STOKE ON TRENT ENERGY FROM WASTE PLANT

PERMIT No QP3234SX

WASTE INCINERATION DIRECTIVE

ANNUAL REPORT

2011

CONTENTS

Annual performance report for MES Environmental Stoke –on-Trent EfW Plant– Permit No. QP3234SX – Year 2011

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	*Stoke EfW Facility*
Permit Number	*QP3234SX*
Address	*Sideway, Campbell Road, Stoke, ST4 4DX*
Phone	*01782 412131*
Contact name	*Mr. D. Rockey*
Position	*Plant Manager*
Further information, description of waste types burned and origin.	*Constructed in 1997 to burn in the region of 210,000 tonnes per annum of local domestic refuse and generate a nominal 14.2MW 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. Rockey on the above number)	

Table 1 – General information

The plant provides a sustainable method of waste disposal and recovery for the whole of the North Staffordshire conurbation, comprising the districts of Stoke-on-Trent, Newcastle under Lyme, Staffordshire Moorlands the northern area of Stafford and limited quantities from East Staffordshire, leicestershire and derbyshire which would usually be taken to lanfill.

Household, commercial or industrial wastes, collected by the local authorities, comprise almost all of the wastes delivered to the plant. In 2011 78.6% of all deliveries were from local authorities in the primary catchment area with a further 15.8% from local authorities in the south of the County. Only around 5.6% of wastes were 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 210,000 tonnes per year of municipal and other specified wastes.

The plant contains two incineration lines with a combined design capacity to process up to 24 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 14.2 MW of electricity and, after satisfying its own power needs, exports approximately 12 MW of electricity to the local electricity network. This assists in contributing to the Government's target of providing 15% of electricity generation from renewable energy sources by the year 2020.

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 2011 28282 tonnes of wastes were imported from the south and east of the County which would otherwise have been disposed of at landfill, with no beneficial use.

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.
- 76 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 QP3234SX) 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 (reference FP3632XM) was also issued in May 2008 and which amended continuous emission limit monitoring for CO from ½ hourly to 10 minute averages as set out in table 2.2.2 and 2.2.2a of the permit

Periodic emission limit values for particulates and hydrogen chloride were also amended to bring these in line with values for continuous monitoring.

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 12 tonnes per hour.

Although this creates a technical capacity for around 210,000 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 210,000 tonnes of mixed municipal waste and 10,500 tonnes of separately collected fractions.

Local authority waste deliveries are comprised entirely of mixed municipal wastes whilst private sector ‘deliveries may be a combination of these and / or separately collected fractions.

Total deliveries for 2011 are set out in Table 2 below.

Annual waste throughputs

Waste Types	***EWC codes***	***Tonnes burnt***
Mixed municipal wastes	*20.03.01*	Stream 1 85253 Stream 2 83599 Total 168852
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 10065
Total burnt – all types		178917

Table 2 - Incinerated Wastes 2011

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 with other stoppages tending to be short term shutdowns of individual streams, for one or two days, to deal with smaller scale issues such as tube leaks. Whilst these are relatively small jobs to repair the time taken to complete is extended whilst waiting for boilers to cool down before work can commence and then to bring back up to operating temperatures.

Routine planned maintenance to boiler 1 commenced for 17 days from 05/09/11 to 21/09/11. Routine planned maintenance to boiler 2 commenced for 19 days from 26/08/11 to 13/09/11. The outage is staggered to reduce the need to divert waste to another facility or landfill. The common outage occurs to enable maintenance to take place on common/shared systems and the turbine.

The overall level of plant availability, in terms of operating hours, was less than anticipated, mainly as a consequence of the issues referred to above, with boiler 1 and boiler 2 available for 7747 and 7598 hours respectively. This was equivalent individually to 88.43% and 86.74% of potential operating hours or 87.59% overall.

Although a higher than anticipated incidence of premature tube failures was experienced in 2011 availability and operating hours are comparable with previous years.

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 27% 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 2011.

