

5th December 2016

Auckland Council
Private Bag 92300
Auckland 1142

Attention: Naveen Kumar, Water Resources Section

Re: Quarterly Report for Three Kings Quarry, Permit 12977

Dear Naveen

As required by Condition 7 of the above resource consent, please find enclosed records of groundwater level measurements for the period of 1st September 2016 to 30th November 2016.

Should you have any queries please do not hesitate to contact me on 027 504 3624 or at angela.klein@gbcwinstone.co.nz.

Yours faithfully



Angela Klein
Environmental Fill Specialist



Three Kings Quarry – Permit No 12977

Groundwater Take To Dewater Three Kings Quarry

Quarterly Report

December 2016

QUARTERLY REPORT

Three Kings Quarry – Permit No 12977

This report is made with regard to Condition 7 of Permit No 12977 and contains records for the period of 1st September 2016 to 30th November 2016.

The results of groundwater level monitoring within boreholes surrounding the take point have been provided for the reporting period.

A plan showing the location of boreholes in which groundwater levels were measured has also been included in this report.

THREE KINGS GROUNDWATER LEVEL RECORD SHEET

| Date | BH 5B | BH 6A | BH 6B | | BH 6C | | BH 7 | BH 10a | | BH 10b | BH 11b | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------|--------|-------|------|-------|------|-------|
| 21-Sep-16 | 41.68 | 36.58 | 32.41 | 46.38 | 37.42 | 41.37 | 41.41 | 37.38 | 28.14 | 40.47 | 29.58 | 51.18 | 8.09 | 72.67 | 7.46 | 72.53 |
| 19-Oct-16 | 40.88 | 37.38 | 32.05 | 46.74 | 36.90 | 41.89 | 40.61 | 38.18 | 27.78 | 40.83 | 29.14 | 51.62 | 8.07 | 72.69 | 7.43 | 72.56 |
| 16-Nov-16 | 40.71 | 37.55 | 31.99 | 46.80 | 36.84 | 41.95 | 40.72 | 38.07 | 27.70 | 40.91 | 29.08 | 51.68 | 8 | 72.76 | 7.4 | 72.59 |

| Date | BH 12a | | BH 12b | BH 13a | | BH13c | | BH 16 | | BH 17 | | BH 18A | | BH 18B | | |
|-----------|--------|-------|--------|--------|-------|-------|------|-------|-------|-------|-------|--------|-------|--------|-------|-------|
| 21-Sep-16 | 20.99 | 51.24 | 4.99 | 67.14 | 14.22 | 57.95 | 6.87 | 66.54 | 48.48 | 51.66 | 41.35 | 36.53 | 46.76 | 37.74 | 37.57 | 46.93 |
| 19-Oct-16 | 20.69 | 51.54 | 4.99 | 67.14 | 13.5 | 58.67 | 7.23 | 66.18 | 48.21 | 51.93 | 40.36 | 37.52 | 46.36 | 38.14 | 37.62 | 46.88 |
| 16-Nov-16 | 20.54 | 51.69 | 5.06 | 67.07 | 13.57 | 58.60 | 7.18 | 66.23 | 48.12 | 52.02 | 40.30 | 37.58 | 46.18 | 38.32 | 37.7 | 46.80 |

| Date | BH 19A | | BH 19B | | BH 20 | | BH 20a | | BH 21 | | BH 22 | | BH 22a | | BH 23 | |
|-----------|--------|-------|--------|-------|-------|-------|--------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| 21-Sep-16 | 43.5 | 36.55 | 41.04 | 39.01 | 1.29 | 55.37 | 4.88 | 51.86 | 35.02 | 37.29 | 24.04 | 51.20 | 10.06 | 65.08 | 5.35 | 51.85 |
| 19-Oct-16 | 42.46 | 37.59 | 41.36 | 38.69 | 1.34 | 55.32 | 4.30 | 52.44 | 34.31 | 38.00 | 24.00 | 51.24 | 9.62 | 65.52 | 5.27 | 51.93 |
| 16-Nov-16 | 42.38 | 37.67 | 41.40 | 38.65 | 1.34 | 55.32 | 4.32 | 52.42 | 34.22 | 38.09 | 23.92 | 51.32 | 9.55 | 65.59 | 5.21 | 51.99 |

