<u>Chemical Waste Treatment Centre</u> <u>Operation Report</u> Jan 97 - Jun 97

I. INTRODUCTION

This Operation Report is prepared by EPD for the Environment and Planning Committee (EPC) of the Provisional Kwai Tsing District Board. It outlines the activities of the Chemical Waste Treatment Centre (CWTC) and provides a summary of environmental performance of the plant.

The environmental performance summary as shown in Section II of this report covers the result of environmental monitoring from January 97 to June 97.

II. <u>ENVIRONMENTAL PERFORMANCE SUMMARY</u>

Enviropace are required to undertake regular checks on environmental performance of the operation of the plant. These include the following:

- Effluent discharge monitoring
- Stack gas monitoring
- Stabilised residue monitoring

Effluent Discharge

Effluent from the CWTC treatment processes has to meet very strict discharge limits on pollutant concentration. Multiple processes are employed inside the CWTC to treat all liquid wastes to ensure a safe waste management system. Automatic monitoring of pH and temperature are conducted to facilitate immediate warning on any significant change detected in the composition of the effluent, such that prompt corrective response can be effected.

Effluent from the plant is discharged in batches. Each batch is sampled and analyzed, and discharges are permitted only if limits are met. Tables 1 to 6 show the summary of effluent quality from January 97 to June 97. No exceedances in effluent discharge limits were observed.

Stack Gas

Air emissions from the incineration system are closely monitored by a comprehensive management and monitoring programme to ensure that the system is operating safely and in an environmentally acceptable manner.

A continuous monitoring system on key parameters is installed in the incinerator stack to ensure combustion and air pollutant removal processes are functionally well. Furthermore, the incinerator is equipped with an automatic waste feed cut-off system. In the event that the continuous monitoring system picks up any potential sign of exceedance of any of the control parameters, waste feed to the incinerator will be stopped automatically. The result for Stack Gas Monitoring from January 97 to June 97 are attached in Tables 7 to 12 and compliance in all stack gas control parameters has been achieved.

Stabilised Residue

All solid wastes and process residues at the CWTC are detoxified, chemically stabilized and physically immobilized to an environmentally benign state. Samples of the stabilized materials have to pass a series of analytical tests, proven to be innocuous before being sent to an off-site landfill for final disposal.

The summaries of result for Stabilized Residue from January 97 to June 97 are attached in Tables 13 to 18. All of the test parameters fell within the control limits and no exceedances occurred.

Parameters	Control Limits	Result	Mean
рН	6-10	7.1 - 9.9	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 33.6	N/A
Total Phosphate (mg/l)	10	< 2	N/A
Total Sulphate (mg/l)	2000	277.7-1014.9	685.1
Total Sulphides (mg/l)	10	< 7.3	N/A
Total Cyanide (mg/l)	0.1	< 0.03	N/A
Total Suspended Solids (mg/l)	100	< 82.8	N/A
Oil and Grease (mg/l)	20	< 15.7	N/A
Total Phenols (mg/l)	0.5	< 0.34	N/A
Total Residual Chlorine (mg/l)	1	< 0.80	N/A
Anionic Detergents (mg/l)	15	< 3	N/A
Dissolved TOC (mg/l)	200	<109.2	N/A
Temperature (°C)	43	20 - 37	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals:			
Arsenic (mg/l)	2	< 0.1	
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.6	
Copper (mg/l)	2	< 0.5	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.2	
Mercury (mg/l)	0.05	< 0.05	N/A
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 0.4	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1	
Total Toxic Metals # (mg/l)	10	< 6.73]
Boron (mg/l)	5	< 2.8	
Iron (mg/l)	10	< 2	N/A

Parameters	Control Limits	Result	Mean	
Pesticides:				
Aldrin (mg/l)	0.01	< 0.01		
BHCS (mg/l)	0.01	< 0.01	N/A	
DDT (mg/l)	0.01	< 0.01		
Semi-volatile Compounds:				
Benzo (A) Pyrene (mg/l)	0.1	< 0.1	N/A	
Volatile Compounds:				
1,1,1-Trichloroethane (mg/l)	0.05	< 0.05	N/A	
Polychlorinated Biphenyls:				
Total PCBs (mg/l)	0.003	< 0.003	N/A	
Radioactive Substances:				
Gross (pc/l)	10000	< 10000		
Radium-226 (pc/l)	30	< 30	N/A	
Strontium-90 (pc/l)	100	< 100		

[#] Total toxic metals include: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Silver, Tin, Zinc.

