Viridor (Greater Manchester) Limited

Bolton TRF

Annual Performance Report 2009

Bolton Thermal Recovery Facility
Permit number BS3042 IM
Year 2009

1 Introduction.

Bolton Thermal Recovery Facility, Raikes Lane, Bolton, BL3 2NH.
Operated by Viridor (Greater Manchester) Ltd as part of the Waste Disposal Authority PFI contract.
The plant burns mixed municipal waste from Bolton MBC, Bury MBC, Salford CC and Rochdale MBC in varying quantities, it also incinerates commercial waste, trade waste and confiscated items from the police and customs.
For further copies of this report or any comment please contact S Entwistle Operations Manager at Viridor (Greater Manchester) Ltd, Bolton Thermal Recovery Facility, Raikes Lane, Bolton, BL3 2NH

2 Plant Description.

The installation is a single incinerator designed to have a capacity to burn municipal waste at approximately 16 tonnes an hour. Waste types are brought to the site by road transport (mainly council collection vehicles) which enters the site via a weighbridge. Acceptable waste is discharged into a reception pit with a holding capacity of 1530m^3 and any excess is discharged onto the floor of the tipping hall, both of which are enclosed within a building. Waste is transferred from the reception pit to the incinerator feed hopper by crane operated grab. From the hopper, it falls by gravity onto the inclined four hearth rocking grate. Primary combustion air is provided through grate and secondary combustion air is provided via ports in the roof of the furnace. Supplementary oil fired burners are used to ensure that the combustion temperature of the waste combustion gases are raised to a minimum of 850^{0}C at all times when waste is being burned on the incinerator grates and particularly during start up and shut down.
Heat from the burning of the waste is used in the heat recovery boiler to raise steam which, in turn is used in the steam turbine driven alternator to generate electricity which is used for powering plant auxiliaries and the surplus is exported to the national grid.
On exiting the heat recovery boiler the combustion gases pass into a reaction area where lime and activated carbon are injected into the gas stream to remove acid gases and organic vapours. The gases then pass through a filter where the scrubbing agents and the dust in the combustion gases are collected before the cleaned gases are discharged to atmosphere via a 60 metres high chimney. A proportion of the scrubbing reagents are recycled in the process. Storage silos are provided for the lime, activated carbon, recycled reagent and the filter dust (APC ash). Ammonia is injected into the combustion gases, to control oxides of nitrogen release, as they pass through the heat recovery boiler.
Ash residues discharges from the incinerator grate and fall into a water quenching trough. The ash is drained of surplus moisture, ferrous metal is recovered and the remaining residue is stored before being sent for reuse.
Continuous emission monitors are installed to analyse the exhaust gases from the chimney and include particulates, sulphur dioxide, oxides of nitrogen, carbon monoxide, hydrogen chloride, TOC and ammonia.
Water is abstracted from the River Croal for use in the cooling tower and for process use. Excess water from the cooling tower is returned to the River Croal.

Surface water from the combustion gas treatment and ash quenching area is recycled to the process. Solids filtered from the river water along with some of the river water is discharged to sewer.

3 Summary of plant operations

(a) The plant is single furnace
(b)

Permitted Waste types in tonnes		
Waste type	Limitation	Total
Mixed Municipal waste	Domestic, bulky and street market collections	83780
Commercial Waste	Cardboard, packaging and confidential documents	552
Animal by- product	International catering waste	0
Trade waste	Similar to household waste	599
Confiscated Items	Brought in by police/customs	8.10
	Total	84939

(c) Total Plant operational hours were 6793

Bi annual planned shut down's May 480 hrs 523 hrs November

Significant plant failures
Planned

Boiler tube failure Feb/May/June/Sept	359.5hrs
Tube failure Eco 1 Jan/Dec	126 hrs
Control Valve manufacture / replacement Turbine	1144 hrs
Crack repaired in by-pass line to condenser	50.5 hrs

(d)

Residues Produced in tonnes		
Bottom Ash	Air Pollution Control	Metal
18724.61	2457.86	1861.15
Recovered	Hazardous Landfill	Recovered

(e)

Electricity Produced MW/h		
Generated	Exported	Average MW/h
43294	35265	7.4MWh gen& 6.60MWh exp.
This is equivalent to supplying 5000 houses		

