



**Three Kings Quarry – Permit No 12977**

**Groundwater Take To Dewater Three Kings Quarry**

**Quarterly Report**

**December 2010**

## **QUARTERLY REPORT**

### **Three Kings Quarry – Permit No 12977**

The following report is made with regard to Condition 7 of Permit No 12977.

This report contains the groundwater levels within boreholes surrounding the take point

A plan showing the location of boreholes in which groundwater levels were measured is attached.

This report contains records for the period of 1 September 2010 to 30 November 2010.

**THREE KINGS GROUNDWATER LEVEL RECORD SHEET**

| Date      | BH 1B |       | BH 2B |       | BH 5B |       | BH 6A |       | BH6B  |       | BH 6C |       | BH 7  |       | BH 10a |       |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|
| 16-Sep-10 | 10.73 | 35.49 | 0.41  | 34.84 | 43.42 | 34.84 | 32.30 | 46.49 | 38.22 | 40.57 | 42.91 | 35.88 | 27.73 | 40.88 | 29.17  | 51.59 |
| 20-Oct-10 | 11.36 | 34.86 | 1.05  | 34.20 | 44.13 | 34.13 | 32.10 | 46.69 | 38.49 | 40.30 | 43.35 | 35.44 | 28.46 | 40.15 | 29.36  | 51.40 |
| 16-Nov-10 | 11.44 | 34.78 | 1.11  | 34.14 | 44.17 | 34.09 | 32.53 | 46.26 | 38.70 | 40.09 | 43.58 | 35.21 | 28.72 | 39.89 | 29.71  | 51.05 |

| Date      | BH 10b |       | BH 11b |       | BH 12a |       | BH 12b |       | BH 13a |       | BH13c |       | BH 16 |       | BH 17 |       |
|-----------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|
| 16-Sep-10 | 8.08   | 72.68 | 7.52   | 72.47 | 20.62  | 51.61 | 4.93   | 67.20 | 11.15  | 61.02 | 7.08  | 66.33 | 48.24 | 51.90 | 43.06 | 34.82 |
| 20-Oct-10 | 8.07   | 72.69 | 7.56   | 72.43 | 20.80  | 51.43 | 5.02   | 67.11 | 12.71  | 59.46 | 7.08  | 66.33 | 48.28 | 51.86 | 43.71 | 34.17 |
| 16-Nov-10 | 8.08   | 72.68 | 7.54   | 72.45 | 21.09  | 51.14 | 5.19   | 66.94 | 15.33  | 56.84 | 7.08  | 66.33 | 48.58 | 51.56 | 43.79 | 34.09 |

| Date      | BH 18A |       | BH 18B |       | BH 19A |       | BH 19B |       | BH 20 |       | BH 20a |       | BH 21 |       | BH 22 |       |
|-----------|--------|-------|--------|-------|--------|-------|--------|-------|-------|-------|--------|-------|-------|-------|-------|-------|
| 16-Sep-10 | 48.09  | 36.41 | 37.64  | 46.86 | 45.18  | 34.87 | 41.29  | 38.76 | 1.19  | 55.47 | 4.22   | 52.52 | 35.00 | 37.31 | 34.02 | 41.22 |
| 20-Oct-10 | 48.39  | 36.11 | 37.76  | 46.74 | 45.84  | 34.21 | 41.47  | 38.58 | 1.22  | 55.44 | 4.65   | 52.09 | 35.86 | 36.45 | 34.02 | 41.22 |
| 16-Nov-10 | 48.7   | 35.80 | 37.95  | 46.55 | 45.90  | 34.15 | 41.46  | 38.59 | 1.45  | 55.21 | 5.17   | 51.57 | 36.07 | 36.24 | 34.04 | 41.20 |

| Date      | BH 22a |       | BH 23 |       | BH 23a |       | BH 24 |       | BH 24a |       | BH 25 |       | BH 25a |       | BH25b1 |       |
|-----------|--------|-------|-------|-------|--------|-------|-------|-------|--------|-------|-------|-------|--------|-------|--------|-------|
| 16-Sep-10 | 9.68   | 65.46 | 5.5   | 51.70 | 5.91   | 51.43 | 6.36  | 56.44 | 1.98   | 60.78 | 21.93 | 37.52 | 9.79   | 49.65 | 9.23   | 48.12 |
| 20-Oct-10 | 9.94   | 65.20 | 5.46  | 51.74 | 5.87   | 51.47 | 6.32  | 56.48 | 1.98   | 60.78 | 22.11 | 37.34 | 10.21  | 49.23 | 9.95   | 48.84 |
| 16-Nov-10 | 10.33  | 64.81 | 5.48  | 51.72 | 6.00   | 51.34 | 6.42  | 56.38 | 1.98   | 60.78 | 22.36 | 37.09 | 11.40  | 48.04 | 9.89   | 48.78 |

