

RECONSIDERATION APPLICATION
JUNE 2011

Our Ref.: EPD/A/RD/11/134



Ing. Vincent Magri
Chief Executive Officer
WasteServ Malta Ltd
Triq Sant' Antnin
Marsascala MSK 9052

29 April 2011

Dear Ing. Magri,

IP 0004/07/A: Reconsideration of IPPC permit for Marsa Thermal Treatment Facility

Reference is made to the IPPC permit for the Marsa Thermal Treatment Facility, determined by MEPA on 31 October 2007.

Regulation 19(1) of the IPPC Regulations (LN 234 of 2002 as amended) requires MEPA to periodically reconsider, and where necessary, update the IPPC permit conditions. Given the time that has elapsed since the issue of the permit and given the frequent defaults on the IPPC permit, MEPA is hereby initiating the procedure for reconsideration of the IPPC permit for the Marsa Thermal Treatment Facility.

As part of this process, WasteServ is required to submit:

- (1) IPPC application forms A and C (available from www.mepa.org.mt/ippc-applications-applications). Proposed variations to the installation should be indicated in Form C.
- (2) A document indicating how all the improvements required by the IPPC permit have been implemented, including date of implementation.
- (3) The final detailed Masterplan of the site.
- (4) A comparison of the operations at the Marsa Thermal Treatment Facility with BAT as specified in the BAT-reference document (BREF) on Waste Incineration. (Please fill in Annex I enclosed with this letter).

As indicated in previous communication, an application for a planning permit also needs to be submitted for the Masterplan of the site.

Please submit the above documentation by 24 June 2011.

Regards,

Dr Petra Bianchi
IPPC Committee Chair
Director of Environment



WasteServ Malta Ltd

Your Ref: IP 0004/07

30th June 2011

Dr Petra Bianchi
Director for Environment Protection, IPPC Committee Chair
Malta Environment & Planning Authority
Hexagon House
Spencer Gardens
Blata l-Bajda

Subject: IP 0004/07/A Reconsideration of IPPC permit for Marsa Thermal Treatment Facility

Dear Dr Bianchi,

I refer to your communication dated 29th April 2011 but received at this office on 25th May 2011 on the subject in caption. As requested kindly find enclosed the following documentation:

1. IPPC application forms A and C as well as other supporting documentation. Form C includes proposed variations to the installation.
2. A document indicating how and by when all the improvements listed in the permit have been implemented. This is attached as Annex 6 to this submission.
3. A copy of proposed Development Brief for the site. This is included as Annex 3 to this submission. This proposal was also submitted to the Director of Planning under separate cover.
4. The completed BAT reference document on Waste Incineration. This is included as Annex 8 to this submission.

Whilst thanking you in anticipation for your consideration, we remain at your disposal for any further information or clarifications at your convenience.

Regards,

Ing. Vincent Magri
Chief Executive Officer

Encl.



IP 0004/07/A: Reconsideration of IPPC Permit for Marsa Thermal Treatment Facility

**Feedback to IPPC Committee
June 2011**

**Form IPPC Part A – application for a permit, variation, transfer or surrender
For Malta Environment & Planning Authority Use Only**

Data received

Fee received: Yes No

Amount received

Name assigned to installation

☐ ☐

**Application for a permit, variation, transfer or
surrender**

Integrated Pollution Prevention and Control

Integrated Pollution Prevention and Control Regulations 2002

Introduction to Part A

When to use this form

Use this form if you are sending an application to the MEPA under the Integrated Pollution Prevention and Control Regulations 2002 ('the IPPC Regulations').

The form is to be used for applications made in respect of both 'installations' and 'mobile plant' (and in the rest of the form, the term 'installation' also covers 'mobile plant' where appropriate).

Before you start to fill in this form

There may be two or more operators in a single installation. Each operator will need a permit, each obtained by a separate application. Your applications will principally relate to the part of the installation under your control, but will also need to include some information on the rest of the installation. This will help us to assess the operation of the whole installation. The term "installation", when used in this application form (and elsewhere) may refer to either the whole or part of the installation, depending on the nature of the information we are seeking to obtain.

Which parts of the form to fill in

The form is in five parts but we usually only send you the parts you need to fill in. Everyone has to fill in Part A, and prepare and sign a covering letter at the end of their application.

The other parts you need to fill in depends on the type of application you are making:

- To apply for a new permit – fill in Parts A and B;
- To vary an existing permit – fill in Parts A and C;
- To transfer all or part of an existing permit to someone else – fill in Parts A and D. This should be a joint application by the transferor and the transferee;
- To surrender all or part of an existing permit – fill in Parts A and E.

Other documents we need to see

There are a number of other documents you will need to send us with your application. Each time a request for documents is made in the application form you will need to record a document reference number for the document or documents that you are submitting in the box provided on the form for this purpose.

Please also mark the document(s) clearly with this reference number and either the application reference number if you know it or your existing permit number. If you do not have either of these, please use the name of the installation.

If you know your Application Reference Number, please enter it into the box below:

IP 0004/07/A

Using continuation sheets

In the case of questions required to be answered on the application form itself, please use a continuation sheet if you need extra space; but please indicate clearly on the form that you have done so by stating a document reference number for that continuation sheet. Please also mark the continuation sheet itself clearly with the information referred to above.

Copies

Please send 1 hard copy and 9 soft copies of the application form and all supporting information.

If you need help and advice

We have made the application form as straightforward as possible, but please get in touch with us if you need any advice on how to set out the information we need.

Please get in touch with us on 2290 7230.

A1 About your application

A1.1 What type of application are you making?

- ☐ new permit
- ☐ variation of an existing permit
- ☐ transfer of an existing permit
- ☐ surrender of an existing permit

A1.2 Name of the installation

Incinerator for Abattoir and Hazardous Waste

Please tell us if this name is:

- ☐ already agreed with the MEPA; or
- ☐ one that you are proposing.

A1.3 Please give the address of the site of the installation, and a map or plan showing the site of the installation and the location of the installation on the site

Street Address	Triq il-Biccerija	
Locality	Marsa	Post Code

A1.4 Give details of any existing permit(s) for the installation.

Please give details of any applicable waste management licences, planning permits or water discharge consents. Include permit number(s), type(s) and date(s) of issue, and submit copies.

IPPC permit IP 0004/07
WM 00012/07

A2 Authorised contacts

It will help us to have someone who we can contact directly with any questions about your application. The person you name should have the authority to act on your behalf.

A2.1 Who can we contact about your application?

This could be an agent rather than the operator.
Name

Ing Vincent Magri

Position

Chief Executive Officer

Address

Street Address	WasteServ Malta Limited	
	EkoCentre	
	Triq il-Latmija	
Locality	Marsascale	Post Code MSK 4613

Phone Number 23858000

Fax Number 21441930

Email address vmagri@wasteservmalta.com

A2.2 Operational contact

If different to the above, please identify the person we should contact to discuss operational matters on an ongoing basis.

Name

Ing Mary Grace Micallef

Position

Assistant Facility Manager

Address

Street Address	WasteServ Malta Limited	
	EkoCentre	
	Triq il-Latmija	
Locality	Marsascale	Post Code MSK 4613

Phone Number 23858000

Fax Number 21441930

Email address
mary.g.micallef@wasteservmalta.com

A3 About the operator

Please provide the information requested below about the 'operator', which means:

- for applications for a new permit – the person who it is proposed will have control over the installation in accordance with the permit (if granted),
- for applications for a variation, transfer or surrender – the person who currently has control over the installation in accordance with the permit.

If you are applying for a transfer, we will ask for more information relating to the proposed new operator (transferee) in Part D.

Legal status of operator

A3.1 Is the operator an individual, a group of individuals, a partnership or a company/corporate body?

- ☐ Individual (sole trader) or group of individuals: go to question A3.2.
- ☐ Partnership: go to question A3.3.
- ☐ **Company or corporate body:** go to question A3.5.

Individual applicants

A3.2 Please give us the following details.

Where more than one person is applying (other than as a partnership) we need details of each person.

Continue on separate sheets if necessary.

Full Name

ID Card/Passport No.

Trading/business name (if any)

Business address

Street Address		
Locality		Post Code

Phone Number

Fax Number

Email address

Now go to question A4, What to do next.

Applications from partnerships

A3.3 Who is applying?

We can only issue permits to named individuals, not to a partnership name. We therefore need details of each person in the partnership.

Continue on separate sheets if necessary.

Person

Full Name

ID Card/Passport No.

Principal place of business

Street Address		
Locality		Post Code

Contact Numbers

Phone Number

Fax Number

Email address

Person

Full Name

ID Card/Passport No.

Principal place of business

Street Address		
Locality		Post Code

Contact Numbers

Phone Number

Fax Number

Email address

Person**Full Name**

--

ID Card/Passport No.

--

Principal place of business

Street Address	
Locality	Post Code

Contact Numbers

Phone Number

Fax Number

Email address

A3.4 Please give us the following details about the partnership.

Name of partnership (if there is one)

--

Principal place of business

Street Address	
Locality	Post Code

Contact Numbers

Phone Number

Fax Number

Email address

Now go to question A4, What to do next.

Companies or other corporate applicants**A3.5 Please give us the following details.**

Full name of company or corporate body.

WASTESERV MALTA LIMITED

Trading/business name (if different)

--

Registered office address

Street Address	EkoCentre	
	Triq il-Latmija	
Locality	Marsascale	Post Code MSK 4613

Company registration number

C30560

Date of formation of company

November 2002

• For applications from companies, please provide a copy of the certificate of incorporation or registration and any certificates of subsequent name changes.

Document reference number

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• For applications from other corporate bodies, please provide evidence of status.

Document reference number

--

A3.6 Is the operator a subsidiary of a holding company?

No ☒

Yes ☐ name of ultimate holding company

--

Registered office address

Street Address		
Locality		Post Code

Principal office address (if different)

Street Address		
Locality		Post Code

Company registration number

--

A4 What to do next

Now you need to fill in the other Parts of this form we sent you.

If you are applying for

- ☐ • A new permit – fill in Part B;
- ☐ • A variation – fill in Part C;
- ☐ • A transfer – fill in Part D;
- ☐ • A surrender – fill in Part E.

Form IPPC Part C: Application for a Variation



For MEPA use only

Application reference:

Use this part of the form if you are applying to vary the conditions or any other provision contained in your permit.

Please read carefully Appendix I attached with this application.

C1 About the installation

Please fill in the installation table below with details of all the activities and operators at the whole installation, even if you are applying for a permit in respect of only part of the installation.

In **Column 1: Activities in “the stationary technical unit”**, please identify all activities listed in Schedule 1 to the IPPC Regulations that are proposed to be carried out in the “stationary technical unit” of the installation.

For **Directly associated activities**, please identify any directly associated activities proposed to be carried out on the same site which:

- have a technical connection with the activities in the stationary technical unit; and
- could have an effect on pollution.

These could include, for example, boilers, generators, water purification systems, scrubbers and other air purification systems.

In **Column 2: Schedule 1 references**, write the category the installation falls under in Schedule 1 of the IPPC Regulations (L.N. 234 of 2002 as amended).

In **Column 3: Operator**, write the name of the operator for each activity (if you are the operator yourself, write “Applicant”).

In **Column 4: Variations**, indicate how the proposed changes would affect the activities.

C1.1 Installation details

COLUMN 1 Permitted activities in the “stationary technical unit”	COLUMN 2 Schedule 1 references	COLUMN 3 Operator	COLUMN 4 Proposed variations
Disposal of animal by-products and hazardous wastes	5.1	Applicant	Change in site boundary to include the Temporary Marsa Sorting and Storage Facility.
			Installation of additional ancillary facilities as outlined in Annex 3
			Variation to list of permitted wastes
			Variation to management condition to reflect new timelines
			List of permitted waste to be included as part of the permit
			Waste delivery
			Variation to waste acceptance procedures

Directly associated activities

C1.2 Non-technical description

Please provide a non-technical description of the proposed changes.

Document reference number:

Annex 1

C1 About the installation *continued***C1.3 The proposed variations**

Please provide a summary of the variations which you are applying for.

This should include:

- a description of the change in operation requiring the variation;
- an indication of the variations to the conditions of the permit that you wish to apply for.

Document reference number for the summary:

Annex 1

C1.4 Site maps and reports

Are you proposing any change in operation that would result in additional land being included within the site of the installation?

Yes ☒ No ☐

Please provide:

C1.4.1

A site report, describing the condition of the site of that part of the installation in respect of which you are applying for a variation, and, in particular, identifying any substance in, on or under the land which may constitute a pollution risk. A baseline report assessing the state of the groundwater and land may also be required by the Authority.

Document reference number for the report:

Annex 2

C1.4.2

A suitable map (or maps) showing the location of the site of the installation, and the area for which a variation of the IPPC permit is being applied for. The outline of the site and the area

requiring the variation should be clearly marked in colour, and the surroundings of the site should be included in the map.

Document reference number for map(s):

Annex 3

C1.4.3

Suitable block plans, properly labelled, showing any changes to the location and nature of the various activities being proposed on that site.

Document reference number for plans:

Annex 3

All maps and plans submitted shall be to scale, using a scale rule. Soft copies of plans should be submitted in .pdf format only.

C2 Your proposed techniques

Please provide written information about the aspects of your installation listed below. We need this information, and that which you give in response to C3 and C4, to determine whether you will operate the installation in a way which meets all the environmental requirements of the IPPC Regulations.

In each case you should:

- address all of the issues set out in each question;
- justify your proposals against any indicative requirements contained in the relevant BREF guidance notes; and
- provide any other information about the installation which you think is relevant to that issue.

C2.1 Environmental Management System

Provide details of any changes to environmental management techniques resulting from your proposals.

Document reference number:

Annex 2

C2.2 Raw materials

Identify any changes to the raw and auxiliary materials to be used as a result of your proposals. Give details of quantities proposed to be used annually and submit respective MSDS sheets.

Document reference number:

Annex 4

C2.3 Proposed activities

C2 Your proposed techniques *continued*

C2.4 Maintenance

Describe any changes to the maintenance programme for the installation.

Document reference number:

No changes foreseen

C2.5 Energy

C2.5.1: Describe any changes to the annual energy consumption, highlighting the main energy-consuming equipment, and generation by source and end-use (including information on energy generated on site, if applicable).

Document reference number:

No changes foreseen

C2.5.2: Describe the proposed basic measures for improvement of energy efficiency.

Document reference number:

No changes foreseen

C2.6 Water

Provide a breakdown of any changes to the proposed annual water consumption by source and end-use.

Document reference number:

No changes foreseen

C2.7 Risk assessment

Describe any changes to the documented system used to identify, assess and minimise the environmental risks and hazards of

Describe any changes to the installation activities and the proposed techniques and measures to prevent and reduce waste and emissions of substances and heat (including during periods of start-up or shut-down, momentary stoppage, leak or malfunction) as a result of your proposals.

Submit a flow diagram summarising the proposed installation activities and indicating the changes.

Document reference number:

Annex 1

accidents and their consequences. Include any changes to emergency plans in case of fire and other emergencies.

Document reference number:

No changes foreseen

C2.8 Training

Please indicate whether any changes to the staff training programme will be required. Please submit the name of the technically competent person on site who will be responsible for such training.

Document reference number:

No changes foreseen

C2.9 Cessation

Describe any changes to the proposed measures upon definitive cessation of activities, to avoid any pollution risk and return the site of the installation to a satisfactory state (including relevant measures for the design and construction of the installation).

Document reference number:

No changes foreseen

C2.10 Multi-operator installations

Where you are not the only operator of the installation, any change to the techniques and measures (including those to be undertaken jointly by yourself and other operators) for ensuring satisfactory operation of the whole installation resulting from your proposals.

Document reference number:

No changes foreseen

C3 Your proposed emissions

In response to the following questions, please provide written information about the emissions which will result from the techniques you described in response to the questions in section C2.

You should also provide any other information about the installation which you think is relevant to that issue.

C3.1 Waste

C3.1.1: Characterise (using the European Waste Catalogue code – Schedule 1 of LN 337

C3 Your proposed emissions *continued*

C3.1.3: Describe how each waste stream identified in C3.1.1 is proposed to be recovered or disposed of and, if you propose any disposal, explain why recovery is technically and economically impossible and describe the measures planned to avoid or reduce any impact on the environment.

Document reference number:

No changes foreseen

C3.2 Emissions to Groundwater

Identify if there may be a discharge of any List I or List II substance as a result of your proposals, and if any are identified, explain how the requirements of the Groundwater Regulations (LN 203 of 2002) have been addressed.

Document reference number:

No changes foreseen

C3.3 Emissions to Sewer

C3.3.1: Is a new sewer connection envisaged as a result of your proposal?

Yes ☐ No ☒

If yes, please submit a block plan of the site, showing the proposed layout of sewer connections and any other drains (colour-coded), as well as the proposed discharge point(s).

Document reference number:

Not applicable

of 2001) and quantify any changes to each waste stream from the installation.

Document reference number:

C3.1.2: Describe any changes to the proposed measures for waste management, storage and handling.

Document reference number:

Annex 3

C3.3.2: If a new sewer connection is envisaged, does the installation have a Sewer Discharge Permit?

Yes ☐ No ☐

Please submit a copy of the permit, or of the submitted application if the permit has not yet been issued.

Document reference number:

Not applicable

C3.3.3: Could the proposal involve the release of any Schedule A or Schedule B substance into the sewers?

Yes ☐ No ☒

If yes, explain how the requirements of LN 139 of 2002 have been addressed.

Document reference number:

Not applicable

C3.4 Emissions to the Sea

Identify if the proposal may result in a direct discharge of any List I or List II substance to coastal (up to 1 nautical mile from the coast line) or territorial waters.

Yes ☐ No ☒

If any are identified, explain how the requirements of the Discharge of Dangerous Substances Regulations (LN 213 of 2001) have been addressed.

Document reference number:

Not applicable

In addition, please submit a block plan of the site, showing the proposed discharge point to the sea.

Document reference number:

Not applicable

C3.5 Emissions to Air

Identify if there may be any changes in emissions of substances to air.

Yes ☐ No ☒

If any are identified, submit details of each emission point, the nature and the proposed quantities of substances emitted from each point. A block plan of the site showing each emission point should be submitted.

Document reference number:

Not applicable

C3.6 Emissions to Land

Identify if there may be any changes in emissions of substances to land.

Yes ☐ No ☒

If any are identified, submit details of the nature and the proposed quantities of substances emitted to land, as well as a map showing the proposed location of such emissions.

Document reference number:

Not applicable

C3 Your proposed emissions *continued*

C3.7 Noise

Describe:

C3.7.1: The main sources of noise and vibration (including infrequent sources) of the proposal;

C3.7.2: The proposed techniques and measures for control of noise;

C3.7.3: The nearest noise sensitive locations and distance away from the site (a site map may be submitted for this purpose); and

C3.7.4: Relevant environmental noise measurement surveys which have been undertaken (using a standard methodology such as BS4142).

Document reference number:

No changes foreseen

C3.8 Monitoring

Describe the proposed measures for monitoring emissions arising from the proposal, including any environmental monitoring. The following must be specified:

C3.8.1: The location of each proposed monitoring point (plotted on a suitably-labelled block plan of the site);

C3.8.2: The substances (in each environmental medium) which are proposed to be monitored;

C3.8.3: The frequency with which monitoring is proposed to take place;

C3.8.4: The proposed measurement methodology, which should be a standard methodology, such as EN or ISO standard, or equivalent;

C3.8.5: The proposed procedure for evaluation of the results.

Document reference number:

No changes foreseen

C3.9 Summary

By means of a mass flow diagram, summarise the emissions and waste described in sections C3.1, C3.2, C3.3, C3.4, C3.5, and C3.6 of this application.

Document reference number:

No changes foreseen

C4 Impact on the environment

Please provide written information about the impact your emissions may have on the environment.

You should:

- address all of the issues set out in the section;
- justify your proposals;
- provide any other information about the installation which you think is relevant to that issue.

C4.1 Environmental effects

Provide an assessment of the potential significant environmental effects (including transboundary effects) of the foreseeable emissions from the proposal.

Document reference number:

No changes foreseen

C4.2 Effects on other sites

Provide an assessment of whether the proposal is likely to have a significant effect on another site in Malta and, if it is, provide an assessment of the implications of the installation for that site.

