STOKE ON TRENT ENERGY FROM WASTE PLANT

PERMIT No QP3234SX

WASTE INCINERATION DIRECTIVE

ANNUAL REPORT

2010

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

Household, commercial or industrial wastes, collected by the local authorities, comprise almost all of the wastes delivered to the plant. In 2010 86.92% of all deliveries were from local authorities in the primary catchment area with a further 8.99% from local authorities in the south of the County. Only around 4.09% 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 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 15300 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 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 81071 Stream 2 82246 Total 163317
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 6967
Total burnt – all types		170284

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 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 16 days from 30/08/10 to 14/09/10. Routine planned maintenance to boiler 2 commenced for 13 days from 07/09/10 to 19/09/10. 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 7361 and 7469 hours respectively. This was equivalent individually to 84.03% and 85.26% of potential operating hours or 84.65% overall.

Although a higher than anticipated incidence of premature tube failures was experienced in 2010, particularly in respect of boiler 1, 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 2010.

Residue	Annual tonnage	Percentage of input waste	Disposal destination.
Bottom ash	36278	21.30%	Landfill
Fly ash	5795	3.40%	Reprocessing prior to landfill
Ferrous metals	1800	1.06%	Recycling

Table 3 - Residues produced & final destination 2010

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 2010 the average calorific value of wastes delivered over the year was 8.7mj/kg in comparison with CV's over the last six years of 8.3, 8.45, 8.74, 8.91, 8.11 and 8.37 mj/kg from 2004 to 2009 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 2010 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
17.53	99990	14785	85205

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, 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 2010 the cumulative volume of water discharged to sewer was 7749m3. 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	0.0010	0.0759	0.0032	0.0031
		2	0.0003	0.0141	0.0039	0.0025
		Overall Ave	0.0036	0.045	0.0035	0.0028
Hg (mg/m³)	0.05 mg/m3	1	0.0040	0.0082	0.0114	0.0030
		2	0.3757	0.0104	0.0175	0.0042
		Overall Ave	0.1898	0.0093	0.0144	0.0036
Hf (mg/m³)	2 mg/m3	1	<0.04	0.1	<0.6	<0.05
		2	<0.04	0.1	<0.01	<0.07
		Overall Ave	<0.04	0.1	0.035	0.6
Group III Metals (mg/m³)	0.5 mg/m3	1	0.0636	0.0721	0.1406	0.1406
		2	0.0713	0.1229	0.2111	0.1209
		Overall Ave	0.0674	0.0975	0.1758	0.1307
Dioxins (ng/m³)	0.1 ng/m3	1	0.0137	0.0154	-	0.0163
		2	0.0107	0.0357	-	0.0925
		Overall Ave	0.0122	0.0256	-	0.0544

Table 6 Emissions of periodically monitored pollutants 2010

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 1.28% depending upon the substance measured.

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 2010 there were only 4 occasions of abnormal operation (see Table 9) all of which were on stream 1.

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 90% and 73% 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	99.35%	99.67%	99.83%
Sulphur Dioxide	100%	100%	100%
Oxides of Nitrogen	100%	100%	100%
Volatile Organic Carbon	100%	98.72%	99.36%
Particulates	98.99%	99%	98.995%
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

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 2010 there were 13 reported incidents of unauthorised releases as set out in Table 8 below. 2 of these related to results of extractive testing for Thallium and mercury. Results were in conflict with historical data and continuous emissions monitoring results and investigations identified extractive test methods as being open to possible contamination which may have influenced results. The other only possible explanation was the disposal of scientific equipment. This may have come from a school or college. An investigation was carried out to isolate the source, no conclusive evidence was found

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.

Date	Stream	Substance	Anomaly
17/03/10	Boiler 1	HCl	Poor waste
08/03/10	Boiler 2	HCl	Poor waste
23/04/10	Boiler 2	Hg	Hg high result during extractive testing. Cause: Waste stream
06/05/10	Boiler 2	Particulates	Build up of debris following work on stream
11/06/10	Boiler 2	VOC	Faulty probe
14/06/10	Boiler 2	VOC	Grate bar problems, grate repaired
19/06/10	Boiler 1	Particulates	Baffles found to have worked loose
22/06/10	Boiler 1	Particulates	Bag filter failed
26/07/10	Boiler 2	VOC	Start up
29/09/10	Boiler 1	Cd/Tl	Tl high result during extractive testing. Cause: Waste stream
22/09/10	Boiler 2	Particulates	Bag filter failure
09/12/10	Boiler 1	HCl	Extreme cold weather caused Lime mixing problem
12/12/10	Boiler 1	Particulates	Ingress due to by-pass problem
31/12/10	Boiler 2	VOC	VOC spike during shut down

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 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 9 identifies the situations in which abnormal operating conditions were applied in 2010.

