 nest boxes that were placed in the Biodiversity Offset Area in April 2016.</li><li>• A total of 8 Glider boxes showed signs of habitation with two Sugar Gliders (<i>Petaurus breviceps</i>) occupying one of the nest boxes.</li><li>• No evidence of occupation of bat boxes were found.</li></ul> |



Photos: Sugar Gliders found in Nest Box 17 (June 2018).

## 2. Construction & Operational Schedule



Quarry operations at Karuah East Quarry has been reduced and it is expected that operations will not recommence until early 2019.

It is anticipated the following activities will occur over the next 6 months:

- Construction of stage 2 of the Crushing Plant will continue and be completed by early 2019;
- Stripping of overburden and topsoil will occur in the extraction area in order to expose more rock;
- Civil works on internal haul roads; and
- Environmental works (i.e., construction of drains, noise mitigation barriers).

# 3. Monitoring & Environmental Performance



- a) Air Quality Monitoring
- b) Blast Monitoring
- c) Noise Monitoring
- d) Surface Water Monitoring
- e) Groundwater Monitoring

# 3a Air Quality Monitoring



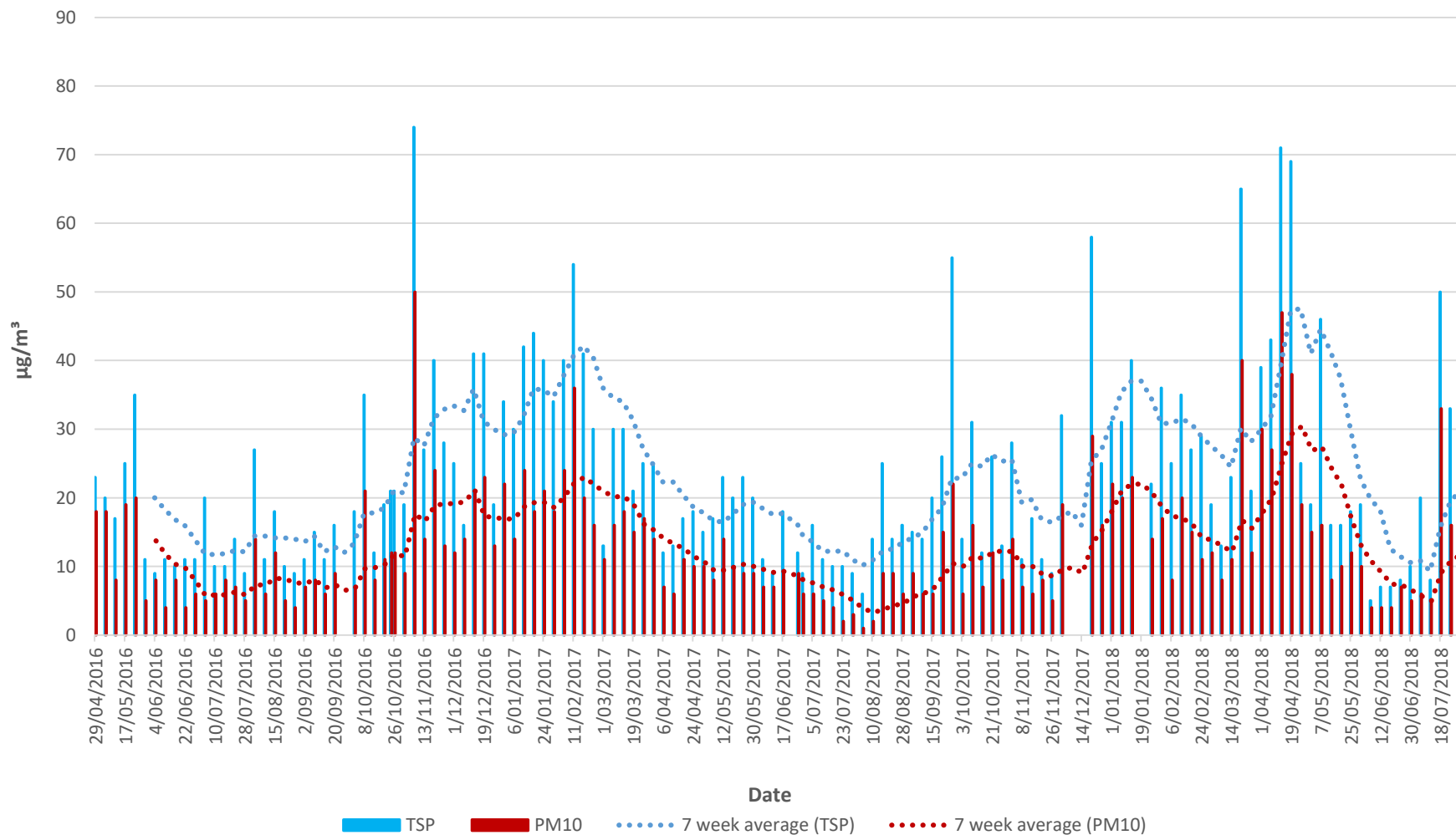
## High Volume Air Sampling (TSP & PM10)