| Date      | BH25b2 |       | BH 26 |       | BH 26a |       | BH 27 |       | BH28a |       | BH28b |       | BH29 |       | BH30  |       |
|-----------|--------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|
| 16-Sep-10 | 8.01   | 51.40 | 0.02  | 59.42 | 4.95   | 54.46 | 0.02  | 49.58 | 6.65  | 51.30 | 3.79  | 52.84 | 8.05 | 58.55 | 16.76 | 54.99 |
| 20-Oct-10 | 7.97   | 51.36 | 0.01  | 59.43 | 5.08   | 54.33 | 0.01  | 49.59 | 6.62  | 51.27 | 3.61  | 52.66 | 8.12 | 58.48 | 16.59 | 54.82 |
| 16-Nov-10 | 7.92   | 51.31 | 0.01  | 59.43 | 5.18   | 54.23 | 0.01  | 49.59 | 6.60  | 51.25 | 3.59  | 52.64 | 8.22 | 58.38 | 16.52 | 54.75 |

| Date      | BH31a |       | BH31b |       | BH32 |       | BH33 |       | BH34 |       | BH35a |       | BH35b |       | BH36a |       |
|-----------|-------|-------|-------|-------|------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| 16-Sep-10 | 15.12 | 48.71 | 12.61 | 49.90 | 2.83 | 55.83 | 0.47 | 59.80 | 8.71 | 50.04 | 17.53 | 48.73 | 10.67 | 55.59 | 7.23  | 59.30 |
| 20-Oct-10 | 14.98 | 48.57 | 12.53 | 49.82 | 3.30 | 55.36 | 0.15 | 60.12 | 9.02 | 49.73 | 17.55 | 48.71 | 10.70 | 55.56 | 7.35  | 59.18 |
| 16-Nov-10 | 14.95 | 48.54 | 12.48 | 49.77 | 3.83 | 54.83 | 0.38 | 59.89 | 9.75 | 49.00 | 17.65 | 48.61 | 10.80 | 55.46 | 7.47  | 59.06 |

