NESS EFW Limited (SC627853)
NESS EfW Facility

Permit Application

PPC/A/1186430

Application Determination Impact - SEPA Cyber-Attack / COVID

On 24 December 2020, SEPA was subject to a serious and complex cyber-attack, displaying significant stealth and malicious sophistication, which significantly impacted our organisation, our staff, our public and private partners, and the communities who rely on our services. Since the attack, we have worked with Scottish Government, Police Scotland, the National Cyber Security Centre (NCSC) and the Scottish Business Resilience Centre (SBRC), to a clear recovery strategy. Further information on the cyber-attack, its impact and SEPAs recovery can be found at our website SEPA: CYBER-ATTACK

The loss of data included information relating to this application and the recording of the decisions taken with respect to its determination. SEPA has made significant efforts to recover the information lost, re-evaluate, and re-record the determination undertaken, at the same time as assessing the further information provided by the applicant as required by SEPA. Where an area of the determination has been impacted by the cyber-attack this has been clearly highlighted.

In addition, it has not been possible for SEPA to carry out its normal registry functions since the cyber-attack meaning that the application documents (submitted on 7 October 2019) and the information provided in response to Notice requiring further information (issued by SEPA 25 November 2020) are not available via SEPAs website. This has been further hampered by COVID and the associated difficulty in maintain offices open. In light of SEPA being unable to provide these documents as it normally would we requested that the applicant host them to allow public access. The applicant agreed and made the documents that would normally be accessible via the SEPA public register available on the Ness Energy Project Website. https://www.aberdeencity.gov.uk/ness-energy-project/sepa-permit-application

It is SEPAs opinion that while the cyber-attack significantly impacted on the determination process and level of rework required it has not impacted on the of the quality of the determination or the conclusions reached.

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1 NON TECHNICAL SUMMARY OF DETERMINATION

The proposed EFW NESS Limited (SC627853), NESS EFW Facility is an Energy from Waste (EFW) plant designed to incinerate and recover the energy from non-hazardous, source segregated, municipal solid waste (MSW) and commercial and industrial (C&I) waste streams of a similar nature. The facility is designed to have a throughput capacity of 150,000 tonnes of waste per year and design thermal capacity of 49.1MW based on 8000 operating hours per year.

All waste delivered to site will have had the majority of recyclable material removed and further recovery is either technically or economically unviable, known as 'residual' waste. The source segregated MSW is to be sourced from the Aberdeenshire, Moray and Aberdeen City local authority areas.

The proposed facility is to be built on a brownfield site of approximately 2 ha (4.9 acres) in size and is located within the East Tullos Industrial Estate on the south side of Aberdeen, approximately 2.5km from Aberdeen city centre and adjacent to the residential area of Torry. The National Grid Reference of the site is NJ 95426 03997 and the site will be accessed via Greenbank Crescent.

Planning Permission for the facility was granted by Aberdeen City Council on 10 October 2016 (Ref. 160276). The facility is due to be operational by 2023.

Proposed Installation Activities

The functions carried out at the proposed NESS EFW Facility can be described as follows:

- The reception, inspection and storage of non-hazardous, source segregated municipal solid waste (MSW) and commercial and industrial (C&I) waste of a similar nature in an enclosed building, maintained under negative pressure. The building has a single waste storage bunker, capable of holding 8700 tonnes of waste, served by grab cranes allowing for the mixing and loading of the waste. A quarantine area for the collection and inspection of non-compliant waste is also provided for;
- a single line combustion grate and associated combustion chamber capable of incinerating the received waste at a temperature above 850°C with a 2 second residence time with a throughput of around 19 tonnes per hour giving a capacity of 150,000 tonnes per year based on 8,000 hours operation of around 19 tonnes per hour with a Net Calorific Value (NCV) of 9.3 MJ/Kg;
- an integral waste heat recovery boiler to recover heat from combustion gases and generate superheated steam to feed a condensing steam turbine for the generation and export of electrical energy as well as allowing for the export of heat. Depending on the operational mode selected the facility can generate around 12.8 to 14.3 MW of electricity and after accounting for the parasitic load of the site (2.17Mwe), an associated export of around 10.6 to 12.2 MW of electricity to the National Grid and 0 and 10 MW of heat respectively. The export of heat is also being actively explored in line with SEPA's Thermal Treatment of Waste Guidelines;
- the seperate collection, transfer, storage and removal from site of Incinerator Bottom Ash (IBA), Boiler ash and Air Pollution Control Residue (APCr);
- the treatment of flue gases to reduce pollutant loading, monitoring of emissions and dispersion of emissions within the flue gas via an 80 metre high stack;
- the treatment of odour during planned and unplanned stoppages via a ground mounted carbon filter bed, served by a 25 metre high stack; and
- a surface water collection and treatment system for the uncontaminated surface water runoff in the form of a Sustainable Urban Drainage System (SUDS) prior to discharge to the east Tullos Burn Culvert;

The Activities carried out at the Stationary Technical Unit are:

- The incineration of source segregated municipal solid waste (MSW) and commercial and industrial (C&I) waste of a similar nature, in a single line moving grate Incinerator with an operational capacity of 150,000 tonnes of waste per year and a combustion design capacity 49.1 MWth per hour of waste feed at 100% thermal capacity being an activity described in Part A (b) Section 5.1 of Chapter 5, of Part 1 of Schedule 1 of the Regulations as the incineration of non-hazardous waste with the exception of waste which is biomass or animal carcasses in an incineration or co-incineration plant; and

- the combustion of liquid fuel in an emergency diesel generator with a net rated thermal input of around 3.5 MW, being an activity described in Part B (d) Section 1.1 of Chapter 1, Part 1 of Schedule 1 of the Regulations as the burning of any fuel in a medium combustion plant with a rated thermal input equal to or greater than 1 megawatt and less than or equal to 20 megawatts.

There are a further number of Directly Associated Activities such as storage of raw material and wastes, surface water treatment etc. A complete description of the proposed installation activities including the directly associated activities are provided in Schedule 1 of the Permit.

Application Determination

An application was made by EFW NESS Limited (SC627853) to SEPA on the 7 October 2019, for a permit under the Pollution Prevention and Control (Scotland) Regulations 2012 (the Regulations) to operate a Part A Installation for an Energy from Waste (EFW) Facility. NESS EfW Facility at Greenbank Crescent, East Tullos Industrial Estate, Aberdeen, Scotland, AB12 3BG being an activity described in Part A (b) Section 5.1 of Chapter 5, of Part 1 of Schedule 1 of the Regulations.