| Date                        | TSP ( $\mu\text{g}/\text{m}^3$ ) | PM10 ( $\mu\text{g}/\text{m}^3$ ) | Comments |
|-----------------------------|----------------------------------|-----------------------------------|----------|
| 2/03/2018                   | 19                               | 12                                |          |
| 8/03/2018                   | 13                               | 8                                 |          |
| 14/03/2018                  | 23                               | 11                                |          |
| 20/03/2018                  | 65                               | 40                                |          |
| 26/03/2018                  | 21                               | 12                                |          |
| 1/04/2018                   | 39                               | 30                                |          |
| 7/04/2018                   | 43                               | 27                                |          |
| 13/04/2018                  | 71                               | 47                                |          |
| 19/04/2018                  | 69                               | 38                                |          |
| 25/04/2018                  | 25                               | 19                                |          |
| 1/05/2018                   | 19                               | 15                                |          |
| 7/05/2018                   | 46                               | 16                                |          |
| 13/05/2018                  | 16                               | 8                                 |          |
| 19/05/2018                  | 16                               | 10                                |          |
| 25/05/2018                  | 18                               | 12                                |          |
| 31/05/2018                  | 19                               | 10                                |          |
| 6/06/2018                   | 5                                | 4                                 |          |
| 12/06/2018                  | 7                                | 4                                 |          |
| 18/06/2018                  | 7                                | 4                                 |          |
| 24/06/2018                  | 8                                | 7                                 |          |
| 30/06/2018                  | 10                               | 5                                 |          |
| 6/07/2018                   | 20                               | 6                                 |          |
| 12/07/2018                  | 8                                | 5                                 |          |
| 18/07/2018                  | 50                               | 33                                |          |
| 24/07/2018                  | 33                               | 16                                |          |
| 30/07/2018                  | 18                               | 10                                |          |
| <b>Year-to-date Average</b> | <b>28</b>                        | <b>16</b>                         |          |
| <b>Limit</b>                | <b>90</b>                        | <b>30</b>                         |          |