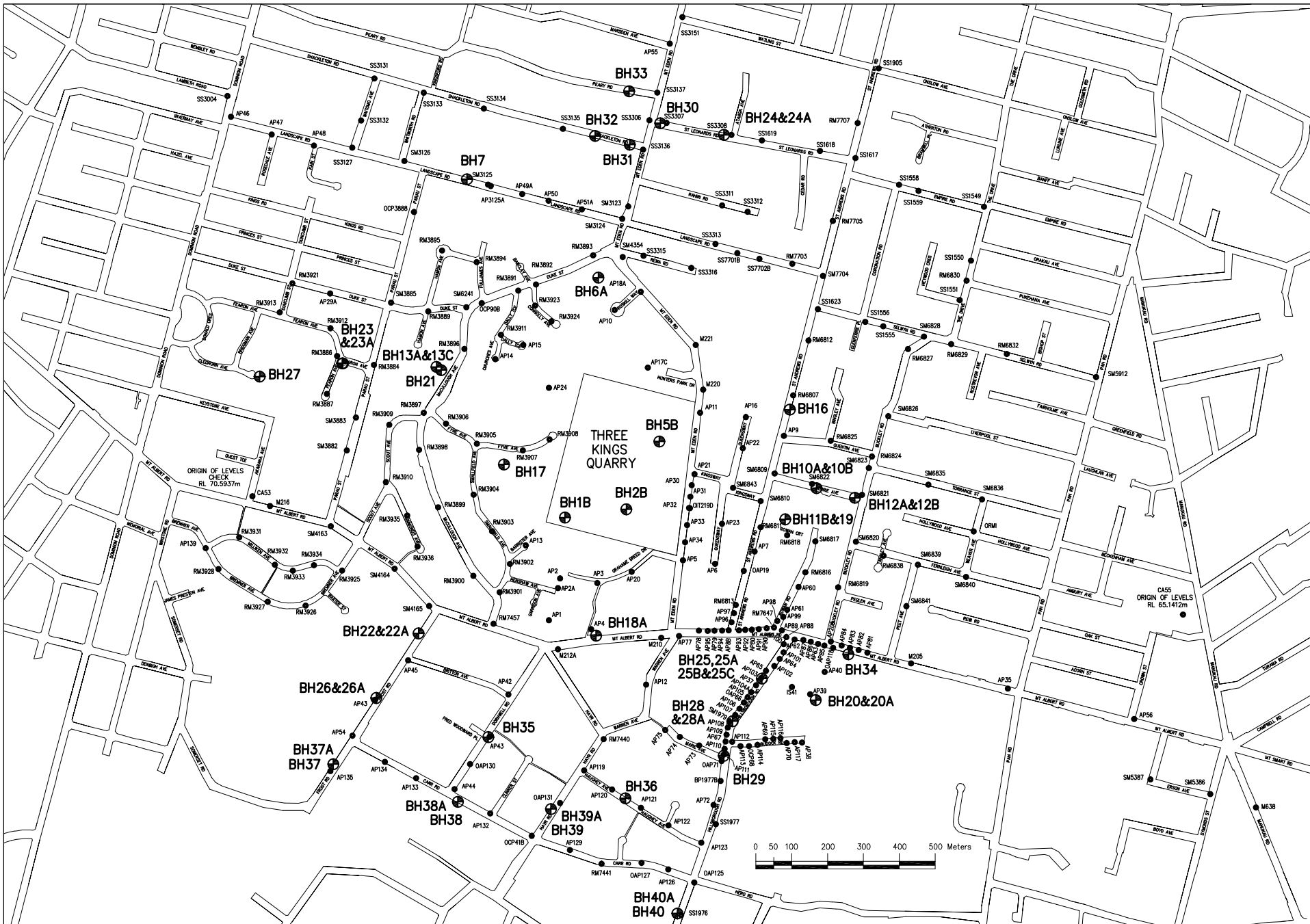
| Date      | BH36b |       | BH37a |       | BH37b |       | BH38a |       | BH38b |       | BH39a |       | BH39b |       | BH40a |       |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 16-Sep-10 | 7.19  | 59.34 | 3.56  | 53.98 | 3.69  | 53.91 | 4.19  | 54.29 | 4.73  | 53.74 | 7.22  | 54.77 | 4.89  | 57.24 | 10.73 | 60.59 |
| 20-Oct-10 | 7.32  | 59.21 | 3.5   | 54.04 | 3.87  | 53.73 | 4.16  | 54.32 | 4.78  | 53.69 | 7.11  | 54.88 | 4.67  | 57.46 | 10.64 | 60.68 |
| 16-Nov-10 | 7.44  | 59.09 | 3.53  | 54.01 | 3.77  | 53.83 | 4.27  | 54.21 | 4.90  | 53.57 | 7.14  | 54.85 | 4.93  | 57.20 | 10.69 | 60.63 |

| Date      | BH40b |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------|-------|-------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 16-Sep-10 | 8.61  | 62.75 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20-Oct-10 | 8.55  | 62.81 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16-Nov-10 | 8.57  | 62.79 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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).



Note:  
 Origin of Levels  
 CA55 S049930  
 RL65.1412m  
 in same terms as  
 M205 S054417  
 RL59.305m

- SS3316 = Precise Level Survey Benchmarks
- ⊕ BH16 = Borehole Location

|           |       |            |              |           |
|-----------|-------|------------|--------------|-----------|
| DESIGNED: | DATE: | SIGNATURE: | PLOT DATE:   | 10/5/05   |
| DRAWN:    | DATE: | SIGNATURE: | CD REF:      | BOREHOLES |
| CHECKED:  | DATE: | SIGNATURE: | SURVEY BY:   | MJD       |
| APPROVED: | DATE: | SIGNATURE: | SURVEY DATE: | 10/3/05   |
| BY:       | DATE: |            | CDR REF:     | BCR       |

ASSOCIATION OF CONSULTING ENGINEERS NEW ZEALAND

ISO 9001 QUALITY ASSURED

**HARRISON GRIERSON**

CONSULTING ENGINEERS SURVEYORS PLANNERS

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PROJECT: WINSTONE AGGREGATES LTD  
THREE KINGS QUARRY

TITLE: BOREHOLE LOCATION PLAN  
AS AT 10-3-05

|              |              |            |           |     |
|--------------|--------------|------------|-----------|-----|
| PLOT STATUS: | PROJECT No:  | SCALE:     | A1 1:5000 | A1  |
|              | 11330/006451 | A3 1:10000 |           | A3  |
|              | DRAWING No:  |            |           | REV |
|              | 6451-100     |            |           | B   |