

H1



Welcome to the H1 Software

Version 2.4 - Nov 2011

Introduction

This version of the tool accompanies the Horizontal Guidance Note H1 and the eleven supporting technical annexes.

Important Notes:

With the exception of Annexes E and J this software tool can be used to complete risk assessments within the technical annexes which support H1. However, further information may need to be provided in the following areas:

- detailed assessment of fate and effects, where required
- decision-making trails for the comparison and ranking of options

This software provides a general structure for assessing costs and environmental impacts. You may need to decide the best way to apply this structure to fit the nature and pattern of your operation, in particular:

- where load is variable, such as seasonal or demand-led operations
- where a number of processes are conducted at the same time, such as integrated operations
- where a number of products are made, with possible differences in unit operations and release points employed
- where fugitive or potential emergency releases are of particular interest

Information in this database will be used to determine your EPR permit, therefore to get the most from this software tool, you should:

- read the H1 Overview document, to understand the basic principles, module structure and methods
- use the HELP boxes and refer to the H1 guidance as you progress to ensure that the data you input is representative and accurate

- use the comments boxes to clarify assumptions and data sources

Some basic instructions for using the software tool are provided on our web site at:
<http://environment-agency.resultspage.com/search?p=Qts=ev2w=H1>

Reference Information

Please complete the following information:

Company Name: Innovative Environmental Solutions (UK) Ltd
Location: Union Road, Oldbury, B69 3EL
Permit Number: EAIEPR/CP332TEVA001

If you have data already stored in a previous version of the H1 software you may import it by pressing the button to the right.

Please note that before the import can take place any data that already exists in this copy of the tool will be removed.

Import Utility

Part 1

Introduction to Part 1

Part 1: Describe the Scope and Options

The aim of this part is to:

- state the OBJECTIVES of the assessment
- in the case of ENVIRONMENTAL ASSESSMENT of the whole facility, describe the scope of the activities to be included in the assessment;
- in the case of OPTIONS APPRAISALS, identify candidate options for BAT by considering all relevant techniques to prevent and minimise pollution and the scope of activities covered by the techniques.

Depending on the reason for the assessment, you will need to complete different modules of the guidance. The software will automatically select the required modules according to the responses you enter.

NOTE: If you are going to complete more than one assessment or appraisal, make sure that you create a copy of the H1 file for each new assessment BEFORE you begin to input data. This is because Microsoft Access automatically saves changes to the current file you are using, rather than allowing you to save your changes at the end of your work.

TO CONTINUE WITH PART 1, PRESS "NEXT".

Describe the Objectives

Depending on the reason for the assessment you will need to complete different parts of the tool.

Select the type of assessment:

- a) to carry out an ENVIRONMENTAL ASSESSMENT of the releases resulting from the facility as a whole Do Parts 1, 2 and 3 only
- b) to conduct a costs/benefits OPTIONS APPRAISAL to determine BAT for selected releases from a facility Do Parts 1, 2, 3 and 4 and continue with 5 and 6 if necessary

1.1 Briefly summarise the objectives and reason for the assessment in terms of the main environmental impacts or emissions to be controlled:

To determine the potential environmental impact from the operation of a 180,000 tonnes / year gasification facility, treating refined ASR located at Union Road, Oldbury

Scope of Environmental Assessment

List the activities included in the assessment

This should include all the activities in your permit, broken down into the basic process steps, such as: raw materials storage, handling, processing, emission control, waste treatment etc. as appropriate. See H1 for guidance and use the comments box below to provide any additional information.

Number	Activity	Comments
1	Receipt of refined automotive shredder residue (ASR) at the installation from the adjacent facility	
2	Storage of ASR at the installation	
3	Raw materials storage and handling	
4	Gasification of ASR at the installation	
5	Energy generation at the installation	
6	Flue gas treatment at the installation	
7	Handling of residues remaining after gasification	
8	Storage and handling of air pollution control residues	
9	Offsite disposal of residues	

Describe the Candidate Options

Identify all reasonably applicable options of techniques

You should include:

- a) a brief description of individual control measures or configurations of control measures selected for each option, and the activities with which they are associated (the existing base-case may conveniently be the first option).
- b) justification why any techniques generally applicable to the regulated facility have not been selected for assessment (see relevant H1 annex) (This should be based on regulated facility-specific technical, not economic reasons).
- c) for new projects, whether any initial environmental assessment that was done at the project evaluation stage, or any screening of technology or process routes prior to this assessment, particularly where this has a bearing on environmental performance. (see H1)

In the case of b) or c) please enter your Comments here:

Selected technology is the only one proven for the specific feedstock (ASR) waste.
Detailed analysis and BAT assessments for the various candidate options for control of emissions are contained in section 7 of the supporting statement.

Option Number	Title	Description
1	Base-Case	Base case' is configuration as proposed and assessed in supporting statement.

Once a series of options have been generated for the proposed project, it is recommended that the Operator discuss these with the local Regulator to check both parties agree that the options are satisfactory. This may save the Operator from spending resources on assessment of options which are unlikely to meet the required environmental performance.

List the main activity or activities to which the release control options are applicable and any other activities that will be affected by the candidate control option on the main activity:

Part 2

Introduction to Part 2

Part 2: Emissions Inventory

The aim of this Part is to produce an inventory of sources and releases of polluting substances from each option. This is used as the basis for the subsequent evaluation of environmental impacts.

For this Part you will require information on:

- release points and sources of emissions to all media
- concentration and mass rate of released substances
- frequency and duration of releases and how these relate to long term and short term effects

IMPORTANT NOTES

- you may need to consider a suitable method for assessment of groups of pollutants, such as VOCs, heavy metals, uncharacterised liquid effluents, etc (see "Grouping air emissions" in Annex F).

TO CONTINUE WITH PART 2, PRESS "NEXT".