Date	Time	Substance / Location	Anomaly
23/03/10	16:30 – 16:59	Particulates Boiler 1	Failed bag filter
14/11/10	15:30 – 15:59	Particulate Boiler 1	Bag house power supply failure
15/11/10	08:00 – 08:59	Particulate Boiler 1	Bag house power supply failure
27/12/10	22:30 – 22:59	HCl Boiler 2	Lime pump tripped

Table 9 – Abnormal Operations 2010

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.

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

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 no specific plant improvements have been carried out during 2010.
An ongoing investigation and implementation of new technologies and ideas concerning the Lime system has continued throughout 2010 and will continue into 2011.

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 2010

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 ……2010……

Waste Description	Disposal Route	Tonnes	Recovery Tonnes
1) Hazardous Wastes			
Named haz. Waste (Specify each separately)	Reprocess Fly ash (APC)	5795	0
Other hazardous wastes			
Total hazardous waste		5795	0
2) Non-Hazardous Wastes			
Named non-haz. Waste (Specify each separately)	Landfill IBA	36278	0
Other non-hazardous wastes	Recycling (Fe)	1800	1800
Total non-hazardous waste		38078	1800
TOTAL WASTE	-	43873	1800

Trends in Waste Disposal and Recovery Year	Parameter		
	Named Waste	Total Waste	Waste per unit output
2009			
	APC	6961	0.078T/MWh
		6961	0.078T/MWh
	IBA	40138	0.448T/MWh
	Fe	2105	0.024T/MWh
		42243	0.471T/MWh
		49204	0.549T/MWh

Operator's comments: Waste per unit output above expressed in terms of nett exported energy of 89694 MW/h in 2009.

If expressed in terms of gross energy production of 105129 MW/h figures are adjusted to 0.066, 0.382 & 0.020T/MWh for APCR, IBA and recycled tins respectively. (0.468T/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 ……2010……

Water Source	Usage (m^3)	Specific Usage (m^3/t)
Mains water	21286	0.125m3/t
Site borehole		
River abstraction		
Canal abstraction	43031	0.253m3/t
TOTAL WATER USAGE	64317	0.378m3/t

Trends in Water Usage Year	Parameter		
	Named Water source	Total Water usage	Water per unit output
2009	Mains supply	22520	0.251m3/MWh
	Canal	46205	0.515 m3/MWh
		68725	0.766m3/MWh

Operator's comments: Water per unit output above expressed in terms of nett exported energy of 89694 MW/h in 2009.

If expressed in terms of gross energy production of 105129MWh figures are adjusted to 0.21 and 0.44m3/MWh for mains and canal water supply respectively (0.65m3/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 ……2010……

Energy Source	Energy Usage Quantity	Primary Energy (MWh)	CO_2 Produced (tonnes)
Electricity	MW/h	14802	6365
Natural Gas	tonnes	N/A	
Gas Oil	tonnes	443.47	1629
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
2009			
	15453	6645	0.074 t/MW/h
	250.44	920	0.010 t/MW/h
		7565	0.084t/MWh

Operator's comments : CO_2 per unit output above expressed in terms of nett exported energy of 89694MWh in 2009.

If expressed in terms of gross energy production of 105129MWh figures are adjusted to 0.063 and 0.009T/MWh for electricity and gas oil consumption respectively. (0.072T/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 …01/01/2010..… to …31/12/2010…….