Document reference number:

No changes foreseen

C5 Environmental statements**C5.1 Environmental statement**

Has the development of the installation (or any subsequent change or extension of the development) required an environmental statement (EIS or EPS) under LN 204 of 2001 on the assessment of the effects of certain public and private projects on the environment?

Yes ☒ No ☐

If yes, please supply a copy of the environmental statement submitted and details of any decision made.

Document reference number:

Supplied as part of original application

C6 Statutory consultees

We will use the information in this section to identify who we must consult about your proposals.

C6.1 Local council

In which area is the installation located? If premises are on a boundary please give the names of all the relevant authorities.

Marsa

C6.2 Other sites

Are there any other sites which may be affected by emissions from the proposal? (Refer also to your answer to C4.2).

Yes ☐ No ☒

If yes, please give the names of the sites:

C6.3 Port Authority

Could the installation involve the release of any substance into a harbour managed by a port authority?

Yes ☐ No ☒

If yes, please name the port authority:

C7 Planning status**C7.1 Planning status**

Which of the following applies to the proposed installation activities?

We cannot issue a permit unless one of the following applies. Please tick the applicable answer and submit a copy of the relevant documents.

☐ You have planning permission.

Document reference number:

☐ You have a certificate of lawful existing use or development.

Document reference number:

☐ Planning permission is not required - please say why and enclose written confirmation from the Planning Directorate at MEPA.

Document reference number:

☐ If you have submitted an application for planning permission which has not yet been determined, please provide a copy of the application.

Document reference number:

Submitted Development Brief included as Annex 3

C8 Technically competent person

Technically competent person

We need to make sure that whoever holds the permit is a 'technically competent person'. This includes consideration of relevant offences, technical competence and financial provision.

Document reference number for copies of relevant qualifications:

C8.1 Technically competent management

Please describe any changes to the technically competent management of the activities.

Please give details for each person and provide written evidence.

Responsible person 4:

Full Name:
Position:
Date of employment:

Responsible person 1:

Full Name: Mary Grace Micallef
Position: Assistant Facility Manager
Date of employment: 01/09/03

Document reference number for copies of relevant qualifications:

Document reference number for copies of relevant qualifications:

Annex 5

Responsible person 2:

Full Name: Ramon Vella
Position: Incinerator Engineer
Date of employment: 09/12/09

Document reference number for copies of relevant qualifications:

Annex 5

Responsible person 3:

Full Name:
Position:
Date of employment:

C8.2 Management of other installations

Is any of the technically competent management already providing the technically competent management at other IPPC installations or at sites licensed under the Environmental Protection Act 2001?

Yes ☐ No ☒

If yes, please use a separate sheet to give details of these people. For each person we need to know the:

- site/installation name and address;
- licence/permit reference number.

Document reference number for this information:

Not applicable

C9 Expenditure plan

C9.1 Expenditure plan

Please provide a plan of the estimated expenditure for each phase of the following specified activities arising from your proposal.

The plan should include the likely costs of:

Appendix I Data Protection Clause

In terms of the Data Protection Act (Chapter 440 of the Laws of Malta), we will process any personal and/ or sensitive data supplied on/ in this submission or subsequently supplied by yourself, whether orally or in writing, for all or any of the following purposes:

1. The proper processing of your submission;
2. internal management, research and statistics;
3. the protection and promotion of our legitimate interests and the proper conduct of our obligations arising under any law or statutory instrument; and
4. to make public the necessary information as specified in the relevant law and/or instrument.

Relevant data will be disclosed or shared as appropriate with all our employees and with other third parties if pertinent to any of the purposes listed above.

You have the right to require that we provide you with access to your **personal data** as well as the right to rectify, or, in appropriate circumstances, erase/edit any inaccurate,

- monitoring (emission/discharge and ambient monitoring);
- clearing the installation (including drainage systems) of all wastes;
- remedial action in the event of the failure of pollution control systems.

We recognise that this plan may need to be revised before the issue of the final permit.

Document reference number for expenditure plan:

No changes foreseen

C10 What to do next

Please read Appendix I, then prepare and sign a covering letter to attach to your application form.

incomplete or immaterial personal data which is being processed. However, you are required to inform us immediately of any alterations relating to your personal data which we are processing.

By sending your submission, you confirm that you are giving your explicit consent, in terms of the Data Protection Act, on behalf of yourself and all the other persons specified in this submission for the Authority to process your respective personal information as outlined above and you confirm that you have brought this Data Protection notice to the attention of these other persons and obtained their respective consents.

We undertake to implement appropriate measures and safeguards for the purpose of protecting the confidentiality, integrity and availability of all personal data processed.

ANNEX 1

PROPOSED VARIATIONS

RENEWAL OF IP 0004/07 (IPPC PERMIT FOR THE MARSA THERMAL TREATMENT FACILITY)

The current application is for a renewal of the integrated pollution prevention and control permit (IP 0004/07) related to the operation of an incinerator for abattoir and hazardous waste located at Marsa. The following variations are being proposed.

Proposed Variation	Description of the change	Conditions to be varied
Change in site boundary to include the Temporary Marsa Sorting and Storage Facility.	To date the operation of the facility has been supported by a neighboring facility also operated by WasteServ Malta Limited, namely the Temporary Marsa Storage and Sorting Facility. This facility is covered by PA 05115/07 and an environmental permit WM 00012/07. Through the implementation of the Development Brief submitted to the Planning Directorate and also as part of this application, WasteServ would like to extend the boundary of the existing incineration facility to include the area currently occupied by the Temporary Marsa Sorting and Storage Facility. This should lead to a consolidation of the area and the creation of adequate space for all the operations to support the receipt, storage and treatment of all waste streams received at the facility.	Condition 1.1.2; Schedule 3
Installation of	The few years of operation of the facility has lead	Various

additional ancillary facilities as outlined in Annex 3	to the identification of a number of operational issues which need to be addressed in order to improve both the operations on site as well as the quality of service provided to clients. Addressing these issues will also lead to a reduction in inconvenience that may be experienced during periods of maintenance.	conditions
Variation to list of permitted wastes	The list of permitted wastes in the current permit is to be varied to include all the waste streams identified in the list of wastes included in this document.	1.2.1
Variation to management condition to reflect new timelines	As yet, this permit condition has not been satisfied such that timelines need to be revised. WasteServ is in the process of recruiting a dedicated officer to be responsible for this task. Furthermore, a private consultancy firm shall be assisting WasteServ to fulfil the requirements of this clause.	1.4.2

List of permitted waste to be included as part of the permit	This is required for ease of reference and to ensure reference to correct list of waste.	2.1
Waste delivery	To be changed to reflect current practices. Waste from the Civil Abattoir is accepted on 24 hour basis whilst all other wastes are received between 0700 hrs and 1200 hrs and between 1230 hours and 1800 hrs.	2.2.4
Variation to waste acceptance procedures	<p>The current permit does not differentiate between different waste streams when it comes to waste acceptance. WasteServ is proposing a different approach towards waste acceptance whereby waste streams are considered on a case by case basis. In the case of clinical waste no major changes are being proposed, other than including the monitoring of radioactivity for the daily delivery of clinical waste.</p> <p>In the case of abattoir waste and animal-by products WasteServ is proposing that these are accepted without any form of analyses. The consignment permit from the Veterinary Department is being included as part of the documentation required for waste acceptance.</p> <p>During the operation of the MTTF WasteServ has had requests for non-hazardous waste. These waste streams are usually safe to incinerate and therefore their majority may be accepted without analyses however WasteServ still wants to have the possibility</p>	2.5

	<p>of asking for analyses should certain non-hazardous waste pose uncertainty. The amount and type of analyses will be at the discretion of WasteServ since not all the parameters would be applicable.</p> <p>When it comes to hazardous waste, WasteServ would again want to distinguish between the different types. The majority of hazardous waste incinerated up to now includes pharmaceutical waste. Having a list of the different types of medicines to be disposed would be sufficient to deem whether the waste can be incinerated or not. This is because the active ingredient within the product is only a small percentage of the whole tablet, plus packaging. The list provided by the waste producers is scrutinized by our scientist on site to determine whether any of the waste is cytotoxic waste. Producers are also made to sign a declaration confirming that the waste delivered to our facility does not contain any cytotoxic waste.</p> <p>We have come across cases when the waste is a raw product which was never used in any process. Waste composition information in this case may be found directly within the MSDS sheet. In any case, WasteServ still wants to have the possibility of asking for analyses should the waste pose uncertainty. The amount and type of analyses will be at the discretion of WasteServ since not all the parameters would be applicable.</p> <p>In the case of other hazardous waste, it is being</p>	
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	<p>proposed that as per the current permit analyses are always requested from the waste producer however one does not necessarily have to carry out the analyses for all the parameters which are currently obligatory within the permit.</p> <p>Proposed conditions as follows:</p> <ol style="list-style-type: none"> 1. The operator shall determine the mass of each category of waste, if possible according to the European Waste Catalogue, prior to accepting the waste at the incineration plant. 2. Prior to accepting waste at the facility the operator shall check documents as required by Legal Notice 337 of 2001 and, where applicable, those required by Council Regulation (EC) 1013/2006 of the European Parliament and of The Council of 14 June 2006 on shipments of waste and by dangerous goods transport regulations. 3. The operator shall set up standard specifications of desired or, respectively, tolerable properties of waste categories that will be admitted for incineration at the plant. This information shall be communicated to interested waste suppliers prior to first delivery of waste. 4. Prior to accepting waste at the facility the following reception procedure shall be carried out by the operator: 	
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	<ul style="list-style-type: none"> - Clinical waste which is received on a daily basis shall be checked for radioactivity through the use of a hand held Geiger Counter. Clinical Waste shall be excluded from any physical or chemical analyses prior to acceptance. - Abattoir and Animal By-Products waste shall be accepted on a daily basis. This waste shall be excluded from any physical or chemical analyses prior to acceptance at the discretion of the operator. Abattoir and Animal By-Products waste shall only be accepted if accompanied by the Consignment Permit as issued by the Animal By-Products Section within the Fish and Farming Regulation and Control, Ministry for Resources and Rural Affairs. - Non-hazardous waste shall be accepted at the facility on a request basis. Prior to acceptance, the operator shall check about the generating process and the type of non-hazardous waste. At the discretion of the operator, non-hazardous waste shall be accepted at the facility without any physical and chemical analyses prior to acceptance. <p>The operator may deem that non-hazardous waste would need to be analysed. In that</p>	
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	<p>case, the following analyses may be requested from the waste producer:</p> <ul style="list-style-type: none"> • Flashpoint [°C] • Lower heating value, LHV (Net calorific value) [kJ/kg] • Water content [% by weight] • Mass loss during combustion [% by weight, DS] • Ash content [% by weight, DS] • Content of Halogens [mg/kg, DS] • Content of Sulphur, S [mg/kg, DS] • Content of Lead, Pb [mg/kg, DS] • Content of Cadmium, Cd [mg/kg, DS] • Content of Chromium, Cr [mg/kg, DS] • Content of Copper, Cu [mg/kg, DS] • Content of Mercury, Hg [mg/kg, DS] • Content of Zinc, Zn [mg/kg, DS] <p>- Acceptance of hazardous waste shall depend on the type of waste, as follows:</p>	
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	<ul style="list-style-type: none"> ○ Pharmaceutical (medicine) waste: Waste producer is asked for a complete inventory list of products to be incinerated. The scientist on site will check whether the list contains any cytotoxic waste or other waste which cannot be incinerated. NO CYTOTOXIC WASTE SHALL BE ACCEPTED AT THE FACILITY – to this end, the waste producer will be asked to sign a declaration confirming that the waste does not contain any cytotoxic waste. <p>On delivery, the producer has to provide a list of the waste being delivered. The scientist on site will check with the previously submitted list of waste. Should the lists not coincide, the waste will be rejected and a rejection note is issued accordingly.</p> <ul style="list-style-type: none"> ○ Contaminated Packaging: Waste producer is asked for information on the packaging type and type of contamination. Since the amount of hazardous waste is usually very little, this waste is excluded from physical and chemical analyses. The waste producer must however produce 	
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	<p>information on the waste generation process.</p> <ul style="list-style-type: none"> ○ CA site waste: Hazardous Wastes from CA sites are very heterogeneous and the quantities are less than 25 litres of each waste stream. Such waste is excluded from any physical or chemical analyses. Incineration of this waste is controlled in such a way that the amount of CA site waste incinerated at any one time is kept to a minimum. ○ Products: In the case where the waste is a product the waste producer will be asked to submit the Material Safety Data Sheet (MSDS) for the product. Should the information on the MSDS sheet be sufficient the waste is accepted on the basis that the waste is the product as declared in the MSDS. To this effect the waste producer will be asked to sign a declaration confirming that the waste being delivered to the facility is the product as represented by the MSDS. <p>At the operator's discretion, should the information on the MSDS not be sufficient, the operator shall ask for</p>	
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	<p>further analysis of the waste. Such analyses may include but are not limited to:</p> <ul style="list-style-type: none"> ▪ Flashpoint [°C] ▪ Lower heating value, LHV (Net calorific value) [kJ/kg] ▪ Water content [% by weight] ▪ Mass loss during combustion [% by weight, DS] ▪ Ash content [% by weight, DS] ▪ Content of Halogens [mg/kg, DS] ▪ Content of Sulphur, S [mg/kg, DS] ▪ Content of Lead, Pb [mg/kg, DS] ▪ Content of Cadmium, Cd [mg/kg, DS] ▪ Content of Chromium, Cr [mg/kg, DS] ▪ Content of Copper, Cu [mg/kg, DS] ▪ Content of Mercury, Hg [mg/kg, DS] ▪ Content of Zinc, Zn [mg/kg, DS] <p>○ Other hazardous waste: In the case of heterogenous waste, the operator will have the discretion of requesting</p>	
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	<p>chemical and physical analyses of the waste from the waste producer. Such chemical and physical analyses may include but are not limited to the following:</p> <p><u>Physical properties:</u></p> <ul style="list-style-type: none"> ▪ Softening temperature (range) [°C] ▪ Melting temperature (range) [°C] ▪ Boiling temperature (range) [°C] ▪ Density [kg/m³] ▪ Bulk density [kg/m³] ▪ Particle size (distribution) [mm] ▪ Vapour pressure at°C [hPa] ▪ Dynamic viscosity at°C [mPa.s] ▪ Kinematic viscosity at°C [m²/s] ▪ pH-value [-] ▪ Flashpoint [°C] ▪ Ignition temperature [°C] ▪ Lower explosion limit (of vapours) at°C [% by volume] ▪ Upper explosion limit (of vapours) at°C [% by 	
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	<p>volume]</p> <ul style="list-style-type: none"> ▪ Lower heating value, LHV (Net calorific value) [kJ/kg ▪ Higher heating value, HHV (Gross calorific value) [kJ/kg] <p><u>Chemical Properties:</u></p> <ul style="list-style-type: none"> ▪ Water content [% by weight] ▪ Mass loss during combustion [% by weight, DS] ▪ Ash content [% by weight, DS] ▪ Content of Polychlorinated Biphenyls (PCB) [mg/kg, DS] ▪ Content of polychlorinated phenols (PCP) [mg/kg, DS] ▪ Content of Halogens [mg/kg, DS] ▪ Content of Sulphur, S [mg/kg, DS] ▪ Content of Antimony, Sb [mg/kg, DS] ▪ Content of Arsenic, As [mg/kg, DS] ▪ Content of Nitrogen, N [mg/kg, DS] ▪ Content of Phosphorus, P [mg/kg, DS] ▪ Content of Lead, Pb [mg/kg, DS] ▪ Content of Cadmium, Cd 	
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	<p>[mg/kg, DS]</p> <ul style="list-style-type: none"> ▪ Content of Chromium, Cr [mg/kg, DS] ▪ Content of Copper, Cu [mg/kg, DS] ▪ Content of Nickel, Ni [mg/kg, DS] ▪ Content of Mercury, Hg [mg/kg, DS] ▪ Content of Zinc, Zn [mg/kg, DS] ▪ Content of Tin, Sn [mg/kg, DS] <p>Other information which may be necessary to evaluate its suitability for the intended incineration process may include:</p> <ul style="list-style-type: none"> • Waste condition at 25°C: <ul style="list-style-type: none"> - homogeneous / heterogeneous - lumps / grain / powder - humid / dry - solid / pasty / liquid - one phase / two phases - high / low viscosity • Description of colour • Description of smell (without smell / feeble / 	
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	<p>intensive smell; character of smell)</p> <ul style="list-style-type: none"> • Hazardous properties, e.g. explosive, oxidizing, inflammable, highly inflammable, irritant, harmful to health, toxic, carcinogenic, corrosive, infectious, toxic to reproduction, mutagenic, ecotoxic; discharges a toxic gas upon contact with air /acid / base etc. • Solubility in water (good / slightly / partly soluble; insoluble; yields a dispersion in water) • Miscibility with water (good / slightly / partly miscible; immiscible; yields an emulsion with water) • Solubility in other solvents (please specify) • Miscibility with other solvents (please specify) 	
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	<ul style="list-style-type: none"> • Reactions when in contact with <ul style="list-style-type: none"> - distilled water - hydrochloric acid HCl 0,01 mol/l - sodium hydroxide solution NaOH 0,01 mol/l - other acids / bases (please specify) • Safety aspects for handling / storage (e.g. inhalation protection / breathing mask; eye protection / safety goggles; hand protection / safety gloves; fire prevention measures; explosion prevention measures; work hygiene measures etc.) • Measures in case of accident / fire, e.g.: <ul style="list-style-type: none"> - recommended measures in case of spillage - recommended extinguishing agent 	
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	<ul style="list-style-type: none"> - extinguishing agent not to be used - recommended binding agent - first aid measures to be taken 	
	<p>5. Frequency of analyses: In the case where:</p> <ul style="list-style-type: none"> ○ a new waste stream is being brought to the facility information is requested prior to acceptance as per the above. ○ waste is accepted without physical and chemical analyses (e.g. non-hazardous waste, pharmaceutical waste and product waste) the waste producer is asked for the information prior to acceptance (as described above) for each and every delivery. ○ In the case of a repeated waste stream accepted through the submission of analyses by the waste producer, such analyses are not required for every consignment but rather twice a 	

	<p>year.</p>	
	<p>6. Where waste is accepted through the submission of waste analyses by the waste producer, the operator is obliged to take representative samples, unless inappropriate, before unloading to verify conformity with the information provided prior to acceptance by means of independent analyses in a laboratory as approved by MEPA. These samples shall be kept for at least one month after incineration.</p>	

PROPOSED LIST OF WASTE

Non-Hazardous Waste

02 01 Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing

02 01 02 animal-tissue waste

02 01 09 agrochemical waste other than those mentioned in 02 01 08*

02 01 99 Waste not otherwise specified

02 02 wastes from the preparation and processing of meat, fish and other foods of animal origin

02 02 02 animal-tissue waste

02 02 03 materials unsuitable for consumption or processing

02 02 99 waste not otherwise specified

02 03 wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation

02 03 99 waste not otherwise specified

02 04 wastes from sugar processing

02 04 99 waste not otherwise specified

02 05 wastes from the dairy products industry

02 05 99 waste not otherwise specified

02 06 wastes from the baking and confectionary industry

02 06 99 waste not otherwise specified

**02 07 wastes from the production of alcoholic and non-alcoholic beverages
(except coffee, tea and cacao)**

02 07 99 waste not otherwise specified

**03 01 Wastes from wood processing and the production of panels and
furniture**

03 01 05 sawdust, shavings, cutting, wood, particle board and veneer other than
those mentioned in 03 01 04

04 02 wastes from the textile industry

04 02 15 waste from finishing other than those mentioned in 04 02 14

04 02 17 dyestuffs and pigments other than those mentioned in 04 02 16

04 02 20 sludges from on-site effluent treatment other than those mentioned in
04 02 19

06 05 sludges from on-site effluent treatment

06 05 03 sludges from on-site effluent treatment other than those mentioned in
06 05 02

07 01 wastes from the MFSU of basic organic chemicals

07 01 12 sludges from on-site effluent treatment other than those mentioned in
07 01 11