Air Release Points

Please define your Release Points for Releases to Air

Are there any Air emissions? Yes

Number	Description	Location or Grid Reference	Activity or Activities	Effective Height metres	Efflux Velocity m/s	Total Flow m ³ /hr	Comments
1	A1	398429, 290777	Exhaust gases from syngas combustion	50	30.6	288720	Stack has two flues. Normalised volumetric flow rate for each flue - 40.1 Nm ³ s ⁻¹ . Actual volumetric flow rate 43.8 Am ³ s ⁻¹

Air Emissions Inventory

Please list all Substances released to Air for each Release Point identified in the previous page.

Number	Substance	Measurement Method	Operating Mode (if relevant)	Data relating to Long Term effects			Data relating to Short Term effect			Annual Rate	ELV Conc.
				Conc.	Release Rate	Measurement Basis	Conc.	Release Rate	Measurement Basis		
				mg/m ³	g/s		mg/m ³	g/s		tonne/yr	mg/m ³
1	Nitrogen Dioxide	Estimated*		200	16.04					433.48	
2	Sulphur Dioxide (15 Min Mean)	Estimated*		50	4		49.87531	4.15 Min Mean		108.1	
3	Sulphur Dioxide (1 Hour Mean)	Estimated*		50	4		49.87531	4.1 Hr Mean			
4	Sulphur Dioxide (24 Hour Mean)	Estimated*		50	4		50	4.01 24 Hr Mean			
5	Particulates (PM10) (24 hr Mean)	Estimated*		10	0.8		10	0.802 24 hr Mean		21.62	
6	Carbon monoxide	Estimated*		50	4.01		50	4.01 8 hr mean		108.1	
7	Hydrogen chloride	Estimated*		10	0.802		10	0.81 hr mean		21.6	
8	Hydrogen fluoride (as F) (Monthly Mean)	Estimated*		1	0.08 Annual		1	0.0802 1 hr mean		2.16	
9	Lead	Estimated*		0.056	0.0044					0.12	
10	Arsenic and compounds (as As)	Estimated*		0.0007	5.6E-05 Annual					0.0015	
11	Cadmium and its compounds (as Cd)	Estimated*		0.025	0.00201 Annual					0.054	
12	Manganese and compounds (as Mn)	Estimated*		0.056	0.00449 Annual		0.056	0.00449 1 hr mean		0.12	
13	Mercury and compounds, except mercury alkyls, (as mercury alkyls, (as	Estimated*		0.05	0.00401 Annual		0.05	0.00401 1 hr mean		0.108	
14	Nickel (total Ni compounds in the PM10 fraction)	Estimated*		0.056	0.00449 Annual					0.12	
15	Chromium (VI) compounds (as Cr)	Estimated*		0.056	0.00449 Annual					1.1E-05	
16	Antimony and compounds (as Sb) except antimony tri	Estimated*		0.056	0.00449 Annual		0.056	0.00449 1 hr mean		0.12	
17	Vanadium	Estimated*		0.056	0.00449 Annual		0.056	0.00449 1 hr mean		0.12	
18	Dioxins and furans	Estimated*		1E-07	8.0E-09					2.2E-07	

Air Emissions Inventory Base Option

19	Chromium, chromium (II) compounds and chromium (III) compounds as Cr	Estimated*	0.056	0.00449 Annual	0.056	0.00449 1 hr mean	0.12
20	Copper dusts and mists (as CU)	Estimated*	0.056	0.00449 Annual	0.056	0.00449 1 hr mean	0.12
21	Particulates (PM10) (Annual Mean)	Estimated*	10	0.802 Annual			

Measurement method: * provide detail in comments box Comments Annual rates calculated on basis of 7507 operating hours / year

Water Discharge Locations

Please define the Final Discharge Locations for Releases to Water

Are there any Water emissions? No

Use the 'Add' button below to list all final discharge points.

For releases to sewer, this should be the point of discharge from the sewage treatment works.

N.B. For Riverine discharges (River, Upper Estuary) you only need enter the River description and flow once. Further details of individual releases can be entered on the next page. For Lower Estuary or Coastal discharges, separate Discharge Locations must be added here for each release point.

Number	Description	Final Discharge Category	River/Freshwater Flow Rate*
1		R	River Flow (m ³ /s):
			2

* For Saltwater discharges (e.g C or LE discharge types) see next

Energy Consumption

Please list all Energy Sources and Annual Consumption

Select energy sources by Clicking on 'Add' and using the pull-down list

Number	Energy Sources		Delivered MWh/yr	Conversion Factor	Primary MWh/yr	CO2	
						Factor	tonne/yr
1	Natural Gas	direct emissions	193605.5	1.00	193,606	0.19	36,785
2	Electricity from public supply	indirect emissions		2.40		0.17	
		Comments					

Raw Materials

Please list all Raw Materials Consumed:

Number	Material	Annual Consumption Units
1	ASR waste	180000 tonnes/year
2	Diesel	10 cubic m/year
3	Non-potable water	21000 cubic m/year
4	Activated carbon	71 tonnes/year
5	Ammonium hydroxide (25% solution)	3100 tonnes/year
6	Sodium bicarbonate	5255 tonnes/year
7	Hydrochloric acid	240 cubic m/year
8	Salt	0.36 tonnes/year
9	Di-ethylhydroxylamine	4 cubic m/year
10	Sodium hydroxide	4 cubic m/year

Comments

Waste Inventory

Please list all Waste Streams emitted:

Are there any Waste emissions? Yes

Number	Waste Stream	Mass tonne/yr	Category of Waste	Disposal/Recovery Option
1	APC residue	4,500	hazardous	Landfill (D5)
2	RODECs residue	25,614	other non-hazardous	Other Recycling (R3;R4;R5;R11 and R12
Comments				

Part 3

Introduction to Part 3

Part 3: Quantify Impacts

The aim of this Part is to quantify the effects on the environment of the releases listed in the inventory in Part 2. The guidance provides methods for assessing the eight main environmental considerations of most relevance to the EPR regime. Your releases may not result in effects to all eight of these considerations, and this tool allows you to screen out any that are not relevant.

