

Chemical Waste Treatment Centre
Monitoring Report
Oct 95 - Mar 96

I. INTRODUCTION

This Operation Report is prepared by EPD for the Environment and Planning Committee (EPC) of the 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 October 95 to March 96.

II. ENVIRONMENTAL PERFORMANCE SUMMARY

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 October 95 to March 96. 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 October 95 to March 96 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 October 95 to March 96 are attached in Tables 13 to 18. All of the test parameters fell within the control limits and no exceedances occurred.

Table 1

Chemical Waste Treatment Centre
Effluent Discharge Summary (October 1995)

Parameters	Control Limits	Result	Mean
pH	6-10 pH	6.6 - 9.2	N/A
Total Kjeldahl Nitrogen	100 mg/1	< 20.3 mg/1	N/A
Total Phosphate	10 mg/1	< 2 mg/1	N/A
Total Sulphate	2000 mg/1	302.7 - 1237 mg/1	874.1 mg/1
Total Sulphides	10 mg/1	< 1.1 mg/1	N/A
Total Cyanide	0.1 mg/1	< 0.06 mg/1	N/A
Total Suspended Solids	100 mg/1	< 50.1 mg/1	N/A
Oil and Grease	20 mg/1	< 15 mg/1	N/A
Total Phenols	0.5 mg/1	< 0.35 mg/1	N/A
Total Residual Chlorine	1 mg/1	< 0.6 mg/1	N/A
Anionic Detergents	15 mg/1	< 3 mg/1	N/A
Dissolved TOC	200 mg/1	20 - 134 mg/1	75.3 mg/1
Temperature	43	25 - 34	N/A
Floatable Substances	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic	2 mg/1	< 0.1 mg/1	N/A
Barium	5 mg/1	< 1 mg/1	
Cadmium	0.1 mg/1	< 0.1 mg/1	
Chromium	1 mg/1	< 0.3 mg/1	
Copper	2 mg/1	< 0.7 mg/1	
Lead	2 mg/1	< 1 mg/1	
Manganese	5 mg/1	< 0.56 mg/1	
Mercury	0.05 mg/1	< 0.05 mg/1	
Nickel	2 mg/1	< 1 mg/1	
Silver	2 mg/1	< 0.4 mg/1	
Tin	5 mg/1	< 1 mg/1	
Zinc	2 mg/1	< 1 mg/1	
Total Toxic Metals #	10 mg/1	< 7 mg/1	
Boron	5 mg/1	< 3.08 mg/1	
Iron	10 mg/1	< 2 mg/1	N/A

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

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

Remark: The COD results are heavily interfered by the presence of chloride in seawater, a constituent of MARPOL waste. As a result, all COD data in effluent samples are considered to be invalid. In the meantime, control is exercised by analysis of TOC and Oil/Grease.

Table 2

Chemical Waste Treatment Centre
Effluent Discharge Summary (November 1995)

Parameters	Control Limits	Result	Mean
pH	6-10 pH	7.1 - 9.9	N/A
Total Kjeldahl Nitrogen	100 mg/1	< 40.9 mg/1	N/A
Total Phosphate	10 mg/1	< 2 mg/1	N/A
Total Sulphate	2000 mg/1	56.6 - 1109.5 mg/1	570.8 mg/1
Total Sulphides	10 mg/1	< 1 mg/1	N/A
Total Cyanide	0.1 mg/1	< 0.08 mg/1	N/A
Total Suspended Solids	100 mg/1	< 48.2 mg/1	N/A
Oil and Grease	20 mg/1	< 15 mg/1	N/A
Total Phenols	0.5 mg/1	< 0.22 mg/1	N/A
Total Residual Chlorine	1 mg/1	< 0.63 mg/1	N/A
Anionic Detergents	15 mg/1	< 3 mg/1	N/A
Dissolved TOC	200 mg/1	20 - 185.1 mg/1	81.4 mg/1
Temperature	43	25 - 31	N/A
Floatable Substances	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic	2 mg/1	< 0.1 mg/1	N/A
Barium	5 mg/1	< 1 mg/1	
Cadmium	0.1 mg/1	< 0.1 mg/1	
Chromium	1 mg/1	< 0.3 mg/1	
Copper	2 mg/1	< 1.9 mg/1	
Lead	2 mg/1	< 1 mg/1	
Manganese	5 mg/1	< 0.2 mg/1	
Mercury	0.05 mg/1	< 0.05 mg/1	
Nickel	2 mg/1	< 1 mg/1	
Silver	2 mg/1	< 0.4 mg/1	
Tin	5 mg/1	< 1 mg/1	
Zinc	2 mg/1	< 1 mg/1	
Total Toxic Metals #	10 mg/1	< 8 mg/1	
Boron	5 mg/1	< 3.9 mg/1	
Iron	10 mg/1	< 2 mg/1	N/A

