FORTUM GLASGOW LTD
SOUTH CLYDE ENERGY CENTRE
Permit Application

Application Number
PPC/A/1168354

CONTENTS

1 NON TECHNICAL SUMMARY OF DETERMINATION

PPC requires that where the draft determination of an application or a SEPA initiated variation is to be subject to public consultation (this is usually referred to as PPD consultation) the decision document will contain a non technical summary of the determination. There is no need to have a non technical summary if the application is no subject to PPD

Will the draft determination be subject to public consultation? Yes

Fortum Glasgow Ltd are proposing to build a Combined Heat and Power (CHP) plant based on a single line incinerator at land adjacent to Bogmoor Road, North Cardonald burning non-hazardous waste to generate steam and electricity. The electricity will be exported to the national grid and heat will be exported to local users. The proposals for energy recovery meet targets for energy recovery specified in SEPA's Thermal Treatment of Waste Guidelines.

The proposed facility will come under the regulation of Chapter 4 "Special provisions for Waste Incineration Plants and Waste Co-Incineration Plants" in the Industrial Emissions Directive (IED) Dir 2010/75/EU by virtue of the fact that it is a Waste Incineration Plant. This means that stringent limits on operating conditions and requirements for continuous monitoring of emissions to air are applicable to limit impact to the environment and human health.

Air dispersion modelling using two different models has been carried out to assess the predicted impact of emissions to air to human health and to ecological receptors using 5 years of meteorological data. The modelling was a 'worst case' assessment which assumed that pollutants are all emitted at the level of the emission limit values (ELV) when in practice actual emissions can be expected to be much lower. No exceedances of air quality standards for the protection of human health or ecological receptors were predicted and it is not anticipated that the proposed facility will cause any adverse impacts. The output from the air dispersion modelling was also used in a human health risk assessment (HHRA). SEPA is satisfied that the conclusions drawn in the HHRA are supported by the assessment and that no unacceptable risk to human health is presented by the proposed activities.

Environmental monitoring will be required by permit conditions to gather baseline soil data in the local area for dioxins and furans prior to commissioning of the plant.

The incineration line will burn 352,000 tonnes per annum of non-hazardous municipal and commercial and industrial solid waste from which recyclable material (plastic, metals, paper, card, glass etc.) have been removed prior to delivery to the site, based on an availability of 8000 hours per annum, but capable of burning up to a maximum of 385,440 tonnes per annum .

The facility comprises the following main equipment:

- a weighbridges for weighing materials and wastes in and out of the site;
- a waste reception area comprising a tipping hall, 5300 tonne capacity waste bunker and a waste quarantine area. Waste delivery vehicles drive into the tipping hall and tip waste into the waste bunker. An overhead crane mixes the waste inside the bunker and delivers it to a waste feed chute;
- a single moving-grate incinerator linked to an integral water-tube heat recovery boiler, steam turbine and electrical generation equipment with an external air cooled condenser. The incinerator will operate with a minimum combustion gas temperature of 850°C with a two second residence time – low NOx gas burners will ensure the temperature is maintained above 850°C when waste is burned. Incinerator bottom ash (IBA) collected from the grate is required to meet specific limits on unburned carbon in ash as specified in permit conditions;
- equipment for water-cooling, storage and handling of IBA;
- flue gas treatment to reduce emissions to air and comprising injection of ammonia into the combustion chamber to reduce emissions of nitrogen oxides; a bag filter to reduce dust emissions; injection of lime upstream of the bag filter to absorb acid gases (sulphur dioxide, hydrogen chloride and

hydrogen fluoride) and injection of activated carbon at the same location to remove VOCs including dioxins and furans and heavy metals including mercury. The treated flue gases will exhaust to atmosphere via an 80 metre stack; solid residues from flue gas treatment known as air pollution control residues (APCr) will be stored inside external silos. A stack height assessment supporting the proposed stack height is provided in the air quality impact assessment in Annex 4 of the PPC Application and in the Clarification on NOx emission limits.

- Reverse osmosis demineralisation plant to treat mains water so it is suitable for use in the boiler for steam generation;
- storage of raw materials including internal storage of boiler chemicals; and external storage of fuel oil, ammonia solution and silo's for storage of quick lime and powdered activated carbon;
- mains water / fire water tank;
- emergency standby generator to provide safe shutdown in the event of a power cut;

Glossary of terms

APCr - Air Pollution Control residues
BAT - Best Available Techniques
BATC - BAT Conclusions
BREF - BAT Reference Document
CHP - Combined Heat and Power
CO - Coordinating Officer
DMA - Dispersion Modelling Assessment
ELV - Emission Limit Value
IBA - Incinerator Bottom Ash
IED - Industrial Emissions Directive
PAHs - polycyclic aromatic hydrocarbons
PCBs - dioxin-like polychlorinated biphenyls
PPC 2012 - The Pollution Prevention and Control (Scotland) Regulations, 2012
SCEC - South Clyde Energy Centre
TOC - Total Organic Carbon
TTWG - SEPA Thermal Treatment of Waste Guidelines
VOC - Volatile Organic Compounds

2 EXTERNAL CONSULTATION AND SEPA'S RESPONSE

***Is Public Consultation Required* - Yes**

Advertisements Check:	***Date***	***Compliance with advertising requirements***
Edinburgh Gazette	10/07/2018	Yes
Daily Record	13/07/2018	Yes

No. of responses received: No responses received

Summary of responses and how they were taken into account during the determination:

N/A - No responses received

***Is PPC Statutory Consultation* Required – YES**

Food Standards Agency: Yes. Letter sent out 23/08/2018

"In our role as statutory consultee under these Regulations, Food Standards Scotland's assessment of the application is limited to potential risks to the safety of the human food chain that could result from the environmental impact of emissions from the installation to the surrounding area.
Based on the application and provided that the applicant complies with the relevant SEPA Guidance and all other relevant PPC Guidance Notes and Regulations, Food Standards Scotland considers it unlikely that there will be any unacceptable effects on the human food chain from the emissions from this installation."

Greater Glasgow and Clyde Health Board: Yes. Letter sent out 23/08/2018
The Consultant in Public Health Medicine responded to query whether and how the potential impact on human health had been considered within the emissions monitoring proposed, the interface between screening and the likelihood of breaching the AQAL and the relevance of the AQAL and air quality standards in protecting human health.
SEPA met with the GGCHB to discuss these queries. GGCHB was satisfied that the potential impact on human health had been considered within the emissions monitoring measures proposed indirectly by the inclusion of ELVs and assessment of compliance which was set on health based criteria. They concluded that "The results of the modelling are acceptable in the light of the considerable amount of conservatism contained in the model. There is unlikely to be any health hazard from the use of the installation to operate specified waste management activities."

Glasgow City Council: Yes. Letter sent out 23/08/2018 No response

Scottish Water: Yes. Letter sent out 23/08/2018 No response

Health and Safety Executive: N/A

Scottish Natural Heritage (PPC Regs consultation): Yes. Letter sent out 23/08/2018
No concerns. Agreed with applicant that classification of Cadder Wilderness was not correct

"The Dispersion Modelling Assessment Report (Section 9.5) states that the APIS website lists coniferous woodland as the most sensitive habitat at Cadder Wilderness SSSI for nitrogen deposition. However, Cadder Wilderness SSSI is in fact notified for lowland mixed broadleaved woodland habitat. The applicant therefore corrects the modelling calculations using the most suitable critical load (10kg/N/ha/yr) for lowland mixed broadleaved woodland and concludes that impacts at all SSSI sites will be insignificant.
Having reviewed the Dispersion Modelling Assessment Report we agree that the levels of emission are of a suitably low level to be of no concern. In our view, the proposal will not adversely affect the notified natural features of the above SSSI's and we are satisfied that these sites do not require further consideration."

Harbour Authority: N/A

Discretionary Consultation - No

Enhanced SEPA public consultation - Yes

Details of enhanced public consultation
Application placed on website to advertise consultation on 20/08/2018. No responses received

***'Off-site' Consultation* - No**
***Transboundary Consultation* - No**
Public Participation Consultation - Yes
STATEMENT ON THE PUBLIC PARTICIPATION PROCESS **The Pollution Prevention and Control (Scotland) Regulations 2012 (schedule 4, para 22) requires that SEPA's draft determination of this application be placed on SEPA's website and public register and be subject to 28 days' public consultation. The dates between which this consultation took place, the number of representations received and SEPA's response to these are outlined below.**

Date SEPA notified applicant of draft determination	21/02/2019
Date draft determination placed on SEPA's Website	26/02/2019
Details of any other 'appropriate means' used to advertise the draft	None, no previous responses
Date public consultation on draft permit opened	26/02/2019
Date public consultation on draft permit consultation closed	26/03/2019
Number of representations received to the consultation	No public responses but a small number of minor corrections were identified by the applicant
Date final determination placed on the SEPA's Website	

Summary of responses and how they were taken into account during the determination:
The applicant noted minor inaccuracies to the decision document and permit with regard to cross referencing between conditions and reporting dates, that the stack was single, not combined and also an inaccuracy in the location of the air extraction system. None of these had environmental implications. The corrections have therefore been incorporated into the final Permit and Decision Document.

3 ADMINISTRATIVE DETERMINATIONS

Determination of the Schedule 1 activity

As detailed in the application and specified in the draft Permit Schedule 1 paragraph 1.1.3

Determination of the stationary technical unit to be permitted:

As detailed in the application and described in in the draft Permit Schedule 1 paragraph 1.1.4.

Determination of directly associated activities:

As described in the draft Permit Schedule 1 paragraph 1.1.5.

Determination of 'site boundary'

As detailed in the application and inserted in Figure 1 in the draft Permit Schedule 1 paragraph 1.2.

4 INTRODUCTION AND BACKGROUND

4.1 Historical Background to the activity and application

The applicant - Fortum Glasgow Limited is proposing to build the South Clyde Energy Centre (the Facility) waste incineration facility on the site adjacent to 339 Bogmoor Road, North Cardonald, Glasgow. This land had previously been developed as railway sidings and since 2007 had been used by Tarmac Limited as an aggregate recycling facility and concrete batching plant. This means that the site has a "brownfield" designation. The site falls within the Glasgow City Council Local Authority Area but with the boundary with Renfrewshire Council immediately to the west of the site.

Planning permission was applied for by the landowner Peel Environmental in June 2012 for the erection of a waste management facility including recyclables recovery facility and energy recovery facility with ancillary buildings, vehicular access and associated infrastructure including electricity substation, application 12/01293/DC. Full planning permission with conditions was granted on the 11th September 2013.

Changes to the scheme were subject to the planning process but SEPA was not consulted by Glasgow City Council on any of the changes, although they could potentially have affected consentability. SEPA was consulted regarding the completion of pre-construction environmental conditions.

A pre-application meeting was held on April 25th 2018. At this point the applicant explained that the greater throughput agreed in the planning revisions had been necessary to deal with the change in awarding financial support. The Facility will not qualify for support under Contracts for Difference (CfD), since it utilises conventional direct-burn technology. As a facility capable of treating (partially) renewable fuel, the Facility may be eligible for support under the Renewable Heat Incentive (RHI) support mechanism, which subsidises renewable energy generation based on the bio-energy content of the fuel. However, new plants which are commissioned after 31st March 2021 will not be eligible for RHI. The Facility will therefore not be eligible for alternative renewable subsidies, including the RHI. The technology was to remain the same. The increased throughput necessary meant that there was no longer room on site for a MRF. SEPA was aware that the Scottish Government requirement for source segregation could met by taking residual waste from councils that had an accepted high level of waste segregation and recycling.

The original application was submitted on the 31/05/2018 but was not Duly Made and a revised application was submitted on the 21st June 2018 which was subsequently Duly Made. On the 5th October, an extension to the determination period was granted until the 31st December and a further extension until the 31st March was agreed on the 19th December to allow time for SEPA to consider a clarification memo detailing the Environmental Impact associated with reducing the emission limit for NOx (NO and NO_2 expressed as NO_2) to 150 mg/m3. This was submitted in response to concern from SEPA that the current BREF limit of 200mg/m^3 used in the EIA in the original application would mean that the emission did not screen out in the Glasgow Byres Road/Dumbarton Road AQMA. The application had included a paragraph stating that at an Emission Limit Value (ELV) for NOx of 165 mg/m3 the emission would screen out at the AQMA.

The Facility will be fuelled by incoming municipal, commercial and industrial non-hazardous waste.

4.2 Description of activity

The application is for an Energy from Waste plant that is a Specified Waste Management Activity (SWMA) as detailed under Chapter 5 Section 5.1 Incineration and Co-incineration of Waste of the Pollution Prevention and Control Regulations (Scotland) 2012. The activity falls under Section 5.1 Part A (b)

Incineration of non-hazardous waste with the exception of waste which is biomass or animal carcasses in an incineration or co-incineration plant.

The Facility includes a moving grate single line waste incinerator with a nominal design capacity of 352,000 tonnes per annum based on an assumed availability of approximately 8,000 hours per annum. On this basis, the Facility will have a nominal design capacity of approximately 352,000 tonnes per annum. However, allowing for a maximum availability of 8,760 hours per annum, the maximum capacity of the Facility is approximately 385,440 tonnes per annum.

The Facility has been designed to thermally treat waste with a net calorific value (NCV) of 8 – 15 MJ/kg. The maximum design capacity of the thermal treatment line is approximately 44 tonnes per hour of waste with an average NCV of 10 MJ/kg. This is represented by point P2 on the firing diagram.

The Facility has been designed to export power to the National Grid. The turbine has been designed to generate up to 40 MWe of electricity (design maximum) and up to 12 MWth of heat. The Facility will have a parasitic load of 5 MWe. Therefore, the maximum export capacity of the Facility is 35 MWe. However, as the fuel quality will fluctuate and when heat is exported from the facility to local heat users in the future, the power exported will fluctuate.

Hot incineration gases will pass to a steam raising boiler before going to flue gas treatment and emission from an 80m stack. Steam will pass to a generator where electricity will be generated for export to the grid.

The facility also consists of waste reception, waste storage, water treatment, auxiliary fuel and air supply systems, a standby generator for emergency shut down, facilities for the treatment of exhaust gases, on-site facilities for storage of raw materials, residues and waste water, flues, stack, devices and systems for controlling operation of the waste incineration plant, recording and monitoring equipment.

4.3 Guidance/directions issued to SEPA by the Scottish Ministers under Reg.60 or 61.

None

4.4 Identification of important and sensitive receptors

Key receptors are:

1. Human health receptors and air quality management areas
2. Special Protection Areas, Sites of Special Scientific Interest and Ramsar Sites.

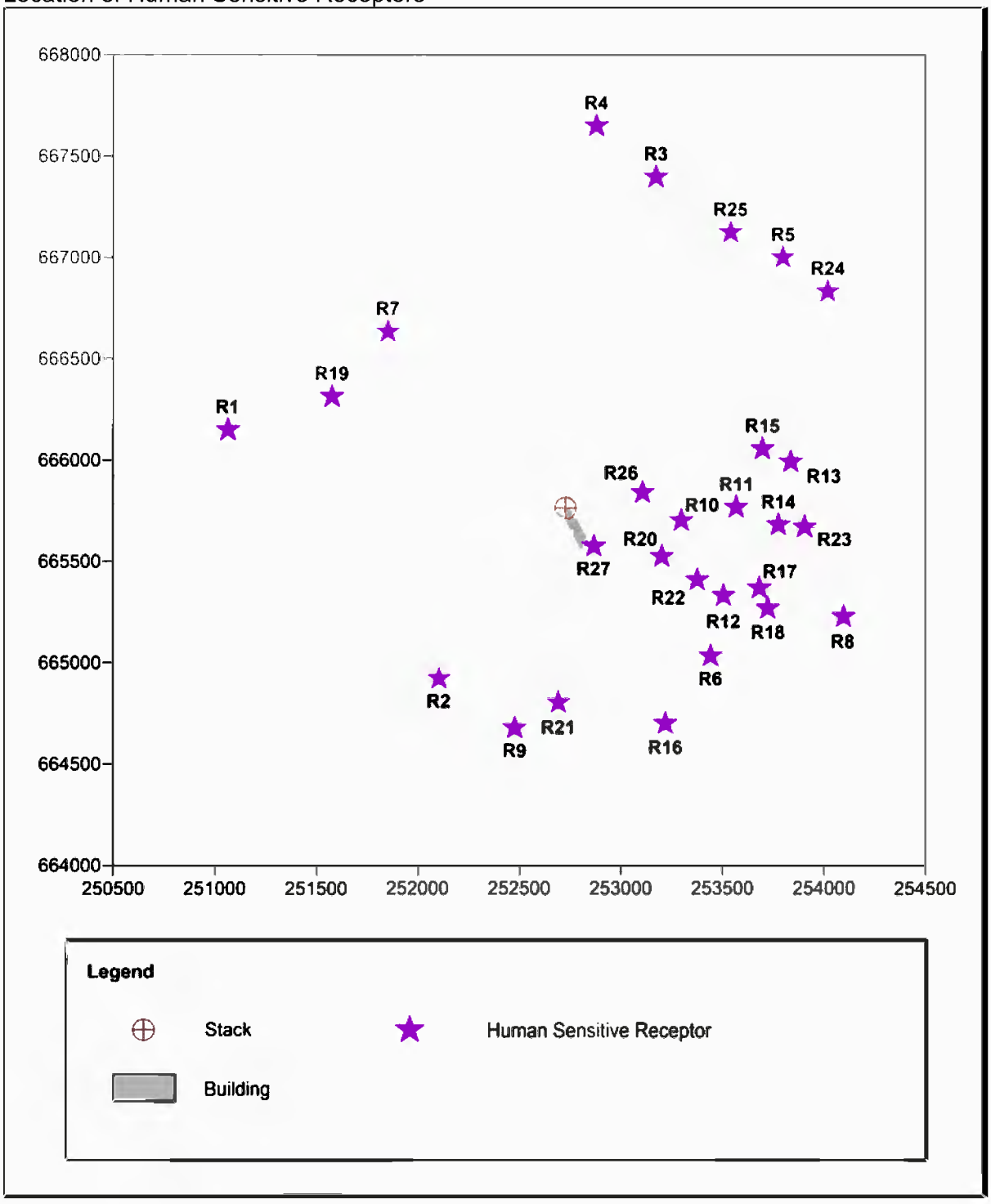
4.4.1 Human health receptors and air quality management areas

The installation is located in a primarily industrial area of Cardonald. To the north of the site on Bogmoor Road is a site comprising a combination of static and mobile homes and further afield residential properties on Hardgate Road/Luma Gardens to the north-east, albeit all these properties are separated from the site by the M8 motorway and A8 Shieldhall Road. To the south lies the urban area of Hillington, separated from the site by the North Cardonald industrial area and by both disused railway and passenger railway lines. The Glasgow Queen Elizabeth University Hospital is situated to the north of the site in the Shieldhall area, separated by the M8 motorway and A8 Renfrew/Shieldhall Road. There is also a school located within the urban area of Cardonald to the south.

The general approach of the assessment is to evaluate the highest predicted process contribution to ground level concentrations, known as the point of maximum impact. In addition, the predicted process contribution at a number of sensitive receptors has been evaluated. The human sensitive receptors identified for assessment are displayed in the table below and in figure and Table 5.1 of the permit application. It should be noted that the point of maximum impact is not at any of the sensitive receptors.

ID	Name	Grid reference X	Grid reference Y	Distance from Stack
R1	Arkleston Rd	251064	666147	1.71
R2	Chirnside Rd	252104	664920	1.05
R3	Duncan Avenue	253175	667394	1.69
R4	Earl Road	252882	667646	1.89
R5	Edzell St Church	253801	666996	1.63
R6	Fulbar Rd	253443	665031	1.02
R7	Glasgow Rd	251854	666631	1.23
R8	Govan High School	254100	665224	1.47
R9	Hartlaw School	252478	664676	1.11
R10	Hospital 1	253299	665699	0.57
R11	Hospital 2	253570	665764	0.84
R12	Hospital 3	253507	665328	0.89
R13	Hospital 4	253839	665989	1.13
R14	Hospital 5	253778	665677	1.05
R15	Hospital 6	253699	666053	1.01
R16	Ladykirk Dr	253220	664698	1.17
R17	Langlands Dr Church	253684	665365	1.03
R18	Mallaig Rd	253726	665265	1.11
R19	Morriston Crescent	251578	666311	1.28
R20	Nithbank Ave	253203	665521	0.53
R21	Reston Dr	252692	664802	0.96
R22	Shieldhall Rd	253378	665405	0.74
R23	Skipness Drive	253907	665667	1.18
R24	Squire St Church	254022	666829	1.68
R25	St Paul's School	253543	667120	1.58
R26	Bogmoor Road Traveller Site	253109	665837	0.39
R27	Bogmoor Road Flats	252868	665572	0.23

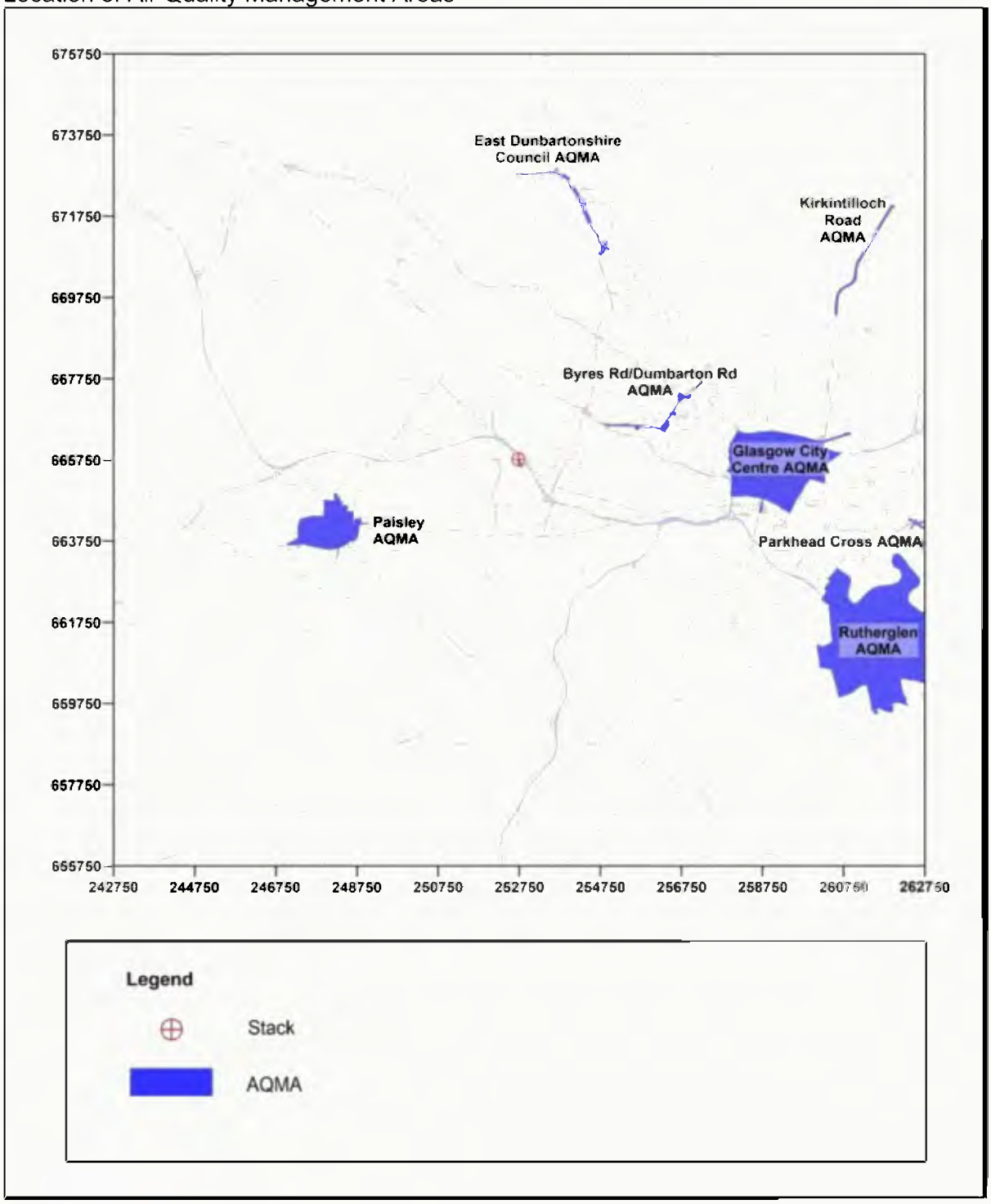
Location of Human Sensitive Receptors



Under Section 82 of the Environment Act (1995) (Part IV), local authorities are required to undertake an ongoing exercise to review air quality within their area of jurisdiction. A review of the local area has shown that several Air Quality Management Areas (AQMAs) have been declared within 10 km of the Facility. The impact of the Facility on these AQMAs has been considered in this assessment.