**07 02 wastes from the MFSU of plastics, synthetic rubber and man-made
fibres**

07 02 12 sludges from on-site effluent treatment other than those mentioned in
07 02 11

07 02 15 wastes from additives other than those mentioned in 07 02 14

07 02 17 waste containing silicones other than those mentioned in 07 02 16

07 03 wastes from the MFSU of organic dyes and pigments (except 06 11)

07 03 12 sludges from on-site effluent treatment other than those mentioned in
07 03 11

**07 04 wastes from the MFSU of organic plant protection products (except
02 01 08 and 02 01 09), wood preserving agents (except 03 02) and
other biocides**

07 04 12 sludges from on-site effluent treatment other than those mentioned in
07 04 11

07 05 wastes from the MFSU of pharmaceuticals

07 05 12 sludges from on-site effluent treatment other than those mentioned in
07 05 11

07 05 14 solid wastes other than those mentioned in 07 05 13

**07 06 wastes from the MFSU of fats, grease, soaps, detergents,
disinfectants and cosmetics**

07 06 12 sludges from on-site effluent treatment other than those mentioned in
07 06 11

**07 07 wastes from the MFSU of fine chemicals and chemical products not
otherwise specified**

07 07 12 sludges from on-site effluent treatment other than those mentioned in
07 07 11

08 01 wastes from MFSU and removal of paint and varnish

08 01 12 waste paint and varnish other than those mentioned in 08 0111

08 01 14 sludges from paint or varnish other than those mentioned in 08 0113

08 01 16 aqueous sludges containing paint or varnish other than those
mentioned in 08 01 15

08 01 18 waste from paint or varnish removal other than those mentioned in 08
01 17

08 01 20 aqueous suspensions containing paint or varnish other than those
mentioned in 08 01 19

08 03 wastes from MFSU of printing inks

08 03 07 aqueous sludges containing ink

08 03 13 waste ink other than those mentioned in 08 03 12

08 03 15 ink sludges other than those mentioned in 08 03 14

08 03 18 waste printing toner other than those mentioned in 08 03 17

**08 04 wastes from MFSU of adhesives and sealants (including
waterproofing products)**

08 04 10 waste adhesives and sealants other than those mentioned in 08 04 09

08 04 12 adhesive and sealant sludges other than those mentioned in 08 04 11

08 04 14 aqueous sludges containing adhesives or sealants other than those
mentioned in 08 04 13

08 04 16 aqueous liquid waste containing adhesives or sealants other than those
mentioned in 08 04 15

10 01 25 wastes from fuel storage and preparation of coal-fired power plants

12 01 wastes from shaping and physical and mechanical surface treatment of metals and plastics

12 01 15 machining sludges other than those mentioned in 12 01 14

12 01 17 waste blasting material other than those mentioned in 12 01 16

12 01 21 spent grinding bodies and grinding materials other than those mentioned in 12 01 20

15 01 packaging (including separately collected municipal packaging waste)

15 01 01 paper and cardboard packaging

15 01 03 wooden packaging

15 02 absorbents, filter materials, wiping cloths and protective clothing

15 02 03 absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing other than those mentioned in 15 02 02

16 01 end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)

16 01 15 antifreeze fluids other than those mentioned in 16 01 14

16 03 off-specification batches and unused products

16 03 06 organic wastes other than those mentioned in 16 03 05

16 10 aqueous liquid wastes destined for off-site treatment

16 10 02 aqueous liquid wastes other than those mentioned in 16 10 01

16 10 04 aqueous concentrates other than those mentioned in 16 10 03

16 11 waste linings and refractories

16 11 02 carbon-based linings and refractories from metallurgical processes
other than those mentioned in 16 11 01

17 02 wood, glass and plastic

17 02 01 wood

**18 01 wastes from natal care, diagnosis, treatment or prevention of disease
in humans**

18 01 01 sharps (except 18 01 03)

18 01 02 body parts and organs including blood bags and blood preserves
(except 18 01 03)

18 01 04 waste whose collection and disposal is not subject to special
requirements in order to prevent infection (e.g. dressings, plaster casts,
linen, disposable clothing, diapers)

18 01 07 chemicals other than those mentioned in 18 01 06

18 01 09 medicines other than those mentioned in 18 01 08

**18 02 wastes from research, diagnosis, treatment or prevention of disease
involving animals**

18 02 01 sharps (except 18 02 02)

18 02 03 waste whose collection and disposal is not subject to special
requirements in order to prevent infection

18 02 06 chemicals other than those mentioned in 18 02 05

18 02 08 medicines other than those mentioned in 18 02 07

19 01 wastes from incineration or pyrolysis of waste

19 01 12 bottom ash and slag other than those mentioned in 19 01 11

19 08 wastes from waste water treatment plants not otherwise specified

19 08 05 sludges from treatment of urban waste water

19 08 09 grease and oil mixture from oil/water separation containing only edible oil and fats

19 08 12 sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11

19 08 14 sludges from other treatment of industrial waste water other than those mentioned in 19 08 13

19 09 wastes from the preparation of drinking water or water for human consumption or water for industrial use

19 09 04 spent activated carbon

19 11 wastes from oil regeneration

19 11 06 sludges from on-site effluent treatment other than those mentioned in 19 11 05

19 12 wastes from the mechanical treatment of waste (e.g. sorting, crushing, compacting, pelletising) not otherwise specified

19 12 01 paper and cardboard

19 12 04 plastic and rubber

19 12 07 wood other than that mentioned in 19 12 06

19 12 08 textiles

19 12 10 combustible waste (refuse derived fuel)

19 12 12 other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11

19 13 wastes from soil and groundwater remediation

19 13 04 sludges from soil remediation other than those mentioned in 19 13 03

19 13 06 sludges from groundwater remediation other than those mentioned in
19 13 05

19 13 08 aqueous liquid wastes and aqueous concentrates from groundwater
remediation other than those mentioned in 19 13 07

20 01 separately collected fractions (except 15 01)

20 01 28 paints, inks, adhesives and resins other than those mentioned in 20 01
27

20 01 38 wood other than that mentioned in 20 01 37

20 01 32 medicines other than those mentioned in 20 01 31

Hazardous waste

**02 01 wastes from agriculture, horticulture, aquaculture, forestry, hunting
and fishing**

02 01 08* Agrochemical waste containing dangerous substances

**03 01 Wastes from wood processing and the production of panels and
furniture**

03 01 04* sawdust, shavings, cutting, wood, particle board and veneer
containing dangerous substances

03 02 wood preservation wastes

03 02 01* non-halogenated organic wood preservatives

03 02 03* organometallic wood preservatives

03 02 05* other wood preservatives containing dangerous substances

04 02 Wastes from the textile industry

04 02 14* waste from finishing containing organic solvents

04 02 16* dyestuffs and pigments containing dangerous substances

04 02 19* sludges from on-site effluent treatment containing dangerous substances

05 01 Wastes from petroleum refining

05 01 05* oil spills

06 05 sludges from on-site effluent treatment

06 05 02* sludges from on-site effluent treatment containing dangerous substances

06 08 waste from the MFSU of silicon and silicon derivatives

06 08 02* waste containing dangerous silicones

06 13 wastes from inorganic chemical processes

06 13 02* spent activated carbon (except 06 07 02

06 10 05* soot

07 01 wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals

07 01 01* aqueous washing liquids and mother liquors

07 01 04* other organic solvents, washing liquids and mother liquors

07 01 08* other still bottoms and reaction residues

07 01 10* other filter cakes and spent absorbents

07 01 11* sludges from on-site effluent treatment containing dangerous substances

07 02 wastes from the MFSU of plastics, synthetic rubber and man-made fibres

07 02 01* aqueous washing liquids and mother liquors

07 02 04* other organic solvents, washing liquids and mother liquors

07 02 08* other still bottoms and reaction residues

07 02 10* other filter cakes and spent absorbents

07 02 11* sludges from on-site effluent treatment containing dangerous substances

07 02 14* wastes from additives other than those containing dangerous substances

07 02 16* waste containing dangerous silicones

07 03 wastes from the MFSU of organic dyes and pigments (except 06 11)

07 03 01* aqueous washing liquids and mother liquors

07 03 04* other organic solvents, washing liquids and mother liquors

07 03 08* other still bottoms and reaction residues

07 03 10* other filter cakes, spent absorbents

07 03 11* sludges from on-site effluent treatment containing dangerous substances

07 04 wastes from the MFSU of organic plant protection products (except 02 01 08 and 02 01 09), wood preserving agents (except 03 02) and other biocides

07 04 01* aqueous washing liquids and mother liquors

07 04 04* other organic solvents, washing liquids and mother liquors

07 04 08* other still bottoms and reaction residues

07 04 10* other filter cakes and spent absorbents

07 04 11* sludges from on-site effluent treatment containing dangerous substances

07 04 13* solid wastes containing dangerous substances

07 05 wastes from the MFSU of pharmaceuticals

07 05 01* aqueous washing liquids and mother liquors

07 05 04* other organic solvents, washing liquids and mother liquors

07 05 08* other still bottoms and reaction residues

07 05 10* other filter cakes and spent absorbents

07 05 11* sludges from on-site effluent treatment containing dangerous substances

07 05 13* solid wastes containing dangerous substances

07 06 wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics

07 06 01* aqueous washing liquids and mother liquors

07 06 04* other organic solvents, washing liquids and mother liquors

07 06 08* other still bottoms and reaction residues

07 06 10* other filter cakes and spent absorbents

07 06 11* sludges from on-site effluent treatment containing dangerous substances

07 07 wastes from the MFSU of fine chemicals and chemical products not otherwise specified

07 07 01* aqueous washing liquids and mother liquors

07 07 04* other organic solvents, washing liquids and mother liquors

07 07 08* other still bottoms and reaction residues

07 07 10* other filter cakes and spent absorbents

07 07 11* sludges from on-site effluent treatment containing dangerous substances

08 01 wastes from MFSU and removal of paint and varnish

08 01 11* waste paint and varnish containing organic solvents or other dangerous substances

08 01 13* sludges from paint or varnish containing organic solvents or other dangerous substances

08 01 15* aqueous sludges containing paint or varnish containing organic solvents or other dangerous substances

08 01 17* waste from paint or varnish removal containing organic solvents or other dangerous substances

08 01 19 * aqueous suspensions containing paint or varnish containing organic solvents or other dangerous substances

08 01 21* waste paint or varnish remover

08 03 wastes from MFSU of printing inks

08 03 12* waste ink containing dangerous substances

08 03 14* ink sludges containing dangerous substances

08 03 16* waste etching solutions

08 03 17* waste printing toner containing dangerous substances

08 03 19* disperse oil

08 04 wastes from MFSU of adhesives and sealants (including waterproofing products)

08 04 09* waste adhesives and sealants containing organic solvents or other dangerous substances

08 04 11* adhesive and sealant sludges containing organic solvents or other dangerous substances

08 04 13* aqueous sludges containing adhesives or sealants containing organic solvents or other dangerous substances

08 04 15* aqueous liquid waste containing adhesives or sealants with organic solvents or other dangerous substances

08 04 17* rosin oil

08 05 wastes not otherwise specified in 08

08 05 01* waste isocyanates

10 01 04* oil fly ash and boiler dust

11 03 sludges and solids from tempering processes

11 03 02* other wastes

12 01 wastes from shaping and physical and mechanical surface treatment of metals and plastics

12 01 07* mineral-based machining oils free of halogens (except emulsions and solutions)

12 01 09* machining emulsions and solutions free of halogens

12 01 10* synthetic machining oils

12 01 12* spent waxes and fats

12 01 14* machining sludges containing dangerous substances

12 01 16* waste blasting material containing dangerous substances

12 01 18* metal sludge (grinding, honing and lapping solution) containing oil

12 01 19* readily biodegradable machining oil

12 01 20* spent grinding bodies and grinding materials containing oil

13 01 waste hydraulic oils

13 01 01* hydraulic oils, containing PCBs

13 01 10* mineral-based non-chlorinated hydraulic oils

13 01 11* synthetic hydraulic oils

13 01 12* readily biodegradable hydraulic oils

13 01 13* other hydraulic oils

13 02 waste engine, gear and lubricating oils

13 02 05* mineral-based non-chlorinated engine, gear and lubricating oils

13 02 06* synthetic engine, gear and lubricating oils

13 02 07* readily biodegradable insulating and heat transmission oils

13 02 08* other engine, gear and lubricating oils

13 03 waste insulating and heat transmission oils and other liquids

13 03 01* insulating or heat transmission oils containing PCBs

13 02 07* mineral-based non-chlorinated insulating and heat transmission oils

13 02 08* synthetic insulating and heat transmission oils

13 02 09* readily biodegradable insulating and heat transmission oils

13 02 10* other engine, gear and lubricating oils

13 03 waste insulating and heat transmission oils

13 03 07* mineral-based non-chlorinated insulating and heat transmission oils

13 03 08* synthetic insulating and heat transmission oils

13 03 09* readily biodegradable insulating and heat transmission oils

13 03 10* other insulating and heat transmission oils

13 04 bilge oils

13 04 01* bilge oils from inland navigation

13 04 02* bilge oils from jetty sewers

13 04 03* bilge oils from other navigation

13 05 oil/water separator contents

13 05 01* solids from grit chambers and oil/water separators

13 05 02* sludges from oil/water separators

13 05 03* interceptor sludges

13 05 06* oil from oil / water separators

13 05 07* oily water from oil / water separators

13 05 08* mixtures of wastes from grit chambers and oil / water separators

13 07 wastes of liquid fuels

13 07 01* fuel oil and diesel

13 07 02* petrol

13 07 03* other fuels (including mixtures)

13 08 oil wastes not otherwise specified

13 06 01* desalter sludges or emulsions

13 08 02* other emulsions

13 08 99* wastes not otherwise specified

15 01 packaging (including separately collected municipal packaging waste)

15 01 10* packaging containing residues of or contaminated by dangerous substances

15 02 absorbents, filter materials, wiping cloths and protective clothing

15 02 02* absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances

16 01 end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)

16 01 07* oil filters

16 01 13* brake fluids

16 01 14* antifreeze fluids containing dangerous substances

16 01 21* hazardous components other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14

16 03 off-specification batches and unused products

16 03 05* organic wastes containing dangerous substances

16 07 wastes from transport tank, storage tank and barrel cleaning (except 05 and 13)

16 07 08* wastes containing oil

16 07 09* waste containing other dangerous substances

16 10 aqueous liquid wastes destined for off-site treatment

16 10 01* aqueous liquid wastes containing dangerous substances

16 10 03* aqueous concentrates containing dangerous substances

16 11 waste linings and refractories

16 11 01* carbon-based linings and refractories from metallurgical processes containing dangerous substances

18 01 wastes from natal care, diagnosis, treatment or prevention of disease in humans

18 01 03* waste whose collection and disposal is subject to special requirements in order to prevent infection

18 01 06* chemicals consisting of or containing dangerous substances

18 02 wastes from research, diagnosis, treatment or prevention of disease involving animals

18 02 02* waste whose collection and disposal is subject to special requirements in order to prevent infection

18 02 05* chemicals consisting of or containing dangerous substances

19 01 wastes from incineration or pyrolysis of waste

19 01 10* spent activated carbon from flue-gas treatment

19 02 wastes from physico/chemical treatments of industrial waste (including dechromatation, decyanidation and neutralisation)

19 02 07* oil and concentrates from separation

19 02 11* other wastes containing dangerous substances

19 08 wastes from waste water treatment plants not otherwise specified

19 08 07* solutions and sludges from regeneration of ion exchangers

19 08 09* grease and oil mixture from oil/water separation containing only edible oil and fats (not hazardous)

19 08 10* grease and oil mixture from oil/water separation other than those mentioned in 19 08 09

19 08 11* sludges containing dangerous substances from biological treatment of industrial waste water

19 08 13* sludges containing dangerous substances from other treatment of industrial waste water

19 11 wastes from oil regeneration

19 11 01* spent filter clays

19 11 02* acid tars

19 11 03* aqueous liquid wastes

19 11 04* wastes from cleaning of fuel with bases

19 11 05* sludges from on-site effluent treatment containing dangerous substances

19 12 wastes from the mechanical treatment of waste (e.g. sorting, crushing, compacting, pelletising) not otherwise specified

19 12 06* wood containing dangerous substances

19 12 11* other wastes (including mixtures of materials) from mechanical treatment of waste containing dangerous substances

19 13 wastes from soil and groundwater remediation

19 13 03* sludges from soil remediation containing dangerous substances

19 13 05* sludges from groundwater remediation containing dangerous substances

19 13 07* aqueous liquid wastes and aqueous concentrates from groundwater remediation containing dangerous substances

20 01 separately collected fractions (except 15 01)

20 01 13* solvents

20 01 14* acids

20 05 15* alkalines

20 01 19* pesticides

20 01 26* oil and fat other than those mentioned in 20 01 25

20 01 27* paints, inks, adhesives and resins containing dangerous substances

ANNEX 2

SITE REPORT

RECONSIDERATION OF IP 0004/07/A (IPPC PERMIT FOR MARSA THERMAL TREATMENT FACILITY)

The current application is for a reconsideration of the integrated pollution prevention and control permit (IP 0004/07/A) related to the operation of the Marsa Thermal Treatment Facility. The current application also includes a request for variation to the current permit to extend the site boundary to include the area currently occupied by the Marsa Temporary Sorting and Storage Facility (permitted through WM 00012/07).

This should lead to a consolidation of the area and the creation of adequate space for all the operations to support the receipt, storage and treatment of all waste streams received at the facility.

The area proposed for the extension was formerly part of the former Malta Shipyards property. It is currently utilized for the storage of various waste streams which are then treated within the facility. The storage facility is fully surfaced and bunded. No information on contamination of the area is currently available.

Concurrently with this application, WasteServ has submitted a request for the approval of a proposed Development Brief which also includes a number of proposed uses for this area to further consolidate operations of the Thermal Treatment Facility.

ANNEX 3



Proposal for a Development Brief for the Marsa Thermal Treatment Facility

June 2011

Development Brief for the Marsa Thermal Treatment Facility (TTF) - Facilities Description

1. Introduction

- 1.1 Inaugurated in December 2007, the Marsa Thermal Treatment Facility (TTF) was co-financed by the Fifth Financial Italo-Maltese Protocol. The plant was originally designed to treat slaughterhouse wastes and animal carcasses. Through an upgrade of the equipment, this facility had its scope extended to accept a wide range of waste fractions for treatment and to improve the efficiency in fuel utilisation. This incinerator is now capable to treat slaughterhouse waste, clinical waste and other hazardous wastes.
- 1.2 The construction of the plant and ancillary facilities was approved through PA 02201/01 and PA 03201/07. The operation of the facility by WasteServ Malta Limited (WasteServ) is governed by an Integrated Pollution and Prevention Control Permit namely IP 0004/07.
- 1.3 The few years of operation of the facility has lead to the identification of a number of operational issues which need to be addressed in order to improve both the operations on site as well as the quality of service provided to clients. Addressing these issues will also lead to a reduction in inconvenience that may be experienced during periods of maintenance.
- 1.4 In 2009 WasteServ submitted a preliminary design for a Master Plan for the area which tackled a number of these issues. This draft Master Plan is now being replaced by this Development Brief which incorporates all issues and proposals for the upgrading of the facility.

2. Development Objectives

2.1 The main objectives of this Development Brief are as follows:

- Extension of the facility boundary to include the area currently occupied by a neighbouring waste management facility;
- Installation of a rendering plant to provide alternative treatment for some of the waste streams currently treated by incineration;
- Introduction of dedicated storage for clinical waste;
- Installation of a wheel washing facility;
- Consolidation of bin washing facilities;
- Creation of a storage area for clean bins;
- Establishment of a shredder area and storage area for shredded wood and Refuse Derived Fuel (RDF);
- Establishment of a paints storage area;
- Introduction of a fly ash silo;
- Establishment of a sodium bicarbonate storage area;
- Establishment of a dedicated storage area for pharmaceutical waste;
- Establishment of an area to be used for the cooling of bottom ash generated by the facility;
- Establishment of a wastewater treatment plant; and
- Creation of organised parking facilities for employees and visitors.

