European Union Network for the Implementation and Enforcement of Environmental Law

WASTE MANAGEMENT & CIRCULAR ECONOMY PROJECT
IED IMPLEMENTATION PROJECT
BATc on Waste Incineration: practical tools

Self-Monitoring Plan for WI plants and Checklist for inspectors

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Introduction to IMPEL

The European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) is an international non-profit association of the environmental authorities of the European Union (EU) Member States, and of other European authorities, namely from acceding and candidate countries of the EU and European Economic Area (EEA). The association is registered in Belgium and its legal seat is in Brussels, Belgium.

IMPEL was set up in 1992 as an informal Network of European regulators and authorities concerned with the implementation and enforcement of environmental law. The Network's objective is to create the necessary impetus in the European Community to make progress on ensuring a more effective application of environmental legislation. The core of the IMPEL activities concerns awareness raising, capacity building and exchange of information and experiences on implementation, enforcement and international enforcement collaboration as well as promoting and supporting the practicability and enforceability of European environmental legislation.

During the previous years IMPEL has developed into a considerable, widely known organisation, being mentioned in a number of EU legislative and policy documents, e.g. the 8th Environment Action Programme that guide European environmental policy until 2030, the EU Action Plan: "Towards a Zero Pollution for Air, Water and Soil" on Flagship 5 and the Recommendation on Minimum Criteria for Environmental Inspections.

The expertise and experience of the participants within IMPEL make the network uniquely qualified to work on both technical and regulatory aspects of EU environmental legislation.

Information on the IMPEL Network is also available through its website at: www.impel.eu

Title of the report: BATc on Waste Incineration: practical tools	**Number report:** 2022(III)WG5
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Executive Summary

BAT Conclusions on waste incineration have been recently implemented (after 4 years from BAT Conclusions issuing) and their relevant application in IED permits is a challenge for regulators. The need for practical guidance for permit writers and inspectors is widely felt.

The aim of the project has been to examine the implementation issues related to the 37 individual BAT Conclusions for the Waste Incineration sector, providing practical tools to the regulators.

Self-monitoring Plan (with associated Report) and Check list for inspectors have been produced to help inspectors and permit writers in setting monitoring provisions according to BATc and in the preparation phase of an inspection focussed on BAT proper implementation.

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1. Scope

BAT Conclusions on waste incineration have been recently implemented (after 4 years from BAT Conclusions issuing) and their relevant application in IED permits is a challenge for regulators. The demand for practical guidance for regulators, permit writers, and inspectors is widely recognized. Under the joint umbrella of IMPEL's "Waste Management & Circular Economy" and "Supporting IED Implementation Project," the Waste Incineration subgroup has been running over the last three years (2022-2024). This project aims to address implementation issues related to the most critical BAT Conclusions for the waste incineration sector, providing practical tools to the regulators.

Self-monitoring Plan (with associated Report) and a Checklist for inspectors have been produced to help inspectors and permit writers in setting monitoring provisions according to BATc and in the preparation phase of an inspection focussed on BAT proper implementation.

1.1. Self-Monitoring Plan and Self-Monitoring Report

These documents aim to:

- Provide guidelines for drafting the Self-Monitoring Plan based on WI BATc provisions. For each item, the elements to be monitored by the operator are listed either as tables or provisions.
- Offer a template for a Self-Monitoring Report, synthesizing all data gathered by the operator during the "reference year" in compliance with BATc and permit requirements.

The documents include tables listing elements of the Self-Monitoring Report (data to be gathered and submitted to authorities annually, as per Article 55 of the IED). An example data sheet is provided in the Annexes as a template for the annual report. Data are often expressed in specific quantities, enabling easy comparisons with other waste incineration plants.

Non compliances and other communications related to non-compliance fall outside the scope of this document. Operators must notify authorities separately when such issues arise.

1.1.1. Preliminary conditions

To comply with the Monitoring Plan requirements, operators must implement an Environmental Management System (EMS) incorporating:

- A monitoring and measurement program.

- A Continuous Emission Monitoring System (CEMS) Management Manual, including an OTNOC management plan for air emissions.
- Waste stream management.
- A residues management plan that includes measures to minimize residue generation, optimise the reuse, regeneration, recycling of, and/or energy recovery from the residues, and ensure proper disposal of residues (waste).
- An evaluation of non compliances, implementation of corrective actions, and a review of their effectiveness.

The EMS is an internal document describing operations for:

- Data collection (e.g., raw material, energy, and water consumption) included in the annual Self-Monitoring Report.
- Monitoring campaigns for air, water, and waste.
- Sample handling and analysis (internal or external laboratories). If external, agreements must comply with Monitoring Plan provisions.

1.1.2. Who performs the monitoring plan

The plant operator is responsible for implementing the Monitoring Plan provisions. External laboratories or companies may carry out monitoring activities under preliminary agreements/contracts, following Monitoring Plan provisions (e.g., sampling procedures, analytical methods). Laboratories accredited under standard EN 17025 are preferred. The operator retains ultimate responsibility for executing the Monitoring Plan.

1.2. Check list for inspectors

This document provides:

- Guidelines for inspectors based on WI BATC provisions. Each item specifies the BATc to verify.
- A customizable on-site Checklist for Inspectors, which can be adjusted based on inspection focus (e.g., air emissions, energy, waste) or the overall scope of the inspection.

1.2.1 Preliminary Activities

Before conducting an on-site inspection, inspectors should:

- Analyze the permit, particularly in cases of “tailored permits.”
- Review the operator’s EMS, including waste stream management, the CEMS Management Manual including OTNOC, and corrective actions for non compliances.
- Identify critical points in the plant.

These steps enhance inspection effectiveness and focus. Annex 3 provides a proposed checklist template.

2. Structure of the documents

This chapter briefly describes the structure and rationale of the documents included in Annexes 1, 2, and 3.

2.1. Self-Monitoring Plan and Self-Monitoring Report

The Self-Monitoring Plan and Self-Monitoring Report were designed to be as schematic and time-efficient as possible.

2.1.1. Self-Monitoring Plan (Annex 1)

The main chapter of the Self-Monitoring Plan is titled "Parameters to Monitor." It consists of the following sections:

- Plant Information: Thermal Capacity, Operating Hours, and Lower Calorific Value (LCV) of waste.
- Incoming Waste and Waste Acceptance Procedures.
- Energy.
- Raw Materials and Auxiliary Fuels.
- Water Usage and Consumption.
- Emissions to Air.
- Emissions to Water.
- Waste management.

- Noise.

Each section contains two subsections:

- Provisions in the Self-Monitoring Plan: This subsection specifies the requirements for operators as outlined in the WI BAT or permit—essentially, "what the operator must do."
- Information to be Found in the Annual Self-Monitoring Report: This subsection details the type of data to be included in the annual report, describing "how the operator must implement the requirements."

For example, in the section on "Raw Materials and Auxiliary Fuels":

- Provision: "During the reference year, the operator shall monitor the consumption of raw materials and reagents (e.g., for the FGC and Wastewater Treatment plant) and auxiliary fuels."
- Information: Table 5 lists the elements to be monitored and reported in the Annual Self-Monitoring Report (Data Sheet - Table 5).

