

Chemical Waste Treatment Centre
Operation Report
Apr 94 - Sep 94

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 April 94 to September 94.

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. Continuous automatic monitoring of pH, temperature and flow rate 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 April 94 to September 94. 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 April 94 to September 94 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 April 94 to September 94 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 (April 1994)

Parameters	Control Limits	Result	Mean
pH	6-10	6.5 – 9.8	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 84.19	N/A
Total Phosphate (mg/l)	10	< 8	N/A
Total Sulphate (mg/l)	2000	761.1 – 1912	1312.8
Total Sulphides (mg/l)	10	< 9.67	N/A
Total Cyanide (mg/l)	0.1	< 0.088	N/A
Total Suspended Solids (mg/l)	100	1.5 – 96.6	32.0
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	< 0.76	N/A
Anionic Detergents (mg/l)	15	< 2	N/A
Temperature (°C)	43	19 – 31	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.5	N/A
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.95	
Copper (mg/l)	2	< 1.82	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.8	
Mercury (mg/l)	0.05	< 0.05	
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 1	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1	
Total Toxic Metals # (mg/l)	10	< 10	
Boron (mg/l)	5	1.11 – 5	2.88
Iron (mg/l)	10	< 5	N/A

Parameters	Control Limits	Result	Mean
Pesticides :			
Aldrin (mg/l)	0.01	< 0.01	N/A
BHCS (mg/l)	0.01	< 0.01	
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	N/A
Radium-226 (pc/l)	30	< 30	
Strontium-90 (pc/l)	100	< 100	

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

Table 2

Chemical Waste Treatment Centre
Effluent Discharge Summary (May 1994)

Parameters	Control Limits	Result	Mean
pH	6-10	6.7 – 9.9	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 80	N/A
Total Phosphate (mg/l)	10	< 8	N/A
Total Sulphate (mg/l)	2000	981 – 1961	1414.3
Total Sulphides (mg/l)	10	< 8.3	N/A
Total Cyanide (mg/l)	0.1	< 0.086	N/A
Total Suspended Solids (mg/l)	100	6 – 94.49	52.6
Oil and Grease (mg/l)	20	< 15.11	N/A
Total Phenols (mg/l)	0.5	< 0.46	N/A
Total Residual Chlorine (mg/l)	1	< 1	N/A
Anionic Detergents (mg/l)	15	< 2	N/A
Temperature (°C)	43	19 – 36	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.5	N/A
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.71	
Copper (mg/l)	2	< 1.87	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.5	
Mercury (mg/l)	0.05	< 0.05	
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 1	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1.45	
Total Toxic Metals # (mg/l)	10	< 10	
Boron (mg/l)	5	0.8 – 4.05	
Iron (mg/l)	10	< 5	N/A

Parameters	Control Limits	Result	Mean
Pesticides :			
Aldrin (mg/l)	0.01	< 0.01	N/A
BHCS (mg/l)	0.01	< 0.01	
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	N/A
Radium-226 (pc/l)	30	< 30	
Strontium-90 (pc/l)	100	< 100	

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 (June 1994)

Parameters	Control Limits	Result	Mean
pH	6-10	6.7 - 9.9	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 80.6	N/A
Total Phosphate (mg/l)	10	< 8	N/A
Total Sulphate (mg/l)	2000	806.1 – 1810.6	1360.3
Total Sulphides (mg/l)	10	< 1	N/A
Total Cyanide (mg/l)	0.1	< 0.052	N/A
Total Suspended Solids (mg/l)	100	< 76.1	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	< 2	N/A
Temperature (°C)	43	21 – 36	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.5	N/A
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.1	
Copper (mg/l)	2	< 1.37	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.58	
Mercury (mg/l)	0.05	< 0.05	
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 1	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1	
Total Toxic Metals # (mg/l)	10	< 10	
Boron (mg/l)	5	< 2.42	
Iron (mg/l)	10	< 5	

Parameters	Control Limits	Result	Mean
Pesticides :			
Aldrin (mg/l)	0.01	< 0.01	N/A
BHCS (mg/l)	0.01	< 0.01	
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	N/A
Radium-226 (pc/l)	30	< 30	
Strontium-90 (pc/l)	100	< 100	

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 (July 1994)

