

Orica Botany Groundwater Project Community Liaison Committee Newsletter

Issue 11

March 2003

Summary of Meeting No. 16

Community Liaison Committee (CLC) Meeting No. 16 was held on Monday 9 December 2002 at Botany Town Hall.

Voluntary Remediation Agreement

The Stage 4 Voluntary Remediation Agreement between Orica and EPA NSW was issued on 21 May 2002, and will remain in force until December 2004. One requirement of the Agreement is for Orica to issue an Annual Report of progress. This is due at the end of February 2003.

Monitoring Program

In July 2002 groundwater samples from the central EDC (ethylene dichloride) plume were collected from a number of monitoring points on the Botany Industrial Park (BIP), Orica Southlands and off-site (including along Foreshore Road). No significant changes were evident in the shallow groundwater. However, the deep EDC plume continues to move towards Botany Bay and Penrhyn Estuary. Importantly, though, the sampling confirmed that the high concentration zone is a 'slug' (i.e., it does not stretch continuously from the source area on the BIP).

The 'northern' plumes (i.e., a number of smaller plumes emanating from sources in the northern half of the BIP) were also sampled in September 2002. Again, there were no significant changes in either the shallow or deep groundwater, although there was some evidence of some contaminant concentrations decreasing. Orica is hoping to be able to collect some additional groundwater samples from sites of neighbouring companies.

Some extra groundwater sampling was done in Southlands in September and October 2002 to fill in some gaps in the design data for the bioremediation field trials (see overleaf). The data was not available in time for the CLC meeting and will be reported in the next one.

Surface waters were collected from Springvale and Floodvale Drains and Penrhyn Estuary in July 2002. Like the previous sampling round, the results were generally lower than had been measured 18 months previously.

Soil vapour emissions were measured in November 2002. This was last done in July 2001. A 15-18 month sampling pattern is used to assess seasonal effects. Again the data was not available at the time of the CLC meeting, but will be presented at the next one.

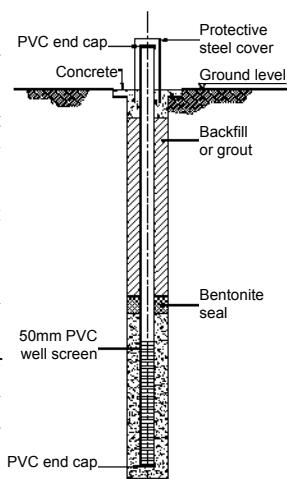
Focus on *Groundwater Monitoring*

You may have noticed in each issue of this newsletter mention of groundwater monitoring. But what does this actually mean and how is it done?

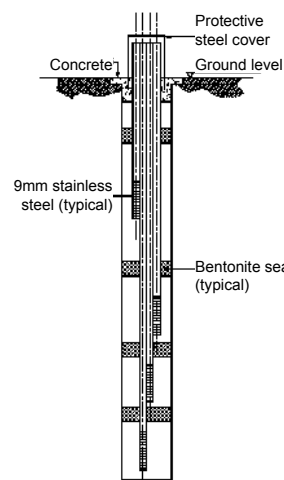
Monitoring is a means of tracking changes – good or bad – in something's performance or condition. With groundwater, this means collecting samples and then analysing them in a laboratory. The results of these analyses are then studied to assess how things are going and whether something needs to be done about it.

Groundwater samples are usually collected from tubes inserted into the ground. These tubes are usually in one of two forms: either a monitoring well; or a piezometer.

Wells are usually 25 or 50 mm in diameter, and are often made from PVC or stainless steel. They are sealed at the bottom, but have closely spaced narrow horizontal slots cut into them near the bottom to let groundwater seep into the well. The length of this "screened interval" may range from a few centimeters to, say, 10 m. The length of this interval is determined by how much the groundwater quality varies with depth and how much detail you wish to find out about that variability.



If the variability is high and you wish to find out a lot of detail about it, you may choose a narrower screened interval, and may install several wells at different depths in a cluster.



However, if you want yet more detail, you may choose to install a bundle of piezometers. These are narrow tubes (~ 9 mm in diameter), usually made from stainless steel. They usually have an open end at the bottom, covered with stainless steel gauze (to prevent soil particles from entering the tube). Piezometers provide groundwater samples from very small depth intervals.