The application was received within the statutory manner with a duly made application being received on the 7 October 2019. The areas requiring further clarification and the submission of further information were identified to the applicant in March 2020 and then formally captured through the issue a Notice requiring further information on the 25 November 2020. The required information was provided to SEPA however on assessment further areas of clarification were identified that were not closed out till February 2022. Additional information was also received through subsequent addendums to the application (for example minor design changes to the applied for application) and clarification was also sought from the operator on minor issues to allow for a better understanding of the activities carried out on site. Sufficient information was provided to enable SEPA to fully determine the application and assess the potential impact of the proposed installation.

The proposed NESS EfW facility represents a new Installation and has been determined accordingly. To determine this application, the impact of the emissions from the proposed EfW Plant on the local environment including impact on human health has been considered in detail. The potential significant impacts from the proposed Installation were identified to include; Emissions to Air, Emissions to Water (surface water only as process water reused), Noise, Odour and Energy Efficiency.

On consideration of the potential impact each of the aspects no potential for significant pollution has been identified and the measures proposed by the applicant have been determined to represent BAT. Controls contained within the proposed draft Conditions are designed to monitor the activities undertaken and ensure that this assessment remains the case.

Final Determination

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

In determining this application SEPA has ensured that all legislative requirements have been met, that due regard has been given to all applicable guidance and has ensured that consideration has been given to issues highlighted from members of SEPAs assessment team, representations received from the consultation process (statutory consultees, discretionary consultees and members of the public) as well as representations received from the Operator. The draft Conditions proposed by SEPA have been developed in the main using standard template Conditions for installations of a similar type. All deviations or additions deemed appropriate have been scrutinised and are highlighted in Section 8 below.

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 and will ensure that the installation is operated to comply with the draft Conditions proposed. SEPA is further satisfied that applicant will be able to operate the installation such that they will use all appropriate preventative measures against pollution, in particular through the application of Best Available Techniques (BAT) and that no significant pollution is caused.

Glossary of terms

AC	Alternating current
ACC	Aberdeen City Council / Air Cooled Condenser
APC	Air Pollution Control
APCr	Air Pollution Control residue
BAT	Best Available Techniques
BAT-AEL	BAT Associated Emission Level. These are Emission levels associated with the BAT for emissions to air.
BAT-AEEL	BAT Associated Energy Efficiency Level. These are Energy Efficiency levels associated with the BAT.
BAT-AEPL	BAT Associated Environmental Performance Level
BATC	BAT Conclusions
BREF	BAT Reference Document
BSI	British Standards Institute
CHP	Combined Heat and Power
CO	Coordinating Officer or Carbon Monoxide
COPCs	Chemicals Of Potential Concern
Cd + Tl	The sum of cadmium, thallium and their compounds, expressed as Cd + Tl
CEMS	Continuous Emissions Monitoring Systems
DMA	Dispersion Modelling Assessment
ELV	Emission Limit Value
EMS	Environmental Management System
ERF	Energy Recovery Facility
FDBR	Fachverband Anlagenbau (from the previous name of the organisation: Fachverband Dampfkessel-, Behälter- und Rohrleitungsbau) (See BAT 2).
FGT	Flue Gas Treatment
GLC	Ground Level Concentration
HCl	Hydrogen Chloride
HF	Hydrogen Fluoride
Hg	The sum of mercury and its compounds, expressed as Hg.
HHRA	Human Health Risk Assessment
IBA	Incinerator Bottom Ash
IED	Industrial Emissions Directive Ref. Directive 2010/75/EU
I-TEQ	International Toxic Equivalent according to the North Atlantic Treaty Organization (NATO) schemes.
LOI	Loss on Ignition

LT	Long-Term
NH_3	Ammonia
NO_x	Oxides of Nitrogen — the sum of nitrogen monoxide (NO) and nitrogen dioxide (NO_2), expressed as NO_2.
N_2O	Nitrous Oxide
OTNOC	Other Than Normal Operating Conditions
PAC	Powdered Activated Carbon
PM_{10}	Particulate matter which is less than 10 microns in diameter
$PM_{2.5}$	Particulate matter which is less than 2.5 microns in diameter
PAH	Polycyclic Aromatic Hydrocarbons
PC	Process Contribution
PEC	Predicted Environmental Concentration
PCB	Polychlorinated biphenyls
Dioxin-like PCB	PCBs showing a similar toxicity to the 2,3,7,8-substituted PCDD/PCDF according to WHO.
PBDD/F	Polybrominated dibenzo-p-dioxins and-furans
PCDD/D	Polychlorinated dibenzo-p-dioxins and-furans
Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V	The sum of antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel, vanadium and their compounds, expressed as Sb+As+Pb+Cr+C0+Cu+Mn+Ni+V.
PPC	Pollution Prevention and Control
RDF	Refuse Derived Fuel
SO_2	Sulphur dioxide
SWMA	Specified Waste Management Activity
ST	Short-Term
TOC	Total Organic Carbon
TPA	Tonnes Per Annum
TPH	Tonnes Per Hour
TTWG	SEPA Thermal Treatment of Waste Guidelines
VOC	Volatile Organic Compounds
WHO	World Health Organisation
WHO-TEQ	Toxic Equivalent according to the World Health Organization (WHO) schemes

2 EXTERNAL CONSULTATION AND SEPA'S RESPONSE

Is Public Consultation Required -

Advertisements Check:	***Date***	***Compliance with advertising requirements***
Edinburgh Gazette	25/10/19	Yes
Press and Journal	24/10/19	Yes

Officer checking advert: [redacted]

No. of responses received: 11

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

The below table provides a summary of the responses that were received by SEPA and how they were considered during the determination. These varied in the nature of the concerns raised and the level of

detail explored, with several responses extending to multiple pages of comments. Several common themes were identified within the responses received and in order to provide a useful summary the decision was taken not to address the comments raised within these common themes providing appropriate examples to illustrate the comments made and confirming the number of responses received relating to the theme being discussed.

On 24 December 2020, SEPA were subject to a serious and complex cyber-attack, which significantly impacted our organisation. This involved a loss of systems and data, which included the original Decision Document for this application and some of the associated consultation responses received. The consultation responses were reviewed on receipt to ensure the concerns raised were addressed during the determination process. In addition, SEPA has made significant effort to recover and re review these consultation responses to ensure that the below summary adequately captures the concerns raised and confirms how they were taken into account.