2.2 The following sections provide a detailed background of the current situation, requirements and WasteServ's proposed actions to fulfil these requirements.

3. Extension of the facility boundary

- 3.1 To date the operation of the facility has been supported by a neighboring facility also operated by WasteServ Malta Limited, namely the Temporary Marsa Storage and Sorting Facility. This facility is covered by PA 05115/07 and an environmental permit WM 00012/07.
- 3.2 Through the implementation of this Development Brief, WasteServ would like to extend the boundary of the existing incineration facility to include the area currently occupied by the Temporary Marsa Sorting and Storage Facility. This should lead to a consolidation of the area and the creation of adequate space for all the operations to support the receipt, storage and treatment of all waste streams received at the facility.

4. Rendering Plant

- 4.1 The disposal of waste considered as animal by-product and derived products not intended for human consumption is regulated by the Council Directive 97/78/EC, (EC) No 1069/2009 and EU No 142/2011. These regulations does not envisage in any way that slaughtering waste needs to be disposed of by incineration. On the contrary, various options are provided depending on the type of waste, the dimensions of the shredded material and other factors with the aim to sustainably use the animal material while protecting public and animal health in the European Union.
- 4.2 An alternative option to incineration is the rendering of the animal by-products through an autoclave plant. Rendering is a process that converts waste animal tissue into stable, value-added materials. This process can

be used for the fatty tissue, bones and offals as well as entire carcasses of animals condemned at slaughterhouses or on farms. The most common animal source is beef, pork, sheep and poultry.

4.3 The rendering process simultaneously dries the material and separates the fat from the bone and protein. A rendering process yields a fat commodity and a protein meal. Rendering plants often also handle other materials such as slaughterhouse blood, feathers and hair but do so using processes distinct from true rendering.

4.4 Various factors affect the process parameters such as:

- the type of material being processed;
- whether the end products are to be used as animal or pet food;
- whether the material is to be process wet or dry;
- the temperature range used; and
- whether the processing is done in discrete batches or in a continuous process;

4.5 The Autoclave Plant proposed as part of this Development Brief is intended to treat the inedible raw material using a dry method in batches. The material shall be heated in a steam-jacketed vessel to drive off the moisture and simultaneously release the fat and drive off the moisture. The protein and fat mixture shall percolate to drain off the free fat and then pressed to remove more fat out of the solids. The solid part shall be then ground to produce the meal and bone meal. The fat obtained may be used as low-cost raw material for making grease, animal feed, soap, candles and biodiesel and also as a feedstock for the chemical industry.

4.5 The process shall be as follows:

- i. Material from the Civil Abattoir shall pass through an on-site shredder and pumped into one of three dedicated refrigerated silos to be installed within the Civil Abattoir boundaries. Each of the three silos shall hold one particular waste category, i.e. Category 1 material which needs to be disposed of, Category 2 material which is not fit for animal consumption and Category 3 material which is not fit for human consumption.
- ii. From these tanks, the material shall be pumped to the rendering plant.
- iii. Slaughtering waste from the private slaughterhouses shall be delivered in bins directly to the rendering plant. The material shall be emptied into a stainless steel hopper or silo depending on the category of the material.
- iv. Material shall be transferred by means of Archimedean screws from the hopper, through a shredder and then pumped into the autoclave plant (pressure cooker). This chamber shall be installed onto two load cells underneath the pressure cooker which controls the quantity of material fed.
- v. Steam shall be fed into the pressure cooker. The agitator inside the cooker shall ensure that the material is homogenized and exposed uniformly to the heat. This shall result in the evaporation of all the water content in the waste, leaving a mixture of bone meal, meat meal and animal fat.
- vi. Steam from the cooker shall then pass through a heat exchanger where it condenses and produces waste water. This shall be bubbled into the waste water treatment plant on site. Heat recovered shall be used within the slaughterhouse.
- vii. The liquid bone meal/meat meal and fat mix shall be poured into a percolator.

- viii. Fat shall be separated by gravity and pumped to a decanter to remove any solid particles and then stored in a settling tank.
 - ix. The bone meal and meat meal shall be passed through a filter press to remove any entrapped fat, leaving a very dry product.
 - x. This material shall be further passed through a crusher to produce a fine odourless powder which can then be stored into jumbo bags or silos for further use.
- .
- 4.6 If the final product is to be sent for digestion, then the fat and protein mix can be pumped directly to the digestion tank without any post treatment.
- 4.7 Blood collected from the slaughtering process can be first treated in a blood coagulator whereby it is sterilized and approximately 50% of the water evaporated. The blood sludge left can either be sent for digestion for biogas production or else be sent to the rendering plant from which blood meal can be produced by evaporating all the water left.
- 4.8 Feathers and pig hair have to be treated separately from the other animal by-products due to their nature. This waste needs only sterilization and drying. Sheep wool and cow hides cannot be rendered.
- 4.9 The plant being recommended will consist of two batch cookers with the capacity of 10,000 and 7,000 litres respectively. It is foreseen that the 10,000 litres cooker can take batches of up to 6 tonnes while the 7,000 litres cooker can treat batches of 4 tonnes. Each batch will normally take a cycle of 2.5 hours. However, the processing time depends mainly on the water content present in the batch.

4.10 Some of the advantages of rendering animal by-products are:

- Waste from slaughterhouses is processed into a clean fat fraction and a protein fraction (bone meal and meat meal).
- Some of the potential uses of the fat recovered are:
 - Fuel for boiler burners
 - Raw material for biodiesel
 - Pet food supplement
 - Input for Biogas.
- Some of the potential uses for bone meal and meat meal are:
 - Pet food.
 - Fertilisers or soil improvers.
 - Biogas.
- Energy is recovered from the steam evaporated from the waste meat in the autoclave.
- Steam generated from the TTF can be used as the heating source for the autoclave process rather than being wasted.
- No need of large refrigerated store for the animal waste.
- The incinerator throughput for hazardous waste by the pharmaceutical industry can increase due to a less throughput of animal by-products.
- This will act as a part of the contingency plan for the TTF.
- Reduction in the fuel costs for the TTF and hence reduction in the treatment cost for animal waste and hazardous waste.
- If biomass boiler is used for the back-up boiler of the autoclave, this will help in the re-use of shredded wood being dumped at the landfill.
- Reducing incineration of wet material in the primary combustion chamber will prolong the lifetime of the refractory and hence reduce the need of long shutdowns.

4.11 Disadvantages of this new process are:

- The Autoclave will consume all the steam produced at the TTF boiler. This will result in a higher demand of treated water for the boiler.
- A spare boiler is required to produce steam for the autoclave when the TTF is on shutdown.
- Water condensed from the steam generated inside the cooker is considered as waste water with high BOD and COD. This waste water needs to be treated in a waste water treatment plant whether on site or at some other site. The condensate needs to be cooled down very quickly to eliminate the release of odours while still hot. Mixing of this waste water with cold water on a 1:1 basis (which may even be second class water from the Waste Water Treatment Plant) may help to quench this hot waste water. It is estimated that circa 33m³ per day of waste water will be generated.
- Waste from different categories will have to be separated in order to obtain good quality end product that can be used for pet food. This may result logistical problems at the Civil Abattoir and other private slaughterhouses.

5. Refrigerated Storage for Clinical Waste

- 5.1 Due to the fact the TTF is the only facility in Malta permitted to treat clinical waste, during maintenance stops, the waste needs to be stored in a safe and appropriate way. The World Health Organisation has published recommendations for the storage of clinical or health-care waste. In warm climate countries, the storage time for health care waste (i.e. the delay between production and treatment) should not exceed 48 hours during the cool season and 24 hours during the hot season. Hence, having a

refrigerated area for the storage of clinical waste is considered as a must at the TTF.

- 5.2 Other recommendations for storage facilities for this waste stream include:
- The storage area should have an impermeable, hard-standing floor with good drainage; it should be easy to clean and disinfect.
 - There should be a water supply for cleaning purposes.
 - The storage area should afford easy access for staff in charge of handling the waste.
 - It should be possible to lock the store to prevent access of unauthorized persons.
 - Easy access for waste-collection vehicles is essential.
 - There should be protection from the sun.
 - The storage area should be inaccessible for animals, insects and birds.
 - There should be good lighting and at least passive ventilation.
 - The storage area should not be situated in the proximity of fresh food stores or food preparation areas.
 - A supply of cleaning equipment, protective clothing, and waste bags or containers should be located conveniently close to the storage area.
- 5.3 After departure from the waste production point, every effort should be made to avoid further handling.
- 5.4 A storage area is being proposed whereby 137 clinical waste bins can be stored at a low temperature during maintenance shutdowns.

6. Wheel Washer

- 6.1 Since the site of the TTF is accessed by various farmers carrying fallen animals, a disinfection facility is necessary to eliminate the spread of disease from one site to the other. It is important that all vehicles leaving the site are clean and sterilized before returning to public roads.
- 6.2 The proposed wheel washer shall consist of two sections, on one side there will be the area where the vehicle is washed and on the other side there will be the storage area for the clean water and for the detergent to be used as well as for the dirty area.
- 6.3 The vehicle shall drive onto the platform. As soon as the vehicle is detected by the sensor, the submersible pump will switch on. Water is sprayed through a series of nozzles to clean the wheels of the vehicle and the bottom part of the vehicle.
- 6.4 The waste water collected will be taken to a waste water treatment plant.

7. Bin Washing Facility

- 7.1 Slaughtering material from the Private slaughter houses shall be delivered to the TTF in 1100 litre wheely bins. Once emptied, these will have to be washed and sterilized to be used again. Similarly, clinical waste is delivered in reusable 1100 litre bins. Once the contents have been incinerated, the empty bin needs to be wash and sterilized and taken back to the hospital or clinic to be reused. Aerosols generated from the washing process may contain hazardous bacteria or viruses that if inhaled may cause severe health problems.

- 7.2 A dedicated enclosed area shall be built where the washing of bins can take place to avoid aerosols generated from the washing process. An air handling system will be installed to circulate the air since employees will be working within this area. HEPA filters will ensure that clean air will be emitted in the atmosphere. Once cleaned, the bins will be stored in a dedicated area for clean bins.

8. Clean Bins Storage Area

- 8.1 Good hygiene practices envisage that clean bins used for the storage and transport of animal by-products and which will be used by food processing establishment needs to be properly cleaned and sterilized. However, to ensure that they remain clean, they need to be stored in a clean area and away from the waste reception area. Otherwise, cross contamination may occur.
- 8.2 This Development Brief envisages a storage area that can hold up to 83 bins. Dirty bins will be taken to the bins washing facility and once cleaned and sterilized will be stored in a dedicated enclosed clean storage area. Food processors will take the bins required from this storage area.

9. Shredder Room and Storage Room for Shredded Wood and Refuse Derived Fuel (RDF)

- 9.1 Shredded wood is currently co-incinerated with the abattoir waste in order to absorb moisture and increase the calorific value of the waste mix so that diesel consumption is reduced. This is usually produced from waste pallets that are not required to transport products.
- 9.2 This Development Brief includes a dedicated enclosed area where these pallets collected at the Civic Amenity Sites can be delivered to and shredded into small chips. This shredded material can be stored safely in a dry and enclosed area to be used as required when the Incinerator is in operation. This will avoid the risk of fire and will protect this fuel from the natural elements. The shredded material will be loaded in wheeled bins and transported to the plant using the goods elevator.
- 9.3 In the case that the stand-by boiler chosen will operate using biomass, these wood chips can also be used as a fuel source. Steam produced from the biomass boiler will produce the steam required to autoclave all the slaughtering waste produced while the incinerator is switched off.
- 9.4 Apart from shredded wood, other material can be used as a fuel source such as RDF from the Materials Recovery Facility in Marsascala. Apart from this, different waste fractions are delivered to the TTF for destruction due to security reasons. Paper documents, uniforms and security paper documents are being incinerated. A secure storage area for such waste streams is important.

10. Paints Storage Area

- 10.1 Waste paints collected from Civic Amenity sites and from Industries are delivered to the Incinerator for final disposal. Water based paints are currently being incinerated while solvent based paints are exported for final disposal in other European countries. Very often, all types of paints are received at the Civic Amenity Sites in a similar container.
- 10.2 Once delivered to the facility, the water based paints are separated from the oil or solvent based paints. Due to the weather conditions in Malta, it is very important that storage of such material is done in an enclosed environment and with temperature controlled. Spillages from these waste streams should be contained and should not arrive to the sewers line. The ambient temperature should be maintained as low as possible in case solvents with a high ignition temperature are present. The area should ideally be ATEX compliant.
- 10.3 A dedicated storage area is being proposed whereby all the different types of paints and hazardous liquids can be received, stored and sorted out prior to incineration or export. The area will be properly bunded to avoid spillages to the drains and seepage into the ground. The area will be well ventilated and ATEX compliant.

11. Fly Ash Silo

- 11.1 Currently the filter cake collected from the Incinerator Bag House Filter and which is a hazardous material in powder form, is being collected within the plant in jumbo bags. This material is transferred by means of an enclosed Archimedean screw from the bottom area of the filter to the bag. Once filled, the employees remove the filled bag and transport the bag to

a storage container. Once a container full is available, the material is exported for final disposal.

- 11.2 It is being recommended that an automatic transfer system is installed whereby the filter cake is transferred pneumatically from the filter to a storage silo. Once full, a tanker truck comes on site, empties the silo and is exported for disposal.
- 11.3 This modification will improve the air quality within the incinerator and reduce the quantity of airborne particles which may be a health hazard to the employees working within the Plant.

12. Sodium Bicarbonate Storage Area

- 12.1 The Thermal Treatment Facility has a dry flue gas scrubber whereby Sodium Bicarbonate and Activated Carbon is used to remove the hazardous substances in the flue gas generated from the Incineration process. Both Sodium Bicarbonate and Activated Carbon are imported from EU countries. For this reason a store is required to store these chemicals together with other bulky items such as refractory material that may be needed during maintenance.
- 12.2 A store having a footprint area of circa 45 square metres and a height of 3 metres will be constructed. Pallet shelving will be installed to maximize the storage capacity.

13. Pharmaceutical Waste Storage Area

- 13.1 Pharmaceutical waste generated in Malta is disposed of at the TTF on a regular basis. This waste may be either in powder form or in blister packs. For security reasons, this waste stream should be stored in secure area under lock.
- 13.2 A storage area for this waste streams will be constructed where the pharmaceutical waste will be unloaded and locked until it is possible to be incinerated. This storage area will also include a quarantined area where pharmaceutical waste that cannot be accepted will be kept until the waste producer takes it back. The waste delivered will be checked by the site Scientist to confirm that the waste actually delivered is what was declared in the consignment note and in the packing list and to confirm that the consignment does not include cytotoxic or radio active substances. Once the material is considered as safe and can be treated at the Marsa facility, the waste is packed in bins and transferred to the Incinerator Plant.
- 13.3 The area will also include an automatic fire detection system.

14. Bottom Ash Cooling Area

- 14.1 Bottom ash coming out of the Primary Combustion Chamber will have a very high temperature. Due to its high temperature, it cannot be safely transported and disposed at the landfill because it may cause fires. For this reason, it has to be kept at the Incinerator at a well ventilated area until the temperature decrease to a safe temperature.

- 14.2 This proposal includes a shed where the full container can be parked for a week until the temperature of the ash decreases and can be safely taken to the engineered landfill without the risk of causing fires. The shed will protect the ash from water since this may cause steam generation and water seepage from the ash to the surrounding area.

15. Parking Area

- 15.1 The TTF employs in total 35 employees which may not be present together since some of them work on a shift basis. The area where the facility is located is one of the busiest areas since it is an industrial area and also due to the close proximity of the Civil Abattoir.
- 15.2 Apart from the employees working there, we receive regularly various visitors such as contractors, personnel from Maltese Authorities, consultants, etc. Furthermore, the plant receives consignments of waste which is confiscated from the port. Usually, such consignments are delivered in 40 foot containers and are left on site until gradually all the contents are emptied and incinerated. Usually this process may take a couple of days. For this reason, a proper parking area is required for the various visitors or consignments received.
- 15.3 A parking area will be allocated for the employees working at the incinerator and for the visitors. Another area will be allocated for the parking of reefer containers delivering waste where these can be emptied safely and once empty, they can be cleaned.

16. Waste Water Treatment Plant

16.1 The waste water generated by the TTF is not compliant to the L.N. 139 of 2002 implemented by the Water Services Corporation (WSC). The waste water generated at the Incinerator has very high BOD, COD, suspended solids, total dissolved solids, nitrogen and phosphates. Discussions are currently on going to identify whether the WSC is in a position to treat the TTF's waste water through available resources. Alternatively, in order to reduce these parameter values, a waste water treatment plant needs to be installed.

16.2 The treatment plant being proposed will include the following:

- 3mm mechanical coarse screen
- 1mm mechanical drum screen
- Primary/sludge storage tank (3m diameter x 4m long) – may require emptying once weekly depending on solids in influent
- One biological tank (3m diameter x 7m long) complete
- Second biological tank (3m diameter x 11m long) complete
- Third biological tank and settlement tank combo (3m diameter x 11m long)
- Sludge return pump (external not submerged)
- pH meter + chemical dosing (will need to raise the pH)
- Hack Lange DO meter
- Diffused air in each of the three biological tanks
- Aeration blowers (duty only)
- Control panel and interconnecting pipework
- Delivery of equipment on site

- Installation, testing & commissioning

Annex 1

Proposed Plans

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Level 0

Legend:

- Emergency Abattoir
- Abattoir
- Ancillary Building
- Incinerator
- Covered diesel tank farm
- Fly-Ash Silo; Fluidized Cat 1/2/3 waste
- Anti-Room to freezer
- Freezers (96B)
- Autoclave
- Biocarbonate Store
- Pharma Store
- Paint Store
- RDF Shredded Wood

- Shredder Room
- Bundled Area / Quarantine Area
- Bottom Ash Store
- Boiler Ash
- Reservoirs (below ground level)
- Compact Waste Water Treatment plant
- Jumbo Bags
- Workshop 1
- Container Storage Area
- Offices
- Weight bridge
- Wheel washing facility
- Washing/ Sanitary facilities

The site plan illustrates the layout of Level 0, featuring a central road network with one-way traffic flow indicated by arrows. Buildings are color-coded: yellow for general storage and processing areas, purple for specialized facilities like the autoclave and pharma store, and green for landscaping. Key features include a large parking area at the bottom left, a series of long rectangular buildings along the top and right edges, and a complex arrangement of smaller structures and containers in the center-right. A north arrow is located in the bottom right corner.