# 3a Air Quality Monitoring (cont.)



### High Volume Air Sampling - TSP & PM10



# 3a Air Quality Monitoring (cont.)



## Insoluble Solids (g/m<sup>2</sup>/month)

| Date                                 | DDG 1      | DDG 2      | DDG 3      | DDG 4      | DDG 5      |
|--------------------------------------|------------|------------|------------|------------|------------|
| 31/8/2016 to 28/9/2016               | 2.1        | 1.6        | 0.8        | 0.8        | 0.9        |
| 28/9/2016 to 26/10/2016              | 0.8        | 0.6        | 0.8        | 0.5        | 0.7        |
| 26/10/2016 to 23/11/2016             | 0.7        | 1.0        | 1.3        | 2.3        | 1.9        |
| 23/11/2016 to 21/12/2016             | 1.3        | 0.5        | 0.9        | 1.0        | 4.2        |
| 21/12/2016 to 18/01/2017             | 0.4        | 0.8        | 0.7        | 2.5        | 3.1        |
| 18/01/2017 to 16/02/2017             | 1.3        | 0.9        | 1.2        | 1.2        | 1.9        |
| 16/02/2017 to 20/03/2017             | 0.4        | 1.4        | 0.5        | 3.8        | 1.3        |
| 20/03/2017 to 21/04/2017             | 0.6        | 0.7        | 0.5        | 0.8        | 1.3        |
| 21/04/2017 to 23/05/2017             | 0.6        | 0.6        | 1.1        | 0.8        | 0.8        |
| 23/05/2017 to 20/06/2017             | 0.5        | 1.3        | 0.9        | 1.6        | 0.5        |
| 20/06/2017 to 18/07/2017             | 0.4        | 0.2        | 0.5        | 1.2        | 0.4        |
| 18/07/2017 to 17/08/2017             | 0.6        | 0.5        | 0.6        | 0.5        | 0.8        |
| 17/08/2017 to 14/09/2017             | 1.4        | 0.2        | 1.4        | 1.5        | 0.7        |
| 14/09/2017 to 12/10/2017             | 1.1        | 0.1        | 1.2        | 1.8        | 1.5        |
| 12/10/2017 to 9/11/2017              | 1.7        | 0.5        | 0.9        | 1.0        | 1.2        |
| 9/11/2017 to 7/12/2017               | 1.0        | 1.8        | 0.7        | 1.8        | 2.1        |
| 7/12/2017 to 8/01/2018               | 1.3        | 0.6        | 1.1        | 1.7        | 1.3        |
| 8/01/2018 to 5/02/2018               | 1.5        | 0.8        | 1.3        | 1.0        | 0.7        |
| 5/02/2018 to 5/03/2018               | 1.6        | 1.0        | 1.5        | 1.5        | 2.0        |
| 5/03/2018 to 3/04/2018               | 0.6        | 0.6        | 1.1        | 2.6        | 0.9        |
| 3/04/2018 to 1/05/2018               | 0.8        | 1.0        | 1.0        | 1.7        | 0.7        |
| 1/05/2018 to 30/05/2018              | 0.9        | 0.5        | 0.7        | 1.1        | 0.3        |
| 30/05/2018 to 27/06/2018             | 0.6        | 0.5        | 0.4        | 0.9        | 0.5        |
| 27/06/2018 to 26/07/2018             | 0.7        | 0.6        | 0.6        | 1.2        | 0.6        |
| 26/07/2018 to 23/08/2018             | 0.9        | 0.9        | 0.9        | 1.3        | 0.8        |
| <sup>1</sup> Rolling Annual Average  | <b>1.1</b> | <b>0.7</b> | <b>1.0</b> | <b>1.5</b> | <b>1.0</b> |
| <sup>2</sup> Annual Average Criteria | <b>4.0</b> | <b>4.0</b> | <b>4.0</b> | <b>4.0</b> | <b>4.0</b> |

**Note** <sup>1</sup>: Rolling annual average from EPL 20611 anniversary date of 26 August.

**Note** <sup>2</sup>: Maximum criteria as specified in EPL 20611.



# 3b Blast Monitoring



| Date and time          | Overpressure and vibration | Nearest Resident (Location B) |
|------------------------|----------------------------|-------------------------------|
| 2/02/2018<br>12:53 PM  | Overpressure dB(L)         | 103.9                         |
|                        | Vibration (mm/s)           | 0.42                          |
| 2/03/2018<br>9:58 AM   | Overpressure dB(L)         | Below detection limits        |
|                        | Vibration (mm/s)           | Below detection limits        |
| 13/03/2018<br>12:43 PM | Overpressure dB(L)         | 108.1                         |
|                        | Vibration (mm/s)           | 0.29                          |
| 27/03/2018<br>12:28 PM | Overpressure dB(L)         | 107.0                         |
|                        | Vibration (mm/s)           | 0.40                          |
| 17/04/2018<br>12:32 PM | Overpressure dB(L)         | Below detection limits        |
|                        | Vibration (mm/s)           | Below detection limits        |
| 10/05/2018             | Overpressure dB(L)         | Below detection limits        |
|                        | Vibration (mm/s)           | Below detection limits        |
| 13/06/2018<br>12:34 PM | Overpressure dB(L)         | 113.5                         |
|                        | Vibration (mm/s)           | 0.91                          |
| 19/07/2018<br>1:27 PM  | Overpressure dB(L)         | 110.0                         |
|                        | Vibration (mm/s)           | 0.55                          |