AQMA Name	Local Authority	Distance and Bearing	Exceedances Recorded (Reason for Declaration)
Byres Rd/Dumbarton Rd	Glasgow	2.3 km north east	Nitrogen dioxide - annual mean
Glasgow City Centre	Glasgow	5.2 km east	Nitrogen dioxide - annual mean; PM10 - annual mean
Parkhead Cross	Glasgow	9.8 km east	Nitrogen dioxide - annual mean
Kirkintilloch Road	East Dunbartonshire	8.5 km north east	Nitrogen dioxide - annual mean; PM10 - annual mean
East Dunbartonshire Council	East Dunbartonshire	5.4 km north	Nitrogen dioxide - annual mean; PM10 - annual mean
Paisley	Renfrewshire Council	4.1 km south west	Nitrogen dioxide - annual mean and 1-hour mean; PM10 - annual mean
Rutherglen	South Lanarkshire	8.1km south east	Nitrogen dioxide - annual mean; PM10 - annual mean

Location of Air Quality Management Areas



4.4.2. Special Protection Areas, Sites of Special Scientific Interest and Ramsar Sites.

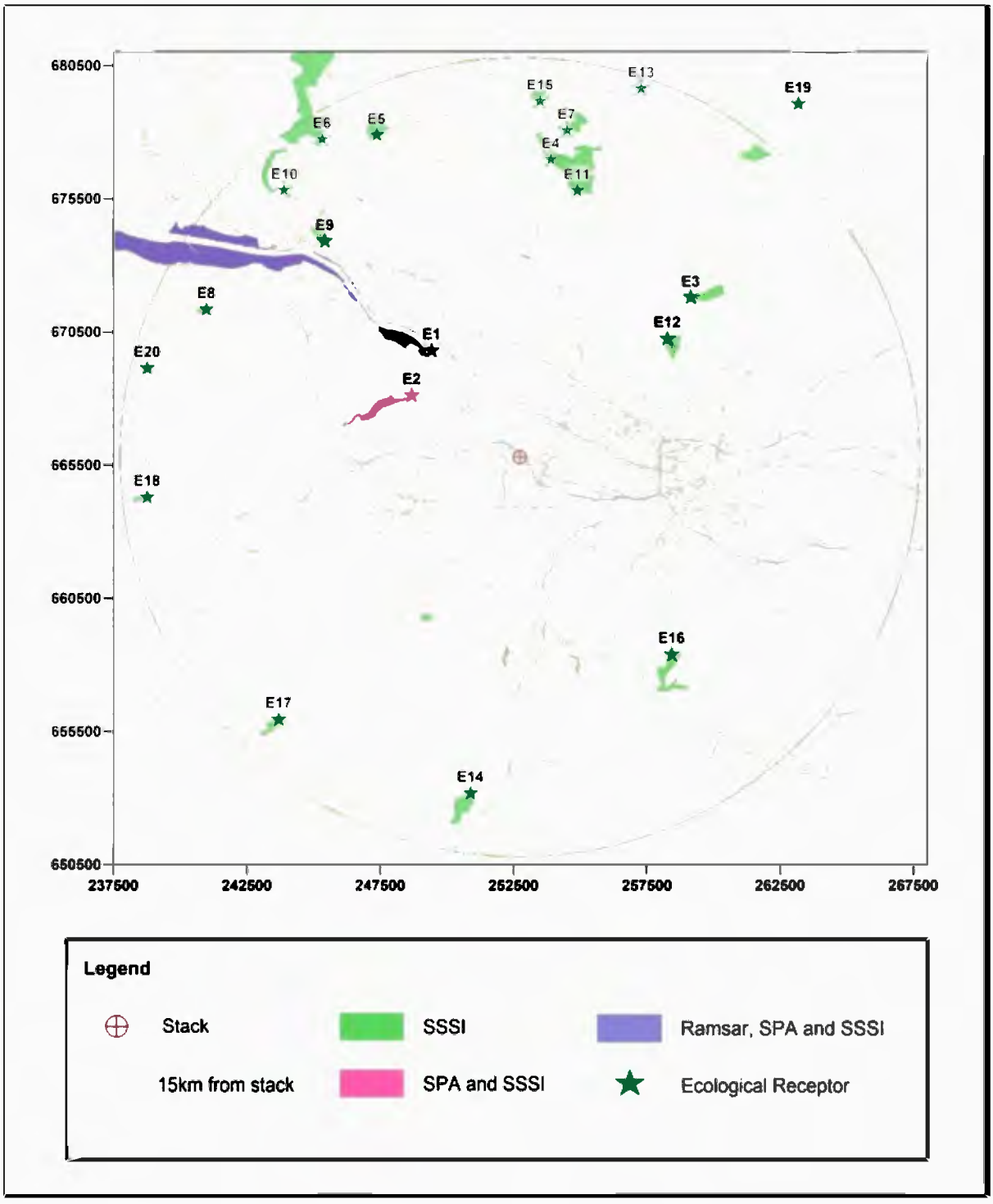
A study was undertaken to identify the following sites of ecological importance in accordance with IPPC H1 (2003) and the correspondence with SEPA on the other similar applications:

- Special Protection Areas (SPAs), Special Areas of Conservation (SACs), or Ramsar sites within 15 km of the Facility;
- Sites of Special Scientific Interest (SSSIs) within 15 km of the Facility; and
- National Nature Reserves (NNR), Local Nature Reserves (LNRs), local wildlife sites and ancient woodlands within 2 km of the Facility.

The ecological receptors identified are displayed below. A review of the citation and APIS website for each site has been undertaken to determine if lichens are an important part of the ecosystem's integrity. If lichens are present, the more stringent Critical Level has been applied. The Fossil Grove SSSI has also been identified within the screening distance. However, this SSSI is a geological feature and does not contain any sensitive ecological features which could be impacted by emissions from the Facility. Therefore, the Fossil Grove SSSI has not been included within this assessment

ID	Name	Designation	Grid Ref X	Grid Ref Y	Distance from Stack (km)
E1	Inner Clyde	SSSI, SPA, Ramsar	249432	669788	5.21
E2	Black Cart Water	SSSI, SPA	248680	668105	4.68
E3	Cadder Wilderness	SSSI	259130	671780	8.79
E4	Craigallian Marshes	SSSI	253895	676960	11.26
E5	Dumbarton Muir 1	SSSI	247365	677870	13.24
E6	Dumbarton Muir 2	SSSI	245320	677710	14.06
E7	Dumbrock Loch Meadows	SSSI	254490	678045	12.41
E8	Formakin	SSSI	240980	671330	13.00
E9	Haw Craig - Glenabuck	SSSI	245425	673890	10.93
E10	Lang Craigs	SSSI	243890	675800	13.38
E11	Mugdock Wood	SSSI	254880	675790	10.26
E12	Possil Marsh	SSSI	258260	670230	7.11
E13	Ballagan Glen	SSSI	257280	679610	14.58
E14	Brother and Little Lochs	SSSI	250880	653170	12.73
E15	Carbeth Loch	SSSI	253490	679145	13.41
E16	Cart and Kittoch Valleys	SSSI	258420	658380	9.32
E17	Loch Libo	SSSI	243690	655940	13.35
E18	Whinnerston	SSSI	238760	664280	14.05
E19	South Braes	SSSI	263165	679045	16.89
E20	Shovelboard	SSSI	238765	669120	14.36

Ecological Sensitive Receptors



5 KEY ENVIRONMENTAL ISSUES

5.1 Summary of significant environmental impacts

The process is a standard moving grate incineration plant capable of burning a maximum of approximately 385,440 tonnes of non-hazardous waste per annum. The key potentially significant impacts of the proposed facility are emissions to air and water, management of residues, odour and noise. These are discussed further in Sections 5.2, 5.3, 5.13, 5.14, 5.7 and 5.17 below together with details of the Best Available Techniques (BAT) for their management.

5.2 Point Sources to Air

5.2.1 Key Emissions and ELVs

One of the key issues associated with the proposed facility is the extent and impact of emissions to air. In addition to carbon dioxide and water vapour from combustion of fuel, the principal emissions from the incineration line will be oxides of nitrogen (NOx), oxides of sulphur (SOx), carbon monoxide, hydrogen chloride and hydrogen fluoride gases, particulate matter (PM), heavy metals, volatile organic compounds (VOCs) and dioxins and furans. These substances when emitted from incineration appliances are subject to the requirements of the Chapter 4 of the Industrial Emissions Directive (IED) which requires compliance with specific emission limit values (ELVs) as set out in IED Annex VI. The details of the main stack, emission point A1 and the associated ELVs required to meet the requirements of IED Annex VI have been specified in Table's 6.1 and 6.2 in the draft Permit.

Additional emissions which are not specifically regulated under IED include ammonia and nitrous oxide associated with ammonia solution injection to abate emissions of NOx. An ELV has been specified for ammonia but not for nitrous oxide for which a requirement is specified in Table 6.2 of the draft Permit for monitoring only, it is however captured in the ELV assessment for oxides of nitrogen. The ELV specified for ammonia is 10 mg/m^3 (daily average) and 10 mg/m^3 (average over sample period for periodic monitoring) which is consistent with ELVs set in Permits for other waste incineration plants in Scotland.

Regulation 29(2) of PPC 2012 also requires that the monitoring for dioxins and furans referred to in Part VI paragraph 2.1(c) in Annex VI of IED is taken to include polycyclic aromatic hydrocarbons (PAHs) and dioxin-like polychlorinated biphenyls (PCBs). Monitoring requirements for these parameters have therefore also been included in Table 6.2 the Permit but no separate ELVs have been set. An ELV for dioxins and furans is included in Table 6.2.

The application states that for the proposed incineration plant the IED emission limits will be complied with and that under normal operating conditions emission concentrations lower than the IED limits will be achieved. Data to support this statement from an existing similarly equipped facility already in operation was supplied in Appendix 9 of the permit application. This data has been assessed and SEPA is satisfied that the proposed technology is capable in principle of meeting the IED ELVs. Control of input materials to the incinerator is important in ensuring that emissions remain within ELVs. In this respect the waste acceptance criteria and procedures are designed to ensure sufficient control of waste inputs to the facility. Air emissions testing will be carried out continuously on the discharged combustion gases from the incineration line for many parameters and also periodically throughout the permit lifetime for all relevant parameters to ensure that the IED Emission Limit Values are met in practice.

The applicant used the current IED Part VI annual mean emission limit of 200mg/m^3 for Oxides of nitrogen (NO and NO_2 expressed as NO_2) in their air dispersion modelling however at this value, the process contribution for NO_2 did not screen out as insignificant at the Byres Road/Dumbarton Road AQMA which is declared for Nitrogen dioxide – annual mean. Section 8.3 of the Dispersion Modelling Assessment in Annex 4 of the permit application assessed the annual mean nitrogen dioxide results further. It was identified that the annual NOx emission would screen out as insignificant at an annual mean emission limit

of 165 mg/Nm^3. Following consultation with the applicant it was identified that the proposed Selective Non-Catalytic Reduction (SNCR) system for the abatement of NOx will be capable of operating at an emission limit of 150mg/Nm^3 (expressed as a daily average). This emission limit is in accordance with the proposed BAT AEL for oxides of nitrogen stated in the pre-final draft Waste Incineration BREF. The submission also considered:

1. The stack height analysis associated with reducing the emission limit as proposed; and
2. The environmental impact associated with the proposed emission limit.

As the impact of short term NOx, the half hourly averages, had screened out as 'insignificant' at the point of maximum impact and at all sensitive receptors within the modelling domain at the original ELV, this was not considered further in the submission. The applicant also confirmed that the proposed emission limit could be achieved with a maximum ammonia slip of 10mg/Nm^3, the permit ELV set for ammonia.

An additional standard condition for the vent from the incineration line is also required to meet the general standard requirement that all emissions to air "other than steam or water vapour, shall be colourless and free from persistent mist, fume and droplets (Ref. Permit Condition 6.1.11).

5.2.2 Predicted Impacts of Emissions to Air

The impact of emissions to air from the proposed development are considered in the following documents in support of the Permit Application;

- Section 2.4.1 and Annex 4 of the Fortum Glasgow Limited permit application consider emissions to air. Annex 4 Air Quality Assessments contained the following assessments: Greenhouse Gas Assessment, Dispersion Modelling Assessment DMA), which includes the Air Quality (Impact) Assessment, Human Health Risk Assessment (HHRA); Impact at Ecological Receptors; Abnormal Emissions Assessment. The Air Quality Assessment (AQA) includes stack height sensitivity analysis.
- Memorandum on South Clyde Energy Centre – Clarification on NOx emission limit (Document Ref s2503-0330-0001JRS) Date 19th December 2018, which also contains a further stack height sensitivity analysis for NOx

The information below is based on all of the responses above.

5.2.2.1 Dispersion Modelling Study

In order to demonstrate the potential impact of the proposed facility the Application has undertaken air dispersion modelling using two 'new generation' dispersion models: ADMS 5.2 and AERMOD. These models are recommended for use by UK Regulators for assessing the impacts of emissions to air from new facilities. The models predicts ground level concentrations for each pollutant. These values are then compared to air quality, standards and objectives (air quality assessment levels (AQALs)) and background data where relevant to assess impact.

Cumulative impacts of the proposed facility combined with emissions from transport and other facilities which have planning permission were modelled as part of the Planning Application (June 2012). No exceedances of air quality standards for the protection of human health were predicted.

5.2.2.2 Air Quality Standards, Objectives and Guidelines

In the UK, ambient concentrations of pollution are controlled by a number of air quality standards and objectives which are described in The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 (the AQS). In Scotland these air quality objectives are implemented via the Air Quality (Scotland) Regulations 2010. For pollutants not directly covered by this Regulation, guidance is available in Appendix D of PPC horizontal guidance note IPPC H1 issued in 2003. This provides both long-term (LT) and short-term (ST) Environmental Assessment Levels (EALs) for the protection of human health and the environment. EALs specified in the Environment Agency's environmental management guidance 'Air Emissions Risk assessment for your Environmental Permit' (Air Emissions Guidance) are also considered. When the AQS does not contain relevant objectives the LT and ST EALs from these documents are therefore used to assess potential impacts. Standards and objectives for the protection of sensitive

ecosystems and habitats are also contained within IPPC H1, the Air Emissions Guidance and the Air Pollution Information System (APIS). The Air Quality Assessment Levels (AQALs) used in the study are summarised in Tables 3.2 to 3.4 in the Dispersion Modelling Assessment and the AELs in Table 3.1.

5.2.2.3 Background Data

Background ambient data for the pollutants assessed was used to assess current levels of pollutants. Local data from ambient monitoring station was used where possible, this was supplemented with UK data or Scottish data where this was not available. The applicant used the most conservative of the mapped datasets. This is identified in Section 4 Baseline Air Quality of the Dispersion Modelling assessment of the AQA for each pollutant and the data used for further assessment is summarised in Table 4.10. One exceedance of the annual mean AQAL for PM10 has been recorded at a roadside site. No background monitoring for PM10 is available within the modelling domain. Monitoring of benzene has been undertaken at one roadside site. The data shows that concentrations have consistently been between 0.6 and 0.8 µg/m³. This shows that the mapped background concentration in the grid square containing the Facility (0.67 µg/m³) and the maximum within the modelling domain (1.01 µg/m³) are conservative, and therefore the mapped background concentration has been used in lieu of any background monitoring.

The maximum mapped background concentrations of nitrogen dioxide (28.0 µg/m³) and benzene (1.01 µg/m³) from within the modelling domain are higher than the maximum representative monitored concentrations, and these have been used as the baseline concentration for this assessment as a conservative estimate. In lieu of any representative monitoring of PM10 and PM2.5, the maximum mapped background concentrations from within the modelling domain (14.1 µg/m³ for PM10 and 8.3 µg/m³ for PM2.5) have been used as the baseline concentration for this assessment as a very conservative estimate.

5.2.2.4 Summary of Atmospheric Dispersion Modelling Study Inputs

The atmospheric dispersion modelling study was undertaken in order to assess the potential impacts of releases from the proposed facility, in relation to both local human health and the local environment.

The study, assumed the worst case operational scenario i.e. that the pollutants are continually discharged at the IED ELVs (daily or half-hourly, as appropriate). VOCs were modelled at the ELV assuming that 100% of the emission was either benzene or 1,3 butadiene. Pollutants where no ELV is specified in IED i.e. nitrous oxide, dioxin-like PCBs, and PAHs as represented by benzo(a)pyrene were modelled at typical/maximum emission concentrations for operating UK incineration plants. All concentrations were converted to grams per second (g/s) release rates for input into the model by multiplying the concentrations by the stack flow rate. The calculations to determine the g/s input data were checked and found to be satisfactory. The flue gas conditions data was based on the Facility operating at design point P2 of the firing diagram of the Facility, as presented in Annex 1 of the application.

The model took account of the following:

- effects of prevailing meteorological conditions including wind speed and direction, temperature, humidity and cloud cover. The impact of meteorological data was taken into account by using weather data from Glasgow Airport for the years 2013 – 2017. Glasgow Airport is approximately 25 km to the south-west of the Westfield site. Data from this site was also used for dispersion modelling to support the planning applications for the Facility.
- 5 years of data are used to take into account inter-annual fluctuations in weather conditions. Wind roses from Glasgow for each year can be found in Figure 6 of Appendix A.
- building effects which can affect the dispersion of the plume (building downwash effects).
- local topography for assessment of impacts within the gridded area;

The model was used to predict the ground level concentration of pollutants on a long-term and short-term basis at the following locations:

- For the purpose of this assessment two modelling domains have been used. The main domain is a 9 km domain with a spatial resolution of 90 m, which was appropriate for the minimum stack height considered in the stack height analysis. This resolution is less than 1.5 times the stack height in accordance with the SEPA's modelling rule of thumb. In addition, a wider modelling domain with a grid spacing of 300m has been assessed which includes all the ecological receptors.

Figure 7 of Appendix A of the application contains a graphical representation of the modelling domains, site, and terrain file used.

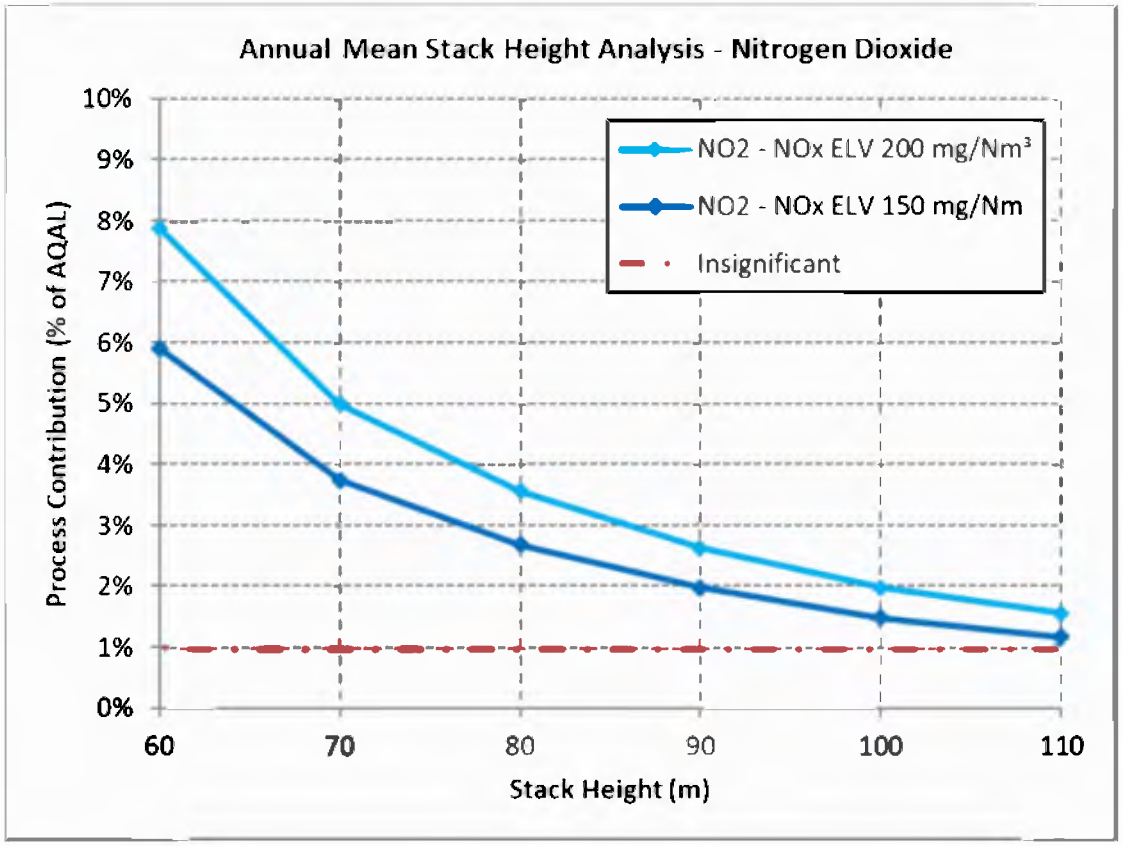
- at 27 specific human health receptors at the closest houses, hospitals and local schools and 23 ecological receptors at designated sites as identified in Section 5 and Figures 4 and 5 in the DMA, and reproduced in Section 4.3 above.

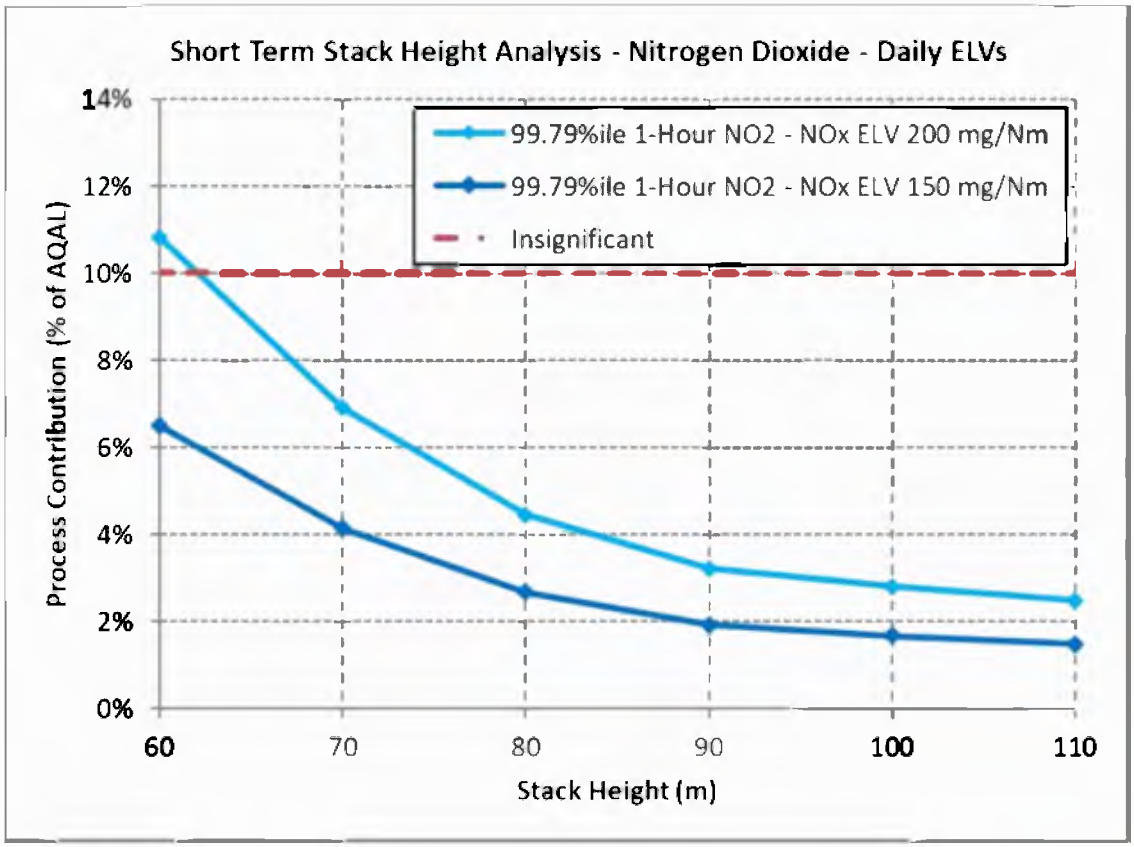
The modelling approach and the details of model input and model set-up have been assessed by SEPA's air dispersion modelling specialists who have confirmed these are satisfactory.

