DUDLEY ENERGY FROM WASTE PLANT

PERMIT No AP3435SD

WASTE INCINERATION DIRECTIVE

ANNUAL REPORT

2010

CONTENTS

Annual performance report for MES Environmental Dudley EfW Plant – Permit No. AP3435SD – Year 2010

Introduction.

This report is produced under the Waste Incineration Directive's Article 12(2) which requires the operator of an incineration or co-incineration plant to produce an annual report to the Regulator on the functioning and monitoring of the plant and to make this available to the public. In accordance with the requirements of the Directive, the following information is therefore provided:

Name of Company	*M E S Environmental*
Name of Plant	*Dudley EfW Facility*
Permit Number	*AP3435SD*
Address	*Lister Road, Dudley DY2 8YT*
Phone	*01384 457321*
Contact name	*Mr. D Williams*
Position	*Operations Manager*
Further information, description of waste types burned and origin.	*Constructed in 1998 to burn in the region of 105,000 tonnes per annum of local domestic refuse and generate a nominal 7.4MW of electricity for the local community.*
(If you would like to make any comment on this report or if you would like any further information or to arrange a visit to the plant please telephone Mr D Williams on the above number)	

Table 1 – General information

The plant provides a sustainable method of waste disposal and recovery, predominantly for the area within the administrative boundary of Dudley Metropolitan Borough Council, with smaller quantities of waste accepted, where capacity and demand exists, from other local authorities within the general vicinity of the plant.

Household, commercial or industrial wastes, collected by the local authorities, their agents or contractors, comprise almost all of the wastes delivered to the plant, at around 99.57% of all deliveries. In 2010 81.78 % was from within the Dudley area with a further 17.79% of wastes from other local authorities in the West Midlands. Only 0.43% of wastes was from private sector contracts.

Priority will always be given however to the delivery of local authority wastes, as required by the terms of contractual arrangements, to ensure that safe, reliable, consistent and sustainable disposal and recovery facilities are available at all times.

This also reduces reliance on and quantities of wastes delivered for disposal to landfill with little or no beneficial outcome. It also contributes significantly to the diversion of biodegradable municipal waste away from landfill consistent with the

European Union and Governments objectives under the terms of the EU Landfill Directive.

Non Technical Plant Description.

The installation comprises an energy from waste facility (EFW) processing a maximum of 105,000 tonnes per year of municipal and other specified wastes.

The plant contains two incineration lines with a combined design capacity to process up to 12 tonnes of waste per hour. Each line has separate waste feed systems, furnaces, boilers and flue gas treatment equipment but share a common electricity generation system.

Heat produced during the incineration process is converted to electrical energy by generating steam in high-pressure boilers and expanding the steam through a steam turbine. Air-cooled condensers re-circulate condensate back to the boilers..

By this means the plant, when operating at full load, will typically generate around 7.4 MW of electricity and, after satisfying its own power needs, exports approximately 6.5 MW of electricity to the local electricity network. This assists in contributing to the Government's target of providing 10% of electricity generation from renewable energy sources by the year 2010.

The combined effect of the plant's energy recovery process and the recycling activities of the local authorities in the area results in the recovery of value from around 80% of the municipal wastes produced in the area, either in the form of electricity production, recycling or composting.

This demonstrates that the two processes have a strong environmental synergy and work in common to treat waste as a resource to be put to beneficial use.

As recycling performance and capacity within the primary catchment area increases this provides further opportunity to divert additional materials away from landfill in conjunction neighbouring local authorities, who are more heavily reliant on landfill as their primary disposal route.

In 2010 16,692 tonnes of mixed municipal wastes were imported from the Sandwell and Walsall areas, which would otherwise have been disposed of by landfill.

In terms of plant operation the incineration processes have been designed against the background of a detailed assessment of the prevailing environmental conditions at the site location and are based upon the Best Available Technology as detailed both in the original Authorisation application and the application for the Permit issued under the Pollution Prevention and Control (England and Wales) Regulations 2000. These include but are not limited to the following:-

- Well proven process plant developed specifically for incineration of municipal solid wastes,
- Efficient, comprehensive process control and monitoring systems to ensure optimum conditions for complete combustion of the wastes and to minimise emissions from the processes.
- Operations confined within buildings under slight negative pressure in order to contain and minimise emissions such as dust and odour.
- Qualified and experienced operating and maintenance personnel to implement procedures to ensure that the required high standards are maintained. Operating and Maintenance Procedures are established according to an

internationally recognised system of quality assurance.