2.1.2. Self-Monitoring Report (Annex 2)

The Self-Monitoring Report is a template (provided as a datasheet) summarizing all data collected by the operator during the "reference year" according to the BATC and the permit.

The template contains 12 folders, each with tables corresponding to items in the Self-Monitoring Plan. These tables list the data elements required by authorities annually (pursuant to Article 55 of the IED). An example datasheet is included in Annex 2 for reference. Data are typically expressed in specific quantities to facilitate comparison with other WI plants.

2.2. Check list for inspectors (Annex 3)

The checklist for inspectors is based on WI BATC provisions. For each item, the corresponding BAT to be verified is listed.

In the first part of the checklist, general information such as permit number, permitted capacity (t/year) and types of waste received have to be indicated. The core of the checklist is the “BAT Implementation”; it is composed of the following sections:

1.1. Environmental management systems (BAT 1)
1.2. Monitoring (BATs 2-8)

1.3. General environmental and combustion performance (BATs 9-18)
1.4. Energy efficiency (BATs 19-20)
1.5. Emissions to air (BATs 21-31)
1.6. Emissions to water (BATs 32-34)
1.7. Material efficiency (BATs 35-36)
1.8. Noise (BAT 37)

The checklist also provides an on-site inspection template that can be adapted or simplified by the inspector, depending on factors such as the scope of the inspection (e.g., emissions to air, energy, or waste) or the overall focus and duration of the inspection.

Annexes

Company: ……
IED category: ……
Permit number: ……

SELF MONITORING PLAN
and
SELF MONITORING REPORT

REFERENCE YEAR: …….

Parameters to monitor

Plant information: Thermal Capacity, Operating Hours and Lower Calorific Value (LCV) of waste

Provisions in the Self-monitoring Plan attached to the permit

During the reference year the operator shall

- record “operating hours” (while waste is burning): NOC and OTNOC
- determine the “average LCV during the year” of waste burnt through periodic sampling, using other methods e.g. monitoring of steam flow and other parameters together with knowledge of the boiler efficiency.

Information to be found in the annual Self-monitoring Report

Table 1 shows the elements to be monitored - and to be found in the annual Self-monitoring Report - (Data Sheet-Table 1)

Reference Year: …..	**unit of measure**		**For each incineration line**			**Note**
			1	**2**	**…**	
Authorised Thermal Capacity	MW	*Total*				
Operating Hours (*burning waste)*	h/year	*Total*				
LCV range of waste burnt *(permit)*	kcal/kg					*Information in the permit* *e.g. Min 1.911 - Max 3.344*
Average LCV of waste during the year	kcal/kg					

Table 1 *– Thermal capacity Operating Hours and LCV of waste*

Incoming waste and waste acceptance procedures

Preliminary condition

Waste acceptance procedures are part of EMS.

These procedures define the elements to be verified upon the delivery of the waste at the plant as well as the waste acceptance and rejection criteria. They may include waste sampling, inspection and analysis.

Waste acceptance procedures are risk-based considering, for example, the hazardous properties of the waste, the risks posed by the waste in terms of process safety, occupational safety and environmental impact, as well as the information provided by the previous waste holder(s)

Provisions in the Self-monitoring Plan attached to the permit

During the reference year the operator shall keep track of all wastes burnt in term of categories (Municipal Solid Waste - code 20, Clinical Waste - code 18 etc) and single code.

BAT 11 allows radioactivity detection to be applied on a risk basis; if applied the operator shall record the results of radioactivity monitoring.

Information to be found in the annual Self-monitoring Report

Table 2 shows the elements to be monitored – and to be found in the annual Self-monitoring Report – for type of waste (Data Sheet- Table 2).

Type of waste	Delivered Quantity (t/year)	% (on total burnt wastes)	Note
Municipal Solid Waste	X	/	
Other non-hazardous waste	X	X	
Hazardous wood waste	X	X	
Clinical waste	X	X	
….		….	
Total burnt wastes		100%	

Table 2 *– Incoming waste for category*

Table 3 shows the elements to be monitored - and to be found in the annual Self-monitoring Report - for each code of waste (Data Sheet- Table 3)

Reference Year

EWC (waste input)	**Delivered Quantity (t/year)**
X (e.g. 20.12.12)	X
X	X
X	X
……	…..

Table 3 *– Incoming waste for single code*

Energy

Provisions in the Self-monitoring Plan attached to the permit

If R1-formula is applicable and energy efficiency has been calculated during the reference year, the operator shall record

- calculation of energy efficiency according to "R1-formula" (ref: Directive 2008/98/EC and amendments)
- calculation of energy efficiency according to BAT 2 and 19 (BAT C) and to permit provisions.

Information to be found in the annual Self-monitoring Report

Table 4 shows the elements to be monitored - and to be found in the annual Self-monitoring Report (Data Sheet-Table 4)

Parameters	u.o.m.	Value	Note
Ep energy produced as heat or electricity	Gj or MWh	X	
Ef energy input to the system from fuels	Gj	X	
Ew energy contained in the treated waste	Gj	X	
Ei energy imported	Gj	X	
R1 value (Directive 2008/98/EC)	-	X (0-1)	*Specify if CCF is applied (1,151)*

***Table 4** – Energy efficiency according to "R1-formula"*

Raw materials and auxiliary fuels

Provisions in the Self-monitoring Plan attached to the permit

During the reference year the operator shall monitor the consumption of raw materials/reagents (FGC and Wastewater Treatment plant) and of auxiliary fuels

Information to be found in the annual Self-monitoring Report

Table 5 shows the elements to be monitored - and to be found in the annual Self-monitoring Report (Data Sheet- Table 5)

Reagents	Specific consumption (Kg/t waste burnt)	Note
Sodium bicarbonate	X	
Activated carbon	X	
Ammonia/urea	X	
Lime	X	
….		

Table 5 *– Reagents*

Table 6 shows the elements to be monitored - and to be found in the annual Self-monitoring Report – for fuels which are secondary fuels other than waste (Data Sheet- Table 6).

Fuel	Annual consumption (m^3/year)	Specific consumption (m^3/t waste burnt)
Natural gas	X	X
Diesel	X	X
….		

Table 6 *– Fuels*

Water usage/consumption

Provisions in the Self-monitoring Plan attached to the permit

During the reference year the operator shall monitor the consumption of water, its source and its usage in the process specifying – if applicable- the specific phase of the process in which water is used, and recirculation percentage.