Residue	Annual tonnage	Percentage of input waste	Disposal destination.
Bottom ash	38162	21.33%	Landfill
Fly ash	5914	3.31%	Reprocessing prior to landfill
Ferrous metals	2291	1.28%	Recycling

Table 3 - Residues produced & final destination 2011

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 of wastes delivered. This can vary seasonally and is dependent upon the types of wastes delivered but, typically, are in the order of 8 to 8.5 Mj/kg.

In 2011 the average calorific value of wastes delivered over the year was 8.7mj/kg. This is comparible with CV's over the last seven years of 8.3, 8.45, 8.74, 8.91, 8.11, 8.37 and 8.7mj/kg from 2004 to 2010 respectively. Variations are most likely to be

attributable to the expansion of local authority recycling schemes which are progressively removing greater quantities of material with both high and low or zero CV wastes such as paper, plastic, green and organic kitchen waste, bottles and tins.

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 20,000 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. At design performance the plant would export 12 MWe from processing around 180,000 tonnes which is equivalent to 6.7MWe per 100,000 tonnes and within the range of guide values.

Details of electrical power produced, used and exported from the plant in 2011 is set out in Table 4 below together with details of small 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
252.6	97602	14972	82630

Table 4 - Electrical power production

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 and 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, with further details of associated plant performance 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 2011 the cumulative volume of water discharged to sewer was 7491m3. This reflects a higher than usual discharge level due to more than usual breakdowns.

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 Monitor`s (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 with 10 minute, ½ hourly and daily average values recorded 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.

Periodic testing is undertaken quarterly by independent and appropriately certified testing laboratories with separate annual validation tests also carried out by an alternative certified testing laboratory on behalf of the Environment Agency.

A summary 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	0.0006	0.0155	0.0023	0.001
		2	0.0023	0.0013	0.0027	0.0015
		Overall Ave	0.00145	0.0084	0.0025	0.00125
Hg (mg/m³)	0.05 mg/m3	1	0.0019	0.0113	0.0062	0.002
		2	0.0041	0.0105	0.0505	0.0276
		Overall Ave	0.003	0.0109	0.02835	0.0148
Hf (mg/m³)	2 mg/m3	1	<0.06	<0.05	<0.06	<0.03
		2	<0.06	<0.06	<0.05	<0.06
		Overall Ave	<0.06	0.055	<0.055	<0.045
Group III Metals (mg/m³)	0.5 mg/m3	1	0.0173	0.7691	0.1463	0.258
		2	0.0707	0.0587	0.2245	0.1611
		Overall Ave	0.044	0.4139	0.1854	0.20955
Dioxins (ng/m³)	0.1 ng/m3	1	0.0280		0.0868	
		2	0.0061		0.1079	
		Overall Ave	0.01705		0.09735	

Table 6 Emissions of periodically monitored pollutants 2011

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 very small and when expressed as a percentage of operating time within limits range from 0 to only 1.03% depending upon the substance measured. (Average 0.19%)

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

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 2011 there were only 8 occasions of abnormal operation (see Table 9) 3 on stream 1 (1.5hrs) and 5 on stream 2 (2.5hrs).

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 over 86.6% and 60.1% 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%	99.98%	99.885%
Sulphur Dioxide	100%	100%	100%
Oxides of Nitrogen	99.99%	100%	99.995%
Volatile Organic Carbon	100%	99.99%	99.995%
Particulates	98.97%	99.95%	98.96%
Carbon Monoxide	100%	100%	100%

Table 7 - Percentage of plant operating time within limits

A summary of all emissions anomalies for 2011 is given below

Unauthorised releases

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.

In 2011 there were 10 reported incidents of unauthorised releases as set out in Table 8 below.

A number of the schedule 1s occurred during plant shut down and start up, or due to the extreme cold weather conditions or poor waste stream.