Parameters	Control Limits	Result	Mean
pH	6-10	7 - 9.6	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 88.73	N/A
Total Phosphate (mg/l)	10	< 8	N/A
Total Sulphate (mg/l)	2000	759 – 1339	976.6
Total Sulphides (mg/l)	10	< 7.1	N/A
Total Cyanide (mg/l)	0.1	< 0.053	N/A
Total Suspended Solids (mg/l)	100	< 83.2	N/A
Oil and Grease (mg/l)	20	< 15.5	N/A
Total Phenols (mg/l)	0.5	< 0.427	N/A
Total Residual Chlorine (mg/l)	1	< 1	N/A
Anionic Detergents (mg/l)	15	< 2	N/A
Temperature (°C)	43	22 – 35.2	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.5	N/A
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.45	
Copper (mg/l)	2	< 1.24	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.58	
Mercury (mg/l)	0.05	< 0.05	
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 1	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1.58	
Total Toxic Metals # (mg/l)	10	< 10	
Boron (mg/l)	5	0.7 – 4.4	1.78
Iron (mg/l)	10	< 5	N/A

Parameters	Control Limits	Result	Mean
Pesticides :			
Aldrin (mg/l)	0.01	< 0.01	N/A
BHCS (mg/l)	0.01	< 0.01	
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	N/A
Radium-226 (pc/l)	30	< 30	
Strontium-90 (pc/l)	100	< 100	

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 (August 1994)

Parameters	Control Limits	Result	Mean
pH	6-10	7 - 10	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 80	N/A
Total Phosphate (mg/l)	10	< 8	N/A
Total Sulphate (mg/l)	2000	734 – 1706.2	1018.4
Total Sulphides (mg/l)	10	< 1	N/A
Total Cyanide (mg/l)	0.1	< 0.087	N/A
Total Suspended Solids (mg/l)	100	< 83.2	N/A
Oil and Grease (mg/l)	20	< 15.5	N/A
Total Phenols (mg/l)	0.5	< 0.49	N/A
Total Residual Chlorine (mg/l)	1	< 1	N/A
Anionic Detergents (mg/l)	15	< 2.81	N/A
Temperature (°C)	43	21 – 37	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.5	N/A
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.45	
Copper (mg/l)	2	< 1.2	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.7	
Mercury (mg/l)	0.05	< 0.05	
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 1	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 1.675	
Total Toxic Metals # (mg/l)	10	< 10	
Boron (mg/l)	5	< 4.88	
Iron (mg/l)	10	< 5	N/A

Parameters	Control Limits	Result	Mean
Pesticides :			
Aldrin (mg/l)	0.01	< 0.01	N/A
BHCS (mg/l)	0.01	< 0.01	
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	N/A
Radium-226 (pc/l)	30	< 30	
Strontium-90 (pc/l)	100	< 100	

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 (September 1994)

Parameters	Control Limits	Result	Mean
pH	6-10	6 – 9.25	N/A
Total Kjeldahl Nitrogen (mg/l)	100	< 83.92	N/A
Total Phosphate (mg/l)	10	< 8	N/A
Total Sulphate (mg/l)	2000	750.9 – 1601.2	1102.1
Total Sulphides (mg/l)	10	< 8.54	N/A
Total Cyanide (mg/l)	0.1	< 0.05	N/A
Total Suspended Solids (mg/l)	100	< 89.78	N/A
Oil and Grease (mg/l)	20	< 16.74	N/A
Total Phenols (mg/l)	0.5	< 0.75	N/A
Total Residual Chlorine (mg/l)	1	< 1	N/A
Anionic Detergents (mg/l)	15	< 3.5	N/A
Temperature (°C)	43	26 – 37	N/A
Floatable Substances (mg/l)	Not to be detected	Not detected	Not detected
Toxic Metals :			
Arsenic (mg/l)	2	< 0.5	N/A
Barium (mg/l)	5	< 1	
Cadmium (mg/l)	0.1	< 0.1	
Chromium (mg/l)	1	< 0.226	
Copper (mg/l)	2	< 1.4	
Lead (mg/l)	2	< 1	
Manganese (mg/l)	5	< 0.84	
Mercury (mg/l)	0.05	< 0.05	
Nickel (mg/l)	2	< 1	
Silver (mg/l)	2	< 1	
Tin (mg/l)	5	< 1	
Zinc (mg/l)	2	< 2	
Total Toxic Metals # (mg/l)	10	< 10	
Boron (mg/l)	5	< 2.7	
Iron (mg/l)	10	< 5	N/A

Parameters	Control Limits	Result	Mean
Pesticides :			
Aldrin (mg/l)	0.01	< 0.01	N/A
BHCS (mg/l)	0.01	< 0.01	
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	N/A
Radium-226 (pc/l)	30	< 30	
Strontium-90 (pc/l)	100	< 100	