4 Summary of Plant Emissions

(a) Pollutants Measured continuously to Air

Particulate	Total hydrocarbons (THC)	Hydrogen Chloride (HCl)	Carbon Monoxide (CO)	Sulphur Dioxide (SO_2)	Oxides of Nitrogen (NOx)	Ammonia (NH_3)

Pollutants Measured continuously to Water

Temperature	Free Chlorine	pH

Pollutants Measured Periodically to Air

Bi-annually			
Particulate	Total hydrocarbons (THC)	Hydrogen Chloride	Carbon Monoxide
Sulphur Dioxide (SO_2)	Oxides of Nitrogen (NOx)	Dioxins	Ammonia (NH_3)
Nitrous Oxide N_2O	Dioxin-like PCB's (WHO-TEQ[1] Humans/mammals)		

Quarterly			
Hydrogen Fluoride (HF)	Cadmium & thallium & their compounds	Mercury & its compounds	SB,As,Pb,Co,Cu,Mn,and V and their compound ((Metals)

(b) % operations time when Continuous Emissions Monitoring equipment (CEM) were operating normal was 99.98%

(c) CEM's Data See Appendix

(d) Periodic emissions monitoring results.

	First quarter	Second quarter	Third quarter	Fourth quarter
Particulate		<0.5		<0.5
TOC		<2		<1
HCL		11.1		3.7
HF	0.24	0.3	0.1	0.15
CO		8		6
SO_2		7.8		3.7
NOx		186		146
N_2O				
Dioxins& Furans		0.0350ng/m^3		0.0019 ng/m^3
NH_3		0.5		4
metals	0.071	0.009	0.022	0.018
Cadmium Thallium	0.0007	<0.002	<0.002	<0.002
Mercury	0.0004	<0.001	<0.0003	0.001
Dioxins & furans 2.10.1				
Humans/animals		0.0350 ng/m^3		0.00160 ng/m^3
Fish minimum		0.0324 ng/m^3		0.00148 ng/m^3
Birds minimum		0.0457 ng/m^3		0.00147 ng/m^3
PCBs (who-12)				
Humans/animals minimum		0.0096 ng/m^3		0.00097 ng/m^3
Fish minimum		0.00005 ng/m^3		0.000554 ng/m^3
Birds minimum		0.0251 ng/m^3		0.0244 ng/m^3
PAH's (WID suite)		<0.0003		0.00097

Note last quarter report delayed due to plant breakdown and poor weather condition in Late December and early January.

5 Summary of plant compliance.

(a)

Percentage of time the plant was compliant with the permit conditions						
Particulate	TOC	HCL	CO	SO_2	NOx	NH_3
100%	100%	100%	99.999%	100%	100%	100%

(b) Non-Compliances

(i) One half hour CO exceedance on 4th September

(c) Abnormal operations (maximum 60 hrs per year)

4hrs claimed as abnormal operations in 2009

(d) Complaints

No complaints received

(e) Formal Enforcement Actions

EA warning letter for one half hour exceedance (CO) on 4th September 2009

6 Summary of plant improvements

The following improvements have been carried out:

- Installation of remote communication to both MCS 100E continuous monitoring units
- Changed both PA fan bearing to a different type which has reduced the noise level by 10db.

7 Summary of information made available

(a) Bolton Thermal Recovery Liaison Forum meets every 3 months. Representatives attend from the three ward Councils, Local Residents Associations, Environmental Agency, Bolton Environmental Health Organisation, and Viridor. The agenda covers the following topics:-

1 Complaints
2 Plant Performance
3 Waste Incinerated, Bottom Ash, APC ash produced
4 Electricity Generated
5 Report on TRF Emission Performance and Monitoring program
6 Environment Agency Report/Comments
7 GMW Environment Department Report
8 AOB.

Minutes from the meeting are circulated to all present.

(b) Bolton Thermal Recovery Information is available at:

Environment Agency
Appleton House
430 Birchwood Boulevard
Birchwood
Warrington
WA3 7WD

Bolton Environment Department
Weston House
Weston Street
Bolton
Lancashire
BL3 2AR.