NO.	Date	Start	End	Stream	S1 or Ab	Substance	Quantity	Accumlative	Comments
1	10/01/2011	08:30	08:59	2	Ab	HCl	61.26	0.5	Lime delivery pump trip- discussion ongoing
2	20/01/2011			2	Ab	HCl		1	Blocked pipe work to dillution tank
3	09/02/2011	14:30	14:59	1	Ab	Dust	31.66	0.5	Bag failure
4	07/04/2011	13:00	13:29	1	Ab	Dust	48.05	1	Bag failure
5	15/04/2011	14:00	14:29	1	Ab	Dust	69.37	1.5	Plant tripped due to external electrical problem
6	15/04/2011			2	Ab	Dust	154.3	1.5	Plant tripped due to external electrical problem
7	15/04/2011			2	Ab	HCl	88.26	2	Plant tripped due to external electrical problem
8	16/04/2011	13:30	13:59	2	S1	Dust	36.23	1	Start up problems
9	16/04/2011	18:30	18:59	2	S1	Dust	31.22	2	Start up problems
10	20/04/2011	06:30	06:59	1	S1	Nox	405.9	3	Poor waste quality
11	10/05/2011	09:36	10;42	1	S1	Metals	0.7691	4	1hr Spike of Cu vapour phase during extractive testing
12	19/06/2011	07:30	07:59	1	S1	HCl	76.15	5	Instrumentation fault
13	27/07/2011	09:00	15:11	2	S1	Dioxin	0.1079 +/- 0.022		Q3 Extractive testing result 0.0859
14	13/09/2011	06:30	06:59	2	S1	Dust	40.81	6	Start up after outage
		08:30	08:59	2		Dust	49.97		
15	21/09/2011	12:00	12:29	1	S1	Dust	31.74	7	Start up after outage
		12:30	12:59	1		Dust	31.6		
16	22/09/2011	10:00	10:29	2	Ab	Dust	35.36	2.5	Bag filter trip due to solenoid fault on popet valve
17	10/11/2011	22:30	22:59	2	S1	VOC	35.92	8	Feed chute blockage caused VOC spike
18	26/11/2011	13:30	13:59	2	S1	Dust	38.68	9	Start up after tube leak
19	30/11/2011			1	S1	HCl	10.16	10	Poor lime slurry quality

Table 8 – Abnormal and Unauthorised Releases 2011

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 and whilst this does not necessarily affect the level of incidence of abnormal operation it significantly reduces the number of operating hours in this situation.

Table 8 identifies the situations in which abnormal operating conditions were applied in 2011.

Non reportable incidents

Non reportable incidents are discussed at managerial level with the Environment Agency, when required, and where possible evidence produced to verify the situation.
On the 27th July 2011 an extractive test recorded a higher than usual release. Once the testing uncertainty is taken into account the result is well within limit. In such circumstances, and even though no breach occurred, MESE carries out an investigation and discusses the issue with the local enforcement officer.

No enforcement notices were issued by the Environment Agency in respect of any aspect of plant operations in 2011

Although technical performance continued to be delivered at high levels throughout, constant and thorough reviews of management and operating systems are undertaken and subjected to a rigorous process of external audit and validation.

6. Summary of plant improvements:

Other than works carried out during the major outage in August/September and ongoing routine maintenance work, the one main plant improvement during 2011 has been the upgrading off the Magnetic seperator used for removing ferrous metals.
An ongoing investigation and implementation of new technologies and ideas concerning the Lime system has continued throughout 2011 and has been a great success.

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 Dudley.

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 the facility by interested groups. Last year numerous schools, colleges and industry or environmental groups visited the site and the same will happen this year.

For information about the facility or to arrange a visit, please contact either the Plant or Operations Manager Mr D Rockey or Mr. J Buckham on 01782 412131

All information sent to the Environment Agency including the operation permit details is 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:

Mr. S Thompson
Environment Manager
MES Environmental
Crown Street
Wolverhampton
WV1 1QB

Appendices

Appendix 1 Performance Reports 2011

Permit Reference Number: QP3234SX **Operator : MES Environmental Limited**
Installation; Hanford Waste Services Limited Form Number : Agency Form / QP3234SX / DR1

Reporting of Waste Disposal and Recovery for the year ……2011……

Waste Description	Disposal Route	Tonnes	Recovery Tonnes
1) Hazardous Wastes			
Named haz. Waste (Specify each separately)	Reprocess Fly ash (APC)	5914	0
Other hazardous wastes			
Total hazardous waste		5914	0
2) Non-Hazardous Wastes			
Named non-haz. Waste (Specify each separately)	Landfill IBA	38162	0
Other non-hazardous wastes	Recycling (Fe)	2291	2291
Total non-hazardous waste		40453	2291
TOTAL WASTE	-	46367	