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 (April 1994)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	0.7 – 5.8	2.5
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	4.4 – 7.1	5.75
Sulphur Dioxide (mg/m ³)	750	5.3 – 60.2	28.13
Hydrochloric Acid (mg/m ³)	38	5 – 16.6	13.2
Total Phosphorus (as P) (mg/m ³)	7.5	< 2.7	N/A
Hydrogen Fluoride (mg/m ³)	7.5	< 3.1	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 0.8	3.4
Toxic Metals I :			
Mercury (mg/m ³)	3	< 0.002	N/A
Cadmium (mg/m ³)	3	< 0.028	
Antimony (mg/m ³)	3	< 0.276	
Toxic Metals II :			
Lead (mg/m ³)	10	< 0.276	N/A
Copper (mg/m ³)	10	< 0.276	
Arsenic (mg/m ³)	10	< 0.002	
Nickel (mg/m ³)	10	< 0.276	
Chromium (mg/m ³)	10	< 0.028	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.161	N/A
Dioxin (ng/m ³)	0.1	< 0.0007	N/A

Table 8

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (May 1994)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	1.2 – 10.8	4.53
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 2.9	N/A
Fluorine and Compounds (as HF) (mg/m ³)	25	< 0.3	N/A
Hydrogen Sulphide (mg/m ³)	5	Not detected	N/A
Acidity (as Sulphuric Acid) (mg/m ³)	100	1.5 – 3.9	2.77
Sulphur Dioxide (mg/m ³)	750	7.6 – 30.8	14.57
Hydrochloric Acid (mg/m ³)	38	12 – 19.7	15.1
Total Phosphorus (as P) (mg/m ³)	7.5	< 2.585	N/A
Hydrogen Fluoride (mg/m ³)	7.5	< 0.8	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 0.8	N/A
Toxic Metals I :			
Mercury (mg/m ³)	3	< 0.002	N/A
Cadmium (mg/m ³)	3	< 0.028	
Antimony (mg/m ³)	3	< 0.284	
Toxic Metals II :			
Lead (mg/m ³)	10	< 0.284	N/A
Copper (mg/m ³)	10	< 0.284	
Arsenic (mg/m ³)	10	< 0.004	
Nickel (mg/m ³)	10	< 0.284	
Chromium (mg/m ³)	10	< 0.028	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.196	N/A
Dioxin (ng/m ³)	0.1	< 0.0012	N/A

Table 9

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (June 1994)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	2.3 – 25.2	9.35
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 3.5	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	0.8 – 11.2	6.33
Sulphur Dioxide (mg/m ³)	750	7.2 – 52.9	25.9
Hydrochloric Acid (mg/m ³)	38	3.1 – 16.5	8.98
Total Phosphorus (as P) (mg/m ³)	7.5	< 2.998	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	< 0.002	N/A
Cadmium (mg/m ³)	3	< 0.026	
Antimony (mg/m ³)	3	< 0.260	
Toxic Metals II :			
Lead (mg/m ³)	10	< 0.260	N/A
Copper (mg/m ³)	10	< 0.260	
Arsenic (mg/m ³)	10	< 0.001	
Nickel (mg/m ³)	10	< 0.260	
Chromium (mg/m ³)	10	< 0.026	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.094	N/A
Dioxin (ng/m ³)	0.1	< 0.0252	N/A

Table 10

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (July 1994)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	5.8 – 11.8	8.2
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 3.5	N/A
Fluorine and Compounds (as HF) (mg/m ³)	25	< 0.4	N/A
Hydrogen Sulphide (mg/m ³)	5	0.4 – 0.5	0.45
Acidity (as Sulphuric Acid) (mg/m ³)	100	1.1 – 14.3	8.78
Sulphur Dioxide (mg/m ³)	750	1.6 – 133.2	88.9
Hydrochloric Acid (mg/m ³)	38	7.6 – 18.9	12.5
Total Phosphorus (as P) (mg/m ³)	7.5	< 2.915	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	< 0.002	N/A
Cadmium (mg/m ³)	3	< 0.034	
Antimony (mg/m ³)	3	< 0.342	
Toxic Metals II :			
Lead (mg/m ³)	10	< 0.342	N/A
Copper (mg/m ³)	10	< 0.342	
Arsenic (mg/m ³)	10	< 0.002	
Nickel (mg/m ³)	10	< 0.342	
Chromium (mg/m ³)	10	< 0.034	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.440	N/A
Dioxin (ng/m ³)	0.1	0.0028 – 0.0044	0.0036