Parameters	Control Limits	Result	Mean
рН	6-10	7 - 9.7	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 30.3	N/A
Total Phosphate (mg/l)	10	< 2	N/A
Total Sulphate (mg/l)	2000	329.6-1245.4	826
Total Sulphides (mg/l)	10	< 5.6	N/A
Total Cyanide (mg/l)	0.1	< 0.09	N/A
Total Suspended Solids (mg/l)	100	< 70.4	N/A
Oil and Grease (mg/l)	20	< 18.1	N/A
Total Phenols (mg/l)	0.5	< 0.4	N/A
Total Residual Chlorine (mg/l)	1	< 0.60	N/A
Anionic Detergents (mg/l)	15	< 3	N/A
Dissolved TOC (mg/l)	200	< 200	76.6
Temperature (°C)	43	20 - 39	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.1	
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.4	
Copper (mg/l)	2	< 1.9	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.2	
Mercury (mg/l)	0.05	< 0.05	N/A
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 0.4	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1	
Total Toxic Metals # (mg/l)	10	< 8.1	
Boron (mg/l)	5	< 2.6	
Iron (mg/l)	10	< 2	N/A

Parameters	Control Limits	Result	Mean	
Pesticides:				
Aldrin (mg/l)	0.01	< 0.01		
BHCS (mg/l)	0.01	< 0.01	N/A	
DDT (mg/l)	0.01	< 0.01		
Semi-volatile Compounds:				
Benzo (A) Pyrene (mg/l)	0.1	< 0.1	N/A	
Volatile Compounds:				
1,1,1-Trichloroethane (mg/l)	0.05	< 0.05	N/A	
Polychlorinated Biphenyls:				
Total PCBs (mg/l)	0.003	< 0.003	N/A	
Radioactive Substances:				
Gross (pc/l)	10000	< 10000		
Radium-226 (pc/l)	30	< 30	N/A	
Strontium-90 (pc/l)	100	< 100		

[#] Total toxic metals include: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Silver, Tin, Zinc.

Chemical Waste Treatment Centre Effluent Discharge Summary (March 1997)

Parameters	Control Limits	Result	Mean
рН	6-10	6.9 - 9.8	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 65.2	N/A
Total Phosphate (mg/l)	10	< 2	N/A
Total Sulphate (mg/l)	2000	107.6-1378.3	789.3
Total Sulphides (mg/l)	10	< 2.5	N/A
Total Cyanide (mg/l)	0.1	< 0.09	N/A
Total Suspended Solids (mg/l)	100	< 47	N/A
Oil and Grease (mg/l)	20	< 15	N/A
Total Phenols (mg/l)	0.5	< 0.5	N/A
Total Residual Chlorine (mg/l)	1	< 0.7	N/A
Anionic Detergents (mg/l)	15	< 3.5	N/A
Dissolved TOC (mg/l)	200	< 85.2	N/A
Temperature (°C)	43	21 - 42	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.1	
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.8	
Copper (mg/l)	2	< 1.13	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.2	
Mercury (mg/l)	0.05	< 0.05	N/A
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 1.3	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1	
Total Toxic Metals # (mg/l)	10	< 7.2	
Boron (mg/l)	5	< 2.4	
Iron (mg/l)	10	< 2	N/A

Parameters	Control Limits	Result	Mean	
Pesticides:				
Aldrin (mg/l)	0.01	< 0.01		
BHCS (mg/l)	0.01	< 0.01	N/A	
DDT (mg/l)	0.01	< 0.01		
Semi-volatile Compounds:				
Benzo (A) Pyrene (mg/l)	0.1	< 0.1	N/A	
Volatile Compounds:				
1,1,1-Trichloroethane (mg/l)	0.05	< 0.05	N/A	
Polychlorinated Biphenyls:				
Total PCBs (mg/l)	0.003	< 0.003	N/A	
Radioactive Substances:				
Gross (pc/l)	10000	< 10000		
Radium-226 (pc/l)	30	< 30	N/A	
Strontium-90 (pc/l)	100	< 100		

[#] Total toxic metals include: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Silver, Tin, Zinc.