# 3c Noise Monitoring



## 2018 Q1 Monitoring Results

| Location                                       | Date/Start Time/ Weather                          | Primary Noise Descriptor (dBA re 20 µPa)                         |                 |                  |                  |                  | Description of Noise Emissions and Typical Maximum Noise Levels (dBA)  |
|--|---|--|-----------------|------------------|------------------|------------------|--|
|  |   | LAm <sub>ax</sub>  | LA <sub>1</sub> | LA <sub>10</sub> | LA <sub>90</sub> | LA <sub>eq</sub> |  |
| <b>F</b><br><b>Lot 50 DP</b><br><b>1036893</b> | 14/2/2018<br>10:23<br>W = 2m/s WSW<br>Temp = 29°C | 84   | 66              | 53               | 47               | 56               | Local road traffic 56 to 84 dBA  |
|  |   | Karuah East Quarry inaudible                                     |                 |                  |                  |                  | Pacific Highway 41 to 52 dBA<br>Insects 39 to 44 dBA<br><b>Karuah East Project inaudible</b>   |
| <b>G</b><br><b>Lot 3 DP</b><br><b>1032636</b>  | 14/2/2018<br>09:56<br>W = 2m/s WSW<br>Temp = 29°C | 56   | 52              | 50               | 45               | 48               | Aeroplane 43 to 45 dBA<br>Birds/insects 32 to 47 dBA   |
|  |   | Estimated LA <sub>eq</sub> (15 minute) noise contribution 43 dBA |                 |                  |                  |                  | <b><u>Karuah East Quarry Audible</u></b><br>Bulldozers 39 to 46 dBA<br>General drone 37 to 45 dBA<br><b>Estimate LA<sub>eq</sub> (15 minute) KEQ Contribution 43 dBA</b> |

## 2018 Q2 Monitoring Results

| Location                                       | Date/Start Time/ Weather                            | Primary Noise Descriptor (dBA re 20 µPa)                         |                 |                  |                  |                  | Description of Noise Emissions and Typical Maximum Noise Levels (dBA)  |
|--|---|--|-----------------|------------------|------------------|------------------|--|
|  |   | LAm <sub>ax</sub>  | LA <sub>1</sub> | LA <sub>10</sub> | LA <sub>90</sub> | LA <sub>eq</sub> |  |
| <b>F</b><br><b>Lot 50 DP</b><br><b>1036893</b> | 17/5/2018<br>12:28<br>W = 1.5m/s SSE<br>Temp = 19°C | 78   | 62              | 52               | 45               | 53               | Local Traffic 62 – 78 Pacific Highway<br>44 – 46 Birdsong 40 – 53<br><b>Karuah East Project Inaudible</b>  |
|  |   | Karuah East Quarry inaudible                                     |                 |                  |                  |                  |  |
| <b>G</b><br><b>Lot 3 DP</b><br><b>1032636</b>  | 17/5/2018<br>10:46<br>W = 1.5m/s SSE<br>Temp = 19°C | 55   | 52              | 50               | 44               | 47               | Pacific Highway 40 – 50 Birds 40 – 41<br>Frogs 39 - 40   |
|  |   | Estimated LA <sub>eq</sub> (15 minute) noise contribution 46 dBA |                 |                  |                  |                  | <b><u>Karuah East Project Audible</u></b><br>Jaw Crusher 48 – 54<br>General processing plant 44 – 47<br><b>Estimated LA<sub>eq</sub>(15minute) Contribution 46 dBA</b> |

# 3c Noise Monitoring



## 2018 Q3 Monitoring Results

| Location                                       | Date/Start Time/ Weather                          | Primary Noise Descriptor (dBA re 20 µPa)            |     |      |      |      | Description of Noise Emissions and Typical Maximum Noise Levels (dBA)  |
|--|---|---|-----|------|------|------|--|
|  |   | LAmx  | LA1 | LA10 | LA90 | LAeq |  |
| <b>F</b><br><b>Lot 50 DP</b><br><b>1036893</b> | 14/8/2018<br>11:14<br>Temp = 18°C<br>W = 2m/s WSW | 80  | 65  | 51   | 43   | 54   | Local Traffic 62 – 80<br>Pacific Highway 40 – 44<br>Birdsong 45 – 53<br><b>Karuah East Project Inaudible</b>   |
|  |   | Karuah East Quarry inaudible                        |     |      |      |      |  |
| <b>G</b><br><b>Lot 3 DP</b><br><b>1032636</b>  | 14/8/2018<br>9:59<br>Temp = 18°C<br>W = 2m/s WSW  | 75  | 52  | 50   | 46   | 49   | Birds 48 – 49<br>Domestic noise 62 – 75<br>Pacific Highway 46 – 51<br><b>Karuah East Project Audible</b><br>Jaw Crusher 49 – 51<br>Reverse beeper 49 – 50<br>General processing plant 45 – 51<br><br><b>Estimated LAeq(15minute) Contribution 47 dBA</b> |
|  |   | Estimated LAeq(15 minute) noise contribution 47 dBA |     |      |      |      |  |