- Multi-stage high efficiency flue gas cleaning systems comprising deNOx Selective Non-Catalytic Reduction (SNCR) for the removal of oxides of nitrogen, activated carbon and lime semi-dry acid gas scrubbing for controlling acid gas, dioxins/furans and mercury emissions.
- Final stage flue gas abatement for particulate materials using fabric filtration.
- 47 metre chimney stacks for effective dispersion of the low emission concentrations
- Residues from the combustion process and from the flue gas cleaning system disposed of by approved means, maximising recycling wherever possible.
- Residues transported in appropriate vehicles, suitably enclosed and covered to ensure that no spillage occurs.
- Operation of the installation under an Environmental Management System, accredited to IS014001 and a Quality Management System, accredited to IS09001
- Waste water from the process is neutralised and recycled as far as is practicable to minimise the quantities released to sewers.
- Provision of bunds or double skinned vessels for storage of fuel and chemicals to prevent accidental and inappropriate discharge to the public sewers and watercourse.

The Plant is regulated under the terms of a Permit issued by the Environment Agency (reference AP3435SD) and which contains conditions to ensure that the requirements of the Waste Incineration Directive are incorporated and will be met.

A variation to the permit (Variation Number CP3136XQ) was issued in 2008 and which amended the periodic emission limit values for particulate matter, hydrogen chloride, carbon monoxide, sulphur dioxide and oxides of nitrogen. The values in each case as now the same as the corresponding ½ hourly of 10 minute averages from continuous emissions monitors.

Summary of plant operation:

The plant is designed to process a heterogeneous mix of municipal type wastes in two identical streams each burning up to 6 tonnes per hour.

Although this creates a technical capacity for around 105,000 tonnes per annum, in reality waste deliveries are typically less than the nominal capacity when taking into consideration periods of planned maintenance and are well within the permit limitations of 105,000 tonnes of mixed municipal waste including a maximum of 5,250 tonnes of separately collected fractions.

Separately collected fractions, if any, are generally wastes delivered by private sector customers with mixed municipal wastes predominantly comprising deliveries from local authorities. Total deliveries for 2010 are set out in Table 2 below.

Annual waste throughputs

Waste Types	***EWC codes***	***Tonnes burnt***
Mixed municipal wastes	*20.03.01*	Stream 1 47281 Stream 2 46116 Total 93397
Separately collected fractions	*15.01.06 Packaging* *20.01.01 Paper & card* *20.01.08 Kitchen waste* *20.02.01 Biodegradable* *20.03.02 Market waste* *20.03.03 Street sweepings*	Total 402
Total burnt – all types		93799

Table 2 - Incinerated Wastes 2010

Plant operational hours in the year and reasons for any significant outages.

Each boiler is designed to operate continuously throughout the year, although regular routine preventative maintenance programmes are in place to ensure performance efficiency is maintained and to prevent the development of major problems resulting in significant plant outages.

Routine maintenance activities represent the principal reason for significant outages. Other stoppages tend to be short term shutdowns of individual streams, for one or two days, to deal with smaller scale issues such as tube leaks or minor repair works. Whilst these are generally relatively small jobs the time taken to complete is often extended whilst waiting for boilers to cool down before work can commence and then to bring back up to operating temperatures.

Routine planned maintenance in 2010 was a staggered outage with both boilers offline for only a short period of time. This reduces the need to redirect waste which may end up as landfill. Scheduled maintenance works were carried out on Boiler 1 for 15 days from 5th June to 19th June with boiler 2 off for 14 days from the 31st May to 13th June. Both boilers were off together so that essential common system and turbine work.
The overall level of plant availability, in terms of operating hours, was consistent with expectations with boiler 1 and boiler 2 available for 8269 and 8249 hours respectively. This was equivalent individually to 94.39% and 94.17% of potential operating hours or 94.28% overall. This is an improvement over previous levels of availability in 2008 average availability was 92.48% and in 2009 average availability was at 92.93%.

Further details on plant performance are contained in Appendix 1

Residues produced.

There are two main sources of residues arising from the operation of the plant comprising:

- Bottom ash from the combustion process (including metals discharged within the ash: and
- Residues from the flue gas treatment system (Fly ash)

Burned out bottom ash residues are discharged from the lower end of each grate into a water filled ash discharger, where it is quenched and then ejected onto a conveyor system. Larger items are screened out and ferrous metals removed by magnetic separation.