Information to be found in the annual Self-monitoring Report

Table 7 shows the elements to be monitored - and to be found in the annual Self-monitoring Report – for water usage (Data Sheet- Table 7)

Source	Reference Year	Usage	Annual consumption (m^3/year)	Specific Annual consumption (m^3/t waste burnt)	% recirculation
Example: Groundwater / Industrial water	X	Process (WI) *Specify the specific phase of the process*	X	X	*If applicable*
Groundwater / Industrial water	X	Domestic	X		

Table 7 *– Water usage*

Emissions to air

Provisions in the Self-monitoring Plan attached to the permit

During the reference year the operator shall monitor each WI channelled emission according to the following Table 8 (*ref. BAT 4 and BATs 25-31*). Furthermore, operator shall

- implement its CEMS (*Continuous Emission Monitoring System*) Management Manual including OTNOC Management Plan
- carry out for each channelled emission of WI plant calibration activity *Quality Assurance Level 2* (QAL2) according to standard EN 14181 (AMS stands for Automated Measuring System: the continuous monitoring system installed by the operator).

If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Table 8 *is a proposal which can be modified or integrated with other parameters/ frequencies/standards as long as compliant with BATC provisions. Note that for some parameters the frequencies are different of those in table at BAT4 (WI BATC). Some ISO standards are proposed. List can be integrated with other parameters like PBDD/F*

	Parameter	ID Emission		Type of measurement/ frequency		Standard (1)	Standard Reference Method (SRM) for Quality Assurance EN 14181- QAL2
		E1	E…	Continuous	Periodic		
Combustion and greenhouse gas	CO	X	X	X		*AMS*	EN 15058
	CO_2	X	X		Once every year	Calculated	
	Ammonia	X	X	X		*AMS*	EN ISO 21877
	TOC	X	X	X		*AMS*	EN 12619
	NO_X	X	X	X		*AMS*	EN 14792
	N_2O (2)	X	X		Once every year	EN ISO 21258	
	SO_X	X	X	X		*AMS*	EN 14791
Metals and metalloids except mercury	Sb	X	X		Once every 4 months	EN 14385	
	As	X	X				
	Tl	X	X				
	Cd	X	X				
	Cr	X	X				
	Cu	X	X				
	Ni	X	X				

	Parameter	ID Emission		Type of measurement/ frequency		Standard (1)	Standard Reference Method (SRM)
	Pb	X	X				
	Co	X	X				
	Se	X	X				
	Sn	X	X				
	Zn	X	X				
	V	X	X				
	Mn	X	X				
Dioxins, PAH and PCB	PCDD + PCDF	X	X	X [5]	Once every 6 months	EN 1948	
	Benzo[a]pyrene	X	X		Once every 6 months	ISO 11338	
	DL - PCBs	X	X	X [5] [6]	Once every 6 months	EN 1948	
Mercury	Hg	X	X	X [4]	(Once every 6 months)	EN 13211 - EN 14884	
Acids and Dust	HCl	X	X	X		*AMS*	EN 1911 - EN 16429
	HF	X	X	X [3]	(Once every 6 months)	*AMS*	ISO 15713:2006
	Dust	X	X	X		*AMS*	EN 13284
Flue gas parameters	Oxygen content (%O2)	X	X	X		*AMS*	EN 14789
	Temperature	X	X	X		*AMS*	EN 16911
	Pressure	X	X	X		*AMS*	EN 16911
	Water vapour content	X	X	X		*AMS*	EN 14790
	Flow	X	X	X		*AMS*	EN 16911

Table 8 *– Air monitoring parameters*

(1) For AMS no specific standard is indicated; generic EN standards for continuous measurements are EN 15267-1, EN 15267-2, EN 15267-3 and EN 14181. EN standards – ISO if no EN standard is available - for periodic measurements are given in the table or in the footnotes.

(2) In case of incineration of waste in fluidised bed furnace or when SNCR is operated with urea. If continuous monitoring of N_2O is applied, the generic EN standards for continuous measurements apply.

(3) The continuous measurement of HF may be replaced by periodic measurements with a minimum frequency of once every six months if the HCl emission levels are proven to be sufficiently stable. No EN standard is available for the periodic measurement of HF.

(4) For plants incinerating wastes with a proven low and stable mercury content (e.g. mono streams of waste of a controlled composition), the continuous monitoring of emissions may be replaced by long-term sampling (no EN standard is available for long-term sampling of Hg) or periodic measurements with a minimum frequency of once every six months. In the latter case the relevant standard is EN 13211.

(5) The monitoring does not apply if the emission levels are proven to be sufficiently stable.

(6) The monitoring does not apply where the emissions of dioxin-like PCBs are proven to be less than 0,01 ng WHO-TEQ/Nm_3.

Information to be found in the annual Self-monitoring Report

Table 9 shows the elements to be monitored for each incineration line - and to be found in the annual Self-monitoring Report (Data Sheet Table 9) – for continuous parameters (Daily/half hourly average values and number of breaches)

EMISSIONS TO AIR- Continuous Parameters: Daily Average and half hourly Values (Reference Year….)					
PARAMETERS	**ELV**	**EMISSION POINT (Ex: E1)**		**EMISSION POINT (Ex: E1)**	
		Daily average values during year……. (2)	**Number or % of breaches % (3)**	**Half hourly Average values during year……. (2)**	**Number or % of breaches % (3)**
Dust					
CO					
TOC					
HCl					
HF (1)					
SO_2					
NO_2					
NH_3					
Mercury (1)					

Table 9 *– Daily average and half hourly values and number of breaches*

Table 10 shows the elements to be monitored for each incineration line - and to be found in the annual Self-monitoring Report (Data Sheet- Table 10) – for non-continuous parameters (Results of analysis during the reference year

EMISSION TO AIR- Non Continuous Parameters: Analysis results (Reference Year….)						
EMISSION POINT (Ex: E1)						
Parameter	**ELV mg/Nm^3**	**Analysis n.1**	**Analysis n.2**	**Analysis n.3**	**Analysis n…..**	**N. of breaches**
Cd + Tl						
Hg						
Metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V) + Sn						
Zn						
(PCDD + PCDF) I-TEQ	[ng/m^3]					
PAH						
PCB-DL WHO-TEQ	[ng/m^3]					
PBDD/F	[ng/m^3]					

Table 10 *– Periodic measurements and number of breaches*

Table 11 shows the elements to be monitored for each incineration line - and to be found in the annual Self-monitoring Report (Data Sheet- Table 11) – for PCDDF and mercury long term monitoring if applied (Results of analysis during the reference year)

PCDD/F

Emiss. n.	U.M.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dic	Annual Average
E1	[ng/m^3]													
...	[ng/m^3]													

MERCURY

Emiss. n.	U.M.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dic	Annual Average
E1														
...														

Table 11 *– PCDD/F and mercury long term monitoring results*

Table 12 shows the elements to be calculated for each incineration line - and to be found in the annual Self-monitoring Report (Data Sheet- Table 12) – on total annual mass flows of each parameter.