The emissions you entered in Part 2 are automatically brought forward for assessment into each environmental consideration that is relevant for that type of release (e.g. a release may have more than one type of effect).

This part of the tool allows you to screen out any releases that are insignificant, and to identify those releases where further, detailed assessment of the potential environmental impact may be required.

IMPORTANT NOTE

This software tool only completes part of the requirements for Part 3, as described above. Depending upon the degree of risk to the environment presented by the releases, the operator may need to do further, detailed assessment of the potential effects using methodologies that are not provided here. This information should be submitted separately, as indicated within this part of the tool.

TO CONTINUE WITH PART 3, PRESS "NEXT".

Identify Relevant Impacts

Identify any environmental impacts that are not relevant to this assessment by deselecting from the list below:

Releases in Part 2?	Justification for omission
<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Air
<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Deposition from Air to Land
<input type="checkbox"/> No	<input type="checkbox"/> Water
<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Waste
<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Visual
<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Ozone Creation
<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Global Warming

If you have deselected an environmental impact as not relevant to this assessment, no further assessment of this impact will be carried out

Local Environmental Quality

Describe the Quality of the Environment:

Provide a brief description of the main local factors that may influence the importance of the impact of emissions in the surrounding environment

Air Quality

Are there any Environmental Quality Standards relating to substances released from the activities, which may be at risk due to additional contribution from the activity?
(Environmental Quality Standards for air and water are described in EPR Technical Guidance Notes)

Annual mean NO₂ objective has been exceeded at a number of locations in Sandwell. The installation will release NO₂ and is close to the junction of Dudley Road East and Roway Lane, an area where the NO₂ annual mean objective is predicted to be exceeded as a result of high traffic volumes, exacerbated by congestion at peak hours.
The incremental increase from the installation is predicted to give rise to a new exceedance at one location. It should however be noted that this is a direct consequence of the measured concentration, which is a four year average, being only 0.1 µg m⁻³ below the objective.

Are there any Local Air Quality Management Plans applicable to releases from the activity?

Air quality reviews and assessments in Sandwell have identified that the annual mean NO₂ objective has been exceeded at a number of locations and so Sandwell MBC has declared the whole Borough to be an air quality management area (AQMA).

Water Quality & Resources

Are there any Environmental Quality Standards relating to substances released from the activities, which may be at risk due to additional contribution from the activity?

No

Are proposals to abstract water satisfactory in order to obtain an abstraction licence?

Not applicable

Is the activity located in a groundwater vulnerable zone (for activities with direct releases to land only)?

Not applicable

Proximity to Sensitive Receptors

Is public annoyance likely to be an issue for noise, odour or plume visibility?

No

Local Environmental Quality

Are there any wildlife habitats, eg Special Areas of Conservation, or Special Protection Areas, likely to be affected by releases from the activity? (Description of requirements of Habitats Directive is provided in EPR Technical Guidance Notes)

No

Air Impacts

Calculate Process Contributions of Emissions to Air

This table estimates the Process Contribution (PC), calculated as the maximum ground level concentration for each emission listed in the inventory, according to the release point parameters input earlier. If you have more accurate data obtained through dispersion modelling, this may be entered as indicated and will be used instead of the estimated PC.

Number	Substance	Long Term			Short Term		
		EAL µg/m ³	PC µg/m ³	*Modelled PC µg/m ³	EAL µg/m ³	PC µg/m ³	Modelled PC µg/m ³
1	Nitrogen Dioxide	40	8.35	2.7	200	497	18.7
2	Sulphur Dioxide (15 Min Mean)		2.08		266	124	14
3	Sulphur Dioxide (1 Hour Mean)		2.08		350	124	13.1
4	Sulphur Dioxide (24 Hour Mean)		2.08		125	124	8.2
5	Particulates (PM10) (24 hr Mean)		0.416		50	24.9	0.65
6	Carbon monoxide		2.09		10000	124	12.3
7	Hydrogen chloride		0.418		750	24.9	6.3
8	Hydrogen fluoride (as F) (Monthly Mean)	16	0.0545	0.019	160	2.49	0.63
9	Lead	0.5	0.00229	0.0011		0.137	
10	Arsenic and compounds (as As)	0.003	0.00002919	0.000014		0.00175	
11	Cadmium and its compounds (as Cd)	0.005	0.00105	0.0005		0.0622	
12	Manganese and compounds (as Mn)	0.15	0.00234	0.0011	1500	0.140	0.035
13	Mercury and compounds, except mercury alkyls, (as Hg)	0.25	0.00209	0.001	7.5	0.125	0.031
14	Nickel (total Ni compounds in the PM10 fraction)	0.02	0.00234	0.0011		0.140	
15	Chromium (VI) compounds (as Cr)	0.0002	0.00234	0.0000001		0.140	
16	Antimony and compounds (as Sb) except antimony trioxide	5	0.00234	0.0011	150	0.140	0.035
17	Vanadium	5	0.00234	0.0011	1	0.140	0.035
19	Chromium, chromium (II) compounds and chromium (III) compounds as Cr	5	0.00234	0.0011	150	0.140	0.035
20	Copper dusts and mists (as CU)	10	0.00234	0.0011	200	0.140	0.035
21	Particulates (PM10) (Annual Mean)	40	0.418	0.19		24.9	

Note that the Process Contribution shown for each substance is the sum of the individual process contributions of each point from which the substance is emitted. Process Contributions obtained from modelling data should incorporate all relevant release points and flow conditions.

* State the location of any detailed air dispersion modelling and also the main assumptions:

Location of any detailed air dispersion modelling	Comments
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Air Impact Screening

Screen Out Insignificant Emissions to Air

This page displays the Process Contribution as a proportion of the EAL or EQS. Emissions with PCs that are less than the criteria indicated may be screened from further assessment as they are likely to have an insignificant impact.

