



Bellevue site – Background and risk

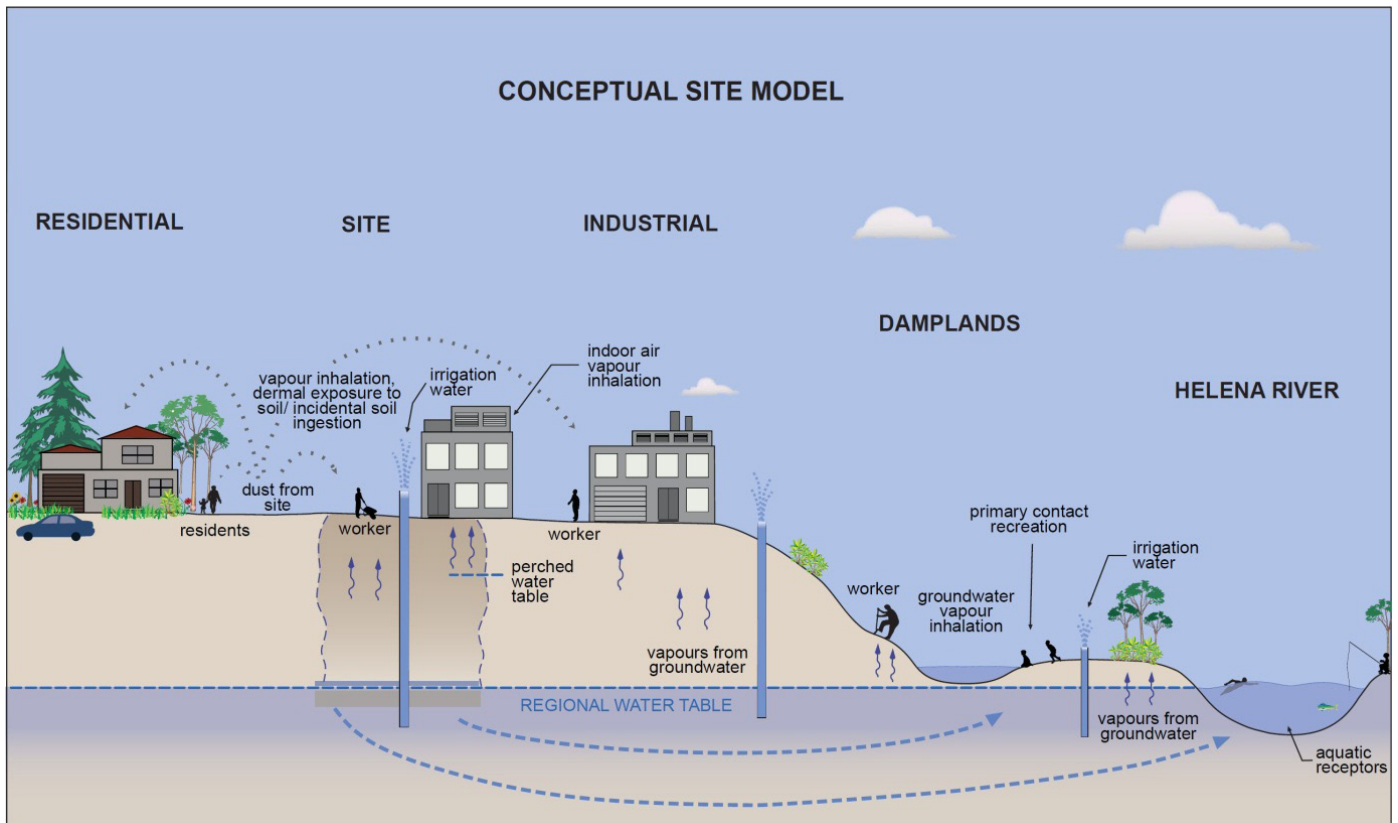


Figure 1: Conceptual site model of the former Waste Control site.

Site background

On 15 February 2001, fire destroyed a liquid waste treatment and recycling facility at 1 Bulbey Street, Bellevue. The business had been operated by Waste Control Pty Ltd since the mid-1980s. The company has since been wound up.

The fire and water runoff from the firefighting operations caused contamination of the Bellevue site and impacted surrounding properties.

The Western Australian Government is now the registered owner of the site and is committed to cleaning it up.

Contamination legacy

Detailed investigations and ongoing monitoring have confirmed that soil and groundwater are contaminated with petroleum hydrocarbons and chlorinated solvents. The contamination can be attributed to both historical site operations and the 2001 fire.

A second source of contamination has also been detected at the end of Stanley Street. The general direction of groundwater movement for both plumes is towards the Helena River.

What is a plume?

A plume is a body of groundwater containing contaminants that exceed acceptable levels, such as those levels prescribed in the Australian drinking water guidelines. Contaminated groundwater usually happens when fuel, solvents or other contaminants are spilled or released on to the ground.

The materials filter through the soil to the water table, where the soil is saturated with water (groundwater). As the groundwater moves, the contaminants are carried with it, creating a plume of contaminated groundwater.

What are the contaminants?

The groundwater plume from the Bellevue site contains a mixture of petroleum, chlorinated and brominated hydrocarbons. The Stanley Street plume is mainly trichloroethene, or TCE, a chlorinated hydrocarbon commonly used as an industrial solvent.

