

H1



Welcome to the H1 Software

Version 2.01- May 2010

Introduction

This version of the tool accompanies Horizontal Guidance Note 1 Version 2.0 April 2010 (As Amended)

Important Notes:

This software tool can be used to complete most of the modules within 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 introduction to the H1 guidance, 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 www.environment-agency.gov.uk/H1SoftwareGuidance



The application has been optimised for a screen resolution of 800 x 600

Version 2.01 31 May 2010

In conjunction with:

www.ability-software.co.uk

Reference Information

Please complete the following information:

Company Name:

IQE Silicon Compounds Ltd.

Location:

Beech House, Pascal Close, Cypress Drive, St.Mellons, Cardiff, CF3 0LW

Permit Number:

BJ6968

Introduction to Module 1

Module 1: Describe the Scope and Options

The aim of this module is to:

- state the OBJECTIVES of the assessment
- in the case of ENVIRONMENTAL ASSESSMENT of the whole installation, 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 MODULE 1, PRESS "NEXT".

Describe the Objectives

Depending on the reason for the assessment, you will need to complete different modules of the guidance.

Select the type of assessment:

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

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

To evaluate severity of releases without the chemsorb scrubbers online

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
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1	Semiconductor process gas scrubbing
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Comments	
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Introduction to Module 2

Module 2: Emissions Inventory

The aim of this module 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 module you will require information on:

- release points and sources of emissions to all media
- concentration and mass rate of emitted substances
- frequency and duration of emissions 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 H1 guidance for details).

TO CONTINUE WITH MODULE 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	Efflux Velocity	Total Flow
				metres	m/s	m3/hr
1	A1	RSE1	Epitaxy	6	6.8	156
2	A2	RSE2	Epitaxy	6	6.7	154
3	A3	RSE3	Epitaxy	6	6.5	149
4	A4	RSE4	Epitaxy	6	7.1	162
5	A5	RSE5	Epitaxy	6		
6	A6	RSE6	Epitaxy	6		

Comments

Air Emissions Inventory

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

Number	Substance	Meas'ment Method	Operating Mode (if relevant)	Data relating to Long Term effects			Data relating to Short Term effects			Annual Rate tonne/yr	ELV Conc. mg/m3
				Conc.	Release Rate	Meas'ment Basis	Conc.	Release Rate	Meas'ment Basis		
				mg/m3	g/s		mg/m3	g/s			
1	Arsine	Periodic*	Normal	0.02	6.48E-07		0.02	6.48E-07			
2	Phosphine	Periodic*	Normal	0.0112	3.23E-07		0.0112	3.23E-07			
3	Diborane	Periodic*	Normal	0.0112	5.17E-07		0.0112	5.17E-07			
4	Germane	Periodic*	Normal	0.00141	1.3E-08		0.00141	1.3E-08			
5	Hydrogen chloride	Periodic*	Normal	0.02	1.03E-06		0.02	1.03E-06			

Measurement method: * provide detail in comments box Comments

Air Emissions Inventory

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

Number	Substance	Meas'ment Method	Operating Mode (if relevant)	Data relating to Long Term effects			Data relating to Short Term effects			Annual Rate	ELV Conc.
				Conc.	Release Rate	Meas'ment Basis	Conc.	Release Rate	Meas'ment Basis		
				mg/m3	g/s		mg/m3	g/s		tonne/yr	mg/m3
1	Hydrogen chloride	Periodic*	Normal	0.02	4.13E-06		0.02	4.13E-06			
2	Phosphine	Periodic*	Normal	0.00932	1.3E-07		0.00932	1.3E-07			
3	Diborane	Periodic*	Normal	0.01087	5.19E-07		0.01087	5.19E-07			
4	Arsine	Periodic*	Normal	0.01398	6.49E-07		0.01398	6.49E-07			