Viridor (Greater Manchester) Limited
PO Box 151
Higher Swan Lane
Bolton, BL3 3WW

Appendix

Monthly Emissions

	January							February							March							April							May							June						
	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO
Half hour limit emission limit	30	10	400	200	20	60	100	30	10	400	200	20	60	100	30	10	400	200	20	60	100	30	10	400	200	20	60	100	30	10	400	200	20	60	100	30	10	400	200	20	60	100
Monthly Max half hour	5.8	4.3	286.0	69.7	4.1	19.5	28.0	2.4	5.1	203.0	60.0	2.7	36.8	45.0	2.4	13.5	230.0	122.0	2.8	32.7	95.0	15.0	4.2	262.0	150.0	1.2	24.0	30.0	9.4	2.5	254.0	51.0	2.7	20.0	33.3	29.7	15.6	271.0	238.0	9.8	22.7	88.0
Monthly Mean half hour	1.7	0.2	130.0	8.2	0.7	9.2	6.6	1.3	0.3	142.0	11.0	0.5	8.5	6.7	1.3	0.2	148.0	12.3	0.4	8.5	6.9	5.6	0.1	144.0	15.7	0.3	9.3	6.0	5.8	0.1	158.0	8.4	0.4	8.5	6.2	3.5	0.3	147.0	14.9	1.0	8.4	7.6
Monthly Minimum half hour	0.5	0.0	0.0	0.0	0.0	0.1	4.3	0.0	0.0	67.0	0.0	0.0	0.0	2.4	0.0	0.0	104.0	0.1	0.0	0.0	2.9	0.0	0.0	105.0	0.3	0.0	0.0	4.0	0.0	0.0	107.0	0.0	0.0	0.0	4.7	0.0	0.0	130.0	0.0	0.0	0.0	4.5
Daily emission limit	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50
Monthly Maximum daily avg.	3.0	0.7	158.9	18.5	2.0	9.9	8.4	1.9	0.9	153.0	20.0	1.6	10.0	8.0	1.9	2.7	157.0	24.8	1.8	9.7	12.6	6.3	1.0	155.0	29.5	0.7	9.9	24.0	8.0	0.3	194.0	19.3	1.0	9.5	9.0	9.0	2.0	192.0	40.0	8.0	10.0	14.5

	July							August							September							October							November							December						
	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO	particulate	NH_3	NOx	SO_2	THC	HCL	CO
Half hour limit emission limit	30	10	400	200	20	60	100	30	10	400	200	20	60	100	30	10	400	200	20	60	100	30	10	400	200	20	60	100	30	10	400	200	20	60	100	30	10	400	200	20	60	100
Monthly Max half hour	16.7	8.0	282.0	99.7	10.7	21.8	39.0	11.4	5.4	248.0	71.0	18.0	21.0	93.0	8.4	7.0	293.0	130.0	10.4	42.0	39.0	16.1	9.0	385.0	53.0	8.0	42.0	99.0	16.3	2.3	246.0	54.0	6.2	97.0	99.5	3.8	3.2	218.0	66.4	0.4	47.8	78.0
Monthly Mean half hour	5.1	0.2	166.0	20.0	1.6	8.2	7.0	6.0	0.1	168.0	16.0	2.0	9.0	7.0	5.8	0.1	154.0	14.0	0.2	9.0	7.0	3.4	0.1	173.0	16.0	0.2	9.0	6.7	0.7	0.1	174.0	13.0	0.2	8.8	6.6	0.4	0.0	164.0	12.0	0.1	8.4	6.4
Monthly Minimum half hour	1.2	0.0	43.0	0.1	0.0	0.0	4.0	4.7	0.0	62.0	0.8	1.2	0.0	4.0	4.7	0.0	70.0	0.1	0.0	0.0	3.4	0.0	0.0	80.0	2.5	0.0	0.0	4.0	0.0	0.0	125.0	3.0	0.0	0.0	3.8	0.0	0.0	0.0	1.3	0.0	0.0	0.5
Daily emission limit	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50	10	n/a	200	50	10	10	50
Monthly Maximum daily avg.	9.8	1.2	188.0	34.0	3.6	9.7	14.2	6.7	2.0	197.0	28.6	9.4	9.8	10.0	6.5	0.9	168.0	25.0	8.8	9.9	9.0	6.1	0.7	193.0	23.0	1.6	9.9	11.0	5.9	0.1	191.0	17.4	1.7	9.9	9.8	1.6	0.3	190.8	23.0	1.1	9.8	7.7

January 2009