MONITORING WELL ID: MW09-3

Keystone Environmental

Project Location: 11900 Haney Place, Maple Ridge. BC.
Drilling Contractor: Beck Drilling
Drilling Equipment/Method: Solid Stem & Hollow Stem Auger
Well Location: Eastern Portion of Site

Project Name/No.: 9213-02
Client: Narland Management
Engineer/Geologist: MLG
Drill Date: April 22, 2009

Depth (ft/m)	Symbol	Soil / Sediment Description	Sample Type	% Recovery	Sample Analyzed (Y,N)	Sample ID	Headspace (PID) ppm	Elevation (m)	Well Construction	Remarks
ft 0 / m 0		Ground Surface						38.80		
		ASPHALT						38.55		
1		***ROADBASE*** Gravelly sand FILL, loose, wet, asphalt debris. Odours and/or staining not observed.								
2		Increasing gravel content with depth.			Y	MW09- 3 (0.76 m)	2.0			
3 / 1		Wet at approximately 0.9 m.								
4					Y	MW09-3 (1.5 m)	1.7			
		CLAY Grey CLAY, very stiff, moist, low plasticity. Odours and/or staining not observed.						37.28		
6										
7 / 2					N	MW09-3 (2.3 m)	2.4			
8										
9					N	MW09-3 (3.1 m)	2.4			
10 / 3		End of Hole						35.75		
11										
12										
13 / 4										
14										
15										
16										

Flushmount in Concrete
Bentonite
10/20 Filter Sand and Screen

Co-ordinates: 4252.688 N, 4165.42 E
Date of Water Level: April 23, 2009
Water Level (from TOC): 0.664 m
Surveyed Water Elevation (m): 38.03 m

Well-Borehole Diameter: 22.0 cm
Well Casing Diameter: 51.0 mm
Well Casing Material: Schedule 40 PVC
Well Screen Slot Size: 0.25 mm (10 slot)

Depth of Well (TOC): 2.330 m
Well Elevation (TOC): 38.71 m
Well Elevation (Ground): 38.80 m
Datum: NAD83/CVGD28

Using the calculated hydraulic gradient, and the hydraulic conductivity, and estimated effective porosity from literature values, the average linear groundwater velocity was calculated for the Fill material:

- Hydraulic gradient of 0.0036;
- Averaged hydraulic conductivity of 5.55 x 10^{-6} m/s; and
- Estimated effective porosity of 25%.

For the fill material, the groundwater velocity was determined to be approximately 25 m per year with an estimated travel time to the Fraser River of 26 years.

4.3.3 PSI 2 Soil Analytical Results

Soil samples from the boreholes drilled during the PSI 2 were submitted to the laboratory for analysis of LEPH, HEPH, PAH, VOC, BTEX, VPH and metals. The analytical results for soil were compared to the CSR CL standards, and are appended in Tables 1 to 4 and presented on Figure 6. Laboratory reports are attached in Appendix O.

4.3.3.1 LEPH, HEPH, and PAH

Soil analytical results indicated that HEPH was detected at concentrations greater than the RDL at MW09-1 (0.76 mbg), MW09-1 (1.2 mbg), and MW09-6 (2.0 mbg), with concentrations of 1,300 µg/g, 2,800 µg/g, and 3200 µg/g respectively; however, these concentrations are less than the CSR CL standard of 5,000 µg/g. The LEPH concentration at MW09-6 (2.0 mbg) was 1,000 µg/g, less than the CSR CL standard of 2,000 µg/g. Various PAH constituents were detected at concentrations less than the CSR CL standards at MW09-6 (2.0 mbg) and BH09-7 (1.4 mbg). The remaining samples did not contain LEPH, HEPH, and PAH at concentrations greater than the RDL, which are less than the CSR CL standards.

4.3.3.2 VOC, BTEX, and VPH

Soil analytical results indicated that VPH at MW09-6 (2.0 mbg) was detected at 590 µg/g, greater than the CSR CL standard of 200 µg/g. Benzene (0.33 µg/g), ethylbenzene (5.9 µg/g) and xylenes (14 µg/g) were also detected in MW09-6 (2.0 mbg) at concentrations greater than the RDL, but less than the CSR CL standards of 10 µg/g, 20 µg/g, and 5 µg/g, respectively. In