5.2.2.5 Stack Height Assessment

A stack height screening assessment was undertaken to determine an appropriate discharge stack height for the discharge stack from the incinerator (Section 7 of the Dispersion Modelling Assessment). When determining a suitable stack height, it is best practice to identify the stack height where the rate of reduction in maximum ground level concentration with increased height slows down. This can be identified on a graph as a step change in the slope. Although planning permission has been granted for an 80 m stack this has been undertaken to confirm that this remains the most suitable stack height for the Facility.
The following parameters were kept constant:
• model – ADMS 5.2
• buildings – included;
• site surface roughness value – 1.5 m;
• meteorological site surface roughness – 0.5 m;
• site and meteorological site Monin Obukov length – 30 m;
• terrain – included at 64 x 64 resolution; and
• meteorological data used – Glasgow 2013 to 2017
This stack height analysis took a phased approach with the stack height for the EFW. Plant. All impacts were calculated as the maximum predicted impact across the modelling domain based on all 5 years of weather data, and are presented as a percentage of the AQAL.
IPPC H1 (2003) states that to screen out 'insignificant' process contributions:
□ the long-term PC must be less than 1% of the long-term environmental standard; and
□ the short-term PC must be less than 10% of the short-term environmental standard.
These criteria has been applied as part of this stack height analysis.

A sensitivity screen analysis was carried out using a range of possible stack heights between 50m and 100m. The results indicated that 80m was the optimum stack height for the incineration line. These heights were therefore used for all elements of the main modelling assessment. SEPA accepted this assessment of the data but had concerns that at the annual mean stack height analysis for nitrogen dioxide the curve had not started to bottom out at 80m.The sensitivity analysis was therefore repeated using the revised emission limit of 150mg/Nm^3 expressed as a daily average instead of the current WID ELV of 200mg/Nm^3 and shows the curve starting to bottom out at 80m. With a stack height of 80 m the short-term NOx impact can be screened out as 'insignificant' at the point of maximum impact, as can the annual mean PM10 and PM2.5 impacts. Therefore, it is considered that the consented stack height of 80 m remains suitable for the Facility.





5.2.2.6 Assessment of Impact (human health receptors)
Outputs from the ADMS model and comparative modelling with AERMOD were used in all assessments of impact at the maximum gridded receptor location as a cross check to assure the validity of the modelled outputs and to provide a view on the sensitivity of the modelling approach. This confirmed that ADMS 5.2 produced the higher results and it was therefore the most conservative of the two models. The emissions modelled are presented in Table 6.2 of the DMA.

The predicted ground level concentrations, known as the process contribution (PC) from modelling are compared to the long-term and short-term AQALs according to the methodology in IPPC H1 to assess impact and **ensure the PEC does not breach the AQAL**. Where necessary ambient data is added to the PC to calculate the predicted environmental concentration (PEC) at the point of maximum impact and the PC and PEC at areas of public exposure. The IPPC H1 methodology for impact assessment of predicted ground level concentrations from emissions to air is summarised as follows:

For long-term (LT) impacts
If the **PC is <1% of the AQAL it can be screened out as insignificant**
If PC is >/= 1% of the long-term AQAL, the PC plus the ambient data, the LT PEC is compared to the AQAL;
If the **PEC is <70% there is little risk of the AQAL being exceeded**.

For short-term (ST) impacts
If the **PC is <10% of the short-term AQAL it can be screened out as insignificant**
If PC is >/= 10% of the AQAL, the PC plus the 2 x the ambient data, ST PEC is compared to the AQAL;
If the ST **PC is <20% of the headroom between the AQAL and twice the background concentration, there is little risk of the AQAL being exceeded**

The long-term 1% PC threshold is based on the judgement that: it is unlikely that an emission at this level will make a significant contribution to air quality; and the threshold provides a substantial safety margin to protect health and the environment. The short-term 10% PC threshold is based on the judgement that spatial and temporal conditions mean that short-term contributions are transient and are limited in comparison with long-term process contributions; and, the threshold provides a substantial safety margin to protect health and the environment.

For emissions that cannot be screened out as insignificant, further assessment is required using detailed modelling data to ensure that there is no risk an AQAL will be exceeded.

Assessment impact of long-term process contribution
The predicted ground level concentration (GLC) values, the Process Contribution (PC) at the point of maximum impact from routine operation based on emission at the daily average ELVs and maximum 30 minute average ELVs where relevant, have been compared to the Long and Short-term AQALs in Section 8 of the DMA.

The general approach of this assessment is to evaluate the highest predicted process contribution to ground level concentrations over the five modelled years (2013 – 2017), known as the point of maximum impact, this is not the location of a sensitive receptor. The results in Table 8.1 f the DMA present the PC from modelling at the point of maximum impact of emissions from the facility. It should be noted that this assessment is considered highly conservative as it assumes:

- that the Facility continually operates at the emission limits outlined in Section 6.2.1 for the entire year;
- operation at the short term ELVs during the worst-case conditions for dispersion of emissions;
- the entire PM emissions are assumed to consist of either PM10s or PM2.5s;
- that the entire VOC emissions are assumed to consist of either benzene or 1,3-butadiene; and
- cadmium and thallium are released at the combined emission limit for cadmium and thallium.

In addition, the predicted impacts have been evaluated at the human sensitive receptors presented in Section 5.

The modelling results from ADMS compared to the LT and ST AQALs are summarised for the highest year in **Table 8.1: Dispersion Modelling Results - Point of Maximum Impact.** Contour plots showing the results plotted over a map are provided for each averaging period and pollutant are provided in Annex 4 of the DMA

Discussion of Results

Table 8.1 shows that for the majority of pollutants assessed, the impact of the proposed facility is not significant. However, potentially significant impacts were identified when the PC was compared to the long-term (LT) AQAL for nitrogen dioxide, PM2.5, VOCs (modelled both as benzene and as 1.3 butadiene), cadmium and also for sulphur dioxide when the 99.9% percentile of annual 15 minute means. The predicted GLCs of these pollutants were therefore added to the relevant background data to assess the Predicted Environmental Concentration (PEC) for comparison to 70% of the LT AQAL. A requirement for further assessment was indicated as being necessary for the following 5 pollutants:

- Nitrogen dioxide;
- Sulphur dioxide
- PM2.5
- VOCs (as 1,3 butadiene)
- Cadmium

These are considered further below:

Nitrogen Dioxide

It should be noted that this assessment is 'worst case assessment' because it assumes the following:

- NOx is emitted at the ELV continuously over the year with no maintenance shutdowns. In reality, the plant will be operated such that NOx emissions will be below the ELV and the plant will have planned maintenance shut-downs even if there are no unplanned shutdowns
- It assumes the worst rate conversion of NOx to NO_2 of 70% for long-term impacts consistent with Environment Agency guidance whereas the conversion rate to NO_2 is likely to be much lower than 70%;
- It assumes there will be no reduction in background levels of NO_2 over time. Whereas background levels are predicted to reduce over time.

Further discussion of the impact of NO_2 with reference to local data is provided in Section 8.3 of the DMA. The applicant used the current IED Part VI annual mean emission limit of 200mg/m3 for nitrogen dioxide however at this value, the process contribution for NOx did not screen out as insignificant at the Byres Road/Dumbarton Road AQMA. Section 8.3 of the Dispersion Modelling Assessment in Annex 4 of the permit application assessed the annual mean nitrogen dioxide results further. Section 8.3 identified that the annual NOx emission would screen out as insignificant at an annual mean emission limit of 165 mg/Nm3. Following consultation with the applicant it was identified that the proposed Selective Non-Catalytic Reduction (SNCR) system for the abatement of NOx will be capable of operating at an emission limit of 150mg/Nm3 (expressed as a daily average). The table below compares the predicted impact associated with the emission limits stated in the PPC application (200mg/Nm3) and the applicant's revised proposed emission limit (150mg/Nm3) from the. The table presents the maximum predicted annual mean nitrogen dioxide concentrations over the five modelled years (2013 – 2017) at the point of maximum impact and at each identified receptor location. The table shows that reducing the emission limit will reduce the PC at the point of maximum impact from 1.43 µg/m3 (or 3.56% of the AQAL) to 1.07 µg/m3 (or 2.68% of the AQAL). Therefore, in proposing a reduced emission limit, the impact at the point of maximum impact will reduce by 0.36 µg/m3 (or 0.88% of the AQAL). Furthermore, reducing the emission concentration to 150mg/Nm3 will increase the number of sensitive receptor locations which can be screened as 'insignificant' from 11 to 15. Therefore, reducing the emission limit, an additional 4 receptors will be screened as 'insignificant'. One of these receptor locations is within the hospital (R12).

Site ID	Site name	AQAL (µg/m3)	200mg/Nm^3 NO_X emission Conc. (µg/m^3)	200mg/Nm^3 NO_X emission as % of AQAL	150mg/Nm^3 NO_X emission Conc. (µg/m3)	150mg/Nm^3 NO_X emission as % of AQAL
Point of maximum impact		40	1.43	3.56%	1.07	2.68%
R1	Arkleston Rd	40	0.13	0.33%	0.10	0.25%
R2	Chirnside Rd	40	0.19	0.47%	0.14	0.35%
R3	Duncan Avenue	40	0.30	0.76%	0.23	0.57%
R4	Earl Road	40	0.17	0.43%	0.13	0.32%
R5	Edzell St Church	40	0.69	1.73%	0.52	1.30%
R6	Fulbar Rd	40	0.16	0.41%	0.12	0.31%
R7	Glasgow Rd	40	0.15	0.37%	0.11	0.28%
R8	Govan High School	40	0.36	0.90%	0.27	0.67%
R9	Hartlaw School	40	0.09	0.22%	0.07	0.17%
R10	Hospital 1	40	0.88	2.20%	0.66	1.65%
R11	Hospital 2	40	0.98	2.44%	0.73	1.83%
R12	Hospital 3	40	0.44	1.09%	0.33	0.82%
R13	Hospital 4	40	0.94	2.36%	0.71	1.77%
R14	Hospital 5	40	0.75	1.88%	0.56	1.41%
R15	Hospital 6	40	1.04	2.61%	0.78	1.96%
R16	Ladykirk Dr	40	0.08	0.20%	0.06	0.15%
R17	Langlands Dr Church	40	0.49	1.22%	0.37	0.92%
R18	Mallaig Rd	40	0.40	1.01%	0.30	0.76%
R19	Morriston Crescent	40	0.15	0.37%	0.11	0.27%
R20	Nithbank Ave	40	0.52	1.29%	0.39	0.97%
R21	Reston Dr	40	0.09	0.23%	0.07	0.17%
R22	Shieldhall Rd	40	0.49	1.23%	0.37	0.92%
R23	Skipness Drive	40	0.68	1.70%	0.51	1.27%
R24	Squire St Church	40	0.70	1.75%	0.52	1.31%
R25	St Paul's School	40	0.61	1.51%	0.45	1.14%
R26	Bogmoor Road Traveller Site	40	0.63	1.58%	0.47	1.19%
R27	Bogmoor Road Flats	40	0.04	0.09%	0.03	0.07%

The table below presents the PEC associated with the revised emission limit (150mg/Nm3). The table presents the maximum predicted annual mean nitrogen dioxide concentrations over the five modelled years (2013 – 2017) at the point of maximum impact and at each identified receptor location. As noted in Section 4 of the air quality assessment within the PPC application this is based on the maximum monitored concentration within the modelling domain.

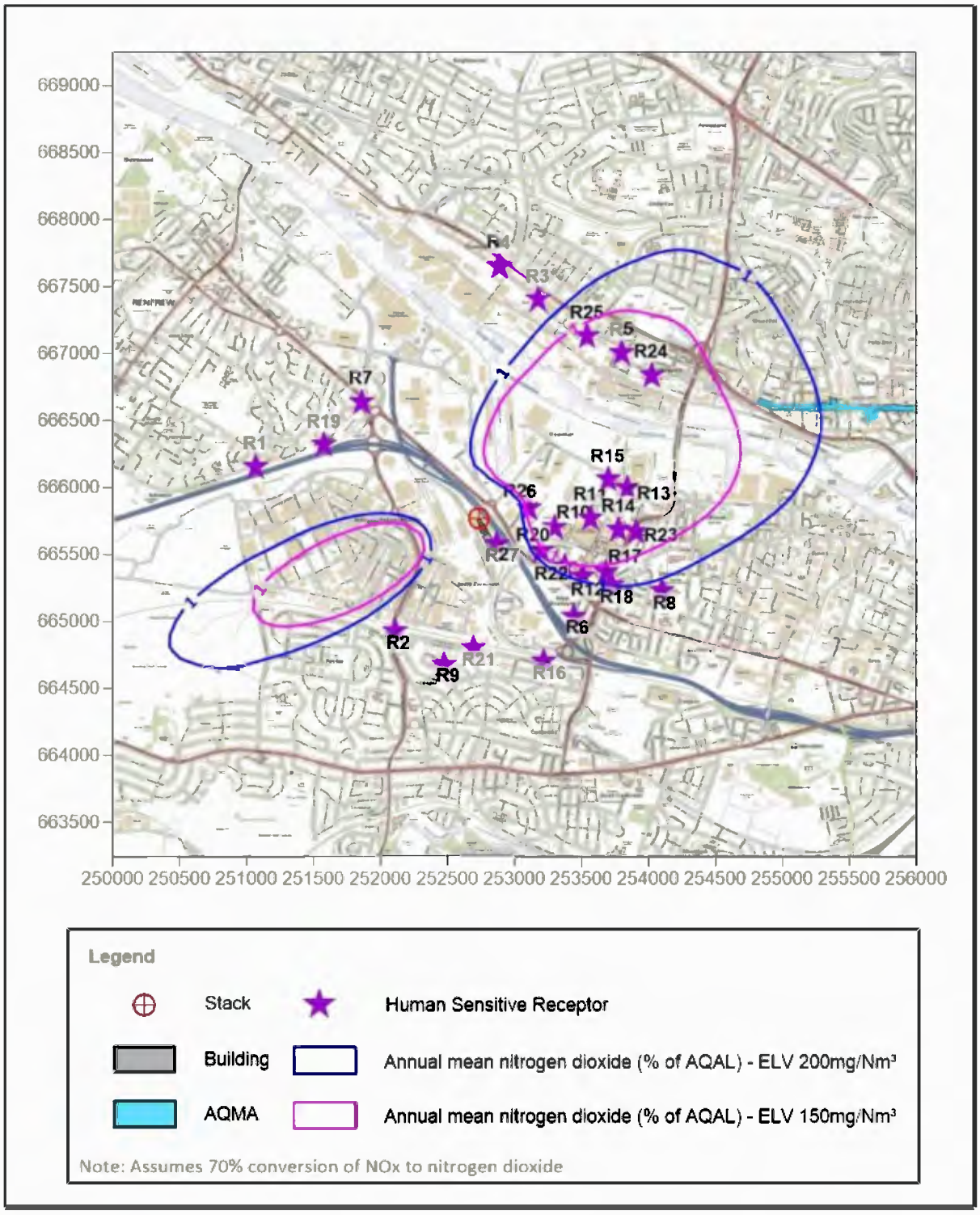
Analysis – Annual Mean Nitrogen Dioxide PEC for the proposed emission limit

Site ID	Site Name	AQAL(µg/m^3)	PC Conc(µg/m^3)	PC as % of AQAL	PEC Conc (µg/m^3)	PEC as % of AQAL
Point of maximum impact		40	1.07	2.68%	29.07	72.7%
R1	Arkleston Rd	40	0.10	0.25%	28.10	70.2%
R2	Chirnside Rd	40	0.14	0.35%	28.14	70.4%
R3	Duncan Avenue	40	0.23	0.57%	28.23	70.6%
R4	Earl Road	40	0.13	0.32%	28.13	70.3%
R5	Edzell St Church	40	0.52	1.30%	28.52	71.3%
R6	Fulbar Rd	40	0.12	0.31%	28.12	70.3%
R7	Glasgow Rd	40	0.11	0.28%	28.11	70.3%
R8	Govan High School	40	0.27	0.67%	28.27	70.7%
R9	Hartlaw School	40	0.07	0.17%	28.07	70.2%
R10	Hospital 1	40	0.66	1.65%	28.66	71.6%
R11	Hospital 2	40	0.73	1.83%	28.73	71.8%
R12	Hospital 3	40	0.33	0.82%	28.33	70.8%
R13	Hospital 4	40	0.71	1.77%	28.71	71.8%
R14	Hospital 5	40	0.56	1.41%	28.56	71.4%
R15	Hospital 6	40	0.78	1.96%	28.78	72.0%
R16	Ladykirk Dr	40	0.06	0.15%	28.06	70.1%
R17	Langlands Dr Church	40	0.37	0.92%	28.37	70.9%
R18	Mallaig Rd	40	0.30	0.76%	28.30	70.8%
R19	Morriston Crescent	40	0.11	0.27%	28.11	70.3%
R20	Nithbank Ave	40	0.39	0.97%	28.39	71.0%
R21	Reston Dr	40	0.07	0.17%	28.07	70.2%
R22	Shieldhall Rd	40	0.37	0.92%	28.37	70.9%
R23	Skipness Drive	40	0.51	1.27%	28.51	71.3%
R24	Squire St Church	40	0.52	1.31%	28.52	71.3%
R25	St Paul's School	40	0.45	1.14%	28.45	71.1%
R26	Bogmoor Rd Traveller Site	40	0.47	1.19%	28.47	71.2%
R27	Bogmoor Rd Flat	40	0.03	0.07%	28.03	70.1%

PEC includes contribution of 28.00 µg/m3 which is the maximum mapped background concentration over the modelling domain.
Assumes 70% conversion of NOx to NO2.

The plot file below shows the areas where the maximum contribution from the Facility with the proposed emission limit is greater than 1% of the AQAL and the impact cannot be screened out as 'insignificant'. The area to the south-west of the Facility has areas of relevant public exposure – the residential properties to the south of the railway line. As can be seen from plot file, the area of exposure at residential receptors which cannot be screened as 'insignificant' has reduced, and the ground level concentrations will also have reduced. With the proposed emission limit the impact within the Byres Road / Dumbarton Road

AQMA can also be screened out as 'insignificant' in accordance with EA guidance note H1 as the AQMA is outside the magenta significance plotline.



The Queen Elizabeth University Hospital, which is located to the north east of the Facility, is an area of relevant public exposure. The receptor location which is exposed to the highest predicted concentration within the modelling domain is within the hospital (R15). As presented in the table above, R15 is predicted to be exposed to a ground level concentration of 0.78 µg/m3 (or 1.96% of the AQAL). This is reduced from 1.04 µg/m3 (or 2.61% of the AQAL) with the proposed emission limit compared to the PPC application. SEPA asked the applicant to carry out further detailed assessment of emissions at the sensitive receptors at the hospital as part of the revised submission at the lower NOx limit.

The applicant reviewed the monitoring data presented in the Dispersion Modelling Assessment submitted with the PPC application to determine if actual representative monitoring data was available as this would provide a greater degree of accuracy than the conservative mapped data that had been used as background for all locations within the modelled area. The review showed that roadside diffusion tubes in the area around the hospital have monitored concentrations of between 26 - 35 µg/m³. The areas of relevant exposure at the hospital are located away from busy roads, and as such the roadside concentrations are not considered representative. There are two background monitoring locations within relatively close proximity to the hospital, at Mallaig Place (M55) and Glasgow Harbour (M59), which have recorded a maximum nitrogen dioxide concentration of 26 µg/m³, which is 65% of the AQAL. Whilst these are not within the hospital site, they are considered to be representative of the background concentrations at the hospital. SEPA reviewed the location of the two background monitoring locations, along with the windroses, and agreed that these could be considered as representative of the background levels at the hospital. When this background concentration of 26 µg/m³ is applied as the baseline concentration to R15, the PEC is less than 67% of the AQAL, and the impact can be described as having insignificant environmental impact'. Similar considerations apply to the other receptors in the hospital where the predicted contribution is greater than 1% (R10, R11, R13 and R14).

The area of impact >1% of the AQAL includes parts of Whiteinch. Whiteinch has an area designated as an Air Quality Management Area (AQMA) – referred to as the Byres Rd/Dumbarton Rd AMQA – which has been designated due to localised exceedances of the annual mean nitrogen dioxide concentrations. The maximum contribution from the Facility in the areas of relevant exposure (R5, R24 and R25) in the Whiteinch area (which are not located within the AQMA) is less than 1.5% of the AQAL. The closest roadside monitoring locations are Harland Street (M11) and South Street (M27), which have recorded a maximum nitrogen dioxide concentration of 25 µg/m³, which is 62.5% of the AQAL. When this is applied as the baseline concentration to the most impacted receptor in this area (R24), the total PEC is approximately 64.0% of the AQAL.

At the new emission limit value the Process Contribution is screened out as insignificant out at 15 of the sensitive receptors. The maximum process contribution is 2% of the AQAL which is set at 40(µg/m3) NO_2. Process Environmental Contributions range between 70.1% and 72% of the AQAL as the concentration is so heavily dominated by background. Even at this there is still 11ug/m^3 or 28% of headroom before the AQAL were to be breached. Using actual monitored data as background, the Process Environmental Contribution screens out at all hospital sensitive receptors and also in Whiteinch. The risk at the original proposed WID ELV of 200mg/Nm^3 was queried with SEPA's Air Modelling Team who responded in Call Ref : (G:0149432) Regarding request for air modelling assessment PPC/A/1168354 EFW Application SCEC

Our technician has added the following update to your request.
The Process contributions are low, and if these were doubled, the conclusions would be unchanged. For example, for NO_2, the PC is 1.43 ug/m3 and background is 28 ug/m3. Therefore, for an exceedance of the 40 ug/m3 threshold, the model would need to be underestimating by a factor of around 8, which is unlikely. Also taking into account that the ELV's from the directive are used in the modelling, the actual emissions are likely to be lower, so therefore this assessment is worst case. The risk of an exceedance is therefore low.

SEPA therefore accepts that SEPA accepts the findings of the revised submission and agrees that a new annual emission limit of 150mg/Nm3 should be included rather than the current IED Chapter IV limit of 200mg/Nm^3. As all scenarios used are worst case, including rate of conversion to NO_2, the background assumed etc, the risk of the PEC exceeding the AQAL threshold is low. In the majority of cases the PC is insignificant and at most, the PEC is 72% of the AQAL at the identified sensitive receptors using mapped data and below the 70% PEC using representative monitored data.

Sulphur Dioxide

Table 8.4 highlights that for the 99.9th %ile of 15 min. means of Sulphur Dioxide (assuming operational at the half-hourly ELV) there is a PC of 10.18% at the point of maximum impact, which therefore is above the 10% of AQAL. This emission does not, therefore screen out as insignificant at the point of maximum impact

however the ST PC is <20% of the headroom between the AQAL and twice the background concentration, so there is little risk of the AQAL being exceeded.

Section 8.4 of the DMA further assesses the maximum predicted 99.9%ile of 15-minute sulphur dioxide concentrations over the five modelled years (2013 – 2017) at the point of maximum impact and at each identified receptor location, in addition to the contribution from background sources. As noted in Section 4 this is based on the maximum monitored concentration within the modelling domain multiplied by two in accordance with the approach set out in IPPC H1. This is based on the Facility operating at the short term ELVs during the worst-case weather conditions for dispersion. As shown, even if the Facility operates at the short term ELV during the worst-case weather conditions for dispersion the maximum contribution from the Facility at an identified receptor location is less than 10% of the AQAL and can be screened out as 'insignificant'. The plot file is provided in Figure 17 of Appendix A of the DMA shows that area where the process contribution is greater than 10% of the AQAL and cannot be screened out as insignificant is restricted to a small area accounting for two grid points. At all areas where members of the public are expected to spend periods of 15-minute of more the impact can be screened out as 'insignificant'.

PM 2.5

PM2.5 - It should be noted that this assessment is 'worst case assessment' because it assumes the following:

- PM2.5 is emitted at the particulates ELV continuously over the year from the incinerator. The application states that speciation of particulate emissions from incineration plants has shown that typically the PM2.5 makes up only a third of the PM10 fraction;
- There are no planned or unplanned shutdowns whereas in reality planned shutdowns are likely to occur even if there are no unplanned shutdowns.
- It assumes there will be no reduction in background levels of PM2.5 over time. Whereas background levels of PM2.5 are predicted to reduce over time.