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

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

Table 3

Chemical Waste Treatment Centre
Effluent Discharge Summary (December 1995)

Parameters	Control Limits	Result	Mean
pH	6-10 pH	7 - 9.5	N/A
Total Kjeldahl Nitrogen	100 mg/1	< 85.9 mg/1	N/A
Total Phosphate	10 mg/1	< 2 mg/1	N/A
Total Sulphate	2000 mg/1	135.6 - 950.6 mg/1	546.7 mg/1
Total Sulphides	10 mg/1	< 1 mg/1	N/A
Total Cyanide	0.1 mg/1	< 0.09 mg/1	N/A
Total Suspended Solids	100 mg/1	< 100 mg/1	N/A
Oil and Grease	20 mg/1	< 16.6 mg/1	N/A
Total Phenols	0.5 mg/1	< 0.33 mg/1	N/A
Total Residual Chlorine	1 mg/1	< 0.8 mg/1	N/A
Anionic Detergents	15 mg/1	< 7.5 mg/1	N/A
Dissolved TOC	200 mg/1	20 - 179 mg/1	78.9 mg/1
Temperature	43	24 - 32	N/A
Floatable Substances	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic	2 mg/1	< 0.1 mg/1	N/A
Barium	5 mg/1	< 1 mg/1	
Cadmium	0.1 mg/1	< 0.1 mg/1	
Chromium	1 mg/1	< 0.3 mg/1	
Copper	2 mg/1	< 1.7 mg/1	
Lead	2 mg/1	< 1 mg/1	
Manganese	5 mg/1	< 0.2 mg/1	
Mercury	0.05 mg/1	< 0.05 mg/1	
Nickel	2 mg/1	< 1 mg/1	
Silver	2 mg/1	< 0.4 mg/1	
Tin	5 mg/1	< 1 mg/1	
Zinc	2 mg/1	< 1 mg/1	
Total Toxic Metals #	10 mg/1	< 7.8 mg/1	
Boron	5 mg/1	< 4.4 mg/1	
Iron	10 mg/1	< 2 mg/1	N/A

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

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

Table 4

Chemical Waste Treatment Centre
Effluent Discharge Summary (January 1996)

