Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Headquarters,
Johnstown Castle Estate,
County Wexford, Ireland

GREENHOUSE GAS EMISSIONS PERMIT

Permit Register Number: IE-GHG058-10373-4

Operator: Intel Ireland Limited
Collinstown Industrial Park
Leixlip
Kildare

Installation Name: Intel Ireland

Site Name: Intel Ireland

Location: Collinstown Industrial Park
Leixlip
Kildare
Ireland

Introductory Note

This introductory note does not form a part of the Greenhouse Gas Emissions Permit.

This Greenhouse Gas Emissions Permit authorises the holder to undertake named activities resulting in emissions of Carbon Dioxide from the listed emission sources. It also contains requirements that must be met in respect of such emissions, including monitoring and reporting requirements. This Greenhouse Gas Emissions Permit places an obligation on the Operator to surrender allowances to the Agency equal to the annual reportable emissions of carbon dioxide equivalent from the installation in each calendar year, no later than four months after the end of each such year.

Contact with Agency:

If you contact the Agency about this Greenhouse Gas Emissions Permit please quote the following reference: Greenhouse Gas Emissions Permit Nº IE-GHG058-10373.

All correspondence in relation to this permit should be addressed to:

Email: help.ets@epa.ie

By Post: Climate Change Unit, Environmental Protection Agency
P.O. Box 3000, Johnstown Castle Estate,
Co. Wexford

Updating of the permit:

This Greenhouse Gas Emissions Permit may be updated by the Agency, subject to compliance with Condition 2. The current Greenhouse Gas Emissions Permit will normally be available on the Agency's website at www.epa.ie and ETSWAP.

Surrender of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially surrendered, a written application must be made to the on-line ETS portal, and written permission received from, the Agency through ETSWAP.

Transfer of the permit or part of the permit:

Before this Greenhouse Gas Emissions Permit can be wholly or partially transferred to another Operator a joint written application to transfer this Greenhouse Gas Emissions Permit must be made (by both the existing and proposed Operators) to, and written permission received from, the Agency through the on-line ETS portal ETSWAP.

Licence held pursuant to the Environmental Protection Agency Act 1992, as amended. (as of the date of this permit)**:**

IPC/IE Licence Register Number
P0207-04

Status Log

Current Permit

Permit number	Date application received	Date Permit issued	Comment
IE-GHG058-10373-4	27 November 2015	13 March 2018	1. Addition of emission source boiler S76 (and related emission point A104) and generator S77 (and related emission point A232). 2. Addition of source stream VOC Solvent Vapours (VO-001). 3. Correction of thermal input capacities of generators S21-S36 and S43 and S44

Previous Permits

Permit number	Change Type	Date application received	Date Permit issued	Comment
IE-GHG058-10373-1	GHG Permit Application	19 August 2013	28 August 2013	
IE-GHG058-10373-2	GHG Variation	25 February 2014	08 July 2014	Addition of 9 new emission sources, relabelling of one emission point and the inclusion of bottled natural gas as a de minimis source stream.
IE-GHG058-10373-3	GHG Variation	23 January 2015	26 February 2015	Addition of 5 emergency burners associated with the ASU as emission sources S71-S75 Addition of a second TMXW System as emission source S70

End of Introductory Note

Glossary of Terms

For the purposes of this permit the terms listed in the left hand column shall have the meaning given in the right hand column below:

The Agency	Environmental Protection Agency.
Agreement	Agreement in writing.
Allowance	Permission to emit to the atmosphere one tonne of carbon dioxide equivalent during a specified period issued for the purposes of Directive 2003/87/EC by the Agency or by a designated national competent authority of a Member State of the European Union.
Annual Reportable Emissions	Reportable Emissions of carbon dioxide made in any calendar year commencing from 1 January 2005 or the year of commencement of the activity, whichever is the later.
A & V Regulation	Commission Regulation (EU) No 600/2012 of 21 June 2012 on the verification of greenhouse gas emission reports and tonne-kilometre reports and the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Category A Installation	As defined in Article 19.2 (a) of the M&R Regulation.
Category B Installation	As defined in Article 19.2 (b) of the M&R Regulation.
Category C Installation	As defined in Article 19.2 (c) of the M&R Regulation.
The Directive	Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
Emissions	The release of greenhouse gases into the atmosphere from sources in an installation.
EPA	Environmental Protection Agency.
Fall-Back Methodology	As defined in Article 22 of the M&R Regulation.
GHG	Greenhouse gas.
GHG Permit	Greenhouse gas emissions permit.
Greenhouse Gas	Any of the gases in Schedule 2 of the Regulations.
IPC/IE	Integrated Pollution Control/Industrial Emissions.
Installation	Any stationary technical unit where one or more activities listed in Schedule 1 to the Regulations are carried out. Also any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution. References to an installation include references to part of an installation.

Installation with low emissions	As defined in Article 47 of the M&R Regulation.
Major Source Streams	As defined in Article 19.3 (c) of the M&R Regulation.
M&R Regulation	Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and any amendments or revisions thereto.
Mis-statement	An omission, misrepresentation or error in the Operators reported data, not considering the uncertainty permissible pursuant to Article 12(1)(a) of Regulation (EU) no 601/2012.
N/A	Not applicable.
Monitoring Plan	The Plan submitted and approved in accordance with Condition 3.1 of this permit and attached at Appendix 1.
Non-conformity	Any act or omission by the Operator, either intentional or unintentional, that is contrary to the greenhouse gas emissions permit and the requirements of the Monitoring Plan.
The National Administrator	The person so designated in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC.
The Operator (for the purposes of this permit)	Intel Ireland Limited
"operator"	Any person who operates or controls an installation or to whom decisive economic power over the functioning of the installation has been delegated.
Person	Any natural or legal person.
Reportable emissions	The total releases to the atmosphere of carbon dioxide (expressed in tonnes of carbon dioxide equivalent) from the emission sources specified in Table 2 and arising from the Schedule 1 activities which are specified in Table 1.
The Regulations	European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 (S.I. No 490 of 2012) and any amendments or revisions thereto.
The Verifier	A legal person or another legal entity carrying out verification activities pursuant to Regulation (EU) No 600/2012 and accredited by a national accreditation body pursuant to Regulation (EC) No 765/2008 and Regulation (EU) No 600/2012 or a natural person otherwise authorised, without prejudice to Article 5(2) of Regulation (EC) No 765/2008, at the time a verification report is issued.
The Registry	The Registry as provided for under Article 19 of Directive 2003/87/EC.

Schedule 1	Schedule 1 to the Regulations.

Reasons for the Decision

The Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of this permit, the Operator is capable of monitoring and reporting emissions in accordance with the requirements of the Regulations.

Activities Permitted

Pursuant to the Regulations the Agency issues this Greenhouse Gas Emissions Permit, subject to any subsequent revisions, corrections or modifications it deems appropriate, to:

The Operator:

Intel Ireland Limited
Collinstown Industrial Park
Leixlip
Kildare

Company Registration Number: 902934

to carry out the following

Categories of activity:

Annex 1 Activity
Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)

at the following installation(s):

Intel Ireland **Installation number:** 45

located at

Collinstown Industrial Park
Leixlip
Kildare
Ireland

subject to the five conditions contained herein, with the reasons therefor and associated tables attached thereto.

Conditions

Condition 1. The Permitted Installation

1.1 This permit is being granted in substitution for the previous GHG permit granted to the Operator as listed in the Status Log of this GHG permit.

1.2 The Operator is authorised to undertake the activities and/or the directly associated activities specified in Table 1 below resulting in the emission of carbon dioxide:

Table 1 - Activities which are listed in Schedule 1 of the Regulations and other directly associated activities carried out on the site:

Installation No.: 45

Activity Description
Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)

Directly Associated Activity Description
N/A

1.3 Carbon dioxide from Schedule 1 activities shall be emitted to atmosphere only from the emission sources as listed in Table 2 below:

Table 2 Emission Sources and Capacities:

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S1	Fab 10 Energy Centre Boiler (A01)	6.17	MW
S2	Fab 10 Energy Centre Boiler (A03)	6.17	MW
S3	Fab 10 Energy Centre Boiler (A04)	6.17	MW
S4	Fab 10 Energy Centre Boiler (A05)	6.17	MW
S5	Fab 10 Energy Centre Boiler (A06)	4.32	MW
S6	Fab 14 Energy Centre Boiler (A101)	9	MW
S7	Fab 14 Energy Centre Boiler (A102)	9	MW

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S8	Fab 14 Energy Centre Boiler (A103)	9	MW
S13	Fab 24 Energy Centre Boilers (A201)	9.13	MW
S14	Fab 24 Energy Centre Boilers (A202)	9.13	MW
S15	Fab 24 Energy Centre Boilers (A203)	9.13	MW
S16	Fab 24 Energy Centre Boilers (A204)	9.13	MW
S17	Fab 24 Energy Centre Boilers (A205)	9.13	MW
S18	Fab 24 Energy Centre Boilers (A248)	9.13	MW
S19	Fab 24 Energy Centre Boilers (A253)	9.13	MW
S21	Emergency Generator No. 3 (A31)	4.7	MW
S22	Emergency Generator No. 4 (A32)	4.7	MW
S23	Emergency Generator No. 6 (A33)	4.7	MW
S25	Emergency Generator No. 2 (A34)	2.5	MW
S27	Emergency Generator No. 11 (A122)	4.3	MW
S28	Emergency Generator No. 10 (A123)	4.3	MW
S29	Emergency Generator No. 9 (A124)	4.3	MW