Chemical Waste Treatment Centre Effluent Discharge Summary (April 1997)

Parameters	Control Limits	Result	Mean
рН	6-10	7 - 7.9	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 20	N/A
Total Phosphate (mg/l)	10	< 2	N/A
Total Sulphate (mg/l)	2000	135.9-1240.3	572.6
Total Sulphides (mg/l)	10	< 3.1	N/A
Total Cyanide (mg/l)	0.1	< 0.03	N/A
Total Suspended Solids (mg/l)	100	< 55.5	N/A
Oil and Grease (mg/l)	20	< 15	N/A
Total Phenols (mg/l)	0.5	< 0.4	N/A
Total Residual Chlorine (mg/l)	1	< 1	N/A
Anionic Detergents (mg/l)	15	< 3	N/A
Dissolved TOC (mg/l)	200	< 105	N/A
Temperature (°C)	43	22 - 42	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.1	
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.5	
Copper (mg/l)	2	< 0.8	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.2	
Mercury (mg/l)	0.05	< 0.05	N/A
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 0.4	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1	
Total Toxic Metals # (mg/l)	10	< 6.7	
Boron (mg/l)	5	< 1.4	
Iron (mg/l)	10	< 2	N/A

Parameters	Control Limits	Result	Mean	
Pesticides:				
Aldrin (mg/l)	0.01	< 0.01		
BHCS (mg/l)	0.01	< 0.01	N/A	
DDT (mg/l)	0.01	< 0.01		
Semi-volatile Compounds:				
Benzo (A) Pyrene (mg/l)	0.1	< 0.1	N/A	
Volatile Compounds:				
1,1,1-Trichloroethane (mg/l)	0.05	< 0.05	N/A	
Polychlorinated Biphenyls:				
Total PCBs (mg/l)	0.003	< 0.003	N/A	
Radioactive Substances:				
Gross (pc/l)	10000	< 10000		
Radium-226 (pc/l)	30	< 30	N/A	
Strontium-90 (pc/l)	100	< 100		

[#] Total toxic metals include: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Silver, Tin, Zinc.

Chemical Waste Treatment Centre Effluent Discharge Summary (May 1997)

Parameters	Control Limits	Result	Mean
рН	6-10	6.1 - 9.8	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 20	N/A
Total Phosphate (mg/l)	10	< 2	N/A
Total Sulphate (mg/l)	2000	340.6- 1087.2	673.2
Total Sulphides (mg/l)	10	< 8.7	N/A
Total Cyanide (mg/l)	0.1	< 0.03	N/A
Total Suspended Solids (mg/l)	100	< 51.3	N/A
Oil and Grease (mg/l)	20	< 15	N/A
Total Phenols (mg/l)	0.5	< 0.3	N/A
Total Residual Chlorine (mg/l)	1	< 0.6	N/A
Anionic Detergents (mg/l)	15	< 3	N/A
Dissolved TOC (mg/l)	200	< 80	72.3
Temperature (°C)	43	28 - 42	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals:			
Arsenic (mg/l)	2	< 0.1	
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.3	
Copper (mg/l)	2	< 1	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.2	
Mercury (mg/l)	0.05	< 0.05	N/A
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 0.4	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1	
Total Toxic Metals # (mg/l)	10	< 7.1	
Boron (mg/l)	5	< 1.4	
Iron (mg/l)	10	< 2	N/A

Parameters	Control Limits	Result	Mean	
Pesticides:				
Aldrin (mg/l)	0.01	< 0.01		
BHCS (mg/l)	0.01	< 0.01	N/A	
DDT (mg/l)	0.01	< 0.01		
Semi-volatile Compounds:				
Benzo (A) Pyrene (mg/l)	0.1	< 0.1	N/A	
Volatile Compounds:				
1,1,1-Trichloroethane (mg/l)	0.05	< 0.05	N/A	
Polychlorinated Biphenyls:				
Total PCBs (mg/l)	0.003	< 0.003	N/A	
Radioactive Substances:				
Gross (pc/l)	10000	< 10000		
Radium-226 (pc/l)	30	< 30	N/A	
Strontium-90 (pc/l)	100	< 100		

[#] Total toxic metals include: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Silver, Tin, Zinc.