# 3d Surface Water Monitoring



## Monthly Monitoring Results – Sediment Dams

| Date                 | LDP001 (Dam 1)     |           |              |          | LDP002 (Dam 2)     |           |              |          | LDP003 (Dam 3)     |           |              |          |
|----------------------|--------------------|-----------|--------------|----------|--------------------|-----------|--------------|----------|--------------------|-----------|--------------|----------|
|                      | pH (Lab)           | TSS       | Oil & Grease | EC       | pH (Lab)           | TSS       | Oil & Grease | EC       | pH (Lab)           | TSS       | Oil & Grease | EC       |
| <b>EPL Criterion</b> | <b>6.50 – 8.50</b> | <b>40</b> | <b>5</b>     | <b>-</b> | <b>6.50 – 8.50</b> | <b>40</b> | <b>5</b>     | <b>-</b> | <b>6.50 – 8.50</b> | <b>40</b> | <b>5</b>     | <b>-</b> |
| 30/08/2016           | 6.07               | <5        | <5           | 74       | -                  | -         | -            | -        | -                  | -         | -            | -        |
| 19/10/2016           | 5.57               | 96        | <5           | 317      | -                  | -         | -            | -        | -                  | -         | -            | -        |
| 29/11/2016           | 5.89               | 63        | <5           | 305      | 5.39               | 72        | <5           | 520      | 5.22               | <5        | 34           | 260      |
| 19/12/2016           | 4.97               | 570       | <5           | 335      | 4.75               | 119       | <5           | 559      | 4.75               | 58        | <5           | 284      |
| 22/02/2017           | 5.90               | 145       | 8            | 349      | -                  | -         | -            | -        | 5.28               | 8         | <5           | 323      |
| 21/03/2017           | 5.97               | 383       | 18           | 612      | -                  | -         | -            | -        | 4.78               | 890       | 16           | 286      |
| 21/04/2017           | 6.48               | 21        | <5           | 586      | -                  | -         | -            | -        | 7.09               | 54        | 8            | 431      |
| 19/05/2017           | 6.81               | 11        | <5           | 907      | -                  | -         | -            | -        | 6.97               | 169       | 14           | 500      |
| 16/06/2017           | 5.94               | 220       | 22           | 457      | -                  | -         | -            | -        | 5.95               | 1180      | 25           | 482      |
| 14/07/2017           | 6.50               | 82        | <5           | 462      | -                  | -         | -            | -        | 6.51               | 228       | <5           | 452      |
| 18/08/2017           | 6.81               | 47        | 8            | 515      | -                  | -         | -            | -        | 6.73               | 190       | 12           | 487      |
| 22/09/2017           | 6.98               | 18        | 10           | 492      | 6.61               | 26        | 8            | 444      | 6.80               | 122       | 10           | 520      |
| 23/10/2017           | 6.78               | 90        | <5           | 438      | 6.73               | 336       | 15           | 382      | 6.63               | 164       | 10           | 475      |
| 21/11/2017           | 6.92               | 71        | 39           | 511      | 6.10               | 18        | <5           | 490      | 7.28               | 15        | 31           | 694      |
| 15/12/2017           | 6.55               | 5         | <5           | 580      | 5.55               | 7         | <5           | 455      | 7.10               | 28        | 6            | 838      |
| 19/01/2018           | 7.29               | 9         | <5           | 665      | 7.29               | 37        | <5           | 434      | 7.08               | 10        | 6            | 925      |
| 16/02/2018           | 7.71               | 9         | <5           | 662      | 6.48               | 22        | <5           | 548      | 7.21               | 16        | <5           | 1075     |
| 20/03/2018           | 6.95               | 19        | <5           | 574      | 6.81               | 6         | <5           | 535      | 7.37               | 27        | <5           | 788      |
| 18/04/2018           | 6.40               | 5         | <5           | 529      | 7.70               | 17        | <5           | 490      | 7.10               | 17        | <5           | 830      |
| 18/05/2018           | 5.86               | 12        | <5           | 555      | 5.80               | 4         | <5           | 345      | 6.48               | 21        | <5           | 654      |
| 19/06/2018           | 7.33               | 76        | <5           | 496      | 7.51               | 828       | <5           | 171      | 7.28               | 418       | <5           | 347      |
| 20/07/2018           | 6.50               | 12        | <5           | 600      | 6.80               | 5         | <5           | 540      | 7.40               | 63        | <5           | 570      |
| 17/08/2018           | 6.71               | 12        | <5           | 553      | 6.64               | 5         | <5           | 604      | 7.16               | 14        | <5           | 622      |