Trends in Waste Disposal and Recovery			
Year	Parameter		
	Named Waste	Total Waste	Waste per unit output
2010			
	APC	5795	0.068T/MWh
		5795	0.068T/MWh
	IBA	36278	0.426T/MWh
	Fe	1800	0.021T/MWh
		38078	0.447T/MWh
		43873	0.515T/MWh

Operator's comments: Waste per unit output above expressed in terms of nett exported energy of 85205 MW/h in 2010.

If expressed in terms of gross energy production of 99990 MW/h figures are adjusted to 0.058, 0.363 & 0.018T/MWh for APCR, IBA and recycled tins respectively. (0.439T/MWh overall)

Signed ……. **Date……..**

(authorised to sign as representative of Operator)

Permit Reference Number: QP3234SX **Operator : MES Environmental Limited**

Installation; Hanford Waste Services Limited Form Number : Agency Form / QP3234SX / WU1

Reporting of Water Usage for the year ……2011……

Water Source	Usage (m^3)	Specific Usage (m^3/t)
Mains water	22748	0.127m3/t
Site borehole		
River abstraction		
Canal abstraction	58807	0.329m3/t
TOTAL WATER USAGE	81555	0.456m3/t

Trends in Water Usage			
Year	Parameter		
	Named Water source	Total Water usage	Water per unit output
2010	Mains supply	21286	0.25m3/MWh
	Canal	43031	0.505 m3/MWh
		64317	0.755m3/MWh

Operator's comments: Water per unit output above expressed in terms of nett exported energy of 85205 MW/h in 2010.

If expressed in terms of gross energy production of 99990 MWh figures are adjusted to 0.213 and 0.43m3/MWh for mains and canal water supply respectively (0.643m3/MWh overall)

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

Permit Reference Number: QP3234SX **Operator : MES Environmental Limited**

Installation; Hanford Waste Services Limited Form Number : Agency Form / QP3234SX / EU1

Reporting of Energy Usage for the year ……2011……

Energy Source	Energy Usage Quantity	Primary Energy (MWh)	CO_2 Produced (tonnes)
Electricity	MW/h	15225	6547
Natural Gas	tonnes	N/A	
Gas Oil	tonnes	352.63	1296
Recovered Fuel Oil	tonnes	N/A	
TOTAL	-		7994

Trends in Energy Usage Year	Parameter		
	Primary Energy usage	CO_2 Produced (tonnes)	CO_2 per unit output
2010			
	14802	6365	0.075 t/MW/h
	443.47	1629	0.019 t/MW/h
		7994	0.094t/MWh

Operator's comments : CO_2 per unit output above expressed in terms of nett exported energy of 85205MWh in 2010.

If expressed in terms of gross energy production of 99990MWh figures are adjusted to 0.064 and 0.016T/MWh for electricity and gas oil consumption respectively. (0.08T/MWh overall)

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

Permit Reference Number: QP3234SX **Operator : MES Environmental Limited**

Installation; Hanford Waste Services Limited Form Number : Agency Form / QP3234SX / PP1

Reporting of Performance Indicators for the period …01/01/2011..… to …31/12/2011…….

Annual Production/Treatment	
Total municipal waste incinerated (excluding separately collected fractions)	168852 tonnes
Total other wastes Incinerated	10065 tonnes
Electrical energy generated and exported	85630MW hrs
Electrical energy generated and used on installation	14972MW hrs

Environmental Performance Indicators

Parameter	Quarterly Average	Units
Electrical energy imported to site	**1.41**	kWhrs/ tonne of waste incinerated (dry basis)
Fuel oil consumption	**1.97**	kg/ tonne of waste incinerated (dry basis)
Mass of bottom ash produced	**213.3**	kg/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance		
Year	Parameter	
2010	Electrical energy imported to site	**0.10** Kwhrs / tonne waste incinerated
	Fuel oil consumption	**3.14** kg / tonne waste incinerated
	Mass of bottom ash produced	**213.04** kg / tonne of waste incinerated