Chemical Waste Treatment Centre Effluent Discharge Summary (June 1997)

Parameters	Control Limits	Result	Mean
рН	6-10	7.1 - 10	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 20.4	N/A
Total Phosphate (mg/l)	10	< 2	N/A
Total Sulphate (mg/l)	2000	495.8-1316.8	795.9
Total Sulphides (mg/l)	10	< 1.7	N/A
Total Cyanide (mg/l)	0.1	< 0.03	N/A
Total Suspended Solids (mg/l)	100	< 43.1	N/A
Oil and Grease (mg/l)	20	< 15	N/A
Total Phenols (mg/l)	0.5	< 0.3	N/A
Total Residual Chlorine (mg/l)	1	< 0.7	N/A
Anionic Detergents (mg/l)	15	< 3	N/A
Dissolved TOC (mg/l)	200	80	N/A
Temperature (°C)	43	30 - 41	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.1	
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.3	
Copper (mg/l)	2	< 0.8	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.2	
Mercury (mg/l)	0.05	< 0.05	N/A
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 0.4	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1	
Total Toxic Metals # (mg/l)	10	< 7	
Boron (mg/l)	5	< 1.3	
Iron (mg/l)	10	< 2	N/A

Parameters	Control Limits	Result	Mean	
Pesticides:				
Aldrin (mg/l)	0.01	< 0.01		
BHCS (mg/l)	0.01	< 0.01	N/A	
DDT (mg/l)	0.01	< 0.01		
Semi-volatile Compounds:				
Benzo (A) Pyrene (mg/l)	0.1	< 0.1	N/A	
Volatile Compounds:				
1,1,1-Trichloroethane (mg/l)	0.05	< 0.05	N/A	
Polychlorinated Biphenyls:				
Total PCBs (mg/l)	0.003	< 0.003	N/A	
Radioactive Substances:				
Gross (pc/l)	10000	< 10000		
Radium-226 (pc/l)	30	< 30	N/A	
Strontium-90 (pc/l)	100	< 100		

[#] Total toxic metals include: Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Manganese, Mercury, Nickel, Silver, Tin, Zinc.

Chemical Waste Treatment Centre Stack Gas Monitoring Summary (January 1997)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	0.5 - 5.5	2.1
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 4	N/A
Fluorine and Compounds (as HF) (mg/m ³)	25	< 0.4	N/A
Hydrogen Sulphide (mg/m ³)	5	Not detected	N/A
Acidity (as Sulphuric Acid) (mg/m³)	100	18.6 - 29	21.9
Sulphur Dioxide (mg/m ³)	750	65.3 - 265.6	142.8
Hydrochloric Acid (mg/m ³)	38	5.1 - 10.3	8.2
Total Phosphorus (as P) (mg/m ³)	7.5	< 1.63	N/A
Hydrogen Fluoride (mg/m ³)	7.5	< 0.9	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 0.9	N/A
Toxic Metals I:			
Mercury (mg/m ³)	3	< 0.079	
Cadmium (mg/m³)	3	< 0.064	N/A
Antimony (mg/m ³)	3	< 0.458	
Toxic Metals II:			
Lead (mg/m ³)	10	< 0.543	
Copper (mg/m ³)	10	< 0.326	
Arsenic (mg/m ³)	10	< 0.005	N/A
Nickel (mg/m ³)	10	< 0.326	
Chromium (mg/m³)	10	< 0.046	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.377	N/A
Dioxin (ng/m³)	0.1	0.008	N/A