Section 8.5 of the DMA further assesses the annual mean PM as PM 2.5 and table 8.5 shows the maximum predicted annual mean particulate matter (as PM2.5) concentrations over the five modelled years (2013 – 2017) at the point of maximum impact and at each identified receptor location, in addition to the contribution from background sources. This conservatively assumes that all the PM released from the Facility consists of only PM2.5. Further discussion of the impact of PM2.5 with reference to local data is provided in Section 8.5 of the DMA. As shown, the maximum contribution from the Facility at an identified receptor location is less than 1% of the AQAL. The plot file is provided in Figure 20 of Appendix A of the DMA. Analysis of the plot file and model output has shown that the area where the impact is greater than 1% of the AQAL is restricted to a single grid point over a single year (2015). For all other weather datasets the process contribution at all model domain points is less than 1% of the AQAL and can be screened out as 'insignificant'. This analysis conservatively assumes that the entire PM is released at the ELV for total dust and the entire emissions consist of only PM2.5s. Applying the likely assumption that the PM2.5 makes up to 33% of the PM10 fraction, and the entire particulate emission consists of PM10, the process contribution would be considerably lower and would definitely screen out as insignificant.

Annual Mean VOCs

Section 8.6 of the DMA considers further the annual mean emission of VOCs. Table 8.6 in the DMA shows the maximum predicted annual mean VOC (as benzene) concentrations over the five modelled years (2013 – 2017) at the point of maximum impact and at each identified receptor location, in addition to the contribution from background sources. It should be noted that this conservatively assumes that all the VOC released from the Facility consist of only benzene. As shown, even if it is assumed that the entire VOC emissions consist of only benzene the maximum PEC is well below 70% of the AQAL. Therefore, although the contribution from the Facility cannot be screened out as 'insignificant' this is not a significant impact and there is no risk of the AQAL being breached as this is well under a PEC of 70%. Table 8.7 shows the maximum predicted annual mean VOC (as 1,3-butadiene) concentrations over the five modelled years (2013 – 2017) at the point of maximum impact and at each identified receptor location, in addition to the contribution from background sources. It should be noted that this conservatively assumes that all the VOC released from the Facility consist of only 1,3-butadiene. Even if it is assumed that the entire VOC

emissions consist of only 1,3-butadiene the maximum PEC is well below 70% of the AQAL. Therefore, although the contribution from the Facility cannot be screened out as 'insignificant' this is not a significant impact.

Cadmium

Section 8.7 of the DMA carries out a further assessment of the result for annual mean cadmium. This assessment has initially used a screening assumption that cadmium is released from the Facility at the combined emission limit for cadmium and thallium. However, monitoring from waste incineration facilities has indicated that concentrations of cadmium are typically approximately 14% of the ELV. Therefore, this assessment has considered the impact of cadmium under the following three scenarios:
(1) screening – assumes cadmium is released at 100% of the combined ELV;
(2) worst-case – assumes cadmium is released at 50% of the combined ELV; and
(3) typical – assumes cadmium is released at 14% of the combined ELV.
Table 8.8 shows the maximum predicted annual mean cadmium concentrations over the five modelled years (2013 – 2017) at the point of maximum impact and at each identified receptor location.

As shown, if it assumed that the Facility operates similarly to other facilities processing a similar fuel stock, the maximum impact at any identified receptor is predicted to be 1.04% of the AQAL. Although the process contribution is slightly greater than 1% the overall PEC is well below 70% of the AQAL even for the screening assumption that the entire cadmium and thallium release consists of only cadmium. Therefore, it can be concluded that there is little risk of the PEC exceeding the AQAL and the impact of the Facility is 'not significant'.

Metals

The applicant has used Environment Agency document 'Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – V.4 June 2016'4 ("Metals Guidance") outlines a two-stage assessment methodology for detailed modelling of Group 3 metals. The Industrial Emissions Directive (IED) has a mandatory Emission Limit Value (ELV) of 0.5 mg/m^3 aggregated for nine Group 3 metals (antimony, arsenic, chromium, cobalt, copper, lead, manganese, nickel, vanadium and their components). Conservatively assuming each metal comprises 100% of this limit could result in exceedances of the environmental standards. Where this theoretical risk exists, a more detailed assessment using more realistic emissions data is required. This guidance states that where the process contribution for any metal exceeds 1% of the long-term or 10% of the short-term environmental standard (in this case the AQAL), the process contribution does not screen out. Where the process contribution exceeds these criteria, the PEC should be compared to the environmental standard. The impact can be screened out as 'not significant' where the PEC is less than the environmental standard. SEPA regards this guidance as suitable as it is designed to assess emissions from Municipal Waste Incinerators.

Step 1 is to model emissions assuming each Group III metal is emitted at the Total Group III metal ELV 0.5 mg/m3. Where any PC exceeds 1% or 10% of the LT or ST AQAL respectively, the second stage is to calculate the PEC and compare this to the relevant AQAL. If the PEC air is greater than 100% the next stage is to proceed to Step 2.

The annual process contributions of arsenic, chromium (VI), cobalt, lead, manganese and nickel are predicted to be greater than 1% of the long-term AQAL at the point of maximum impact. However, only the PECs for arsenic and chromium (VI) are predicted to be greater than 100% of the AQAL under this worst-case screening assumption.

Step 2 requires further more refined screening based on a summary of typical Group III emissions from 34 measured values from 18 MWI and waste wood co-incinerators between 2007-2015. Proceeding to Step 2 was necessary for the predicted LT PC for both arsenic and chromium VI because the PEC for both pollutants were predicted to exceed the relevant LT AQAL. If it is assumed that the Facility will perform no worse than a currently permitted facility, the predicted process contribution is below 1% of the AQAL for all pollutants with the exception of arsenic and nickel. However, the PECs for arsenic and nickel are well below 100% of the AQAL, and so the impacts can be screened out. Therefore, using the EA guidance

criteria, it can be concluded that there is no risk of exceeding the long-term AQAL for any metal and there is no potential for significant pollution. This is detailed further in Section 8.8 and Table 8.9 of the DMA

As shown in Table 8.10, if it is assumed that the entire emissions of metals consist of only one metal, only the maximum 1-hour process contributions of lead is predicted to be greater than 10% of the short-term AQAL at the point of maximum impact. However, the PEC for lead is predicted to be 23.98% as % AQAL, less than 100% of the AQAL under this worst-case screening assumption. Following the methodology to Step 2, if it is assumed that the Facility will perform no worse than a currently permitted facility, the predicted process contribution is below 10% of the AQAL for all pollutants at the point of maximum impact, and so the impacts can be screened out. Therefore, using the EA guidance criteria, it can be concluded that there is no risk of exceeding the short-term AQAL for any metal and there is no potential for significant pollution.

Conclusion
Modelling of emissions to air from the proposed facility has been completed using two recognised air dispersion models. The modelling using ADMS was more conservative than AERMOD giving the higher results of the two. In conclusion, releases from the proposed facility are considered unlikely to result in a breach of current AQSs or have a detrimental effect on local human health at the maximum predicted receptor concentration for each statistic (averaging period and percentile). Consequently, the same conclusion can be reached for all sensitive receptor locations considered in this assessment.

The applicant used the current IED Part VI annual mean emission limit of 200mg/m3 for nitrogen dioxide however at this value, the process contribution for nitrogen dioxide did not screen out as insignificant at the Byres Road/Dumbarton Road AQMA which is declared for Nitrogen dioxide – annual mean. Following consultation with the applicant it was identified that the proposed Selective Non-Catalytic Reduction (SNCR) system for the abatement of NOx will be capable of operating at an emission limit of 150mg/Nm3 (expressed as a daily average). This emission limit is in accordance with the proposed BAT AEL for oxides of nitrogen stated in the pre-final draft Waste Incineration BREF. Regarding the Glasgow Byres Road/Dumbarton Road Air Quality Management Area which is based on the annual nitrogen dioxide levels, emissions in the AQMA can be screened out as 'insignificant' at the revised ELV of 150mg/m^3 which will be included in the permit.

5.2.2.7 Abnormal Operations
An assessment of the impact on air quality associated with abnormal operating conditions from the incineration line assessed potential abnormal emissions based on a review of monitoring data from operational facilities of a similar type in the UK (Annex 4 of Application). The applicant considered the following to be examples of abnormal operating conditions which may lead to 'abnormal emission levels' of pollutants:
(1) Reduced efficiency of the lime injection system such as through blockages or failure of fans leading to elevated acid gas emissions (with the exception of hydrogen chloride);
(2) Complete failure of the lime injection system leading to unabated emissions of hydrogen chloride. (Note: this would require the plant to have complete failure of the bag filter system. As a plant of modern design the plant would have shut down before reaching these operating conditions);
(3) Reduced efficiency of particulate filtration system due to bag failure and inadequate isolation, leading to elevated particulate emissions and metals in the particulate phase;
(4) Reduced efficiency of the Selective Non-Catalytic Reduction (SNCR) system as a result of blockages or failure of ammonia injection system, leading to elevated oxides of nitrogen emissions; and
(5) Complete failure of the activated carbon injection system and loss of temperature control leading to high levels of dioxin reformation and their unabated release.

As a modern design, it is anticipated that the Facility would be operated to a high degree of compliance. Therefore, the identification of plausible abnormal emission levels has been based primarily on the data obtained from modern plants. Where actual data is not available, worst case conservative assumptions have been.

The predicted impact on air quality associated with the identified plausible abnormal emissions was calculated by pro-rating the impact associated with normal operations by the ratio between the normal and plausible abnormal emission values. This is considered to be a highly conservative assessment as it assumes that the plausible abnormal emissions coincide with the worst case meteorological conditions. Even with this highly conservative factor, there are no predicted exceedances of any of the short term or long term air quality limits associated with abnormal operations. The maximum predicted short term process contribution (as % of the applied AQAL) is less than 30%; and the maximum predicted long term process contribution (as % of the applied AQAL) is less than 13%. Abnormal emissions from the Facility will not cause any exceedances of any AQAL. In addition, there will not be any exceedances of the TDI for dioxins.

The study therefore concluded that any periods of abnormal operation as permitted under the IED (Article 46) and implemented by standard conditions in Schedule 5 of the draft permit under Condition 5.4 were not predicted to give rise to an unacceptable impact on air quality or the environment. This is accepted by SEPA.

Plume Visibility

A plume visibility assessment was not included within the air dispersion modelling but Condition 6.1.11 Emissions to air from the incinerator stack emission point A1 other than water vapour or steam shall be colourless and free from persistent mist, fumes and droplets is included. See Section 8 for further details and discussion.

5.2.3 Ecological Impact Assessment

For protection of ecosystems, the Habitats Directive (92/43/EEC), was transposed into Scottish law by the creation of the Conservation (Natural Habitats) Regulations 1994 (as amended). The emissions from the proposed incineration plant are required to have an assessment, to determine if the proposal is likely to give rise to a significant effect on European Sites. For undertaking the assessment, the air dispersion model (ADMS) (referred to in the section on air quality above) was used to predict short and long term concentrations of pollutant across the grid and at specific receptors. The short range deposition impacts on terrestrial sites are assessed, using Site Relevant Critical Loads, available from the UK Air Pollution Information System web database (APIS).

If the predicted Process Contribution (PC) of the proposed plant exceeds 1% of the Critical Level, the Predicted Environmental Concentration (PEC) is then reviewed, and if this is below 70% of the Critical Level, the installation is unlikely to have a significant impact on the habitat of interest. The Critical Levels are indicated are specific pollutant concentrations below which harmful effects are unlikely, and are given below (Table 4 excerpt from the AQA).

While a Process Contribution (PC) of <1% of the Critical Load is assumed to be a non-significant effect, exceedance of the 1% figure does not necessarily imply any significant impact. It is a value above which it is appropriate to undertake a more detailed assessment of effects. The significance of the exceedance depends on factors such as the duration of the impact, the proportional increase over current levels and the sensitivity of the habitats affected.

The Critical Load is used to assess the risk of impact on specific habitats, and is determined by the sensitivity of different designated features. The acid critical load is a measure of the degree of acidification, from acidifying compounds, above which acidification impacts may start to occur; the nutrient nitrogen critical load is the equivalent for the degree of eutrophication, from nutrient nitrogen deposition. (Exceedance of a Critical Load is not a quantitative estimate of damage to a particular habitat, but represents the potential for damage to occur).

Section 9 of the Air dispersion Modelling assessment in Annex 4 of the PPC permit application considered the impact at ecological receptors. The correct screening methodology was used, the screening distance correct, the protected sites and the correct sensitive habitats identified.

Designated Site	Notified features
Inner Clyde Site of Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), Ramsar	Redshank (Tringa tetanus), non-breeding Cormorant (Phalacrocorax carbo), non-breeding Eider (Somateria mollissima), non-breeding Goldeneye (Bucephala clangula), non-breeding Oystercatcher (Haematopus ostralegus), non breeding Red-breasted merganser (Mergus serrator), non-breeding Red-throated diver (Gavia stellata), non-breeding Saltmarsh
Black Cart Water SSSI, SPA	Whooper swan (*Cygnus Cygnus*), non breeding
Cadder Wilderness SSSI	Invertebrate assemblage Lowland mixed broadleaved woodland
Craigallian Marshes SSSI	Flood-plain fen
Dumbarton Muir SSSI	Blanket bog Raised bog
Dumbrock Loch Meadows SSSI	Lowland neutral grassland
Formakin SSSI	Lowland acid grassland
Haw Craig – Glenarbuck SSSI	Rocky slopes (includes inland cliff, rocky outcrops, chasmophytic vegetation) Upland mixed ash woodland
Lang Craigs SSSI	Tall herb ledge
Mugdock Wood SSSI	Beetle assemblage Lowland dry heath Lowland wet heath Mesotrophic loch Upland oak woodland Wet woodland
Possil Marsh SSSI	Mesotrophic loch
Ballagan Glen SSSI	Lower Carboniferous [Dinantian – Namurian (part)] Upland mixed ash woodland
Brother and Little Lochs SSSI	Oligotrophic loch Varnished hook-moss (*Hamatocaulis vernicosus*)
Carbeth Loch SSSI	Mesotrophic loch Open water transition fen
Cart and Kittoch Valleys SSSI	Upland mixed ash woodland
Loch Libo SSSI	Eutrophic loch
Whinnerston SSSI	Lowland neutral grassland
South Braes SSSI	Fen meadow Lowland acid grassland
Shovelboard SSSI	Basin fen

Appendix C of the Dispersion Modelling assessment in the application presents the results at each of the identified statutory designated ecological receptors. The contribution from the operation of the Facility has been assessed against the most sensitive feature in each statutory designated site. As shown, at all local European and UK designated sites, with the exception of Cadder Wilderness SSSI, the contribution is less than 1% of the nitrogen and acid deposition Critical Loads, and the impact can be described as not significant using the screening assumption that the most sensitive habitat in APIS is present at each site.

At Cadder Wilderness SSSI, APIS states that the most sensitive habitat for nitrogen deposition is coniferous woodland. However, a review of the citation has shown that this is designated due to the presence of birch and oak woodland. Therefore the Critical Load for coniferous woodland is not applicable at the site. This was queried with SNH in the consultation letter sent on the 28th August and SNH agreed with the applicant. The most suitable Critical Load is 10 kg/N/ha/yr. The maximum process contribution at Cadder Wilderness SSSI as a percentage of this Critical Load is 0.80% and can be described as not significant. At Cadder Wilderness SSSI, the process contribution to acid deposition is 1.18% of the lower Critical Load, and 0.96% of the upper Critical Load for unmanaged broadleaved woodlands.

APIS does not contain site-specific Critical Loads for non-statutory designated sites. To screen for potential impacts, the contribution at the point of maximum impact have been assessed against the Critical Load for woodland and grassland habitats. As shown in Appendix C the contribution from the combined operation of the Facility for nutrient nitrogen and acid deposition are below the Critical Loads, and therefore the impact on non-statutory designated sites can be described as not significant.

Critical loads and levels therefore screen out and there is no requirement for an appropriate assessment to be carried out as there is no likelihood of significant effect.

5.2.4 Human Health Risk Assessment

The results of the atmospheric dispersion modelling study were used to undertake a human health risk assessment ("HHRA"). The advice from health specialists such as the Health Protection Agency and Health Protection Scotland is that the damage to health from waste incineration plats is likely to be very small and probably not detectable. However, it is a requirement for a PPC application for any waste incineration plant that an assessment of the specific risks to human health are considered in a specific human health risk assessment. This has been provided in Annex 4 of the PPC Application.

The specific emissions from a waste incineration plant are described in Section 5.2.1 above. For most of these substances: NO_2, SO_2, particulate matter, CO, ammonia, HCl, HF and volatile organic compounds, the most significant effects on human health will be by inhalation. These impacts have been modelled to identify the predicted ground level concentrations and compared to the relevant standards set in the UK Air Quality Standards and in additional guidance issued by SEPA and the Environment Agency as discussed in section 5.2.2 above. These standards have been set at a level designed to present minimum or zero risk to human health [Ref. 5.2.3.1 The HHRA in Annex 4 of the PPC Application].

Some pollutants accumulate in the environment which mean that inhalation is only one of the potential exposure routes. Therefore an assessment needs to be made of the overall human exposure to these substances by the local population and the risk that this exposure causes on a long-term basis. The HHRA assessed the risk of the following chemicals of potential concern (COPCs):

- Benzo-a-pyrene to represent PAH emissions
- PCDD/Fs (individual congeners (compounds in the same group)) and dioxin-like PCBs
- Benzene
- The following heavy metals:
- Group 1: cadmium
- Group 2: mercury
- The following Group 3 heavy metals:, arsenic, chromium and nickel

The following Group 3 heavy metals antimony, cobalt, copper, lead, manganese and vanadium do not require assessment because they pose little or no risk at the predicted emission levels..

Further assessment of the COPCs listed above has been undertaken using the United States Environmental Protection Agency's ("USEPA") Human Health Risk Assessment Protocol ("HHRAP") methodology using the Industrial Risk Assessment Program - Human Health ("IRAP-h View-Version 4") software. IRAP calculates the total exposure through different exposure pathways to calculate doses from inhalation and ingestion for each receptor. The following pathways are excluded from the assessment because the risk is considered insignificant: groundwater, surface water and absorption through the skin.

The results are assessed in The Human Health Risk Assessment in Annex 4 to the application. As was the case for the dispersion modelling study, the HHRA assumed the worst case operational scenario with all pollutants emitted at ELVs although comparison was made to impacts at 'typical' emission rates in the updated HHRA. The overall conclusion was that the facility will not result in appreciable health risks from its operation.

5.2.5 Global Warming Potential (GWP)

This is provided in Annex 4 of the Permit Application and was accepted. In summary, the operation of the power generating processes at the Installation will lead to the release of approximately:

• 162,600 tonnes per year of carbon dioxide equivalent from the incineration of non-biogenic waste;

• 5,700 tonnes per year of carbon dioxide equivalent from nitrous oxide from the incineration process;

• 200 tonnes per year of carbon dioxide equivalent from imported electricity for the incineration facility; and

• 2,700 tonnes per year of carbon dioxide equivalent from the combustion of light fuel oil for start-up and shutdown of the CHP Plant

Therefore, in total it is predicted that approximately 171,200 tonnes per year of carbon dioxide equivalent would be released from the Installation with the majority arising from the incineration of non-biogenic waste. However, this would be off-set by 100,500 tonnes carbon dioxide equivalent from energy recovery so the net emission would be 70,700 tonnes per year of carbon dioxide equivalent from the generation of heat and power from the thermal treatment of waste compared to generating the equivalent heat and power in a conventional power plant. This doesn't include avoided emissions from the disposal of the waste in a landfill, or from any other alternative methods of waste treatment and is therefore considered to be a highly conservative assessment of greenhouse gas emissions associated with the operation of a thermal treatment facility.

5.2.6 Abatement Techniques

5.2.6.1 NOx Control

A BAT assessment of the different options for controlling NOx emissions was provided in Annex 5 and is discussed further in section 2.6.1.2 of the application. This compared Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR) and SNCR with Flue Gas Recirculation (FGR). These techniques can be summarised as follows:

- Option 1 - SNCR injects ammonia solution or urea into the combustion chamber to reduce NOx emissions to nitrogen;
- Option 2 - SCR injects ammonia solution or urea into the flue gas immediately upstream of a reactor containing layers of a catalyst to reduce NOx emissions to nitrogen;
- Option 3 - SNCR as described above plus FGR – FGR reduces NOx formation by replacing some of the combustion air with recirculated flue gas to reduce NOx formation due to the lower levels of nitrogen in the recirculated air.

The BAT assessment concluded that BAT was to introduce SNCR using ammonia injection. This is due to the following:

- Whilst SCR can achieve greater NOx reduction, typically 70 mg/m^3 compared to 150 mg/m^3 with SNCR, and an overall reduction of 170 Tonnes per annum compared to SNCR or SNCR + FGR, there was little difference in the predicted environmental concentration from of all 3 options in the air quality assessment, this is due to the dominant contribution of the background nitrogen dioxide compared to the process contribution. There was also no difference in impact from Option 1 and 3;
- The photochemical ozone creation potential which impacts air quality is less favourable for SCR;
- The global warming potential is lowest for SNCR. This is because whilst the carbon dioxide and nitrous oxide emissions are similar for all 3 options, SCR has a greater energy requirement because it imposes a pressure drop on the flue gases leading to higher power consumption on the induced draft fan and because SCR requires the flue gases to be reheated prior to being exhausted to atmosphere.
- The raw material consumption and associated cost is higher for SNCR and lowest for SNCR + FGR but the annualised costs are significantly higher for SCR at £1.8M per annum due to the higher installation cost £8.1M compared to £500K for SNCR and £1.1M for SNCR + FGR and significantly higher maintenance costs - £162K per annum for SCR compared to £10K for SNCR and £22K for SCR.
- The cost per tonne of NOx abated is £1,750 per annum for SNCR compared to £2,900 for SNCR plus FGR and £4,920 per annum for SCR.

However, the Application states that suitable space has been allowed for within the installation boundary to enable SCR to be installed in the future to achieve any relevant emission limits for NOx required by the Waste Incineration BREF or any future revisions [Ref. Supporting information in Original application]. SEPA consider that SNCR is an appropriate technique to reduce NOx emissions below the current daily mean and 30 minute average ELVs specified in Annex 6 of IED.

The computerised fluid dynamic (CFD) model required by prior operating condition 2.8.5 will include modelling to determine the optimum location for injection of ammonia solution into the combustion zone.

Selection of ammonia as the reagent for SNCR is discussed in Section 5.12 below. Prior operating condition 2.8.19 has been inserted to require Fortum Glasgow Ltd to confirm the design details for SNCR system 12 months following issue of the permit.

5.2.6.2 Acid Gases Control (SO_2, HF and HCl)

A BAT assessment of the different techniques was provided in Annex 5 for control of acid gases. The 3 options are wet scrubbing, semi-wet scrubbing and dry scrubbing where an absorbent which reacts with acid gases is injected upstream of a bag filter. Wet scrubbing was not considered further, however, because it generates a large volume of hazardous effluent, it also reduces the power generating efficiency of the facility. This left the following 2 options which were considered further in the BAT assessment:

- Semi-dry scrubbing which involves scrubbing using a wet slurry of calcium oxide in which acid gases are absorbed before being collected on a bag filter;
- Dry scrubbing where solid lime or sodium carbonate are injected upstream of a bag filter to react with acid gases in the exhaust gas flow.

The BAT assessment concluded that BAT was to introduce dry scrubbing because this does not produce an effluent stream and water use is significantly lower than for semi-wet scrubbing.

5.2.6.3 Control of Emissions of Metals, VOCs and Dioxins

VOC emissions including dioxins and furans, dioxin-like PCBs and PAHs emissions will be controlled in the combustion process itself and any reformed dioxins, PCBs and heavy metals should be removed by

adsorption onto the powdered activated carbon upstream of the bag filter. This is a standard technique used in the waste incinerators for achieving IED Annex VI ELVs in Annex VI and is therefore considered to be BAT for the proposed facility.

5.2.6.4 Control of Emissions of Particulate Matter

Particulate emissions will be controlled using a bag filter. This is a standard technique used in the waste incinerators and is capable of producing very low levels of particulate emission, typically below 3 mg/m^3; installation of a bag filter is therefore considered to be BAT for the proposed facility.

The techniques discussed above are considered to be consistent with BAT for abatement of emissions to air from waste incineration and consistent with standard techniques and reagents used in the EfW Sector.

5.3 Point Source Emissions to Surface Water and Sewer

Process effluents will consist of washdown water, regeneration water from the reverse osmosis plant, boiler blown down, steam samples and inert bottom ash quench, this will be collected in the waste water collection system.