Incineration line n...../ Emission n. …

Parameter	Annual mass flow		Emission factor	
Dust		t/year		g/t of wastes burnt
TOC		t/year		g/t of wastes burnt
HCl		t/year		g/t of wastes burnt
HF		t/year		g/t of wastes burnt
SO_2		t/year		g/t of wastes burnt
NO_2		t/year		g/t of wastes burnt
CO		t/year		g/t of wastes burnt
NH_3		t/year		g/t of wastes burnt
Cd + Tl		t/year		mg/t of wastes burnt
Hg		t/year		mg/t of wastes burnt
Metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V) + Sn		kg/year		mg/t of wastes burnt
Zn		kg/year		mg/t of wastes burnt
(PCDD + PCDF)		g/year		ng/t of wastes burnt
PAH		g/year		ng/t of wastes burnt

Table 12 *– Emission Annual mass flows*

Emissions to water

During the reference year the operator shall monitor each discharge according to the following Table 13 (*ref. BAT 6 and BAT 34*). Furthermore, operator shall

- implement its own sampling procedure describing how to collect 24-hour flow- proportional/time-proportional composite samples.
- implement its own calibration procedure of instruments for continuous measurement: flow, pH, temperature.

If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

Table 13 *is a proposal which can be modified or integrated with other parameters/ frequencies/ standards as long as compliant with BATC provisions. For each discharge a table has to be completed. Some parameters are added in comparison to the list of BAT 34. Some ISO standards are proposed. Examples of Process/origin other than wet FGC are surface run-off water, cooling water, drainage water collected from the waste reception, handling and storage areas.*

ID Discharge: *Dis 1 (Example)* **Process/Origin:** *wet FGC (Example)* **Direct/indirect:** *if direct specify receiving water body*				
Parameter (**)	*to monitor (X)*	**Type of measurement/ frequency**		**Standard**
		Continuous	**Periodic**	
Flow (*)	**X**	**X**		EN 17075 EN ISO 5167-6 EN ISO 20456
pH (*)	**X**	**X**		EN 17075 EN ISO 10523:2012
Temperature (*)	**X**	**X**		EN 17075
Conductivity		**X**		EN 17075 EN 27888
Total suspended solids (TSS) (§) (*)	**X**		Once every day (2)	EN 872
Total organic carbon (TOC) (§) (*)	**X**		Once every month	EN 1484
COD			Once every month	ISO 15705:2002
Al			Once every month	EN ISO 11855

ID Discharge: *Dis 1 (Example)* **Process/Origin:** *wet FGC (Example)* **Direct/indirect:** *if direct specify receiving water body*				
Parameter (**)	*to monitor (X)*	**Type of measurement/ frequency**		**Standard**
		Continuous	**Periodic**	
As (*)	**X**			EN ISO 15586 EN ISO 17294-1:2006 EN ISO 17294-2:2016
Sb (*)	**X**			
B				
Cd	**X**			
Cr (*)	**X**			
Fe				
Mn				
Mo (*)	**X**			
Hg (*)	**X**			
Ni (*)	**X**			
Pb (*)	**X**			
Cu (*)	**X**			
Se				
Sn				
Tl (*)	**X**			
Zn (*)	**X**			
Sulphate (SO_4^{2-})	**X**		Once every six months	EN 10304-1
Chloride (Cl^-)	**X**		Once every six months	EN ISO 10304-1 EN ISO 10304-4 EN 15682
Fluoride (F^-)	**X**		Once every six months	EN ISO 10304-1 EN ISO 10304-4
Total Phosphorus (P)			Once every six months	EN ISO 15681-1 EN ISO 15681-2

ID Discharge: *Dis 1 (Example)* **Process/Origin:** *wet FGC (Example)* **Direct/indirect:** *if direct specify receiving water body*				
Parameter (**)	*to monitor (X)*	**Type of measurement/ frequency**		**Standard**
		Continuous	**Periodic**	
Ammonium-nitrogen (NH4-N)	**X**		Once every six months	EN ISO 11732 EN ISO 14911
Total Nitrogen (N)	**X**		Once every six months	EN 10304-1 EN 10304-3 EN 10304-4
Hydrocarbon Oil Index (HOI)	**X**		Once every six months	EN ISO 9377-2
Phenols	**X**		Once every six months	EN ISO 14402
PAH	**X**		Once every six months	EN ISO 17993
PCDD-DF (*)	**X**		Once every month (1)	
……				

Table 13 *– Water monitoring parameters*

(§) Monitoring is mandatory for wet FGC in case of direct discharge to a receiving water body (BAT34)

(*) Monitoring is mandatory for wet FGC in case of direct or indirect discharge (BAT34)

(1) The monitoring frequency may be at least once every six months if the emissions are proven to be sufficiently stable.

(2) The daily 24-hour flow-proportional composite sampling measurements may be substituted by daily spot sample measurements.

Information to be found in the annual Self-monitoring Report

Table 14 shows the elements to be calculated (from the results of analysis during the reference year)- and to be found in the annual Self-monitoring Report (Data Sheet- Table 14).

EMISSIONS TO WATER FROM FGC (Reference Year….)			
DISCHARGE POINT:			
Parameter	**ELV mg/l**	**Annual average values**	**N. of breaches (1)**
TSS			
TOC			
As			
Cd			
Cr			
Cu			
Hg			
Ni			
Pb			
Sb			
Tl			
Zn			
(PCDD + PCDF)	[ng I-TEQ/l]		
…..			

Table 14 *– Water discharge annual average values*

Residues (fly ashes from filters/heat exchanger and bottom ashes)

Provisions in the Self-monitoring Plan attached to the permit.

Monitoring includes residues sampling and analysis according EN standard – if available.
Arrangements shall be done with the final treatment plant for ensuring the proper recover/disposal of residues.
Sampling is performed according to the following table 15 and 16

Residues	Sampling	Parameters	Monitoring frequency
Bottom ashes	in the storage bunker	Unburnt substances in bottom ashes (see Table 16)	Once every three months (see Table 16)
Fly ashes from filters/heat exchanger	in silos/tank/big bag	Key substances (e.g. content of halogens and metals/metalloids)	every 6 months (or compliant with the requirements of final treatment plant)

Table 15 –*Sampling and analysis of residues*

Parameter	Unit	Standard(s)	Monitoring frequency
Loss on ignition (1)	Dry wt-%	EN 14899 and either EN 15169 or EN 15935	Once every three months
Total organic carbon (1)(2)	Dry wt-%	EN 14899 and either EN 13137 or EN 15936	Once every three months

Table16 *– Parameter Standard and frequency for unburnt substances in bottom ashes*

(1) Either the loss on ignition or the total organic carbon is monitored.

(2) Elemental carbon (e.g. determined according to DIN 19539) may be subtracted from the measurement result.

Information to be found in the annual Self-monitoring Report

Table 17 shows un example of the elements to be monitored - and to be found in the annual Self-monitoring Report - for residues (Data Sheet- Table 17).