**Units:** pH in pH units, Total Suspended Solids (TSS) in mg/L, Oil & Grease in mg/L, Electrical Conductivity (EC) in  $\mu\text{S}/\text{cm}$

**Note:** EPL Criterion is for discharge limits.

# 3d Surface Water Monitoring (cont.)



## Monthly Monitoring Results – Creeks

| Date       | SW1 (Bulga Creek) |     |              |     | SW2 (Bulga Creek) |     |              |     | SW3 (Yalimbah Creek) |     |              |     | SW4 (Yalimbah Creek) |     |              |     |
|------------|-------------------|-----|--------------|-----|-------------------|-----|--------------|-----|----------------------|-----|--------------|-----|----------------------|-----|--------------|-----|
|            | pH (Lab)          | TSS | Oil & Grease | EC  | pH (Lab)          | TSS | Oil & Grease | EC  | pH (Lab)             | TSS | Oil & Grease | EC  | pH (Lab)             | TSS | Oil & Grease | EC  |
| 19/01/2016 | 5.60              | <5  | 9            | 204 | 4.66              | <5  | <5           | 173 | 5.40                 | 6   | <5           | 104 | 5.70                 | 13  | <5           | 201 |
| 25/07/2016 | -                 | -   | -            | -   | 5.97              | 7   | <5           | 158 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 30/08/2016 | -                 | -   | -            | -   | 5.70              | <5  | <5           | 207 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 19/10/2016 | -                 | -   | -            | -   | 5.84              | 7   | <5           | 172 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 29/11/2016 | -                 | -   | -            | -   | -                 | -   | -            | -   | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 19/12/2016 | -                 | -   | -            | -   | -                 | -   | -            | -   | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 21/03/2017 | 4.90              | <5  | <5           | 313 | 4.76              | 12  | <5           | 309 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 31/03/2017 | -                 | -   | -            | -   | 5.70              | 86  | 34           | 319 | -                    | -   | -            | -   | 5.79                 | 9   | 97           | 263 |
| 21/04/2017 | -                 | -   | -            | -   | 5.76              | 12  | <5           | 369 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 19/05/2017 | -                 | -   | -            | -   | 5.89              | 7   | <5           | 414 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 16/06/2017 | 5.47              | 6   | <5           | 329 | 5.54              | 65  | 8            | 313 | -                    | -   | -            | -   | 5.29                 | 6   | 24           | 259 |
| 14/07/2017 | -                 | -   | -            | -   | 5.81              | 47  | <5           | 348 | 5.70                 | 86  | 5            | 237 | -                    | -   | -            | -   |
| 18/08/2017 | -                 | -   | -            | -   | 6.04              | 22  | <5           | 385 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 22/09/2017 | -                 | -   | -            | -   | 6.34              | 10  | <5           | 406 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 23/10/2017 | -                 | -   | -            | -   | 6.42              | 29  | 6            | 323 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 21/11/2017 | -                 | -   | -            | -   | 6.01              | 33  | 17           | 466 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 15/12/2017 | -                 | -   | -            | -   | 6.10              | 23  | <5           | 520 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 19/01/2018 | -                 | -   | -            | -   | -                 | -   | -            | -   | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 16/02/2018 | -                 | -   | -            | -   | -                 | -   | -            | -   | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 20/03/2018 | -                 | -   | -            | -   | -                 | -   | -            | -   | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 18/04/2018 | -                 | -   | -            | -   | 6.60              | 9   | <5           | 550 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 18/05/2018 | -                 | -   | -            | -   | 5.75              | 5   | <5           | 536 | 5.55                 | 12  | <5           | 331 | -                    | -   | -            | -   |
| 19/06/2018 | -                 | -   | -            | -   | 7.10              | 72  | <5           | 255 | 7.00                 | 270 | <5           | 112 | 6.55                 | 61  | <5           | 259 |
| 20/07/2018 | -                 | -   | -            | -   | 6.50              | 14  | <5           | 410 | -                    | -   | -            | -   | -                    | -   | -            | -   |
| 17/08/2018 | -                 | -   | -            | -   | 6.52              | 16  | <5           | 385 | -                    | -   | -            | -   | -                    | -   | -            | -   |