Response by Theme (No. of related responses)	**Description/ Comment**
General Opposition / Location **(11)**	All the responses received were opposed to the siting of the proposed incinerator in the Torry area with its proximity to housing and schools highlighted. Comments included: '*I object to the placing of the incinerator so close to housing in Torry…, with schools also present.'* *'This is inappropriate siting of an incinerator so close to a school and a local community and adds to the other significant problems suffered in this area. … The residents of Torry deserve a healthier, fairer and better quality of life than having this situated on their doorstep.'* *'Stop the incinerator in Aberdeen.'* *'Using the proximity principal waste should be disposed of as close to the place of production as possible and avoid passing on the environmental cost of waste management to a community which is not responsible for generating the waste'* *'I object to the incinerator in my community … Why not make this in the middle of nowhere?'* The incineration activity applied for is one allowed for within the regulations and SEPA, on receipt of a duly made (valid) application, have duty under Regulation 13 of The Pollution Prevention and Control (Scotland) Regulations 2012 (as amended) to either (a) grant a permit subject to the conditions required or (b) refuse the application. (SEPA must refuse an application for a permit if it considers that the applicant will not be the person who will have control over the operation of the installation or ensure that it is operated to comply with the conditions which would be included in the permit). SEPA therefore need to determine the application and must do so for the location for which it was applied for, SEPA cannot consider alternative locations. In determining the application SEPA have given significant consideration to the location of the proposed facility with respect to potential impacts on local identified receptors (human and ecological). See Section 5 (Key Environmental Issues) and associated appendices for SEPAs consideration on potential impact.

Road Traffic **(3)**	Several responses raised concerns of the impact from the additional road traffic within the local area. Comments include: *'The impact of transporting 150,000 tonnes of waste … will have a severe impact on local roads. Wellington Road is already classed as one of the most polluted roads in Aberdeen and other roads in Torry already suffer problems from HGV usage.'* *'… the associated noise and fumes from the estimated 300 heavy vehicles per week (7 per hour) directly affecting children's and residents air quality.'* *SEPA should request a detailed analysis of all vehicle movements to and from the project during its operating hours. This would allow an analysis of the estimated gaseous emissions and particulates attributable to both HGV and other traffic.* In determining a PPC application SEPA can only consider the impacts from the installation activities themselves, in this case the proposed EfW facility. SEPA cannot and have not considered the impact from additional road traffic in the area
Waste Hierarchy & Recycling **(4)**	Comments were made on the compatibility of permitting the facility with adherence to the waste hierarchy and potential impact on meeting targets with respect to recycling rates and the establishment of a circular economy as well. Comments include: *'This undermines the local authority commitment to reduce, reuse and recycle and is incompatible with the environmental benefits of recycling.'* *'According to guidance from the European Commission: "…over-capacity in incineration undermines waste prevention, re-use and recycling, drives waste imports to feed existing under-used facilities and can represent high costs for the taxpayers. Priority should be given to the development of the necessary infrastructures to ensure high re-use, recycling (including composting) rates including the development of the necessary separate collection systems'* *'This plant will kill the circular recycling economy that we should all be working to improve.'* *'With regard to waste, there should be a robust inspection process to eliminate the possibility of dangerous material entering the incineration process.'* *'In contrast to the municipal waste stream which is subject to pre-sorting by residents (although elsewhere here described as inadequate), there appears to be no system in place to prevent incineration of recyclable materials arriving in consignments of this waste stream. The stated procedure of random (perhaps as seldom as weekly) visual inspections of open loads or on the tipping floor is surely inadequate. There will in any case be no incentive for rigorous screening when the priority will be to feed the incinerator.'* As detailed in SEPAs Thermal Treatment of Waste Guidelines 2014, there continues to be waste that cannot be recycled either technically or economically, referred to as 'residual waste'. This waste is currently disposed of to landfill (lowest option in the waste hierarchy). While the fraction of 'residual waste' will decrease it is expected to persist for some time, even with high levels of recycling. Scotland have introduced a ban on landfilling biodegradable municipal waste, to take effect in 2025. Scottish Government's policy, while recognising energy recovery as being lower in the hierarchy than prevention, re-use and recycling, does identify thermal treatment to produce electricity, heat, fuels or chemicals as an alternative option to landfill for residual waste and which is higher up the waste hierarchy. It further recognises that recovering energy from residual waste should not be at the expense of actions taken to prevent, reuse or recycle waste and as such segregated, marketable recyclable waste must not be sent for energy recovery. The draft conditions contained within the Permit have as far as is reasonably practicable taken steps to ensure that that only the incineration of residual waste in the form source segregated municipal solid waste (MSW) (schemes approved by SEPA) and commercial and industrial (C&I) waste of a similar nature is allowed. Specific Conditions relating to permitted types (4.1) and

	quantities (4.2) of waste, waste acceptance (4.3) and storage (4.4) for incineration have been included.
Pest Control **(2)**	Concerns were raised with respect to the potential impacts from pests/vermin. Comments include: *'There should also be a clear enforceable policy regarding vermin and seagull control ….'* SEPA have considered this aspect as part of its determination and included draft Condition 3.5.2 with respect to the inspection for and control of insects, birds and vermin. It should also be noted that all waste arrives covered and is handled and stored indoors.
Climate Change **(2)**	Comments were made with respect to the impact that permitting the facility would have with respect to climate change and global warming. Comments include: *'incineration increases the emission of greenhouse gases responsible for global warming'* *'… SEPA should include conditions that show how the applicant will reduce net carbon emissions to minimum 90% (net zero target of 2050) in not more that 5-year steps within the period of the licence…'* As detailed in SEPAs Thermal Treatment of Waste Guidelines 2014, SEPA has a key role in helping Scotland respond to climate change and sustainable resource use through our activities as a regulator, advisor and a statutory consultee. With respect to the recovery of the inherent energy in waste it needs to be borne in mind that the energy recovered in an incineration plant is from the fraction of the waste stream that that cannot be recycled either technically or economically, referred to as 'residual waste' that is currently being sent to landfill. Where this material is processed through a thermal treatment facility SEPA recognises the benefits in addressing a range of issues including climate change, energy security and resource efficiency. See Section 5.15 of this document for further detail.
Energy Use & Heat Network Delivery **(7)**	Several responses made reference to energy generation, use and efficiency of the proposed facility as well as the wider described heat network. Comments include: *'No information regarding the heating network from the incinerator has not been communicated to Torry residents.'* *'no plans for electricity generation or local subsidized heating have been put through council approval'* *'We ask that the heat network proposals are independently evaluated for SEPA by consultants with no vested interest in the outcome. In addition to establishing the credibility of the plans at application stage, SEPA is also asked to confirm what action will be taken, for instance the withdrawal of the licence, if the Council fails to deliver an effective heat network and through this the requirement for the plant to be efficient.'* *Facebook Poll Results Torry Community Group - Who has been consulted by the council ref the heating network from the incinerator Yes – 0, No – 75.'* *It is NOT an energy from waste plant, as no project to produce electricity or heat has passed through ACC.* *SEPA should have the absolute right to demand detailed proposals from the applicant as to the viability of such a scheme. There has always been considerable doubt in our view as to the economics of this.* *'The submitted section on the heat and power plan it not credible, not demonstrably achievable and shows little evidence of being actively pursued.'* SEPA has carried a thorough assessment of the provided heat and power plan. See Section 15 for full details. In summary SEPA has concluded that, in line with SEPAs Thermal Treatment of