Table 11

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (August 1994)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	8.6 – 10.5	9.63
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 3.6	N/A
Fluorine and Compounds (as HF) (mg/m ³)	25	< 0.4	N/A
Hydrogen Sulphide (mg/m ³)	5	0.1 – 0.4	0.25
Acidity (as Sulphuric Acid) (mg/m ³)	100	2.9 – 5.5	3.93
Sulphur Dioxide (mg/m ³)	750	25.1 – 57.4	44.6
Hydrochloric Acid (mg/m ³)	38	10.4 - 26	15.9
Total Phosphorus (as P) (mg/m ³)	7.5	< 3.444	N/A
Hydrogen Fluoride (mg/m ³)	7.5	< 1.1	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 1.0	N/A
Toxic Metals I :			
Mercury (mg/m ³)	3	< 0.002	N/A
Cadmium (mg/m ³)	3	< 0.033	
Antimony (mg/m ³)	3	< 0.334	
Toxic Metals II :			
Lead (mg/m ³)	10	< 0.334	N/A
Copper (mg/m ³)	10	< 0.334	
Arsenic (mg/m ³)	10	< 0.002	
Nickel (mg/m ³)	10	< 0.334	
Chromium (mg/m ³)	10	< 0.033	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.440	N/A
Dioxin (ng/m ³)	0.1	0.0169	N/A

Table 12

Chemical Waste Treatment Centre
Stack Gas Monitoring Summary (September 1994)

Parameters	Control Limits	Result	Mean
Particulates (mg/m ³)	75	8.5 – 37.9	16.96
Chlorine and Compounds (as Cl ₂) (mg/m ³)	100	< 4.3	N/A
Fluorine and Compounds (as HF) (mg/m ³)	25	< 0.5	N/A
Hydrogen Sulphide (mg/m ³)	5	Not detected	N/A
Acidity (as Sulphuric Acid) (mg/m ³)	100	10.1 – 27.9	14.24
Sulphur Dioxide (mg/m ³)	750	272.5 – 663.8	427.52
Hydrochloric Acid (mg/m ³)	38	8.7 – 46.7	34.24
Total Phosphorus (as P) (mg/m ³)	7.5	< 3.045	N/A
Hydrogen Fluoride (mg/m ³)	7.5	< 1.0	N/A
Hydrogen Bromide (mg/m ³)	7.5	< 8.4	N/A
Toxic Metals I :			
Mercury (mg/m ³)	3	< 0.002	N/A
Cadmium (mg/m ³)	3	< 0.032	
Antimony (mg/m ³)	3	< 0.320	
Toxic Metals II :			
Lead (mg/m ³)	10	< 0.320	N/A
Copper (mg/m ³)	10	< 0.320	
Arsenic (mg/m ³)	10	< 0.005	
Nickel (mg/m ³)	10	< 0.320	
Chromium (mg/m ³)	10	< 0.032	
Total of Toxic Metals I & II (mg/m ³)	10	< 1.350	N/A
Dioxin (ng/m ³)	0.1	0.0048	N/A

Table 13

Chemical Waste Treatment Centre
Stabilised Materials Summary (April 1994)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	10.04 – 12.67	N/A
% Solids (%)	30 (lower limit)	36.6 – 100	79.2
Toxic Metals :			
Cadmium (ppm)	0.5	< 0.5	N/A
Mercury (ppm)	0.1	< 0.1	
Total Chromium (ppm)	10	< 1.2	
Copper (ppm)	-	< 5.49	
Nickel (ppm)	-	< 2.1	
Lead (ppm)	-	< 4.3	
Zinc (ppm)	-	< 20.82	
Total of copper, nickel, lead, zinc (ppm)	25	< 20.87	
Iron (ppm)	20	< 18.1	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 5.46	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents (ppm)	5000	< 126	N/A
Total Organic Halides (ppm)	10	< 2.99	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls (ppm)	1	< 1	N/A
TCDD equivalent (ITEF method) (ppb)	1	< 1	N/A