Mass of APC residues produced	**33.05**	kg/ tonne of waste incinerated (dry basis)
Mass of other solid residues produced	**12.8**	kg/ tonne of waste incinerated (dry basis)
Urea consumption	**1.35**	kg/ tonne of waste incinerated (dry basis)
Activated carbon consumption	**0.02**	kg/ tonne of waste incinerated (dry basis)
Lime consumption	**11.23**	kg/ tonne of waste incinerated (dry basis)
Water consumption	**0.456**	m^3/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance		
2010	Mass of APC residues produced	**34.03** kg / tonne of waste incinerated
	Mass of other solid residues produced	**10.57 kg** / tonne of waste incinerated
	Urea consumption	**0.97 kg** / tonne of waste incinerated
	Activated carbon consumption	**0.02 kg** / tonne of waste incinerated
	Lime consumption	**12.40 kg** / tonne of waste incinerated
	Water consumption	**0.378 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 – 2011

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	76	Monthly ½ Hrly Max	36	14	38	48	47	76	24	25	21	31	34	42
	Annual ½ Hrly Mean	7	Monthly ½ Hrly Mean	7	6	5	6	6	7	7	8	5	6	6	6
Daily Ave ELV 10	Annual Daily Max	10	Monthly Daily Max	9	8	6	8	9	9	9	10	9	8	10	8
	Annual Daily Mean	7	Monthly Daily Mean	7	6	5	6	6	7	7	8	5	6	6	6

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	152	Monthly ½ Hrly Max	48	106	133	101	84	120	121	66	74	110	120	152
	Annual ½ Hrly Mean	19	Monthly ½ Hrly Mean	9	16	26	19	18	15	17	14	22	24	26	24
Daily Ave ELV 50	Annual Daily Max	39	Monthly Daily Max	16	35	38	30	32	29	33	20	28	34	39	31
	Annual Daily Mean	19	Monthly Daily Mean	9	16	26	19	18	15	17	14	22	24	26	24

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	344	Monthly ½ Hrly Max	201	250	344	406	209	286	195	213	238	285	300	236
	Annual ½ Hrly Mean	149	Monthly ½ Hrly Mean	126	133	144	146	145	117	112	155	176	178	179	179
Daily Ave ELV 200	Annual Daily Max	191	Monthly Daily Max	138	153	180	180	162	164	123	177	179	183	191	182
	Annual Daily Mean	149	Monthly Daily Mean	126	133	144	146	145	117	112	155	176	178	179	179

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	13	Monthly ½ Hrly Max	3	4	5	5	9	10	11	8	13	10	11	8
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	2	2	2	2	1	1	2	1	1	1	1	1
Daily Ave ELV 10	Annual Daily Max	3	Monthly Daily Max	2	2	3	3	2	3	3	2	1	2	2	2
	Annual Daily Mean	1	Monthly Daily Mean	2	2	2	2	1	1	2	1	1	1	1	1

NH_3	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av No ELV	Annual ½ Hrly Max	103	Monthly ½ Hrly Max	63	103	61	61	51	46	36	12	10	24	50	10
	Annual ½ Hrly Mean	7	Monthly ½ Hrly Mean	8	10	10	10	17	10	7	1	2	2	3	0
Daily Ave No ELV	Annual Daily Max	29	Monthly Daily Max	14	15	23	21	28	29	12	8	4	7	14	4
	Annual Daily Mean	7	Monthly Daily Mean	8	10	10	10	17	10	7	1	2	2	3	0

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 30	Annual ½ Hrly Max	69	Monthly ½ Hrly Max	27	32	18	69	10	3	5	6	32	29	3	2
	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	1	2	3	3	2	1	1	1	6	1	1	1
Daily Ave ELV 10	Annual Daily Max	10	Monthly Daily Max	8	6	7	8	4	2	2	2	10	2	1	1
	Annual Daily Mean	2	Monthly Daily Mean	1	2	3	3	2	1	1	1	6	1	1	1

CO	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 Min Av ELV 150	Annual 10 min Max	145	Monthly 10 min max	30	83	83	90	124	145	120	68	39	83	54	35
	Annual 10 min Mean	14	Monthly 10 min mean	7	12	20	15	22	16	18	11	5	15	13	12
Daily Ave ELV 50	Annual Daily Max	36	Monthly Daily Max	10	23	31	30	36	36	25	17	7	31	17	15
	Annual Daily Mean	14	Monthly Daily Mean	7	12	20	15	22	16	18	11	5	15	13	12

* Figures reported to the nearest whole number.