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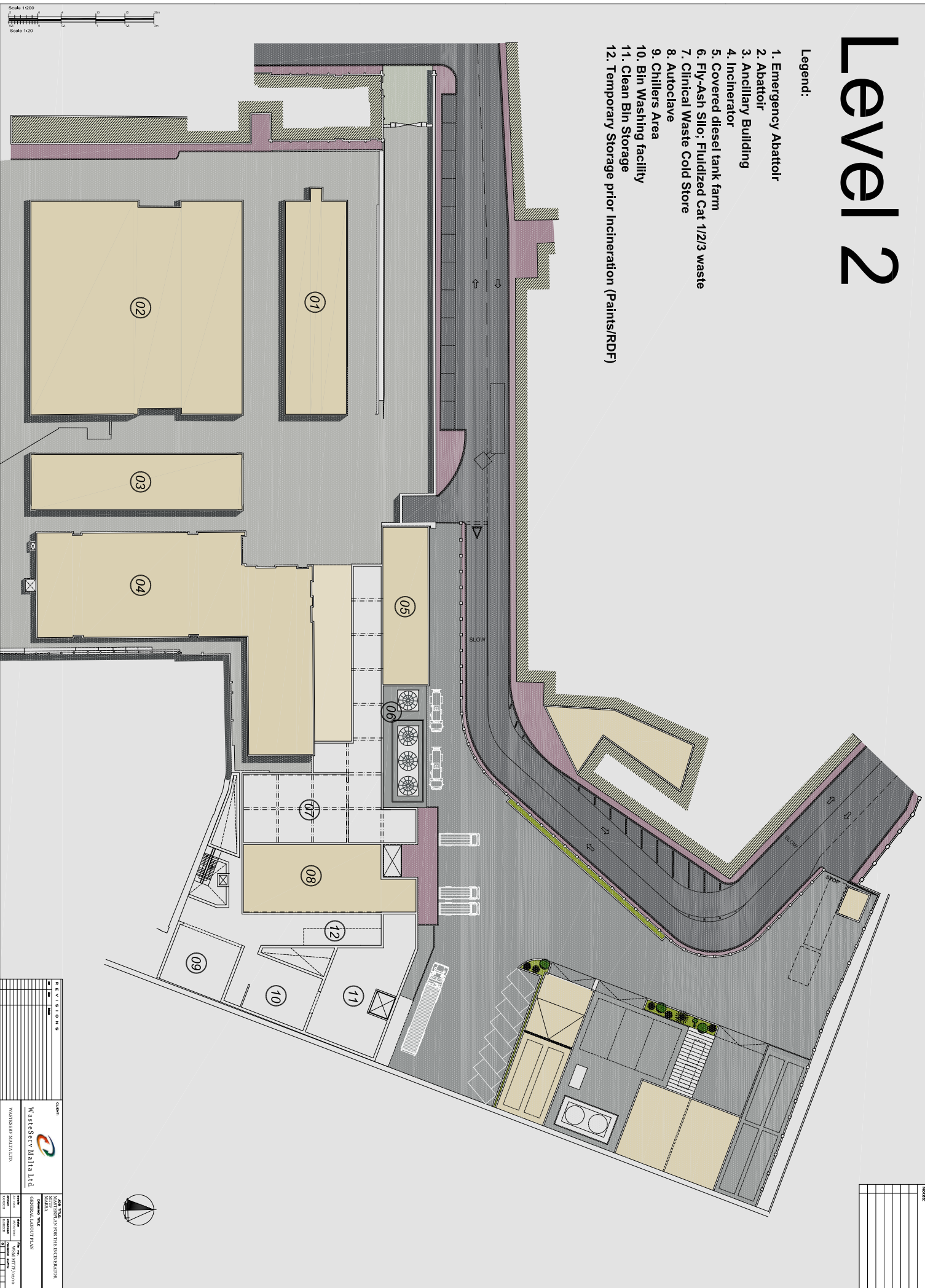
1. Emergency Abattoir
2. Abattoir
3. Ancillary Building
4. Incinerator
5. Covered diesel tank farm
6. Fly-Ash Silo; Fluidized Cat 1/2/3 waste
7. Anti-Room to freezer
8. Freezers (96B)
9. Autoclave
10. Clean Bin Storage 85B (open)



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COMPANY TITLE: GENERAL MANAGER					
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Watesery Malia Ltd (INCORPORATED IN MALAYSIA)					
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COMPANY TITLE: GENERAL MANAGER					
DATE		BY		REMARKS	

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1. Emergency Abattoir
2. Abattoir
3. Ancillary Building
4. Incinerator
5. Covered diesel tank farm
6. Fly-Ash Silo; Fluidized Cat 1/2/3 waste
7. Clinical Waste Cold Store
8. Autoclave
9. Chillers Area
10. Bin Washing facility
11. Clean Bin Storage
12. Temporary Storage prior Incineration (Paints/RDF)



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[illegible]

1. Emergency Abattoir
2. Abattoir
3. Ancillary Building
4. Incinerator
5. Covered diesel tank farm
6. Fly-Ash Silo; Fluidized Cat 1/2/3 waste
7. Chillers Area

[illegible]

ANNEX 4

SPECIFICA DI PRODOTTO

Data emissione:

Novembre 2008

Edizione: 1

Versione: 0

Codice Prodotto : 019016 / 019017

AIRBLUE

VALORI GARANTITI:

DETERMINAZIONI	UNITÀ DI MISURA	VALORI	METODO ANALISI
Aspetto		Liquido chiaro	VIS. (1)
Colore		Incolore	VIS. (1)
Odore		Leggermente ammoniacale	VIS. (1)
Densità (20 °C)	g/cm3	1,087 – 1,092	
Indice di rifrazione (20 °C)		1,3817 – 1,3840	
Formaldeide	ppm	10 max	
Residuo insolubile	ppm	20 max	
Fosfati	ppm	0,5 max	
Calcio	ppm	0,5 max	
Ferro	ppm	0,5 max	
Rame	ppm	0,2 max	
Zinco	ppm	0,2 max	
Cromo	ppm	0,2 max	
Nichel	ppm	0,2 max	
Magnesio	ppm	0,5 max	
Sodio	ppm	0,5 max	
Potassio	ppm	0,5 max	

ALTRE CARATTERISTICHE (Valori indicativi tipici medi):

Viscosità (25 °C)	mPa x s	1,4 c.a.	
Temperatura di cristallizzazione	°C	- 11,5	
Alcalinità (come NH3)	%	0,2 c.a.	
Carbonati (come CO2)	%	0,2 c.a.	
Biuret	%	0,3 c.a.	

La specifica corrisponde alle esigenze di cui alla norma DIN V 70070.

(1) = Metodo di analisi citato dal produttore.

(2) = Procedura EVS per la rintracciabilità dei metodi analitici.

SPECIFICA DI PRODOTTO	
Data emissione: Novembre 2008	Edizione: 1 Versione: 0

Codice Prodotto : 019016 / 019017

AIRBLUE

Trasporto e stoccaggio:

La spedizione avviene in container (IBC di materia plastica), fustini o autocisterne isolate.

Per evitare la separazione di cristalli e la idrolisi di Airblue si raccomanda uno stoccaggio a condizioni normali (al di sopra di -11°C e al di sotto di 25°C) e protetto da radiazione solare diretta. Airblue ha un effetto corrosivo su acciaio, ferro, nichelio e metalli non ferrosi. Sono resistenti gli acciai austenitici altolegati, HDPE, PP, titanio e Viton.

Rispettando le condizioni di stoccaggio menzionate e utilizzando contenitori di materiale appropriato, Airblue potrà essere conservato per almeno un anno.

Per ulteriori indicazioni riguardanti la tutela della qualità di Airblue nell'ambito della catena logistica rimandiamo al documento CEFIC "AUS 32 Direttive per la garanzia della qualità".

Sicurezza e protezione dell'ambiente:

Airblue nonché dei residui secchi del prodotto sono fisiologicamente innocui.

Airblue non è una sostanza pericolosa.

Airblue va trasportata e immagazzinata localmente separata da nitriti, ipocloriti e da sali che contengono nitrati.

La scheda di sicurezza fornisce ulteriori informazioni riguardanti le caratteristiche del prodotto e contiene indicazioni rispetto alla classificazione della pericolosità nonché rispetto alle prescrizioni da rispettare e descrive le misure richieste per la manipolazione di Airblue per proteggere le persone e l'ambiente.

Approvata il: 10/11/2008

**Firma: Responsabile Qualità
(Dr. S. Del Bo')**

⁽¹⁾ = Metodo di analisi citato dal produttore.

⁽²⁾ = Procedura EVS per la rintracciabilità dei metodi analitici.

SCHEDA DI SICUREZZA

AIR BLUE

Edizione0 – Versione 0 – Emissione: Febbraio 2007

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1 Identificazione della sostanza/preparato e della società/impresa

Nome commerciale : AIR BLUE
Codice prodotto : 019016, 019017
Utilizzi : Riducente di NOx nei gas di scarico
Fornitore : Elettrochimica Valle Staffora Spa
Via Oslavia, n° 17 – 20134 Milano
Tel. 02-2105161 fax 02-21051633
Tel. 0383-945511 fax 0383-944594
Numero di emergenza : Milano - Ospedale Niguarda - Tel. 02-66101029

2 Composizione/informazione sugli ingredienti

Caratteristiche chimiche : Soluzione acquosa di urea
Sostanze contenute : urea 32,5%
CAS : 57-13-6
EINECS : 200-315-5

3 Identificazione dei pericoli

Classificazione di pericolosità : Nessun rischio specifico è riferito al prodotto

4 Interventi di primo soccorso

Indicazioni generali : Non sono necessari provvedimenti specifici.
Inalazione : Portare all'aria fresca.
Contatto con la pelle : Lavare con abbondante acqua - Togliere tutti gli
indumenti contaminati.
Contatto con gli occhi : Risciacquare immediatamente con abbondante
acqua, anche sotto le palpebre, per almeno 15 minuti - Se i sintomi persistono
chiamare un medico.
Ingestione : Risciacquare la bocca con acqua - bere
abbondante acqua - non indurre il vomito - chiamare un medico.

5 Misure antincendio

Idonei mezzi estinguenti : Il prodotto di per se non brucia - Procedure
standard per incendi chimici.
Mezzi estinguenti interdetti : Nessuno.
Rischi particolari : Riscaldando può liberare gas pericolosi (NOx,
HCN, NH3).
Speciali mezzi protettivi per il personale antincendio : Indossare l'autorespiratore
e indumenti di protezione impermeabili.

6 Provvedimenti in caso di dispersione accidentale

Precauzioni per le persone : Evitare il contatto con pelle e gli occhi - Evitare il
rischio.

SCHEDA DI SICUREZZA

AIR BLUE

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Precauzioni ambientali : Impedire che il prodotto penetri in fognature, nelle acque superficiali e sotterranee.

Metodi di bonifica : Raccogliere con mezzi meccanici, mettere in contenitori adatti per eliminazione - Eliminare conformemente alle regolamentazioni locali e nazionali - Dopo la pulizia lavare i residui con acqua.

7 Manipolazione e immagazzinamento

MANIPOLAZIONE

Indicazioni per una manipolazione sicura : Evitare il contatto con la pelle e gli occhi.

STOCCAGGIO

Condizioni generali : Mantenere i contenitori ermeticamente chiusi in un posto asciutto e freddo.

Indicazioni sullo stoccaggio misto : Tenere lontano dagli agenti ossidanti forti (permanganati, cromati, nitrati, nitriti, cloro ed ipocloriti)

8 Protezione personale/controllo dell'esposizione

Ulteriori indicazioni sulla struttura di impianti tecnici : Nessun dato ulteriore, vedere punto 7

Valori limite per l'esposizione : Nessun limite specifico di esposizione determinato per la sostanza.

Controllo dell'esposizione professionale

Mezzi protettivi individuali

Norme generali protettive e di igiene del lavoro : Evitare il contatto con pelle e gli occhi - Lavar le mani prima delle pause e subito dopo la manipolazione del prodotto.

Protezione respiratoria : Non necessario.

Protezione delle mani : PVC, lattice o altri materia plastica/guanti di gomma - Non portare i guanti di cuoio.

Protezione degli occhi : Occhiali di protezione

Protezione della pelle o del corpo : Non portare scarpe di cuoio.

9 Proprietà fisiche e chimiche

Informazioni generali

Forma : liquido

Colore : chiaro, incolore – giallastro

Odore : possibile odore di ammoniac

Variazioni di stato

Temperatura di fusione : -11 °C

Temperatura di ebollizione : 103 °C

Punto di infiammabilità : non applicabile

Proprietà comburenti : Prodotto non autoinfiammabile.

limiti di esplosività nell'aria:

SCHEDA DI SICUREZZA

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inferiore : Non applicabile
superiore : Non applicabile
Tensione di vapore : nessun dato disponibile
Densità:
Densità relativa a 20°C : 1,09 g/cm³
Solubilità in/Miscibilità con : Acqua: completamente solubile.
: Solventi: nessun dato disponibile.
Liposolubilità : nessun dato disponibile.
Valori di pH(100 g/l) a -°C : 10
Coefficiente di ripartizione n-ottanolo/acqua : -2,59 Log Pow (20-25 °C) (come urea).
Viscosità a 25 °C : circa 1,4 mPas

10 Stabilità e reattività

Stabilità : Il prodotto non si decompone se utilizzato secondo le norme.
Condizioni da evitare
Sostanze da evitare : Agenti ossidanti forti (permanganati, cromati, nitrati, nitriti, cloro, ipocloriti).
Prodotti di decomposizione pericolosi : Riscaldando può liberare gas pericolosi (NO_x, HCN, NH₃)

11 Informazioni tossicologiche

Tossicità
Tossicità acuta:
Urea : LD50/orale/ratto = 14300 mg/kg
: LD50/orale/topo = 11500 mg/kg
Irritazione : Può causare irritazione alla pelle
Sensibilizzazione : L'urea non ha causato sensibilizzazione sugli animali da laboratorio.
Ulteriori dati tossicologici : Tossicità subacuta, subcronica prolungata: Nessun dato disponibile.
Esperienza umana : nessun effetto avverso sulla salute è conosciuto o previsto con un uso normale.

12 Informazioni ecologiche

Ecotossicità
Ecotossicità acquatica : LC50/96h!Barilius barna> 9100 mg/l (come urea)
: LC50/24h/daphnia> 10000 mg/l (come urea)
Biodegradabilità : Biodegradabile.
Comportamento in compartimenti ecologici:
Mobilità : Solubile in acqua - L'adsorbimento nel terreno è basso.

SCHEDA DI SICUREZZA

AIR BLUE

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Potenziale di bioaccumulazione : L'accumulazione è improbabile, LogPow
(urea): -2,59.

13 Osservazioni sullo smaltimento

Prodotto : In conformità con le regolazioni locali e
nazionali.

Imballaggi non puliti : In conformità con le regolazioni locali e
nazionali.

14 Informazioni sul trasporto

Trasporto/ulteriori indicazioni : Non sottoposto a regolamentazione sul
trasporto.

15 Informazioni sulla normativa

Classificazione secondo le direttive CEE:

Nella manipolazione di prodotti chimici osservare le consuete misure
precauzionali.

Conformemente alle direttive CEE il prodotto non è soggetto all'obbligo di
codifica.

Sigla e etichettatura di pericolosità del prodotto: Non classificato.

16 Altre informazioni

Le informazioni contenute in questa pubblicazione sono esatte al meglio della
nostra conoscenza. Qualsiasi informazione o consiglio ottenuto con mezzi diversi
da questa pubblicazione, relativamente ai nostri materiali, è fornita in buona fede.
Rimane comunque ed in ogni caso responsabilità del Cliente di assicurarsi che i
materiali forniti siano rispondenti alle sue esigenze.

USE OF UREA FOR CONTROL OF NO_x

WasteServ shall be utilizing urea to control NO_x levels in emissions from the facility. The quantities of urea that shall be used will vary depending on the NO_x levels. When NO_x is low, no urea shall be injected. Only when NO_x levels are high and the temperature window in the secondary combustion chamber are such that urea can be used, will be urea be injected. From tests conducted, WasteServ does not envisage that more than 50 litres per day will be used.

A material safety data sheet for urea is included as part of this Annex.

ANNEX 5

ING. MARY GRACE MICALLEF

Address: 20, 'Graziella'
Triq il-Qoton,
Zabbar, ZBR06
Malta

Date of Birth: 19th August, 1981

Tel: +356 21808423
Mobile: +356 99229501
E-mail: mgmicallef@onvol.net

Educational Background:

1999 – 2003 University of Malta
Bachelor of Engineering Degree (Honours) Mechanical /
Manufacturing

Thesis: 'Conceptual Design of a Waste Separation Strategy
for the Inflight Catering Cabin Waste'.

1997 – 1999 G.F. Abela Junior College, Msida

*A'level in 'Pure Mathematics' and 'Advanced Physics'
Intermediate level in 'English', 'Philosophy', 'Information
Technology' and 'Systems of Knowledge'*

1992 – 1997 Carlo Diacono Junior Lyceum, Zejtun

12 O'levels subjects

Computer skills: Computer Aided Draughting and Design using AutoCAD 3D
Computer graphical animation using 3D Studio MAX

Other Course: Microsoft Project XP – Level 1
Project Management

Work Experience:

Summer 2000 EneMalta Corporation Training Center, MarsaXlokk
Engineering student training workphase
*Training received covered various useful skills such as
pipefitting, machining using the lathe, jointing techniques,
mechanical equipment, etc....*

Summer 2001 Drainage Department, Floriana
Engineering student worker
*Gained knowledge on the drainage system in Malta including
visits to various pumping stations and the sewage treatment
plant. Learned about health and safety issues, preparing
tenders and how to supervise operations being carried out by
contractors.*

Summer 2002 'Sant' Antnin Solid Waste Treatment Plant', MarsaScala

Engineering student worker

Responsible for conducting various national surveys including the 'Domestic Waste Composition Survey (2002)' on the type and amount of waste generated by the Maltese households.

September 2003

Employed as a Waste Treatment Engineer with WasteServ Malta Ltd. Currently being employed as an Assistant Facility Manager at the Thermal Treatment Facility.

Was involved in the preparation of EU funding projects and applications. Gained knowledge on the different waste treatment technologies, including landfilling, composting, digestion and incineration. Was involved in the implementation of the waste separation at source in Malta. Gained experiences on how to prepare, submit, manage/administer projects and tenders, both local and EU funded projects. I was the Project leader of the EU Twinning Project entitled "Technical Assistance for the Development of Implementation Systems for the Producer Responsibility Directives". I was a member of the task force working on the Waste Management Plan for the Maltese Islands. I was also responsible for the upgrading of the Thermal Treatment Facility at Marsa and for the operation of the Thermal Treatment Facility.

**Incineration
Study Visits:**

Addenbrooke's Hospital N.H.S in Cambridge, England
[Clinical Waste Moving Grate Incinerator]

Simmeringes Haide in Vienna, Austria
[Hazardous Waste Rotary Kiln Incinerator and Fluidised Bed Incinerator]

Ava Velsen in Völklingen, Germany
[Mixed Municipal Solid Waste Moving Grate Incinerator]

AVN – Abfallverwertung Niederösterreich GesmbH in Zwenterdorf, Austria

[Mixed Municipal Solid Waste Moving Grate Incinerator]

AVG Incinerator in Hamburg, Germany

[Hazardous Waste 2-line Rotary Kiln Incinerator]

GFA in Olching, Germany

[Mixed Municipal Solid Waste Moving Grate Incinerator]

Fernwärmewerk Spittelau in Vienna, Austria

[Mixed Municipal Solid Waste Moving Grate Incinerator]

Fawley Hazardous Waste Incinerator in Hampshire, England

[Chemical Waste Rotary Kiln Incinerator]

ABRG in Arnoldstein, Austria

[Hazardous Waste Rotary Kiln and Fluidised Bed Incinerators]

Languages:

Maltese – mother language

English – good working knowledge

German and Italian – reasonable working knowledge

Other Interests: Netball, playing the piano & clarinet, crafts, gardening, woodwork and reading.

Professional Affiliations: Chamber of Engineers

Awards and Honours

Award given by the **Group of Professional Engineering Institutions** for

- The best thesis project with the best Industrial Application and
- The best Project Presentation, 2002/3

Publications

MG Micallef, J Borg, C Ciantar, V Magri: “Prototype of an In-Flight Service Trolley for Segregation of Cabin Waste”

Recycling and Reuse of Waste Materials, *Proceedings of the International Symposium held at the University of Dundee, Scotland, UK on 9-11 September 2003, pp. 95-106*

EU Projects Experiences

Took part in a Grundtvig Project entitled “Sustainable Development using Information Technology.

Project Leader of a Twinning Project with Germany entitled “Technical Assistance for the Development of Implementation System for the Producer Responsible Directives”.