Classification

The site was classified in December 2006 under the Contaminated Sites Act 2003. Groundwater contamination from the former waste control site originally extended for about 200 metres, beneath several properties, south-west of the site.

Five lots were classified as 'contaminated—remediation required' and eight lots as 'contaminated—restricted use'. Restrictions were placed on the abstraction of groundwater from these lots because the groundwater was found not to be suitable for generally accepted uses, such as for irrigation or for washing down vehicles.

The classifications are now under review. This review will take into account the extensive monitoring that has been undertaken since 2006 and the remediation works undertaken in 2010 to protect the Helena River.

Helena River

The protection of the Helena River has been the primary objective for the management of this site. Extensive groundwater modelling, conducted in 2006, indicated that the chlorinated solvent plume could reach the Helena River in five to 10 years.

The first major remediation works were conducted in 2010 with the installation of two underground treatment walls designed to intercept and treat the contaminated groundwater (permeable reactive barrier system). For more information about the treatment walls, see fact Sheet 17 in this series.

A comprehensive monitoring well network has been installed, and monitoring has not detected any chlorinated substances in the Helena River since the trace levels identified in 2009.

Assessing the risk

Western Australia uses a risk-based approach (risk assessment) to identify and manage contaminated land. This provides a way to predict the severity of potential impacts on human health and the environment and investigate how to prevent or minimise any risk.

The Bellevue site

A human health and ecological risk assessment has been conducted for the former Waste Control site and neighbouring properties. The study was first completed in 2006 and later updated in 2008, 2009 and 2013 with new information on the properties of the contaminants assessed and risk assessment practice.

The assessment looked at potential risks to local residents, workers at nearby businesses, recreational users of the Helena River, stock animals and the ecosystem of the Helena River.

Risk is determined by measuring the concentrations of contaminants in air, water and soil and comparing the results with relevant national standards and site-specific values for acceptable levels of exposure.

A summary of the updated outcomes of the risk assessment is provided in the table on page 3.

What have we done?

The risk assessment process provided the information needed to initiate early management measures, such as preventing access to the site of the fire and restricting the use of groundwater.

The assessment also identified the Helena River as a priority target for protection from contaminated groundwater. This led to the installation of the underground treatment walls (permeable reactive barriers), which are now preventing the flow of contaminants from reaching the river and damplands.

In 2011, some additional air monitoring was conducted inside a newly constructed building close to the off-site plume. The testing showed there was no current risk to the health of workers at this new site.

Where to from here?

A risk-based approach has been used to develop a set of targets for the reduction or elimination of contaminants, which will be used to evaluate and quantify the clean-up of the site.

LandCorp, the project managers for the site, will use these remediation targets to appoint an environmental remediation contractor and assess the results after the clean-up has been completed.

Risks assessed	Assessment outcomes	Actions taken	Actions to come
Off-site			
Children and adults living near the site, who could breathe in windblown dusts	No unacceptable risks identified	Contaminated soil is covered by concrete or clean fill to control dust	Remediation of contaminant sources to reduce contamination offsite
People working outside – maintenance/irrigation	Potential unacceptable risk to human health when using groundwater	Groundwater use restricted. Memorials have been registered on Certificates of Title to prevent groundwater use	
Indoor workers	Potential unacceptable risk to human health from vapours trapped in buildings	Indoor air quality was tested and no contamination was found	
Recreational use of the Helena River by children and adults – swimming or wading or walking along the riverbank	Potential risks to human and ecological health in the future if permeable reactive barrier stops working and source contamination is not reduced	Permeable reactive barrier installed in 2010; Expression of Interest issued to address clean-up of contaminant sources; monitoring shows contaminant levels have stabilised or are decreasing	
Helena River – fish and invertebrates living in the river			
Helena River – animals e.g. bandicoots and cattle, drinking from the river			
On-site (former waste control site is currently unoccupied)			
Indoor workers – assuming buildings are located over the contaminant source area	Potential unacceptable risk to the health of workers at the site	Expression of Interest issued to remediate the site. No occupation of the site permitted until it is safe to do so.	Remediation to restore site to commercial/ industrial use with restrictions on using groundwater.
Outdoor workers exposed to soil and/or groundwater			

More information on the Bellevue site

Visit DER's webpage www.der.wa.gov.au/bellevue for more information and updates on the former Waste Control Site at Bellevue.

More information is also available in other fact sheets published as part of this series:

- ◆ Fact Sheet 17 – Clean-up
- ◆ Fact Sheet 18 – Groundwater monitoring

More information on contaminated sites in WA

DER has published a series of fact sheets and administrative and technical guidelines to assist with the assessment, management and remediation of contaminated sites. These are available at www.der.wa.gov.au/contaminatedsites.

More information is available by writing to:

Contaminated Sites
Department of Environment Regulation
Locked Bag 33
CLOISTERS SQUARE WA 6850

or by calling the Contaminated Sites Hotline on 1300 762 982

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Legislation

Free electronic copies of the *Contaminated Sites Act 2003*; the Contaminated Sites Regulations 2006; and the *Environmental Protection Act 1986* are available from the State Law Publisher (www.slp.wa.gov.au).

Contact details

For information on compliance with the *Contaminated Sites Act 2003* and Contaminated Sites Regulations 2006, or any other related matter, please contact the Contaminated Sites Information Line on 1300 762 982.