Units: pH in pH units, Total Suspended Solids (TSS) in mg/L, Oil & Grease in mg/L, Electrical Conductivity (EC) in  $\mu\text{S}/\text{cm}$

# 3e Groundwater Monitoring



## Groundwater Levels

| Date       | Unit                | <sup>2</sup> BH205 | <sup>3</sup> BH207 | BH208 | BH303 |
|------------|---------------------|--------------------|--------------------|-------|-------|
| 30/03/2016 | <sup>1</sup> metres | 22.83              | 12.38              | 19.54 | 29.93 |
| 04/10/2016 | <sup>1</sup> metres | 24.00              | 9.61               | 19.77 | 30.45 |
| 04/04/2017 | <sup>1</sup> metres | 25.30              | 9.39               | 19.99 | 30.66 |
| 05/10/2017 | <sup>1</sup> metres | 22.87              | 8.88               | 19.90 | 30.60 |
| 17/01/2018 | <sup>1</sup> metres | 21.98              | 9.12               | 20.27 | 30.67 |
| 18/04/2018 | <sup>1</sup> metres | 21.69              | 9.20               | 20.47 | 30.80 |
| 26/07/2018 | <sup>1</sup> metres | 20.46              | 8.89               | 20.49 | 30.86 |

- Note:**
1. Groundwater levels are measured in metres below ground level.
  2. BH205 was relocated on 26 September 2016.
  3. BH207 was relocated on 13 March 2017.

# 4. Community Complaints



Two (2) complaints were received in the past six months, with one complaint is still pending an outcome.

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**Date/Time of Complaint:** 13 April 2018, 12:45pm

**Method of Complaint:** Phone / Email

**Nature of Complaint:** Noise

Complaint received via CCC member reporting of complaints at properties at Halloran Road.

It was reported that the noise from the Quarry was particularly loud and getting “annoying”. It was identified that the main jaw crusher from the fixed crushing plant was causing the most annoyance. The noise was described as a “thumping”.

An immediate investigation commenced. The outcome of the investigation had indicated that the noise levels were compliant at properties over ~2km from the source of noise, but the noise levels were non compliant at the dwelling identified as Location G in the PA and EPL. It was found that the noise levels at Location was caused primarily by the jaw crusher.

The DPE was notified of the issue and KEQ is presently consulting with the DPE and the complainant in resolving the issue. KEQ have since engaged acoustic and structural engineers to build suitable noise barriers to mitigate the noise emissions.

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**Date/Time of Complaint:** 22 June 2018, 12:42pm

**Method of Complaint:** Email

**Nature of Complaint:** Blasting

Received a complaint from a resident on Halloran Road, North Arm Cove. It was reported that the blasting event that took place on 13 June 2018 caused a horse to spook from the explosion. The horse spooked as a rider was attempting to mount the horse. It was noted that the blast on the 13 June 2018 was noticeable at a great distance from KEQ, which was unusual. Possible cause of this was from the weather conditions at the time of the blast. It was recorded from the blast monitors that the ground vibration and overpressure was within the allowable criterion.

As an outcome, all residents of Halloran and Hunterview Roads, North Arm Cove, have been added to the Quarry’s blast register. Residents on the blast register receive SMS notifications 24 hours before the blast and within 1 hour of the blast.