Parameters	Control Limits	Result	Mean
pH	6-10 pH	7.1 - 9.9	N/A
Total Kjeldahl Nitrogen	100 mg/1	< 54.5 mg/1	N/A
Total Phosphate	10 mg/1	< 2 mg/1	N/A
Total Sulphate	2000 mg/1	345.4 - 1011.5 mg/1	520.7 mg/1
Total Sulphides	10 mg/1	< 1 mg/1	N/A
Total Cyanide	0.1 mg/1	< 0.06 mg/1	N/A
Total Suspended Solids	100 mg/1	< 90.4 mg/1	N/A
Oil and Grease	20 mg/1	< 15 mg/1	N/A
Total Phenols	0.5 mg/1	< 0.47 mg/1	N/A
Total Residual Chlorine	1 mg/1	< 0.9 mg/1	N/A
Anionic Detergents	15 mg/1	< 3 mg/1	N/A
Dissolved TOC	200 mg/1	48 - 180.2 mg/1	79.2 mg/1
Temperature	43	21 - 33	N/A
Floatable Substances	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic	2 mg/1	< 0.1 mg/1	N/A
Barium	5 mg/1	< 1 mg/1	
Cadmium	0.1 mg/1	< 0.1 mg/1	
Chromium	1 mg/1	< 0.3 mg/1	
Copper	2 mg/1	< 1.86 mg/1	
Lead	2 mg/1	< 1 mg/1	
Manganese	5 mg/1	< 0.2 mg/1	
Mercury	0.05 mg/1	< 0.05 mg/1	
Nickel	2 mg/1	< 1 mg/1	
Silver	2 mg/1	< 0.4 mg/1	
Tin	5 mg/1	< 1 mg/1	
Zinc	2 mg/1	< 1 mg/1	
Total Toxic Metals #	10 mg/1	< 7.56 mg/1	
Boron	5 mg/1	< 4.7 mg/1	
Iron	10 mg/1	< 2 mg/1	N/A

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

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

Table 5

Chemical Waste Treatment Centre
Effluent Discharge Summary (February 1996)

Parameters	Control Limits	Result	Mean
pH	6-10 pH	6.8 - 9.9	N/A
Total Kjeldahl Nitrogen	100 mg/1	< 33.3 mg/1	N/A
Total Phosphate	10 mg/1	< 2 mg/1	N/A
Total Sulphate	2000 mg/1	373.4 - 901.7 mg/1	543.9 mg/1
Total Sulphides	10 mg/1	< 1 mg/1	N/A
Total Cyanide	0.1 mg/1	< 0.095 mg/1	N/A
Total Suspended Solids	100 mg/1	< 85.9 mg/1	N/A
Oil and Grease	20 mg/1	< 15 mg/1	N/A
Total Phenols	0.5 mg/1	< 0.49 mg/1	N/A
Total Residual Chlorine	1 mg/1	< 0.9 mg/1	N/A
Anionic Detergents	15 mg/1	< 3 mg/1	N/A
Dissolved TOC	200 mg/1	55.1 - 175.5 mg/1	86.5 mg/1
Temperature	43	12 - 38	N/A
Floatable Substances	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic	2 mg/1	< 0.1 mg/1	N/A
Barium	5 mg/1	< 1 mg/1	
Cadmium	0.1 mg/1	< 0.1 mg/1	
Chromium	1 mg/1	< 0.3 mg/1	
Copper	2 mg/1	< 1.5 mg/1	
Lead	2 mg/1	< 1 mg/1	
Manganese	5 mg/1	< 0.2 mg/1	
Mercury	0.05 mg/1	< 0.05 mg/1	
Nickel	2 mg/1	< 1 mg/1	
Silver	2 mg/1	< 0.4 mg/1	
Tin	5 mg/1	< 1 mg/1	
Zinc	2 mg/1	< 1 mg/1	
Total Toxic Metals #	10 mg/1	< 7.69 mg/1	
Boron	5 mg/1	< 2.1 mg/1	
Iron	10 mg/1	< 2 mg/1	N/A

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

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

Table 6

Chemical Waste Treatment Centre
Effluent Discharge Summary (March 1996)