Residues from the flue gas treatment process are discharged in an enclosed system into double skinned heavy duty bags prior to removal from site for treatment and disposal.

The residual material represents approximately 10% of the original refuse volume and around 23% of its weight with bottom ash discharged into the residues storage bunker.

The storage capacity for bottom ash residues and separated ferrous metals is sufficient to ensure 4 days storage. Collections for delivery to disposal or treatment sites are made on Mondays to Fridays and are scheduled to ensure sufficient storage capacity is maintained at all times.

Bottom ash is now widely used in the UK and Europe as a substitute for valuable primary aggregate materials in the construction of roads and embankments. Although bottom ash from the plant is not currently recycled MESE are currently actively investigating alternatives to landfill in conjunction with its local authority 'partners'

Table 3 shows the total quantities of the various residues produced in 2010.

Residue	Annual tonnage	Percentage of input waste	Disposal destination.
Bottom ash	17574	18.7%	Landfill
Fly ash	2839	3.03%	Reprocessing prior to landfill
Ferrous metals	1287	1.37%	Recycling

Table 3 - Residues produced & final destination

Electricity Production

All deliveries to the plant are weighed and, in conjunction with the quantities of electricity produced, details used to determine the calorific values (CV) of wastes delivered. This can vary seasonally and is dependent upon the types of wastes delivered but, typically, are in the order of 8.5 Mj/kg.

In 2010 the average calorific value of wastes delivered over the year was 8.64 Mj/Kg. This is comparable with previous years.

The combustion of municipal waste at the plant not only produced sufficient electrical power to supply the majority of the plant's own power but sufficient also to meet the power demands for around 10,000 households during the year.

This reduces the demand for electricity produced in a conventional fossil fuel power stations and the use of a renewable energy source not only saves the depletion of an irreplaceable natural resource but also reduces the associated CO_2 production and pollution from the mining operation and transportation of the fossil fuel.

The Sector Guidance note IPPC S5.06 contains a guide value of 5 to 8 MWe exported per 100,000 tonnes of waste. Typically at design performance the plant exports 6.5 MWe from processing around 95,000 tonnes which is equivalent to 6.8MWe per 100,000 tonnes and within the range of guide values.

Details of electrical power produced, used and exported from the plant is set out in Table 4 below together with details of smaller quantities of power imported during the times when the plant or part of the plant is shutdown for servicing.

Electrical power production (in MWhrs) 1 MWh = 10,000 X 100 watt light bulbs powered for 1 hour			
Imported	Production	Site use	Exported
241	45513	7842	37671

Table 4 - Electrical power production 2009

Plant emissions monitoring:

Emissions to air and water are continuously monitored in accordance with legal and regulatory requirements. Emissions to air are either combustion emissions from the stack or fugitive emissions from the storage of materials and chemicals on site.

Stack emissions (Particulates, Hydrogen Chloride, Sulphur Dioxide, Volatile Organic Carbons, Ammonia, Carbon Monoxide, Oxides of Nitrogen) are monitored and recorded continuously on site. Periodic (Bi annual) checks of these are also made by accredited external testing laboratories together with further quarterly or bi-annual checks as may be required by the permit of Dioxins, Mercury, Hydrogen Fluoride, Cadmium / Thallium and other metals.

Fugitive emissions monitoring, for substances having no specific emissions limit value specified in the permit, is part of the general maintenance regime carried out on site.

Table 5 below sets out the frequencies of monitoring for the various substances specified within the permit and in order to comply with the requirements of the Waste Incineration Directive. Further details of associated plant performance are also shown in Table 6 and Appendices 1 and 2.

Pollutants measured	**Continuously**	**Periodically**
Particulates	✓	✓
Oxides of Nitrogen	✓	✓
Sulphur Dioxide	✓	✓
Carbon Monoxide	✓	✓
Ammonia	✓	✓
Total Organic Carbon	✓	✓
Hydrogen Chloride	✓	✓
Mercury		✓
Cadmium and Thallium		✓
Group III metals		✓
PCDD and PCDF		✓
Hydrogen Fluoride		✓

Table 5 - Emissions monitoring frequencies

Emissions to water are monitored by equipment built into the on-site effluent treatment plant which aims to recycle 100% of water from site for reuse on site excluding sewerage. During any water emission to external sewer there is a water sample taken and the sample sent to external laboratory for analysis. In 2010 the cumulative volume of water discharged to sewer was 3875m3.