As the boiler and steam system is air rather than water cooled, there is no large volume of process water to be treated. The process effluents will be discharged into a cooling basin, which will be designed to be impermeable, prior to discharge into the Scottish Water Sewage system. Domestic effluents will also be discharged to the foul sewer system. An application has been submitted to Scottish Water and discussions are ongoing with Scottish Water regards securing the Trade Effluent Consent for the Facility.

As the process effluent is not being treated on-site and is not heavily contaminated ELVs have not been included in the permit as these will be the subject of a trade effluent discharge consent from Scottish Water. The Trade Effluent Consent must be secured from Scottish Water prior to the commencement of commissioning

Surface water run-off from low risk areas such as buildings, roadways and carparks will be discharged into the surface water drainage system. All surface water will pass through two Hydro Downstream Defenders prior to discharge into a Detention Basin. The Hydro Downstream Defenders will capture and retain sediments, oils and insoluble pollutants within the surface water runoff. The Downstream Defenders will be subject to a periodic maintenance regime to ensure that all sediments which have been contained are removed using a gulley-sucker (or similar technique) and transferred off-site to a suitably licenced waste management facility.

All chemicals will be stored in an appropriate manner incorporating the use of suitable secondary and other measures (such as acid and alkali resistant coatings) to ensure appropriate containment and tertiary abatement measures. All storage facilities for chemicals will be designed in accordance with Environment Agency Pollution Prevention Guidance PPG 2, PPG 3 and PPG 18. Deliveries of all chemicals will be unloaded and transferred to suitable storage facilities. Areas and facilities for the storage of chemicals and liquid hazardous materials will be situated within secondary containment. Secondary containment facilities will have capacity to contain whichever is the greater of 110% of the tank capacity or 25% of the total volume of materials being stored, in case of failure of the storage systems. Tanker off-loading of chemicals will take place within areas where the drainage is contained with the appropriate capacity to contain a spill during delivery. In addition spill prevention techniques will be adopted through the use of site procedures. The risk of chemical contamination of the surface water is therefore limited. The Detention Basin will discharge into the existing public surface water sewer system which passes through the site. The discharge from the Detention Basin will be fitted with a Hydrobrake which will enable the discharge to be prohibited in the event of an incident occurring on site which required the surface water drainage to be retained within the site. As there is no direct discharge to the water environment a requirement to meet Controlled Activities Regulations 2011 (as amended) GBR 10 and 11 have been identified as suitable and included in the permit in table 7.1 for the surface water discharge.

5.4 Point Source Emissions to Groundwater

There are no point source emissions to groundwater proposed from the permitted installation. All waste handling activities will be carried out over impervious surfaces such as the waste reception hall floor, the waste bunker and the bottom ash hall which will all have a concrete floor and are inside a building. Liquid materials presenting a pollution hazard will be held in vessels with secondary containment to prevent loss to drains or to ground/groundwater. These techniques are considered to be BAT for prevention of fugitive emissions to groundwater.

5.5 Fugitive Emissions to Air

Fugitive emissions to air will be minimised using the following techniques:

Waste will be off-loaded is from vehicles inside the tipping hall directly into the waste bunker inside the Waste Reception Area. The waste bunker is maintained under negative pressure to prevent the escape of odour. When the incineration process is operational, primary combustion air in the incineration process will drawn from the waste bunker. When the incinerator is off-line, air will be extracted from the waste bunker via fans to a carbon filter when it is off-line (See 5.7 for further discussion). Fast acting roller shutter doors on the Waste Reception Area will be kept closed when not required for entry or exit.

Storage of dusty materials e.g. quick lime, powdered activated carbon and air pollution control residues (APCr) will be inside fully enclosed silos fitted with fabric filters on the top to abate air emissions, a high-level alarm will be in place to prevent over-filling;

Dust from incinerator bottom ash (IBA) is minimised by it being dropped into a water bath from the grate for cooling purposes. The cooled ash with a moisture content of between 15-20% is then transferred by conveyor to the Bottom Ash Hall which is fully enclosed and located on concrete hardstanding. Storage is inside a bay within the hall and the ash is transferred to vehicles inside the building using loading shovels for removal from site.

The above techniques are considered to be BAT for prevention of fugitive emissions to air.

5.6 Fugitive Emissions to Water

Fugitive emissions to water will be minimised using the following techniques:

Surface water run-off from low risk areas such as buildings, roadways and carparks will be discharged into the surface water drainage system. All surface water will pass through two Hydro Downstream Defenders prior to discharge into a Detention Basin. The Hydro Downstream Defenders will capture and retain sediments, oils and insoluble pollutants within the surface water runoff. The Downstream Defenders will be subject to a periodic maintenance regime to ensure that all sediments which have been contained are removed using a gulley-sucker (or similar technique) and transferred off-site to a suitably licenced waste management facility. All chemicals will be stored in an appropriate manner incorporating the use of suitable secondary and other measures (such as acid and alkali resistant coatings) to ensure appropriate containment and tertiary abatement measures. All storage facilities for chemicals will be designed in accordance with Environment Agency Pollution Prevention Guidance PPG 2, PPG 3 and PPG 18. Deliveries of all chemicals will be unloaded and transferred to suitable storage facilities. Areas and facilities for the storage of chemicals and liquid hazardous materials will be situated within secondary containment. Secondary containment facilities will have capacity to contain whichever is the greater of 110% of the tank capacity or 25% of the total volume of materials being stored, in case of failure of the storage systems. Tanker off-loading of chemicals will take place within areas where the drainage is contained with the appropriate capacity to contain a spill during delivery. The risk of chemical contamination of the surface water is therefore limited. The Detention Basin will discharge into the existing public surface water sewer

system which passes through the site. The discharge from the Detention Basin will be fitted with a Hydrobrake which will enable the discharge to be prohibited in the event of an incident occurring on site which required the surface water drainage to be retained within the site.

The majority of process equipment is located inside fully enclosed buildings so contact with surface water is prevented. The waste reception area comprising the tipping hall, waste bunker and waste quarantine area are located inside a building. Waste is stored inside a concrete waste bunker designed to prevent leakage out of any liquids.

Tanker off-loading of chemicals will take place within areas where the drainage is contained with the appropriate capacity to contain a spill during delivery.

Adequate quantities of spillage absorbent materials will be made available at easily accessible location(s), where chemicals are stored. A site drainage plan, including the location of process and surface water drainage will be made available on-site following completion of detailed design.

Any spillage that has the potential to cause environmental harm or to leave the installation will be reported to the site management and recorded in accordance with installations inspection, audit and reporting procedures. The relevant regulatory authorities (SEPA / Health and Safety Executive) will be informed as specified as required in accordance with the installation's documented management procedures.

In the event of a fire, contaminated water used for fighting fires will be collected through the wastewater drainage system. Site drainage for external areas will be fitted with an isolation valve to prevent the discharge of water from the drainage system in the event of a fire. Additional storage will be available from the site kerbing.

In accordance with the emergency response procedures which will be developed for the Facility, spillages will be reported to the site management and a record of the incident will be made. The relevant authorities (SEPA / Health and Safety Executive) will be informed if spillages/leaks are significant. The effectiveness of the emergency response procedures will be subject to Management Review and will be revised and updated as appropriate following any major spillages.

Prior operating conditions 2.8.10, 2.8.11, 2.8.12 and 2.8.13 require final design details of drains, subsurface pipework and storage vessels; of provisions for fire water containment; containment provisions for bulk storage and storage areas including how these prevent emissions to the water environment; and, details of the surface water drainage system, construction of the surface water detention basin, hydrobrake defenders. These have been specified so the final details can be checked by SEPA prior to commissioning. See Section 8 of this document for further details.

The above techniques and permit conditions will ensure the proposed facility meets BAT for prevention of fugitive emissions to water. Firewater containment measures are discussed further in Section 5.16 Accidents.

5.7 Odour

The processing of municipal and commercial and industrial waste has potential to cause offensive odour emissions. The design of the proposed facility will use the following techniques to minimise odour generation and emissions:

- Waste is offloaded from road vehicles inside the tipping hall into the waste bunker inside the Waste Reception Area (WRA). The air void above the waste pile within the waste bunker will be maintained at a negative pressure. Air will be extracted from the bunker area and combusted in the EfW to 'burn' the odour. There will be no direct air extraction from the Tipping Hall. The tipping chutes on the waste bunker will be installed with fast acting roller-shutter doors. These will be maintained closed during periods when waste is not being tipped. During this time, the extracted air will be replaced with air from the Tipping Hall area via adjustable louvres. During periods when waste is being tipped the tipping doors will be maintained open, and air which is being 'pulled' from the void above the bunker will be replaced by non-odorous air

from within the Tipping Hall that will be 'pulled' through both the openings of the tipping chutes and the adjustable louvres. When tipping operations have been completed, the doors on the tipping chutes will be closed and odorous air will be contained within the bunker and led to combustion. The doors to and from the Tipping Hall will also be fast acting roller-shutter doors which are required by permit conditions to remain closed whenever they are not being used for entry or exit. No waste is to be stored externally

- Waste bunker management procedures (mixing and periodic emptying and cleaning) will be implemented to avoid the development of anaerobic conditions which can generate odorous emissions (this is also a requirement of standard Permit Condition 4.4.7). Waste in the bunker will also be run down ahead of periods of planned maintenance on the incineration line to minimise potential for odour generation; during longer unplanned shutdowns waste would be diverted elsewhere and waste already received will be back-loaded to alternative treatment facilities.

- Permit condition 4.4.6 requires a regular cleaning regime which will be laid out in a Hygiene Plan - this should have benefits for minimising odour generation as well as reducing fire risk, vermin etc.;

- During operation of the incineration line primary combustion air for incineration is drawn from the waste bunker area and therefore odours are combusted during incineration and exhaust gas vented to atmosphere via the 80m stack.

- During periods when the incineration line is not operational estimated at approximately 10% of the year in the application, air from above the waste bunker will be extracted via fans to carbon filter prior to discharge via a 48.2 m stack routed through the boiler hall roof (Emission point Ref. A2 in Table 6.1 of the Permit). Prior Operating Condition (POC) 2.8.18 has been specified so the Operator can review this against SEPA requirements along with providing final design details of this abatement system and measures to prevent deterioration of the carbon so it does not become a source of odour on its own

- POC 2.8.18 also includes a requirement for the designed Odour Abatement System to achieve a level of 1.5 OUE/m3 as the 98th percentile of hourly averages beyond the site boundary, see Section 8 for further details. Dispersion modelling based on an emission of 1000 OUE/m3 from the exhaust of the carbon filter system to predict the number of odour units at sensitive receptors confirmed this threshold was achievable. Because this value cannot be easily measured in ambient air, the value of 1000 OUE/m3 has been specified as an Emission Limit Value for odour at emission point A2 in Table 6.2 of the Permit. In reality the modelling results suggest that a higher ELV could still achieve 1.5 OUE/m3 beyond the site boundary but the ELV has been set at 1000 OUE/m3 because this is the OUE/m3 value the modelling was based on.

In addition to the techniques and permit conditions described above, the requirement to develop an Odour Management Plan has been inserted into the Odour Conditions in Schedule 3 of the Permit. Additional conditions require:

- The odour abatement system to remain operational during any period of planned or unplanned shutdown of the incineration line and for the Operator to notify SEPA when this is the case;

- A requirement for smoke testing to be carried out to test the effectiveness of the air extraction system particularly when the incineration plant is off-line in maintaining negative pressure. The methodology for doing this is required to be agreed by SEPA in advance. This will also ensure the structural integrity of the building, to ensure there is no leakage.

The techniques and conditions described above will ensure the proposed facility meets BAT for prevention of odours. These are considered necessary due to the nature of the waste being handled.

5.8 Management

Details of the arrangements for management of the proposed facility are discussed in the application supporting information in Section 2.10; additional information on technical competence is provided in Annex 11 of the permit application.

The Applicant, Fortum Glasgow Ltd has stated that they will carry out the day to day operation and management of the plant. Fortum Glasgow Ltd will maintain the EMS in accordance with the ISO:14001 standard. Fortum Glasgow Ltd will ensure that the EMS objectives and scope meet these requirements by:

- Identifying potential environmental impacts;
- Documenting and implementing standard procedures to mitigate and control these impacts;
- Determining a procedural hierarchy that considers the interaction of the relevant processes;
- Ensuring adequate responsibility, authority and resources to management necessary to support the EMS;
- Establishing performance indicators to measure the effectiveness of the procedures;
- Monitoring, measuring and analysing the procedures for effectiveness; and
- Implementing actions as required based on the results of auditing to ensure continual improvements of the processes.

The EMS will cover the design and development of the plant; operation of the plant; and, processing of waste. Documented procedures detailing how each activity will be controlled will be contained in an environmental procedures manual.

Day-to-day operation and maintenance of the Facility will be undertaken by Fortum Glasgow Ltd. Fortum Glasgow Ltd will ensure that sufficient numbers of staff, in various grades, are provided to manage, operate and maintain the plant on a continuous basis, seven days per week throughout the year. The plant will be managed, operated and maintained by experienced managers, boiler operators and maintenance staff. An indicative organisational structure for the Facility is presented in Annex 1. As set out in the organisation structure, the key environmental management responsibilities will be allocated as described below:

- The Operations Manager will have overall responsibility for management of the plant and compliance with the operating permit. He or she will also be responsible for waste management and scheduling. The general manager will have extensive experience relevant to his responsibilities.

- The EfW Plant Manager will have day-to-day responsibility for the operation of the plant, to ensure that the plant is operated in accordance with the permit and that the environmental impact of the plant's operations is minimised. In this context, he or she will be responsible for designing and implementing operating procedures which incorporate environmental aspects.

- The Regulations and Economics Engineer will be responsible for the development and management of the EMS, for the monitoring of authorised releases and for interaction with the Environment Agency.

- The Maintenance Manager will be responsible for the management of maintenance activities, for maintenance planning and for ensuring that the plant continues to operate in accordance with its design.

Fortum Glasgow Ltd will aim to ensure that any persons performing tasks for it, or on its behalf, which have the potential to cause significant environmental impact, are competent on the basis of appropriate education and training or experience.

The EMS will contain a training procedure to make employees aware of:

- The importance of conformity with the environment policies and procedures and with the requirements of the EMS;
- Potentially significant environmental aspects associated with their work;
- Their roles and responsibilities in achieving conformity with the requirements of the EMS, including emergency preparedness and response requirements;
- The relevance and importance of their activities and how they contribute to the achievement of the environmental and quality objectives; and

• The potential consequences of the departure from specified procedures.

Fortum Glasgow Ltd will comply with industry standards or codes of practice for training (e.g. WAMITAB or similar), where they exist. This will include ensuring that a suitable number of employees that have achieve the WAMITAB level 4 in waste management operations: managing thermal treatment – hazardous waste: pyrolysis and gasification, or similar qualification to be agreed with SEPA.

The proposed facility is a Specified Waste Management Activity (SWMA) and the Operator is therefore required to meet the Fit and Proper Persons (FAPP) test. The FAPP requirements are described in Section 10 of the Administrative decision document, DD-01 and SEPA is satisfied that these requirements have been met.

SEPA is satisfied that the measures described are consistent with BAT for the management of the proposed facility.

5.9 Raw Materials

This is discussed in the application Supporting Information in Section 2.1 and 2.2
The key raw material is the municipal, commercial and industrial waste used to fuel to incineration process. This will be delivered to site in covered trucks and will stored inside the Waste Reception area in the waste bunker.

Other key raw materials are summarised as follows:

- light fuel oil for start-up, shutdown and maintaining temperature above 850°C in the combustion chamber and for firing the boilers stored in an external bunded tank;
- quick lime (CaO) and powdered activated carbon (PAC) which will both be stored in bulk in silos;
- chemicals used for water treatment in the reverse osmosis plant;
- 24.5% ammonia solution will be stored in a tank in a bunded area;
- CO2 and fire-fighting foam agents;
- Refrigerant gases for the air conditioning plant
- Low sulphur fuel oil for the auxillary/back up engines for safe shutdown
- Various hydraulic oils, silicon based oils lubricants etc which will be stored in bunded areas.

Storage arrangements are described further in Section 5.5 and 5.6 above. Consumption of mains water is discussed in Section 5.12 below. Raw materials selection is discussed in 5.10 and efficient use of raw materials in 5.11 below.

5.10 Raw Materials Selection

This is discussed in the permit application in Supporting Information Section 2.1.3 and the application Annex 5 BAT Assessment.

Gas oil has been selected as the support fuel for the incineration line. As identified by the requirements of IED the only available fuels that can be used for auxiliary firing are:

(1) liquefied gas (LPG);
(2) fuel oil; or
(3) natural gas.

LPG is a flammable mixture of hydrocarbon gases. It is a readily available product and can be used for auxiliary firing. As LPG turns gaseous under ambient temperature and pressure, it is required to be stored in purpose-built pressure vessels. If there was a fire within the site, there would be a significant explosion risk from the combustion of flammable gases stored under pressure. Considering the centralised urban

location of the Facility and the proximity to the adjacent motorway, this is not considered to be a suitable auxiliary fuel for the Facility.

Natural gas can be used for auxiliary firing and is safer to handle than LPG. As stated previously, auxiliary firing will only be required intermittently. When firing this requires large volumes of gas, which would be need to be supplied from a high-pressure gas main. The applicant is not aware of a high-pressure gas main already being installed at the Facility, so due to insufficient supply this is not considered to be an available fuel. However, this will be reviewed during detailed design of the Facility.

A low sulphur fuel oil tank can be easily installed at the Installation. Whilst it is acknowledged that fuel oil is classed as flammable, it does not pose the same type of safety risks as those associated with the storage of LPG. The combustion of fuel oil will lead to emissions of sulphur dioxide, but these emissions will be minimised as far as reasonably practicable through the use of low sulphur fuel oil.

Therefore, low sulphur light gas oil will be used for auxiliary firing. This is considered a suitable fuel as emissions are low and there is no mains gas line within the vicinity of the installation.

As discussed in Section 5.2.4 the selected abatement techniques for acid gases will use quick lime (calcium oxide). A BAT assessment for this choice of raw material was provided in section 3 in Annex 5 of the application against sodium bicarbonate. SEPA accepts the choice of quick lime which is a standard raw material used in the Energy from Waste (EfW) Sector for abatement of acid gases.

Powdered activated carbon has been selected as the absorbent for dioxins/ heavy metal adsorption from flue gases and is accepted as this is a standard raw material used in the EfW Sector for this purpose.

Ammonia solution has been selected as the appropriate raw material for use in SNCR. NOx abatement systems can be operated with dry urea (prills), urea solution or aqueous ammonia solution. There are advantages and disadvantages with all options:

• urea is easier to handle than ammonia - the handling and storage of ammonia can introduce an additional risk;
• dry urea needs big-bag handling whereas urea solution can be stored in silos and delivered in tankers; and
• ammonia emissions (or 'slip') can occur with both reagents, but good control will limit this.

The Sector Guidance on Waste Incineration considers all options as suitable for NOx abatement. It is proposed to use aqueous ammonia for the SNCR system, because the climate change impacts of urea outweigh the handling and storage issues associated with ammonia solution. These issues can be overcome by good design of the ammonia tanks and pipework and the use of suitable procedures for the delivery of ammonia. The alternative, urea can be slightly less effective in abatement NOx emissions than ammonia, the ammonia will be stored in a bulk storage tank. Further design details for the proposed system with a comparison of emissions from different reagents for SNCR will be obtained by Prior Operating Condition 2.8.19 no later than 12 months prior to Commissioning. This is to give SEPA sufficient time to review the proposals in detail prior to construction.

A detailed inventory of raw materials will be maintained and Fortum Glasgow Ltd will develop a procedure for the regular review of developments in the raw materials used. A procedure will also be in place to manage changes in raw materials which may have an impact on the environment. Waste acceptance procedures for waste for incineration is discussed in section 5.13 Waste Handling.

The raw materials selected for use and the procedures to manage them and monitor developments are consistent with BAT for the proposed facility.

5.11 Waste Minimisation Requirements

The key techniques to minimise waste are covered in Supporting Information Section 2.2.3 of the Application. These include:

- Improving feed-stock homogeneity to improve process stability and therefore reduced reagent use in flue gas treatment and reduced residue production associated with this. This can be achieved though waste acceptance procedures and mixing of fuel from different sources in the bunker prior to incineration.
- Optimising furnace conditions to reduce residue quantities by optimising waste feed rates and air flows to achieve burn out requirements for Total Organic Carbon in bottom ash;
- Trimming dosing of hydrated lime into the flue gas treatment system by matching to acid gas levels in the flue gas using a fast response monitoring system and matching activated carbon injection to flue gas flow to maintain a steady rate of adsorption gaseous metals and dioxins;

The standard permit conditions for Resource Utilisation (Condition 2.6.1 to 2.6.6) have been inserted into the Draft permit. These will require the operator to carry out a systematic assessment every 4 years to review and where appropriate, implement, opportunities for improving the efficiency of use of raw materials and energy; and waste minimisation. Progress towards this will be reviewed periodically by SEPA during inspections.

Conditions 8.1.1 and 8.1.2 require a Residue Management Plan to be produced and reviewed every 2 years to assess how the residue from the plant is prevented or reduced to a minimum, in amount and harmfulness and where residues are produced how they are, in order of priority, prepared for re-use, recycled, recovered or, where that is technically and economically impossible, disposed of while avoiding or reducing any impact on the environment.

The techniques described above together with the Permit conditions in the draft Permit are considered to satisfy the BAT requirements for waste minimisation for the proposed facility.

5.12 Water Use

This is discussed in the application in Section 2.3. The main use of water at the plant will be to make up the water for the boiler. Steam used in the turbine boiler will be recycled as condensate. Potable water from the mains water supply will be used to provide feedwater for the boiler. This will be treated in a reverse osmosis water treatment plant to produce high quality boiler feedwater. Wastewater from the blowdown systems will be re-used within the process, either within the FGT system or within the ash quench. Potable water will be used to supplement process effluent in the ash quench system Although the applicant states that the water system has been designed with the two key objectives of minimal process water discharge and minimal consumption of potable water discharge into the drainage systems, no detailed design has been submitted with the application and there are no quantifications for water use, water balances and water recycling. The following POC 2.8.14 has therefore been added

2.8.14 No later than 6 months prior to Commissioning, the Operator shall submit a report in writing containing the detailed design of the water system on site. The report shall include water balances, quantified estimates of potable water use, condensate returns, waste water re-used, process water discharge and potable water discharge. In order to minimise use of natural resources, the Operator shall review the proposed design to identify and assess options to minimise the projected mains water consumption requirements of the Permitted Installation and associated effluent arisings.

5.13 Waste Handling

Schedule 4 of the Permit will specifies conditions for permitted waste types including prohibiting the incineration of separately collected recyclable wastes including hard plastics and non-ferrous metals; permitted quantities of waste; requirements for waste acceptance and waste storage.

The Application acknowledges that waste acceptance procedures will require a pre-acceptance step to ensure that recyclates have been segregated from the incoming waste stream prior to their arrival on site.

This may require an approval letter from SEPA where this relates to local authority waste. Additional inspection checks will be carried out periodically to confirm that accepted waste is in conformance with these requirements. Prior Operating Condition 2.8.16 requires submission of the waste acceptance procedures and associated inspection schedule to SEPA at least 3 months prior to commissioning. The techniques described together with the standard conditions in Schedule 4 of the Permit are consistent with BAT for Waste inputs to the facility.

Waste outputs are covered in section 2.2.3.5 and 2.9 of the Application. The key waste streams generated by the facility will be non-hazardous incinerator bottom ash (IBA) and hazardous air pollution control residues (APCr). The storage and handling arrangements for IBA and APCr are described in Section 5.5 and 5.6 above, a key requirement is that these two residue streams are stored, and disposed of, separately. The procedures for characterising and managing these waste streams will be covered by the Residue Management Plan required by Condition 8.1.1.

5.14 Waste Recovery or Disposal

This is covered in Section 2.9 of the Application. IBA and APCr are segregated waste streams as discussed in section 5.5 and 5.6.

The intention is to recycle IBA from the facility as secondary aggregate. There are limited options for recycling of APCr, a hazardous waste, from the facility so this waste stream may require disposal to hazardous waste landfill. The residue management plan required by Condition 8.1.1 of the Permit will require this to be kept under review.

5.15 Energy

Basic Energy Efficiency Requirements are described in Section 2.8 of the permit application and are consistent with BAT techniques and requirements described in Section 2.7 of the Sector Guidance. This includes use of high efficiency motors, variable speed drives and high standards of cladding/ insulation etc.

Heat and Power plan

Section 2.8 and Annex 6 of the PPC Application discuss the Heat and Power Plan (HAPP) for the facility.