Annual Production/Treatment	
Total municipal waste incinerated (excluding separately collected fractions)	163317 tonnes
Total other wastes Incinerated	6967 tonnes
Electrical energy generated and exported	85205 MW hrs
Electrical energy generated and used on installation	14785 MW hrs

Environmental Performance Indicators

Parameter	Quarterly Average	Units
Electrical energy imported to site	**0.10**	kWhrs/ tonne of waste incinerated (dry basis)
Fuel oil consumption	**3.14**	kg/ tonne of waste incinerated (dry basis)
Mass of bottom ash produced	**213.04**	kg/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance Year	Parameter	
2009	Electrical energy imported to site	**0.10** Kwhrs / tonne waste incinerated
	Fuel oil consumption	**1.38** kg / tonne waste incinerated
	Mass of bottom ash produced	**221.34** kg / tonne of waste incinerated

Mass of APC residues produced	**34.03**	kg/ tonne of waste incinerated (dry basis)
Mass of other solid residues produced	**10.57**	kg/ tonne of waste incinerated (dry basis)
Urea consumption	**0.97**	kg/ tonne of waste incinerated (dry basis)
Activated carbon consumption	**0.02**	kg/ tonne of waste incinerated (dry basis)
Lime consumption	**12.40**	kg/ tonne of waste incinerated (dry basis)
Water consumption	**0.378**	m^3/ tonne of waste incinerated (dry basis)

Trends in Environmental Performance		
2009	Mass of APC residues produced	**38.39** kg / tonne of waste incinerated
	Mass of other solid residues produced	**11.61 kg** / tonne of waste incinerated
	Urea consumption	**0.92 kg** / tonne of waste incinerated
	Activated carbon consumption	**0.04 kg** / tonne of waste incinerated
	Lime consumption	**15.73 kg** / tonne of waste incinerated
	Water consumption	**0.379 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	89	Monthly ½ Hrly Max	53	47	89	49	15	13	17	20	20	26	31	62
	Annual ½ Hrly Mean	7	Monthly ½ Hrly Mean	6	7	8	8	7	7	6	7	7	7	7	7
Daily Ave ELV 10	Annual Daily Max	9	Monthly Daily Max	9	9	9	9	8	8	7	7	7	8	8	8
	Annual Daily Mean	7	Monthly Daily Mean	6	7	8	8	7	7	6	7	7	7	7	7

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	54	Monthly ½ Hrly Max	52	49	54	48	29	22	37	31	33	39	50	48
	Annual ½ Hrly Mean	6	Monthly ½ Hrly Mean	5	8	6	6	4	3	4	3	6	7	9	8
Daily Ave ELV 50	Annual Daily Max	15	Monthly Daily Max	11	13	9	7	5	6	5	7	7	11	13	15
	Annual Daily Mean	6	Monthly Daily Mean	5	8	6	6	4	3	4	3	6	7	9	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	270	Monthly ½ Hrly Max	270	248	243	142	141	200	233	173	216	149	196	225
	Annual ½ Hrly Mean	116	Monthly ½ Hrly Mean	133	133	123	109	107	114	114	97	112	110	129	113
Daily Ave ELV 200	Annual Daily Max	181	Monthly Daily Max	151	149	145	127	126	124	181	116	122	124	161	147
	Annual Daily Mean	116	Monthly Daily Mean	133	133	123	109	107	114	114	97	112	110	129	113

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	9	Monthly ½ Hrly Max	3	4	8	3	2	3	9	6	3	6	7	9
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	2	2	1	1	1	1	1	1	1	2	2
Daily Ave ELV 10	Annual Daily Max	3	Monthly Daily Max	2	2	2	2	2	2	1	1	2	1	3	2
	Annual Daily Mean	1	Monthly Daily Mean	1	2	2	1	1	1	1	1	1	1	2	2

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	49	Monthly ½ Hrly Max	40	27	20	35	19	20	38	46	17	43	46	49
No ELV	Annual ½ Hrly Mean	6	Monthly ½ Hrly Mean	9	5	5	4	4	4	3	8	4	5	10	7
Daily Ave	Annual Daily Max	23	Monthly Daily Max	18	8	9	7	6	9	4	23	9	9	17	14
No ELV	Annual Daily Mean	6	Monthly Daily Mean	9	5	5	4	4	4	3	8	4	5	10	7

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	43	Monthly ½ Hrly Max	30	19	34	12	27	36	1	5	13	6	31	43
ELV 30	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	1	2	4	1	1	3	0	1	3	0	2	5
Daily Ave	Annual Daily Max	10	Monthly Daily Max	2	6	10	3	4	10	0	2	6	1	3	9
ELV 10	Annual Daily Mean	2	Monthly Daily Mean	1	2	4	1	1	3	0	1	3	0	2	5