Measurement method: * provide detail in comments box Comments

Air Emissions Inventory

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

Number	Substance	Meas'ment Method	Operating Mode (if relevant)	Data relating to Long Term effects			Data relating to Short Term effects			Annual Rate	ELV Conc.
				Conc.	Release Rate	Meas'ment Basis	Conc.	Release Rate	Meas'ment Basis		
				mg/m3	g/s		mg/m3	g/s		tonne/yr	mg/m3
1	Hydrogen chloride	Periodic*	Normal	0.02	4.13E-06		0.02	4.13E-06			
2	Phosphine	Periodic*	Normal	0.00932	1.3E-07		0.00932	1.3E-07			
3	Diborane	Periodic*	Normal	0.01087	5.19E-07		0.01087	5.19E-07			
4	Arsine	Periodic*	Normal	0.01398	6.49E-07		0.01398	6.49E-07			

Measurement method: * provide detail in comments box Comments

Air Emissions Inventory

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

Number	Substance	Meas'ment Method	Operating Mode (if relevant)	Data relating to Long Term effects			Data relating to Short Term effects			Annual Rate	ELV Conc.
				Conc.	Release Rate	Meas'ment Basis	Conc.	Release Rate	Meas'ment Basis		
				mg/m3	g/s		mg/m3	g/s		tonne/yr	mg/m3
1	Hydrogen chloride	Periodic*	Normal	0.03	4.28E-06		0.03	4.28E-06			
2	Phosphine	Periodic*	Normal	0.01258	2.55E-07		0.01258	2.55E-07			
3	Diborane	Periodic*	Normal	0.01258	5.1E-07		0.01258	5.1E-07			
4	Arsine	Periodic*	Normal	0.01617	6.37E-07		0.01617	6.37E-07			

Measurement method: * provide detail in comments box Comments

Air Emissions Inventory

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

Number	Substance	Meas'ment Method	Operating Mode (if relevant)	Data relating to Long Term effects			Data relating to Short Term effects			Annual Rate	ELV Conc.
				Conc.	Release Rate	Meas'ment Basis	Conc.	Release Rate	Meas'ment Basis		
				mg/m3	g/s		mg/m3	g/s		tonne/yr	mg/m3
1	Arsine	Periodic*	Normal	0.01613	6.24E-07		0.01613	6.24E-07			
2	Phosphine	Periodic*	Normal	0.01433	3.74E-07		0.01433	3.74E-07			
3	Diborane	Periodic*	Normal	0.01254	5E-07		0.01254	5E-07			
4	Germane	Periodic*	Normal	0.00013	1.26E-08		0.00013	1.26E-08			
5	Hydrogen chloride	Periodic*	Normal	0.33	4.5E-06		0.33	4.5E-06			

Measurement method: * provide detail in comments box Comments

Raw Materials

Please list all Raw Materials Consumed:

Number	Material	Annual Consumption	Units
1	Non-potable Water		tonnes/year
2	Potable Water		tonnes/year

Comments

Introduction to Module 3

Module 3: Quantify Impacts

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

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

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

IMPORTANT NOTE

This software tool only completes PART of the requirements for module 3, as described above. Depending upon the degree of risk to the environment presented by the emissions, 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 module.

TO CONTINUE WITH MODULE 3, PRESS "NEXT".

Identify Relevant Impacts

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

Emissions in
Module 2?

Yes

☒ Air

Justification for omission

Yes

☐ Deposition from Air to Land

N/A

No

☐ Water

N/A

No

☐ Noise

assessment of this impact should be carried out according to sector guidance

No

☐ Odour

assessment of this impact should be carried out according to sector guidance

No

☐ Waste

N/A

-

☐ Accidents

assessment of this impact should be carried out according to sector guidance

Yes

☐ Visual

N/A

Yes

☐ Ozone Creation

N/A

Yes

☐ Global Warming

N/A

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 IPPC Technical Guidance Notes)

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

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?