Curriculum Vitae:

Personal Information:

Name: Ramon Vella

ID Number: 281485(M)

Date of Birth: 24th May, 1985

Address: “Il-Hagra”
Triq Abram Gatt,
Zebbug, Malta

Telephone Number: 21462594

Mobile Number: 79734550

Email Address: ramon_vella@hotmail.com

Work Experience:

December 2009 to date Eco-Councillor at Wasteserv Malta

Summer 2008 Mechanical Engineer Apprentice at Malta Shipyards Limited, Marsa

Education:

Tertiary Education (2004-2009) University of Malta

Post-Secondary Education (2001-2004) G.F. Abela Junior College, Msida

Secondary Education (1996-2001) M.A. Vassalli, Tal-Handaq, Qormi

Primary Education (1990-1996) Pillar School, Valletta

Qualifications:

Degree

Bachelor of Engineering Honours(Mechanical) (May 2009)

Advanced Level

Subject	Board	Session	Grade
Mathematics	University of Malta	May 2004	C
Physics	University of Malta	May 2004	C

Intermediate Level

Subject	Board	Session	Grade
Systems of Knowledge	University of Malta	May 2004	C
Maltese Language	University of Malta	May 2004	D
Religious Knowledge	University of Malta	May 2004	D
Applied Maths	University of Malta	May 2004	E

Ordinary Level

Subject	Board	Session	Grade
Physics	Matsec	May 2001	1
Chemistry	Matsec	May 2001	3
Maltese Language	Matsec	May 2001	3
Mathematics	Matsec	May 2001	3
English Language	Matsec	May 2001	4
French	Matsec	May 2001	4
Religious Knowledge	Matsec	May 2001	4
Social Studies	Matsec	May 2001	4

Languages:

English –Fluent
Maltese – Fluent
French – Basic

Other Qualifications:

First Aid Course	July 2010
Steam Engine Driving Licence	May 2010
Statistical Process Control	April 2010
Internal Auditing Course	February 2010
Work Phase on Practical Aspects of Engineering at MCAST	Summer 2007

Personal Interests:

Sports
Fitness
Water sports

Referees:

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ANNEX 6

IP 0004/07 IPPC Permit for Marsa Abattoir and Hazardous Waste Incinerator

Improvement Programme (Table 1.5.1)

Reference	Requirement	Date	Date of Submission
1	Submission of an odour panel for the Marsa plant to give evidence of the efficiency of mitigation measures.	To be submitted within 3 months of issue of permit.	Odour monitoring report submitted in May 2010
2	Submission of monitoring data from plant acceptance tests.	Monitoring reporting to take place 2 month after completion of qualification.	Plant is not fully commissioned as per communications dated June 2009 and November 2009.
3	Plan showing sewer emission points	To be submitted before operation.	June 2009
4	Results of analyses from main waste components (delivered to and released by the waste incineration plant) to be submitted to MEPA.	Within 3 months from start of operation and immediately after new waste categories are incinerated after obtaining prior approval by MEPA.	June 2009
5	The energy and mass	Within 6 months	June 2009

	balance sheet (Appendix 6 of the Application Documents) has to be updated and communicated to the authority.	after acceptance tests.	
6	Furthermore, the energy and mass balance sheet (Appendix 6 of the Application Documents) has to be updated and communicated to the authority.	Within 1 month of expiry of this permit.	June 2009
7	Standard operating procedures (SOP) of all relevant activities shall be sent to MEPA. Updated SOPs shall be submitted as soon as they become available.	Within six months after commissioning.	Some SOPs have been submitted; finalisation of this process is subject to the implementation of the EMS
8	Emergency plan covering safety, security and pollution control aspects.	Prior to acceptance of hazardous waste.	Not yet submitted
9	A furnace capacity diagram, as shown in the brochure "Modification of the Public Abattoir incinerator to treat additional waste	To be submitted before operation.	June 2009

	streams, Marsa; Environmental Impact Assessment – Addendum”.		
10	Drawing of temporary storage area for sludge and solvents, with a description of how the anticipated storage time for 2 days is going to be achieved.	Prior to acceptance of hazardous waste.	June 2009

ANNEX 7

Annex I: Comparison of the processes at the Marsa Thermal Treatment Facility with the BREF for Waste Incineration (published August 2006).

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
Installation design	<p>Selection of an installation design suited to the characteristics of the waste received at the installation in terms of both its physical and chemical characteristics. This BAT is fundamental to ensuring the installation may treat the waste received with a minimum of process disturbances – which themselves may give rise to additional environmental impacts.</p> <p>In operation, it is considered BAT to use various techniques (e.g. control of air supply and distribution) to control combustion.</p>	<p>The Thermal Treatment Facility is designed to co-incinerate slaughtering waste together with other hazardous waste including clinical waste, pharmaceutical waste and other hazardous solid waste and sludges.</p> <p>Air inside the PCC is manually controlled via inverters while air in the SCC is automatically controlled via an oxygen probe. The quantity of air is controlled manually by the Plant Operator according to the instantaneous emissions released through the stack.</p>
	<p><i>Specific BAT for hazardous waste incineration and for clinical waste incineration:</i></p> <p>The use of a combustion chamber design that provides for containment, agitation and transport of the waste, for example: rotary kilns - either with or without water cooling. Water cooling for rotary kilns (see section 4.2.15 of BREF), may be favourable in situations where:</p> <ol style="list-style-type: none"> the LHV of the fed waste is higher (e.g. >15-17 GJ/tonne), or higher temperatures e.g. >1100 °C are used (e.g. for ash slagging or destruction of specific wastes). 	<p>The rotary kiln at the Thermal Treatment Facility is not equipped with a water cooling system since the highest percentage of the waste incinerated is slaughtering waste with a calorific value less than 5MJ/kg.</p> <p>According to section 4.2.1 the Rotary Kiln technology for our type of waste is according to the BAT.</p>
Environmental management system (EMS)	<p>BAT is to implement and adhere to an Environmental Management System (EMS) that incorporates, as appropriate to individual circumstances, the following features: (see Chapter 4.8 of BREF)</p>	<p>The Thermal Treatment Facility is managed by an Assistant Facility Manager responsible for the overall management of the Plant. An Incinerator Engineer is responsible for the technical operations of the Plant. Both the Assistant Facility</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<ul style="list-style-type: none"> definition of an environmental policy for the installation by top management (commitment of the top management is regarded as a precondition for a successful application of other features of the EMS) planning and establishing the necessary procedures implementation of the procedures, paying particular attention to <ul style="list-style-type: none"> structure and responsibility training, awareness and competence communication employee involvement documentation efficient process control maintenance programme emergency preparedness and response safeguarding compliance with environmental legislation. checking performance and taking corrective action, paying particular attention to <ul style="list-style-type: none"> monitoring and measurement corrective and preventive action maintenance of records independent (where practicable) internal auditing in order to determine whether or not the environmental management system conforms to planned arrangements and has been properly implemented and maintained. review by top management. <p>Three further features, which can complement the above</p>	<p>Manager and Plant Engineer fall under the responsibility of the Chief Operations Officer. The Plant is operated by six Heads of Shift who are responsible for the operations of the Plant and the operators.</p> <p>All TTF employees have a basic fire fighting course and a number of employees have First Aid course. The Heads of Shift have a Boiler Driving Certificate which they have gained following an exam on the operations of a boiler.</p> <p>WasteServ has started working on the establishment of an Environmental Management System through the recruitment a dedicated officer to be responsible for this task. WasteServ has also sought the assistance of an external consultant to assist with this task.</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<p>stepwise, are considered as supporting measures:</p> <ul style="list-style-type: none"> • having the management system and audit procedure examined and validated by an accredited certification body or an external EMS verifier • preparation and publication (and possibly external validation) of a regular environmental statement describing all the significant environmental aspects of the installation, allowing for year-by-year comparison against environmental objectives and targets as well as with sector benchmarks as appropriate • implementation and adherence to an internationally accepted voluntary system such as EMAS and EN ISO 14001:1996. <p>The following potential features of the EMS also need to be considered:</p> <ul style="list-style-type: none"> • giving consideration to the environmental impact from the eventual decommissioning of the unit at the stage of designing a new plant • giving consideration to the development of cleaner technologies • where practicable, sectoral benchmarking on a regular basis, including energy efficiency and energy conservation activities, choice of input materials, emissions to air, discharges to water, consumption of water and generation of waste • the development and use of procedures for the commissioning stages of new installations, generally including: <ul style="list-style-type: none"> • the prior preparation of a detailed programme of 	

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<p>works describing the commissioning programme</p> <ul style="list-style-type: none"> • an initial gap analysis of training requirements to identify pre-commissioning training needs • health & safety needs which meet European and local requirements • the availability of sufficient and up to date documentation regarding the installation • emergency and accident prevention planning, generally including procedures for: <ul style="list-style-type: none"> • serious fire • major explosion • sabotage/bomb • site intruders • major injury/death of employee/visitor/contractor • traffic accident • theft • environmental incident • power interruption • where the plant commissioning and tuning period may give rise to emissions outside the normal regulatory controls. <p>In all incineration installations, and in particular for those receiving hazardous wastes, personnel training programs are considered an important part of all safety management systems, especially training on:</p> <ul style="list-style-type: none"> - explosion and fire prevention - fire extinguishing 	

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	- knowledge of chemical risks (labelling, carcinogenic substances, toxicity, corrosion, fire) and transportation	
Site management	The maintenance of the site in a generally tidy and clean state (see Section 4.1.2 of BREF).	<p>Due to the type of waste delivered at the Thermal Treatment Facility and the way waste is delivered, cleaning is carried out continuously throughout the day. Cleaning tasks are usually categorised into two, the cleaning of the waste marshalling area where the waste is received, stored and/or shredded prior to incineration and cleaning of the mechanical part of the Plant which falls under the maintenance section. Cleaning of the waste marshalling area from spillages of blood or tissue waste is done to maintain the site clean and reduce nuisance odours. Cleaning of the mechanical part of the Plant is done as preventive maintenance to avoid equipment break downs, such as cleaning of air compressors from dust, cleaning dust from chains prior to lubrication, etc.</p> <p>Periodical cleaning jobs done as part of preventive maintenance are recorded on job sheets.</p>
	The provision of operators with a means to visually monitor, directly or using television screens or similar, waste storage and loading areas.	The site is equipped with various CCTV cameras. Cameras are monitored by the Security personnel and a back up of the recordings are kept in case some evidence is needed.
Waste input	<p>Establishing and maintaining quality controls over the waste input, according to the types of waste that may be received at the installation, by:</p> <ul style="list-style-type: none"> • Establishing installation input limitations and identifying key risks; • Communicating with waste suppliers to improve 	The most significant waste fraction delivered to the Thermal Treatment Facility is slaughtering waste from the private slaughter houses, from the Civil Abattoir and from the food processors. Apart from slaughtering waste the facility also receives fallen animals from farms. These waste fractions

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<p>incoming waste quality control;</p> <ul style="list-style-type: none"> • Controlling waste feed quality on the incinerator site (see Section 4.1.3.3 of BREF); • Checking, sampling and testing incoming wastes, and • Installation of detectors for radioactive materials, for example at the entrance of the plant, in particular for wastes at risk of containing higher radioactivity levels, e.g. hospital wastes. 	<p>cannot be tested analytically. Each consignment is visually checked to ensure that the waste does not have items which can damage the plant such as steel objects. Fallen animals which are delivered to the site and which have been dead more than 24 hours are reported to the Chief Veterinary within the Veterinary Department and fined €100.</p> <p>Clinical waste from hospitals cannot be tested and analysed due to the potential risks associated with such wastes.</p> <p>Pharmaceutical waste is accepted after that the list of all the pharmaceutical items is submitted. Once each item is confirmed by the Scientist that it is safe to be incinerated a confirmation acceptance is sent to the supplier. The supplier needs also to submit a declaration by a pharmacist that the consignment does not include cytotoxic material. Waste is accepted by appointment only. Once on site, the weighbridge officer confirms that the waste is accompanied by all documents such as MEPA consignment note, declaration from Pharmacist, WasteServ transfer note and waste list. The Scientist confirms that the waste delivered is what has been declared and also that the packaging used is according to the material delivered.</p> <p>Other waste streams accepted such as paper and shredded wood are not considered as hazardous.</p>
	<p><i>Specific BAT for hazardous waste incinerators:</i></p> <p>In addition to the above quality controls, to use specific systems and procedures, using a risk based approach according to the source of the waste, for the labelling, checking, sampling and testing of waste to be stored/treated.</p>	<p>First and foremost, the full waste analysis is requested to the waste producer before any waste acceptance takes place. In case that a waste stream is found to be acceptable from the analysis provided, a sample is taken and either analysed at the TTF laboratory or sub-contracted to an independent</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<p>Analytical procedures should be managed by suitable qualified personnel and using appropriate procedures. In general equipment is required to test:</p> <ul style="list-style-type: none"> • the calorific value • the flashpoint • PCBs • Halogens (e.g. Cl, Br, F) and sulphur • heavy metals • waste compatibility and reactivity • radioactivity (if not already covered through fixed detectors at the plant entrance. <p>Knowledge of the process or origin of the waste is important, as certain hazardous characteristics (for example toxicity or infectiousness) are difficult to determine analytically.</p>	<p>laboratory. The site is equipped with a bomb calorimeter to measure the calorific value. The laboratory is also equipped with another equipment to measure the water content in other waste streams e.g. solvents.</p>
Waste storage	<p>The storage of wastes according to a risk assessment of their properties, such that the risk of potentially polluting releases and odours is minimised.</p>	<p>Waste is stored, as far as technically feasible, in enclosed areas. Hazardous filter cake from the flue gas scrubber is stored in a water proof dry container. Paints from Civic Amenity Sites are also stored in a dry container to ensure that spillages are contained. Pharmaceutical waste is stored in a masonry shed. Two fire vaults are installed within the facility for the storage of waste streams with high flash points. Slaughtering waste that will not be incinerated within the same day is stored in freezers to stop biological degradation.</p>
	<p>To store waste in areas that have sealed and resistant surfaces, with controlled and separated drainage.</p>	<p>The site drainage is connected to the public sewers. However, the development brief being submitted together with this submission envisages that a waste water treatment</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
		plant shall be installed to treat all the waste water generated on site in line with L.N. 139 of 2002.
	<p>To use techniques and procedures to restrict and manage waste storage times, in order to generally reduce the risk of releases from storage of waste/container deterioration, and of processing difficulties that may arise. In general it is BAT to:</p> <ul style="list-style-type: none"> • prevent the volumes of wastes stored from becoming too large for the storage provided • in so far as is practicable, control and manage deliveries by communication with waste suppliers, etc. 	Hazardous waste is only accepted if it can be treated within 48 hours. Waste is accepted by appointment. In case that the Plant is down for maintenance, waste appointments are cancelled and postponed.
	The segregation of the storage of wastes according to a risk assessment of their chemical and physical characteristics to allow safe storage and processing (see Section 4.1.4.5 of BREF).	Different types of waste streams are stored in different locations depending on their properties.
	The clear labelling of wastes stored in containers such that they may continually be identified.	Hazardous waste is labelled as part of the waste acceptance procedure.
	<p><i>Specific BAT for clinical waste incineration:</i> The receipt and storage of clinical wastes in closed containers that are suitably resistant to leaks and punctures.</p>	Clinical waste is delivered in ADR approved clinical waste bins.
	<p><i>Specific BAT for clinical waste incineration:</i> The washing out of waste containers that are to be re-used in a specifically designed, designated washing facility, with disinfection as required, and the feeding of any accumulated solids to the waste incinerator.</p>	All bins are washed using hot water and disinfectant before being sent back to clients.

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
Waste pretreatment	<p>The mixing (e.g. using bunker crane mixing) or further pretreatment (e.g. the blending of some liquid and pasty wastes, or the shredding of some solid wastes) of heterogeneous wastes to the degree required to meet the design specifications of the receiving installation, taking into consideration cross-media effects (e.g. energy consumption, noise) of the more extensive pretreatments (e.g. shredding). Pretreatment is most likely to be a requirement where the installation has been designed for a narrow specification, homogeneous waste.</p> <p><i>Specific BAT for hazardous waste incineration:</i> The mixing, blending and pretreating of the waste in order to improve its homogeneity, combustion characteristics and burn-out to a suitable degree with due regard to safety considerations. Examples are the shredding of drummed and packaged hazardous wastes, described in sections 4.1.5.3 and 4.1.5.6 of the BREF. If shredding is carried out then blanketing with an inert atmosphere should be carried out.</p>	<p>The only pre-treatment of waste is the shredding of slaughtering waste and fallen animals prior to incineration. Mixing of waste takes place in the loading hopper where waste is inserted from different loading areas, i.e. the Archimedean screw transferring meat from the shredder and the elevator and bin tipper transferring solid waste from bins. Once the waste is emptied in the loading hopper, this is closed and all the waste is pushed into the Primary Combustion Chamber.</p> <p>Hazardous waste is not shredded. It is incinerated directly in the Primary Combustion Chamber (PCC).</p>
Waste loading into incinerator	<p><i>Specific BAT for hazardous waste incineration:</i> The use of a feed equalisation system for solid hazardous wastes (e.g. section 4.1.5.4 of BREF or other similar feeding technology) in order to improve the combustion characteristics of the fed waste and to improve the stability of flue-gas composition including the improved control of short-term CO peak emissions.</p> <p><i>Specific BAT for hazardous waste incineration:</i> The direct injection of liquid and gaseous hazardous wastes, where those wastes require specific reduction of exposure,</p>	<p>The Plant is not equipped with a feed equalisation system. The quantity of waste loaded is dependant on the operators filling the bins. Emission values are also dependent on the Plant Operator who regulate the feeding rate of Sodium Bicarbonate, oxygen and temperature depending on the instantaneous emissions released in order to maintain these below the established thresholds.</p> <p>Liquid waste such as solvents can be mixed with diesel and injected into the burner. Other liquids are pumped directly into a liquid lance into the PCC. Hence odours are</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	releases or odour risk.	minimised. Gaseous waste cannot be incinerated.
	<p><i>Specific BAT for clinical waste incineration:</i> The use of non-manual waste handling and loading systems.</p>	Clinical waste is loaded through a semi-manual operation. The bin is attached to the elevator manually. The operator presses the button to start the elevator. The bin is raised up to the unloading hopper. As the bin tilts, the contents are emptied automatically. The empty bin comes down again. The operator removes the empty bin manually from the elevator and moves it to the bin washing area.
Conditions of combustion	The minimisation of the uncontrolled ingress of air into the combustion chamber via waste loading or other routes (see section 4.1.6.4 of BREF).	Waste loading is controlled via a two shutter system. When the loading hopper lid is open to load the waste the fire door is closed. Only when the hopper lid is closed that the fire door could be opened and waste loaded into the Plant. Secondary air required for combustion is done through blowers which are controlled manually via inverters depending on the oxygen level in the Secondary Combustion Chamber (SCC).
	Use of the combustion operating conditions (i.e. temperatures, residence times and turbulence) specified in Article 6 of Directive 2000/76/EC (WID). In order to limit potential cross-media impacts, combustion conditions should generally not be significantly in excess of those conditions.	Loading of waste is done continuously and regularly to maintain uniform parameters. The bottom ash is continuously monitored and sampled to ensure that it conforms to the parameters stipulated in the landfill waste acceptance procedure. Temperature in the SCC is maintained above 850°C to ensure low CO levels. Waste with chlorine content higher than 1% is not accepted. The PCC is equipped with a modulating burner that fluctuates depending on the energy released from the waste.
	The provision of auxiliary burner(s) for achieving and maintaining operational conditions is considered to be BAT when waste is being burned.	A secondary burner is installed in the SCC in line with the Incineration Directive to ensure a temperature above 850°C and a residence time of 2 seconds. This burner ensures that organic particles and CO are fully combusted.
	The use of flow modelling which may assist in providing	There are no concerns on the flue gas treatment

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	information for new plants or existing plants where concerns exist regarding the combustion or flue-gas treatment (FGT) performance.	performance of the Marsa Plant.
	The use of key combustion criteria and a combustion control system to monitor and maintain these criteria within appropriate boundary conditions, in order to maintain effective combustion performance (see section 4.2.6 of BREF). Techniques to consider for combustion control may include the use of infrared cameras, or others such as ultra-sound measurement or differential temperature control.	Combustion inside the PCC is controlled manually by the Plant Operator. First and foremost the waste loaded (type and quantity) are monitored. Temperature in the PCC and SCC are monitored together with the rotation velocity of the PCC, ID Fan velocity and emissions released in the stack. The Plant Operator may take different actions to control the Plant stable and emissions within limits.
	<p>The optimisation and control of combustion conditions by a combination of:</p> <ul style="list-style-type: none"> a. the control of air (oxygen) supply, distribution and temperature, including gas and oxidant mixing b. the control of combustion temperature level and distribution, and c. the control of raw gas residence time. <p>(See sections 4.2.8, 4.2.9, 4.2.11, 4.2.19 and 4.2.4 of BREF).</p>	The Plant Operator has the faculty to regular manually the PCC rotation velocity, PCC temperature, the waste feeding rate, control the secondary air required for combustion inside the PCC and regulated the dosing rate of Sodium Bicarbonate in the flue gas stream. The Plant is highly dependent on the Plant Operator's decisions and needs to be monitored continuously (24 hours).
	The preheating of primary combustion air for low calorific value wastes, by using heat recovered within the installation, in conditions where this may lead to improved combustion performance (e.g. where low LCV (Lower Calorific Value)/high moisture wastes are burned). In general this technique is not applicable to hazardous waste incinerators.	Primary combustion air is not preheated. This is another contributing fact to the high diesel combustion required for the Incineration of slaughtering waste since this waste is wet and with low calorific value. Hence, diesel is required to heat the secondary air and to dry the material from all the water prior to burning.
	The use of auxiliary burner(s) for start-up and shut-down	The incineration of waste inside the PCC is done by using a

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	and for maintaining the required operational combustion temperatures (according to the waste concerned) at all times when unburned waste is in the combustion chamber.	burner. The burning process is not self sufficient. The waste is very wet and has very low calorific value and will not self ignite.
	<p>The use of a combination of heat removal close to the furnace (e.g. the use of water walls in grate furnaces and/or secondary combustion chambers) and furnace insulation (e.g. refractory areas or other lined furnace walls) that, according to the net calorific value (NCV) and corrosiveness of the waste incinerated, provides for:</p> <ol style="list-style-type: none"> adequate heat retention in the furnace (low NCV wastes require higher retention of heat in the furnace); additional heat to be transferred for energy recovery (higher NCV wastes may allow/require heat removal from earlier furnace stages); <p>(See sections 4.2.22 and 4.3.12 of the BREF).</p>	The Plant does not have any heat removal mechanisms close to the furnace.
	The use of furnace (including secondary combustion chambers, etc.) dimensions that are large enough to provide for an effective combination of gas residence time and temperature, such that combustion reactions may approach completion and result in low and stable CO and VOC emissions.	The Plant has been designed and sized in a way to guarantee a residence time of 2 seconds in the SCC and to ensure that CO and TOC are within the IPPC limits.
	<p><i>Specific BAT for clinical waste incineration:</i></p> <p>Where grates are used, the use of a grate design that incorporates sufficient cooling of the grate such that it permits the variation of the primary air supply for the main purpose of combustion control, rather than for the cooling of the grate itself. Air-cooled grates with well distributed air</p>	The Thermal Treatment Facility at Marsa is a Rotary Kiln.

