## 1 Introduction

Baseline monitoring at M3 and C3 was undertaken from 24 January 2007 to 30 January 2007 in accordance with the Groundwater Monitoring Working Plan endorsed by EPD on 31 October 2006 and the Updated Groundwater Monitoring Working Plan submitted to EPD on 31 January 2007.

The results from the baseline monitoring at M3 and C3 are supplementary data to the Groundwater Monitoring Working Plan.

## 2 Baseline Monitoring Methodology

### 2.1 Location of Sampling Works

Table 2-1 shows the respective recharge areas, monitoring wells and control wells for the recharge operation for different excavation zones.

| Zone | Dewatering Period | Recharge Area/Well | Monitoring Well | Control Well |
| :--- | :--- | :--- | :--- | :--- |
| Zone A | Nov 06 to Mar 07 | R2 | M2a | C1/C3 |
| Zone B+C | April 07 to Aug 07 | R2 | M3 | C3 |
| Zone D+E | Mar 07 to Aug 07 | R1 | M1/AGM5a (M4) | C3 |
| Zone F | May 07 to Oct 07 | R1 | M1/AGM5a (M4) | C3 |
| Zone G | Jun 07 to Nov 07 | R1 | M1/AGM5a (M4) | C3 |

Table 2-1 Recharge Areas and Monitoring Locations

### 2.1.1 Sampling Frequency

Groundwater samples from the wells M3 and C3 were collected daily for 7 consecutive days in accordance with the KSL EM\&A manual.

### 2.1.2 Testing Parameters

Groundwater samples were tested for the parameters as listed in Table 5-3 of the Updated Groundwater Monitoring Working Plan.

## 3 Baseline Monitoring Results

### 3.1 Monitoring Results

Table 3-1 summarises average values of the baseline monitoring results at M3 and C3 throughout the sampling period. Detailed baseline monitoring results from M3 and C3 are shown in Table 3-2 and Table 3-3.

| Parameters |  | Discharge Limit | C3 | M3 |
| :---: | :---: | :---: | :---: | :---: |
| Temperature | Average | $<40^{\circ} \mathrm{C}$ | 20.3 | 20.31 |
|  | Range |  | 19.7-22.2 | 19.8-21.8 |
| pH | Average | 6-9 | 7.6 | 7.61 |
|  | Range |  | 7.6-7.6 | 7.6-7.7 |
| Groundwater Level | Average | - | -0.46 | 1.71 |
| Mercury | Average | 1 | 0.51 | N/A |
|  | Range |  | 0.5-0.6 | N/A |
| Cadmium | Average | 1 | 0.41 | 0.20 |
|  | Range |  | 0.2-1.0 | 0.20-0.20 |
| Copper | Average | 100 | 11.14 | N/A |
|  | Range |  | 6.0-26.0 | N/A |
| Lead | Average | 100 | 125.43 | N/A |
|  | Range |  | 64-258 | N/A |
| Zinc | Average | 100 | 50.0 | N/A |
|  | Range |  | 20-130 | N/A |
| Total Toxic Metals | Average | 200 | 187.49 | N/A |
|  | Range |  | 90.7-415.6 | N/A |
| TPH C6-C9 | Average | - | 20.0 | 20.0 |
|  | Range |  | 20.0-20.0 | 20.0-20.0 |
| TPH C10-C14 | Average | - | 62.29 | 69.71 |
|  | Range |  | 49.0-71.0 | 60.0-81.0 |
| TPH C15- C28 | Average | - | 360.43 | 346.57 |
|  | Range |  | 255.0-414.0 | 312.0-394.0 |
| TPH C29-C36 | Average | - | 58.71 | 45.0 |
|  | Range |  | 38.0-87.0 | 36.0-52.0 |
| TPH (Total) | Average | - | 501.43 | 481.29 |
|  | Range |  | 362.0-570.0 | 432.0-541.0 |

Notes:

1. All units are in $\mu \mathrm{g} / \mathrm{L}$ except for groundwater level. Groundwater level is in mPD.
2. No groundwater level limit is stipulated in $T M$.
3. TPH is prohibited substance according to TM.
4. N/A - Testing of the parameters was not carried out. Referring to Section 5.1, the parameters are not of concern at the relevant locations.