Residue	Waste code	Classification	Quantity (t/year)	Specific quantity (t/t wastes burnt)	Recovery/Disposal (R/D)	Waste treatment options
IBA	19 01 12	MN				IBA aggregate (e.g. municipal); non-haz landfill (e.g. clinical)
(including when mixed with boiler ash or standalone co-incinerator boiler ash)	10 01 15	MN				Non-haz landfill, fertiliser production (end-of-waste)
	19 01 11*	MH				Haz waste landfill (e.g. haz-waste incinerator)
	10 01 14*	MH				Haz waste landfill (e.g. waste wood incinerator)
Boiler ash	19 01 15*	MH				Haz waste landfill (e.g. municipal)
(standalone)	19 01 16	MN				Non-haz waste landfill
APCR	19 01 07*	AH				Haz waste landfill, aggregate manufacture
	10 01 18*	MH				Haz waste landfill, aggregate manufacture
	10 01 19	MN				Non-haz waste landfill
.....						

Table 17 *– Residues*

Noise

Provisions in the Self-monitoring Plan attached to the permit

In case of substantial changes (with a possible effect on noise emissions) during the reference year operator shall monitor the effects of these changes on noise emissions (considering the noise emissions at emitter and receiver).

Information to be found in the annual Self-monitoring Report

Noise emission Report (here attached)

ATTACHMENTS

Document (Example)	**ID**
Report on breaches (emissions to air)	
Noise report year 2024	
Quality assurance Report (CEMS)	

OPERATOR
Information and contact

Company	
Address	
City	
Operator (name)	
Contact (mail/phone)	
Permit number	
IED code	
Other IED codes	

Self monitorng reference year:

PLANT INFORMATION
Table 1 – Thermal Capacity, Operating Hours and Lower Calorific Value (LCV) of wast

REFERENCE YEAR:

Reference Year: …..	**unit of measure**		**For each incineration line**			**Note**
			1	**2**	**…**	
Authorised Thermal Capacity	MW	*Total*				
Operating Hours (*burning waste)*	h/year	*Total*				
LCV range of waste burnt *(permit)*	kcal/kg					*Information in the permit e.g. Min 1.911 - Max 3.344*
Average LCV of waste during the year	kcal/kg					

INCOMING WASTE
Table 2 – Incoming waste for category
Table 3 – Incoming waste for single code

REFERENCE YEAR:

Type of waste	Delivered Quantity (t/year)	% (on total burnt wastes)	Note
Municipal Solid Waste	X	/	
Other non-hazardous waste	X	X	
Hazardous wood waste	X	X	
Clinical waste	X	X	
….		….	
Total burnt wastes		100%	

Table 2 – Incoming waste for category

Code	Delivered Quantity (t/year)
X (e.g. 20.12.12)	X
X	X
X	X
……	…..

Table 3 – Incoming waste for single code

ENERGY

Table 4 – Energy efficiency according to "R1-formula"

REFERENCE YEAR:

Parameters	u.o.m.	Value	Note
Ep energy produced as heat or electricity	Gj or MWh	X	
Ef energy input to the system from fuels	Gj	X	
Ew energy contained in the treated waste	Gj	X	
Ei energy imported	Gj	X	
R1 value (Directive 2008/98/EC)	-	X (0-1)	*Specify if CCF is applied (1,151)*

RAW MATERIALS AND AUXILIARY FUELS

Table 5 – Reagents

Table 6 – Fuels

REFERENCE YEAR:

Reagents	Specific consumption (Kg/t waste burnt)	Note
Sodium bicarbonate	X	
Activated carbon	X	
Ammonia/urea	X	
Lime	X	
….		

Table 5 – Reagents

Fuel	Annual consumption (m^3/year)	Specific consumption (m^3/t waste burnt)
Natural gas	X	X
Diesel	X	X
….		

Table 6 – Fuels

WATER
USAGE
Table 7 – Water usage

REFERENCE YEAR:

Source	Reference Year	Usage	Annual consumption (m^3/year)	Specific Annual consumption (m^3/t waste burnt)	% recirculation
Example: Mains water / borehole water	X	Process (WI) *Specify the specific phase of the process*	X	X	*If applicable*
Mains water / borehole water	X	Domestic	X		

EMISSIONS TO AIR

Table 9 – Daily average and hal hourly values and number of breaches

REFERENCE YEAR:

EMISSIONS TO AIR- Continuous Parameters: Daily Average and half hourly Values (Reference Year….)					
PARAMETERS	**ELV**	**EMISSION POINT (Ex: E1)**		**EMISSION POINT (Ex: E1)**	
		Daily average values during year……. (2)	**Number or % of breaches % (3)**	**Half hourly Average values during year……. (2)**	**Number or % of breaches % (3)**
Dust					
CO					
TOC					
HCl					
HF (1)					
SO_2					
NO_2					
NH_3					
Mercury (1)					

(1) if continuous monitoring is applied

(2) calculated on the basis of the average daily values (mg/Nm3) of the reference year

(3) for every breach Table of breaches has to be filled up

Table of breaches (Reference year:….)				
EMISSION POINT	**DATE**	**MEASUARED CONCENTRATION during BREACH**	**LAST of BREACH (i.e. daily or half-hourly average)**	**ACTIONS**

EMISSIONS TO AIR

Table 10 – Periodic measurements

REFERENCE YEAR:

EMISSION TO AIR- Non Continuous Parameters: Analysis results (Reference Year….)						
EMISSION POINT (Ex: E1)						
Parameter	**ELV mg/Nm³**	**Analysis n.1**	**Analysis n.2**	**Analysis n.3**	**Analysis n…..**	**N. of breaches**
Cd + Tl						
Hg						
Metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V) + Sn						
Zn						
(PCDD + PCDF) I-TEQ	[ng/m³]					
PAH						
PCB-DL WHO-TEQ	[ng/m³]					
PBDD/F	[ng/m³]					

Table of breaches (Reference year:….)			
EMISSION POINT	**DATE**	**MEASUARED CONCENTRATION during BREACH**	**ACTIONS**

EMISSIONS TO AIR
Table 11 – PCDD/F and Mercurry long term monitoring results

REFERENCE YEAR:

PCDD/F

Emiss. n.	U.M.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dic	Annual Average
E1	[ng/m^3]													
...	[ng/m^3]													

Mercury

Emiss. n.	U.M.	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dic	Annual Average
E1														
...														

EMISSIONS TO AIR
Table 12 – Annual mass flows

REFERENCE YEAR:

Incineration line n...../ Emission n. ...

Parameter	Annual mass flow		Emission factor	
Dust		t/year		g/t of wastes burnt
TOC		t/year		g/t of wastes burnt
HCl		t/year		g/t of wastes burnt
HF		t/year		g/t of wastes burnt
SO_2		t/year		g/t of wastes burnt
NO_2		t/year		g/t of wastes burnt
CO		t/year		g/t of wastes burnt
NH_3		t/year		g/t of wastes burnt
Cd + Tl		t/year		mg/t of wastes burnt
Hg		t/year		mg/t of wastes burnt
Metals (Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V) + Sn		kg/year		mg/t of wastes burnt
Zn		kg/year		mg/t of wastes burnt
(PCDD + PCDF)		g/year		ng/t of wastes burnt
PAH		g/year		ng/t of wastes burnt

EMISSIONS TO WATER

Table 14 – Annual average values and number of breaches

REFERENCE YEAR:

EMISSIONS TO WATER FROM FGC			
DISCHARGE POINT:			
Parameter	**ELV mg/l**	**Annual average values**	**N. of breaches (1)**
TSS			
TOC			
As			
Cd			
Cr			
Cu			
Hg			
Ni			
Pb			
Sb			
Tl			
Zn			
(PCDD + PCDF)	[ng I-TEQ/l]		
…..			

