

Bellevue

COMMUNITY UPDATE

Work continues to determine the most effective clean-up options for the former liquid waste treatment and recycling facility at Bellevue. As the site contamination is complex, extensive investigations have been necessary to develop the most appropriate remedial strategy for the site.

On-site investigations and laboratory-based studies are being carried out by consultants, Golder Associates, under contract to the Department of Environment and Conservation (DEC).

Background

Detailed investigations have confirmed that soil and groundwater at the Bellevue site is contaminated with petroleum hydrocarbons and chlorinated solvents. Groundwater contamination extends for about 200m underneath several properties south-west of the site. The contamination can be attributed to both historical site operations and a fire in 2001.

A second, off-site plume, has also been detected. The general direction of contaminated groundwater movement is towards the Helena River.

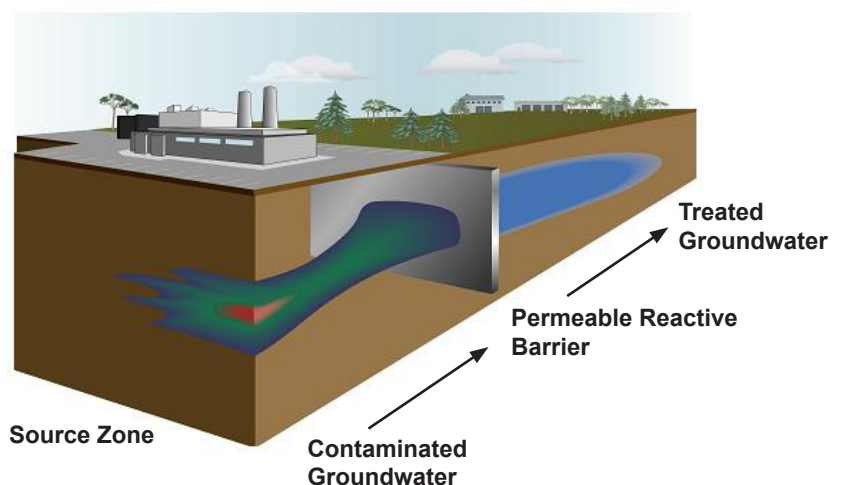
A number of options for cleaning up Bellevue, both on-site and off-site, are being considered.

Off-site groundwater remediation trials

DEC's consultants recommend the installation of a permeable reactive barrier (PRB) at the base of the escarpment in the Damplands area, adjoining the Helena River (WA Planning Commission-owned land).

A PRB is an underground flow-through wall containing granular iron, which intercepts and treats groundwater contaminants and breaks them down to an environmentally acceptable form. Laboratory results have shown that this form of granular iron barrier can successfully remove trichloroethene (TCE) and other site-related contaminants from the groundwater within a contact period of four to eight hours.

Placing a PRB at this location will prevent contaminants from reaching the Helena River. (Note: groundwater monitoring data from October 2008 confirms that contaminants from the former Waste Control site have not reached the river).



Graphic courtesy Adventus

Advantages of PRB technology as a remediation method at Bellevue include:



- Contaminants are destroyed in situ and not transferred to another location for disposal.
- There are no pumps or other electrical or mechanical requirements. It operates continuously with no noise or exhaust emissions.
- The PRB is underground so is not visible and will not affect the use of the land.
- Granular zero valent iron is non-toxic.
- Laboratory tests indicate that there are no harmful by-products following treatment.

Installation of a granular iron permeable reactive barrier at an industrial site (photo courtesy Adventus)

On-site source delineation program



In a first for WA, two specialised, German designed tools (The Rapid Optical Screening Tool (ROST) and the Membrane Interface Probe (MIP) were used to refine the known extent of contamination in the soil profile at Bellevue. Results from these tests show exactly where, at what depth and in what type of soil the contaminants are located, providing a more accurate estimate of the amount of soil that needs treatment compared with traditional soil sampling techniques. This allows different options to be costed and compared more accurately.

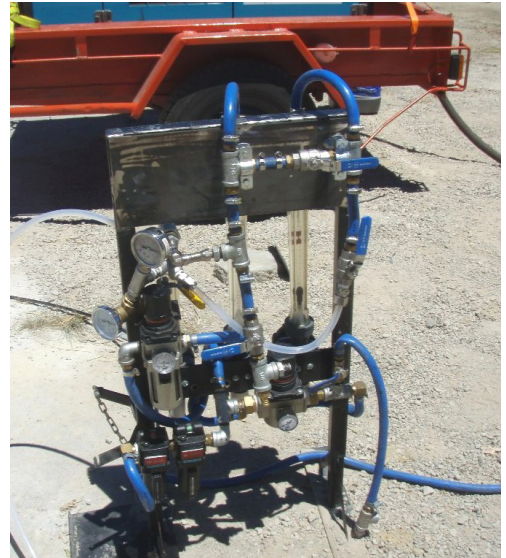
Truck-mounted rig used to conduct ROST and MIP investigations on site at Bellevue (photo courtesy Golder Associates)

On-site source remediation testing program

Testing to evaluate the feasibility of In Situ Chemical Oxidation (ISCO) has been under way since September last year. Laboratory tests have demonstrated that the oxidants sodium persulfate and ozone would effectively treat the soil contaminants if they could be efficiently delivered directly to the contaminants.



Preparing for injection at the former Waste Control site



Injection control manifold

In February 2009, DEC's consultants carried out injection tests using air and helium to see how effectively gas could be delivered into the ground. Helium is a safe, inert gas that does not break down and can be detected at low concentrations, making it an ideal testing agent.

While the injection trials showed the gas could be distributed throughout the contaminated zone in a lower sand layer, gas injection was not as effective within an intermediate clayey soil layer.

Groundwater monitoring



Seasonal pond at base of escarpment, next to the Helena River

The annual groundwater monitoring is being carried out this month. Samples from more than 50 wells will be collected and tested as well as water from the Helena River both upstream and downstream of the Bellevue site.

[Link to latest results...](#)

Future work

DEC's consultants are developing a clean-up plan discussing the design, construction and operation of the PRB. It will include details of the monitoring program impacts and contingency measures in case the PRB does not perform to specifications.

Remedial options for the contamination (on site) at the former Waste Control Site are being re-evaluated in light of the detailed delineation results and results of the ISCO testing program.

Following consultation with stakeholders, a clean-up plan will be finalised and DEC will hold a public open day to explain the proposed clean-up work and answer community questions.

Contaminated Sites Hotline 1300 762 982