	Waste Guidelines 2014, the applicant has provided the necessary level of detail at the application stage to demonstrate that the proposed facility can achieve at least 20% (gross calorific value basis) energy recovery generating electricity only on commissioning and that within a period of seven years from cessation of commissioning, further energy can be recovered over and above the initial operational energy recovery with an indicative efficiency greater than 35%. It is the applicant's responsibility to ensure a high level of energy efficiency and that these targets are met. Due to the uncertainties involved in such a project it is not practical to expect that all of the necessary measures can and will be confirmed at the commissioning stage and this explains why there is a period to allow the applicant to develop this aspect of the facility, identify heat users, enter into agreements and install the necessary infrastructure. SEPA will monitor the progress being made by the applicant in meeting the necessary targets and will take the proportionate and appropriate action in line with SEPAs enforcement policy should sufficient progress not be made.
Noise **(3)**	Noise was highlighted as an issue of concern. Comments included: *'The noise created during the current building phase and which will continue when operational as indicated in the noise assessment (5.2.3) will be a significant nuisance to people living or working nearby not to mention the pupils of Tullos Primary School attempting to learn whilst tolerating this.'* Noise from construction (or off-site traffic) does not form part of SEPAs assessment or fall under SEPAs remit as we can only control noise from the PPC activity, in this case from the operation of the proposed energy from waste facility. It is understood that construction and traffic noise will be considered by the Local Authority. The noise from the installation activities has been considered in full. See Section 5.17 of this document for further detail.
Light **(2)**	Light was highlighted as an issue of concern. Comments included: *'SEPA are requested to establish formal guidelines for noise and light emission for the proposed plant, and for all the vehicles and machinery using the site for inclusion in the permit.'* Light does not fall within the definition of pollution under PPC and as such does not form part of SEPAs assessment.
Financial Cost **(2)**	The financial cost of the project was highlighted as an issue of concern. Comments included: *'The EU no longer approves of the construction of Incinerators, and no subsidy from the EU will be forthcoming to finance this plant.'* The financial cost and level of subsidy available to the project does not fall to SEPA for consideration and as such does not form part of SEPAs assessment.
Air Quality / Human Health **(5)**	The impacts on air quality and human health from the proposed facility were highlighted as issues of concern. Comments included: *'Torry is already located next to one of the most polluted roads in Scotland (Wellington Road), and ACC has plans to introduce a low emissions zone within Torry. This shows that the air quality in Torry is already very poor, and with the building of the new Harbour, and the Incinerator, the construction works and massive increases in operational heavy vehicle passing through the area, the air pollution will only get worse.'* *'Of more concern is the regularity of "issues" with these plants where "accidental" releases of much higher levels of toxins into our community happen. We cannot allow this plant to poison our air with NOx, CO, Dust, TOC, HCl, HF and SO2, Mercury, cadmium, zinc, arsenic, thallium'* *'It's unacceptable for young children to be breathing in high levels of toxins as they are trying to learn and us even within our houses, consuming high levels of toxins.'*

	'SEPA must therefore demonstrate how the granting of an operator permit for up to twenty-five years would not contribute additional levels of CO2, other gases and fine particulates into the atmosphere.' *'SEPA must demonstrate their own robust evaluation of dispersal of gases in the plume and identify the model(s) that have been utilised for the conclusion drawn for their analysis. In addition, SEPA are requested to comment on the effect of building downwash'* The impact from the proposed facility on air quality and human health represents a key area of assessment for SEPA and has been considered in full. It is important to note that the proposed facility will contribute additional emission to the local environment however all additional pollutant contributions have been determined to be insignificant. The assessment of potential air quality impacts has included consideration of normal and abnormal operation, dispersion model selection, pollutants of concern, stack height assessment, meteorological conditions (including coastal effects), ground conditions (terrain, building effects etc.). In addition, a Human Health Risk Assessment was undertaken. See Section 5.2 of this document for full details.
Stack Height **(1)**	*'There is some considerable doubt that the proposed 80 metre stack will enable the waste gases to be safely dispersed.'* SEPA have considered stack height within its assessment. See Section 5.2 of this document for further detail
Contributory Sources **(1)**	*'On the basis of demonstrating an analytical approach to air quality monitoring, SEPA must also acknowledge that the intention to create an additional incinerator near Inverurie, some 15 miles from East Tullos introduces another source of gases generated by the chemistry of combustion.'* While contributory sources and their potential addition to background air quality concentrations have been considered, see Section 5.2 for further detail, this has not included the energy from waste facility proposed for Inverurie. This has not been considered due to the distance form this proposed facility and the fact that it is at a very early stage of that project and may not be realised.
Monitoring Stack Emissions & Public Scrutiny **(3)**	Several comments were made in relation to the monitoring of emissions and level of public scrutiny needed. Comments included: *'There should be an online monitoring facility open to general public scrutiny.'* *'… integrated to a network of on and off-site air sensors using open data access software, being automatically triggered at agreed acceptable standards being located in settlements and all schools within a 20-mile perimeter of the site, and that implementation and oversight of this condition within the permit will be regularly monitored by a community-led, independently-established group comprised of community and statutory organisations. In addition, members of this group are to be granted all reasonable access for visits and inspections of the plant. The establishment of such a group, paid for by the operators and Local Authorities, should be fully public, and a condition of the licence.'* *'that such monitoring by the Independent group will be acted upon by SEPA in instruction of ceasing emissions with 24 hours of request from the group. Reason to ensure that the plant does not emit gases when air quality conditions fail to meet acceptable standards within the effective zone.'* Monitoring of emissions from the proposed facility has been considered by SEPA, see Section 5.18 of this document for further detail. Condition 6.1.14 requires that continuous emissions monitoring data shall be made publicly available. With respect to the comments on oversight and unacceptable impact on air quality, even if it were in SEPAs power to establish such a group it remains SEPAs duty to ensure compliance with the requirements of draft Conditions, not establish a third-party group to do so. Measures have been included within proposed draft Conditions that would minimise the potential impact during a period of plant upset. See Conditions 5.3 (Interlocks, Control Systems and Alarms)