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S30	Emergency Generator No. 8 (A125)	4.3	MW
S31	Fab 24 Emergency Generator No. 15 (A227)	5	MW
S32	Fab 24 Emergency Generator No. 16 (A228)	5	MW
S33	Fab 24 Emergency Generator No. 17 (A229)	5	MW
S34	Fab 24 Emergency Generator No.18 (A230)	5	MW
S35	Fab 24 Emergency Generator No. 19 (A231)	5	MW
S36	Fab 24 Emergency Generator No. 21 (A233)	5	MW
S37	Fab 24 RCTO Oxidiser Exhaust No. 1 (A214)	0.4	MW
S38	Fab 24 RCTO Oxidiser Exhaust No. 2 (A215)	0.4	MW
S39	Fab 24 RCTO Oxidiser Exhaust No. 3 (A216)	0.4	MW
S41	Fab 10 RCTO Oxidiser Exhaust (A65)	0.4	MW
S43	Emergency Generator No. 13 (A58)	5	MW
S44	Emergency Generator No. 12 (A59)	5	MW
S46	IR2 Firewater Pump (A99)	0.46	MW
S47	Fab 24 Firewater Pump (A299)	0.39	MW

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S60	Fab 10 RCTO Oxidiser Exhaust (A66)	0.53	MW
S62	Fab 14 RCTO Oxidiser Exhaust (A155)	0.53	MW
S63	Fab 14 RCTO Oxidiser Exhaust (A156)	0.53	MW
S64	Fab 14 RCTO Oxidiser Exhaust (A157)	0.53	MW
S65	Fab 24-1 RCTO Oxidiser Exhaust (A287)	0.53	MW
S66	Fab 24-2 RCTO Oxidiser Exhaust (A267)	0.53	MW
S67	Fab 24-2 RCTO Oxidiser Exhaust (A268)	0.53	MW
S68	Fab 24-2 RCTO Oxidiser Exhaust (A269)	0.53	MW
S69	Trimix Waste Treatment System A (A256A)	1.17	MW
S71	Fab 10 ASU Emergency Burner No. 1 (A301)	2.2	MW
S72	Fab 10 ASU Emergency Burner No. 2 (A301)	2.2	MW
S73	Fab 10 ASU Emergency Burner No. 3 (A301)	2.2	MW
S74	Fab 10 ASU Emergency Burner No. 4 (A301)	2.2	MW
S75	Fab 10 ASU Emergency Burner No. 5 (A301)	2.2	MW
S70	Trimix Waste Treatment System B (A256B)	1.17	MW

Emission Source Reference	Emission Source Description	Capacity	Capacity Units
S76	Fab 14 Energy Centre Boiler (A104)	2.47	MW
S77	Fab 24 Emergency Generator No. 20 (A232)	4.25	MW

1.4 The activity shall be controlled, operated and maintained so that emissions of carbon dioxide shall take place only as set out in this GHG Emissions Permit. The permit does not control emissions of gases other than carbon dioxide. All agreed plans, programmes and methodologies required to be carried out under the terms of this permit, become part of this permit.

1.5 This GHG Permit is for the purposes of GHG emissions permitting under the European Communities (Greenhouse Gas Emissions Trading) Regulations 2012 and any amendments to the same only and nothing in this permit shall be construed as negating the Operator's statutory obligations or requirements under any other enactments or regulations unless specifically amended by the Regulations.

1.6 Any reference in this permit to 'installation' shall mean the installation as described in the Greenhouse Gas Emissions Permit application and any amendments approved by the Agency.

Reason: To describe the installation and clarify the scope of this permit.

Condition 2. Notification

2.1 No alteration to, or reconstruction in respect of, the activity or any part thereof which would, or is likely to, result in a change in:

2.1.1 the nature or functioning of the installation;

2.1.2 the capacity of the installation as detailed in this permit;

2.1.3 the fuels used at the installation;

2.1.4 the range of activities to be carried out at the installation

that may require updating of the GHG permit shall be carried out or commenced without prior notice to and without the prior written agreement of the Agency.

2.2 The Operator shall notify the Agency in writing of the cessation of all or part of any activity listed in Table 1 of this permit no later than one month from the date of cessation or by 31 December of the year of cessation, whichever is sooner.

2.3 The Operator shall apply for an update of this GHG Permit where there is a change to the Operator name and/or registered address of the Operator, within seven days of the change.

2.4 For installations or parts of installations which have not come into operation when the application for this permit was made the Operator shall notify the Agency of the date of commencement of the activity within seven days of commencement.

2.5 The Operator shall notify the Agency in writing within three days of becoming aware of any factors which may prevent compliance with the conditions of this permit.

2.6 The Operator shall submit to the Agency by 21 January of each year a declaration of operability. The declaration submitted shall be in the format required by the Agency.

2.7 All notifications required under Condition 2 above shall be made to the address given in the Explanatory Note included with this permit.

2.8 The Operator shall submit to the Agency by 31 December of each year all relevant information about any planned or effective changes to the capacity, activity level and operation of an installation. The information submitted shall be in the format required by the Agency.

Reason: To provide for the notification of updated information on the activity.

Condition 3. Monitoring and Reporting

3.1 The Operator shall monitor and record greenhouse gas emissions on site in accordance with the M&R Regulation and the approved Monitoring Plan attached at Appendix 1 to this GHG permit and in compliance with any other guidance approved by the Agency for the purposes of implementing the Directive and/or the Regulations.

3.2 The Operator shall modify the monitoring plan in any of the following situations:

3.2.1 new emissions occur due to new activities carried out or due to the use of new fuels or materials not yet contained in the monitoring plan;

3.2.2 the change of availability of data, due to the use of new measurement instrument types, sampling methods or analysis methods, or for other reasons, leads to higher accuracy in the determination of emissions;

3.2.3 data resulting from the previously applied monitoring methodology has been found incorrect;

3.2.4 changing the monitoring plan improves the accuracy of the reported data, unless this is technically not feasible or incurs unreasonable costs;

3.2.5 the monitoring plan is not in conformity with the requirements of the M&R Regulation and the Agency requests a change;

3.2.6 it is necessary to respond to the suggestions for improvement of the monitoring plan contained in the verification report.

The Operator shall notify any proposals for modification of the monitoring plan to the Agency without undue delay. Any significant modifications of the monitoring plan, as defined in Article 15 of the M&R Regulation, shall be subject to approval by the Agency. Where approved these changes shall be implemented within a timeframe agreed by the Agency.

3.3 Temporary changes to the monitoring methodology:

3.3.1 Where it is for technical reasons temporarily not feasible to apply the tier in the monitoring plan for the activity data or each calculation factor of a fuel or material stream as approved by the Agency, the Operator shall apply the highest achievable tier until the conditions for application of the tier approved in the monitoring plan have been restored. The Operator shall take all necessary measures to allow the prompt restoration of the tier in the approved monitoring plan. The Operator shall notify the temporary change to the monitoring methodology without undue delay to the Agency specifying:

(i) The reasons for the deviation from the tier;

(ii) in detail, the interim monitoring methodology applied by the Operator to determine the emissions until the conditions for the application of the tier in the monitoring plan have been restored;

(iii) the measures the Operator is taking to restore the conditions for the application of the tier in the approved monitoring plan;

(iv) the anticipated point in time when application of the approved tier will be resumed.

3.3.2 A record of all non-compliances with the approved monitoring plan shall be maintained on-site and shall be available on-site for inspection by authorised persons of the Agency and/or by the Verifier at all reasonable times.

3.4 The Operator shall appoint a Verifier to ensure that, before their submission, the reports required by Condition 3.5 below are verified in accordance with the criteria set out in Schedule 5 of the Regulations, the A&V Regulation and any more detailed requirements of the Agency.

3.5 The written report of the verified annual reportable emissions and the verification report in respect of each calendar year shall be submitted to the Agency by the Operator no later than 31 March of the following year. The reports shall be in the format required by the Agency and meet the criteria set out in the M&R and A&V Regulations.

3.6 The Operator shall enter the verified annual reportable emissions figure for the preceding year into the Registry no later than 31 March of the following year. This figure shall be electronically approved by the Verifier in the registry no later than 31 March of each year.

3.7 Where an Operator is applying the Fall-Back methodology, the Operator shall assess and quantify each year the uncertainties of all parameters used for the determination of the annual emissions in accordance with the ISO Guide to the Expression of Uncertainty in Measurement or another equivalent internationally accepted standard and include the verified results in the written report of the verified annual reportable emissions to be submitted to the Agency by 31 March each year.

3.8 An Operator shall submit to the Agency for approval a report containing the information detailed in (i) or (ii) below, where appropriate, by the following deadlines:

(a) for a category A installation, by 30 June every four years;

(b) for a category B installation, by 30 June every two years;

(c) for a category C installation, by 30 June every year.

(i) Where the Operator does not apply at least the tiers required pursuant to the first subparagraph of Article 26(1) and to Article 41(1) of the M&R Regulation, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply the required tiers. Where evidence is found that measures needed for reaching those tiers have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan and submit proposals for implementing appropriate measures and its timing.

(ii) Where the Operator applies a fall-back monitoring methodology, the Operator shall provide a justification as to why it is technically not feasible or would incur unreasonable costs to apply at least tier 1 for one or more major or minor source streams. Where evidence is found that measures needed for reaching at least tier 1 for those source streams have become technically feasible and do not incur unreasonable costs, the Operator shall notify the Agency of appropriate modifications to the monitoring plan, submit proposals and a timeframe for implementing appropriate measures.

3.9 Where the verification report states outstanding non conformities, misstatements or recommendations for improvements the Operator shall submit a report to the Agency for approval by 30 June of the year in which the verification report is issued. This requirement does not apply to the Operator of an installation with low emissions where the verification report contains recommendations for improvements only. The report shall describe how and when the Operator

has rectified or plans to rectify the non-conformities identified and to implement recommended improvements. Where recommended improvements would not lead to an improvement of the monitoring methodology this must be justified by the Operator. Where the recommended improvements would incur unreasonable costs the Operator shall provide evidence of the unreasonable nature of the costs. The Operator shall implement the improvements specified by the Agency in response to the report submitted in accordance with this Condition in accordance with a timeframe set by the Agency.