Chemical Waste Treatment Centre Stack Gas Monitoring Summary (February 1997)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	0.2 - 1.4	0.9
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 3.4	N/A
Fluorine and Compounds (as HF) (mg/m ³)	25	< 0.4	N/A
Hydrogen Sulphide (mg/m ³)	5	0.9 - 1	1
Acidity (as Sulphuric Acid) (mg/m³)	100	10.8 - 22.9	17.3
Sulphur Dioxide (mg/m ³)	750	17.3 - 378.6	174.5
Hydrochloric Acid (mg/m ³)	38	< 20.3	N/A
Total Phosphorus (as P) (mg/m ³)	7.5	< 0.6	N/A
Hydrogen Fluoride (mg/m ³)	7.5	< 0.9	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 0.9	N/A
Toxic Metals I:			
Mercury (mg/m ³)	3	< 0.72	
Cadmium (mg/m³)	3	< 0.051	N/A
Antimony (mg/m ³)	3	< 0.506	
Toxic Metals II:			
Lead (mg/m ³)	10	< 0.6	
Copper (mg/m ³)	10	< 0.08	
Arsenic (mg/m ³)	10	< 0.006	N/A
Nickel (mg/m ³)	10	< 0.12	
Chromium (mg/m³)	10	< 0.081	
Total of Toxic Metals I & II (mg/m ³)	10	< 2.1	N/A
Dioxin (ng/m ³)	0.1	0.015	N/A

Chemical Waste Treatment Centre Stack Gas Monitoring Summary (March 1997)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	0.6 - 3.4	1.45
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 4.2	N/A
Fluorine and Compounds (as HF) (mg/m ³)	25	< 0.4	N/A
Hydrogen Sulphide (mg/m ³)	5	< 2.3	N/A
Acidity (as Sulphuric Acid) (mg/m³)	100	10.3 - 46	33.8
Sulphur Dioxide (mg/m ³)	750	< 374.4	N/A
Hydrochloric Acid (mg/m ³)	38	< 28.1	N/A
Total Phosphorus (as P) (mg/m³)	7.5	< 0.618	N/A
Hydrogen Fluoride (mg/m ³)	7.5	< 0.9	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 0.9	N/A
Toxic Metals I:			
Mercury (mg/m ³)	3	< 0.057	
Cadmium (mg/m³)	3	< 0.052	N/A
Antimony (mg/m ³)	3	< 0.522	
Toxic Metals II:			
Lead (mg/m ³)	10	< 0.618	
Copper (mg/m ³)	10	< 0.071	
Arsenic (mg/m ³)	10	< 0.006	N/A
Nickel (mg/m ³)	10	< 0.124	
Chromium (mg/m³)	10	< 0.052	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.473	N/A
Dioxin (ng/m ³)	0.1	0.0135	N/A

Chemical Waste Treatment Centre Stack Gas Monitoring Summary (April 1997)

Parameters	Control Limits	Result	Mean
Particulates (mg/m³)	75	0.7 - 2	1.2
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 3.9	N/A
Fluorine and Compounds (as HF) (mg/m ³)	25	< 0.4	N/A
Hydrogen Sulphide (mg/m ³)	5	Not detected	N/A
Acidity (as Sulphuric Acid) (mg/m ³)	100	37.5 - 69.8	49.5
Sulphur Dioxide (mg/m ³)	750	< 688.8	N/A
Hydrochloric Acid (mg/m ³)	38	24.9 - 28.5	26.7
Total Phosphorus (as P) (mg/m³)	7.5	< 0.662	N/A
Hydrogen Fluoride (mg/m ³)	7.5	< 1	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 0.9	N/A
Toxic Metals I:			
Mercury (mg/m ³)	3	< 0.079	
Cadmium (mg/m³)	3	< 0.056	N/A
Antimony (mg/m ³)	3	< 0.558	
Toxic Metals II:			
Lead (mg/m ³)	10	< 0.662	
Copper (mg/m ³)	10	< 0.077	
Arsenic (mg/m³)	10	< 0.007	N/A
Nickel (mg/m ³)	10	< 0.132	
Chromium (mg/m³)	10	< 0.056	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.473	N/A
Dioxin (ng/m ³)	0.1	0.0067	N/A