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

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

Proximity to Sensitive Receptors

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

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 IPPC Technical Guidance Notes)

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	PC	* Modelled PC	EAL	PC	Modelled PC
		µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
1	Arsine	1.6	0.000201		48	0.00489	
2	Phosphine		0.00008485		42	0.00207	
3	Diborane	1.2	0.000161		36	0.00391	
4	Germane	6.4	0.00000201		190	0.00004884	
5	Hydrogen chloride		0.00110		750	0.0267	

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: Comments

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	EAL	PC	% PC of EAL	> 1% of EAL?	PC	% PC of EAL	> 10% of EAL?
		µg/m3	µg/m3	µg/m3	%		µg/m3	%	
1	Arsine	1.61	48.0	0.000201	0.0126	No	0.00489	0.0102	No
2	Phosphine	-	42.0	0.00008485	-		0.00207	0.00492	No
3	Diborane	1.21	36.0	0.000161	0.0134	No	0.00391	0.0109	No
4	Germane	6.41	190	0.00000201	0.00003136	No	0.00004884	0.00002571	No
5	Hydrogen chloride	-	750	0.00110	-		0.0267	0.00355	No

Air Impact Modelling Assessment

See guidelines in H1 Document

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

Describe source of background information:

Document Reference of detailed modelling work:

	Summary Tables
Print or Preview summary tables:	