Table 14

Chemical Waste Treatment Centre
Stabilised Materials Summary (May 1994)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	11.08 – 12.98	N/A
% Solids (%)	30 (lower limit)	66.8 – 100	90.9
Toxic Metals :			
Cadmium (ppm)	0.5	< 0.5	N/A
Mercury (ppm)	0.1	< 0.1	
Total Chromium (ppm)	10	< 8.19	
Copper (ppm)	-	< 5	
Nickel (ppm)	-	< 1	
Lead (ppm)	-	< 4.62	
Zinc (ppm)	-	< 7.4	
Total of copper, nickel, lead, zinc (ppm)	25	< 10.8	
Iron (ppm)	20	< 5	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 4.9	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents (ppm)	5000	< 37.22	N/A
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls (ppm)	1	< 1	N/A
TCDD equivalent (ITEF method) (ppb)	1	< 1	N/A

Table 15

Chemical Waste Treatment Centre
Stabilised Materials Summary (June 1994)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	11.33 – 13.97	N/A
% Solids (%)	30 (lower limit)	51.1 - 100	88.5
Toxic Metals :			
Cadmium (ppm)	0.5	< 0.5	N/A
Mercury (ppm)	0.1	< 0.1	
Total Chromium (ppm)	10	< 1.31	
Copper (ppm)	-	< 5	
Nickel (ppm)	-	< 1	
Lead (ppm)	-	< 5.31	
Zinc (ppm)	-	< 2.25	
Total of copper, nickel, lead, zinc (ppm)	25	< 8.97	
Iron (ppm)	20	< 5	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 4.3	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents (ppm)	5000	< 15	N/A
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls (ppm)	1	< 1	N/A
TCDD equivalent (ITEF method) (ppb)	1	< 1	N/A

Table 16

Chemical Waste Treatment Centre
Stabilised Materials Summary (July 1994)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	10.32 – 12.69	N/A
% Solids (%)	30 (lower limit)	40.63 – 99.99	88.04
Toxic Metals :			
Cadmium (ppm)	0.5	< 0.5	N/A
Mercury (ppm)	0.1	< 0.1	
Total Chromium (ppm)	10	< 1	
Copper (ppm)	-	< 8.84	
Nickel (ppm)	-	< 3.67	
Lead (ppm)	-	< 10.87	
Zinc (ppm)	-	< 9.61	
Total of copper, nickel, lead, zinc (ppm)	25	< 23.12	
Iron (ppm)	20	< 5	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 8.06	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents (ppm)	5000	< 15	N/A
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls (ppm)	1	< 1	N/A
TCDD equivalent (ITEF method) (ppb)	1	< 1	N/A

Table 17

Chemical Waste Treatment Centre
Stabilised Materials Summary (August 1994)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	9.73 – 13.17	N/A
% Solids (%)	30 (lower limit)	68.4 – 99.99	86.36
Toxic Metals :			
Cadmium (ppm)	0.5	< 0.5	N/A
Mercury (ppm)	0.1	< 0.1	
Total Chromium (ppm)	10	< 1.19	
Copper (ppm)	-	< 7.39	
Nickel (ppm)	-	< 1	
Lead (ppm)	-	< 2.95	
Zinc (ppm)	-	< 9.61	
Total of copper, nickel, lead, zinc (ppm)	25	< 12.62	
Iron (ppm)	20	< 5	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 8.43	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents (ppm)	5000	< 15	N/A
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls (ppm)	1	< 1	N/A
TCDD equivalent (ITEF method) (ppb)	1	< 1	N/A

Table 18

Chemical Waste Treatment Centre
Stabilised Materials Summary (September 1994)

Parameters	Control Limits	Result	Mean
Section A			
pH (water)	8 (lower limit)	9.97 – 13.03	N/A
% Solids (%)	30 (lower limit)	69.6 – 100	86.0
Toxic Metals :			
Cadmium (ppm)	0.5	< 0.5	N/A
Mercury (ppm)	0.1	< 0.1	
Total Chromium (ppm)	10	< 2.47	
Copper (ppm)	-	< 7.39	
Nickel (ppm)	-	< 1	
Lead (ppm)	-	< 5.1	
Zinc (ppm)	-	< 4.2	
Total of copper, nickel, lead, zinc (ppm)	25	< 9.23	
Iron (ppm)	20	< 5	N/A
Sulphide (ppm)	10	< 5	N/A
Ammoniacal Nitrogen (ppm)	10	< 7.38	N/A
Cyanide (ppm)	5	< 5	N/A
Section B			
Volatile Organic Contents (ppm)	5000	< 15	N/A
Total Organic Halides (ppm)	10	< 2	N/A
Total Chloro Phenols (ppm)	2	< 2	N/A
Polychlorinated Biphenyls (ppm)	1	< 1	N/A
TCDD equivalent (ITEF method) (ppb)	1	< 1	N/A