CO	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 Min Av	Annual 10 min Max	173	Monthly 10 min max	24	112	60	50	71	173	48	91	39	25	91	57
ELV 150	Annual 10 min Mean	6	Monthly 10 min mean	5	5	6	4	7	9	4	5	5	3	9	8
Daily Ave	Annual Daily Max	18	Monthly Daily Max	8	9	10	9	15	18	6	9	7	5	14	14
ELV 50	Annual Daily Mean	6	Monthly Daily Mean	5	5	6	4	7	9	4	5	5	3	9	8

* 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	81	Monthly ½ Hrly Max	54	25	28	81	18	16	21	33	25	30	31	74
	Annual ½ Hrly Mean	7	Monthly ½ Hrly Mean	6	7	8	7	7	6	7	7	7	7	7	7
Daily Ave ELV 10	Annual Daily Max	10	Monthly Daily Max	8	8	9	9	8	8	8	8	8	9	8	10
	Annual Daily Mean	7	Monthly Daily Mean	6	7	8	7	7	6	7	7	7	7	7	7

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	123	Monthly ½ Hrly Max	61	71	55	42	78	80	68	30	58	73	79	123
	Annual ½ Hrly Mean	8	Monthly ½ Hrly Mean	8	13	11	7	9	7	4	2	6	10	10	9
Daily Ave ELV 50	Annual Daily Max	18	Monthly Daily Max	14	18	16	12	14	12	8	5	9	16	18	17
	Annual Daily Mean	8	Monthly Daily Mean	8	13	11	7	9	7	4	2	6	10	10	9

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	262	Monthly ½ Hrly Max	184	159	196	196	166	197	189	176	193	230	194	262
	Annual ½ Hrly Mean	110	Monthly ½ Hrly Mean	115	114	117	111	104	107	102	96	95	106	129	131
Daily Ave ELV 200	Annual Daily Max	170	Monthly Daily Max	131	126	140	150	114	130	133	125	143	132	154	170
	Annual Daily Mean	110	Monthly Daily Mean	115	114	117	111	104	107	102	96	95	106	129	131

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	26	Monthly ½ Hrly Max	8	15	12	11	15	24	23	17	10	7	5	26
	Annual ½ Hrly Mean	1	Monthly ½ Hrly Mean	1	1	1	1	1	2	1	1	1	1	1	1
Daily Ave ELV 10	Annual Daily Max	4	Monthly Daily Max	1	1	1	1	2	4	2	1	2	1	1	3
	Annual Daily Mean	1	Monthly Daily Mean	1	1	1	1	1	2	1	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	Annual ½ Hrly Max	56	Monthly ½ Hrly Max	34	24	30	53	21	32	13	11	56	14	5	23
No ELV	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	2	2	2	2	2	4	2	1	2	1	1	1
Daily Ave	Annual Daily Max	9	Monthly Daily Max	7	7	3	4	9	7	5	1	2	2	2	2
No ELV	Annual Daily Mean	2	Monthly Daily Mean	2	2	2	2	2	4	2	1	2	1	1	1

Particulates	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
½ Hourly Av	Annual ½ Hrly Max	48	Monthly ½ Hrly Max	11	23	15	4	48	27	3	2	30	3	22	12
ELV 30	Annual ½ Hrly Mean	2	Monthly ½ Hrly Mean	1	2	2	1	5	4	1	1	5	1	1	1
Daily Ave	Annual Daily Max	10	Monthly Daily Max	2	4	3	1	8	8	2	1	10	1	2	3
ELV 10	Annual Daily Mean	2	Monthly Daily Mean	1	2	2	1	5	4	1	1	5	1	1	1

CO	Annual Summary		Monthly Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10 Min Av	Annual 10 min Max	110	Monthly 10 min max	41	42	48	66	75	110	100	73	82	35	35	107
ELV 150	Annual 10 min Mean	7	Monthly 10 min mean	4	6	6	9	9	15	10	8	8	4	6	9
Daily Ave	Annual Daily Max	37	Monthly Daily Max	7	10	15	24	20	33	28	20	9	9	8	37
ELV 50	Annual Daily Mean	7	Monthly Daily Mean	4	6	6	9	9	15	10	8	8	4	6	9

* Figures reported to the nearest whole number.