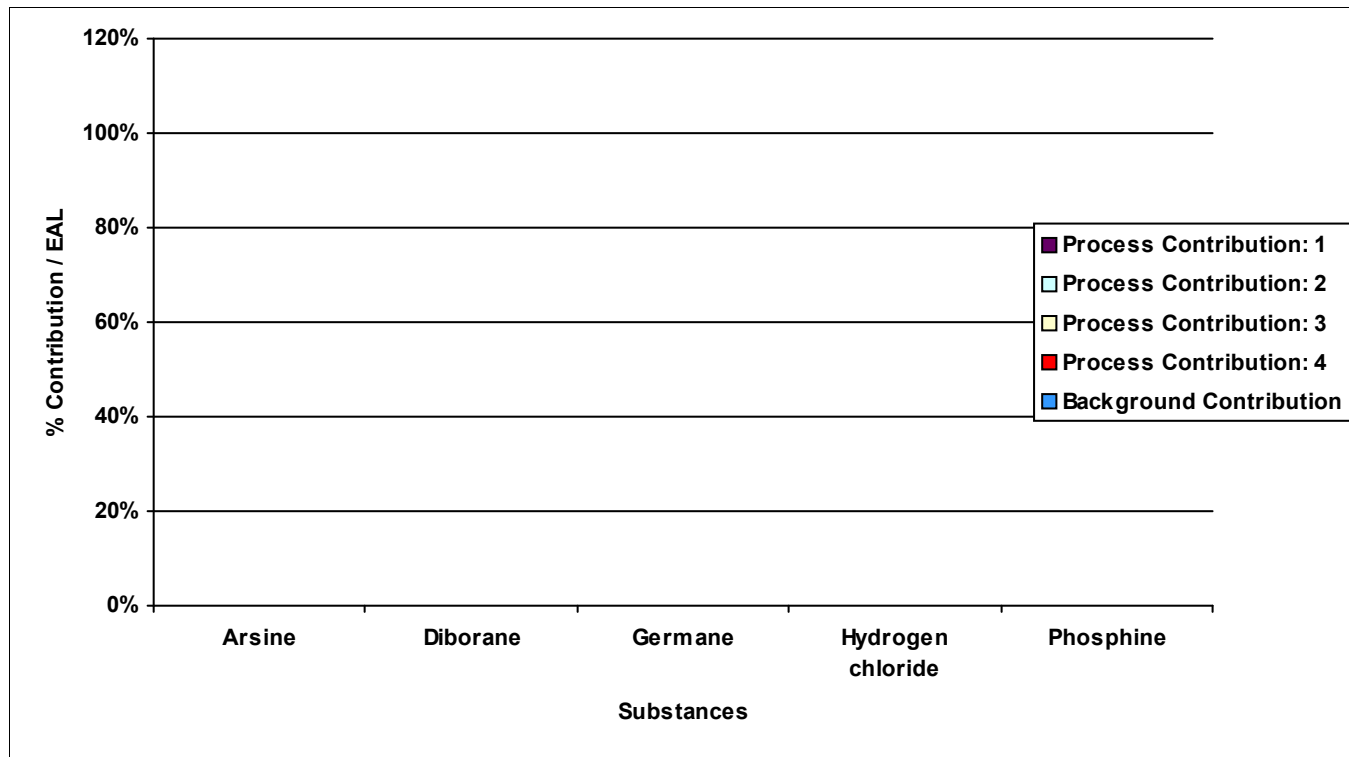
Choose a summary table

Air

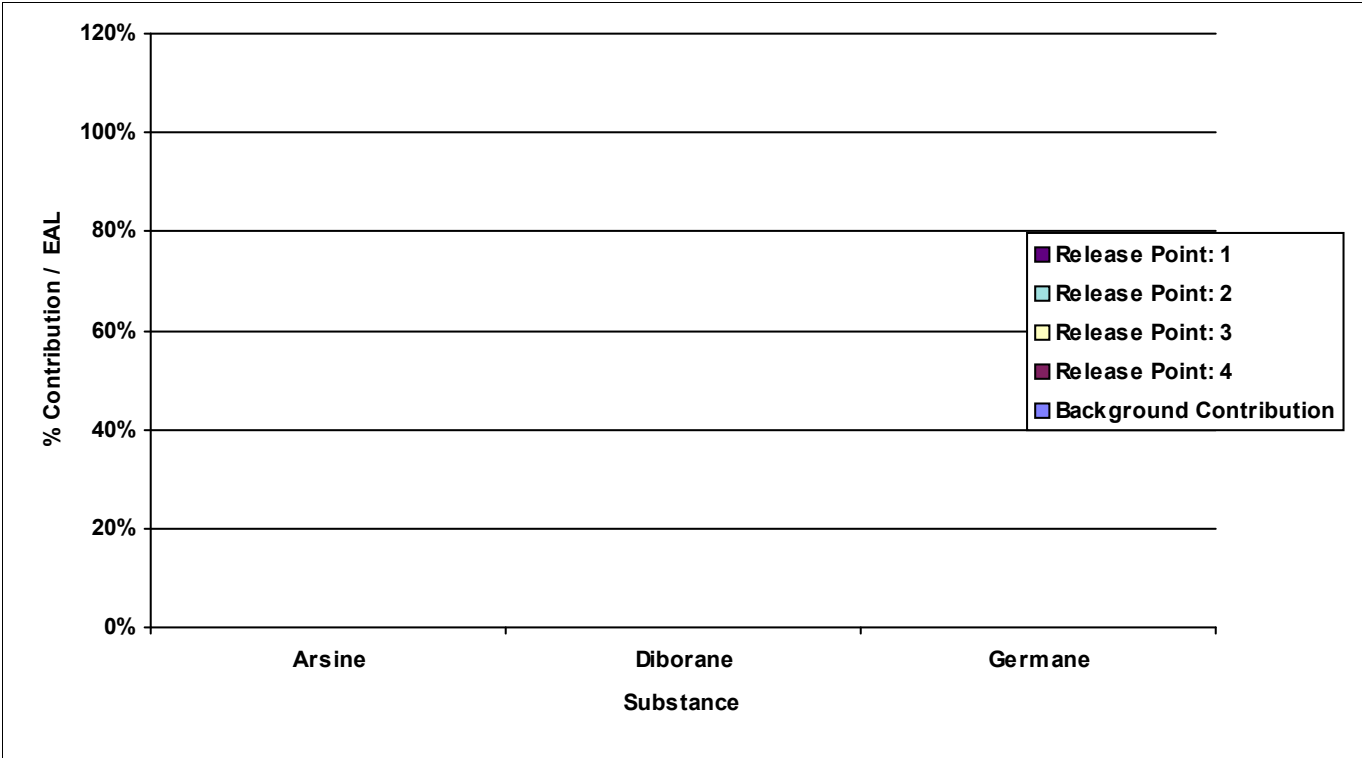
Preview

Print

Air Short Term Effects - Comparison by Substance



Air Long Term Effects - Comparison by Substance



	Ozone Creation - Substance Comparison

No Data Available

	Global Warming - Substance Comparison

No Data Available

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.