Number	Substance	Long Term		Short Term		Long Term		Short Term		
		EAL	PC	EAL	PC	% PC of EAL	> 1% of EAL?	PC	% PC of EAL	> 10% of EAL?
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	%		µg/m ³	%	
1	Nitrogen Dioxide	40.0	200	2.71	6.76	Yes	18.8	9.36	No	
2	Sulphur Dioxide (15 Min Mean)	-	266	2.08	-	No	14.0	5.27	No	
3	Sulphur Dioxide (1 Hour Mean)	-	350	2.08	-	No	13.2	3.75	No	
4	Sulphur Dioxide (24 Hour Mean)	-	125	2.08	-	No	8.20	6.56	No	
5	Particulates (PM10) (24 hr Mean)	-	50.0	0.416	-	No	0.651	1.31	No	
6	Carbon monoxide	-	10,000	2.09	-	No	12.4	0.124	No	
7	Hydrogen chloride	-	750	0.418	-	No	6.31	0.841	No	
8	Hydrogen fluoride (as F) (Monthly Mean)	16.0	160	0.0191	0.119	No	0.631	0.394	No	
9	Lead	0.501	-	0.00111	0.221	No	0.137	-		
10	Arsenic and compounds (as As)	0.00301	-	0.00001400	0.467	No	0.00175	-		
11	Cadmium and its compounds (as Cd)	0.00500	-	0.000501	10.00	Yes	0.0622	-		
12	Manganese and compounds (as Mn)	0.151	1,500	0.00111	0.734	No	0.0351	0.00234	No	
13	Mercury and compounds, except mercury alkyls, (as mercury alkyls, (as	0.251	7.51	0.001000	0.401	No	0.0311	0.414	No	
14	Nickel (total Ni) compounds in the	0.0201	-	0.00111	5.51	Yes	0.140	-		

PM10 fraction)									
15	Chromium (VI) compounds (as Cr)	0.000201	-	0.00000010	0.0501	No	0.140	-	
16	Antimony and compounds (as Sb) except antimony tri	5.00	150	0.00111	0.0220	No	0.0351	0.0234	No
17	Vanadium	5.00	1,000	0.00111	0.0220	No	0.0351	3.51	No
19	Chromium, chromium (II) compounds and chromium (III) compounds as Cr	5.00	150	0.00111	0.0220	No	0.0351	0.0234	No
20	Copper dusts and mists (as CU)	10.00	200	0.00111	0.0110	No	0.0351	0.0176	No
21	Particulates (PM10) (Annual Mean)	40.0	-	0.191	0.476	No	24.9	-	

Air Impact Modelling

Identify need for Detailed Modelling of Emissions to Air

This page displays the Process Contributions in relation to the background pollutant levels and the EAL or EQS. You should use this information to decide whether to conduct detailed modelling. Note that releases that are insignificant are not shown as they are screened from further assessment. Also complete this page if you have already done detailed modelling.

Number	Substance	Air Bkgnd Conc.	PC	Long Term		Short Term	
				% PC of headroom (EAL -)	PEC	% PEC of EAL	PC (EAL - Bkgnd)
1	Nitrogen Dioxide	30	2.71	27.0	32.8	81.8	18.8
11	Cadmium and its compounds (as Cd)	0.000091	0.000501	10.2	0.000592	11.9	0.0622
14	Nickel (total Ni compounds in the PM10 fraction)	0.000677	0.00111	5.70	0.00178	8.89	0.140

Air Impact Modelling Assessment

See guidelines in H1 Annex F section entitled "Decide if you need detailed air modelling."

Describe here the justification for whether detailed modelling is, or is not required for any of the releases. Refer to the guidelines in H1 Annex F

In accordance with guidance given in H1 Annex F, detailed modelling is not required for cadmium or nickel as the PC long term + background concentration is < 70% standard at 11.9% and 8.9% respectively. For NO2, PC long term + background concentration is > 70% standard (81.8%). Further consideration of NO2 short term is not required. PC short term is less than 10% of the short term EQS and PCshort term is less than the value (28 microgram/m3) above which detailed modelling may be useful (Pcshort term <20% (standard shortterm - 2 X background long term). Detailed modelling using ADMS has been undertaken.

Describe source of background information:

Background data for cadmium and nickel taken from most recent available data (2009) from nearest monitoring point (Beacon Hill) in Defra heavy metals network. http://pollutantdeposition.defra.gov.uk/heavy_metals

Background data for NO2 taken from NETCEN (given in Table 3.1 of Air quality assessment report ref P1205 v9 issued 27 March 2013)

Document Reference of detailed modelling work:

Air quality assessment of emissions to atmosphere from proposed advanced recycling and electricity generation facility Report ref P1205 (File=P1205\text\Oldbury AQ v9.doc issue date 27 March 2013)

Deposition to Land from Air

With reference to H1 Guidance, describe assessment of deposition below:

Number	Substance	% PC of EAL	Insignificant?	Decision whether to screen as insignificant	Reason (See section "Deposition of air emissions onto land/Screen out insignificant emissions" of Annex F in H1)
1	Nitrogen Dioxide	6.76	%	Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR. Does contribute to acidification but no relevant sites that could be affected.	
2	Sulphur Dioxide (15 Min Mean)	-		Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR. Does contribute to acidification but no relevant sites that could be affected.	
3	Sulphur Dioxide (1 Hour Mean)	-		Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR. Does contribute to acidification but no relevant sites that could be affected.	
4	Sulphur Dioxide (24 Hour Mean)	-		Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR. Does contribute to acidification but no relevant sites that could be affected.	
5	Particulates (PM10) (24 hr Mean)	-		Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR.	
6	Carbon monoxide	-		Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR. Does contribute to acidification but no relevant sites that could be affected.	