	and 5.4 (Abnormal Operation, Breakdowns and Other Than Normal Operating Conditions (OTNOC)).
Operational Control & BAT **(2)**	Comments were raised in relation to combustion control, the maintenance of required temperature and residence times, and how the selected measures for NOx reduction represent BAT. Comments include: *'In Best Available Techniques (BAT) Reference Document for Waste Incineration the options for further reducing NOx emissions are outlined. It explains that two processes can potentially be used for the removal of nitrogen from flue gases - selective non-catalytic reduction (SNCR) and selective catalytic reduction (SCR). SCR has a greater capacity to remove NOx from the flue gases but is more expensive to operate as well as having a higher capital cost. I contend therefore the chosen technology is not the best available technique and SEPA should reject this component of the Permit Application on those grounds'* *'SEPA are therefore requested to establish the means by which the operator will consistently control and maintain the obligatory temperature targets required (a minimum temperature of 850 degrees centigrade for a minimum time of two seconds) … If the combustion temperatures are too low, will oil or gas be injected to increase the temperatures?'* *'SEPA are requested through external evaluation and examination that a robust means of minimum and maximum temperatures in the combustion chambers can be controlled and maintained'* Both combustion control and the demonstration that the proposed techniques for NOx reduction have been considered in SEPAs determination. Within the draft Conditions, the process design, operation and maintenance is covered under Condition 5.1 with the specific requirements for maintaining 850°C for 2 seconds required by Condition 5.1.1 c) and d) respectively. The consideration of BAT is made throughout this document and not simply a comparison of one technology choice against another but an assessment of the combination of techniques proposed, how they will be managed and maintained alongside the consideration of the impact from any associated emissions, resource/energy use etc. In relation to NOx reduction see Section 19, Appendix G of this document and in particular the entry against BAT 29 which confirms that BAT for NOx control is to use an appropriate combination of the techniques described. SEPA has determined that an appropriate combination of techniques that can achieve the NOx BAT-AEL range has been described and determined to represent BAT.
Technically competent **(1)**	*'It is my considered opinion that the management structure of the workforce on site with full job descriptions and personal specifications should be a formal condition of any permit.'* The management of the proposed installation activities has been considered in full. See Section 5.8 of this document for further detail. Condition 2.1.1. requires the operator to identify an appropriate person (and deputy) as the primary point of contact. And Conditions 2.12 describes the requirements for technical competence and staffing.
Site Conditions **(1)**	*'Further investigation and assessment is required to fully characterise the potential contamination risks present from on-site and off-site sources. There appears to be no further reference in any of the documentation to the fact that this work has been completed.'* The Site Condition and Baseline report has been considered in full. See Section 5.20 of this document for further detail.
Ash **(2)**	Several comments were received in relation to the handling, storage and disposal of ash. Comments include: *'what requirements will SEPA demand for the safe storage and distribution of such ashes on the site prior to and during transportation to a secure site for landfill or reprocessing?'*

	'SEPA are also requested to make a condition of the licence that any bottom ash is removed from the site within 2-4 week period from production' *SEPA should insist on a comprehensive plan for such residues, their safe handling and disposal procedure.'* The generation, handling, storage and removal of ash from site has been considered. See Section 5.13 of this document for further detail.
Surface Water **(1)**	*'SEPA are requested to include a condition in the permit that all surface water run for discharge into the East Tullos Burn will be cleansed to potable standards'* The treatment and discharge of surface water runoff from the proposed installation has been considered. See Section 5.3 of this document for further detail. On consideration of the application detail SEPA did not determine the need for the surface water to be cleaned to a potable standard before discharge or that such a standard would represent BAT.
Odour **(3)**	*'In the section on the FIDOL assessment, the applicant states that an Odour Management Plan will be produced prior to the commissioning of the facility.'* *'SEPA are requested that the Odour Management Plan, following consultations be included as a condition in the permit'* The potential impact from odour and the measure in place to prevent and reduce the emissions of odour has been considered in full. See Section 5.7 of this document for further detail. The requirement for an odour management plan is included in Condition 3.2.2.
Accident Potential **(3)**	*'With regard to the potential of failures within the plant that compromises safety, it is noted that the applicant has undertaken an accident risk assessment. SEPA are requested to examine all relevant issues, with particular reference to the use of emergency shutdowns, fire precautions and electrical trips and to link all stages to proposed timescales.'* *'The inclusion of dump stacks in the design of the plant may be a safety measure to prevent the plant from being damaged, but the result is that the toxic pollution is released into our neighbourhood. This is wholly unacceptable.'* *'SEPA should insist on comprehensive risk assessments for every part of the operation of this plant. This would also address emergency procedures in the possible evacuation of the plant and also the possible evacuation of the local community.'* The potential impact from abnormal operation and accident potential has been considered. See Section 5.16 Accidents and their Consequences of this document for further detail. The potential for offsite / community evacuation has not been considered as part of this determination falling out with the scope of the assessment.

Summary of responses withheld from the public register on request and how they were taken into account during the determination:

All responses received, whither they have been withheld from the public register or not, have been included in the total number of responses received above and the issues highlighted also included for consideration in line with those highlighted above. All responses received have been considered in full during the determination of this application.

***Is PPC Statutory Consultation* Required – Yes**

Food Standards Agency:	Response: No objection.

	Response concluded that provided that the relevant regulations and guidance is complied with, Food Standards Scotland considers it unlikely that there will be any unacceptable effects on the human food chain from the emissions from this installation. (Response not currently available due to cyber-attack.)
Health Board:	Response: Received 31/10/19 (GMC 3266447) Locum Consultant Health Protection, NHS Grampian (Summerfield House, 3 Eday Road, Aberdeen, AB15 6RE) The following response was provided: *'The NHS does not monitor environmental emissions and is unable to provide an expert view on safe operation of industrial processes to prevent emissions.'* **SEPA Response -** Noted. '*The area within which the facility will be built is an area of multiple deprivation. The definition of deprivation is based on, amongst other measures, records of poor health. Therefore during construction and once the EfW facilities in operation it will be important that it operates to the highest standards to prevent any adverse physical or mental health impact on an already vulnerable population'.* **SEPA Response –** SEPA has carefully considered the above comment in its determination of the application and in particular with regard to the potential impact of emissions on air quality on the local population from the proposed Installation and in the setting of appropriate Emission Limit Values expressed in the draft Conditions. In addition, SEPA's Human Health Specialist reviewed the relevant aspects of the application. Continued compliance will be confirmed on inspection with an ongoing review of the limits set with a view to reducing them further where possible over time. *'Should an incident resulting in harmful emissions arise the NHS should be informed and we would ensure the correct human health advice is provided to the public.'* **SEPA Response -** Not relevant to the application determination however noted for ongoing regulation. There are additional issues which may be material considerations: 1. '*Reference has been made to noise during construction. The modelled noise levels during construction period are high and may give rise to public distress. This may be a problem particularly given the location of the nearest primary school.'* **SEPA Response -** Noise from construction does not form part of SEPAs assessment as we can only control noise from the PPC activity, in this case from the operation of the proposed energy from waste facility. It is