3.10 The Operator shall make available to the Verifier and to the Agency any information and data relating to emissions of carbon dioxide which are required in order to verify the reports referred to in Condition 3.5 above or as required by the Agency to facilitate it in establishing benchmarks and/or best practice guidance.

3.11 Provision shall also be made for the transfer of environmental information, in relation to this permit, to the Agency's computer system, as may be requested by the Agency.

3.12 The Operator shall retain all information as specified in the M&R Regulation for a period of at least 10 years after the submission of the relevant annual report.

3.13 A record of independent confirmation of capacities listed in this permit shall be available on-site for inspection by authorised persons of the Agency at all reasonable times.

3.14 The Operator shall keep records of all modifications of the monitoring plan. The records shall include the information specified in Article 16.3 of the M&R Regulation.

3.15 The Operator shall ensure that members of the public can view a copy of this permit and any reports submitted to the Agency in accordance with this permit at all reasonable times. This requirement shall be integrated with the requirements of any public information programme approved by the Agency in relation to any other permit or licence held by the Operator for the site.

Reason: To provide for monitoring and reporting in accordance with the Regulations.

Condition 4. Allowances

4.1 Surrender of Allowances

4.1.1 The Operator shall, by 30 April in each year, surrender to the Agency, or other appropriate body specified by the Agency, allowances equal to the annual reportable emissions in the preceding calendar year.

4.1.2 The number of allowances to be surrendered shall be the annual reportable emissions for the preceding calendar year plus such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due. This includes allowances to cover the amount of any annual reportable emissions in respect of which allowances were not surrendered in accordance with Condition 4.1.1 in the previous year, and the amount of any reportable emissions which were discovered during the previous year to have been unreported in reports submitted under Condition 3 in that or in earlier years.

4.1.3 In relation to activities or parts of activities which have ceased to take place and have been notified to the Agency in accordance with Condition 2.2 above, the Operator shall surrender to the Agency allowances equal to the annual reportable emissions from such activities in the preceding calendar year or part thereof, together with such allowances as may be necessary to cover any earlier calendar year in respect of which allowances remain outstanding and due as described in Condition 4.1.2 above.

4.1.4 The Operator may, from 2008 onwards, subject to the provisions of the Regulations and the relevant National Allocation Plan for that compliance year, surrender emission reduction units (ERUs) and certified emission reduction units (CERs) in place of allowances.

4.2 The holding, transfer, surrender and cancellation of allowances shall be in accordance with the requirements of any Regulations adopted as provided for under Article 19.3 of Directive 2003/87/EC, any amendment or revision to the same and any guidance issued by the Agency or the National Administrator.

4.3 The Operator shall provide the National Administrator with all the necessary information for the opening of an Operator holding account for the installation described in Condition 1 of this permit within twenty working days of the issue of this permit, unless such an account is already open.

Reason: *To provide for the surrendering, holding, transfer and cancellation of allowances in respect of reported emissions.*

Condition 5. Penalties

5.1 Any Operator who fails to comply with Condition 4.1 above shall be subject to the provisions of the Regulations, including, but not limited to the payment of penalties.

Reason: To provide for the payment of excess emissions penalties as required under the Regulations.

Sealed by the seal of the Agency on this the 13 March 2018:

PRESENT when the seal of the Agency was affixed hereto:

_____

Ms. Annette Prendergast
Inspector/ Authorised Person

Appendix 1 to Greenhouse Gas Emissions Permit Number IE-GHG058-10373

Monitoring Plan

1. Guidelines & Conditions

1. Directive 2003/87/EC as amended by Directive 2009/29/EC (hereinafter "the (revised) EU ETS Directive") requires operators of installations which are included in the European Greenhouse Gas Emission Trading Scheme (the EU ETS) to hold a valid GHG emission permit issued by the relevant Competent Authority and to monitor and report their emissions and have the reports verified by an independent and accredited verifier.

The Directive can be downloaded from:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:PDF

2. The Monitoring and Reporting Regulation (Commission Regulation (EU) No 601/2012) (hereinafter the "MRR") defines further requirements for monitoring and reporting.

The MRR can be downloaded from:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:181:0030:0104:EN:PDF

Article 12 of the MRR sets out specific requirements for the content and submission of the monitoring plan and its updates. Article 12 outlines the importance of the Monitoring plan as follows:

The monitoring plan shall consist of a detailed complete and transparent documentation of the monitoring methodology of a specific installation [or aircraft operator] and shall contain at least the elements laid down in Annex I.

Furthermore Article 74(1) states:

Member States may require the operator and aircraft operator to use electronic templates or specific file formats for submission of monitoring plans and changes to the monitoring plan as well as for submission of annual emissions reports tonne-kilometre data reports verification reports and improvement reports. Those templates or file format specifications established by the Member States shall at least contain the information contained in electronic templates or file format specifications published by the Commission

3. All Commission guidance documents on the Monitoring and Reporting Regulation will be published at the link below as they become available:

http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

(a) Information sources:

EU Websites:

EU-Legislation: http://eur-lex.europa.eu/en/index.htm
EU ETS general: http://ec.europa.eu/clima/policies/ets/index_en.htm

Monitoring and Reporting in the EU ETS: http://ec.europa.eu/clima/policies/ets/monitoring/index_en.htm

Environmental Protection Agency Website:

http://www.epa.ie

Environmental Protection Agency Contact:

GHGpermit@epa.ie

2. Application Details

The Installation Name, Site Name and the address of the site of the installation are detailed below. The Site Name and address can be updated from the Organisation Details Page on the ETSWAP website. The Installation Name can only be updated by your Competent Authority.

Installation name	Intel Ireland
Site name	Intel Ireland
Address	Collinstown Industrial Park Leixlip Kildare Ireland
Grid reference of site main entrance	298500E, 237000N
Licence held pursuant to the Environmental Protection Agency Act 1992, as amended.	Yes

IPC/IE Licence Register Number	Licence holder	Competent body
P0207-04	Intel Ireland Limited	Environmental Protection Agency

Has the regulated activity commenced at the Installation?	Yes
Date of Regulated Activity commencement	01 January 2005

This information is only required to identify the first relevant reporting year of an installation. If the installation was in operation from the beginning of 2008 and held a Greenhouse Gas Emissions Permit from this point, 1 January 2008 will be used where the actual date of commencement is not readily known.

3. About the Operator

The information about the "Operator" is listed below. The "Operator" is defined as the person who it is proposed will have control over the relevant Regulated Activities in the installation in respect of which this application is being made.

(b) Operator Details

The name of the operator and where applicable the company registration number are detailed below. These details can only be updated by the Environmental Protection Agency.

Operator name	Intel Ireland Limited
Company Registration Number	902934

Operator Legal status

The legal status of the operator is:	Company / Corporate Body

(c) Company / Corporate Body

Is the trading / business name different to the operator name?	No

Details of the individual authorised to submit this application on behalf of the company / corporate body.

Title	Mr
Forename	Mark
Surname	Rutherford
Position	Environmental, Health and Safety Manager

Registered office address

Address Line 1	Collinstown Industrial Park
Address Line 2	N/A
City/Town	Leixlip
County	Kildare
Postcode	N/A

Principal office address

Is the principal office address different to the registered office address?	No

Holding company

Does the company belong to a holding company?	No

(d) Operator Authority

Does the operator named above have the authority and ability to:

a.	manage site operations through having day-to-day control of plant operation including the manner and rate of operation	Yes
b.	ensure that permit conditions are effectively complied with	Yes
c.	control monitor and report specified emissions	Yes
d.	be responsible for trading in Allowances so that at the	Yes

end of a reporting period allowances can be balanced against reported emissions.

4. Service Contact

e. Service Contact

Name	Mr Mark Rutherford
Address / Email Address	Collinstown Industrial Park Leixlip Kildare Ireland

5. Installation Activities

f. Installation Description

Below is a description of the installation and its activities, a brief outline description of the site and the installation and the location of the installation on the site. The description also includes a non-technical summary of the activities carried out at the installation briefly describing each activity performed and the technical units used within each activity.

Intel Ireland operates a semiconductor manufacturing plant, located west of Leixlip, Co. Kildare. The manufacturing part of the site is bounded by the R148 Road to the south, the river Ryewater to the north, Kellystown Lane to the west and the Royal Canal to the east. The manufacturing plant includes Medium Pressure Hot Water Boilers (MPHW) which operate on Natural Gas, but can use Gas Oil as a back-up. In addition, Natural Gas is used in the RCTO (Rotary Concentratory Thermal Oxidiser) Air Abatement Systems, the Trimix Waste Treatment (TMXW) System and the emergency burners on the Air Separation Unit (ASU). Gas Oil is also used for Emergency Generators and Firewater Pumps. Bottled Natural Gas is used as a pilot fuel when the Boilers are run on Gas Oil. The RCTO's also burn VOC Solvent Vapours in addition to Natural Gas.

g. Annex 1 Activities

The table below lists the technical details for each Annex 1 activity carried out at the installation.

Note that 'capacity' in this context means:

- Rated thermal input (for combustion installations) which is defined as the rate at which fuel can be burned at the maximum continuous rating of the installation multiplied by the calorific value of the fuel and expressed as megawatts thermal.
- Production capacity for those specified Annex I activities for which production capacity determines ETS eligibility.

Annex 1 Activity	Total Capacity	Capacity units	Specified Emissions
Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)	220.45	MW	Carbon Dioxide

h. Site Diagram

The table below lists attachments (if available) that provide a simple diagram showing emissions sources source streams sampling points and metering/measurement equipment.