Table 3-1 Summary of Baseline Groundwater Monitoring Results

| Parameter | Unit | R.L | 24-Jan-07 | 25-Jan-07 | 26-Jan-07 | 27-Jan-07 | 28-Jan-07 | 29-Jan-07 | 30-Jan-07 | Average |
| :--- | :--- | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Temperature | degree C | 0.1 | 22.2 | 20.1 | 20.1 | 20.1 | 20.1 | 19.7 | 19.8 | 20.30 |
| pH | pH | 0.1 | 7.6 | 7.6 | 7.6 | 7.6 | 7.6 | 7.6 | 7.6 | 7.60 |
| Grounwater Level | mPD | 0.1 | -0.6 | -0.6 | 0.4 | -0.6 | -0.6 | -0.6 | -0.6 | -0.46 |
| Mercury (Dissolved) | $\mu \mathrm{g} / \mathrm{L}$ | 0.5 | $<0.5$ | $<0.5$ | $<0.5$ | $<0.5$ | $<0.5$ | $<0.5$ | $<0.5$ | 0.50 |
| Mercury (Total) | $\mu \mathrm{g} / \mathrm{L}$ | 0.5 | $<0.5$ | $<0.5$ | $<0.5$ | $<0.5$ | 0.6 | $<0.5$ | $<0.5$ | 0.51 |
| Cadmiun (Dissolved) | $\mu \mathrm{g} / \mathrm{L}$ | 0.2 | $<0.2$ | $<0.2$ | $<0.2$ | $<0.2$ | $<0.2$ | $<0.2$ | $<0.2$ | 0.20 |
| Cadmium (Total) | $\mu \mathrm{g} / \mathrm{L}$ | 0.2 | 1 | 0.4 | 0.3 | 0.2 | 0.3 | 0.3 | 0.4 | 0.41 |
| Copper (Dissolved) | $\mu \mathrm{g} / \mathrm{L}$ | 1 | $<1$ | $<1$ | $<1$ | $<1$ | $<1$ | $<1$ | $<1$ | 1.00 |
| Copper (Total) | $\mu \mathrm{g} / \mathrm{L}$ | 1 | 26 | 13 | 9 | 6 | 7 | 6 | 11 | 11.14 |
| Lead (Dissolved) | $\mu \mathrm{g} / \mathrm{L}$ | 1 | 11 | 7 | 13 | 6 | 6 | 8 | 14 | 9.29 |
| Lead (Total) | $\mu \mathrm{g} / \mathrm{L}$ | 1 | 258 | 143 | 89 | 64 | 89 | 84 | 151 | 125.43 |
| Zinc (Dissolved) | $\mu \mathrm{g} / \mathrm{L}$ | 10 | $<10$ | $<10$ | $<10$ | $<10$ | $<10$ | $<10$ | 10 | 10.00 |
| Zinc (Total) | $\mu \mathrm{g} / \mathrm{L}$ | 10 | 130 | 60 | 30 | 20 | 30 | 30 | 50 | 50.00 |
| C6-C9 Fraction | $\mu \mathrm{g} / \mathrm{L}$ | 20 | $<20$ | $<20$ | $<20$ | $<20$ | $<20$ | $<20$ | $<20$ | 20.00 |
| C10-C14 Fraction | $\mu \mathrm{g} / \mathrm{L}$ | 25 | 49 | 60 | 66 | 49 | 70 | 71 | 71 | 62.29 |
| C15-C28 Fraction | $\mu \mathrm{L} / \mathrm{L}$ | 25 | 414 | 371 | 410 | 255 | 336 | 364 | 373 | 360.43 |
| C29-C36 Fraction | $\mu \mathrm{g} / \mathrm{L}$ | 25 | 87 | 63 | 59 | 38 | 43 | 54 | 67 | 58.71 |
| TPH (Total) | $\mu \mathrm{m} / \mathrm{L}$ | 95 | 570 | 514 | 555 | 362 | 469 | 509 | 531 | 501.43 |