Any emissions which exceed the limits that are imposed upon the operation are reported to the Environment Agency without delay along with plans for the prevention of further occurrences.

Continuous Emissions Monitors (CEMs) Operation

The CEMs equipment operated satisfactorily throughout the year with minor breakdowns on individual sampling streams being responded to by CBISS the company contracted to service the equipment. At no time was the plant shut down due to CEMs failure.

CEMs equipment continuously measures and records information on emission limits for the substances set out in Table 5 above with10 minute, ½ hourly and daily average values recorded as required and compared with corresponding emission limit values set out in the permit. Monthly reports are prepared for each substance although these only need to be submitted to the Environment Agency every 6 months.

A summary of CEM data for all continuously monitored substances is shown at Appendix 2 with a summary of results for substances which are only monitored periodically shown below in Table 6

Pollutant	ELV	Stream	*Qtr 1*	*Qtr 2*	*Qtr 3*	*Qtr 4*
Cd/Th (mg/m³)	0.05 mg/m3	1	0.0015	0.0016	0.0010	0.0030
		2	0.0004	0.0057	0.0159	0.0007
		Overall Ave	0.0009	0.0036	0.0084	0.0018
Hg (mg/m³)	0.05 mg/m3	1	0.0081	0.0022	0.0011	0.0030
		2	0.0078	0.0059	0.0059	0.0086
		Overall Ave	0.0079	0.0040	0.0040	0.0058
Hf (mg/m³)	2 mg/m3	1	<0.04	0.09	0.06	<0.06
		2	<0.04	0.07	0.11	<0.06
		Overall Ave	<0.04	0.08	0.085	<0.06
Group III Metals (mg/m³)	0.5 mg/m3	1	0.1805	0.0847	0.0920	0.0780
		2	0.1096	0.0955	0.1268	0.0475
		Overall Ave	0.1450	0.0901	0.1094	0.0627
Dioxins (ng/m³)	0.1 ng/m3	1	0.2815	0.0142	0.0183	
		2	0.1326	0.0146	0.0389	
		Overall Ave	0.2070	0.0144	0.0286	

Table 6 Emissions of periodically monitored pollutants

Summary of plant compliance:
Description of non-compliances and abnormal operations notified to the Environment Agency.

Set against the total operational hours on each stream plant performance is of an extremely high level. The numbers of occasions where emission limit values have been exceeded are comparatively small and when expressed as a percentage of operating time within limits equates to 0.31% for the whole year.

This is primarily based on the numbers of 10 minute or ½ hourly average readings taken by emissions monitoring instruments and, in reality, although each complete 10 minute or ½ hourly period has been considered in this evaluation the duration during which any limit was exceeded is usually for a much shorter length of time.

The permit also recognises that equipment can malfunction and allows, in certain circumstances, for the plant to remain in service under abnormal operating conditions with increased emission limit values. This allows for short term continuous emissions monitoring or purification equipment to be rectified.

Although the permit restricts the period of abnormal operating conditions above to a maximum of 4 hours on any one occasion, or no more than 60 hours of abnormal operation on each line per year, boilers are generally shutdown after the first ½ hour of abnormal operation. In 2010 there was 3 occasion of abnormal operation resulting in 3 schedule1 reports for stream 1 (see table 8).

Table 7 below sets out the percentage of time that the plant was operating within its permitted limits for each continuously monitored parameter, both on individual and combined streams. No figures are included below for NH_3 as, whilst this is continuously measured and monitored, there is no limit specified for emissions within the permit.

It is also important to consider that in addition to the high levels of performance indicated in terms of operating times actual emission levels were also considerably lower than prescribed daily averages. Across all parameters actual emissions were, on average 88.5% and 69% lower than 10 minute or ½ hourly and daily limits respectively.

Substance	Stream 1 (% operating time within limits)	Stream 2 (% operating time within limits)	Combined (% operating time within limits)
Hydrogen Chloride	99.99%	100%	99.995%
Sulphur Dioxide	100%	100%	100%
Oxides of Nitrogen	99.7%	100%	99.85%
Volatile Organic Carbon	100%	100%	100%
Particulates	99.7%	99.96%	99.83%
Carbon Monoxide	100%	100%	100%

Table 7 - Percentage of plant operating time within limits

A summary of all emissions anomalies for 2010 is given below

Unauthorised releases / Schedule 1's

Unauthorised releases relate to circumstances in which permitted emission limit values have been exceeded in situations not considered to comply with the exceptions provided for in abnormal operation.