	understood that construction noise will be considered by the Local Authority. 2. *'I note also the community will be informed if there are any significant events in the facility which might have an impact on the community. Whilst welcome, I would suggest that before construction begins Ness establishes a group which includes community representatives. This should provide an opportunity for not only early warning of issues but an opportunity for the community to engage in mitigation.'* **SEPA Response -** This is not a matter for SEPAs determination of the application however it is understood that a community liaison group has been established.
Local Auth:	Response: Received 12/12/19 Principal Environmental Health Officer, Aberdeen City Council, Operations & Protective Services, Operations (Marischal College, 3rd Floor South, Broad Street, Aberdeen, AB10 1AB) The following response was provided: *'Considering the above assessments including the aspect of tonality (which para 3 on page 21 within Section 1.7 (discussion) of the assessment advises will not occur and no tonal penalty was applied during the assessment) the outcome of the assessment is considered reasonable for operational noise'* **SEPA Response –** The consideration that the outcome of the assessment is reasonable is noted. In determining the application SEPA have required the applicant to consider a tonal penalty which was subsequently addressed. See Section 5.17 of this document for further detail. The following recommendations were also made: 1. *'Adherence to the predicted noise level emissions at the relevant sensitive receptors, including those detailed within; Table 8 'External Lp of facility at principal receptors', Table 11 'Lp of facility at additional community receptors'.'* 2. *'Application of best available techniques to ensure tonal acoustic characters from facility plant do not occur at the nearest residential receptors.'* 3. *'Ensure the material used for the external walls and roofs of all rooms/halls, louvre and sliding doors achieve a minimum sound reduction as detailed within table 7:key TL (transmission loss) spectra.'* 4. *'Produce and implement an effective Noise Management Plan for the management of noise from operations at the facility as indicated in para 5 on page 22 within Section 1.8 (Conclusion) of the assessment.' A list of minimum requirements for the plan was also include.*

	SEPA Response – The recommendations have been considered in full as part of SEPAs determination. Draft Conditions include; - the requirement to confirm that the specific noise levels of the facility do not exceed those identified in the application (2.9.2 k)); - periodic assessment of noise and vibration emissions (3.1.1); and - the preparation, implementation and maintenance of a Noise and Vibration Management Plan (3.1.2) The proposed design will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection. See Section 5.17 Noise of this document for further detail on how noise impact and mitigation has been addressed.
Scottish Water:	Not Applicable, no discharge to sewer proposed
Health and Safety Executive:	No response received. Assumed no objection.
Scottish Natural Heritage (PPC Regs consultation):	Response – No objection. (Response not currently available due to cyber-attack.)

Discretionary Consultation –

Yes. Standing local Community Councils were identified as discretionary consultees**.**

Torry Community Council – not formed at time of consultation
Cove and Alten's Community Council – response consideration included above

Enhanced SEPA public consultation –

Yes specific enhanced public consultation was undertaken. Due to the complexity of the application, the level of local interest and the time of the year the consultation process took place additional measures were adopted. These included;

- In line with SEPA guidance and as is the case for other EfW sites SEPA created a Webpage NESS EfW facility - EfW application where SEPAs role, the determination process and the supporting application documents were described;
- As well as via the above webpage a hard copy was also made available through the public register in the Aberdeen Office (as is the case for all PPC applications). A separate PC station was set up in the reception area to allow an electronic copy of the application documents to be used. This was in place for the duration of the consultation period;
- SEPA attended a session of the Cove and Alten's Community Council meeting (13/01/2020) to answer questions on the PPC application process; and
- Additional time was given to the discretionary consultee and members of the public by agreement to provide them with sufficient time to consider the submitted documents and subsequent response in full.

'*Off-site' Consultation* - No

***Transboundary Consultation* – No**

***Public Participation Consultation* - Yes**

STATEMENT ON THE PUBLIC PARTICIPATION PROCESS

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

The Pollution Prevention and Control (Public participation)(Scotland) Regulations 2005 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	**15/03/2022**
Date draft determination placed on SEPA's Website	**15/03/2022**
Details of any other 'appropriate means' used to advertise the draft.	**None**
Date public consultation on draft permit opened	**15/03/2022**
Date public consultation on draft permit consultation closed	**12/04/2022**
Number of representations received to the consultation	**4**
Date final determination placed on the SEPA's Website	**02/05/2022**

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

Response by Theme (No. of related responses)	Description/ Comment
General Opposition / Location **(4)**	All the responses received were opposed to the siting of the proposed incinerator in the Torry area with its proximity to housing and schools highlighted as well as identifying Torry as being impacted from other existing activities in areas such as noise an odour. SEPA would reiterate that the incineration activity applied for is one allowed for within the regulations and SEPA, on receipt of a duly made (valid) application, have duty under Regulation 13 of The Pollution Prevention and Control (Scotland) Regulations 2012 (as amended) to either (a) grant a permit subject to the conditions required or (b) refuse the application. (SEPA must refuse an application for a permit if it considers that the applicant will not be the person who will have control over the operation of the installation or ensure that it is operated to comply with the conditions which would be included in the permit). SEPA therefore need to determine the application and must do so for the location for which it was applied for, SEPA cannot consider alternative locations. In determining the application SEPA have considered the location of the proposed facility with respect to potential impacts on local identified receptors (human and ecological) with the impact from existing activities being captured on consideration of background values employed in the assessments. See Section 5 (Key Environmental Issues) and associated appendices for SEPAs consideration on potential impacts. ***No further assessment or consideration of addition Conditions deemed necessary.***
Road Traffic **(2)**	Two responses raised concerns of the impact from the additional road traffic within the local area. SEPA would reiterate that in determining a PPC application SEPA can only consider the impacts from the installation activities themselves, in this case the proposed EfW facility. SEPA cannot and have not considered the impact from additional road traffic in the area. ***No further assessment or consideration of addition Conditions deemed necessary.***