Table 3-2 Baseline Groundwater Monitoring Results at C3

| Parameter | Unit | R.L | 24-Jan-07 | 25-Jan-07 | 26-Jan-07 | 27-Jan-07 | 28-Jan-07 | 29-Jan-07 | 30-Jan-07 | Average |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Temperature | degree C | 0.1 | 21.8 | 20.4 | 20.3 | 19.8 | 19.8 | 20 | 20.1 | 20.31 |
| pH | pH | 0.1 | 7.7 | 7.6 | 7.6 | 7.6 | 7.6 | 7.6 | 7.6 | 7.61 |
| Grounwater Level | mPD | 0.1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1.71 |
| Cadmiun (Dissolved) | $\mu \mathrm{g} / \mathrm{L}$ | 0.2 | $<0.2$ | $<0.2$ | $<0.2$ | $<0.2$ | $<0.2$ | $<0.2$ | <0.2 | 0.20 |
| Cadmium (Total) | $\mu \mathrm{g} / \mathrm{L}$ | 0.2 | $<0.2$ | $<0.2$ | $<0.2$ | <0.2 | <0.2 | $<0.2$ | <0.2 | 0.20 |
| C6-C9 Fraction | $\mu \mathrm{g} / \mathrm{L}$ | 20 | <20 | $<20$ | $<20$ | <20 | <20 | <20 | <20 | 20.00 |
| C10-C14 Fraction | $\mu \mathrm{g} / \mathrm{L}$ | 25 | 62 | 73 | 67 | 60 | 81 | 81 | 64 | 69.71 |
| C15-C28 Fraction | $\mu \mathrm{g} / \mathrm{L}$ | 25 | 336 | 362 | 352 | 312 | 394 | 351 | 319 | 346.57 |
| C29-C36 Fraction | $\mu \mathrm{g} / \mathrm{L}$ | 25 | 52 | 51 | 46 | 40 | 46 | 44 | 36 | 45.00 |
| TPH (Total) | $\mu \mathrm{g} / \mathrm{L}$ | 95 | 470 | 506 | 485 | 432 | 541 | 496 | 439 | 481.29 |

Table 3-3 Baseline Groundwater Monitoring Results at M3
Kowloon Southern Link - KDB300 and KDB400 Tunnels, Jordan Road to Nam Hyder Consulting Ltd
n Overrun
Baseline Groundwater Monitoring Results (M3 and C3)
K:IEA01273 KSL KDB300\&400 Env TeamIF-Reports|GroundwaterIBaseline GW Monitoring Results (M3 and

### 3.2 Limit Levels

The limit level for the groundwater level and TPH at monitoring well M3 has been developed from the baseline monitoring results. Limit levels for M1, AGM5a and M2a were previously developed from the baseline results presented in the EPD endorsed Groundwater Monitoring Working Plan. The limit levels for the groundwater level and TPH at the monitoring wells are shown in Table 3-4.

| Parameters | Limit Level |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | M1 | AGM5a (M4) | M2a | M3 |
| Groundwater level | 3.2 | 3.1 | 6.0 | 2.71 |
| TPH (C6-C9) | 284.4 | 148.8 | 238.8 | 24 |
| TPH (C10-C14) | 96 | 50.4 | 122.4 | 97.2 |
| TPH (C15-C28) | 639.6 | 1095.6 | 381.6 | 472.8 |
| TPH (C29-C36) | 63.6 | 48 | 62.4 | 62.4 |

Notes:

1. Exceedance is considered valid only if there is no justification from the monitoring at the control well.
2. Limit level for groundwater level is 1 m above baseline level.
3. Limit level for TPH is $120 \%$ of the maximum concentration of the baseline monitoring. As M2a is close to M 2 , baseline monitoring results of M 2 is considered representative for establishing the limit level of M2a.
4. Limit levels for M1, AGM5a and M2a were presented in the EPD endorsed Groundwater Monitoring Working Plan.
Table 3-4 Limit Levels of Groundwater Level at Monitoring Wells
In case of any exceedance of Limit Levels, actions in accordance with the event and action plan as shown in Table 7-7 in the Updated Groundwater Monitoring Working Plan should be taken.