Attachment	Description
GSS-EHS-EMS-PRO-039 (7th Oct 2016).doc	Attachment 2 includes location of Fab 14 Trim Boiler and Additional Emergency Generator (EG20).

i. Estimated Annual Emissions

Detail of the estimated annual emission of CO_2 equivalent. This information enables categorisation of the installation in accordance with Article 19 of the MRR and is based on the average verified annual emissions of the previous trading period data OR if this data is not available or is inappropriate a conservative estimate of annual average emissions including transferred CO_2 excluding CO_2 from biomass.

Estimated Annual Emissions (tonnes $CO_{2(e)}$)	39000
Justification for the use of a conservative estimate of CO_2 emissions.	The figure of 39,000 tonnes CO2 is based upon the verified emissions in 2015 and with the addition of an allowance for the additional CO2 emissions associated with the combustion of the VOC Solvent Vapours in the RCTO Abatement Units. This is likely to be a more accurate estimate of emissions that emissions in the previous trading period.

Installation Category: A

6. Emissions Details

j. About your emissions

Annex I of the Monitoring and Reporting Regulations (MRR) requires that monitoring plans include a description of "the installation" and activities to be carried out and monitored including a list of emission sources and source streams. The

information provided in this template relates to the Annex I activity(ies) comprised in the installation in question and should relate to a single installation. It includes any activities carried out by the operator and does not include related activities carried out by other operators.

k. Emission Sources

The table below lists all the emission sources at the installation, which may include directly associated activities/excluded activities.

Emission Source Reference	**Emission Source Description**
S1	Fab 10 Energy Centre Boiler (A01)
S2	Fab 10 Energy Centre Boiler (A03)
S3	Fab 10 Energy Centre Boiler (A04)
S4	Fab 10 Energy Centre Boiler (A05)
S5	Fab 10 Energy Centre Boiler (A06)
S6	Fab 14 Energy Centre Boiler (A101)
S7	Fab 14 Energy Centre Boiler (A102)
S8	Fab 14 Energy Centre Boiler (A103)
S13	Fab 24 Energy Centre Boilers (A201)
S14	Fab 24 Energy Centre Boilers (A202)
S15	Fab 24 Energy Centre Boilers (A203)
S16	Fab 24 Energy Centre Boilers (A204)
S17	Fab 24 Energy Centre Boilers (A205)
S18	Fab 24 Energy Centre Boilers (A248)
S19	Fab 24 Energy Centre Boilers (A253)
S21	Emergency Generator No. 3 (A31)
S22	Emergency Generator No. 4 (A32)
S23	Emergency Generator No. 6 (A33)
S25	Emergency Generator No. 2 (A34)
S27	Emergency Generator No. 11 (A122)
S28	Emergency Generator No. 10 (A123)
S29	Emergency Generator No. 9 (A124)
S30	Emergency Generator No. 8 (A125)
S31	Fab 24 Emergency Generator No. 15 (A227)
S32	Fab 24 Emergency Generator No. 16 (A228)
S33	Fab 24 Emergency Generator No. 17 (A229)
S34	Fab 24 Emergency Generator No.18 (A230)
S35	Fab 24 Emergency Generator No. 19 (A231)
S36	Fab 24 Emergency Generator No. 21 (A233)
S37	Fab 24 RCTO Oxidiser Exhaust No. 1 (A214)

Emission Source Reference	**Emission Source Description**
S38	Fab 24 RCTO Oxidiser Exhaust No. 2 (A215)
S39	Fab 24 RCTO Oxidiser Exhaust No. 3 (A216)
S41	Fab 10 RCTO Oxidiser Exhaust (A65)
S43	Emergency Generator No. 13 (A58)
S44	Emergency Generator No. 12 (A59)
S46	IR2 Firewater Pump (A99)
S47	Fab 24 Firewater Pump (A299)
S60	Fab 10 RCTO Oxidiser Exhaust (A66)
S62	Fab 14 RCTO Oxidiser Exhaust (A155)
S63	Fab 14 RCTO Oxidiser Exhaust (A156)
S64	Fab 14 RCTO Oxidiser Exhaust (A157)
S65	Fab 24-1 RCTO Oxidiser Exhaust (A287)
S66	Fab 24-2 RCTO Oxidiser Exhaust (A267)
S67	Fab 24-2 RCTO Oxidiser Exhaust (A268)
S68	Fab 24-2 RCTO Oxidiser Exhaust (A269)
S69	Trimix Waste Treatment System A (A256A)
S71	Fab 10 ASU Emergency Burner No. 1 (A301)
S72	Fab 10 ASU Emergency Burner No. 2 (A301)
S73	Fab 10 ASU Emergency Burner No. 3 (A301)
S74	Fab 10 ASU Emergency Burner No. 4 (A301)
S75	Fab 10 ASU Emergency Burner No. 5 (A301)
S70	Trimix Waste Treatment System B (A256B)
S76	Fab 14 Energy Centre Boiler (A104)
S77	Fab 24 Emergency Generator No. 20 (A232)

The table below lists the emission sources which are linked to the Regulated Activities at the installation.

Emission Source Reference	**Emission Source Description**
S1	Fab 10 Energy Centre Boiler (A01)
S2	Fab 10 Energy Centre Boiler (A03)
S3	Fab 10 Energy Centre Boiler (A04)
S4	Fab 10 Energy Centre Boiler (A05)
S5	Fab 10 Energy Centre Boiler (A06)
S6	Fab 14 Energy Centre Boiler (A101)
S7	Fab 14 Energy Centre Boiler (A102)
S8	Fab 14 Energy Centre Boiler (A103)

Emission Source Reference	**Emission Source Description**
S13	Fab 24 Energy Centre Boilers (A201)
S14	Fab 24 Energy Centre Boilers (A202)
S15	Fab 24 Energy Centre Boilers (A203)
S16	Fab 24 Energy Centre Boilers (A204)
S17	Fab 24 Energy Centre Boilers (A205)
S18	Fab 24 Energy Centre Boilers (A248)
S19	Fab 24 Energy Centre Boilers (A253)
S21	Emergency Generator No. 3 (A31)
S22	Emergency Generator No. 4 (A32)
S23	Emergency Generator No. 6 (A33)
S25	Emergency Generator No. 2 (A34)
S27	Emergency Generator No. 11 (A122)
S28	Emergency Generator No. 10 (A123)
S29	Emergency Generator No. 9 (A124)
S30	Emergency Generator No. 8 (A125)
S31	Fab 24 Emergency Generator No. 15 (A227)
S32	Fab 24 Emergency Generator No. 16 (A228)
S33	Fab 24 Emergency Generator No. 17 (A229)
S34	Fab 24 Emergency Generator No.18 (A230)
S35	Fab 24 Emergency Generator No. 19 (A231)
S36	Fab 24 Emergency Generator No. 21 (A233)
S37	Fab 24 RCTO Oxidiser Exhaust No. 1 (A214)
S38	Fab 24 RCTO Oxidiser Exhaust No. 2 (A215)
S39	Fab 24 RCTO Oxidiser Exhaust No. 3 (A216)
S41	Fab 10 RCTO Oxidiser Exhaust (A65)
S43	Emergency Generator No. 13 (A58)
S44	Emergency Generator No. 12 (A59)
S46	IR2 Firewater Pump (A99)
S47	Fab 24 Firewater Pump (A299)
S60	Fab 10 RCTO Oxidiser Exhaust (A66)
S62	Fab 14 RCTO Oxidiser Exhaust (A155)
S63	Fab 14 RCTO Oxidiser Exhaust (A156)
S64	Fab 14 RCTO Oxidiser Exhaust (A157)
S65	Fab 24-1 RCTO Oxidiser Exhaust (A287)
S66	Fab 24-2 RCTO Oxidiser Exhaust (A267)
S67	Fab 24-2 RCTO Oxidiser Exhaust (A268)
S68	Fab 24-2 RCTO Oxidiser Exhaust (A269)

Emission Source Reference	Emission Source Description
S69	Trimix Waste Treatment System A (A256A)
S71	Fab 10 ASU Emergency Burner No. 1 (A301)
S72	Fab 10 ASU Emergency Burner No. 2 (A301)
S73	Fab 10 ASU Emergency Burner No. 3 (A301)
S74	Fab 10 ASU Emergency Burner No. 4 (A301)
S75	Fab 10 ASU Emergency Burner No. 5 (A301)
S70	Trimix Waste Treatment System B (A256B)
S76	Fab 14 Energy Centre Boiler (A104)
S77	Fab 24 Emergency Generator No. 20 (A232)

I. Emission Points

The table below lists all the emission points at the installation, which may include directly associated activities/excluded activities.