(1) for every breach Table of breaches has to be filled up

DISCHARGES Table of breaches (Reference year:….)			
DISCHARGE POINT	**DATE**	**MEASUARED CONCENTRATION during BREACH**	**ACTIONS**

RESIDUES
Table 17- Residues from incineration

REFERENCE YEAR:

Residue	Waste code	Classification	Quantity (t/year)	Specific quantity (t/t wastes burnt)	Recovery/Disposal (R/D)	Waste treatment options
IBA	19 01 12	MN				IBA aggregate (e.g. municipal); non-haz landfill (e.g. clinical)
(including when mixed with boiler ash or standalone co-incinerator boiler ash)	10 01 15	MN				Non-haz landfill, fertiliser production (end-of-waste)
	19 01 11*	MH				Haz waste landfill (e.g. haz-waste incinerator)
	10 01 14*	MH				Haz waste landfill (e.g. waste wood incinerator)
Boiler ash	19 01 15*	MH				Haz waste landfill (e.g. municipal)
(standalone)	19 01 16	MN				Non-haz waste landfill
APCR	19 01 07*	AH				Haz waste landfill, aggregate manufacture
	10 01 18*	MH				Haz waste landfill, aggregate manufacture
	10 01 19	MN				Non-haz waste landfill
.....						

On-site inspection checklist

Waste incineration

Date:		**Time:**	
Lead Inspector :			
Other inspectors:			

Site	
Operator name:	
Installation name:	
Permit number:	
Expiry date:	

Plant features	
Type of incineration plant:	
Types of waste received:	
Types of waste generated:	
Activities carried out at the facility:	
Permitted capacity (t/year):	
Storage capacity:	
Product/waste:	
e.g. incoming waste, IBA and APCR	
Other products (e.g.fuel):	
Temporary storage:	

Air emissions (be completed for each emissions point to be checked)	
Point sources	
Emission source	
Emission point reference	
Emission point height	
Installed thermal input (LCV)	

Emission regime	
Fuel or waste	
Operating hours and fuel consumption logs	
Emissions treatment	
Monitoring plan	
Continuous monitoring	
Results reporting	

Maintenance and metrological control	
Maintenance plan	
Verification of the metrological control	
Meteorological data	

Various	
Noise	
Complaints	
Noise assessment	
Adoption of noise-reduction measures	

Waste transportation	
Incoming	
Outgoing	
Radioactive material detection	
Slag and bottom ash	
Monitoring	
Monitoring reporting	

BAT Implementation			
1.9. Environmental management systems		**YES**	**NO**
BAT 1	In order to improve the overall environmental performance, BAT is to elaborate and implement an environmental management system (EMS)		
	Incorporates all 28 features		
OBS./NOTES			
1.10. Monitoring		**YES**	**NO**
BAT 2	BAT is to determine either the gross electrical efficiency, the gross energy efficiency, or the boiler efficiency of the incineration plant as a whole or of all the relevant parts of the incineration plant.		
OBS.			

BAT 3	BAT is to monitor key process parameters relevant for emissions to air and water including those given below.						
	Stream/Location	*Parameter(s)*	*Monitoring*				
	Flue-gas from the incineration of waste	Flow, oxygen content, temperature, pressure, water vapour content	Continuous measurement				
	Combustion chamber	Temperature					
	Waste water from wet FGC	Flow, pH, temperature					
	Waste water from bottom ash treatment plants	Flow, pH, conductivity					
OBS.							
BAT 4	BAT is to monitor channelled emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.						
	Substance/ Parameter	*Process*	*Standard(s)*	*Minimum Monitoring frequency*	*Monitoring Associated with*		
	NO_x	Incineration of waste	Generic EN Standards	Continuous	BAT 29		
	NH_3	Incineration of waste when SNCR and/or SCR is used	Generic EN Standards	Continuous	BAT 29		

	N_2O	Incineration of waste in fluidised bed furnace Incineration of waste when SNCR is operated with urea	EN 21258	Once every year	BAT 29		
	CO	Incineration of waste	Generic EN Standards	Continuous	BAT 29		
	SO_2	Incineration of waste	Generic EN Standards	Continuous	BAT 27		
	HCl	Incineration of waste	Generic EN Standards	Continuous	BAT 27		
	HF	Incineration of waste	Generic EN Standards	Continuous	BAT 27		
	Dust	Bottom ash treatment	EN 13284-1		BAT 26		
		Incineration of waste	Generic EN standards and EN 13284-2	Continuous	BAT 25		

	Metals and metalloids except mercury (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Tl, V)	Incineration of waste	EN 14385	Once every six months	BAT 25		
	Hg	Incineration of waste	Generic EN standards and EN 14884	Continuous	BAT 31		
	TVOC	Incineration of waste	Generic EN Standards	Continuous	BAT 30		
	PBDD/F	Incineration of waste	No EN standard available	Once every six months	BAT 30		
	PCDD/F	Incineration of waste	EN 1948-1, EN 1948- 2, EN 1948-3	Once every six months for short-term sampling	BAT 30		
			No EN standard available for long-term sampling, EN 1948-2, EN 1948- 3	Once every month for long-term sampling	BAT 30		
	Dioxin-like PCB's	Incineration of waste	EN 1948-1, EN 1948- 2, EN 1948-4	Once every six months for short-term sampling	BAT 30		
			No EN standard available for long-term sampling, EN 1948-2, EN 1948- 4	Once every month for long-term sampling	BAT 30		

	Benzo[a] pyrene	Incineration of waste	No EN standard available	Once every year	BAT 30		
OBS.							
BAT 5	BAT is to appropriately monitor channelled emissions to air from the incineration plant during OTNOC.						
OBS.							
BAT 6	BAT is to monitor emissions to water from FGC and/or bottom ash treatment with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.						
	Substance/ Parameter	*Process*	*Standard(s)*	*Minimum monitoring frequency*	*Monitoring associated with*		
	Total organic carbon (TOC)	FGC	EN 1484	Once every month	BAT 34		
		Bottom ash treatment		Once every month			
	Total suspended solids (TSS)	FGC	EN 872	Once every day			
		Bottom ash treatment		Once every month			
	As	FGC	Various EN standards available (e.g. EN ISO 11885, EN ISO 15586 or EN	Once every month			
	Cd	FGC					
	Cr	FGC					