Levels of unauthorised releases are tightly controlled and prompt remedial action is taken to address the situation with boilers closed down as soon as is practicable where necessary.

Unauthorised releases are notified to the Environment Agency without delay and confirmed in writing by use of 'Schedule 1' Notices. Schedule 1 notices shall also be sent to the Environment Agency should any accident occur which has caused or has the potential to cause pollution.

In 2010 there were 3 occasions where Schedule 1 incidents were reported as shown in Table 8 below.

Schedule 1			
Date	**Time**	**Substance / Location**	**Anomaly**
27/01/10	6 hr extraction	Stream 1 PCDDs & PCDFs	Extractive testing results showed elevated PCDDs & PCDFs from Stream 1.
24/02/10	24hr	Stream 1 Particulates	Hole found in bag
17/08/10	24hr	Stream 1 NOx	Equipment problems due to electrical surge
Abnormal			
Date	**Time**	**Substance / Location**	**Anomaly**
26/07/10	0.5 hr	Stream 1 HCL	Poor waste stream.
07/11/10	3 hrs	Stream 2 Particulates	Unit pressurised. Blocked pipe work. Unit taken off and cleared system.

Table 8 – Unauthorised Releases 2010

Abnormal Operations

As with any type of plant or machinery there will inevitably be occasions where problems or breakdowns are experienced.

Abnormal operations are technically unavoidable stoppages, disturbances, or failures of the abatement plant or measurement devices, during which the concentrations into air and the purified water of the regulated substances may exceed normal emission limit values

As referred to earlier this is recognised within the permit which provides for the plant to continue to operate within limited circumstances for up to 4 hours to enable restoration of normal operations or failed equipment or its replacement as quickly as possible.

In practice MES Environmental have adopted a policy to initiate the shut down process after only ½ hour of any abnormal operation unless it is clear that the problem can be resolved well within the 4 hour period. Whilst this does not necessarily affect the level of incidence of abnormal operation it significantly reduces the number of operating hours in this situation.

During 2010 there were 2 occasions of abnormal operations, 1 per stream. See table 8 for further details.

Non reportable incidents

In addition to unauthorised releases and abnormal operations there are also situations where incidents will occur that are not required to be reported to the Environment Agency if these either result in no emission being made to atmosphere or occur during start up or shut down mode.

Enforcement Notices.

No enforcement notices were issued by the Environment Agency in respect of any aspect of plant operations in 2010.

6. Summary of plant improvements:

Other than works carried out during the major outage in May/June and ongoing routine maintenance work, the one major area of plant improvement for 2010 was the continuation of upgrading the Lime abatement system. To help insure that the system is as effective as possible and that no abnormal operations or schedule 1 situations occur, a dual preparation tank was installed and a dual back up system is being developed. Commissioning of the system is due within the next 12 months. The COSWIN computer based maintenance system is now in daily operation though it still needs further populating and upgrading to full fill all of the plants operational and maintenance needs.

Notwithstanding this the operational and environmental efficiency and effectiveness of the plant infrastructure and systems are constantly monitored to identify potential areas for improvement.

Key performance indicators are considered at regular management meetings to identify trends and variations in performance, not only at an individual plant level but in comparison with sister plants at Wolverhampton and Stoke.

This provides a focus for Managers to consider possible areas for improvement and/or situations where action may be necessary in the future.

7. Summary of information made available:

MES. Environmental operate an inclusive policy of involving the public in their operations by encouraging escorted tours of their facilities by interested groups. Last year numerous schools, colleges and industry or environmental groups visited sites and the same will happen this year.

For information about the facility or to arrange a visit, please contact the Operations Manager Mr. D Williams on 01384 457321

All information sent to the Environment Agency including the operation permit details are available on the public register which is accessible on the Environment Agency website.