Emission Point Reference	Emission Point Description
A01	Fab 10 Energy Centre Boiler
A03	Fab 10 Energy Centre Boiler
A04	Fab 10 Energy Centre Boiler
A05	Fab 10 Energy Centre Boiler
A06	Fab 10 Energy Centre Boiler
A101	Fab 14 Energy Centre Boiler
A102	Fab 14 Energy Centre Boiler
A103	Fab 14 Energy Centre Boiler
A122	Emergency Generator No. 11
A123	Emergency Generator No. 10
A124	Emergency Generator No. 9
A125	Emergency Generator No. 8
A201	Fab 24 Energy Centre Boiler No. 1
A202	Fab 24 Energy Centre Boiler No. 2
A203	Fab 24 Energy Centre Boiler No. 3
A204	Fab 24 Energy Centre Boiler No. 4
A205	Fab 24 Energy Centre Boiler No. 5
A248	Fab 24 Energy Centre Boiler No. 6
A253	Fab 24 Energy Centre Boiler No. 7
A214	Fab 24 RCTO Oxidiser Exhaust No. 1
A215	Fab 24 RCTO Oxidiser Exhaust No. 2

Emission Point Reference	Emission Point Description
A216	Fab 24 RCTO Oxidiser Exhaust No. 3
A227	Fab 24 Emergency Generator No. 15
A228	Fab 24 Emergency Generator No. 16
A229	Fab 24 Emergency Generator No. 17
A230	Fab 24 Emergency Generator No. 18
A231	Fab 24 Emergency Generator No. 19
A233	Fab 24 Emergency Generator No. 21
A299	Fab 24 Firewater Pump
A31	Emergency Generator No. 3
A32	Emergency Generator No. 4
A33	Emergency Generator No. 6
A34	Emergency Generator No. 2
A65	Fab 10 RCTO Oxidiser Exhaust
A58	Emergency Generator No. 13
A59	Emergency Generator No. 12
A99	IR2 Firewater Pump
A66	Fab 10 RCTO Oxidiser Exhaust
A155	Fab 14 RCTO Oxidiser Exhaust
A156	Fab 14 RCTO Oxidiser Exhaust
A157	Fab 14 RCTO Oxidiser Exhaust
A287	Fab 24-1 RCTO Oxidiser Exhaust
A267	Fab 24-2 RCTO Oxidiser Exhaust
A268	Fab 24-2 RCTO Oxidiser Exhaust
A269	Fab 24-2 RCTO Oxidiser Exhaust
A256A	Trimix Waste Treatment System A
A301	Fab 10 ASU Burners Stack (S71-75)
A256B	Trimix Waste Treatment System B
A104	Fab 14 Energy Centre Boiler (S76)
A232	Fab 24 Emergency Generator No. 20 (S77)

m. Source Streams (fuels and/or materials)

The table below lists the source streams which are used in Schedule 1 Activities at the installation.

Source Stream Reference	Source Stream Type	Source Stream Description
NG-001	Combustion: Other gaseous & liquid fuels	Natural Gas

Source Stream Reference	Source Stream Type	Source Stream Description
GO-001	Combustion: Commercial standard fuels	Gas/Diesel Oil
NG-002	Combustion: Other gaseous & liquid fuels	Natural Gas (bottled)
VO-001	Combustion: Other gaseous & liquid fuels	VOC Solvent Vapours

n. Emissions Summary

The table below provides a summary of the emission source and source stream details in the installation.

Source streams (Fuel / Material)	Emission Source Refs.	Emission Point Refs.	Annex 1 Activity
NG-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68,S69,S71,S72,S73,S74,S75,S70,S76	A01,A03,A04,A05,A06,A101,A102,A103,A201,A202,A203,A204,A205,A248,A253,A214,A215,A216,A65,A66,A155,A156,A157,A287,A267,A268,A269,A256A,A301,A256B,A104	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
GO-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S21,S22,S23,S25,S27,S28,S29,S30,S31,S32,S33,S34,S35,S36,S43,S44,S46,S47,S77	A01,A03,A04,A05,A06,A101,A102,A103,A122,A123,A124,A125,A201,A202,A203,A204,A205,A248,A253,A227,A228,A229,A230,A231,A233,A299,A31,A32,A33,A34,A58,A59,A99,A232	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
NG-002	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19	A01,A03,A04,A05,A06,A101,A102,A103,A201,A202,A203,A204,A205,A248,A253	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)
VO-001	S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68	A214,A215,A216,A65,A66,A155,A156,A157,A287,A267,A268,A269	Combustion of fuels in installations with a total rated thermal input exceeding 20 MW (except in installations for the incineration of hazardous or municipal waste)

o. Excluded Activities

Certain activities that result in greenhouse gas emissions may be excluded under the EU ETS Directive for example truly mobile sources such as vehicle emissions.

Do you have any excluded activities which need to be identified in your monitoring plan?	No

7. Low Emissions Eligibility

p. Low Emissions Eligibility

The operator may submit a simplified monitoring plan for an installation where no nitrous oxide activities are carried out and it can be demonstrated that:

(a) the average verified annual emissions of the installation during the previous trading period was less than 25 000 tonnes $CO_{2(e)}$ per year or;

(b) where this data is not available or inappropriate a conservative estimate shows that emissions for the next 5 years will be less than 25 000 tonnes $CO_{2(e)}$ per year.

Note: the above data shall include transferred CO_2 but exclude CO_2 stemming from biomass.

Does the installation satisfy the criteria for installations with low emissions (as defined by Article 47 of the MRR)?	No

8. Monitoring Approaches

q. Monitoring Approaches

Emissions may be determined using either a calculation based methodology ("calculation") or measurement based methodology ("measurement") except where the use of a specific methodology is mandatory according to the provisions of the MRR. [MRR Article 21].

Note: the operator may subject to competent authority approval combine measurement and calculation for different sources. The operator is required to ensure and demonstrate that neither gaps nor double counting of reportable emissions occurs.

Please specify whether or not you propose to apply the following monitoring approaches. Select all monitoring approaches that are applicable to you. The consecutive sections will become mandatory based on the selected approaches.

Calculation	Yes
Measurement	No
Fall-back approach	No
Monitoring of N_2O	No
Monitoring of PFC	No
Monitoring of transferred / inherent CO_2	No

9. Calculation

r. Approach Description

The calculation approach including formulae used to determine annual CO_2 emissions:

The Site is a Class A Installation and, therefore, as a minimum, the Tiers specified in Annex V of the MRR must be met. The site uses Natural Gas (NG-001) within its Hot Water Boilers, the Rotary Concentrator Thermal Oxidiser (RCTO) Abatement and the Trimix Waste Treatment (TMXW) Systems as well as the 5 No. emergency burners associated with the Fab 10 ASU. It also uses Gas Oil/Diesel (GO-001) for the operation of the Emergency Generators and Fire Pumps and as a back-up fuel to the Hot Water Boilers. In addition, bottled Natural Gas (NG-002) is used as a pilot fuel for the boilers when they operate on Gas Oil/Diesel. The RCTO's also burn VOC Solvent Vapours (VO-001) in addition to the Natural Gas.

The CO2 emissions (tCO2) is calculated as the product of Activity Level x Emission Factor (EF) x Oxidisation Factor (OF).

The Activity Level for Natural Gas is derived from the amount of gas (kWh) used based on the monthly gas bills supplied by Bord Gais. The kWh figure from Bord Gais is multiplied by the NCV value to be provided by the EPA in the document entitled "Country Specific Net Calorific Values and CO2 Emission Factors for use in the Annual Installation Emissions report" for the year being reported (typically around 0.903) and then multiplied again by 0.0000036 to convert to TeraJoules (TJ). The Emission Factor used is the Country Specific Factor (tCO2/TJ) (contained in the document titled "Country Specific Net Calorific Values and CO2 Emission Factors for use in the Annual Installation Emissions report" for the year being reported which is available on the EPA website (Tier 2a) and an Oxidation factor of 1 is used. Hence, the amount of CO2 (in tonnes) from Natural Gas is calculated.

The amount of CO2 generated between 2005-2011 from the use of gas oil was on average less than 2% of the total CO2 emissions and less than 1,000 tonnes/annum, however, this can change over time, so this is classified as a Minor Source and Tier 2 activity level is used. The amount of Gas Oil (in litres) is derived from the supplier invoices for deliveries during the reporting year and the opening and closing balances of gas oil based on the Level indicators installed in the Storage Tanks used by the Emergency Generators and Hot Water Boilers. (In the case of opening and closing balances for the Fire Pump storage tanks, a conservative assumption is made with regard to the levels). The formula used is:- Use = Opening Balance + Deliveries - Closing Balance. This volume is converted to mass (in kilotonnes) using a density factor provided by the supplier. This mass of gas oil is converted to Energy Content (in TJ) by multiplying by the NCV (Country Specific Factor). This is, in turn, converted into tCO2 by taking into account the Emission Factor (Country Specific) and the Oxidation Factor of 1. The value for Net Calorific Value and Emission factor is taken from the document titled "Country Specific Net Calorific Values and CO2 Emission Factors for use in the Annual Installation Emissions report" for the year being reported which is available on the EPA website.

In relation to the bottled Natural Gas (NG-002), this is "de minimis" and the following protocol is used:-A very conservative assumption is used that all cylinders are used up on an annual basis. Each cylinders contains 6.41kgs of Natural Gas (CH4) and there are 4 cylinders at each of the 3 energy centres on site. The total is taken as 6.41*3*4 = 77 kgs. Calculation factors (Tier 1) are taken from Annex VI of the MRR to convert from kgs of Natural Gas to Tonnes of CO2.

In relation to the VOC Vapour Solvents, this is classified as Minor Source. The mass of solvent is determined from quarterly flow measurement at the RCTO's and the continuous on-line Inlet TOC FID Analysers. The quarterly flow measurements are taken by an accredited emissions monitoring company. The figures used in the calculation will be conservative as the highest of the quarterly flow measurements at each RCTO will be used in the calculation. The option of installing continuous flow meters at the Inlet's to each of the RCTO Systems has been explored but has been deemed to incur un-reasonable costs (a copy of this Unreasonable Costs spreadsheet is submitted to the Agency for consideration with this request for Variation).