Parameters	Control Limits	Result	Mean
pH	6-10 pH	6.2 - 9.7	N/A
Total Kjeldahl Nitrogen	100 mg/1	< 41.7 mg/1	N/A
Total Phosphate	10 mg/1	< 2 mg/1	N/A
Total Sulphate	2000 mg/1	234 - 977 mg/1	420 mg/1
Total Sulphides	10 mg/1	< 1 mg/1	N/A
Total Cyanide	0.1 mg/1	< 0.04 mg/1	N/A
Total Suspended Solids	100 mg/1	< 92.5 mg/1	N/A
Oil and Grease	20 mg/1	< 15 mg/1	N/A
Total Phenols	0.5 mg/1	< 0.44 mg/1	N/A
Total Residual Chlorine	1 mg/1	< 0.74 mg/1	N/A
Anionic Detergents	15 mg/1	< 9.3 mg/1	N/A
Dissolved TOC	200 mg/1	34.6 - 198 mg/1	72.8 mg/1
Temperature	43	22 - 38	N/A
Floatable Substances	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic	2 mg/1	< 0.1 mg/1	N/A
Barium	5 mg/1	< 1 mg/1	
Cadmium	0.1 mg/1	< 0.1 mg/1	
Chromium	1 mg/1	< 0.3 mg/1	
Copper	2 mg/1	< 1.5 mg/1	
Lead	2 mg/1	< 1 mg/1	
Manganese	5 mg/1	< 0.2 mg/1	
Mercury	0.05 mg/1	< 0.05 mg/1	
Nickel	2 mg/1	< 1 mg/1	
Silver	2 mg/1	< 0.4 mg/1	
Tin	5 mg/1	< 1 mg/1	
Zinc	2 mg/1	< 1 mg/1	
Total Toxic Metals #	10 mg/1	< 7.65 mg/1	
Boron	5 mg/1	< 4.2 mg/1	
Iron	10 mg/1	< 2 mg/1	N/A

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

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

Table 7

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (October 1995)

Parameters	Control Limits (mg/m ³)	Result (mg/m ³)	Mean (mg/m ³)
Particulates	75	0.6 - 1.5	0.93
Chlorine and Compounds (as Cl ₂)	100	< 4	N/A
Fluorine and Compounds (as HF)	25	< 0.4	N/A
Hydrogen Sulphide	5	Not detected	N/A
Acidity (as Sulphuric Acid)	100	0.4 - 10.8	8.1
Sulphur Dioxide	750	4.8 - 427.3	255.3
Hydrochloric Acid	38	4.7 - 17	12.8
Total Phosphorus (as P)	7.5	< 1.7	N/A
Hydrogen Fluoride	7.5	< 1.1	N/A
Hydrogen Bromide	7.5	< 1	N/A
Toxic Metals I :			
Mercury	3	< 0.002	N/A
Cadmium	3	< 0.033	
Antimony	3	< 0.332	
Toxic Metals II :			
Lead	10	< 0.332	N/A
Copper	10	< 0.332	
Arsenic	10	< 0.002	
Nickel	10	< 0.332	
Chromium	10	< 0.033	
Total of Toxic Metals I & II	10	< 1.396	N/A
Dioxin (Monthly)	0.1 ng/m ³	0.0087 ng/m ³	N/A

Table 8

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (November 1995)

Parameters	Control Limits (mg/m ³)	Result (mg/m ³)	Mean (mg/m ³)
Particulates	75	0.7	N/A
Chlorine and Compounds (as Cl ₂)	100	< 3.6	N/A
Fluorine and Compounds (as HF)	25	< 0.4	N/A
Hydrogen Sulphide	5	Not detected	N/A
Acidity (as Sulphuric Acid)	100	15.4	N/A
Sulphur Dioxide	750	613.6	N/A
Hydrochloric Acid	38	9.1	N/A
Total Phosphorus (as P)	7.5	< 1.4	N/A
Hydrogen Fluoride	7.5	< 1.1	N/A
Hydrogen Bromide	7.5	< 1.1	N/A
Toxic Metals I :			
Mercury	3	< 0.001	N/A
Cadmium	3	< 0.028	
Antimony	3	< 0.275	
Toxic Metals II :			
Lead	10	< 0.275	N/A
Copper	10	< 0.275	
Arsenic	10	< 0.001	
Nickel	10	< 0.275	
Chromium	10	< 0.028	
Total of Toxic Metals I & II	10	< 1.158	N/A
Dioxin (Monthly)	0.1 ng/m ³	0.0284 ng/m ³	N/A