SEPA's *Thermal Treatment of Waste Guidelines* (TTWG) were first issued in 2009 and updated in 2014. The TTWG describe what is expected of developers in order to comply with the PPC Regulations 2012 and is focussed on ensuring that waste treatment proposals do not impede other waste management options e.g. recycling or waste prevention opportunities further up the waste management hierarchy and work in conjunction with best practices to maximise the benefit from treatment of waste. Therefore only 'residual waste' i.e. waste which has been subject to all reasonably practicable measures to recover materials for recycling should go forward for thermal treatment (See Section 5.13).

Best practice for thermal treatment of residual waste is deriving maximum benefit from the waste in the form of heat and electrical energy recovery during incineration.

The Facility will be designed to generate up to 40 MWe of electricity (design maximum when operating in fully condensing mode), approximately 5 MWe of which will be consumed as parasitic load by the Facility and the balance exported to the local grid. The Heat and Power Plan is based on an expected electricity generation of 37.3 MW. The Facility proposes to also export heat to local heat consumers, subject to technical and economic viability.

The TTWG sets out the SEPA approach to permitting thermal treatment of waste facilities. The guidance requires new waste thermal treatment plants to achieve a minimum level of energy recovery. In order to demonstrate compliance, thermal treatment plants processing over 70,000 tpa of fuel, such as the Facility, must meet or exceed a QI of 93 or an indicative overall efficiency of at least 35%.

Based on a Z factor of 6.96 (assuming steam extraction at a pressure of 1.7 bar(a) which is sufficient to meet the needs of identified consumers), the Facility will achieve a QI of 96.87 when exporting 12.05 MWth when applying SEPA's QI calculation methodology. This arrangement would therefore exceed SEPA's energy recovery target if implemented and demonstrate best practice in the thermal treatment of waste. To achieve the QI target of 93, 5.0 MWth of heat would need to be exported from the Facility.
Operating the Facility in CHP mode to deliver the 12.05 MWth heat load to identified potential heat consumers would reduce the expected net electrical output of the facility from 32.3 MWe to 30.57 MWe. Aside from financial viability, there is no reason to suggest that the proposed heat network outlined in this Heat and Power Plan cannot be implemented within 7 years starting on cessation of commissioning of the Facility.

A grid connection offer has been accepted from Scottish Power Energy Networks and is appended to the HAPP. This demonstrates that there is 35MW connection capacity agreed at the Braehead Park GSP substation

SEPA has set energy recovery efficiency targets in Annex 1 of TTWG for the recovery of electrical and heat energy from the combustion process. The Quality Assurance for Combined Heat and Power (CHPQA) standard published by DEFRA has been adopted in defining how energy recovery efficiencies are calculated. These targets are summarised in Table 5.15.1 below for both initial operation at start up and at the end of a maximum 7 year period; the predicted energy efficiency levels provided in the PPC Application are shown for comparison. Initial operation at start-up on cessation of commissioning is required to meet a target of 20% (gross calorific value basis) equivalent energy recovery. The predicted energy efficiency level of the South Clyde Energy Centre is 26.1% at start up.

Load Case Heat Efficiency (%)	Annual average heat export at Turbine (MW)	Power Efficiency (%)	Heat Efficiency (%)	Indicative Overall Efficiency (%)	CHP QI
1. No heat export	0.00	26.1	0.0	26.1	91.25
2. Heat load required for QI value of 93	5.0	25.6	3.5	29.1	93.68
3. Average network heat load	12.05	24.9	8.4	33.3	97.12
4. Maximum heat export capacity	12.05	24.9	8.4	33.3	97.12

Energy Efficiency Directive
The Energy Efficiency Directive (EED) requires that applicants carry out a Cost Benefit Assessment (CBA) as part of the application for a permit to determine whether waste heat can be utilised within a radius of 15km from the installation. SEPA consider that this requirement has been met through the HAPP submission and that the accompanying SEPA duty to ensure that the proposed use of the heat will be realised is met through the inclusion of the HAPP Standard Conditions which require that the heat will be utilised within 7 years of plant commissioning. The techniques described in the Application as updated by information on the Schedule 4 Notice response is consistent with BAT for Energy.

5.16 Accidents and their Consequences

Firewater will be provided by an on-site water tank which is connected to the towns water supply. The firewater/raw water tank will be a combined tank to supply raw water to the process and firewater to the

fire-fighting systems. The tank will be designed as a split tank on the off-take from the tank located to maintain the relevant capacity of water for both raw water and firewater purposes. Water for fire-fighting will be stored in a firewater storage facility with a duty electric pump and standby diesel pump.

Potentially contaminated rainwater from the roadways, car parks and other hardstanding will be contained by kerbs. Surface water run-off from buildings, roadways and carparks will be discharged into the surface water drainage system. All surface water will pass through two Hydro Downstream Defenders prior to discharge into a Detention Basin. The Detention Basin will have a discharge into the existing public surface water sewer system which passes through the site. The discharge from the Detention Basin will be fitted with a Hydrobrake which will enable the discharge to be prohibited in the event of an incident occurring on site which required the surface water drainage to be retained within the site.

Adequate quantities of spillage absorbent materials will be made available at easily accessible location(s), where chemicals are stored. A site drainage plan, including the location of process and surface water drainage will be made available on-site following completion of detailed design.

Any spillage that has the potential to cause environmental harm or to leave the installation will be reported to the site management and recorded in accordance with installations inspection, audit and reporting procedures. The relevant regulatory authorities (SEPA / Health and Safety Executive) will be informed as specified as required in accordance with the installation's documented management procedures.

In the event of a fire, contaminated water used for fighting fires will be collected through the wastewater drainage system. Site drainage for external areas will be fitted with an isolation valve to prevent the discharge of water from the drainage system in the event of a fire. Additional storage will be available from the site kerbing.

In accordance with the emergency response procedures which will be developed for the Facility, spillages will be reported to the site management and a record of the incident will be made. The relevant authorities (SEPA / Health and Safety Executive) will be informed if spillages/leaks are significant. The effectiveness of the emergency response procedures will be subject to Management Review and will be revised and updated as appropriate following any major spillages.

Further design details for firewater containment including detailed capacity calculations and associated assumptions will be provided by a prior operating condition in the Permit, 2.8.11. As described in Section 2.10, emergency procedures will be developed as part of the documented management system required for the site. Standard conditions 2.5.7 and 2.5.8 require the development of an Incident prevention and mitigation.

The techniques and permit conditions described are consistent with BAT for accident management.

5.17 Noise

The Applicant's Environmental Consultants (Noise and Vibration Consultants Ltd) have provided information on noise and vibration (see Appendix 9 of Planning Application, supplemented by Annex 3 of PPC Application). A noise survey was carried out between Sunday 04th and Tuesday 06th March 2012 to establish the background and ambient noise climate. It is stated that the survey was discussed with Glasgow City Council Environmental Health Officers prior to commencement (no contact was made with SEPA. Whilst the data is now >6 years old, the Applicant claims that the noise climate has not changed significantly from that measured in 2012. As the industrial component has not changed and road traffic will have increased slightly (if anything), and following a site visit on 07 Nov 2018 – SEPA is reasonably comfortable with the Applicants assertion.

The following issues were noted:

1. the submission defines the limits of the Installation activities and notes the main sources of noise and vibration likely to be present (with data supplied by Fortum Glasgow Ltd – an operator of similar plant in the UK).
2. nearby receptors are correctly identified (Section 2.2) and the residual noise climate at each is adequately described (Table 2.1). Monitoring was carried out in compliance with BS 7445, modelling was undertaken to ISO 9631-2 (using CadnaA software), and an assessment of impact carried out as per BS 4142 (results below background), NR curves, and BS 8233 indoor ambient sound levels;
3. The levels of mitigation within the plant design are covered in Section 4. SEPA have some concerns when models use manufacturer's RW data to predict the "as built" performance of building envelopes. A safety margin should be included to account for practical installation and construction of the building.
4. Specifically, Table 4.1 and Annex 2, note the expected performance of the Turbine Hall walls and roof. SEPA's experience is that the issue of low frequency sound is often insufficiently dealt with (through the reliance on models) – the Applicant should be advised (at this design stage) that a high level of attenuation is expected at the turbine hall (sufficient design to mitigate any potential for low frequency noise transmission).
5. a commitment to carrying out regular (annual) operational noise monitoring surveys is given, together with an outline complaints handling procedure and an undertaking to investigate any noise problems identified (Appendix 9.8);
6. vehicle access / egress systems should be designed such that a one way traffic system is in place (i.e. no external vehicle reversing) and doors to the main waste reception hall are open for the minimum time to allow safe access / egress from the facility (i.e. automatic quick close mechanisms should be installed); and
7. the specific noise levels expected near the flats opposite the existing site entrance on Bogmoor Road (Monitoring Location 2) appear high. SEPA note that this location is already significantly impacted upon by the adjacent M8, other roads and local industry.

Vibration

Due to the nature of machinery used by / serving the site and the site location (i.e. immediately adjacent to the M8 / A8 and sawmills), it is unlikely that vibration associated with installation activities will have a significant effect off-site. There may be the potential from HGV movements on the public road to affect some NSRs. However, vehicle movement on the public highway is outwith SEPA's regulatory remit.

GCC Planning Conditions

The Planning Consent (issued by Glasgow City Council) contains two conditions relevant to the PPC activity.

Condition 3
Hours for import or export of materials and HGV access:- 0700 hours to 1900 hours Monday to Friday, 0700 hours to 1200 hours on Saturdays, except for 0700 hours to 1700 hours on
Saturdays following a bank holiday.
Reason: To protect local residents from exposure to noise and disturbance at unsocial hours.

Condition 18
Noise from or associated with the completed development (the building and fixed plant) shall not give rise to a noise level, assessed with windows closed, within any dwelling or noise sensitive building in excess of that equivalent to Noise Rating Curve 35 between 0700 and
2200, and Noise Rating Curve 25 at all other times.
Reason: To protect the occupiers of dwellings or noise sensitive buildings from excessive noise.

If the Applicant follows the operating hours restrictions and NR Curves (NR25 at night) as a design aim - then it should address most foreseeable noise impact issues.

Summary

Due to the existing high ambient noise levels near this site; operational noise from the facility should be able to be adequately controlled by the strict application of BAT and the Applicant's design criteria of NR 25 (night time) at the closest residential receptor.

However, "strict application of BAT" includes close scrutiny over the design and "as built" performance of the turbine hall; particularly in relation to mitigating the potential transmission of low frequency sound. It is time consuming, technically challenging, and expensive to retrofit low frequency attenuation after the hall is built. The Developer should therefore look to 'over-spec' the low frequency attenuation of the turbine hall at the design stage.

To ensure that the building "as built" does meet the high levels of attenuation as designed, the following conditions, as used in PPC/A/1168354, are included

3.1.4 Notwithstanding the requirements of Condition 3.1.1, within 3 months of cessation of commissioning, the Operator shall complete and submit an acoustic survey designed to confirm the acoustic attenuation performance of the operational buildings and validate predictions contained within the pre-construction noise submissions.

3.1.5 The acoustic survey required by Condition 3.1.4 shall be carried out to a recognised British Standard methodology and the survey report shall include an assessment comparing the survey findings with the original application noise assessment.

5.18 Monitoring

Monitoring techniques are discussed in Section 2.5 of the PPC Application.

- Monitoring of Emissions to Air

Monitoring requirements consistent with IED Annex VI Part 4 for waste incineration plants have been specified in schedule 6 of the Permit. The proposed techniques described in section 2.5.1 for monitoring of emissions to air provide assurance that the requirements of Schedule 6 will be met for monitoring, recording, data handling, reporting and calibration.

Schedule 6 of the Permit requires Continuous Emission Monitoring Systems (CEMS) equipment to be used for continuous monitoring of particulate, oxides of nitrogen (NO and NO_2 expressed as NO_2), sulphur dioxide, carbon monoxide, total organic carbon and hydrogen chloride. The Applicant proposes to install duplicate CEMS so that there is redundancy in the event that one CEMS fails; this would allow the incineration line to continuing incinerating waste.
Periodic monitoring has been specified in Table 6.2 for hydrogen fluoride (HF) monitoring as allowed for by IED Annex VII Part 6 para 2.3 because treatment stages for hydrogen chloride are used however the applicant proposes to continuously monitor hydrogen fluoride.

The number of runs specified for periodic monitoring in Table 6.2 other than dioxins and furans and dioxin-like PCBs, is three with the average over the three runs being the reported value for compliance purposes. This is consistent with the proposed frequency for testing in the draft Waste Incineration BREF (page 681).

In addition to the standard pollutants which are required to be monitored by IED, additional monitoring requirements have also been specified for the following pollutants:

- Ammonia – due to potential for generation known as ammonia slip from the Selective Non-Catalytic Reduction using ammonia solution, therefore continuous monitoring requirements have been specified in the Permit. These are consistent with the frequency specified in the S5.01 and the Draft WI BREF BATC 5 and is consistent with monitoring already carried out at other operating UK EfW sites.

- Nitrous oxide – N_2O emissions are known to increase when SNCR is used. The Draft WI BREF BATC 5 specified an annual frequency for monitoring [Ref. 15.8.1.1 Draft WI BREF D1 BATC for monitoring requirements and BAT-AELs], therefore monitoring requirements have been specified in the Permit. Monitoring has been specified to be quarterly for the first year of operation consistent with other periodic monitoring frequencies for the first year, and then annually.

- Dioxin-like polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) – monitoring is a requirement of Regulation 29(2) of PPC 2012 which specifies that where dioxins and furans are referred to in IED for waste incineration plants, specifically in Chapter IV and Annex VI, this is to be read as if it is substituted with the words "dioxins, furans, dioxin-like polychlorinated PCBs and PAHs. Monitoring requirements for these pollutants are therefore specified in Table 6.2 of the draft permit.

- Which species should be monitored?

    - Dioxin-like PCBs – The standard list already specified in Table 6.2 of the Sector Template IED-T-14 has been used in the Draft Permit.
    - PAHs – The standard list for PAHs specified in footnote 2 to Table 6.2 in Schedule 6 of IED-T-14 is under review by the Waste Incineration Delivery Group because the currently listed PAHs do not cover all 16 of the historically monitored PAHs. PPC Regulation 29(2) does not specify which PAHs require to be monitored and this is not detailed in either the EA Monitoring Technical Guidance Note M2, or the Draft Waste Incineration BREF D1 where there is the only PAH monitoring required is for benzo(a) pyrene on an annual basis. The list of 16 PAHs identified in Section 2.10.1 (Indicative BAT item 11) of the UK Incinerator Sector Guidance Note IPPC S5.01 Issue 1 [Ref. 5.18.1-2] has therefore been used instead to update the Table 6.2 footnote 2. This is consistent with the suite of 16 PAHs commonly monitored by Stack Monitoring Contractors for existing operational Energy from Waste facilities in Scotland (Records checked for MEB, Dundee and RWE Markinch Biomass Plant, Glenrothes) and commonly known as the DEFRA 16 list.

  The frequency specified for monitoring dioxin-like PCBs and PAHs in Table 6.2 is the same as for dioxins and furans as recommended in Section 2.10.1 of S5.01 (Indicative BAT 10) and implied by PPC Regulation 29(2).

In Table 6.2 Footnote 2 has been changed to refer to the list of 16 PAHs recommended for monitoring in the Sector Guidance s5.01.

Prior operating condition 2.8.15 will require the details of the plans for continuous and periodic monitoring of emissions to air to be confirmed 6 months prior to commissioning of the installation.

The proposals described by the Applicant and additional requirements specified by SEPA in Table 6.2 of the Permit are consistent with BAT and the requirements of IED Annex VI for waste incineration plants.

- Monitoring and reporting of emissions to Water

Monitoring proposals are described by the Applicant in section 2.5.2 of the Application. Additional requirements specified by SEPA in Table 7.1 of the Permit are consistent with BAT and the requirements of IED Annex VI for waste incineration plants.

- Process Monitoring requirements

Section 2.5.3 outlines the process monitoring which will be undertaken by the plant. The process will be controlled from a dedicated control room.

Requirements for continuous monitoring of the exhaust gas from the main stack (A1) to meet Annex VI requirements for oxygen, water vapour (unless gas dried prior to analysis for CEMS), temperature, pressure and flow are inserted in Table 6.3 of the draft permit.

- Environmental monitoring (beyond the installation)

Soil Monitoring

Requirements for environmental monitoring have been specified for dioxins and furans in soil in Table 9.1 of the Permit at locations to be agreed in writing with SEPA. This is to be carried out initially prior to commissioning to establish a baseline level in soils prior to operation of the incineration line commencing. Further monitoring will be carried out after operation has commenced at periodic intervals to monitor how the baseline has changed over time. The locations will be chosen to reflect the point of maximum impact identified by the modelling and some of the sensitive receptors as well as a location 'upwind' of the prevailing wind direction.

5.19 Closure

Closure is covered in section 2.11 of the Permit Application. The installation is designed to have an operational life of over 25 years depending on continued supply of waste over this period. At the end of its operating life, the site could be demolished and cleared for a new use and left in a 'satisfactory state' or redeveloped for extended use. Fortum Glasgow Ltd have committed to developing a site closure plan to ensure decommissioning is carried out in a safe and clean way and proposed to do this prior to commencement of operation. Some of the requirements are identified in section 2.11.3.1 to 2.11.3.3 of the Permit.

Standard permit conditions have been applied for closure in Condition 2.11 of the draft permit. The information provided together with permit conditions are consistent with BAT for site closure.

5.20 Site Condition Report (and where relevant the baseline report)

The site condition and baseline reports were considered by SEPA's Contaminated Land Team who gave the following comments and recommendations:

In summary the site condition and baseline report provided was not fully in line with the requirements of SEPA's guidance (IED-TG02) and required additional work including identifying relevant hazardous substances (RHS) to be used, produced and released at the site in line with the correct hazardous regulations, fully identifying potential leakage points and additional site investigations. Due to the need for site investigations, and issues gaining access for such work, a pre-commissioning condition to supply a revised site condition and baseline report has been agreed (2.8.9) in consultation with the applicant, including details of the investigation. In order to ensure that the works are carried out as agreed informally it would be beneficial to have a pre-submission condition for the draft site condition report (addressing the identification of RHS and potential emission points which is required to justify the additional site investigation and its design).

Soil and Groundwater monitoring is to be stipulated by SEPA in Section 7.3.5 and 7.3.6 of the permit, however further information is required from the applicant to do this. To set the RHS to be monitored SEPA require information that will be produced in the amended site condition and baseline report. To set the monitoring frequencies information on containment design and quality is required and this information is to be provided as pre-commissioning conditions (2.8.10; 2.8.11; 2.8.12; 2.8.21 (d)). As such it is recommended that the details of the monitoring to go into tables 7.2 and 7.3 are set by SEPA following the completion of condition 2.8.9 and other conditions referenced above regarding containment.

More specific details of the comments provided from SEPA contaminated land specialists to the applicant on the site condition and baseline report that necessitate the conditions above are provided below:

- The initial site condition report references priority hazardous substances as listed in Annex II of Directive 2008/105/EC rather than under the CLP Regulations (Stage 2 of Initial Site Report process as described in IED-TG02). As a result of this and subsequent failure to identify Relevant Hazardous Substances it is not possible to conclude that the baseline report adequately characterises the site conditions in relation to the proposed activities. The applicant must re-assess the substances on the site

with reference to Article 3 of the Hazardous Substances Regulation. (REGULATION (EC) No 1272/2008, 16 December 2008, on classification, labelling and packaging of substances and mixtures.

- The ground investigation is a geotechnical and environmental site investigation aimed at satisfying the planning requirements rather than a targeted baseline investigation. The report must be revised to remove detail that is not relevant in a PPC site condition and baseline report such a quantified screening of risks.

- Potential emissions to soil and groundwater have not been fully considered. For example the waste bunker will be a water retaining structure but there is no consideration of the potential for leakage from this structure or from the waste reception hall. There are similar issues with a lack of consideration of fuel storage or feed lines between the Bulk Storage tank and day tanks. Both the attenuation pond and cooling pond will be water retaining structures however, there hasn't been any consideration of the potential for emissions from these or associated pipework. The revised report must consider all potential emission points and RHS associated with the activities to be undertaken in those areas. Where risks are considered minimal this should be justified by appropriate evidence which may include information required by other pre-commissioning conditions.

- Notwithstanding the above, the site investigation is reasonably thorough and much of the information could probably be used to form the majority of a baseline report with a suitable justification of the use of marker substances. The lack of a detailed annotated site plan to relate to the sampling locations and depths, in combination with a lack of determination of RHS, means that it is not possible to tell if an appropriate baseline have been set for RHS in the relevant locations. Upon completion of the required actions above, any gaps in the baseline must be filled by further site investigations.

- The statement of site condition is presented as an assessment of risk based on the proposed activities and design and operational procedures to limit or remove this risk. This is not relevant for PPC sites and the report must be revised to align with the requirements of IED-TG-02 to make a factual statement of site condition rather than a risk based statement.

On the recommendation of the SEPA Contaminated Land team the following 3 Pre-operational Conditions were not included

2.8.5 No later than 9 months prior to commencement of Commissioning of the Incineration plant, the Operator shall provide SEPA with a report detailing the design and construction timetable for the groundwater monitoring boreholes to be installed at the locations specified in table 7.4a. Said design must be suitable for the collection of representative samples of the groundwater.
2.8.6 No commissioning of the Incineration plant may commence until the groundwater monitoring boreholes, referred to in the report required by Condition 2.8.5 and tables 7.4a and 7.4b are constructed.
2.8.7 Soil samples must be taken from the groundwater monitoring boreholes referred to in the report required at Condition 2.8.5 and tables 7.4a and 7.4b, during their construction. Said samples should subsequently be tested for the relevant hazardous substances as required by Condition 7.6.6 and detailed in Table 7.4b. Additionally the depth of all soil samples and groundwater encountered during installation of said groundwater monitoring boreholes should be recorded in metres Above Ordnance Datum (mAOD).

And new Condition 2.8.8 was included

2.8.8 No later than 12 months prior to commencement of Commissioning of the Incineration plant, the Operator shall provide SEPA with an updated site condition report detailing the relevant hazardous substances used, produced and released on site and an updated conceptual site model in line with IED-TG02. The report should include a design and construction timetable for the additional soil and groundwater monitoring boreholes required to provide an adequate baseline assessment as required by Condition 2.8.9.

5.21 Consideration of BAT

The techniques described in 5.2 to 5.20 above are considered to demonstrate that BAT requirements are met for the proposed facility in line with the requirements of the UK technical guidance note s5.01 and the recently published draft IPPC BAT reference document (BREF) on best available techniques for waste incineration.

Further BAT considerations of the proposed installation are detailed below:

- Choice of combustion technology for waste incineration

A number of alternative technologies for waste combustion were assessed as detailed in Section 2.6.1 of the PPC Application. These included: moving grate; fixed hearth; pulsed hearth; rotary and oscillating kilns; fluidised bed and pyrolysis/ gasification. Of these the two most suited and proven for the mixed waste throughput planned for the proposed facility are moving grate and fluidised bed. A quantitative BAT assessment was therefore undertaken to assess these two techniques for the proposed capacity based on data obtained from a range of projects - this is provided in Section 5 of Annex 5 of the PPC application.

The moving grate system has several advantages over fluidised bed and is therefore the preferred technology of Fortum Glasgow Ltd. These advantages are summarised below:

- Similar quantities of bottom ash residue produced by moving grate and fluidised bed but the fluidised bed produces more of the air pollution residue (6000 tpa) which is classed as a hazardous waste;
- Lower annual operating costs due to cost of power, consumption of lime and activated carbon in the abatement equipment, consumption of ammonia is 33% lower than in a fluidised bed and annual cost if disposal;
- Less sensitive to changes in waste composition and delivery into the incineration plant than a fluidised bed where inconsistent fuel feed can cause emission spikes.

SEPA accept that moving grate is consistent with BAT for the proposed installation.

- Choice of steam condenser technology

The following technology types are identified in the UK Technical Guidance Note on waste Incineration s5.01: air-cooled condenser; once-through cooling and evaporative condenser.

Once through cooling and evaporative cooling were both ruled out due to the lack of available water supply other than mains water at the site location which would be required to meet the large demand required. Air-cooled condensers do not require a water supply and do not generate a visible plume. Whilst ACCs can have noise impacts mitigation to be applied at design can ensure these are at an acceptable level, the planned location of site buildings to screen the ACC should also minimise noise emissions. SEPA has experience of ACCs having been used successfully at other locations and accept the technology is consistent with BAT for the proposed installation.