A stoichiometric equation of 44/12 is used to convert from TOC (as C) to CO2. It is assumed that all the solvent is Cyclohexanone (C6H10O) as this is the most common solvent evaporated with the highest Heating Value. The mass of TOC is converted stoichiometrically into a mass of Cyclohexanone (73% of Cyclohexanone is Carbon) and the mass of Cyclohexanone is used as the Activity Level. A NCV value of 33.61 TJ/Gg (33,614,000 J/kg) is taken from literature (source:American Institute of Chemical Engineer (AIChE)) and allows us to calculate the heat content of the VOC Solvent Vapours. The Emission Factor is back calculated from the tCO2 and heat content. The Emission Factor to be used in 80

tCO2/TJ and is derived as follows; 1 Tonnes of Cyclohexanone has an NCV of 0.03361 TJ (i.e. 1,000kgs*33,614,000J/kg = 33,614,000,000J = 33,614,000kJ = 33,614MJ = 33.614GJ = 0.03361 TJ), a carbon content of 0.73 tonnes C (i.e. 1 tonne * 73%) and generates 2.68 tonnes CO2 (i.e. 0.73 tonnes C * 44/12 tonnes CO2/tonne C). Therefore, there is 2.68 tonnes CO2 in 0.03361 TJ of Cyclohexanone which allows us to calculate an Emission Factor for Cyclohexanone of 80 tCO2/TJ (i.e. 2.68 tonnes CO2 / 0.03361 TJ = 80 tonnes CO2/TJ). This Emission Factor meets the definition of Tier 2a (as per Article 31.1 (c)) as standard literature values.

The following sources of uncertainty have been identified;

- Metering Data for Natural Gas

- Metering Data for Gas Oil provided by supplier

- Level information for Gas Oil in Oil Storage Tanks

- Level information for Gas Oil in Fire Pump Tanks

- Density Information for Gas Oil provided by Supplier

- Measurement of TOC and Flow at the Inlet to the RCTO's

- The assumption that all the TOC on the Inlet to the RCTO's is associated with Cyclohexanone

The only one of these factors which is related to a "major source stream" is the Metering Data for Natural Gas. There are a total of 6 meters within the Bord Gais compound on the Intel Ireland site, however, two of these meters are not related to Intel but support the Bord Gais distribution network. Of the remaining 4 meters, only two of these meter (Serial Numbers:- 83034799, 8034800) are currently in use to supply Intel. These meters are the property of Bord Gais who are responsible for maintenance and calibrations. The stated accuracy of the meter is 1% and the pressure/temperature converstion uncertainty is also 1%. Hence, the overall uncertainty is 1.41% which is less than the maximum uncertainly of Tier 4 which is +/- 1.5%.

s. Measurement Devices

Below is a description of the specification and location of the measurement systems used for each source stream where emissions are determined by calculation

Also a description of all measurement devices including sub-meters and meters used to deduct non-Annex I activities to be used for each source and source stream.

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
NG-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68,S69,S71,S72,S73,S74,S75,S70,S76	S/N 83034798	Turbine Meter-Bord Gais Incoming Gas Meter A	10000	Sm3/hr	1.41	Bord Gais Gas Compound
NG-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68,S69,S71,S72,S73,S74,S75,S70,S76	S/N 83034797	Turbine Meter - Bord Gais Incoming Gas Meter B	10000	Sm3/hr	1.41	Bord Gais Gas Compound
NG-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68,S69,S71,S72,S73,S74,S75,S70,S76	S/N 83034800	Turbine Meter-Bord Gais Incoming Gas Meter C	5000	Sm3/hr	1.41	Bord Gais Gas Compound
NG-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S37,S	S/N 83034799	Turbine Meter-Bord Gais Incoming Gas Meter D	5000	Sm3/hr	1.41	Bord Gais Gas Compound

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
	38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68,S69,S71,S72,S73,S74,S75,S70,S76						
GO-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S21,S22,S23,S25,S27,S28,S29,S30,S31,S32,S33,S34,S35,S36,S43,S44,S77	Oil Tank Level Indicators (IR1-LT-161-1-01 LT-25U-1-1 LT-25U-1-2 LT-25U-1-3 LT-161-1-200 LT-161-2-200 IRC3-LIT-161-01-200 IRC3-LIT-161-02-200 IRC3-LIT-161-03-200	Bellows meter	Various	Various	5	Oil Tanks
GO-001	S46,S47	Firewater Pump Tank Level Switches (IR1 & IR2 & Fab 24)	Level Switch	N/A	N/A	N/A	Firewater Pump Tanks
NG-002	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19	(N/A) - Conservative Estimate	Not Applicable-Activity based upon Estimated Usage	NA	NA	N/A	Exterior of each Energy Centre
VO-001	S41,S60	Fab 10 TOC Analysers	Flame Ionisation Detector (FID)	0 - 400	ppm	1	Near Fab 10 RCTO's
VO-001	S62,S63,S64	Fab 14 TOC Analyser	Flame Ionisation Detector	0 - 400	ppm	1	Near Fab 14 RCTO's
VO-001	S37,S38,S39,S65	Fab 24-1 TOC Analyser	Flame Ionisation Detector (FID)	0 - 400	ppm	1	Near Fab 24-1 RCTO's
VO-001	S66,S67,S68	Fab 24-2 TOC Analyser	Flame Ionisation Detection (FID)	0 - 400	ppm	1	Near Fab 24-2 RCTO's

Source Stream Refs.	Emission Source Refs.	Measurement Device Ref.	Type of Measurement Device	Measurement Range	Metering Range Units	Specified Uncertainty (+/- %)	Location
GO-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S21,S22,S23,S25,S27,S28,S29,S30,S31,S32,S33,S34,S35,S36,S43,S44,S46,S47,S77	Gas Oil Supplier Fiscal Meters	Supplier Owned and Controlled	Supplier Owned and Controlled	Supplier Owned and Controlled	5	Supplier Owned and Controlled
VO-001	S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68	RCTO Inlet Flow Measurements	Pitot Tube	Variable	Nm3/hr	4.75	Inlet to RCTO Units

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Under Control Of	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
NG-001	S/N 83034798	Continual	Trade partner	Yes	Yes	Yes
NG-001	S/N 83034797	Continual	Trade partner	Yes	Yes	Yes
NG-001	S/N 83034800	Continual	Trade partner	Yes	Yes	Yes
NG-001	S/N 83034799	Continual	Trade partner	Yes	Yes	Yes
GO-001	Oil Tank Level Indicators (IR1-LT-161-1-01 LT-25U-1-1 LT-25U-1-2 LT-25U-1-3 LT-161-1-200 LT-161-2-200 IRC3-LIT-161-01-200 IRC3-LIT-161-02-200 IRC3-LIT-161-03-200	Continual	Operator	N/A	N/A	N/A
GO-001	Firewater Pump Tank Level Switches (IR1 &	Batch	Operator	N/A	N/A	N/A

Source Stream Refs.	Measurement Device Ref.	Determination Method	Instrument Under Control Of	Conditions Of Article 29(1) Satisfied	Invoices Used To Determine Amount Of Fuel Or Material	Trade Partner And Operator Independent
	IR2 & Fab 24)					
NG-002	(N/A) - Conservative Estimate	Batch	Operator	N/A	N/A	N/A
VO-001	Fab 10 TOC Analysers	Continual	Operator	N/A	N/A	N/A
VO-001	Fab 14 TOC Analyser	Continual	Operator	N/A	N/A	N/A
VO-001	Fab 24-1 TOC Analyser	Continual	Operator	N/A	N/A	N/A
VO-001	Fab 24-2 TOC Analyser	Continual	Operator	N/A	N/A	N/A
GO-001	Gas Oil Supplier Fiscal Meters	Continual	Trade partner	Yes	Yes	Yes
VO-001	RCTO Inlet Flow Measurements	Batch	Operator	N/A	N/A	N/A

t. Applied Tiers

The table below identifies the tiers applied against the relevant input data for each source stream and confirms whether a standard (MRR Article 24) or mass balance (MRR Article 25) approach is applied.

(i) The highest tiers as defined in Annex II of the MRR should be used by Category B and C installations to determine the activity data and each calculation factor (except the oxidation factor and conversion factor) for each major source stream. Category A installations should apply as a minimum the tiers listed in Annex V.

(ii) Operators may apply a tier one level lower than those referred to in sub paragraph (i) above for Category C installations and up to two levels lower for Category A and B installations with a minimum of tier 1 if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier. The justification for not applying the higher tier should be recorded when completing the tier table.

(iii) The competent authority may allow an operator to apply even lower tiers than those referred to in the sub paragraph (ii) with a minimum of tier 1 for a transition period of up to three years if the operator can demonstrate to the satisfaction of the competent authority that this is not technically feasible or would lead to unreasonable cost to apply the higher tier and provides an improvement plan detailing how and by when at least the tier referred to in sub paragraph (ii) will be achieved. The improvement plan should be referenced in subsequent table and provided to the competent authority at the time of submission of this plan.

(iv) For minor source streams operators shall apply the highest tier which is technically feasible and will not lead to unreasonable costs with a minimum of tier 1 for activity data and each calculation factor. For de-minimis source streams operators may use conservative estimations rather than tiers unless a defined tier can be achieved without additional effort (MRR Article 26(2)).

(v) Installations with low emissions as identified in section 6(d) may apply as a minimum tier 1 for determining activity data and calculation factors for all source streams unless higher accuracy is achievable without additional effort.

* Note 1: For commercial standard fuels the minimum tiers listed in Annex V of the MRR may be applied for all activities in all installations.

* Note 2: If you are intending to apply a fall-back approach please complete the table below and select "n/a" for the tiers to be applied for each source stream where a fall-back approach is used. Section 10 "Fall-back" must also be completed for these source streams.

* Note 3: For biomass or mixed fuels the emission factor is the preliminary emission factor as defined in Definition 35 Article 3 of the MRR.