Waste Hierarchy & Recycling **(2)**	Comments were made on the compatibility of permitting the facility with adherence to the waste hierarchy and potential impact on meeting targets with respect to recycling rates and the establishment of a circular economy as well with respect to specific waste streams that should not be permitted. SEPA would reiterate that as detailed in SEPAs Thermal Treatment of Waste Guidelines 2014, there continues to be waste that cannot be recycled either technically or economically, referred to as 'residual waste'. This waste is currently disposed of to landfill (lowest option in the waste hierarchy). While the fraction of 'residual waste' will decrease it is expected to persist for some time, even with high levels of recycling. Scotland have introduced a ban on landfilling biodegradable municipal waste, to take effect in 2025. Scottish Government's policy, while recognising energy recovery as being lower in the hierarchy than prevention, re-use and recycling, does identify thermal treatment to produce electricity, heat, fuels or chemicals as an alternative option to landfill for residual waste and which is higher up the waste hierarchy. It further recognises that recovering energy from residual waste should not be at the expense of actions taken to prevent, reuse or recycle waste and as such segregated, marketable recyclable waste must not be sent for energy recovery. The draft conditions contained within the Permit have as far as is reasonably practicable taken steps to ensure that that only the incineration of residual waste in the form source segregated municipal solid waste (MSW) (schemes approved by SEPA) and commercial and industrial (C&I) waste of a similar nature is allowed. Specific Conditions relating to permitted types (4.1) and quantities (4.2) of waste, waste acceptance (4.3) and storage (4.4) for incineration have been included. Further comment was made with respect to confirming the effectiveness of the source segregated collection schemes through off site inspection. While SEPA is responsible for the approval of the source segregation schemes this is separate to the Permit requirements which relate to the Incineration (on site) activity. While consideration has been given to the effectiveness of the schemes in determine the application it is not possible for the Permit to impose Conditions on these schemes. Conditions relating to waste reception have been included and no further control in this regard is considered possible. ***No further assessment or consideration of addition Conditions deemed necessary.***
Energy Use & Heat Network Delivery **(2)**	Two responses referred to energy generation, use and efficiency of the proposed facility as well as the wider described heat network. These centred on i. the described lag between the plant being operational (in receipt of waste) and the development of any off site heat network with a suggestion that the plant should not be allowed to operate until such time a District Heating scheme is in place; and ii. that the scale of energy use proposed and the ability to achieve the required 20% (gross calorific value basis) energy recovery on start-up is not credible. SEPA reiterates that it has carried a thorough assessment of the provided heat and power plan. See Section 15 for full details. In summary SEPA has concluded that, in line with SEP As Thermal Treatment of Waste Guidelines 2014, the applicant has provided the necessary level of detail at the application stage to demonstrate that the proposed facility can achieve at least 20% (gross calorific value basis) energy recovery generating electricity only on commissioning and that within a period of seven years from cessation of commissioning, further energy can be recovered over and above the initial operational energy recovery with an indicative efficiency greater than 35%. It is the applicant's responsibility to ensure a high level of energy efficiency and that these targets are met. Due to the uncertainties involved in such a project it is not practical to expect that all of the necessary measures can and will be confirmed at the commissioning stage and this explains why there is a period to allow the applicant to develop this aspect of the facility, identify heat users, enter into agreements and install the necessary infrastructure. SEPA will monitor the progress being made by the applicant in meeting the necessary targets and will take the proportionate and appropriate action in line with SEPAs enforcement policy should sufficient progress not be made.

	No further assessment or consideration of addition Conditions deemed necessary.
Noise **(1)**	Noise was highlighted as an issue of concern. SEPA reiterates that the noise from the installation activities has been considered in full. See Section 5.17 of this document for further detail. ***No further assessment or consideration of addition Conditions deemed necessary.***
Ongoing Regulation **(2)**	Two responses referred to the ongoing inspection of the facility. <u>Inspection</u> SEPA can confirm that the site will be subject to regular inspection. The exact nature and frequency on inspection will be subject to change depending on the performance of the installation, any identified areas of concern etc. Inspections will consist of a mixture of announced and unannounced inspections or audits depending on the nature and focus of the inspection. <u>Management Plans</u> Proposed that the Management plans are agreed before a Permit is issued. SEPA can confirm that Management Plan requirements are specific to the individual installation and will be subject to review and approval by SEPA during commissioning and then on an a routine and ongoing basis to ensure they remain fit for purpose. <u>Record Keeping</u> Proposed to retain operational records off site and following site decommissioning. SEPA can confirm that the record keeping proposals in the Permit are in line with SEPA policy and legal requirements. It is highlighted that SEPA maintains a separate record of its interventions / inspections / audits of the site as well as any records required to be submitted by a Condition of the Permit. ***No further assessment or consideration of addition Conditions deemed necessary.***
Air Quality / Human Health **(3)**	The impacts on air quality and human health from the proposed facility were highlighted as issues of concern. SEPA reiterate that the impact from the proposed facility on air quality and human health represents a key area of assessment for SEPA and has been considered in full. It is important to note that the proposed facility will contribute additional emission to the local environment however all additional pollutant contributions have been determined to be insignificant. The assessment of potential air quality impacts has included consideration of normal and abnormal operation, dispersion model selection, pollutants of concern, stack height assessment, meteorological conditions (including coastal effects) (Dyce and Inverbervie), ground conditions (terrain, building effects etc.). In addition, a Human Health Risk Assessment was undertaken. See Section 5.2 of this document for full details. ***No further assessment or consideration of addition Conditions deemed necessary.***
Stack Height **(1)**	SEPA have considered stack height within its assessment. See Section 5.2 of this document for further detail ***No further assessment or consideration of addition Conditions deemed necessary.***
Contributory Sources **(1)**	Contributory sources and their potential addition to background air quality concentrations have been considered, see Section 5.2 for further detail. ***No further assessment or consideration of addition Conditions deemed necessary.***

Monitoring, Stack Emissions & Public Scrutiny **(1)**	SEPA reiterates that monitoring of emissions from the proposed facility has been considered by SEPA, see Section 5.18 of this document for further detail. Condition 6.1.14 requires that continuous emissions monitoring data shall be made publicly available. Wider environmental monitoring has been captured in Schedule 9.1 'Environmental Monitoring' ***No further assessment or consideration of addition Conditions deemed necessary.***
Odour **(2)**	The potential impact from odour and the measure in place to prevent and reduce the emissions of odour has been considered in full. See Section 5.7 of this document for further detail. The requirement for an odour management plan is included in Condition 3.2.2. This includes consideration of vehicle movements in and out of the Incineration building. ***No further assessment or consideration of addition Conditions deemed necessary.***

On consideration of the comments provided and review of the determination undertaken SEPA have concluded that the issues identified have been considered in full and that no further assessment or consideration of addition Conditions are deemed necessary.

Summary of responses withheld from the public register on request and how they were taken into account during the determination:

All responses received, whither they have been withheld from the public register or not, have been included in the total number of responses received above and the issues raised have been considered within the comments raised above. It is considered that all the comments raised have been considered in full during the determination of this application.

Officer: [redacted]

3 ADMINISTRATIVE DETERMINATIONS

Determination of the Schedule 1 activity

As detailed in the application.

Determination of the stationary technical unit to be permitted:

As detailed in the application.

Determination of directly associated activities:

As detailed in the application.

Determination of 'site boundary'

As detailed in the application.

Officer: [redacted]

4 INTRODUCTION AND BACKGROUND

4.1 Historical Background to the activity

The proposed EFW NESS Limited (SC627853), NESS EFW Facility is an Energy from Waste (EFW) plant designed to incinerate and recover the energy from non-hazardous, source segregated, municipal solid waste (MSW) and commercial and industrial (C&I) waste streams of a similar nature. The facility is designed to have a throughput capacity of 150,000 tonnes of waste per year and design thermal capacity of 49.1MW based on 8000 operating hours per year.

The NESS EfW Facility is being developed to fulfil the requirements of the Scottish Government's Zero Waste Plan, as a joint project by Aberdeen City Council, Aberdeenshire Council and Moray Council in order to be able to comply with the proposed landfill ban in Scotland. All waste delivered to site will have had the majority of recyclable material removed and further recovery is either technically or economically unviable, known as 'residual' waste. The source segregated MSW is to be sourced from the Aberdeenshire, Moray and Aberdeen City local authority areas.