Chemical Waste Treatment Centre Stack Gas Monitoring Summary (May 1997)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	0.4 - 2.4	1.6
Chlorine and Compounds	100	< 4.2	N/A
(as Cl ₂) (mg/m ³)			
Fluorine and Compounds	25	< 0.4	N/A
(as HF) (mg/m ³)			
Hydrogen Sulphide (mg/m ³)	5	Not detected	N/A
Acidity (as Sulphuric Acid)	100	< 13.8	N/A
(mg/m^3)			
Sulphur Dioxide (mg/m ³)	750	< 75.9	N/A
Hydrochloric Acid (mg/m ³)	38	< 24.1	N/A
Total Phosphorus (as P)	7.5	< 0.72	N/A
(mg/m^3)			
Hydrogen Fluoride (mg/m ³)	7.5	< 1	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 1	N/A
Toxic Metals I:			
Mercury (mg/m ³)	3	< 0.018	
Cadmium (mg/m³)	3	< 0.061	N/A
Antimony (mg/m ³)	3	< 0.607	
Toxic Metals II:			
Lead (mg/m ³)	10	< 0.72	
Copper (mg/m ³)	10	< 0.076	
Arsenic (mg/m³)	10	< 0.007	N/A
Nickel (mg/m ³)	10	< 0.144	
Chromium (mg/m³)	10	< 0.061	
Total of Toxic Metals I & II	10	< 1.69	N/A
(mg/m^3)			
Dioxin (ng/m ³)	0.1	0.048	N/A

Chemical Waste Treatment Centre Stack Gas Monitoring Summary (June 1997)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	0.5 - 2.5	1.6
Chlorine and Compounds	100	< 3.3	N/A
(as Cl ₂) (mg/m ³)			
Fluorine and Compounds	25	< 0.3	N/A
(as HF) (mg/m ³)			
Hydrogen Sulphide (mg/m ³)	5	1.7	N/A
Acidity (as Sulphuric Acid)	100	< 3.1	N/A
(mg/m^3)			
Sulphur Dioxide (mg/m ³)	750	< 39.1	N/A
Hydrochloric Acid (mg/m ³)	38	< 11.2	N/A
Total Phosphorus (as P)	7.5	< 0.604	N/A
(mg/m^3)			
Hydrogen Fluoride (mg/m ³)	7.5	< 0.9	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 0.9	N/A
Toxic Metals I:			
Mercury (mg/m ³)	3	< 0.009	
Cadmium (mg/m³)	3	< 0.051	N/A
Antimony (mg/m ³)	3	< 0.511	
Toxic Metals II:			
Lead (mg/m ³)	10	< 0.604	
Copper (mg/m ³)	10	< 0.07	
Arsenic (mg/m³)	10	< 0.006	N/A
Nickel (mg/m ³)	10	< 0.121	
Chromium (mg/m³)	10	< 0.051	
Total of Toxic Metals I & II	10	< 1.422	N/A
(mg/m^3)			
Dioxin (ng/m ³)	0.1	0.0926	N/A

Chemical Waste Treatment Centre Stabilised Materials Summary (January 1997)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	11.4 - 12.9	N/A
% Solids (%)	30 (lower limit)	60.5 - 100	83.9
Toxic Metals:			
Cadmium (ppm)	0.5	< 0.5	
Mercury (ppm)	0.1	< 0.02	
Total Chromium (ppm)	10	< 0.5	
Copper (ppm)	-	< 9	N/A
Nickel (ppm)	-	< 0.5	
Lead (ppm)	-	< 22.3	
Zinc (ppm)	-	< 2	
Total of copper, nickel, lead,	25	< 24.9	
zinc (ppm)			
Iron (ppm)	20	< 9.7	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 4.5	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
(ppm)			
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
(ppm)			
TCDD equivalent (ITEF	1	< 1	N/A
method) (ppb)			