A brief summary of how the proposed design meets each of the requirements of IED Chapter 4 on waste Incineration is provided in Section 2.7 of the PPC Application and summarised in Table 5.21.1 below:

Table 5.21.1 How design meets IED Chapter 4 requirements "Special provisions for waste incineration plants and waste co-incineration plants"

2.8	Requirement	How this is met
42	Scope	Plant falls within Scope of Article 42(1) because it is a waste incineration plant incinerating solid waste, none of the exemptions in Article 42(2) apply. Schedule 1 of the draft permit provides further details of the waste incineration plant.
46	Control of Emissions	
46(1)	Waste gases from waste incineration plants and waste co-incineration plants shall be discharged in a controlled way by means of a stack the height of which is calculated in such a way as to safeguard human health and the environment.	Refer to Section 5.2.2 (iv) of this document.
46(2)	Emissions into air from waste incineration plants and waste co-incineration plants shall not exceed the emission limit values set out in parts 3 and 4 of Annex VI or determined in accordance with Part 4 of that Annex. If in a waste co-incineration plant more than 40 % of the resulting heat release comes from hazardous waste, or the plant co-incinerates untreated mixed municipal waste, the emission limit values set out in Part 3 of Annex VI shall apply.	Refer to Section 5.2.1 of this document. Not applicable – application is for a waste incineration plant, not a waste co-incineration plant.
46(3)	Discharges to the aquatic environment of waste water resulting from the cleaning of waste gases shall be limited as far as practicable and the concentrations of polluting substances shall not exceed the emission limit values set out in Part 5 of Annex VI.	Not applicable – there are no discharges to the aquatic environment from cleaning of waste gases as dry abatement techniques are used. See Section 5.2.6 in this document for further details.
46(4)	The emission limit values shall apply at the point where waste waters from the cleaning of waste gases are discharged from the waste incineration plant or waste co-incineration plant.	
46(5)	Waste incineration plant sites and waste co-incineration plant sites, including associated storage areas for waste, shall be designed and operated in such a way as to prevent the unauthorised and accidental release of any polluting substances into soil, surface water and groundwater. Storage capacity shall be provided for contaminated rainwater run-off from the waste incineration plant site or waste co-incineration plant site or for contaminated water arising from spillage or fire-fighting operations. The storage capacity shall be adequate to ensure that such waters can be tested and treated before discharge where necessary.	See techniques described in Section 5.4 and 5.6 of this document. See techniques described in Section 5.16 of this document.
46(6)	Without prejudice to Article 50(4)(c), the waste incineration plant or waste co-incineration plant or individual furnaces being part of a waste incineration plant or waste co-incineration plant shall under no circumstances continue to incinerate waste for a period of more than 4 hours uninterrupted where emission limit values are exceeded. The cumulative duration of operation in such conditions over 1 year shall not exceed 60 hours. The time limit set out in the second subparagraph shall apply to those furnaces which are linked to one single waste gas cleaning device.	This requirement is implemented by Condition 5.4.2 in the draft permit with further supporting requirements included in Condition 5.4.3 to 5.4.5. See Section 5.2.2 (vi) in this document for further discussion on abnormal operations. This requirement is implemented by Condition 5.4.4 in the draft permit. N/A – single line plant so only a single waste gas cleaning system known as the flue gas abatement system.
47	Breakdown.	

2.8	Requirement	How this is met
	In the case of a breakdown, the operator shall reduce or closedown operations as soon as practicable until normal operations can be restored.	This requirement is implemented via Condition 5.4.1 in the draft permit.
48	Monitoring of emissions	
48(1)	Member States shall ensure that the monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	Implemented by Conditions in Schedule 6 and 7 of the draft permit and prior operating condition 2.8.15.
48(2)	The installation and functioning of the automated measuring systems shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI.	Implemented by Condition 6.2 in Schedule 6 of the draft permit with assurance provided in Section 2.5.1.1 of the PPC application.
48(3)	The competent authority shall determine the location of the sampling or measurement points to be used for monitoring of emissions.	These are specified in Table 6.1 and Table 7.1 and covered by Condition 6.5 and prior operating conditions 2.8.15 (sub-paragraph c).
48(4)	All monitoring results shall be recorded, processed and presented in such a way as to enable the competent authority to verify compliance with the operating conditions and emission limit values which are included in the permit.	Implemented by Condition 6.3 and 6.4 in Schedule 6 of the draft permit with assurance provided in Section 2.5.1.1 of the PPC application.
48(5)	As soon as appropriate measurement techniques are available within the Union, the Commission shall…set the date from which continuous measurements of emissions into the air of heavy metals and dioxins and furans are to be carried out.	This point has not yet been reached but is considered in the draft Waste Incineration BREF and may therefore become relevant at the review of the Permit once this BREF is finalised.
49	Compliance with Emission Limit Values (ELVs) The emission limit values for air and water shall be regarded as being complied with if the conditions described in Part 8 of Annex VI are fulfilled.	This is only relevant for emissions to air as there are no emissions to water associated with treatment of waste gases. The rules for assessing compliance with ELVs for emissions to air are laid out in Schedule 6 of the Permit.
50	Operating Conditions	
50(1)	Waste incineration plants shall be operated in such a way as to achieve a level of incineration such that the total organic carbon content of slag and bottom ashes is less than 3 % or their loss on ignition is less than 5 % of the dry weight of the material. If necessary, waste pre-treatment techniques shall be used.	The plant has been designed to achieve this and this requirement is reflected by Condition 5.1.1 (a) in the draft permit. Testing requirements associated with this are detailed in schedule 8 of the Draft Permit. Prior operating condition 2.8.20 requires submission of a protocol for sampling and testing of residues, this will be used to demonstrate compliance with these limits and allow SEPA to review the proposed methodology in advance.
50(2)	Waste incineration plants shall be designed, equipped, built and operated in such a way that the gas resulting from the incineration of waste is raised, after the last injection of combustion air, in a controlled and homogeneous fashion and even under the most unfavourable conditions, to a temperature of at least 850 °C for at least two seconds. If hazardous waste with a content of more than 1 % of halogenated organic substances, expressed as chlorine, is incinerated or co-incinerated, the temperature required to comply with the first and second subparagraphs shall be at least 1 100 °C. In waste incineration plants, the temperatures set out in the first and third subparagraphs shall be measured near the inner wall of the combustion chamber. The competent authority may authorise the measurements at another representative point of the combustion chamber.	The plant has been designed to achieve this as has been demonstrated in a computational fluid dynamics (CFD) model for a similar plant; a specific CFD model will be provided by the applicant in response to prior operating and prior commissioning condition 2.8.6; condition 2.8.5 requires submission of a methodology by which compliance with the 850°C 2 second residence time requirement will be demonstrated during commissioning. Not applicable – The proposed installation is for the incineration of non-hazardous waste only and waste acceptance procedures should ensure that no hazardous waste is inadvertently accepted for incineration at the Permitted Installation. The location for temperature measurement has not been included in the application as the design is not yet completed. The specific location for temperature measurement will be confirmed in the CFD report required by Condition 2.8.6.
50(3)	Each combustion chamber of a waste incineration plant shall be equipped with at least one auxiliary burner. This burner shall be switched on automatically when the temperature of the combustion gases after the last injection of	Gas-fired low NOx auxiliary burners will be provided to maintain heat above 850°C during operation and during shutdown whilst unburned waste remains on the grate, and during start up to reach the minimum temperature requirements before waste can be

2.8	Requirement	How this is met
	combustion air falls below the temperatures set out in paragraph 2. It shall also be used during plant start-up and shut-down operations in order to ensure that those temperatures are maintained at all times during these operations and as long as unburned waste is in the combustion chamber. The auxiliary burner shall not be fed with fuels which can cause higher emissions than those resulting from the burning of gas oil as defined in Article 2(2) of Council Directive 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels (1) OJ L 121, 11.5.1999, p. 13., liquefied gas or natural gas.	introduced. This is required by Conditions in Schedule 5 of the Permit. The auxiliary burners fuel will be low sulphur fuel oil as described in the PPC Application in Section.2.1.3.3, and they burners will be low NOx type as discussed above. This is considered to be BAT for the installation and meets this requirement of IED.
50(4)	Waste incineration plants and waste co-incineration plants shall operate an automatic system to prevent waste feed in the following situations: (a) at start-up, until the temperature set out in paragraph 2 of this Article or the temperature specified in accordance with Article 51(1) has been reached; (b) whenever the temperature set out in paragraph 2 of this Article or the temperature specified in accordance with Article 51(1) is not maintained; (c) whenever the continuous measurements show that any emission limit value is exceeded due to disturbances or failures of the waste gas cleaning devices.	The PPC Application provides assurance that such automatic systems known as interlocks will be part of the design and this is required by draft Permit Condition 5.3.2. These interlocks are to be tested during commissioning as described in Condition 2.9.4 (c).
50(5)	Any heat generated by waste incineration plants or waste co-incineration plants shall be recovered as far as practicable.	The facility has been designed to achieve the energy recovery targets in SEPAs Thermal Treatment Of Waste Targets as identified in the Permit Application and Condition 2.7 in the draft Permit.
50(6)	Infectious clinical waste shall be placed straight in the furnace, without first being mixed with other categories of waste and without direct handling.	Not applicable – no clinical waste is to be burned at the proposed facility.
50(7)	Member States shall ensure that the waste incineration plant or waste co-incineration plant is operated and controlled by a natural person who is competent to manage the plant.	This has been confirmed – See Section 5.8 for details.
51	Authorisation to change operating conditions	Not applicable – No application made
52	**Delivery and reception of waste**	
52(1)	The operator of the waste incineration plant or waste co-incineration plant shall take all necessary precautions concerning the delivery and reception of waste in order to prevent or to limit as far as practicable the pollution of air, soil, surface water and groundwater as well as other negative effects on the environment, odours and noise, and direct risks to human health.	The proposed measures are described in the PPC application and detailed in conditions in schedule 4 of the draft Permit.
52(2)	The operator shall determine the mass of each type of waste, if possible according to the European Waste List established by Decision 2000/532/EC, prior to accepting the waste at the waste incineration plant or waste co-incineration plant.	Two weighbridges will be installed for this purpose for weighing waste in and empty delivery trucks out. Specific conditions relating to the weighbridge are included in schedule 3 in Condition 3.3.
52(3) to 52(4)	Relate to acceptance of hazardous waste.	Not applicable – the proposed facility will only be permitted to accept non-hazardous in line with the PPC Application.
52(5)	The competent authority may grant exemptions from paragraphs 2, 3 and 4 to waste incineration plants or waste co-incineration plants which are a part of an installation covered by Chapter II and only incinerate or co-incinerate waste generated within that installation.	Not applicable – the facility is a merchant waste incineration plant.
53	Residues	

2.8	Requirement	How this is met
53(1)	Residues shall be minimised in their amount and harmfulness. Residues shall be recycled, where appropriate, directly in the plant or outside.	Conditions in Schedule 8 of the draft permit cover specific requirements for residue management.
53(2)	Transport and intermediate storage of dry residues in the form of dust shall take place in such a way as to prevent dispersal of those residues in the environment.	Intermediate storage of Air Pollution residues will be inside an external enclosed silo which will be emptied by tanker; bottom ash will be handled inside the building and removed from site in covered trucks.
53(3)	Prior to determining the routes for the disposal or recycling of the residues, appropriate tests shall be carried out to establish the physical and chemical characteristics and the polluting potential of the residues. Those tests shall concern the total soluble fraction and heavy metals soluble fraction.	This is covered by Conditions in Schedule 8 of the draft Permit.
54	Substantial change	Not applicable – first application for a permit for a new installation

6 OTHER LEGISLATION CONSIDERED

Nature Conservation (Scotland) Act 2004* & *Conservation (Natural Habitats &c.) Regulations 1994

Is there any possibility that the proposal will have any impact on site designated under the above legislation? Yes

Screening distance(s) used – 15 km

Are there any SSSIs within the area screened? *Yes*

Has SNH been consulted under section 15(5) of the 2004 Act? *Yes*

Date consultation letter sent – 28th August 2018

Summary of response received including date – 17 September 2018

"*Dear Sir/Madam,*
Pollution Prevention and Control (Scotland) Regulations 2012
Pollution Prevention and Control Permit Application
Application by: South Clyde Energy Centre
Site: Land adjacent to 338 Bogmoor Road, North Cardonald, Glasgow, G51 4FE
Activity: Thermal Treatment of Non Hazardous Waste
Many thanks for your consultation received on the 28 August 2018 regarding an application to SEPA for a permit under the Pollution Prevention and Control (Scotland) Regulations 2012 by the South Clyde Energy Centre.
The Fortum Glasgow Ltd, South Clyde Energy Centre, Dispersion Modelling Assessment Report, Fichtner, 29 May 2018 considers the potential impacts on nineteen Sites of Special Scientific Interest (SSSI) within 15km of the proposed installation adjacent to 338 Bogmoor Road. These sites are listed in the below table alongside the notified interests of each site.

The Dispersion Modelling Assessment Report (Section 9.5) states that the APIS website lists coniferous woodland as the most sensitive habitat at Cadder Wilderness SSSI for nitrogen deposition. However, Cadder Wilderness SSSI is in fact notified for lowland mixed broadleaved woodland habitat. The applicant therefore corrects the modelling calculations using the most suitable critical load (10kg/N/ha/yr) for lowland mixed broadleaved woodland and concludes that impacts at all SSSI sites will be insignificant.

Having reviewed the Dispersion Modelling Assessment Report we agree that the levels of emission are of a suitably low level to be of no concern. In our view, the proposal will not adversely affect the notified natural features of the above SSSI's and we are satisfied that these sites do not require further consideration."

SEPA Ecology reviewed the habitat assessment, and confirmed that an investigation of the Critical Levels across each of the designated sites identified above indicated that the background levels for both NOx and SO2 were well below the CLevel for each site and associated habitats.

Modelling results show that the process contribution for atmospheric concentrations of both NOx and SO2 were below the 1% PC. Where the process contribution (PC) > 1% and the predicted environmental concentration (PEC) > 100% of the relevant long-term benchmark (e.g. critical load) then a conclusion of likely significant effect is reached.

While a Process Contribution (PC) of <1% of the Critical Load is assumed to be a non-significant effect, exceedance of the 1% figure does not necessarily imply a significant impact, rather a value above which it is appropriate to undertake a more detailed assessment of effects. The significance of the exceedance depends on factors such as the duration of the impact, the proportional increase over current levels and the sensitivity of the habitats affected.

It is SEPA's view that the proposal will not have a likely significant effect on the designated sites within the screening distance (listed above). No further assessment is required.

Are there any SPA or SAC designated areas within the area screened? ***yes***

Have you carried out an appropriate assessment? ***No***

SEPA Ecology reviewed the habitat assessment, and confirmed that an investigation of the Critical Levels across each of the designated sites identified above indicated that the background levels for both NOx and SO2 were well below the CLevel for each site and associated habitats.

Modelling results show that the process contribution for atmospheric concentrations of both NOx and SO2 were below the 1% PC. Where the process contribution (PC) > 1% and the predicted environmental concentration (PEC) > 100% of the relevant long-term benchmark (e.g. critical load) then a conclusion of likely significant effect is reached.

While a Process Contribution (PC) of <1% of the Critical Load is assumed to be a non-significant effect, exceedance of the 1% figure does not necessarily imply a significant impact, rather a value above which it is appropriate to undertake a more detailed assessment of effects. The significance of the exceedance depends on factors such as the duration of the impact, the proportional increase over current levels and the sensitivity of the habitats affected.
It is SEPA's view that the proposal will not have a likely significant effect on the designated sites within the screening distance (listed above). No further assessment is required.

Summary of responses received from SNH including date - Designated Site
Notified features

Inner Clyde Site of Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), Ramsar
Redshank (Tringa tetanus), non-breeding
Cormorant (Phalacrocorax carbo), non-breeding
Eider (Somateria mollissima), non-breeding
Goldeneye (Bucephala clangula), non-breeding
Oystercatcher (Haematopus ostralegus), non breeding
Red-breasted merganser (Mergus serrator), non-breeding
Red-throated diver (Gavia stellata), non-breeding
Saltmarsh

Black Cart Water SSSI, SPA
Whooper swan (Cygnus Cygnus), non breeding

Other legislation?
None

7 ENVIRONMENTAL IMPACT ASSESSMENT AND COMAH

How has any relevant information obtained or conclusion arrived at pursuant to Articles 5, 6 and 7 of Council Directive 85/337/EEC on the assessment of the effects certain public and private projects on the environment been taken into account? N/A

How has any information contained within a safety report within the meaning of Regulation 7 (safety report) of the Control of Major Accident Hazards Regulations 1999 been taken into account? N/A

8 DETAILS OF PERMIT

Do you propose placing any non-standard conditions in the Permit? Yes

The following changes were made to the Standard waste incineration permit template IED-T-14 downloaded from Q-Pulse on 6 November 2017.

Condition number	Justification
Interpretation of Terms SEPA Odour Guidance- means the guidance entitled "SEPA Odour Guidance 2010" or any revision of that guidance as subsequently published on SEPA's website at **www.sepa.org.uk**. Waste reception area - means the building containing the tipping hall and the waste bunker.	To explain where the guidance is from due to it being mentioned in prior operating condition 2.8.18. To explain the term which is used throughout Permit
Schedule 1	None.
Schedule 2	

2.6.7 For climate change agreement sites – deleted.	Not a climate change agreement site as confirmed in response to application form B question B2.8.3.
2.8 The following prior operating conditions: 2.8.1 Requirement for a construction and commission plan by 3 months after date of issue of permit.	Based on legally approved conditions 3.11.15 and 3.11.16 respectively from the Viridor Waste Management Dunbar Energy Recovery (ERF) PPC Permit PPC/A/1032878 to allow progress to be tracked.
2.8.2 Requirement for quarterly updates of the construction and commissioning plan required by Condition 2.8.1.	As above.
2.8.3 is renumbered 2.8.1 from standard template IED-T-14	
2.8.4 is renumbered 2.8.2 from IED-T-14	
2.8.5 is renumbered standard Prior operating condition (POC) 2.8.3 in IED-T-14.	
2.8.6 At least 12 months prior to Commissioning, the Operator shall submit a written report to SEPA on the details of the computational fluid dynamic (CFD) modelling. The report shall demonstrate the following: (a) that the design combustion conditions comply with the temperature and residence time requirements as defined in Condition 5.1.1 (d) and Condition 5.1.1 (e) respectively; (b) the optimum positional requirements for the location of the secondary air injection system; (c) the minimum oxygen level required to ensure adequate combustion; (d) the optimum positional requirements for the location of the urea SNCR injection system; and, (e) identify the optimum position of the temperature sensor in the secondary combustion chamber (f) the optimal flue gas flow through the flue gas cleaning system.	Condition required because CFD modelling provided for an example plant, Berlin Ruhrleben WTE plant Facility as this and the SCEC will have quadruple vortex systems is given in Annex 8 of the permit application, pending completion of final design. Whilst this indicated that the proposed plant which is based on a similar design should be capable of achieving the requirements of Article 50(2) of the Industrial Emissions Directive, sub-paragraph (a) is required to demonstrate the waste incineration plant will meet these requirements based

	on the actual plant design once finalised. Sub-paragraphs (b) to (d) should demonstrate that the design will achieve optimal combustion. The wording used for 2.8.5 (a) to (d) and f)(is based on legally approved prior operating condition 3.11.2 in the Viridor Waste Management Permit for Dunbar ERF and 2.8.5 is renumbered standard Prior operating condition (POC) 2.8.3 in IED-T-14. Additional sub-paragraph (e) has been inserted as the monitoring position for the secondary chamber has not yet been identified
2.8.8 No later than 12 months prior to commencement of Commissioning of the Incineration plant, the Operator shall provide SEPA with an updated site condition report detailing the relevant hazardous substances used, produced and released on site and an udated conceptual site model in line with IED-TG02. The report should include a design and construction timetable for the additional soil and groundwater monitoring boreholes required to provide an adequate baseline assessment as required by Condition 2.8.9.	New condition 2.8.8 is an amendment of standard IED-T-14 template POC conditions 2.8.5. incorporated at the recommendation of SEPA's Contaminated Land Team to address the lack of information in the site baseline report and inform the report required in Condition 2.8.9
2.8.9 At least 4 months prior to Commissioning, the Operator shall submit in writing to SEPA an updated site condition and baseline report which describes the condition of the site after completion of the final design of the Permitted Installation and any remediation required under Planning Conditions. Said report shall meet the requirements of SEPA Site and Baseline Report Guidance (IED TG02)	Condition modified from POC 3.11.12 in the Viridor Dunbar ERF PPC permit. As used in Earls Gate Energy Centre permit PPC/A/1157446 number 2.8.7 The proposed facility will be located on a brownfield site

	formerly used for manufacture of chemicals which will require further intrusive site investigation and possible remediation prior to construction starting as a condition of the Planning Permission, this means that the condition of the site may change from that presented in Annex 2 of the Permit Application. Furthermore: a) The report format submitted with the PPC Application did not meet the requirements of SEPA Guidance Note TG02 (See Section 5.2 and Annex 3 of this Decision Document for further details); b) Final design is not yet complete including the site drainage plan, so it is not possible to determine the positon of all possible emission points until then; and, c) The data on hazardous substances presented in the Permit Application did not identify all potential hazardous or

	other substances with potential to cause pollution which might be present. For the reasons above the site condition and baseline report needs to be updated and further intrusive investigation is required following any remediation and prior to commissioning of the installation to ensure that baseline conditions are accurately recorded. POC 2.8.9 has therefore been drafted to require the updated site condition and baseline report. The requirement to undertake soil and groundwater monitoring to inform the baseline condition is implicit in this requirement. The requirements of this condition take into account comments from the SEPA Contaminated Land Specialist who reviewed the Initial Site Report in Annex 2 of the Permit application and subsequent additional information provided in response to the Schedule 4 Notice.

2.8.10 No later than 6 months prior to Commissioning, the Operator shall submit to SEPA a copy of the plan or plans that identify the configuration, specification and the position of all drains, subsurface pipework, subsurface sumps and storage vessels within the Site as required by Condition 7.2.6. The report should also confirm the arrangements for and location of discharge to Scottish water sewer, including the consent number and grid reference of discharge point W1 and confirm the arrangements for and location of discharge to surface water sewer including grid reference of discharge point S1 and ultimate destination of discharge to the water environment No later than 6 months prior to Commissioning , the Operator shall submit to SEPA a copy of the plan or plans that identify the configuration, specification and the position of all drains, subsurface pipework, subsurface sumps and storage vessels within the Site as required by Condition 7.5.6.	This is an amended Condition 2.2.8 from Earls gate Energy Permit PPC/A/1157446 and requirement for a detailed site drainage plan together with additional plans as necessary to provide details of the specification of the drains and any subsurface pipes, sump or storage. This was not provided in the PPC application because final design of the drainage system and specifications are not yet compete. The information has been requested 6 months prior to Commissioning to tie in with the timescales for both the detailed design of the firewater containment system and the requirements for an updated baseline report both of which should be informed by the final design of these systems. In addition, information is required to confirm the location and discharge consent for the discharge to SW sewer and surface water sewer and ultimate discharge to the water environment as this had not been finalised at the time of application.
2.8.10 No later than 6 months prior to commencement of commissioning of the Permitted Installation, the Operator shall submit a report to SEPA confirming how compliance with Article 46(5) of IED will be achieved with respect to the management of contaminated water from fire-fighting following completion of final design. The report shall include but not be limited to the following: (a) Details of the arrangements for the storage of contaminated water from fire-fighting;	Based on the legally approved POC 3.11.5 in the Viridor Dunbar ERF PPC permit. This is required because whilst the overall

(b) Plans to show the location, size and integrity of containment facilities; (c) Calculations to confirm the storage capacity is adequate to ensure that there will be no emissions to the Water Environment (i.e. groundwater or surface water) by any means, including but not limited to over-topping or seepage through the containment walls. The calculations should take into account, but not be limited to: fire-fighting arrangements on site, number of appliances likely to attend a fire, duration (including time for subsequent sampling prior to disposal) and storm events to provide a conservative estimate of the volume which may require to be contained, and; (d) Copies of procedure(s) for routine management of containment facilities to ensure adequate capacity is always available in event of a fire.	philosophy for firewater containment looks reasonable, the design has not been finalised. Of particular importance are the calculations required by (c) because the detailed assumptions were not included; similarly the procedures required by (d) have not yet been developed. Paragraph (c) has also been updated to include requirement for details of integrity of the containment facilities to be provided to CIRIA C736.

