



Botany Groundwater Cleanup Project

Fact Sheet 13

September 2004

Fact sheets are designed to provide the community with simple and easy-to-understand information on environmental science and technology. Readers requiring greater detail should contact Orica:

- by email to info@oricabotanygroundwater.com
- by phoning our Community Feedback Line - 1800 025 138
- by writing to - Community Matters, 16-20 Beauchamp Road, Matraville 2036

Dioxins in the environment

What are dioxins?

Dioxins are a group of about 75 different compounds produced as by-products in chemical reactions involving chlorine and hydrocarbons. They remain in the environment for a long time and can accumulate in the body fat of animals and humans. They are members of three closely related families:

- polychlorinated dibenzo-p-dioxins (PCDDs)
- polychlorinated dibenzofurans (PCDFs or furans)
- certain co-planar polychlorinated biphenyls (PCBs)

They are listed among the 12 worst persistent organic pollutants (POPs). The Stockholm Convention on Persistent Organic Pollutants, which entered into force on 17 May 2004, directs governments to take measures to eliminate or reduce the release of POPs into the environment (See fact sheet 14).

How are dioxins relevant to Orica's groundwater cleanup project?

In order to clean the contaminated groundwater, Orica is planning to construct a Groundwater Treatment Plant (see Fact Sheet 10). The plant will use a process known as "thermal oxidation" to treat the water and may release a very small quantity of dioxins into the environment.

Thermal Oxidation – Best available Technology and Best Environmental Practices

The United Nations Environment Programme expert group on Best Available Technology (BAT) and Best Environmental Practices (BEP) published guidelines in October 2004 relevant to the Stockholm Convention.¹ For treatment of the waste recovered in the Groundwater Treatment Plant, we intend to follow the guidelines. In the section on Chemical Production Processes that describes the products formerly produced at Botany, the guidelines state the following:

"The EU BREFs and Stockholm Convention BAT for Hazardous Waste Combustion and downstream treatment of gas, liquid and solid wastes are useful here as the processes are fairly well known and generic. When these techniques are practised, emission of by product POPs is virtually eliminated."

Public Perception of Thermal Oxidation?

Many people may confuse a modern Thermal Oxidiser with 1970s vintage municipal incinerators. The old incinerators had low temperatures (~800 deg C) and poor control of exhaust gases. POPs, including dioxins, were not destroyed and in some cases were formed during the processing. These poor designs did generate POPs and created environmental damage. Today the means of preventing dioxins and other hazardous material is well understood and modern well-designed incinerators treat waste in Europe and North America to exacting environmental standards. They operate at higher temperatures (1100+ deg C) with treatment systems for the exhaust gas.

The thermal oxidiser currently being considered by Orica is not an incinerator – it is fed by a stream of vapour and air rather than any solid materials. It will be designed to operate at temperatures and with exhaust gas cleaning to meet BAT and BEP. A key operating criteria will be to operate within the required Australian and European environmental standards of a maximum dioxin emission of 0.1 ng/m³. (ng = nanogram, 1,000,000,000 ng = 1 gram)

¹ United Nations Environment Programme (UNEP) Expert Group on Best Available Techniques and Best Environmental Practices – Third Session: http://www.pops.int/documents/meetings/bat_bep/3rd_session/Default.htm