Table 9

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (December 1995)

Parameters	Control Limits (mg/m ³)	Result (mg/m ³)	Mean (mg/m ³)
Particulates	75	1.1 - 2.1	1.7
Chlorine and Compounds (as Cl ₂)	100	< 5.2	N/A
Fluorine and Compounds (as HF)	25	< 0.5	N/A
Hydrogen Sulphide	5	Not detected	N/A
Acidity (as Sulphuric Acid)	100	0.3 - 6.5	3
Sulphur Dioxide	750	1.3 - 74.5	30.1
Hydrochloric Acid	38	< 9.8	N/A
Total Phosphorus (as P)	7.5	< 1.47	N/A
Hydrogen Fluoride	7.5	< 0.9	N/A
Hydrogen Bromide	7.5	< 0.9	N/A
Toxic Metals I :			
Mercury	3	< 0.002	N/A
Cadmium	3	< 0.029	
Antimony	3	< 0.295	
Toxic Metals II :			
Lead	10	< 0.295	N/A
Copper	10	< 0.295	
Arsenic	10	< 0.001	
Nickel	10	< 0.295	
Chromium	10	< 0.029	
Total of Toxic Metals I & II	10	< 1.241	N/A
Dioxin (Monthly)	0.1 ng/m ³	0.0098 ng/m ³	N/A

Table 10

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (January 1996)

Parameters	Control Limits (mg/m ³)	Result (mg/m ³)	Mean (mg/m ³)
Particulates	75	0.1 - 3.4	1.75
Chlorine and Compounds (as Cl ₂)	100	< 1.8	N/A
Fluorine and Compounds (as HF)	25	< 0.3	N/A
Hydrogen Sulphide	5	Not detected	N/A
Acidity (as Sulphuric Acid)	100	6 - 11.3	8.7
Sulphur Dioxide	750	1.5 - 451.9	226.7
Hydrochloric Acid	38	< 9.9	N/A
Total Phosphorus (as P)	7.5	< 1.47	N/A
Hydrogen Fluoride	7.5	< 0.8	N/A
Hydrogen Bromide	7.5	< 0.8	N/A
Toxic Metals I :			
Mercury	3	< 0.002	N/A
Cadmium	3	< 0.029	
Antimony	3	< 0.294	
Toxic Metals II :			
Lead	10	< 0.294	N/A
Copper	10	< 0.294	
Arsenic	10	< 0.001	
Nickel	10	< 0.294	
Chromium	10	< 0.029	
Total of Toxic Metals I & II	10	< 1.238	N/A
Dioxin (Monthly)	0.1 ng/m ³	0.0265 - 0.0299 ng/m ³	0.0282ng/m ³

Table 11

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (February 1996)

Parameters	Control Limits (mg/m ³)	Result (mg/m ³)	Mean (mg/m ³)
Particulates	75	0.3 - 10.1	3.7
Chlorine and Compounds (as Cl ₂)	100	< 7.1	N/A
Fluorine and Compounds (as HF)	25	< 0.5	N/A
Hydrogen Sulphide	5	< 0.7	N/A
Acidity (as Sulphuric Acid)	100	4 - 11.5	7.8
Sulphur Dioxide	750	226.6 - 547.3	388.7
Hydrochloric Acid	38	< 17.7	N/A
Total Phosphorus (as P)	7.5	< 1.45	N/A
Hydrogen Fluoride	7.5	< 1.1	N/A
Hydrogen Bromide	7.5	< 1.1	N/A
Toxic Metals I :			
Mercury	3	< 0.002	N/A
Cadmium	3	< 0.029	
Antimony	3	< 0.29	
Toxic Metals II :			
Lead	10	< 0.29	N/A
Copper	10	< 0.29	
Arsenic	10	< 0.001	
Nickel	10	< 0.29	
Chromium	10	< 0.029	
Total of Toxic Metals I & II	10	< 1.219	N/A
Dioxin (Monthly)	0.1 ng/m ³	0.0069 ng/m ³	N/A