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	cooling flow are generally suitable for wastes of NCV of up to approx. 18 MJ/kg. Higher NCV wastes (e.g. above approx. 18 MJ/kg) may require water (or other liquid) cooling in order to prevent the need for excessive primary air levels to control grate temperature, i.e. levels that result in a greater air supply than the optimum for combustion control (see section 4.2.14 of BREF).	
Maintenance	To maintain all equipment in good working order, and to carry out maintenance inspections and preventative maintenance in order to achieve this.	All equipment needs to be kept in good working order to ensure that the Plant provides the service expected. Preventive maintenance is done on a daily basis such a lubrication of chains, cleaning of certain equipment, etc. However, the majority of the maintenance needs the Plant to be switched off due to safety reasons.
Shutdowns	In order to reduce overall emissions, to adopt operational regimes and implement procedures (e.g. continuous rather than batch operation, preventative maintenance systems) in order to minimise as far as practicable planned and unplanned shutdown and start-up operations.	Plant shut downs for maintenance cannot be reduced due to the design. The fact that the SCC is in a horizontal position and the boiler does not have a radiation heat boiler before, dust accumulates along the SCC and blocks the entrance to the boiler. Hence switching off is done every 4 weeks, whereby the Plant is cooled down and cleaned.
Emissions to air	The use of an overall flue-gas treatment (FGT) system that generally provides for the operational emission levels listed in Table 5.2 of the BREF for releases to air associated with the use of BAT (see pp. 25-26 of this document). (Concentrations are standardised at 11 % Oxygen, dry gas, 273K and 101.3kPa).	<i>(Please provide a document showing whether compliance with the upper associated emission levels indicated in Table 5.2 is being achieved. Please also compare this data to the emission limit values indicated in Annex VI the Industrial Emissions Directive, 2010/75/EU).</i>

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		Compliance table for 2010 in respect of upper 24 hour threshold:						
			HCl	CO	SO2	TOC	NOx	Dust
		% Compliance with 100% limit	99.9		99.9	99.2	99.7	99.7
		% Compliance with 97% limit	99.5		99.7	96.5	89.9	99.0
		% Compliance with 95% limit		95.2				
		% Daily compliance (CO)		50.0				
Flue gas treatment	<p>When selecting the overall FGT system, to take into account:</p> <ul style="list-style-type: none">a. the general factors described in section 4.4.1.1 and 4.4.1.3 of the BREF;b. the potential impacts on energy consumption of the installation (section 4.4.1.2 of BREF);c. the additional overall-system compatibility issues that may arise when retrofitting existing installations (see section 4.4.1.4 of BREF)	<p>The FGT system has been designed to treat the emissions expected to be generated from the incineration of abattoir waste. It was designed to use lime. However, when the Facility was upgraded to co-incinerate small fractions of hazardous wastes, the FGT was upgraded to use Sodium Bicarbonate and Activated Carbon. It was designed to achieve the emission limits stipulated in the Incineration Directive 2000/76 EC.</p>						

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
		WasteServ is currently upgrading further the FGT system with the introduction of UREA injection in the SCC to improve the NOX emission levels.
	When selecting between wet, semi-wet, and dry FGT systems, to take into account the (non-exhaustive) general selection criteria given as an example in Table 5.3 (p. 27 of this document).	Considering the quantities and type of waste incinerated, a dry scrubber was sufficiently efficient to achieve the emission thresholds.
	To prevent the associated increased electrical consumption, to generally avoid the use of two bag filters in one FGT line.	The FGT has only one bag house filter since there is only one incineration line.
	<p>The reduction of FGT reagent consumption and of FGT residue production in dry, semi-wet, and intermediate FGT systems by a suitable combination of:</p> <ol style="list-style-type: none"> adjustment and control of the quantity of reagent(s) injected in order to meet the requirements for the treatment of the flue-gas such that the target final operational emission levels are met; the use of the signal generated from fast response upstream and/or downstream monitors of raw HCl and/or SO₂ levels (or other parameters that may prove useful for this purpose) for the optimisation of FGT reagent dosing rates; the re-circulation of a proportion of the FGT residues collected (which usually contain a significant proportion of unreacted flue-gas treatment reagents). <p>The applicability and degree of use of the above techniques that represents BAT will vary according to the waste characteristics and consequential flue-gas nature, the final emission level required, and technical experience from their</p>	<p>The injection of reagent is manually controlled whereby the Plant operator monitoring the emission values increase and decrease manually the feeding rate. In case that the feeding rate cannot be increased further and the HCl and SO₂ levels are high, waste loading is stopped.</p> <p>The filter cake collected from the Bag House filter is not re-circulated. It is collected and exported for final disposal.</p>

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	practical use at the installation.	
	<p>The use of primary (combustion-related) NOX reduction measures to reduce NOX production, together with either SCR or SNCR, according to the efficiency of flue-gas reduction required.</p> <p>In general SCR is considered BAT where higher NOX reduction efficiencies are required (i.e. raw flue-gas NOX levels are high) and where low final flue-gas emission concentrations of NOX are desired.</p>	<p>WasteServ is currently installing an automatic UREA injection system to lower further the NOX emission values.</p>
	<p>For the reduction of overall PCDD/F emissions to all environmental media, the use of:</p> <ol style="list-style-type: none"> techniques for improving knowledge of and control of the waste, including in particular its combustion characteristics, using a suitable selection of techniques described in section 4.1 of the BREF; primary (combustion related) techniques (summarised in section 4.4.5.1 of BREF) to destroy PCDD/F in the waste and possible PCDD/F precursors; the use of installation designs and operational controls that avoid those conditions (see 4.4.5.2) that may give rise to PCDD/F reformation or generation, in particular to avoid the abatement of dust in the temperature range of 250–400 °C (even 200-400 °C); the use of a suitable combination of one or more of the following additional PCDD/F abatement measures: <ol style="list-style-type: none"> adsorption by the injection of activated carbon or other reagents at a suitable reagent dose rate, 	<p>Incineration of waste takes place at temperatures above 850°C and the temperature is manually maintained at a constant temperature. In order to reduce the formation of PCDD/F the Plant is equipped with an economiser following the Waste Heat Recovery Boiler to ensure that the temperature coming out of the Economiser is not above the 180°C. Only after that the temperature is low enough that flue gas cleaning commences. The flue gas cleaning starts by the injection of Sodium Bicarbonate and Activated Carbon. The mixture of flue gas and reagent passes through a cyclone where the gas is mixed thoroughly with the reagent and then passes through the Bag House Filter.</p>

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	<ul style="list-style-type: none"> with bag filtration, or ii. adsorption using fixed beds with a suitable adsorbent replenishment rate, or iii. multi layer SCR, adequately sized to provide for PCDD/F control, or iv. the use of catalytic bag filters (but only where other provision is made for effective metallic and elemental Hg control). 	
	<p>Where wet scrubbers are used, to carry out an assessment of PCDD/F build up (memory effects) in the scrubber and adopt suitable measures to deal with this build up and prevent scrubber breakthrough releases. Particular consideration should be given to the possibility of memory effects during shut-down and start-up periods.</p>	The FGT at the Thermal Treatment Facility is a Dry System.
	If re-burn of FGT residues is applied, then suitable measures should be taken to avoid the re-circulation and accumulation of Hg in the installation.	Not applicable
	<p>For the control of Hg emissions where wet scrubbers are applied as the only or main effective means of total Hg emission control:</p> <ul style="list-style-type: none"> a. the use of a low pH first stage with the addition of specific reagents for ionic Hg removal, in combination with the following additional measures for the abatement of metallic (elemental) Hg, as required in order to reduce final air emissions to within the BAT emission ranges given for total Hg, b. activated carbon injection, or c. activated carbon or coke filters. 	Not applicable

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	For the control of Hg emissions where semi-wet and dry FGT systems are applied, the use of activated carbon or other effective adsorptive reagents for the adsorption of PCDD/F and Hg (section 4.4.6.2 of BREF), with the reagent dose rate controlled so that final air emissions are within the BAT emission ranges given for Hg.	Hg is controlled by the injection of Activated Carbon at an hourly rate of 4kg.
	<p><i>Specific BAT for hazardous waste incineration:</i></p> <p>For merchant hazardous waste incinerators (commercial plants normally accepting a wide range of hazardous wastes) and other hazardous waste incinerators feeding wastes of highly varying composition and sources, the use of:</p> <ol style="list-style-type: none"> wet FGT is generally BAT to provide for improved control of short-term air emissions (although dry FGT is also applied at some hazardous waste incinerators treating such wastes; such systems may have specific local advantages where there are particular restrictions e.g. on the use or discharge of water); specific techniques for the reduction of elemental iodine and bromine emissions (section 4.4.7.1 of BREF), where such substances exist in the waste at appreciable concentrations. 	Not applicable
Odour	To minimise the release of odour (and other potential fugitive releases) from bulk waste storage areas (including tanks and bunkers, but excluding small volume wastes stored in containers) and waste pretreatment areas by passing the extracted atmosphere to the incinerator for	Secondary combustion air used for the Incineration of waste is extracted from the shredder room to reduce odours and also from the bottom ash container to maintain the room at a negative pressure to avoid dust release into the atmosphere.

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	combustion.	
	<p>In addition it is also considered to be BAT to make provision for the control of odour (and other potential fugitive releases) when the incinerator is not available (e.g. during maintenance) by:</p> <ol style="list-style-type: none"> avoiding waste storage overload, and/or extracting the relevant atmosphere via an alternative odour control system. 	<p>When the Plant is down for maintenance, hazardous waste acceptance is stopped but waste acceptance of slaughtering waste and fallen animals cannot be stopped due to the fact that there is no alternative disposal plant and storage of this particular place at the place of origin is not possible due to lack of facilities.</p>
Discharges of waste water	<p>The use of separate systems for the drainage, treatment and discharge of rainwater that falls on the site, including roof water, so that it does not mix with potential or actual contaminated waste water streams.</p>	<p>Roof rain water is currently collected in a dedicated water reservoir and used at the Plant. Ground rain water is considered as contaminated water and is discharged in the sewers.</p>
	<p>Where wet flue-gas treatment is used:</p> <ol style="list-style-type: none"> the use of on-site physico/chemical treatment of the scrubber effluents prior to their discharge from the site (section 4.5.11 of the BREF), and thereby to achieve, at the point of discharge from the effluent treatment plant (ETP), emission levels generally within the operational emission level ranges associated with BAT that are identified in Table 5.4 (p. 28 of this document); the separate treatment of the acid and alkaline waste water streams arising from the scrubber stages, when there are particular drivers for the additional reduction of releases to water that result, and/or where HCl and/or gypsum recovery is to be carried out; the re-circulation of wet scrubber effluent within the 	<p><i>(Amongst others, for point (a) please compare the monitoring and emission levels at the MTTF to the ones in Table 5.4).</i></p> <p>The facility is equipped with a dry flue-gas treatment.</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<p>scrubber system, and the use of the electrical conductivity (mS/cm) of the re-circulated water as a control measure, so as to reduce scrubber water consumption by replacing scrubber feed-water;</p> <p>d. the provision of storage/buffering capacity for scrubber effluents, to provide for a more stable waste water treatment process;</p> <p>e. the use of sulphides (e.g. M-trimercaptotriazine) or other Hg binders to reduce Hg (and other heavy metals) in the final effluent;</p> <p>f. when SNCR is used with wet scrubbing the ammonia levels in the effluent discharge may be reduced using ammonia stripping, and the recovered ammonia re-circulated for use as a NOX reduction reagent.</p>	
Residue (waste) production	<p>In order to avoid operational problems that may be caused by higher temperature sticky fly ashes, to use a boiler design that allows gas temperatures to reduce sufficiently before the convective heat exchange bundles (e.g. the provision of sufficient empty passes within the furnace/boiler and/or water walls or other techniques that aid cooling). The actual temperature above which fouling is significant is waste type and boiler steam parameter dependent. In general for MSW it is usually 600 – 750 °C, lower for hazardous waste and higher for sewage sludges. Radiative heat exchangers, such as platten type super heaters, may be used at higher flue-gas temperatures than other designs.</p>	<p>The facility is not equipped with a Radiation Heat Boiler. Immediately after the Secondary Combustion Chamber is found the convective heat exchange bundles. This is the reason why the Plant needs to be switched off after 4 weeks of operations. The sticky fly ash blocks the entrance to the boiler.</p> <p>Modifying the Plant to introduce a radiation heat boiler would entail a long shutdown which cannot be afforded.</p>
	<p>The use of a suitable combination of the techniques and principles described in section 4.6.1 of the BREF for</p>	<p>All slaughtering waste is shredded to a particle size of 50mm to facilitate its incineration. The rotation of the PCC</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<p>improving waste burnout to the extent that is required so as to achieve a TOC value in the ash residues of below 3 wt % and typically between 1 and 2 wt %, including in particular:</p> <ol style="list-style-type: none"> the use of a combination of furnace design, furnace operation and waste throughput rate that provides sufficient agitation and residence time of the waste in the furnace at sufficiently high temperatures, including any ash burn-out areas; the use of furnace designs that, as far as possible, physically retain the waste within the combustion chamber (e.g. narrow grate bar spacings for grates, rotary or static kilns for appreciably liquid wastes) to allow its combustion. The return of early grate riddlings to the combustion chamber for re-burn may provide a means to improve overall burn out where they contribute significantly to the deterioration of burnout; the use of techniques for mixing and pretreatment of the waste, according to the type(s) of waste received at the installation; the optimisation and control of combustion conditions, including air (oxygen) supply and distribution. 	<p>is maintained at a low rotational velocity not higher than 15 Hz so that while mixing takes place, the waste will have ample time to dry and incinerate properly.</p> <p>On the waste entrance side, the main Primary Chamber burner is installed and secondary air needed for combustion is introduced. At the opposite end another secondary air blower is installed to assist the incineration of waste that is not fully combusted in case not sufficient oxygen is available in the PCC.</p> <p>Furthermore, clinical and hazardous waste with higher calorific value is introduced in the PCC in small quantities to assist combustion of abattoir waste which has a low calorific value.</p>
Management of residues (wastes) from incineration	<p>The use of the techniques described in sections 4.1.5.5 or 4.6.4 of the BREF to, as far as practicably and economically viable, remove ferrous and non-ferrous recyclable metals for their recovery either:</p> <ol style="list-style-type: none"> after incineration from the bottom ash residues, or where the waste is shredded (e.g. when used for certain combustion systems) from the shredded 	<p>Due to the fact that the waste incinerated consists mainly of slaughtering waste and fallen animals, ferrous and non-ferrous recyclable metals are not found in the waste stream. There was no scope in installing such a recovery system.</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	wastes before the incineration stage.	
	<p>The separate management of bottom ash from fly ash and other FGT residues, so as to avoid contamination of the bottom ash and thereby improve the potential for bottom ash recovery. Boiler ash may exhibit similar or very different levels of contamination to that seen in bottom ash (according to local operational, design and waste specific factors) – it is therefore also BAT to assess the levels of contaminants in the boiler ash, and to assess whether separation or mixing with bottom ash is appropriate. It is BAT to assess each separate solid waste stream that arises, for its potential for recovery either alone or in combination.</p>	<p>Bottom ash is collected separately from Boiler ash and filter ash. Bottom ash is considered (through ash analysis) as non-hazardous and can be landfilled. Filter cake and boiler dust are considered to be hazardous and needs to be exported to authorised facilities for final disposal.</p>
	<p>Where a pre-dedusting stage is in use (see sections 4.6.3 and 4.4.2.1 of the BREF), an assessment of the composition of the fly ash so collected should be carried out to assess whether it may be recovered, either directly or after treatment, rather than disposed of.</p>	<p>Not applicable</p>
	<p>The treatment of bottom ash (either on or off-site), by a suitable combination of:</p> <ol style="list-style-type: none"> dry bottom ash treatment with or without ageing (sections 4.6.6 and 4.6.7 of the BREF), or wet bottom ash treatment, with or without ageing (sections 4.6.6 and 4.6.8 of the BREF), or thermal treatment (section 4.6.9 of the BREF for separate treatment, and section 4.6.10 for in-process thermal treatment) or screening and crushing (section 4.6.5) <p>to the extent that is required to meet the specifications set</p>	<p>Bottom as collected is kept in a container for a week (to cool down) and then taken to the landfill for disposal. No further treatment is carried out.</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	for its use or at the receiving treatment or disposal site e.g. to achieve a leaching level for metals and salts that is in compliance with the local environmental conditions at the place of use.	
	The treatment of FGT residues (on or off-site) to the extent required to meet the acceptance requirements for the waste management option selected for them, including consideration of the use of the FGT residue treatment techniques described in section 4.6.11 of the BREF.	Filter cake from the FGT is exported to an authorised facility for final disposal.
Noise and vibration	The implementation of noise reduction measures to meet local noise requirements (techniques are described in sections 4.7 and 3.6 of the BREF); for IPPC sites in Malta, noise limits are normally set at less than 5 dB above background.	The main equipment which generates noise is all enclosed in sound proof chambers to limit noise emissions. Noise monitoring was carried out to ensure that the Plant is compliant with the noise limits stipulated for a safe work environment.
Raw material consumption	The general optimisation of the re-circulation and re-use of waste water arising on the site within the installation, as described in section 4.5.8 of the BREF, including for example, if of sufficient quality, the use of boiler drain water as a water supply for the wet scrubber in order to reduce scrubber water consumption by replacing scrubber feed-water (see section 4.5.6 of the BREF).	Waste water for the boiler together with reject water from the RO are mixed with clean rain water and used for the washing of the Facility. Waste water contaminated with blood is disposed in the drains because it cannot be recycled.
Accident prevention and control	<p>The development of a plan for the prevention, detection and control (described in section 4.1.4.7 of the BREF) of fire hazards at the installation, in particular for:</p> <ul style="list-style-type: none"> • waste storage and pretreatment areas • furnace loading areas • electrical control systems 	The Plant is equipped with a number of fire extinguishers depending on the fire class that is possible in that particular area where the extinguisher is installed. Around the Plant perimeter there is a fire extinguishing ring installation. The Plant has a dedicated fire fighting water reservoir. The Solvents Platform has an automatic fire sensing installation.