7	Hydrogen chloride	-	Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR. Does contribute to acidification but no relevant sites that could be affected.
8	Hydrogen fluoride (as F) (Monthly Mean)	0.119	Yes Maximum process contribution is <1% EAL
9	Lead	0.221	Yes Maximum process contribution is <1% EAL
10	Arsenic and compounds (as As)	0.467	Yes Maximum process contribution is <1% EAL
11	Cadmium and its compounds (as Cd)	10.00	Yes PC is 0.001254 mg/m ² /day calculated on basis of emissions at limit (Appendix I supporting statement).
12	Manganese and compounds (as Mn)	0.734	Yes Maximum process contribution is <1% EAL
13	Mercury and compounds, except mercury alkyls, (as	0.401	Yes Maximum process contribution is <1% EAL
14	Nickel (total Ni compounds in the PM10 fraction)	5.51	Yes PC is 0.0028 mg/m ² /day compared with MDR of 0.11 mg/m ² /day calculated on basis of emissions at limit (Appendix I supporting statement).
15	Chromium (VI) compounds (as Cr)	0.0501	Yes Maximum deposition rate is 0.0% of MDR
16	Antimony and compounds (as Sb) except antimony tri	0.0220	Yes Maximum process contribution is <1% EAL

Deposition to Land from Air Base Option

17 Vanadium	0.0220	Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR.
18 Dioxins and furans	-	Yes
19 Chromium, chromium (II) compounds and chromium (III) compounds as Cr	0.0220	No
20 Copper dusts and mists (as CU)	0.0110	Yes Maximum process contribution is <1% EAL
21 Particulates (PM10) (Annual Mean)	0.476	Yes Not highly toxic, bioaccumulative or persistent. No sensitive receptors that could be affected. No relevant MDR. Does contribute to acidification but no relevant sites that could be affected.

For those emissions not screened as insignificant, describe the location of any further assessment here:

Dioxins and furans specifically addressed in accompanying Human Health Risk Assessment (report ref P1205).

Visual Impacts

Assess the visual impacts of plumes generated from the release points

Can ANY of the Options generate a visible plume

Yes

Can any of the release points generate a Visible Plume?

Yes

For what % of daylight hours per year does the Plume extend beyond the facility boundary?:

<5%

Refer to the guidance in Annex A and assign a level of significance:

Insignificant

Provide any supporting evidence below

Plume visibility assessment contained in Appendix I of supporting statement

Photochemical Ozone Creation Impacts

Number	Substance	Annual Rate tonne/yr	POCP Value per tonne	POCP
6	Carbon monoxide	108.10	2.7	291.87
1	Nitrogen Dioxide	433.48	2.8	1,213.74
2	Sulphur Dioxide (15 Min Mean)	108.10	4.8	518.88
3	Sulphur Dioxide (1 Hour Mean)		4.8	
4	Sulphur Dioxide (24 Hour Mean)		4.8	
Total:				2,024.49

Comments

Global Warming Potential Impacts

Substance	Source	Annual Rate MMW/yr	GWP Value per tonne	Annual GWP
CO2 Energy: direct	direct emissions	193,605.50	1.00	36,785.05
CO2 Energy: indirect	indirect emissions		1.00	
	Comments		Total:	36,785.05

Waste Impact Score Calculation

Number	Waste Stream	Mass	Final treatment or disposal method	(Score)	Waste Type	(Score)	Impact Score
1	APC residue	4,500	Landfill (D5)	30	hazardous	10	1350000
2	RODECs residue	25,614	Other Recycling (R3:R4:R5:R11 and R12)	3	other non-hazardous	2	153684
	Comments						

Summary Tables

Print or Preview summary tables:

Choose which summary tables

Air
Deposition from Air to Land
Waste
Visual
Ozone Creation
Global Warming

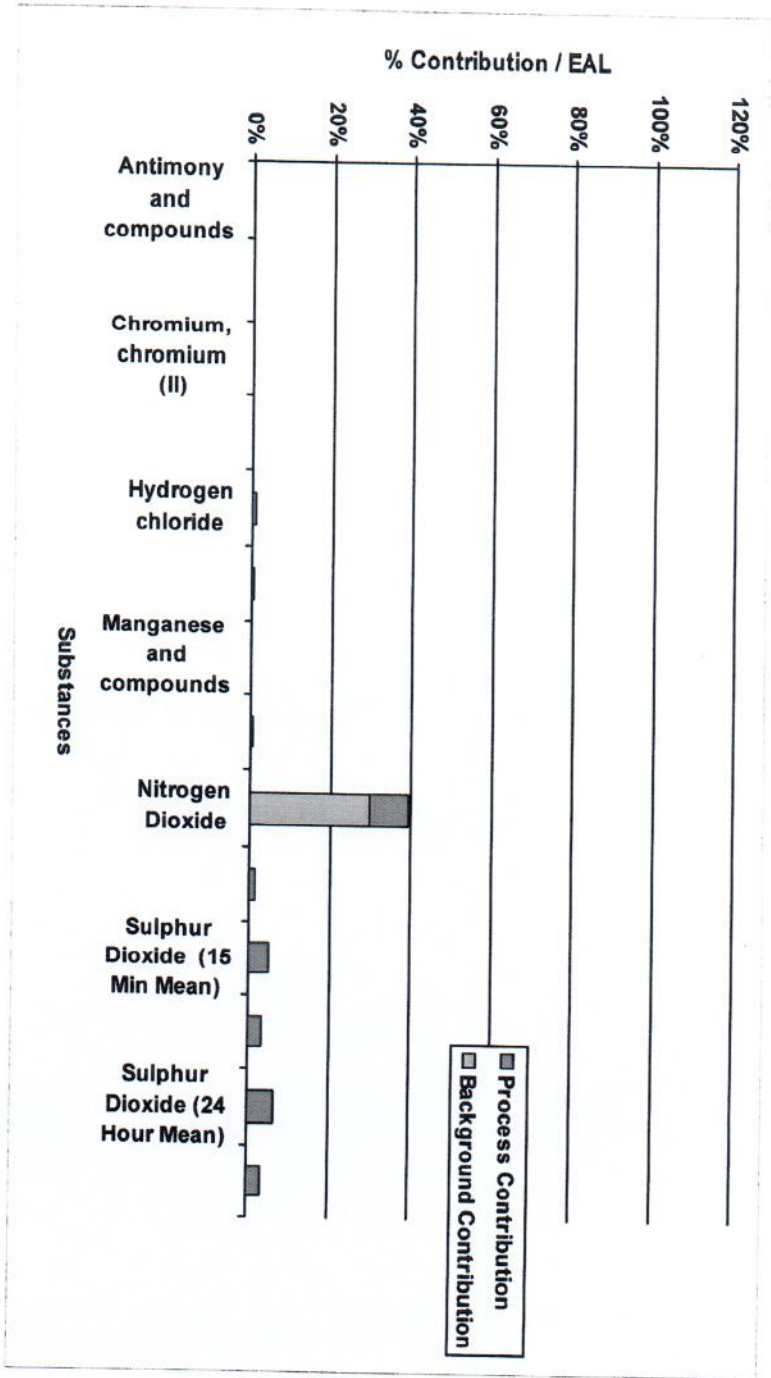
Preview

Print

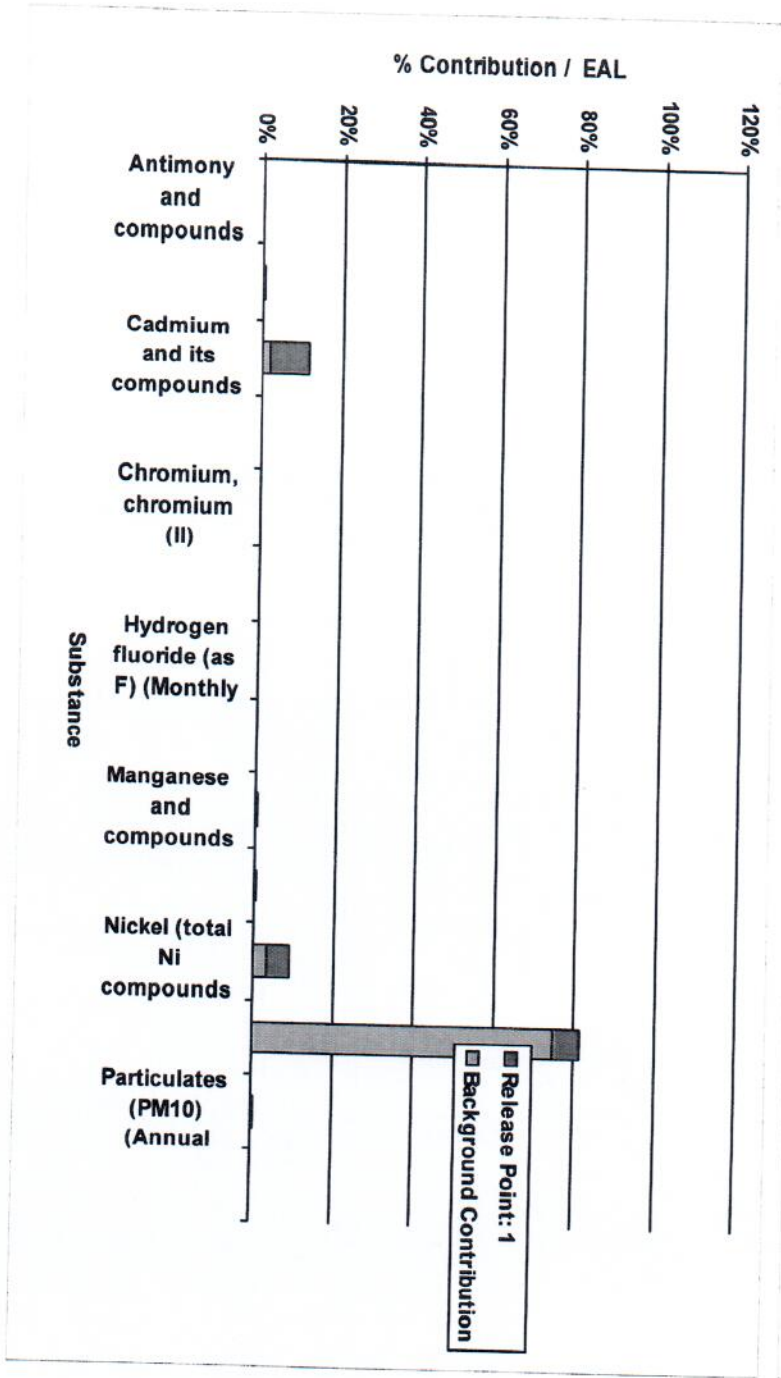
Include

- All Air and Water Substance