	Cu	FGC	ISO 17294-2)				
	Mo	FGC					
	Ni	FGC					
	Pb	FGC		Once every month			
		Bottom ash treatment		Once every month			
	Sb	FGC		Once every month			
	Tl	FGC					
	Zn	FGC					
	Hg	FGC	Various EN standards available (e.g. EN ISO 11885, EN ISO 15586 or EN ISO 17294-2)				
	Ammonium-nitrogen (NH_4-N	Bottom ash treatment	Various EN standards available (e.g. EN ISO 11732, EN ISO 14911)	Once every month			
	Chloride (Cl^-)	Bottom ash treatment	Various EN standards available (e.g. EN ISO 10304-1, EN ISO 15682)	Once every month			

	Sulphate (SO_4^{2-})	Bottom ash treatment	EN ISO 10304-1	Once every month			
	PCDD/F	FGC	No EN standard available	Once every six months			
		Bottom ash treatment					
OBS.							
BAT 7	BAT is to monitor the content of unburnt substances in slags and bottom ashes at the incineration plant with at least the frequency given below and in accordance with EN standards.						
	Parameter	*Standard(s)*	*Minimum monitoring frequency*	*Monitoring associated with*			
	Loss on ignition	EN 14899 and either EN 15169 or EN 15935	Once every three months	BAT 14			
	Total organic carbon	EN 14899 and either EN 13137 or EN 15936					
OBS.							
BAT 8	For the incineration of hazardous waste containing POPs, BAT is to determine the POP content in the output streams (e.g. slags and bottom ashes, flue-gas, waste water) after the commissioning of the incineration plant and after each change that may significantly affect the POP content in the output streams.						
OBS.							
1.11. General environmental and combustion performance						**YES**	**NO**
BAT 9	In order to improve the overall environmental performance of the incineration plant by waste stream management (see BAT 1), BAT is to use all of the techniques (a) to (c) given below, and, where relevant, also techniques (d), (e) and (f).						

	(a)	Determination of the types of waste that can be incinerated		
	(b)	Set-up and implementation of waste characterisation and pre-acceptance procedures		
	(c)	Set-up and implementation of waste acceptance procedures		
	(d)	Set-up and implementation of a waste tracking system and inventory		
	(e)	Waste segregation		
	(f)	Verification of waste compatibility prior to the mixing or blending of hazardous wastes		
OBS.				
BAT 10	In order to improve the overall environmental performance of the bottom ash treatment plant, BAT is to include output quality management features in the EMS (see BAT 1).			
OBS.				
BAT 11	In order to improve the overall environmental performance of the incineration plant, BAT is to monitor the waste deliveries as part of the waste acceptance procedures (see BAT 9(c)) including, depending on the risk posed by the incoming waste, the elements given below.			
	Waste type	*Waste delivery monitoring*		
	Municipal solid waste and other non-hazardous waste	Radioactivity detection		
		Weighing of the waste deliveries		
		Visual inspection		
		Periodic sampling of waste deliveries and analysis of key properties/substances (e.g. calorific value, content of halogens and metals/metalloids). For municipal solid waste, this involves separate unloading.		

	Sewage sludge	Weighing of the waste deliveries (or measuring the flow if the sewage sludge is delivered via pipeline)		
		Visual inspection, as far as technically possible		
		Periodic sampling and analysis of key properties/substances (e. g. calorific value, content of water, ash and mercury)		
	Hazardous waste other than clinical waste	Radioactivity detection		
		Weighing of the waste deliveries		
		Visual inspection, as far as technically possible		
		Control and comparison of individual waste deliveries with the declaration of the waste producer		
		Sampling of the content of all bulk tankers and trailers		
		Sampling of the content of packed waste (e.g. in drums, intermediate bulk containers (IBCs) or smaller packaging)		
		Analysis of combustion parameters (including calorific value and flashpoint)		
		Analysis of waste compatibility, to detect possible hazardous reactions upon blending or mixing of wastes, prior to storage (BAT 9 f)		
		Analysis of key substances including POPs, halogens and sulphur, metals/metalloids		

	Clinical waste		Radioactivity detection		
			Weighing of the waste deliveries		
			Visual inspection of the packaging integrity		
OBS.					
BAT 12	In order to reduce the environmental risks associated with the reception, handling and storage of waste, BAT is to use both of the techniques given below.				
	(a)	Impermeable surfaces with an adequate drainage infrastructure			
	(b)	Adequate waste storage capacity			
OBS.					
BAT 13	In order to reduce the environmental risk associated with the storage and handling of clinical waste, BAT is to use a combination of the techniques given below.				
	(a)	Automated or semi-automated waste handling			
	(b)	Incineration of non-reusable sealed containers, if used			
	(c)	Cleaning and disinfection of reusable containers, if used			
OBS.					
BAT 14	In order to improve the overall environmental performance of the incineration of waste, to reduce the content of unburnt substances in slags and bottom ashes, and to reduce emissions to air from the incineration of waste, BAT is to use an appropriate combination of the techniques given below.				
	(a)	Waste blending and mixing			
	(b)	Advanced control system			

	(c)	Optimisation of the incineration process		
OBS.				
BAT 15	In order to improve the overall environmental performance of the incineration plant and to reduce emissions to air, BAT is to set up and implement procedures for the adjustment of the plant's settings, e.g. through the advanced control system (see description in Section 2.1), as and when needed and practicable, based on the characterisation and control of the waste (see BAT 11).			
OBS.				
BAT 16	In order to improve the overall environmental performance of the incineration plant and to reduce emissions to air, BAT is to set up and implement operational procedures (e.g. organisation of the supply chain, continuous rather than batch operation) to limit as far as practicable shutdown and start-up operations.			
OBS.				
BAT 17	In order to reduce emissions to air and, where relevant, to water from the incineration plant, BAT is to ensure that the FGC system and the waste water treatment plant are appropriately designed (e.g. considering the maximum flow rate and pollutant concentrations), operated within their design range, and maintained so as to ensure optimal availability.			
OBS.				
BAT 18	In order to reduce the frequency of the occurrence of OTNOC and to reduce emissions to air and, where relevant, to water from the incineration plant during OTNOC, BAT is to set up and implement a risk-based OTNOC management plan as part of the environmental management system (see BAT 1) that includes all of the following elements:			
	identification of potential OTNOC (e.g. failure of equipment critical to the protection of the environment ('critical equipment')), of their root causes and of their potential consequences, and regular review and update of the list of identified OTNOC following the periodic assessment below;			
	appropriate design of critical equipment (e.g. compartmentalisation of the bag filter, techniques to heat up the flue-gas and obviate the need to bypass the bag filter during start-up and shutdown, etc.);			

	set-up and implementation of a preventive maintenance plan for critical equipment (see BAT 1(xii));			
	monitoring and recording of emissions during OTNOC and associated circumstances (see BAT 5);			
	periodic assessment of the emissions occurring during OTNOC (e.g. frequency of events, duration, amount of pollutants emitted) and implementation of corrective actions if necessary.			
OBS.				
1.12. Energy efficiency			**YES**	**NO**
BAT 19	In order to increase the resource efficiency of the incineration plant, BAT is to use a heat recovery boiler.			
OBS.				
BAT 20	In order to increase the energy efficiency of the incineration plant, BAT is to use an appropriate combination of the techniques given below.			
	(a)	Drying of sewage sludge		
	(b)	Reduction of the flue-gas flow		
	(c)	Minimisation of heat losses		
	(d)	Optimisation of the boiler design		
	(e)	Low-temperature flue-gas heat exchangers		
	(f)	High steam conditions		
	(g)	Cogeneration		
	(h)	Flue-gas condenser		
	(i)	Dry bottom ash handling		