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<ul style="list-style-type: none"> bag house filters and static bed filters. <p>It is generally BAT for the plan implemented to include the use of:</p> <ol style="list-style-type: none"> automatic fire detection and warning systems, and the use of either a manual or automatic fire intervention and control system as required according to the risk assessment carried out. 	In case of fire, foam is used to extinguish the fire.
Energy efficiency and energy recovery	<p>The overall optimisation of installation energy efficiency and energy recovery, taking into account the techno-economic feasibility (with particular reference to the high corrosivity of the flue-gases that results from the incineration of many wastes e.g. chlorinated wastes), and the availability of users for the energy so recovered, as described in section 4.3.1 of the BREF, and in general:</p> <ol style="list-style-type: none"> to reduce energy losses with flue-gases, using a combination of the techniques described in sections 4.3.2 and 4.3.5 of the BREF; the use of a boiler to transfer the flue-gas energy for the production of electricity and/or supply of steam/heat with a thermal conversion efficiency of: <ol style="list-style-type: none"> for mixed municipal waste at least 80 %; for pretreated municipal wastes (or similar waste) treated in fluidised bed furnaces, 80 to 90 %; for hazardous wastes giving rise to increased boiler corrosion risks (typically from chlorine/sulphur content), above 60 to 70 %; for other wastes, conversion efficiency should generally be increased in the range 60 to 90 %. 	The Thermal Treatment Facility is not equipped with a steam turbine to transfer the heat energy into electrical energy. However, it is foreseen in the Development Brief to utilise the steam for the Autoclave Plant in order to dry and sterilise the material.

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	To secure where practicable, long-term base-load heat/steam supply contracts to large heat/steam users, so that a more regular demand for the recovered energy exists and therefore a larger proportion of the energy value of the incinerated waste may be used.	The plant only produces maximum of 3500kg/hr of steam. It is not possible to find a market for such small quantities of steam at low pressure of 8.5 bar.
	<p>In cases where electricity is generated, the optimisation of steam parameters (subject to user requirements for any heat and steam produced), including consideration of (see section 4.3.8 of the BREF):</p> <ol style="list-style-type: none"> the use of higher steam parameters to increase electrical generation, and the protection of boiler materials using suitably resistant materials (e.g. claddings or special boiler tube materials). <p>The optimal parameters for an individual installation are highly dependent upon the corrosivity of the flue-gases and hence upon the waste composition.</p>	Not applicable
	<p>The selection of a turbine suited to:</p> <ol style="list-style-type: none"> the electricity and heat supply regime, as described in section 4.3.7 of the BREF; high electrical efficiency. 	Not applicable
	At new or upgrading installations, where electricity generation is the priority over heat supply, the minimisation of condenser pressure, as described in section 4.3.9 of the BREF.	Not applicable
	The general minimisation of overall installation energy	The Incineration process is kept to the minimum

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	<p>demand, including consideration of the following (see section 4.3.6 of the BREF):</p> <ol style="list-style-type: none"> for the performance level required, the selection of techniques with lower overall energy demand in preference to those with higher energy demand; wherever possible, ordering flue-gas treatment systems in such a way that flue-gas reheating is avoided (i.e. those with the highest operational temperature before those with lower operational temperatures); where SCR is used: <ol style="list-style-type: none"> to use heat exchangers to heat the SCR inlet flue-gas with the flue-gas energy at the SCR outlet; to generally select the SCR system that, for the performance level required (including availability/fouling and reduction efficiency), has the lower operating temperature; where flue-gas reheating is necessary, the use of heat exchange systems to minimise flue-gas reheating energy demand; avoiding the use of primary fuels by using self produced energy in preference to imported sources. 	<p>requirements to maintain electricity consumption at a minimum level. There is no flue gas reheating and no SCR.</p>
	<p><i>Specific BAT for hazardous waste incineration:</i></p> <p>To reduce installation energy demand in general, and to achieve an average installation electrical demand (excluding pretreatment or residue treatment) of generally below 0.3-0.5 MWh/tonne of waste processed (see sections 3.5.5 and 4.3.6 of BREF). Smaller installations generally result in consumption levels at the upper end of this range. Weather conditions may have a significant impact on consumption</p>	<p>Electricity demand can only be improved by the installation of a new Power Factor for all the Plant. This needs an upgrade of the Plant Switch Room. In terms of equipment, no further reduction is possible.</p>

Aspect of BAT	BAT	Status at Marsa Thermal Treatment Facility
	owing to heating requirements, etc.	
Selection of cooling system	Where cooling systems are required, the selection of the steam condenser cooling system technical option that is best suited to the local environmental conditions, taking particular account of potential cross-media impacts, as described in section 4.3.10 of the BREF.	Not applicable
Boiler cleaning	The use of a combination of on-line and off-line boiler cleaning techniques to reduce dust residence and accumulation in the boiler, as described in section 4.3.19 of the BREF (this results in better heat exchange and may also reduce the risk of dioxin formation in the boiler).	The boiler is equipped with soot blowers which operate every 18 hours to clean dust which accumulates around the boiler water tubes.

Substance(s)	Table 5.2: Operational emission level ranges associated with the use of BAT (see notes below) for releases to air (in mg/Nm ³ or as stated)			
	Non-continuous samples	½ hour average	24 hour average	Comments
Total dust		1 – 20 (see split view 2)	1 – 5	In general the use of fabric filters give the lower levels within these emission ranges. Effective maintenance of dust control systems is very important. Energy use can increase as lower emission averages are sought. Controlling dust levels generally reduces metal emissions too.
Hydrogen chloride (HCl)		1 – 50	1 – 8	Waste control, blending and mixing can reduce fluctuations in raw gas concentrations that can lead to elevated short-term emissions.
Hydrogen fluoride (HF)		<2 (see split view 2)	<1	Wet FGT systems generally have the highest absorption capacity and deliver the lowest emission levels for these substances, but are generally more expensive. See Table 5.3 for consideration of criteria for selection between the main FGT systems, including cross-media impacts.
Sulphur dioxide (SO ₂)		1 – 150 (see split view 2)	1 – 40 (see split view 2)	Waste and combustion control techniques coupled with SCR generally result in operation within these emission ranges. The use of SCR imposes an additional energy demand and costs. In general at larger installations the use of SCR results in less significant additional cost per tonne of waste treated. High N waste may result in increased raw gas NO _x concentrations.
Nitrogen monoxide (NO) and nitrogen dioxide (NO ₂), expressed as nitrogen dioxide for installations using SCR		40 – 300 (see split view 2)	40 – 100 (see split view 2)	Waste and combustion control techniques with SNCR generally result in operation within these emission ranges. 24 hour averages below this range generally require SCR although levels below 70mg/Nm ³ have been achieved using SNCR e.g. where raw NO _x is low and/or at high reagent dose rates) Where high SNCR reagent dosing rates are used, the resulting NH ₃ slip can be controlled using wet FGT with appropriate measures to deal with the resultant ammoniacal waste water. High N waste may result in increased raw gas NO _x concentrations. (See also note 8 below in respect of small installations).
Nitrogen monoxide (NO) and nitrogen dioxide (NO ₂), expressed as nitrogen dioxide for installations not using SCR		30 – 350	120 – 180	Techniques that improve combustion conditions reduce emissions of these substances. Emission concentrations are generally not influenced greatly by FGT. CO levels may be higher during start-up and shut down, and with new boilers that have not yet established their normal operational fouling level
Gaseous and vaporous organic substances, expressed as TOC		1 – 20	1 – 10	Adsorption using carbon based reagents is generally required to achieve these emission levels with many wastes - as metallic Hg is more difficult to control than ionic Hg. The precise abatement performance and technique required will depend on the levels and distribution of Hg in the waste. Some waste streams have very highly variable Hg concentrations – waste pretreatment may be required in such cases to prevent peak overloading of FGC system capacity. Continuous monitoring of Hg is <u>not</u> required by Directive 2000/76/EC but has been carried out in some MSs
Carbon monoxide (CO)		5 – 100	5 – 30	See comments for Hg. The lower volatility of these metals than Hg means that dust and other metal control methods are more effective at controlling these substances than Hg.
Mercury and its compounds (as Hg)	<0.05 (see split view 2)	0.001 – 0.03	0.001 – 0.02	Techniques that control dust levels generally also control these metals
Total cadmium and thallium (and their compounds expressed as the metals)	0.005 - 0.05 (see split view 2)			Combustion techniques destroy PCDD/F in the waste. Specific design and temperature controls reduce <i>de-novo</i> synthesis. In addition to such measures, abatement techniques using carbon based absorbents reduce final emissions to within this emission range. Increased dosing rates for carbon absorbent may give emissions to air as low as 0.001 but result in increased consumption and residues.
Σ other metals	0.005 - 0.5			
Dioxins and furans (ng TEQ/Nm ³)	0.01 – 0.1 (see split view 2)			

Substances not included in Directive 2000/76/EC on waste incineration:				
Ammonia (NH ₃)	<10	1 – 10	<10 (see split view 1)	Effective control of NO _x abatement systems, including reagent dosing contributes to reducing NH ₃ emissions. Wet scrubbers absorb NH ₃ and transfer it to the waste water stream.
Benz(a)pyrene	For these substances there was insufficient data to draw a firm BAT conclusion on emission levels. However, the data provided in Chapter 3 indicates that their emission levels are generally low. PCBs, PAHs and benz(a)pyrene can be controlled using the techniques applied for PCDD/F. N ₂ O levels are determined by combustion technique and optimisation, and SNCR optimisation where urea is used.			Techniques that control PCDD/F also control Benz(a)pyrene, PCBs and PAHs
PCBs				
PAHs				
Nitrous oxide (N ₂ O)				Effective oxidative combustion and control of NO _x abatement systems contribute to reducing N ₂ O emissions. The higher levels may be seen with fluidised beds operated at lower temperatures e.g. below ~900 °C
NOTES:				
1. The ranges given in this table are the levels of operational performance that may generally be expected as a result of the application of BAT – they are not legally binding emission limit values (ELVs)				
2. Σ other metals = sum of Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and their compounds expressed as the metals				
3. Non-continuous measurements are averaged over a sampling period of between 30 minutes and 8 hours. Sampling periods are generally in the order of 4 – 8 hours for such measurements.				
4. Data is standardised at 11 % Oxygen, dry gas, 273K and 101.3kPa				
5. Dioxin and furans are calculated using the equivalence factors as in EC/2000/76				
6. When comparing performance against these ranges, in all cases the following should be taken into account: the confidence value associated with determinations carried out; that the relative error of such determinations increases as measured concentrations decrease towards lower detection levels				
7. The operational data supporting the above-mentioned BAT ranges were obtained according to the currently accepted codes of good monitoring practice requiring measurement equipment with instrumental scales of 0 – 3 times the WID ELV. For parameters with an emission profile of a very low baseline combined with short period peak emissions, specific attention has to be paid to the instrumental scale. For example changing the instrumental scale for the measurement of CO from 3-times the WID ELV to a 10-times higher value, has been reported in some cases, to increase the reported values of the measurement by a factor of 2 – 3. This should be taken into account when interpreting this table.				
8. One MS reported that technical difficulties have been experienced in some cases when retrofitting SNCR abatement systems to existing small MSW incineration installations, and that the cost effectiveness (i.e. NO _x reduction per unit cost) of NO _x abatement (e.g. SNCR) is lower at small MSWIs (i.e. those MSWIs of capacity <6 tonnes of waste/hour).				
SPLIT VIEWS:				
1 BAT 35 : Based upon their knowledge of the performance of existing installations a few Member States and the Environmental NGO expressed the split view that the 24 hour NH ₃ emission range associated with the use of BAT should be <5 mg/Nm ³ (in the place of <10 mg/ Nm ³)				
2 BAT 35 : One Member State and the Environmental NGO expressed split views regarding the BAT ranges in table 5.2 (air). These split views were based upon their knowledge of the performance of a number of existing installations, and their interpretation of data provided by the TWG and also of that included in this BREF document (e.g. in Chapter 3). The final outcome of the TWG meeting was the ranges shown in Table 5.2, but with the following split views recorded: total dust 1/2hr average 1 - 10 mg/Nm ³ ; NO _x (as NO ₂) using SCR 1/2hr average 30 - 200 and 24hr average 30 - 100 mg/Nm ³ ; Hg and its compounds (as Hg) non-continuous 0.001 - 0.03 mg/Nm ³ ; Total Cd + Tl non-continuous 0.005 - 0.03mg/Nm ³ ; Dioxins and furans non-continuous 0.01 - 0.05 ng TEQ/Nm ³ . Based on the same rationale, the Environmental NGO also registered the following split views: HF 1/2hr average <1 mg/Nm ³ ; SO ₂ 1/2hr average 1 – 50 mg/Nm ³ and 24hr average 1 – 25 mg/Nm ³ .				

Table 5.2 Operational emission level ranges associated with the use of BAT for releases to air from waste incinerators

Criteria	Wet FGT (W)	Semi-wet FGT (SW)	Dry lime FGT (DL)	Dry sodium bicarbonate FGT (DS)	Comments
Air emissions performance	+	0	-	0	<ul style="list-style-type: none"> in respect of HCl, HF, NH₃ & SO₂ wet systems generally give the lowest emission levels to air each of the systems are usually combined with additional dust and PCDD/F control equipment DL systems may reach similar emission levels as DS & SW but only with increased reagent dosing rates and associated increased residue production.
Residue production	+	0	-	0	<ul style="list-style-type: none"> residue production per tonne waste is generally higher with DL systems and lower with W systems with greater concentration of pollutants in residues from W systems material recovery from residues is possible with W systems following treatment of scrubber effluent, and with DS systems
Water consumption	-	0	+	+	<ul style="list-style-type: none"> water consumption is generally higher with W systems Dry systems use little or no water
Effluent production	-	+	+	+	<ul style="list-style-type: none"> the effluents produced (if not evaporated) by W systems require treatment and usually discharge – where a suitable receptor for the salty treated effluent can be found (e.g. marine environments) the discharge itself may not be a significant disadvantage ammonia removal from effluent may be complex
Energy consumption	-	0	0	0	<ul style="list-style-type: none"> energy consumption higher with W systems due to pump demand – and is further increased where (as is common) combined with other FGT components e.g. for dust removal
Reagent consumption	+	0	-	0	<ul style="list-style-type: none"> generally lowest reagent consumption with W systems generally highest reagent consumption with DL – but may be reduced with reagent re-circulation SW, and DL & DS systems can benefit from use of raw gas acid monitoring (see 4.4.3.9)
Ability to cope with inlet variations of pollutant	+	0	-	0	<ul style="list-style-type: none"> W systems are most capable of dealing with wide ranging and fast changing inlet concentrations of HCl, HF and SO₂ DL systems generally offer less flexibility – although this may be improved with the use of raw gas acid monitoring (see 4.4.3.9)
Plume visibility	-	0	+	+	<ul style="list-style-type: none"> plume visibility is generally higher with wet systems (unless special measures used) dry systems generally have the lowest plume visibility
Process complexity	- (highest)	0 (medium)	+	+	<ul style="list-style-type: none"> W systems themselves are quite simple but other process components are required to provide an all round FGT system, including a waste water treatment plant etc.
Costs - capital	Generally higher	medium	Generally lower	Generally lower	<ul style="list-style-type: none"> additional cost for wet system arises from the additional costs for complementary FGT and auxiliary components – most significant at smaller plants
Costs – operational	medium	Generally lower	medium	Generally lower	<ul style="list-style-type: none"> there is an additional operational cost of ETP for W systems – most significant at smaller plants higher residue disposal costs where more residues are produced, and more reagent consumed. W systems generally produce lowest amounts of reagents and therefore may have lower reagent disposal costs. op. costs include consumables, disposal and maintenance costs. Op. costs depend very much on local prices for consumables and residue disposal.
Note: + means that the use of the technique generally offers an advantage in respect of the assessment criteria considered 0 means that the use of the technique generally offers no significant advantage or disadvantage in respect of the assessment criteria considered - means that the use of the technique generally offers a disadvantage in respect of the assessment criteria considered					

Table 5.3: An example assessment of some IPPC relevant criteria that may be taken into account when selecting between wet/semi-wet/dry FGT options

Parameter	BAT range in mg/l (unless stated)	Sampling and data information
Total suspended solids as defined by Directive 91/271/EEC	10 – 30 (95 %) 10 – 45 (100 %)	<ul style="list-style-type: none"> based on spot daily or 24 hour flow proportional sample
Chemical oxygen demand	50 – 250	<ul style="list-style-type: none"> based on spot daily, or 24 hour flow proportional sample
pH	pH 6.5 – pH 11	<ul style="list-style-type: none"> continuous measurement
Hg and its compounds, expressed as Hg	0.001 – 0.03 (see split view 1)	<ul style="list-style-type: none"> based on monthly measurements of a flow proportional representative sample of the discharge over a period of 24 hours with one measurement per year exceeding the values given, or no more than 5 % where more than 20 samples are assessed per year There have been some positive experiences with continuous monitoring of Hg Total Cr levels below 0.2 mg/l provide for control of Chromium VI Sb, Mn, V and Sn are not included in Directive 2000/76
Cd and its compounds, expressed as Cd	0.01 – 0.05 (see split view 1&2)	
Tl and its compounds, expressed as Tl	0.01 – 0.05 (see split view 2)	
As and its compounds, expressed as As	0.01 – 0.15 (see split view 1)	
Pb and its compounds, expressed as Pb	0.01 – 0.1	
Cr and its compounds, expressed as Cr	0.01 – 0.5 (see split view 2)	
Cu and its compounds, expressed as Cu	0.01 – 0.5 (see split view 2)	
Ni and its compounds, expressed as Ni	0.01 – 0.5 (see split view 2)	
Zn and its compounds, expressed as Zn	0.01 – 1.0 (see split view 2)	
Sb and its compounds, expressed as Sb	0.005 – 0.85 (see split view 1)	
Co and its compounds, expressed as Co	0.005 – 0.05	
Mn and its compounds, expressed as Mn	0.02 – 0.2	
V and its compounds, expressed as V	0.03 – 0.5 (see split view 1)	
Sn and its compounds, expressed as Sn	0.02 – 0.5	
PCDD/F (TEQ)	0.01 – 0.1 ng TEQ/l (see split view 1&2)	<ul style="list-style-type: none"> average of 6 monthly measurements of a flow proportional representative sample of the discharge over a period of 24 hours

NOTE:

1. Values are expressed in mass concentrations for unfiltered samples
2. Values relate to the discharge of treated scrubber effluents without dilution
3. BAT ranges are not the same as ELVs – see comments in introduction to Chapter 5
4. pH is one important parameter for waste water treatment process control
5. Confidence levels decrease as measured concentrations decrease towards lower detection levels

SPLIT VIEWS:

1 BAT 48: One Member State and the Environmental NGO expressed split views regarding the BAT ranges in table 5.4 (water). These split views were based upon their knowledge of the performance of a number of existing installations, and their interpretation of data provided by the TWG and also of that included in this BREF document (e.g. in Chapter 3). The final outcome of the TWG meeting was the ranges shown in Table 5.4, but with the following split views recorded: Hg 0.001 - 0.01 mg/l; Cd 0.001 - 0.05 mg/l; As 0.003 - 0.05 mg/l; Sb 0.005 - 0.1 mg/l; V 0.01 - 0.1 mg/l; PCDD/F <0.01 - 0.1 ng TEQ/l.

2 BAT 48: Based on the same rationale, the Environmental NGO also registered the following split views: Cd 0.001 - 0.02 mg/l; Tl 0.001 – 0.03 mg/l; Cr 0.003 – 0.02 mg/l; Cu 0.003 – 0.3 mg/l; Ni 0.003 – 0.2 mg/l; Zn 0.01 – 0.05 mg/l; PCDD/F <0.01 ng TEQ/l.

Table 5.4: BAT associated operational emission levels for discharges of waste water from effluent treatment plant receiving FGT scrubber effluent