Source Stream Refs.	Emission Source Refs.	Measurement Device Refs.	Overall Metering Uncertainty (less than +/- %)	Applied Monitoring Approach	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied	Estimated Emissions $tCO_{2(e)}$	% of Total Estimated Emissions	Source Category	Highest Tiers Applied	Justification for not applying the highest tiers	Improvement Plan Reference (where applicable)
NG-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S37,S38,S39,S41,S60,S62,S63,S64,S65,	S/N 83034797,S/N 83034800,S/N 83034799	<1.5%	Standard	4	2b	2a	N/A	1	N/A	N/A	36500	93.59	Major	Yes	n/a	n/a

Source Stream Refs.	Emission Source Refs.	Measurement Device Refs.	Overall Metering Uncertainty (less than +/- %)	Applied Monitoring Approach	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied	Estimated Emissions $tCO_{2(e)}$	% of Total Estimated Emissions	Source Category	Highest Tiers Applied	Justification for not applying the highest tiers	Improvement Plan Reference (where applicable)
	S66,S67,S68,S69,S71,S72,S73,S74,S75,S70,S76																
GO-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S21,S22,S23,S25,S27,S28,S29,S30,S31,S32,S33,S34,S35,S36,S43,S44,S46,S47,S77	Oil Tank Level Indicators (IR1-LT-161-1-01 LT-25U-1-1 LT-25U-1-2 LT-25U-1-3 LT-161-1-200 LT-161-2-200	<5.0%	Standard	2	2a	2a	N/A	1	N/A	N/A	1000	2.56	Minor	N/A	n/a	n/a

Source Stream Refs.	Emission Source Refs.	Measurement Device Refs.	Overall Metering Uncertainty (less than +/- %)	Applied Monitoring Approach	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied	Estimated Emissions $tCO_{2(e)}$	% of Total Estimated Emissions	Source Category	Highest Tiers Applied	Justification for not applying the highest tiers	Improvement Plan Reference (where applicable)
		IRC3-LIT-161-01-200 IRC3-LIT-161-02-200 IRC3-LIT-161-03-200,Firewater Pump Tank Level Switches (IR1 & IR2 & Fab 24)															
NG-002	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S1	(N/A) - Conservative Estimate	N/A	Standard	No tier	1	1	N/A	1	N/A	n/a	0.3	0	De-minimis	N/A	n/a	n/a

Source Stream Refs.	Emission Source Refs.	Measurement Device Refs.	Overall Metering Uncertainty (less than +/- %)	Applied Monitoring Approach	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied	Estimated Emissions $tCO_{2(e)}$	% of Total Estimated Emissions	Source Category	Highest Tiers Applied	Justification for not applying the highest tiers	Improvement Plan Reference (where applicable)
	5,S16,S17,S18,S19																
VO-001	S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68	Fab 10 TOC Analysers,Fab 14 TOC Analyser,Fab 24-1 TOC Analyser,Fab 24-2 TOC Analyser,RCTO Inlet Flow Measurements	N/A	Standard	No tier	2a	2a	N/A	1	N/A	N/A	1500	3.85	Minor	No	Un-Reasonable Cost associated with installing continuous Flow Meters at the inlets to the RCTO Systems. (Unreasonable Costs Spreadsheet	n/a

Source Stream Refs.	**Emission Source Refs.**	**Measurement Device Refs.**	**Overall Metering Uncertainty (less than +/- %)**	**Applied Monitoring Approach**	**Activity Data Tier Applied**	**Net Calorific Value Tier Applied**	**Emission Factor Tier Applied**	**Carbon Content Tier Applied**	**Oxidation Factor Tier Applied**	**Conversion Factor Tier Applied**	**Biomass Fraction Tier Applied**	**Estimated Emissions $tCO_{2(e)}$**	**% of Total Estimated Emissions**	**Source Category**	**Highest Tiers Applied**	**Justification for not applying the highest tiers**	**Improvement Plan Reference (where applicable)**
																calculation provided to Agency - 22nd Dec 2017)	

Total Estimated Emissions for Calculation (tonnes $CO_{2(e)}$) 39000.3

u. Uncertainty Calculations

The table below lists evidence attached to the application that demonstrates compliance with the applied tiers in accordance with Article 12 of the MRR.

Attachment	**Description**
Extract from GSS-EHS-EMS-PRO-039 (Uncertainty).docx	Blank Document

v. Applied tiers

Applied tiers for each source stream

Source Stream Ref.	Emission Source Refs.	Activity Data Tier Applied	Net Calorific Value Tier Applied	Emission Factor Tier Applied	Carbon Content Tier Applied	Oxidation Factor Tier Applied	Conversion Factor Tier Applied	Biomass Fraction Tier Applied
NG-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68,S69,S71,S72,S73,S74,S75,S70,S76	4	2b	2a	N/A	1	N/A	N/A
GO-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S21,S22,S23,S25,S27,S28,S29,S30,S31,S32,S33,S34,S35,S36,S43,S44,S46,S47,S77	2	2a	2a	N/A	1	N/A	N/A
NG-002	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19	No tier	1	1	N/A	1	N/A	n/a
VO-001	S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68	No tier	2a	2a	N/A	1	N/A	N/A

w. Justification for Applied tiers

Justifications for the applied tiers for each major source stream where highest tiers are not currently achieved.

Source Stream Ref.	Emission Source Refs.	Justification for the applied tier	Improvement Plan Reference (where applicable)
VO-001	S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68	Un-Reasonable Cost associated with installing continuous Flow Meters at the inlets to the RCTO Systems. (Unreasonable Costs Spreadsheet calculation provided to Agency - 22nd Dec 2017)	n/a

10. Calculation Factors

x. Default Values

The table below lists, for each parameter, where default values are to be used for calculation factors.

Source Stream Refs.	Emission Source Refs.	Parameter	Reference Source	Default Value applied (where appropriate)
NG-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68,S69,S71,S72,S73,S74,S75,S70,S76	EF	Ireland's National Greenhouse Gas Inventory	n/a
GO-001	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19,S21,S22,S23,S25,S27,S28,S29,S30,S31,S32,S33,S34,S35,S36,S43,S44,S46,S47,S77	NCV & EF	Ireland's National Greenhouse Gas Inventory	n/a
NG-002	S1,S2,S3,S4,S5,S6,S7,S8,S13,S14,S15,S16,S17,S18,S19	EF and NCV	Annex VI of the MRR	n/a
VO-001	S37,S38,S39,S41,S60,S62,S63,S64,S65,S66,S67,S68	NCV and Emission Factor	Literature and Stoichiometric Carbon Content of Cyclohexanone and literature NCV	80 t CO2/TJ ; 33.614 TJ/kT of Cyclohexanone

Sampling and Analysis

Do you undertake sampling and analysis of any of the parameters used in the calculation of your CO_2 emissions? No

11. Management

y. Monitoring and Reporting Responsibilities

Responsibilities for monitoring and reporting emissions from the installation are listed below:

Relevant job titles/posts and provide a succinct summary of their role relevant to monitoring and reporting are listed below.

Job Title / Post	**Responsibilities**
EHS (GHG Program Owner)	Overall responsibly for management of program including, identification of sources, maintenance of procedures and records, completion of calculations, obtaining 3rd party verification, submission of Emission Reports.
CS Engineering (Energy Engineer)	Overall responsibility for use of Energy, including reviewing fuel usage data, reviewing energy saving projects and implementing the projects where feasible.
Operation & Maintenance	Maintenance of records with regard to the delivery of Oil and calibration of Oil Tank Indicators
Finance	Maintenance of records with regard to the purchase of Natural Gas and Oil.
EHS Manager	Appoint the GHG Program Owner and ensure his/her competence.

Attachment	**Description**
N/A	N/A

z. Assignment of Responsibilities

Details of the procedure used for managing the assignment of responsibilities for monitoring and reporting within the installation and for managing the competencies of responsible personnel in accordance with Article 58(3)(c) of the MRR:

This procedure identifies how the monitoring and reporting responsibilities for the roles identified above are assigned and how training and reviews are undertaken.

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Responsibilities are set out in Section 5 of this procedure including the responsibility on the EHS Manager to appoint a competent GHG Program Owner. Section 5 has been amended to describe how training and reviews are undertaken in relation to assigned roles.
Post or department responsible for the procedure and for any data generated	EHS Dept
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A

aa. Monitoring Plan Appropriateness

Details of the procedure used for regular evaluation of the monitoring plan's appropriateness covering in particular any potential measures for the improvement of the monitoring methodology:

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 9.1 describes how the list of emissions sources is kept up to date and how changes to the installation are included in emission plan. Section 9.4 describes how the uncertainty thresholds are set. The GHG Program owner is responsible for assessing the potential for improvement of the monitoring methodology.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)

List of EN or other standards applied	N/A

bb. Data Flow Activities

Details of the procedures used to manage data flow activities in accordance with Article 57 of the MRR:

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 9.2 describes the collection of the data and Section 9.4 describes the calculation methodology. Section 13.0 includes a diagram of the Data Flow
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A
List of primary data sources	Natural Gas Bills (from Bord Gais) Gas Oil/Diesel Delivery Dockets Gas Oil/Diesel Annual Stock-takes (based upon level indicators in Storage Tanks) RCTO TOC Monitors
Description of the relevant processing steps for each specific data flow activity. Identify each step in the data flow and include the formulas and data used to determine emissions from the primary data. Include details of any relevant electronic data processing and storage systems and other inputs (including manual inputs) and confirm how outputs of data flow activities are recorded	Natural Gas:- 1. Natural Gas Bills show kWh used (This is the Gross Calorific Value (GCV) 2. kWh figure multiplied by gross to net conversion factor to convert from kWH (in GCV) to kWH (in NCV). 3. NCV kWh figure multiplied by 0.0000036 to convert to TeraJoules (TJ) 4. kWh figures (NCV) is multiplied by Country Specific Emission Factor (tCO2/TJ) and multiplied by an Oxidation Factor of 1 to obtain the emission in tCO2. (The raw data (i.e. kWh figure from Bord Gais) are entered into a spreadsheet stored in the ICM-TL System. The calculations are also completed in this spreadsheet).