OBS.			
1.13. Emissions to air		**YES**	**NO**
BAT 21	In order to prevent or reduce diffuse emissions from the incineration plant, including odour emissions, BAT is to:		
	store solid and bulk pasty wastes that are odorous and/or prone to releasing volatile substances in enclosed buildings under controlled subatmospheric pressure and use the extracted air as combustion air for incineration or send it to another suitable abatement system in the case of a risk of explosion;		
	store liquid wastes in tanks under appropriate controlled pressure and duct the tank vents to the combustion air feed or to another suitable abatement system		
	control the risk of odour during complete shutdown periods when no incineration capacity is available, e.g. by: sending the vented or extracted air to an alternative abatement system, e.g. a wet scrubber, a fixed adsorption bed;		
	control the risk of odour during complete shutdown periods when no incineration capacity is available, e.g. by: minimising the amount of waste in storage, e.g. by interrupting, reducing or transferring waste deliveries, as a part of waste stream management (see BAT 9);		
	control the risk of odour during complete shutdown periods when no incineration capacity is available, e.g. by: storing waste in properly sealed bales.		
OBS.			
BAT 22	In order to prevent diffuse emissions of volatile compounds from the handling of gaseous and liquid wastes that are odorous and/or prone to releasing volatile substances at incineration plants, BAT is to introduce them into the furnace by direct feeding.		
OBS.			
BAT 23	In order to prevent or reduce diffuse dust emissions to air from the treatment of slags and bottom ashes, BAT is to include in the environmental management system (see BAT 1) the following diffuse dust emissions management features:		

	identification of the most relevant diffuse dust emission sources (e.g. using EN 15445);			
	definition and implementation of appropriate actions and techniques to prevent or reduce diffuse emissions over a given time frame.			
OBS.				
BAT 24	In order to prevent or reduce diffuse dust emissions to air from the treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques given below.			
	(a)	Enclose and cover equipment		
	(b)	Limit height of discharge		
	(c)	Protect stockpiles against prevailing winds		
	(d)	Use water sprays		
	(e)	Optimise moisture content		
	(f)	Operate under subatmospheric pressure		
OBS.				
BAT 25	In order to reduce channelled emissions to air of dust, metals and metalloids from the incineration of waste, BAT is to use one or a combination of the techniques given below.			
	(a)	Bag filter		
	(b)	Electrostatic precipitator		
	(c)	Dry sorbent injection		
	(d)	Wet scrubber		
	(e)	Fixed- or moving-bed adsorption		

OBS.				
BAT 26	In order to reduce channelled dust emissions to air from the enclosed treatment of slags and bottom ashes with extraction of air (see BAT 24(f)), BAT is to treat the extracted air with a bag filter (see Section 2.2).			
OBS.				
BAT 27	In order to reduce channelled emissions of HCl, HF and SO2 to air from the incineration of waste, BAT is to use one or a combination of the techniques given below.			
	(a)	Wet scrubber		
	(b)	Semi-wet absorber		
	(c)	Dry sorbent injection		
	(d)	Direct desulphurisation		
	(e)	Boiler sorbent injection		
OBS.				
BAT 28	In order to reduce channelled peak emissions of HCl, HF and SO2 to air from the incineration of waste while limiting the consumption of reagents and the amount of residues generated from dry sorbent injection and semi-wet absorbers, BAT is to use technique (a) or both of the techniques given below.			
	(a)	Optimised and automated reagent dosage		
	(b)	Recirculation of reagents		
OBS.				
BAT 29	In order to reduce channelled NOX emissions to air while limiting the emissions of CO and N2O from the incineration of waste and the emissions of NH3 from the use of SNCR and/or SCR, BAT is to use an appropriate combination of the techniques given below.			

	(a)	Optimisation of the incineration process		
	(b)	Flue-gas recirculation		
	(c)	Selective non-catalytic reduction (SNCR)		
	(d)	Selective catalytic reduction (SCR)		
	(e)	Catalytic filter bags		
	(f)	Optimisation of the SNCR/SCR design and operation		
	(g)	Wet scrubber		
OBS.				
BAT 30	In order to reduce channelled emissions to air of organic compounds including PCDD/F and PCBs from the incineration of waste, BAT is to use techniques (a), (b), (c), (d), and one or a combination of techniques (e) to (i) given below.			
	(a)	Optimisation of the incineration process		
	(b)	Control of the waste feed		
	(c)	On-line and off-line boiler cleaning		
	(d)	Rapid flue-gas cooling		
	(e)	Dry sorbent injection		
	(f)	Fixed- or moving-bed adsorption		
	(g)	SCR		
	(h)	Catalytic filter bags		

	(i)	Carbon sorbent in a wet scrubber		
OBS.				
BAT 31	In order to reduce channelled mercury emissions to air (including mercury emission peaks) from the incineration of waste, BAT is to use one or a combination of the techniques given below.			
	(a)	Wet scrubber (low pH)		
	(b)	Dry sorbent injection		
	(c)	Injection of special, highly reactive activated carbon		
	(d)	Boiler bromine addition		
	(e)	Fixed- or moving-bed adsorption		
OBS.				
1.14. Emissions to water			**YES**	**NO**
BAT 32	In order to prevent the contamination of uncontaminated water, to reduce emissions to water, and to increase resource efficiency, BAT is to segregate waste water streams and to treat them separately, depending on their characteristics.			
OBS.				
BAT 33	In order to reduce water usage and to prevent or reduce the generation of waste water from the incineration plant, BAT is to use one or a combination of the techniques given below.			
	(a)	Waste-water-free FGC techniques		
	(b)	Injection of waste water from FGC		
	(c)	Water reuse/recycling		

	(d)	Dry bottom ash handling			
OBS.					
BAT 34	In order to reduce emissions to water from FGC and/or from the storage and treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques given below, and to use secondary techniques as close as possible to the source in order to avoid dilution.				
	Technique		*Typical pollutants targeted*		
	Primary techniques				
	(a)	Optimisation of the incineration process (see BAT 14) and/or of the FGC system (e.g. SNCR/SCR, see BAT 29(f))	Organic compounds including PCDD/F, ammonia/ammonium		
	Secondary techniques				
	Preliminary and primary treatment				
1.15. Material efficiency				**YES**	**NO**
BAT 35	In order to increase resource efficiency, BAT is to handle and treat bottom ashes separately from FGC residues.				
OBS.					

BAT 36	In order to increase resource efficiency for the treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques given below based on a risk assessment depending on the hazardous properties of the slags and bottom ashes.		
OBS.			
1.16. Noise		**YES**	**NO**
BAT 37	In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to use one or a combination of the techniques given below.		
OBS.			