- Air and Water Release Not Screenshot

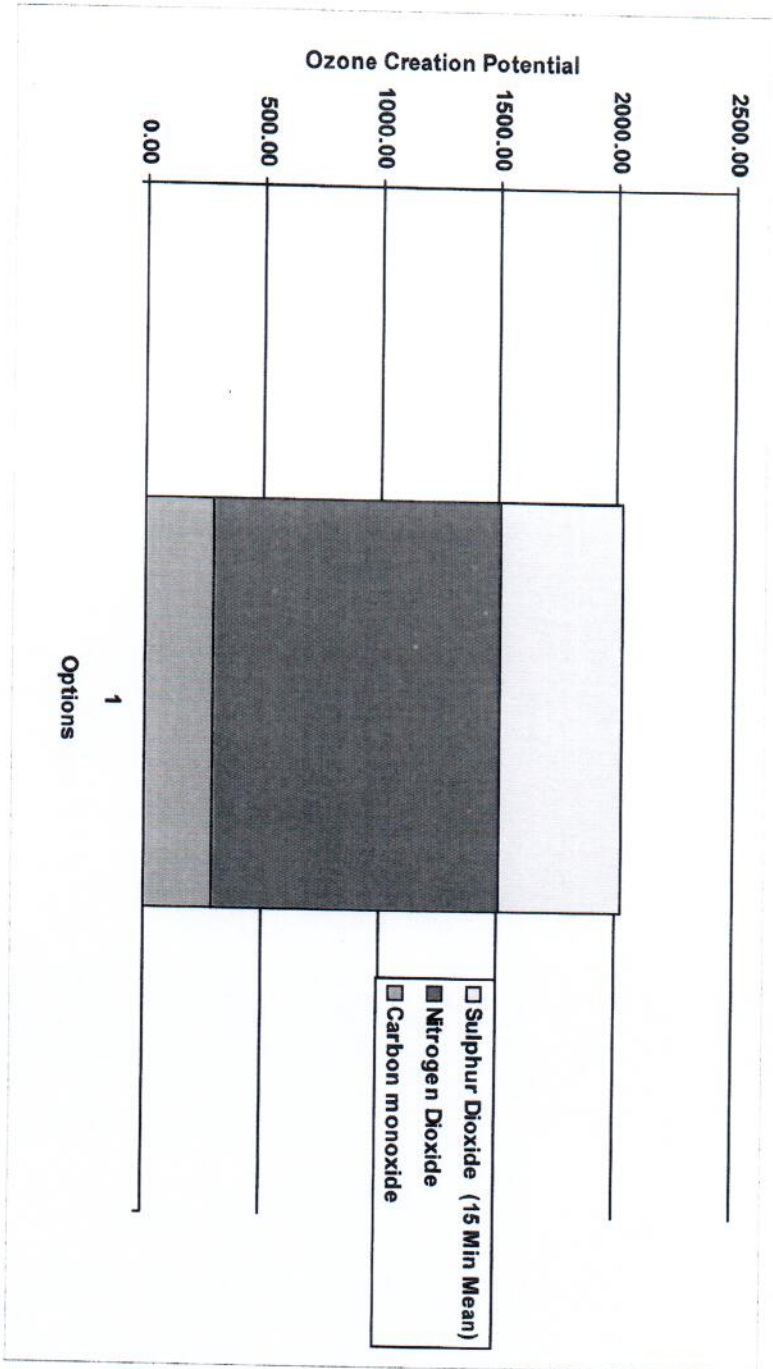
Air Short Term Effects - Comparison by Substance



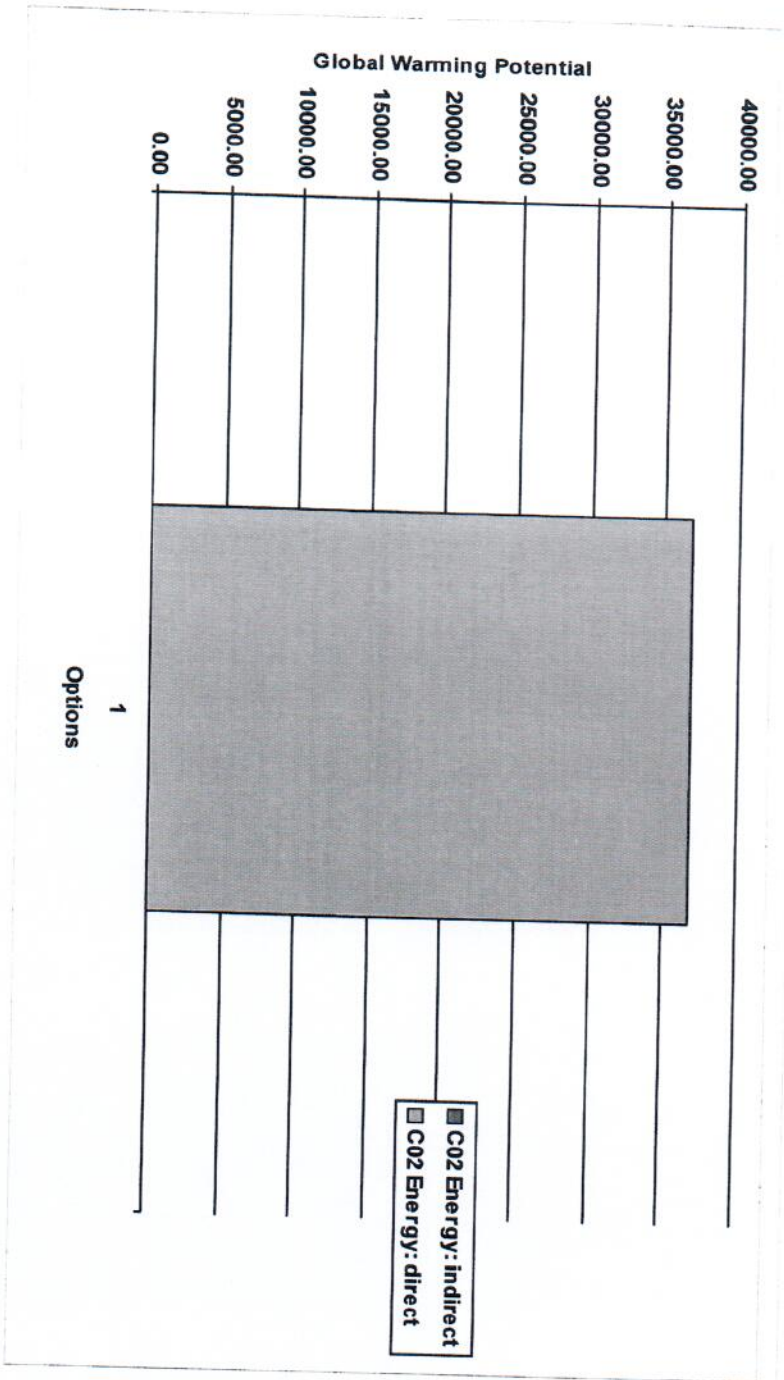
Air Long Term Effects - Comparison by Substance