Gas Oil/Diesel

1. The amount of oil used is determined by using the formula:- Deliveries + Opening Stock - Closing Stock.

2. This figures is converted to tonnes using a density factor provided by the oil supplier.

3. This figures is then converted to kilotonnes (kt) by dividing by 1,000.

4. The quantity of oil used (in tonnes) is multiplied by the Country Specific NCV. This in turn is multiplied by the Country Specific Emission Factor (tCO2/TJ) to calculate the emissions (in tCO2).

(The raw data (i.e. quantities on delivery dockets, annual stock-takes and oil density from supplier) are entered into a spreadsheet stored in the ICM-TL System. The calculations are also completed in this spreadsheet).

Bottled Natural Gas:-

1. A very conservative approach is taken to estimate the CO2 emitted from the Bottled Natural Gas.

VOC Solvent Vapours:-

1. The amount of VOC Solvent Vapours is calculated from the TOC monitors on the RCTO Inlets. In cases where TOC monitored data is not available, an extrapolation based upon production levels is used to estimate the TOC loads on the RCTO's.

2. This figure is multiplied by 44/12 to convert to CO2

3. It is assumed that all of the VOC Solvent Vapour is Cyclohexanone is this is the most common solvent evaporated. The carbon content of Cyclohexanone is 73% w/w.

4. The Calorific Value of the Cycohexanone (33,614,000 J/kg) is then used to estimate the TJ's and, therefore, the value of TonnesCO2/TJ of VOC is back calculated. The calculated Emission Factor (EF) is 80 tCO2/TJ for

	Cyclohexanone. 5. The flow value used for each RCTO System is based upon the highest of the four measurements taken on that RCTO System in each year.

Submit relevant documents to record data flow activities

Attachment	**Description**
N/A	N/A

cc. Assessing and Controlling Risks

Details of the procedures used to assess inherent risks and control risks in accordance with Article 58 of the MRR:

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 12.0 includes a Risk Assessment. The task of assessment of inherent risks and control risks are assigned to the GHG Program Owner and documented in Section 5 (Responsibilities). This is required to be reviewed on an annual basis.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A

dd. Quality Assurance of Metering / Measuring Equipment

Details of the procedures used to ensure quality assurance of measuring equipment in accordance with Article 58 and 59 of the MRR.

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Section 9.5 (expanded) outlines the controls in place for the calibration of measuring equipment (gas oil tank level

	indicators) including the requirements for Quality Assurance. Additional responsibilities are also outlined in Section 5 (Responsibilities). Gas Networks Ireland are responsible for the maintenance and calibration of the gas meters at Intel. Copies of the Gas Networks Ireland Calibration certificates for the four meters are obtained and held on site.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A

ee. Quality Assurance of Information Technology used for Data Flow Activities

Details of the procedures used to ensure quality assurance of information technology used for data flow activities in accordance with Article 58 and 60 of the MRR:

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	This procedures outlines the IT Systems used for Data Flow Activities. External IT systems (e.g. Bord Gais systems) are the responsibilty of the external supplier. Internal IT systems are the responsibility of Intel's IT Department. The key internal IT system is the ICM-TL Document Managment System which is used to store raw data, complete calculations and store procedures and records. This system is managed by the CSIS which has its own protocols for testing, back-up, recovery and security.
Post or department responsible for the procedure and for any data generated	EHS / CSIS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A

ff. Review and Validation of Data

Details of the procedures used to ensure regular internal reviews and validation of data in accordance with Articles 58 and 62 of the MRR.

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039

Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	The review of data is shared between the EHS GHG Program Owner and the CS Energy Engineer (Section 5 of Procedure). This includes comparison with recent years and analysis of the causes of increases or decreases. The final review of the data before submission to the EPA is done by the EHS Manager (Section 9.7 of Procedure).
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A

gg. Corrections and Corrective Actions

Details of the procedures used to handle corrections and corrective actions in accordance with Articles 58 and 63 of the MRR:

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Corrective and Preventative Actions are outlines in Section 9.8. This section defines what actions are to be taken when errors or inaccuracies are identified. Section 9.5 specifies the controls in place for the calibration of measuring equipment including the requirements for Quality Assurance.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A

hh. Control of Outsourced Activities

Details of the procedures used to control outsourced processes in accordance with Articles 59 and 64 of the MRR.

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Outsourced Activities include measurement of incoming gas flows (by Bord Gais), measurement of oil deliveries (Oil

	Company), determination of density of oil (Oil Company), annual stock-takes of oil (Currently SGS OGC). Each of these bodies are believed to be reputable and reliable, but secondary checks includes analysis of gas usage before payment of bills and comparison of oil deliveries and stock-takes with the level indicators on the oil tanks.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A

ii. Record Keeping and Documentation

Details of the procedures used to manage record keeping and documentation:

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	Document are managed through the ICM-TL System and hard copies of documents are retained in the EHS Department Filing System (EHS Cabinets) for a period of 10 years. Section 10 of the Procedure specifies that records must be held to meet the requirement of Article 66 and Annex IX of the Monitoring and Reporting Regulation.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)
List of EN or other standards applied	N/A

jj. Risk Assessment

The results of a risk assessment that demonstrates that the control activities and procedures are commensurate with the risks identified:

Attachment	**Description**
Blank Document.docx	Risk Assessment is included in Procedure GSS-EHS-EMS-PRO-039

kk. Environmental Management System

Does your organisation have a documented Environmental Management System?	Yes
Is the Environmental Management System certified by an accredited organisation?	Yes
The standard to which the Environmental Management System is certified:	ISO 14001

12. Changes in Operation

ll. Changes in Operation

Article 24(1) of Commission Decision 2011/278/EC requires that Member States must ensure that all relevant information about any planned or effective changes to the capacity activity level and operation of an installation is submitted by the operator to the competent authority by 31 December each year. Article 12(3) of the MRR further provides that Member States may require information to be included in the monitoring plan of an installation for the purposes of meeting these requirements.

Details of the procedure used to ensure regular reviews are carried out to identify any planned or effective changes to the capacity activity level and operation of the installation that have an impact on the installation's allocation:

The procedure specified below cover the following:

- planning and carrying out regular checks to determine whether any planned or effective changes to the capacity activity level and operation of an installation are relevant under Commission Decision 2011/278/EC; and
- Procedures to ensure such information is submitted to the competent authority by 31 December of each year.

Title of procedure	The Data Management, Quality Assurance and Control Processes for Green House Gases (GHG) Monitoring and Reporting.
Reference for procedure	GSS-EHS-EMS-PRO-039
Diagram reference	N/A
Brief description of procedure. The description should cover the essential parameters and operations performed	This responsibility is assigned to the GHG Program Owner and the procedure is included under section 9.1. The GHG Program Owner completes regular reviews to identify any planned or effective changes to the capacity, activity level and operation of the installation and that have an impact on the installation's allocation under Commission Decision

	2011/278/EC. If such changes are identified, then these will be communicated to the EPA before 31st December of each year. Details of the Activity Level each year will be submitted to the EPA by 21st of January of the following year.
Post or department responsible for the procedure and for any data generated	EHS
Location where records are kept	ICM-TL (Document Management System)
Name of IT system used	ICM-TL (Document Management System)

13. Abbreviations

mm. Abbreviations Acronyms or definitions

Abbreviations acronyms or definitions that have been used in this monitoring plan:

Abbreviation	**Definition**
FAB	Semiconductor Fabrication Plant (i.e. manufacturing plant)
EG	Emergency Generator
RCTO	Rotary Concentrator Thermal Oxidiser (a type of Air Emission Abatement System)
NG	Natural Gas
GO	Gas Oil
MPHW	Medium Pressure Hot Water
IR....	Building Designation on the Intel Ireland site (e.g. IR1, IR3, IR5)
S....	Emissions Source Reference
A...	Emission Point Reference
LT	Level Transmitter
LIT	Level Indicator and Transmitter
EHS	Environmental Health and Safety Department
ICM-TL	"Intel Content Management - Technology Leadership" (Intels' Document Management System)
VOC	Volatile Organic Compound

14. Additional Information

Any other information:

Attachment	Description
Intel Ireland - Continuous RCTO Inlet Flow Meters - Unreasonable_Costs_Tool_en (22nd Dec 2017).xlsx	Intel Ireland - Continuous RCTO Inlet Flow Meters - Unreasonable Costs Calculation
GSS-EHS-EMS-PRO-039-87 (22nd Dec 2017).doc	GSS-EHS-EMS-PRO-039 (Updated Site Monitoring and Reporting Procedure)
4016TAG1A2A - TSL4234E9.pdf	TIC of Emission Source S77
S76 5822209_1_vdp_000.pdf	TIC of S76
Source of NCV for Cyclohexanone.pdf	Source of NCV for Cyclohexanone

15. Confidentiality

nn. Confidentiality Statement

It is the Environmental Protection Agency's policy to make information received by it in the course of its work open to inspection by any person on request. This is in accordance with the provisions of the European Communities (Access to Information on the Environment) Regulations 2007 to 2011.

In the event that you considered that some of the information being submitted of a confidential nature, then the nature of this information and the reasons why it should be considered confidential, with reference to the European Communities (Access to Information on the Environment) Regulations 2007 to 2011 and any amendments must be explicitly requested using the facility below. The Board of the Environmental Protection Agency will consider the requests and if the information can be deemed as confidential and necessary.

Notwithstanding any request for confidentiality, the Environmental Protection Agency explicitly reserves the right to release data to the Commission, including emissions and allocations to the public, on the basis that the data will be used for the purposes foreseen in Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.

Please tick this box if you consider that any part of your form should be treated as commercially confidential/sensitive: false

END of Appendix I.