Continuously Monitored Emissions to Air (mg/m3*) from Emission Point A2 – 2011

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	88	Monthly ½ Hrly Max	71	22	34	88	43	28	40	33	40	27	57	30
	Annual ½ Hrly Mean	6	Monthly ½ Hrly Mean	7	6	6	7	7	7	7	7	4	6	7	6
Daily Ave ELV 10	Annual Daily Max	9	Monthly Daily Max	9	8	9	9	8	8	9	9	6	8	9	8
	Annual Daily Mean	6	Monthly Daily Mean	7	6	6	7	7	7	7	7	4	6	7	6

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	163	Monthly ½ Hrly Max	66	95	90	103	163	112	75	55	141	93	82	82
	Annual ½ Hrly Mean	18	Monthly ½ Hrly Mean	12	14	20	22	19	14	13	11	28	23	22	23
Daily Ave ELV 50	Annual Daily Max	34	Monthly Daily Max	21	25	27	32	24	22	18	15	34	31	32	31
	Annual Daily Mean	18	Monthly Daily Mean	12	14	20	22	19	14	13	11	28	23	22	23

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	313	Monthly ½ Hrly Max	225	225	225	211	232	223	274	226	255	279	285	313
	Annual ½ Hrly Mean	155	Monthly ½ Hrly Mean	136	137	141	137	147	142	146	157	176	177	180	180
Daily Ave ELV 200	Annual Daily Max	190	Monthly Daily Max	161	165	170	174	163	167	168	184	185	190	189	190
	Annual Daily Mean	155	Monthly Daily Mean	136	137	141	137	147	142	146	157	176	177	180	180

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	36	Monthly ½ Hrly Max	4	4	5	7	18	6	11	16	5	5	36	5
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	2	2	2	2	1	1	1	2	1	1	1	1
Daily Ave ELV 10	Annual Daily Max	3	Monthly Daily Max	2	2	3	3	2	1	2	2	1	1	2	1
	Annual Daily Mean	1	Monthly Daily Mean	2	2	2	2	1	1	1	2	1	1	1	1

NH_3	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av No ELV	Annual ½ Hrly Max	38	Monthly ½ Hrly Max	23	21	17	26	15	22	36	4	13	38	24	8
	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	1	1	1	1	1	1	1	2	3	3	2	2
Daily Ave No ELV	Annual Daily Max	9	Monthly Daily Max	2	3	1	1	1	2	3	2	6	9	2	2
	Annual Daily Mean	2	Monthly Daily Mean	1	1	1	1	1	1	1	2	3	3	2	2

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av ELV 30	Annual ½ Hrly Max	154	Monthly ½ Hrly Max	23	17	14	154	34	10	10	5	49	17	39	25
	Annual ½ Hrly Mean	3	Monthly ½ Hrly Mean	1	3	4	6	3	2	2	1	5	2	3	4
Daily Ave ELV 10	Annual Daily Max	10	Monthly Daily Max	2	5	6	10	5	2	3	2	8	6	7	7
	Annual Daily Mean	3	Monthly Daily Mean	1	3	4	6	3	2	2	1	5	2	3	4

CO	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 Min Av ELV 150	Annual 10 min Max	121	Monthly 10 min max	12	60	71	117	99	70	114	121	82	63	31	44
	Annual 10 min Mean	12	Monthly 10 min mean	6	10	14	15	12	11	12	15	8	14	13	14
Daily Ave ELV 50	Annual Daily Max	28	Monthly Daily Max	7	19	19	28	18	13	17	19	9	22	16	16
	Annual Daily Mean	12	Monthly Daily Mean	6	10	14	15	12	11	12	15	8	14	13	14

* Figures reported to the nearest whole number.