| Date | BH 23a | | BH 24 | | BH 24a | | BH 25 | | BH 25a | | BH 26 | | BH 26a | | BH 27 | |
|-----------|--------|-------|-------|-------|--------|-------|-------|-------|--------|-------|-------|-------|--------|-------|-------|-------|
| 21-Sep-16 | 6 | 51.34 | 6.31 | 56.49 | 2.60 | 60.16 | 20.95 | 38.50 | 10.82 | 48.62 | 1.55 | 57.89 | 4.97 | 54.44 | 0.00 | 49.60 |
| 19-Oct-16 | 5.74 | 51.60 | 6.17 | 56.63 | 2.49 | 60.27 | 20.72 | 38.73 | 10.15 | 49.29 | 1.59 | 57.85 | 4.86 | 54.55 | 0.00 | 49.60 |
| 16-Nov-16 | 5.69 | 51.65 | 6.20 | 56.60 | 2.52 | 60.24 | 20.78 | 38.67 | 10.12 | 49.32 | 1.55 | 57.89 | 4.90 | 54.51 | 0.00 | 49.60 |

| Date | BH28a | BH29 | BH30 | BH33 | BH34 | BH35a | BH35b | BH36a | | | | | | | | |
|-----------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|------|-------|
| 21-Sep-16 | 9.54 | 54.16 | 7.50 | 59.10 | 17.24 | 55.46 | 0.00 | 60.27 | 9.46 | 49.29 | 17.66 | 48.60 | 10.62 | 55.64 | 7.17 | 59.36 |
| 19-Oct-16 | 7.77 | 52.39 | 7.38 | 59.22 | 17.48 | 55.70 | 0.10 | 60.17 | 9.10 | 49.65 | 17.58 | 48.68 | 11.56 | 54.70 | 7.08 | 59.45 |
| 16-Nov-16 | 7.92 | 52.54 | 7.32 | 59.28 | 17.37 | 55.59 | 0.04 | 60.23 | 9.04 | 49.71 | 17.50 | 48.76 | 11.62 | 54.64 | 7.15 | 59.38 |

| Date | BH36b | BH37a | BH37b | BH38a | BH38b | BH39a | BH39b | BH40a | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|------|-------|------|-------|-------|-------|
| 21-Sep-16 | 9.07 | 57.46 | 3.57 | 53.97 | 3.73 | 53.87 | 4.10 | 54.38 | 4.80 | 53.67 | 7.26 | 54.73 | 4.82 | 57.31 | 10.54 | 60.78 |
| 19-Oct-16 | 7.05 | 59.48 | 3.51 | 54.03 | 3.56 | 54.04 | 4.08 | 54.40 | 4.72 | 53.75 | 7.14 | 54.85 | 4.70 | 57.43 | 10.48 | 60.84 |
| 16-Nov-16 | 6.94 | 59.59 | 3.54 | 54.00 | 3.52 | 54.08 | 3.99 | 54.49 | 4.74 | 53.73 | 7.10 | 54.89 | 4.79 | 57.34 | 10.4 | 60.92 |

| Date | BH40b |
|-----------|-------|
| 21-Sep-16 | 8.56 |
| 19-Oct-16 | 8.46 |
| 16-Nov-16 | 8.42 |

Locations of boreholes are marked on the attached plan.

Waterlevels within standpipe piezometers are expressed as depth below surface levels (first column) and as elevations above sealevel (second column). Waterlevels within pneumatic piezometers are expressed as head of water above piezometer tip (first column) and as elevations above sealevel (second column). All values expressed in meters.

BH32 was destroyed by Roading Contractors in June 2011.

The pneumatic piezometer in BH28b stopped producing reliable results and monitoring ceased in July 2012. Waterlevels continue to be monitored by the piezometers installed in BH28a.

The pneumatic piezometers BH25b1 and BH25b2 stopped producing reliable results and monitoring of these ceased in April 2013 and November 2013, respectively. Waterlevels continue to be monitored by the standpipe piezometer BH25.

The pneumatic piezometers 31a and 31b stopped producing reliable result and monitoring of these ceased in January 2014 and July 2012, respectively. Waterlevels continue to be monitored by the standpipe piezometer installed in BH33.

As a result of fill activities the last monitoring round for BH2b was January 2015 with the decommission of this borehole undertaken in early February 2015. Waterlevels within the quarry will continue to be monitored by BH5b. Council was notified of the proposed substitution of BH5b for BH2b via email on 16 December 2014 with approval granted on 17 December 2014.