Table 12

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (March 1996)

Parameters	Control Limits (mg/m ³)	Result (mg/m ³)	Mean (mg/m ³)
Particulates	75	0.1 - 1.5	1.03
Chlorine and Compounds (as Cl ₂)	100	< 7.5	N/A
Fluorine and Compounds (as HF)	25	< 0.3	N/A
Hydrogen Sulphide	5	< 2.4	N/A
Acidity (as Sulphuric Acid)	100	9 - 9.8	9.3
Sulphur Dioxide	750	161.4 - 437.2	297.9
Hydrochloric Acid	38	8.6 - 16.2	12.5
Total Phosphorus (as P)	7.5	< 1.55	N/A
Hydrogen Fluoride	7.5	< 0.8	N/A
Hydrogen Bromide	7.5	< 0.9	N/A
Toxic Metals I :			
Mercury	3	< 0.002	N/A
Cadmium	3	< 0.031	
Antimony	3	< 0.31	
Toxic Metals II :			
Lead	10	< 0.31	N/A
Copper	10	< 0.31	
Arsenic	10	< 0.002	
Nickel	10	< 0.31	
Chromium	10	< 0.031	
Total of Toxic Metals I & II	10	< 1.302	N/A
Dioxin (Monthly)	0.1 ng/m ³	0.0061 ng/m ³	N/A

Table 13

Chemical Waste Treatment Centre
Stabilised Materials Summary (October 1995)

Parameters	Control Limits (ppm)	Result (ppm)	Mean (ppm)
Section A			
pH (water)	8 (lower limit)	8.4 - 12.8	N/A
% Solids	30 (lower limit)	52.4 - 100	83.9
Toxic Metals :			
Cadmium	0.5	< 0.08	N/A
Mercury	0.1	< 0.02	
Total Chromium	10	< 0.5	
Copper	-	< 4	
Nickel	-	< 0.5	
Lead	-	< 6.7	
Zinc	-	< 3.8	
Total of copper, nickel, lead, zinc	25	< 10.5	
Iron	20	< 3.5	N/A
Sulphide	10	< 5	N/A
Ammoniacal Nitrogen	10	< 1.1	N/A
Cyanide	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
Total Organic Halides	10	< 2.5	N/A
Total Chloro Phenols	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
TCDD equivalent (ITEF method)	1 ppb	< 1 ppb	N/A

Table 14

Chemical Waste Treatment Centre
Stabilised Materials Summary (November 1995)

Parameters	Control Limits (ppm)	Result (ppm)	Mean (ppm)
Section A			
pH (water)	8 (lower limit)	11.5 - 13	N/A
% Solids	30 (lower limit)	52.2 - 100	86.4
Toxic Metals :			
Cadmium	0.5	< 0.5	N/A
Mercury	0.1	< 0.02	
Total Chromium	10	< 0.5	
Copper	-	< 10	
Nickel	-	< 6.4	
Lead	-	< 1.3	
Zinc	-	< 11	
Total of copper, nickel, lead, zinc	25	< 13	
Iron	20	< 8.4	N/A
Sulphide	10	< 5	N/A
Ammoniacal Nitrogen	10	< 2	N/A
Cyanide	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
Total Organic Halides	10	< 9.1	N/A
Total Chloro Phenols	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
TCDD equivalent (ITEF method)	1 ppb	< 1 ppb	N/A

Table 15

Chemical Waste Treatment Centre
Stabilised Materials Summary (December 1995)

