



LEDNEZ PROJECT DIRECT THERMAL DESORPTION (DTD)



*Stockholm Convention

Australia is a signatory to the Stockholm Convention on Persistent Organic Pollutants (POPs). Article 5 requires that Parties to the Convention take measures to minimise or eliminate certain POPs including dioxins. Guidelines on the best available techniques (BAT) to do this have been prepared under the Convention for various technologies. The BAT guidelines identify parameters such as time and temperature as critical in any thermal oxidiser that is used to treat hazardous waste. They also identify rapid cooling, dust removal and acid gas removal from the thermal oxidiser off gas stream as critical for minimising dioxin reformation when treating organochlorine compounds. They state that a dioxin emission level of 0.1 to 0.01ng/ Nm³ of off gas should be achievable if this is done.

THIESS SERVICES IS USING A DIRECTLY HEATED THERMAL DESORPTION (DTD) PLANT, CONFIGURED ACCORDING TO THE STOCKHOLM CONVENTION* 'BEST AVAILABLE TECHNIQUES' (BAT), TO TREAT CONTAMINATED SOIL AND BAY SEDIMENT ON THE FORMER LEDNEZ/UNION CARBIDE SITE.

DTD is a technology which is well established in the USA for the treatment of soil contaminated with organochlorine compounds (OCCs). In DTD the soil is heated until the contaminants turn into vapour (or gas). The contaminant vapour is then destroyed by combustion, all within the one plant.

Over 70 hazardous waste treatment projects have been successfully undertaken in the USA using the DTD process. Thiess Services' DTD plant addresses the potential air quality risks associated with the treatment of OCCs in soil by using a proven technological process that will deliver a safe environmental outcome to the community.

HOW DOES DTD WORK?

The DTD process relies on heating soil to volatilise the OCCs, which are then destroyed in a thermal oxidiser. The treated soil is subsequently suitable for use as backfill on site. During the DTD process:

- The contaminated soil is directly heated by combustion gas in a rotating drum or rotary dryer
- Every batch of treated soil is tested to ensure that all the contaminants have been removed to the standard set by the Department of Environment & Climate Change (DECC)
- All gases are processed through a thermal oxidiser to destroy the OCCs and

CONTACT US.

We value your feedback and input. Please let us know of any concerns you have, or if you want to be included on our mailing list. You can contact the Community Relations Manager by:

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REMEDICATION
PROJECTS

Homebush Bay and the former
Lednez and Allied Feeds sites

Thiess
services

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ensure that discharges to the atmosphere are safe

- A rapid cooling system lowers the temperature of gas leaving the thermal oxidiser through the dioxin reformation window, to minimise the potential for dioxin to reform
- A baghouse removes dust from the gas stream exiting the rapid cooling system
- An acid gas scrubber removes hydrochloric acid created by the combustion of the OCCs, so that it is not emitted to the atmosphere, and
- Gas discharge quality is monitored to ensure compliance with emission criteria set by the DECC.

AIR POLLUTION SYSTEM / EMISSION CONTROLS

The DTD plant is designed to meet all of the regulatory requirements associated with contaminant destruction and air emissions.

Stack emission limits for dioxins are set at a level of 0.1ng/Nm³ (normal or standard cubic metre) which is well below a level of concern for human health. The DTD stack height (30 metres) has been designed to ensure compliance with ambient air standards for exhaust gases at the nearest residence.

PRE-TREATMENT BUILDING

The atmosphere controlled pre-treatment building is used to prepare soil prior to its treatment in the DTD. The building is fitted with an air emission control system which includes dust filters and activated carbon beds to remove contaminants from the exhaust air stream.

DTD BUILT-IN SAFETY FEATURES

The DTD plant has many built-in safety features as well as prescriptive operational procedures and shut down mechanisms in the unlikely event of an accident or mechanical failure. If pressures, temperatures or flows move towards predetermined limits, an early warning alarm will be activated, alerting the operator to the situation. If corrective action is not effective, and a preset absolute upper or lower limit is exceeded, the plant feed soil is automatically stopped. The operator is not able to recommence feeding soil to the plant until the conditions which caused the non-compliance have been corrected.

The DTD plant is owned and operated by Thiess Services. Personnel have been trained in safe operating procedures by the plant's manufacturer.

SOIL CLEAN-UP CRITERIA

The DTD plant is designed to treat soil containing a range of contaminants to meet the approved soil re-use criteria for the site.

COMMUNITY IMPACTS

The DTD plant has several large vertical components including the thermal oxidiser, cooler and acid gas scrubber stack that will be visible from beyond site boundaries. It also produces a noticeable steam plume from the acid gas scrubber.

The DTD plant generates noise that does not contain dominant tones and specific noise control features have been incorporated into its design. DTD plants have been used in close proximity to residential areas in the USA. Support equipment such as the feed soil loader, which uses a safety alarm when reversing, may require modification to keep noise impacts within acceptable levels.

The DTD plant operates 24 hours a day, 7 days a week to maintain operations at peak efficiency and avoid lengthy daily heating up and cooling down periods. Planned maintenance is undertaken one day each fortnight.