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Remediation Strategy Review

As mentioned in the last newsletter, Orica had engaged Dr Hans Stroo, a highly regarded remediation specialist, of RETEC Associates, USA, to independently review Orica's two-pronged remediation strategy. Compared with available alternatives and given the site conditions, Dr Stroo found that Orica had selected the two most appropriate *in situ* groundwater remediation technologies (i.e., reactive iron barriers and enhanced bioremediation). He recommended that Orica should monitor for any undesirable side effects such as slowing groundwater flow or dissolving metals into the groundwater, and be flexible in the technologies' designs and implementation.

Reactive Iron Barrier

Steady progress is being made with the design and installation of a full-scale reactive iron barrier (FSRIB). This barrier will capture and destroy a range of chlorinated hydrocarbons (CHCs) found in the groundwater flowing under Orica's site. It will be located on Orica Southlands to the southwest of the manufacturing site. URS (the groundwater specialists assisting Orica with the overall Botany Groundwater Project) have been engaged to provide project management services for the installation.

Installation is planned for 2003.

The design of the barrier and the method of construction still need to be finalised. Some groundwater samples were collected from up- and downgradient of the existing pilot-scale (trial) barrier to assess the impact the barrier has on metals dissolved in the groundwater. The results – not yet available – will influence the positioning of the FSRIB.

An Orica representative attended and presented a paper at a Permeable Reactive Barrier conference in the USA in December 2002, primarily to keep in touch with the latest developments in this technology. He also took the opportunity to meet with ETI (the Canadian licensor of the technology), construction contractors and site owners where the barriers are being installed.

Springvale Drain Sediment Removal and Drain Reconstruction

Orica has restored the original alignment of Springvale Drain running through Orica Southlands. The excavated contaminated sediments are being stored in sediment containment structures pending classification for disposal. A formal application to EPA NSW has been made for waste classification, which proposes the removal of 2 small 'hot spots' for separate treatment, and off-site disposal for the remainder.

Bioremediation Field Trials

In late August 2002 Orica submitted a Combined Development & Construction Certificate Application (DA) to the City of Botany Bay for installing and operating field-scale bioremediation research trials. Copies were provided for Council to forward to the DLWC and EPA NSW for their comment. The DA was revised in early October to reflect a relocation of one of the trial areas.

The trials are expected to last 8-18 months. They will be used to assess the feasibility of enhancing the degradation of CHCs in the groundwater by naturally occurring microorganisms. This enhancement will be achieved by injecting selected nutrients into the groundwater, which will help the existing bacteria consume the contaminants.

At present, Orica is working to develop a local supplier of one of the key nutrients. Orica is also trying to secure licensing to use the technology. Once this is achieved, a detailed cost estimate can be finalised for internal approval.

Depending on the internal Orica approvals and also approval of the DA, installation is planned to start in the first quarter of 2003.

Interested readers may find out more about bioremediation in the US EPA's *Citizen's Guide to Bioremediation*. This reader-friendly brochure can be downloaded from the Internet at <http://www.epa.gov/swertio1/download/citizens/bioremediation.pdf>.

Larry Collis

After many tireless years of service with the City of Botany Bay, Larry Collis is retiring as Manager Health and Environmental Services. The CLC would like to thank Larry for his generous support of the Committee and of the community. (A case in point was his stand-in chairmanship of this CLC meeting.) We wish him a long, happy and healthy retirement. β

About this Newsletter

This newsletter aims to keep the Randwick and Botany communities informed about progress of the Orica Botany Groundwater Project. The newsletter is prepared by Orica on behalf of the CLC following each meeting of the CLC. Meetings are held approximately every 3 months.

Who Receives this Newsletter?

This newsletter is distributed throughout the suburbs neighbouring Orica's Botany Site including Banksmeadow, Botany, East Botany, Eastgardens, Hillsdale, Matraville and Pagewood.

Meeting No. 17 is planned for Tuesday 8 April 2003, at 1 p.m. in Botany Town Hall. If you wish to inquire about the CLC or its meetings, please call Orica's Community Hotline on 1800 025 138.