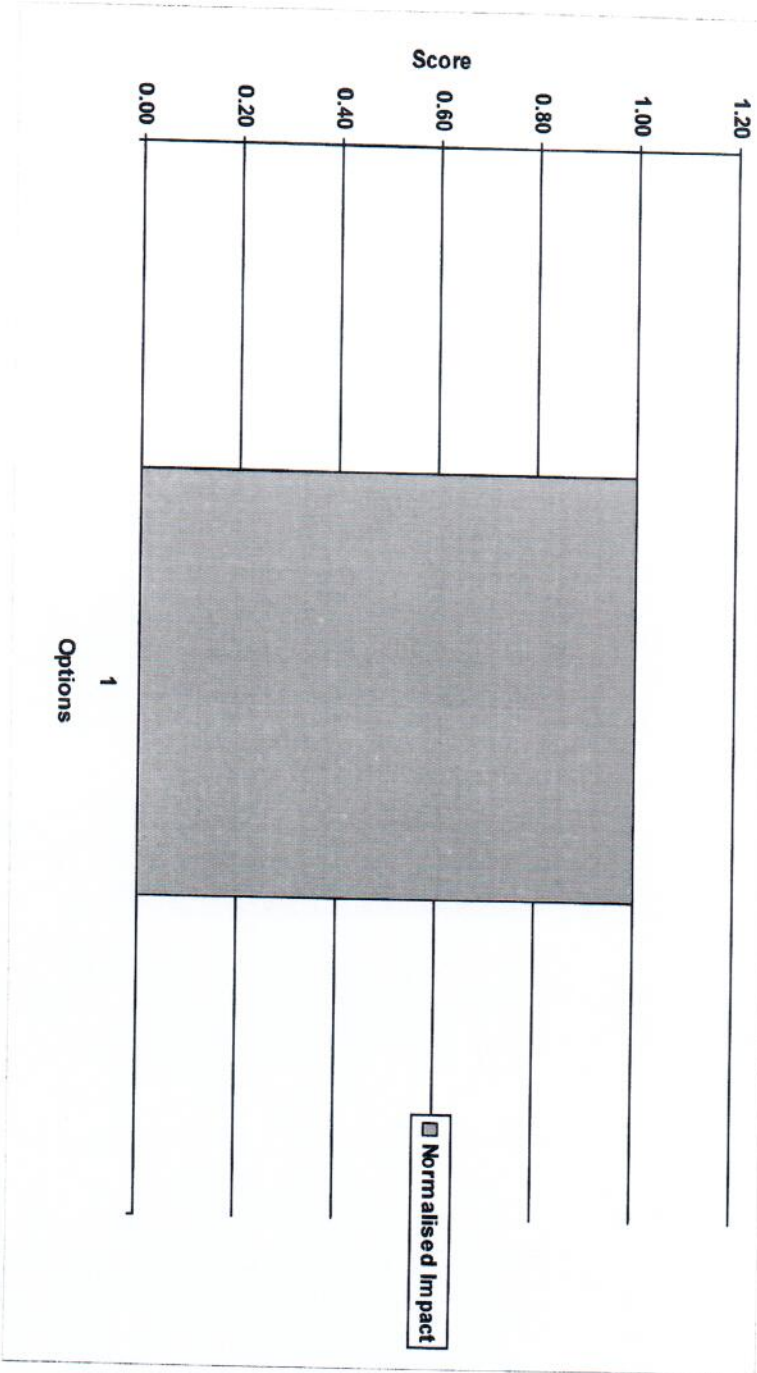
Ozone Creation - Substance Comparison



Global Warming - Substance Comparison



Waste - Option Comparison



Summary of Environmental Assessment

You have now completed all of the steps in this software for the environmental assessment. This will provide you with:

- an inventory of all emissions sources and substances emitted from your activities
- an information trail of how the impacts of these emissions have been assessed
- a summary of the impacts

You now need to use this information to confirm whether the emissions are acceptable, i.e. that they do not cause significant pollution to occur, by responding below:

Do any of the emissions exceed any of the following

Statutory Emission limit values: No If yes, identify the substances concerned and improvements that are needed to at least meet the statutory requirement

Environmental Quality Standards (air and water): No If yes, identify the substances concerned, the contribution from the activities and investigate whether further detailed fate and effect modelling and/or pollution controls are needed. Ensure that the relevant EQS reference conditions are applied.

Environmental Assessment Levels: No If yes, identify the substances concerned, the contribution from the activities and investigate whether further detailed fate and effect modelling and/or pollution controls are needed.

Use the box below to provide further information on any of the above to which you have responded 'Yes':

Finally, print all of the information and submit with your application. Remember to include any supplementary information and reports that you have had made reference to during the assessment procedure.

Part 4

Compare Impacts between Options

The aim of this Part is to compare the overall performance of each option for all of the environmental considerations assessed in Part 3, in order to identify which option represents the lowest impact on the environment as a whole.

IMPORTANT NOTE

Unless the best option is self-evident (i.e. results in the lowest impact for all considerations), you will need to use professional judgement to decide which option is the best overall. This judgement should be made taking into account the considerations described in the H1 guidance notes and may require decisions about the relative importance of environmental considerations. The operator should submit a response to the Regulator that describes how the decision has been made. The following page provides a structure which may be used to summarise the decision-making process.

To continue with Part 4, click 'Next'

Compare the Options

Review the graphs and summary data to rank the options according to environmental impact

Is the best Option self-evident?
i.e. results in the lowest impact in all environmental considerations

No

Is cost information required before the Best Available Technique can be selected?
If yes, continue to Part 5, after resolving cross media conflicts (next page) where relevant.

No

Resolve Cross Media Conflicts

Environmental Consideration	Importance	Comments / Justification
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Releases to Air: Long Term:

Short Term:

Deposition to Land:

Releases to Water: Long Term:

Short Term:

Visual:

POCP:

GWP:

Disposal of Waste:

Provide a description of how cross media conflicts have been resolved:

This will require reasoned judgement, with reference to any decisions or assumptions made over the relative importance of different environmental impacts. See H1 for requirements, guidelines and examples to assist in the process. You may submit this information

Location or reference to information on resolution of cross media conflicts:

Present a summary of the final ranking of options in the table below:

Number	Title	Ranking
1	Base-Case	

Summary of Option Appraisal

You have now completed all of the steps in this software for appraisal of BAT.

Finally, print all of the information and submit with your application. Remember to include any supplementary information and reports that you have had made reference to during the assessment procedure.