Parameters	Control Limits (ppm)	Result (ppm)	Mean (ppm)
Section A			
pH (water)	8 (lower limit)	11 - 13.2	N/A
% Solids	30 (lower limit)	55.3 - 100	79.9
Toxic Metals :			
Cadmium	0.5	< 0.5	N/A
Mercury	0.1	< 0.02	
Total Chromium	10	< 0.5	
Copper	-	< 8.8	
Nickel	-	< 3.1	
Lead	-	< 7.3	
Zinc	-	< 5.6	
Total of copper, nickel, lead, zinc	25	< 11.2	
Iron	20	< 8.4	N/A
Sulphide	10	< 5	N/A
Ammoniacal Nitrogen	10	< 2.4	N/A
Cyanide	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
Total Organic Halides	10	< 4.8	N/A
Total Chloro Phenols	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
TCDD equivalent (ITEF method)	1 ppb	< 1 ppb	N/A

Table 16

Chemical Waste Treatment Centre
Stabilised Materials Summary (January 1996)

Parameters	Control Limits (ppm)	Result (ppm)	Mean (ppm)
Section A			
pH (water)	8 (lower limit)	11.8 - 13.1	N/A
% Solids	30 (lower limit)	56.2 - 100	82.2
Toxic Metals :			
Cadmium	0.5	< 0.5	N/A
Mercury	0.1	< 0.02	
Total Chromium	10	< 0.7	
Copper	-	< 7.8	
Nickel	-	< 0.9	
Lead	-	< 2.6	
Zinc	-	< 3.1	
Total of copper, nickel, lead, zinc	25	< 12.4	
Iron	20	< 19.4	N/A
Sulphide	10	< 5	N/A
Ammoniacal Nitrogen	10	< 1.9	N/A
Cyanide	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
Total Organic Halides	10	< 2	N/A
Total Chloro Phenols	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
TCDD equivalent (ITEF method)	1 ppb	< 1 ppb	N/A

Table 17

Chemical Waste Treatment Centre
Stabilised Materials Summary (February 1996)

Parameters	Control Limits (ppm)	Result (ppm)	Mean (ppm)
Section A			
pH (water)	8 (lower limit)	10.9 - 13.1	N/A
% Solids	30 (lower limit)	49.9 - 100	79.8
Toxic Metals :			
Cadmium	0.5	< 0.5	N/A
Mercury	0.1	< 0.02	
Total Chromium	10	< 0.6	
Copper	-	< 19.7	
Nickel	-	< 2.5	
Lead	-	< 3.1	
Zinc	-	< 3.1	
Total of copper, nickel, lead, zinc	25	< 23.4	
Iron	20	< 7.2	N/A
Sulphide	10	< 5	N/A
Ammoniacal Nitrogen	10	< 1.4	N/A
Cyanide	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
Total Organic Halides	10	< 2	N/A
Total Chloro Phenols	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
TCDD equivalent (ITEF method)	1 ppb	< 1 ppb	N/A

Table 18

Chemical Waste Treatment Centre
Stabilised Materials Summary (March 1996)

Parameters	Control Limits (ppm)	Result (ppm)	Mean (ppm)
Section A			
pH (water)	8 (lower limit)	11.4 - 12.8	N/A
% Solids	30 (lower limit)	51.7 - 100	86
Toxic Metals :			
Cadmium	0.5	< 0.5	N/A
Mercury	0.1	< 0.02	
Total Chromium	10	< 0.6	
Copper	-	< 14	
Nickel	-	< 0.5	
Lead	-	< 18.6	
Zinc	-	< 3.1	
Total of copper, nickel, lead, zinc	25	< 20.2	
Iron	20	< 8.6	N/A
Sulphide	10	< 5	N/A
Ammoniacal Nitrogen	10	< 7.6	N/A
Cyanide	5	< 5	N/A
Section B			
Volatile Organic Contents	5000	< 15	N/A
Total Organic Halides	10	< 7.5	N/A
Total Chloro Phenols	2	< 2	N/A
Polychlorinated Biphenyls	1	< 1	N/A
TCDD equivalent (ITEF method)	1 ppb	< 1 ppb	N/A