Extra copies of this report are available by request from either the above referenced persons or by writing to:

Stuart Thompson
Environmental Manager
MES Environmental
Crown Street
Wolverhampton
WV1 1QB

Appendices

Appendix 1 Performance Reports 2010

Permit Reference Number: AP3435SD **Operator : MES Environmental Limited**

Installation; Dudley Waste Services Limited Form Number : Agency Form / / R1

Reporting of Waste Disposal and Recovery for the year ……2010……

Waste Description	Disposal Route	Disposal Tonnes	Recovery Tonnes
1) Hazardous Wastes			
Named haz. Waste (Specify each separately)	Reprocess Fly ash (APC)	2839	0
Other hazardous wastes			
Total hazardous waste		2839	0
2) Non-Hazardous Wastes			
Named non-haz. Waste (Specify each separately)	Landfill IBA	17574	0
Other non-hazardous wastes	Recycling (Fe)	1287	1287
Total non-hazardous waste		18861	1287
TOTAL WASTE	-	21700	1287

Trends in Waste Disposal and Recovery			
Year	Parameter		
	Named Waste	Total Waste	Waste per unit output
2009			
	APC	3071	0.080T/MWh
		3071	0.080T/MWh
	IBA	17387	0.456T/MWh
	Fe	1328	0.035T/MWh
		18715	0.491T/MWh
		21786	0.571T/MWh

Operator's comments : Waste per unit output above expressed in terms of nett exported energy of 38103 MWh in 2009.

If expressed in terms of gross energy production of 46035 MWh figures are adjusted to 0.067, 0.378 & 0.029 T/MWh for APCR, IBA and recycled tins respectively. (0.474T/MWh overall)

Signed …… Date……..

(authorised to sign as representative of Operator)

Permit Reference Number: AP3435SD Operator : MES Environmental Limited

Installation; Dudley Waste Services Limited Form Number : Agency Form / AP3435SD / WU1

Reporting of Water Usage for the year ……2010……

Water Source	Usage (m^3)	Specific Usage (m^3/t)
Mains water	44463	0.474m3/t
Site borehole		
River abstraction		
Canal abstraction		
TOTAL WATER USAGE	44463	0.474m3/t

Year	Trends in Water Usage Parameter		
	Named Water source	Total Water usage	Water per unit output
2009	Mains supply	31599	0.829m3/MWh
	Canal		
		31599	0.829m3/MWh

Operator's comments : Water per unit output above expressed in terms of nett exported energy of 38103 MWh in 2009.

If expressed in terms of gross energy production of 46035MWh figures are adjusted to 0.686m3/MWh

Signed …… Date……..
(authorised to sign as representative of Operator)

Permit Reference Number: AP3435SD **Operator : MES Environmental Limited**

Installation; Hanford Waste Services Limited Form Number : Agency Form / AP3435SD / E1

Reporting of Energy Usage for the year ……2010……

Energy Source	Energy Usage		CO_2 Produced (tonnes)
	Quantity	Primary Energy (MWh)	
Electricity	MWh	8083	3476
Natural Gas	tonnes	N/A	
Gas Oil	tonnes	32.6	120
Recovered Fuel Oil	tonnes	N/A	
TOTAL	-		
			3596

Year	Trends in Energy Usage Parameter		
	Primary Energy usage	CO_2 Produced (tonnes)	CO_2 per unit output
	8104.8	3485	0.091T/MWh
2009			
	43.2	159	0.004T/MWh
		3628	0.095T/MWh

Operator's comments : CO_2 per unit output above expressed in terms of nett exported energy of 38103 MWh in 2009.

If expressed in terms of gross energy production of 46035MWh figures are adjusted to 0.076 and 0.003T/MWh for electricity and gas oil consumption respectively. (0.079T/MWh overall)

Signed …… Date……..
(authorised to sign as representative of Operator

Permit Reference Number: AP3435SD Operator : MES Environmental Limited

Installation; Dudley Waste Services Limited Form Number : Agency Form / AP3435SD / PI1

Reporting of Performance Indicators for the period …01/01/2010..… to …31/12/2010…….