Chemical Waste Treatment Centre Stabilised Materials Summary (February 1997)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	11.3 - 13.2	N/A
% Solids (%)	30 (lower limit)	54.5 - 100	81.2
Toxic Metals:			
Cadmium (ppm)	0.5	< 0.5	
Mercury (ppm)	0.1	< 0.04	
Total Chromium (ppm)	10	< 1.27	
Copper (ppm)	-	< 5.03	N/A
Nickel (ppm)	-	< 2.15	
Lead (ppm)	-	< 22.6	
Zinc (ppm)	-	< 1.7	
Total of copper, nickel, lead,	25	< 24.2	
zinc (ppm)			
Iron (ppm)	20	< 2.59	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 6	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
(ppm)			
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
(ppm)			
TCDD equivalent (ITEF	1	< 1	N/A
method) (ppb)			

Chemical Waste Treatment Centre Stabilised Materials Summary (March 1997)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	11.7 - 12.9	N/A
% Solids (%)	30 (lower limit)	58.4 - 100	84
Toxic Metals:			
Cadmium (ppm)	0.5	< 0.5	
Mercury (ppm)	0.1	< 0.056	
Total Chromium (ppm)	10	< 1.3	
Copper (ppm)	-	< 14.7	N/A
Nickel (ppm)	-	< 3.5	
Lead (ppm)	-	< 17	
Zinc (ppm)	-	< 6.4	
Total of copper, nickel, lead,	25	< 20.7	
zinc (ppm)			
Iron (ppm)	20	< 6.2	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 5.3	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			_
Volatile Organic Contents	5000	< 15	N/A
(ppm)			
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
(ppm)			
TCDD equivalent (ITEF	1	< 1	N/A
method) (ppb)			

Chemical Waste Treatment Centre Stabilised Materials Summary (April 1997)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	10.6 - 12.8	N/A
% Solids (%)	30 (lower limit)	39.5 - 100	80.9
Toxic Metals:			
Cadmium (ppm)	0.5	< 0.5	
Mercury (ppm)	0.1	< 0.054	
Total Chromium (ppm)	10	< 0.57	
Copper (ppm)	-	< 13	N/A
Nickel (ppm)	-	< 2	
Lead (ppm)	-	< 11.2	
Zinc (ppm)	-	< 7	
Total of copper, nickel, lead,	25	< 23	
zinc (ppm)			
Iron (ppm)	20	< 5.4	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 5.9	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			_
Volatile Organic Contents	5000	< 15	N/A
(ppm)			
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
(ppm)			
TCDD equivalent (ITEF	1	< 1	N/A
method) (ppb)			

Chemical Waste Treatment Centre Stabilised Materials Summary (May 1997)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	10.8 - 12.7	N/A
% Solids (%)	30 (lower limit)	37.1 - 99.5	81.1
Toxic Metals:			
Cadmium (ppm)	0.5	< 0.5	
Mercury (ppm)	0.1	< 0.02	
Total Chromium (ppm)	10	< 1.4	
Copper (ppm)	-	< 6.7	N/A
Nickel (ppm)	-	< 1.1	
Lead (ppm)	-	< 7.9	
Zinc (ppm)	-	< 2.9	
Total of copper, nickel, lead,	25	< 15.5	
zinc (ppm)			
Iron (ppm)	20	< 3	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 4	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
(ppm)			
Total Organic Halides (ppm)	10	< 2.3	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
(ppm)			
TCDD equivalent (ITEF	1	< 1	N/A
method) (ppb)			

Chemical Waste Treatment Centre Stabilised Materials Summary (June 1997)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	11.3 - 12.8	N/A
% Solids (%)	30 (lower limit)	48.5 - 99.9	79.4
Toxic Metals:			
Cadmium (ppm)	0.5	< 0.5	
Mercury (ppm)	0.1	< 0.02	
Total Chromium (ppm)	10	< 0.5	
Copper (ppm)	-	< 3	N/A
Nickel (ppm)	-	< 0.5	
Lead (ppm)	-	< 21.3	
Zinc (ppm)	-	< 0.9	
Total of copper, nickel, lead,	25	< 24.1	
zinc (ppm)			
Iron (ppm)	20	< 2.2	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 9.8	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
(ppm)			
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
(ppm)			
TCDD equivalent (ITEF	1	< 1	N/A
method) (ppb)			