2.8.12 At least 6 months prior to Commissioning, the Operator shall provide SEPA with a report confirming the proposed design of containment provisions for all bulk storages and storage areas including for solid raw materials and residues and the bulk storage of ammonia solution, gas oil and the associated offloading/loading areas. The purpose of said report shall be to describe how the design of the storages and associated bunding etc. will prevent emissions to the water environment, for example, due to tank overfill, other leak or spillage during routine storage or offloading/ loading activities.	Based on legally approved POC 3.11.17 in the Viridor Dunbar ERF. This is required to ensure final design details can be checked by SEPA.
2.8.13 No later than 6 months prior to Commissioning, the Operator shall submit in writing to SEPA detailed plans, drawings, technical details and calculations of the surface water drainage system. Such plans and details should include details of the Hydro downstream defenders, the construction, design and capacity calculations of the surface water detention basin, hyrobrake and its operation and all associated pipework.	Based on legally approved POC 2.8.11 from the Earls Gate Energy Centre permit Ref. PPC/A/1157446). This has been used because an effluent attenuation tank was proposed for the EGEC facility but details design was not available at the time of application. Similarly the design details for the surface water detention basin and hydrobrake system were not available at the time of application and are important factors in ensuring there is no pollution to the water environment

2.8.14 No later than 6 months prior to commissioning, the Operator shall submit a report in writing containing the detailed design of the water system on site. The report shall include water balances, quantified estimates of potable water use, condensate returns, waste water re-used, process water discharge and potable water discharge. In order to minimise use of natural resources, the Operator shall review the proposed design to identify and assess options to minimise the projected mains water consumption requirements of the Permitted Installation and associated effluent arisings.	New condition 2.3.14 has been added because no information on water use was provided in the application although there was mention of use of condensate so it has not been possible to determine use of BAT. As the plant has not been fully designed yet there may be opportunities to maximise efficiencies in water use and re-use for example many permitted waste incineration plants in Scotland many of which undertake rainwater harvesting and have minimal effluent flows due to the use of dry or semi-dry abatement techniques and air cooled condensing Given that the application is for a brand new EfW plant for which final design is not yet complete, but which can be expected to have an operating life of 25-30 years, it is considered important to raise water consumption as an issue early on; promoting the need to use natural resources more sustainably is also consistent with SEPA's One Planet Prosperity Philosophy and our culture shift towards achieving 'Beyond Compliance' status at SEPA regulated sites.

2.8.15 At least 6 months prior to the first operation of the Permitted Installation, the Operator shall submit a written report to SEPA specifying arrangements for continuous and periodic monitoring of emissions to air to comply with all relevant standards/ guidance, including but not limited to: BS EN 15267-3; BS EN 15259; BS EN 14181; BS EN 13284; DD CEN 15675 and Environment Agency Technical Guidance Notes M1 and M2. The report shall include the following: (a) Plant and equipment details including relevant accreditation; (b) Methods and standards for sampling and analysis of all substances and parameters identified in Table 6.2 and Table 6.3 in Schedule 6 of the Permit, and Table 7.2 in Schedule 7; and, (c) Detailed diagrams of monitoring locations and access for each emission point in order to satisfy the requirements of BS EN 15259.	This legally approved POC 2.8.13. in Earls gate Energy Centre Permit PPC/A/1157446 and included to require that IED requirements for monitoring will be met when the plant is operational requirements
2.8.16 At least 3 months prior to Commissioning, the Operator shall submit to SEPA the waste acceptance procedures and associated inspection schedule to be applied at the Permitted Installation to ensure compliance with the conditions of the Permit. Said procedures and inspection schedule shall be agreed in writing with SEPA.	This is legally approved POC 2.8.16 in the Earls gate Energy Centre Permit PPC/A/1157446 Permit to ensure the proposed waste acceptance procedures and associated inspections are appropriate to achieve compliance with conditions in schedule 4 of the Permit and specifically conditions in 4.1 of Schedule 4.

2.8.17 No later than 6 weeks prior to commissioning, the operator shall report the results of the first set of results of environmental monitoring as required by Condition 9.1.2.	From legally approved POC 2.8.4 in IED-T-14 renumbered 2.8.17.
2.8.18 At least 12 months prior to the Commissioning of the Permitted Installation, the Operator shall submit a written report to SEPA specifying the final design of the Odour Abatement System for providing abatement of odour emissions from the tipping hall and waste bunker during periods of planned and unplanned shutdowns of the incineration line in order to achieve ground level odour below a target of 1.5 OU_E/m^3 as the 98th percentile of hourly averages from the Permitted Installation. Said report shall confirm the following: (a) the Flow rate of the air extraction system used for the odour abatement system and the number of air changes per hour taking account of SEPA guidance on the minimum number of air changes per hour; (b) the Emission point height and grid reference if different from that in Table 6.1 of the Permit; (c) the number of odour units per cubic metre the odour abatement system is designed to treat and an explanation as to how this figure has been calculated; and, (d) the monitoring and maintenance regime to be applied to ensure that the condition of the carbon in the odour abatement system is maintained at an appropriate efficiency to achieve the 1.5 OU_E/m^3 target ground level concentration of odour originating from the Permitted Installation (NB Monitoring of odour emissions from the odour abatement system stack (Emission Point A7) should be undertaken as specified in Table 6.2 in Schedule 6 to confirm that the 1.5 OUE/m3 significance criterion is being achieved).	Condition is based on legally approved Condition 2.8.18 of Earls Gate Energy Centre Permit PPC/A/1157446 Condition required to ensure the final design details of the Odour Abatement Plant (OAP) used for abatement of odours during planned and unplanned shutdown is confirmed well in advance of commissioning. This is to enable time for further discussion if necessary. Control of odour is one of the key potential environmental impacts of the installation 1.5 OU_E/m^3 as the 98th percentile of hourly averages from the Permitted Installation is the indicative criterion for offensive odour from putrescible waste in Table 2 of the SEPA Odour Guidance.
2.8.19 No later than 12 months from the date of issue of the Permit, the Operator shall submit a written report to SEPA to confirm the design of the Selective Non-Catalytic Reduction (SNCR) system for NOx abatement using ammonia solution.	The initial part of this condition is taken from legally approved condition 2.8.18 of Earls Gate Energy Centre Permit PPC/A/1157446. The detailed design of the SNCR had not been completed at the time of application but the use of SNCR using ammonia solution does satisfy BAT criteria.

2.8.20 No later than 3 months prior to Commissioning, the Operator shall submit in writing to SEPA for approval a protocol for the sampling and testing of residues for the purposes of assessing their hazard status and for achieving compliance with the monitoring requirements specified in Table 8.1 in Schedule 8.	Taken directly from legally approved POC 2.8.19 in the Earls gate Energy Centre Permit PPC/A/1157446. To ensure appropriate methods are in place prior to commencement of Commissioning.
2.8.21 No later than 6 months prior to Commissioning, the Operator shall submit details of the equipment and plant selected. This shall include a drawing and technical description of: (a) the layout of the inside of the main site buildings including waste reception area, incinerator and energy recovery; steam turbine and generator; flue gas cleaning equipment and control room; (b) the waste infeed system to the incinerator; (c) the incinerator grate and first and second pass showing the location of all air supply systems; support burners; instrumentation and urea injection. (d) the bottom ash transport, cooling and storage system and associated collection (e) the heat recovery and steam turbine energy generation systems including provisions for take-off of heat energy and waste heat removal and associated cooling systems; (f) the flue gas cleaning system with an explanation for the choice and location of dosing points; optimum injection rate and temperature ranges; the filtration system; transport and storage system; and,	Taken from legally approved POC 18.3.4 in LREL Permit and POC 2.8.6 in the Viridor Glasgow Recycling and Renewable Energy Centre (GRREC) at Polmadie in Glasgow Permit No. PPC/A/1110002 This is required to confirm details of the actual design on completion of the design process.

2.8.22 At least 6 months prior to Commissioning, the Operator shall provide SEPA with a report to confirm the techniques to be used for the control of emissions of noise and vibration from the Permitted Installation during normal, abnormal and emergency conditions. Said report shall explain how BAT has been applied to prevent or reduce noise from individual noise sources, and should include, but not be limited to, consideration of the following: (a) Procedures and operational controls for management of start-up noise including scheduling of start up to ensure day time operation; (b) Techniques for abatement of noise from normal and emergency relief valves e.g. high-pressure silencers to mitigate noise from emergency relief valves; (c) Noise abatement techniques for externally located equipment, e.g. the air-cooled condensers and flue gas treatment plant fans; (d) Techniques to prevent noise from vehicle reversing alarms e.g. use of one way drive through systems inside and outside Incinerator building, alternatives to tonal intermittent bleeping. These should be compliant with SEPA's guidance at http://www.sepa.org.uk/air/process_industry_regulation/pollution_prevention__control/sepa_guidance.aspx; (e) Siting of noise sources e.g. air-cooled condensers, pressure relief valves and reception hall entrance away from Noise Sensitive Receptors; (f) The level of noise insulation to be provided by the fabric of the main building including at ingress/egress points; (g) Basic good practice measures including noise insulation and maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise; (h) Any other noise control techniques necessary to ensure that the noise from the installation does not give rise to reasonable cause for annoyance and (i) how the turbine hall will be constructed with sufficient mass (or other technique) to ensure emissions of low frequency noise from the turbine / generator set are minimised.	Based on legally approved POC 3.11.7 in the Viridor Dunbar ERF permit. Required to ensure that design changes prior to construction consider noise emission reduction and that the BAT assessment is updated accordingly. (i) Was added on the recommnedation of the SEPA Noise Specialist to address issues that had been found at other EFW plants
Condition 2.9 Commissioning Conditions: 2.9.4 The following non-standard conditions inserted after standard conditions a) to e) from IED-T-14: : h) confirm the selected monitoring locations in Table 6.1 and Table 10.1 meet the stack flow criteria requirements and the homogeneity requirements specified in sections 6.2 and 8.3 respectively of BS EN 15259; i) To optimise the combustion settings and the operation of the NOx abatement system to minimise oxides of nitrogen (NOx) emissions and ammonia within the Emission Limit Values described in Table 6.2 of Schedule 6 of this Permit. The tests should include an assessment of the NOx, ammonia and N_2O emissions under optimum operating conditions. j) Carry out a performance test at full load to determine the gross electrical efficiency and/ or the gross heat efficiency as detailed in Footnote 1 of Bat 3 in Chapter 5 of the Draft Waste Incineration BREF.).	These are taken from legally approved condition 2.9.4 of Earls gate Energy Centre permit PPC/A/1157446 Recommended for inclusion by the SEPA Senior Specialist Scientist (Emissions to Air) to confirm the monitoring locations comply with the requirements of BS EN 15259 in practice. Recommended for inclusion by the Applicant in Section 2.12.3 of Supporting Information in the Permit Application. Included to ensure that NOx, ammonia and N_2O emissions are optimised at the outset in line with

	BAT. NB - The BAT-AEL range for NOx in the current draft Waste Incineration BREF is below the level of the NOx ELVs specified in Table 6.2 which implement the requirements of Chapter IV and Annex VI of IED. This is a new plant although it will be an existing installation under IED because the Permit is likely to be issued prior to the waste Incineration BREF. This condition has been inserted for future-proofing.
Schedule 3	
3.1 Noise and Vibration 3.1.4 Notwithstanding the requirements of Condition 3.1.1, within 3 months of cessation of commissioning, the Operator shall complete and submit an acoustic survey designed to confirm the acoustic attenuation performance of the operational buildings and validate predictions contained within the pre-construction noise submissions. 3.1.5 The acoustic survey required by Condition 3.1.4 shall be carried out to a recognised British Standard methodology and the survey report shall include an assessment comparing the survey findings with the original application noise assessment.	Legally approved conditions 3.1.4 and 3.1.4.1 in the GRREC permit PPC/A/1110002. They have been included because the noise specialist has raised concerns that basing noise emissions on a model should be backed up with assessment to ensure the modelled emissions are correct as noise from turbine halls at EFW plant has proved problematic on some sites.
3.2 Odour Conditions 3.2.6 All doors and openings to the tipping hall and areas where odour is likely to be generated shall be kept closed at all times other than to allow entry and exit of vehicles and personnel.	Legally approved Conditions 3.2.6 to 3.2.11 from Earls Gate Energy Centre permit PPC/A/1157446, based on similar legally approved

3.2.7 The Odour Abatement System shall be operational during any period of planned or unplanned shutdown of the incineration line until such time as all RDF has been removed from the site and there is no odour present inside the Waste Reception Area. 3.2.8 The Operator shall notify SEPA in writing of each occasion when the Odour Abatement System is required to be operational due to the circumstances described by Condition 3.2.7. 3.2.9 The effectiveness of the air extraction system in minimising fugitive odours from the Waste Bunker Area shall be assessed by smoke testing by a methodology and at a frequency to be agreed by SEPA in writing and the outcomes from that assessment reported. The methodology shall cover the following two situations: (a) when the incineration line is online and the forced draft fan is extracting air from the tipping hall and waste bunker for combustion in the incineration process; and, (b) when the incineration line is off-line and the air from the tipping hall and waste bunker is being collected by the air extraction system for abatement in the Odour Abatement System. 3.2.10 At least one month prior to first acceptance of waste at the facility, the first smoke test for the incineration line online and offline scenarios shall be completed and the results reported. 3.2.11 At least one month prior to carrying out the first smoke tests, the methodology for smoke testing referred to in condition 3.2.8 shall be submitted for agreement.	condition in FCC Millerhill Permit PPC/A/1136072 and variation of similar used elsewhere. Seen as good practice in minimising odour breakout from the building. New condition to confirm when operation of the OAS is required. Inserted so SEPA are aware of occasions when the OAS is operating. These and subsequent conditions cover requirements for smoke tests to demonstrate negative pressure inside buildings etc. This is important to minimise odour emissions due to the urban location of the proposed facility. Approved condition updated to require tests for both the incinerator “on” and incinerator “off” situations. It is possible the incinerator “on” situation is only required infrequently due to the significantly higher air extraction rate from the Waste Bunker Area when the incineration line is operational.

3.3 Weighbridge 3.3.1 and 3.3.2 Optional Weighbridge conditions from IED-T-14 inserted	Considered good practice and consistent with other recently issued EfW PPC permits e.g. Millerhill PPC/A/113072 and Levenseat PPC/A/1150156.
3.6 Environmental Management and Maintenance Systems 3.6.1 Within 6 months of submission of the final commissioning report required by condition 2.9.7, the Operator shall define, record and implement such operational management and maintenance systems as are necessary for compliance with the Conditions of this Permit. The systems shall be subject to documented review at intervals of not more than 4 years. 3.6.2 All plant, instrumentation and buildings used in carrying on the Permitted Activities shall be properly maintained and the maintenance recorded. 3.6.3 The systems required by Condition 3.6.1 shall include details showing how the maintenance required, whether under a scheme of planned maintenance or consequent to a breakdown, is to be organised to ensure that emissions of potentially polluting substances are prevented or, where that is not practicable, minimised.	Legally approved Conditions 3.6.1, 3.6.2 and 3.6.3 from Earls Gate Energy Centre Permit PPC/A/1157446 Based on same set of conditions as used in the permit for Dunbar ERF and considered consistent with BAT for operation and maintenance. The high reliability levels experienced with Moving Grate incineration plant in general means there is potential to operate for long periods with little downtime. The conditions relating to maintenance are inserted to ensure that this is not at the expense of keeping the plant in good working order as this could lead to increased emissions of polluting substances.
Schedule 4 4.2.2 Standard condition specifies annual aggregated amount of waste which may be incinerated and hourly rate of waste feed. 4.2.3 The Operator shall record the monthly total quantity of all wastes incinerated in the Permitted Installation, and the monthly quantities of each waste specified in Table 4.1 that is incinerated in the Permitted Installation.	Figures taken from application Slight change to wording so reads better – consistent with legally approved

	condition in Viridor Permit No. PPC/A/1032878 CP01.
Optional conditions 4.4 (Pre-treatment/ Materials Recycling facilities); 4.6 (Co-incineration/Incineration of Hazardous Waste); 4.7 (Co-incineration/Incineration of Clinical Waste) or 4.8 (Co-incineration/Incineration of Animal carcasses) were not required as they are not relevant to the activities of the proposed installation.	Self-explanatory.
Condition 4.5 from IED-T-14 was renumbered as 4.4 in this Permit. The following additional changes were made: Condition 4.4.6 All storage areas and associated internal and external infrastructure: walkways, floors, railings, doors, walls, ductwork, equipment etc. shall be subject to planned cleaning according to a Hygiene Plan prepared, recorded and implemented at the Permitted Installation.	This is an adaption of 4.5.6 in IED-T-14 which has been copied from the legally approved condition 4.4.6 in the Earls gate Energy centre permit PPC/A/1157446 and FCC Millerhill Permit No. PPC/A/1136072, the wording is considered an improvement on the text in IED-T-14 as it gives flexibility to devise a site specific plan. Cleaning is considered important to minimise risks due to odour, vermin and fire.
Schedule 5 Condition 5.1.1 b) Standard minimum oxygen concentration of 6% v/v as a dry gas is deleted and replaced with "b) an oxygen concentration of not less than the concentration defined in the report required by Condition 2.8.6".	The minimum oxygen concentration was historically set at 6% v/v as a dry gas in the hazardous waste incineration directive but this has since been superseded firstly by the waste incineration and more recently by Chapter IV of the Industrial Emissions Directive which non longer specifies a minimum oxygen level required for combustion. Therefore the

	minimum oxygen level for the proposed facility will be confirmed as part of the computational fluid dynamic modelling to be undertaken as part of a prior operating and commissioning condition 2.8.6.
Schedule 6	None required.
Schedule 7	None required
Schedule 8	None required.
Schedule 9	None required.

9 EMISSION LIMIT VALUES OR EQUIVALENT TECHNICAL PARAMETERS/ MEASURES

Are you are dealing with either a permit application, or a permit variation which would involve a review of existing ELVs or equivalent technical parameters? Yes

Emission limit values Air

Substance: For continuously measured parameters monitored by the Continuous Emission Monitoring Systems and parameters which are monitored through periodic measurement such as dioxins and furans and hydrogen fluoride the limits are taken directly from the requirements of the IED and are mandatory and standard for incinerators. An additional ELV has been set for ammonia for both continuous and periodic monitoring. Whilst none is specified in Annex VI of IED, this is considered necessary to control ammonia slip associated with the SNCR NOx abatement system. See Section 5.2.1 for further discussion.

In the case of periodic measurements for parameters, emission limits have been set based the requirements of the IED. Where additional confirmatory periodic monitoring of parameters measured continuously such as oxides of nitrogen has been required then limits are set based on the half hourly 100th percentile limit as this most closely approximates the conditions under periodic measurement where the sample times are around 30 minutes.

Annual NOx
It was identified that the an emission meeting the current Bref annual average ELV of 200mg/m3 would mean that annual NOx would not screen out as insignificant within the Glasgow AQMA. The applicant had highlighted this in the report and identified that an annual NOx limit of 165mg/m^3 would result in the NOx emission screening out as insignificant in the AQMA. On further discussion with the applicant it was identified that the SNCR being fitted would meet an annual average for NOx of 150mg/m3 which is the NOX annual average ELV that is in the draft Bref for existing plant. The applicant therefore sent in an addendum with the revised figures demonstrating that an ELV of 150mg/m3 would result in the

emission screening out for NOx in the AQMA. An annual ELV of 150mg/m3 has therefore been included in the permit.

Emissions of smoke are not anticipated from the technology and abatement selected but as a precaution a limit based on the Ringelmann scale has been incorporated into Table 6.2. Ringelmann shade 1 is the lightest shade limit in the scale (zero being no visible smoke impact) and is applied during start-up when smoke emission is most likely.

Visible plume is anticipated from the facility incinerator discharges and limits have been incorporated to require that no persistent mist or fume be discharged. NB it is understood that under some weather conditions there will be a continuously present but short condensation plume from the incinerator as this is inevitable for combustion emissions.

Relevant emission benchmarks: For incineration emissions - IED Annex VI, Part 3

ELV: as set out in permit Table 6.2

Emission point: A1

***Rationale*:** As above

Details of any equivalent technical parameters adopted to supplement or replace ELVs:
Emissions of smoke are not anticipated from the technology and abatement selected but as a precaution a limit based on the Ringelmann scale has been incorporated into Table 6.2. Ringelmann shade 1 is the lightest shade limit in the scale (zero being no visible smoke impact) and is applied during start-up when smoke emission is most likely.
Visible plume is anticipated from the facility incinerator discharges and limits have been incorporated to require that no persistent mist or fume be discharged. NB it is understood that under certain weather conditions there will be a continuously present but short condensation plume from the incinerator. This is inevitable for all combustion emissions

Details of any derogations from the ELVs set out in the BAT conclusions; None

Has an Annex been inserted to the permit containing reasons, assessment and justifications for setting the value: N/A

Details of any temporary derogation for the use of emerging techniques. NB Such temporary derogations do not require PPD consultation or the insertion of reasons etc. into the permit N/A

Substance: Odour

Relevant emission benchmarks: 1,000 OUE/m3

ELV: as set out in permit Table 6.2

Emission point: A2

Rationale: To ensure that odour emissions from the Waste Reception Area are sufficiently controlled so that there is no emission of odour above the threshold of 1.5 OUE/m3 outside the boundary of the Permitted Installation. See Section 5.7 for further comment and discussion.

Emission limit values Water

Substance: N/A

Relevant emission benchmarks: N/A

ELV: N/A

Emission point: N/A

Rationale: No direct emissions to the Water Environment

Details of any equivalent technical parameters adopted to supplement or replace ELVs:
Controlled Activities Regulations(as amended) 2011 GBR 10 and11 for discharge to surface water sewer
Scottish Water Trade Effluent Consent for process and domestic effluent discharge to Scottish Water Sewer

Details of any derogations from the ELVs set out in the BAT conclusions;

Has an Annex been inserted to the permit containing reasons, assessment and justifications for setting the value NO

Details of any temporary derogation for the use of emerging techniques. NB Such temporary derogations do not require PPD consultation or the insertion of reasons etc. into the permit

Emission limit values Land

Substance: N/A

ELV: N/A

Emission point: N/A

Rationale: N/A

Details of any equivalent technical parameters adopted to supplement or replace ELVs:

Details of any derogations from the ELVs set out in the BAT conclusions;

Has an Annex been inserted to the permit containing reasons, assessment and justifications for setting the value [YES/NO]

Details of any temporary derogation for the use of emerging techniques. NB Such temporary derogations do not require PPD consultation or the insertion of reasons etc. into the permit

Emission limit values Noise and Vibration

Substance: N/A

ELV: N/A

Emission point: N/A

Rationale: N/A

Details of any equivalent technical parameters adopted to supplement or replace ELVs: No emission limit values necessary other than meeting BS4142 for neighbourhood noise. Noise and vibration monitoring plans to be submitted every 4 years
Details of any derogations from the ELVs set out in the BAT conclusions; N/A
Has an Annex been inserted to the permit containing reasons, assessment and justifications for setting the value N/A
Details of any temporary derogation for the use of emerging techniques. NB Such temporary derogations do not require PPD consultation or the insertion of reasons etc. into the permit N/A

10 FINAL DETERMINATION

Issue a Permit – Based on the information available at the time of the determination SEPA is satisfied that

- The applicant will be the person who will have control over the operation of the installation/mobile plant,
- The applicant will ensure that the installation/mobile plant is operated so as to comply with the conditions of the Permit,
- The applicant is a fit and proper person (specified waste management activities only),
- Planning permission for the activity is in force (specified waste management activities only),
- That the operator is in a position to use all appropriate preventative measures against pollution, in particular through the application of best available techniques.
- That no significant pollution should be caused.

11 REFERENCES AND GUIDANCE

The Pollution Prevention and Control (Scotland) Regulations 2012, known as 'PPC2012'.

SEPA's Thermal Treatment of Waste Guidelines 2014.

SEPA Odour Guidance, Version 1, January 2010.

UK technical Guidance note s5.01, Guidance for the incineration of Waste and Fuel Manufactured from or Including Waste, July 2004.

UK Technical horizontal guidance note H1 Environmental Assessment and Appraisal of BAT, known as 'UK guidance note H1', 2003.

Air Emissions Risk Assessment for your Environmental Permit, GOV.UK web-site, 2 August 2016.

Draft BAT reference document (BREF) D1 WI BREF on Best Available Techniques for Waste Incineration, known as 'The Waste Incineration BREF', May 2017.

'Releases from municipal waste incinerators - Guidance To Applicants On Impact Assessment For Group 3 Metals' – Environment Agency, September 2012- version 3.

Environment Agency Monitoring Technical Guidance Note M2, August 2017.