Annual Production/Treatment	
Total municipal waste incinerated (excluding separately collected fractions)	93397 tonnes
Total other wastes Incinerated	402 tonnes
Electrical energy generated and exported	45513 MWhrs
Electrical energy generated and used on installation	7842 MWhrs

Environmental Performance Indicators

Parameter	Quarterly Average	Units
Electrical energy imported to site	**2.57**	kWhrs/ tonne of waste incinerated (dry basis)
Fuel oil consumption	**0.35**	kg/ tonne of waste incinerated (dry basis)
Mass of bottom ash produced	**187.36**	kg/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance		
Year	Parameter	
2009	Electrical energy imported to site	**1.85** Kwhrs / tonne waste incinerated
	Fuel oil consumption	**0.46** kg / tonne waste incinerated
	Mass of bottom ash produced	**186.07** kg / tonne of waste incinerated

Mass of APC residues produced	**30.27**	kg/ tonne of waste incinerated (dry basis)
Mass of other solid residues produced	**13.72**	kg/ tonne of waste incinerated (dry basis)
Urea consumption	**1.48**	kg/ tonne of waste incinerated (dry basis)
Activated carbon consumption	**0.06**	kg/ tonne of waste incinerated (dry basis)
Lime consumption	**9.58**	kg/ tonne of waste incinerated (dry basis)
Water consumption	**0.474**	m^3/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance		
2009	Mass of APC residues produced	**32.86** kg / tonne of waste incinerated
	Mass of other solid residues produced	**14.21** kg / tonne of waste incinerated
	Urea consumption	**1.68** kg / tonne of waste incinerated
	Activated carbon consumption	**0.10** kg / tonne of waste incinerated
	Lime consumption	**8.98** kg / tonne of waste incinerated
	Water consumption	**0.338** m3 / tonne of waste incinerated

Operator's comments :

Signed …… Date……..

(authorised to sign as representative of Operator)

APPENDIX 2

Continuously Monitored Emissions to Air (mg/m3*) from Emission Point A1 – 2010

HCL	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 60	Annual ½ Hrly Max	64	Monthly ½ Hrly Max	27	49	48	52	58	48	64	48	36	42	47	13
	Annual ½ Hrly Mean	5	Monthly ½ Hrly Mean	6	6	6	6	7	6	3	3	4	5	4	2
Daily Ave ELV 10	Annual Daily Max	10	Monthly Daily Max	8	10	8	10	10	10	6	6	6	9	7	4
	Annual Daily Mean	5	Monthly Daily Mean	6	6	6	6	7	6	3	3	4	5	4	2

SO_2	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 200	Annual ½ Hrly Max	60	Monthly ½ Hrly Max	47	47	14	28	16	26	16	10	12	12	9	60
	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	9	2	1	3	1	2	1	0	1	0	1	4
Daily Ave ELV 50	Annual Daily Max	15	Monthly Daily Max	15	10	2	8	4	9	2	2	1	1	1	7
	Annual Daily Mean	2	Monthly Daily Mean	9	2	1	3	1	2	1	0	1	0	1	4

NOx	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 400	Annual ½ Hrly Max	394	Monthly ½ Hrly Max	268	269	285	310	303	343	316	306	375	349	389	394
	Annual ½ Hrly Mean	176	Monthly ½ Hrly Mean	164	172	180	180	176	176	177	182	169	177	181	181
Daily Ave ELV 200	Annual Daily Max	200	Monthly Daily Max	180	179	184	182	181	182	187	218	195	189	185	200
	Annual Daily Mean	176	Monthly Daily Mean	164	172	180	180	176	176	177	182	169	177	181	181

VOC	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 20	Annual ½ Hrly Max	22	Monthly ½ Hrly Max	11	19	18	20	9	8	15	22	9	16	15	14
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	2	2	4	0	0	0	0	0	0	0	0
Daily Ave ELV 10	Annual Daily Max	9	Monthly Daily Max	2	4	5	9	1	1	1	1	0	1	1	1
	Annual Daily Mean	1	Monthly Daily Mean	1	2	2	4	0	0	0	0	0	0	0	0

NH_3	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	166	Monthly ½ Hrly Max	22	31	28	15	42	55	106	76	72	166	55	107
No ELV	Annual ½ Hrly Mean	3	Monthly ½ Hrly Mean	1	1	1	3	1	3	2	2	4	7	3	11
Daily Ave	Annual Daily Max	21	Monthly Daily Max	6	2	3	3	8	4	4	4	15	13	7	21
No ELV	Annual Daily Mean	3	Monthly Daily Mean	1	1	1	3	1	3	2	2	4	7	3	11

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	27	Monthly ½ Hrly Max	25	27	27	9	2	3	2	2	2	3	2	4
ELV 30	Annual ½ Hrly Mean	3	Monthly ½ Hrly Mean	4	5	4	2	2	2	2	2	2	2	2	2
Daily Ave	Annual Daily Max	11	Monthly Daily Max	7	11	9	3	2	2	2	2	2	2	2	2
ELV 10	Annual Daily Mean	3	Monthly Daily Mean	4	5	4	2	2	2	2	2	2	2	2	2

CO	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 min Av	Annual 10 min Max	145	Monthly 10 min Max	36	49	64	78	33	105	11	24	26	17	20	145
ELV 150	Annual 10 min Mean	11	Monthly 10 min Mean	6	15	18	32	5	9	6	5	5	8	9	16
Daily Ave	Annual Daily Max	49	Monthly Daily Max	18	31	33	49	15	15	18	25	9	14	15	28
ELV 50	Annual Daily Mean	11	Monthly Daily Mean	6	15	18	32	5	9	6	5	5	8	9	16

* Figures reported to the nearest whole number.

Continuously Monitored Emissions to Air (mg/m3*) from Emission Point A2 – 2010

HCL	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 60	Annual ½ Hrly Max	55	Monthly ½ Hrly Max	33	35	50	48	42	55	35	29	16	49	42	7
	Annual ½ Hrly Mean	4	Monthly ½ Hrly Mean	4	5	4	6	7	6	3	2	2	4	2	1
Daily Ave ELV 10	Annual Daily Max	10	Monthly Daily Max	7	9	6	9	8	10	9	6	4	5	4	2
	Annual Daily Mean	4	Monthly Daily Mean	4	5	4	6	7	6	3	2	2	4	2	1

SO_2	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 200	Annual ½ Hrly Max	93	Monthly ½ Hrly Max	67	66	31	60	60	87	64	38	71	93	69	46
	Annual ½ Hrly Mean	7	Monthly ½ Hrly Mean	5	4	4	5	6	6	2	3	15	16	13	8
Daily Ave ELV 50	Annual Daily Max	23	Monthly Daily Max	9	9	6	8	10	11	10	16	20	23	18	14
	Annual Daily Mean	7	Monthly Daily Mean	5	4	4	5	6	6	2	3	15	16	13	8

NOx	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 400	Annual ½ Hrly Max	387	Monthly ½ Hrly Max	264	189	211	287	263	237	265	327	318	304	231	387
	Annual ½ Hrly Mean	163	Monthly ½ Hrly Mean	161	149	164	173	179	153	167	170	163	164	150	157
Daily Ave ELV 200	Annual Daily Max	185	Monthly Daily Max	178	164	175	180	180	173	185	183	179	181	166	179
	Annual Daily Mean	163	Monthly Daily Mean	161	149	164	173	179	153	167	170	163	164	150	157

VOC	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 20	Annual ½ Hrly Max	79	Monthly ½ Hrly Max	6	19	8	10	9	10	14	2	4	79	18	19
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	1	1	2	1	1	1	0	0	1	0	0
Daily Ave ELV 10	Annual Daily Max	5	Monthly Daily Max	1	1	1	5	1	1	1	1	1	1	1	1
	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	2	1	1	1	0	0	1	0	0

NH_3	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	52	Monthly ½ Hrly Max	24	33	6	75	5	39	22	32	18	35	46	52
No ELV	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	0	0	1	0	1	1	1	1	1	0	4
Daily Ave	Annual Daily Max	12	Monthly Daily Max	1	2	0	3	0	1	1	2	5	2	1	12
No ELV	Annual Daily Mean	1	Monthly Daily Mean	1	0	0	1	0	1	1	1	1	1	0	4

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	129	Monthly ½ Hrly Max	29	17	3	5	2	4	6	1	2	1	129	28
ELV 30	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	2	1	1	1	0	1	1	1	1	1	2	2
Daily Ave	Annual Daily Max	9	Monthly Daily Max	4	4	1	1	1	1	1	1	1	1	6	9
ELV 10	Annual Daily Mean	1	Monthly Daily Mean	2	1	1	1	0	1	1	1	1	1	2	2

CO	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 min Av	Annual 10 min Max	106	Monthly 10 min Max	11	34	15	106	8	88	9	10	22	16	47	44
ELV 150	Annual 10 min Mean	6	Monthly 10 min Mean	5	6	6	13	4	7	4	4	4	5	5	10
Daily Ave	Annual Daily Max	27	Monthly Daily Max	11	18	13	31	6	16	7	8	10	27	22	31
ELV 50	Annual Daily Mean	6	Monthly Daily Mean	5	6	6	13	4	7	4	4	4	5	5	10

* Figures reported to the nearest whole number.