The proposed facility is to be built on a brownfield site of approximately 2 ha (4.9 acres) in size and is located within the East Tullos Industrial Estate on the south side of Aberdeen, approximately 2.5km from Aberdeen city centre and adjacent to the residential area of Torry. The National Grid Reference of the site is NJ 95426 03997. The proposed development is accessed off Greenbank Crescent and is bound to the north by Greenbank Road and to the west by Greenbank Crescent. A fish processing plant is located to the east and south of the site. Immediately to the south of the fish processing plant is Tullos Hill which is the location of a former (now closed) landfill.

The site was formerly used as a gas supply depot and gas distribution complex containing an above ground gas storage holder and associated gas distribution infrastructure.

Planning Permission for the facility was granted by Aberdeen City Council on 10 October 2016 (Ref. 160276). The facility is due to be operational by 2023.

4.2 Description of activity

The proposed EFW NESS Limited (SC627853), NESS EFW Facility is an Energy from Waste (EFW) plant designed to incinerate and recover the energy from residual non-hazardous, source segregated, municipal solid waste (MSW) and commercial and industrial (C&I) waste streams of a similar nature.

The Activities carried out at the Stationary Technical Unit are:

- The incineration of source segregated municipal solid waste (MSW) and commercial and industrial (C&I) waste of a similar nature, in a single line moving grate Incinerator with an operational capacity of 150,000 tonnes of waste per year and a combustion design capacity 49.1 MWth per hour of waste feed at 100% thermal capacity being an activity described in Part A (b) Section 5.1 of Chapter 5, of Part 1 of Schedule 1 of the Regulations as the incineration of non-hazardous waste with the exception of waste which is biomass or animal carcasses in an incineration or co-incineration plant; and

- the combustion of liquid fuel in an emergency diesel generator with a net rated thermal input of around 3.5 MW, being an activity described in Part B (d) Section 1.1 of Chapter 1, Part 1 of

Schedule 1 of the Regulations as the burning of any fuel in a medium combustion plant with a rated thermal input equal to or greater than 1 megawatt and less than or equal to 20 megawatts.

The functions carried out at the proposed NESS EFW Facility can be described as follows:

- The reception, inspection and storage of non-hazardous, source segregated municipal solid waste (MSW) and commercial and industrial (C&I) waste of a similar nature in an enclosed building, maintained under negative pressure. The building has a single waste storage bunker, capable of holding 8700 tonnes of waste, served by grab cranes allowing for the mixing and loading of the waste. A quarantine area for the collection and inspection of non-compliant waste is also provided for;

- A single line combustion grate and associated combustion chamber capable of incinerating the received waste at a temperature above 850°C with a 2 second residence time with a throughput of around 19 tonnes per hour giving a capacity of 150,000 tonnes per year based on 8,000 hours operation of around 19 tonnes per hour with a Net Calorific Value (NCV) of 9.3 MJ/Kg;

- an integral waste heat recovery boiler to recover heat from combustion gases and generate superheated steam to feed a condensing steam turbine for the generation and export of electrical energy as well as allowing for the export of heat. Depending on the operational mode selected the facility can generate around 12.8 to 14.3 MW of electricity and after accounting for the parasitic load of the site (2.17Mwe), an associated export of around 10.6 to 12.2 MW of electricity to the National Grid and 0 and 10 MW of heat respectively. The export of heat is also being actively explored in line with SEPA's Thermal Treatment of Waste Guidelines;

- the separate collection, transfer, storage and removal from site of Incinerator Bottom Ash (IBA), Boiler ash and Air Pollution Control Residue (APCr);

- the treatment of flue gases to reduce pollutant loading, monitoring of emissions and dispersion of emissions within the flue gas via an 80 metre high stack;

- the treatment of odour during planned and unplanned stoppages via a ground mounted carbon filter bed, served by a 25 metre high stack; and

- a surface water collection and treatment system for the uncontaminated surface water runoff in the form of a Sustainable Urban Drainage System (SUDS) prior to discharge to the East Tullos Burn Culvert;

There are a further number of Directly Associated Activities such as storage of raw material and wastes, surface water treatment etc. A complete description of the proposed installation activities including the directly associated activities are provided in Schedule 1 of the Permit.

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

No guidance or direction issued under Regulation 60 or 61.

4.4 Identification of important and sensitive receptors

4.4.1 Site Location

The proposed facility is located on a brownfield site of approximately 2 ha (4.9 acres) in size, within the East Tullos Industrial Estate on the south side of Aberdeen, approximately 2.5km from Aberdeen city centre and adjacent to the residential area of Torry. The National Grid Reference of the site is NJ 95426 03997. The proposed development is accessed off Greenbank Crescent and is bound to the north by Greenbank Road and to the west by Greenbank Crescent.

4.4.2 Air Quality & Human Health Receptors

A total of 43 sensitive human health receptors were identified and assessed in the Air Dispersion Modelling Assessment. This assessed the predicted air quality impacts on the surrounding local environment as well as feeding into the Human Health Risk Assessment (HHRA). Receptors were identified as '*those residential properties/schools/ hospitals/businesses or areas where people may spend time that are likely to experience a change in pollutant concentrations and/or dust nuisance due to the construction and operation of the proposed scheme*.'.

These receptors are presented in Table 10 and Figure 7 of the Air Quality Assessment report provided as part of the application and updated in response to SEPAs Notice requiring further information. These are replicated below for ease. SEPA have determined that the identified receptors accurately represent those at risk within the immediate environment.

Figure 7: Human receptor locations

Table 10: Sensitive human receptor locations

ID	Receptor Name	Distance from stack (m)	OS grid reference	
			X	Y
1	Kirkhill Road 1	751	394744	804226
2	Kirkhill Road 2	611	394929	804288
3	Kirkhill Crescent 1	471	395100	804284
4	Kirkhill Crescent 2	430	395336	804383
5	Tullos Primary School	474	395450	804442
6	Balnagask Circle	847	395881	804697
7	Burnbanks	1,884	395792	802115
8	Caravan Park	937	395006	803142
9	West Tullos Road	1,320	394199	803545
10	Clockwork Nursery	1,070	394704	803200
11	Craigpark	974	394715	803328
12	Altens Nursery	737	394776	803668
13	Wellington Road	785	394675	803838
14	Balnagask Road 1	810	394831	804492
15	Balnagask Road 2	718	395106	804599
16	Farquhar Avenue	829	395438	804797
17	Torry Academy	916	394967	804747
18	Torry Care Home	746	394876	804445
19	Torry Public Library	1,256	394866	805081
20	Beech House Nursery	772	394828	804427
21	Mansefield Place	943	395124	804853
22	Grampian Place	1,200	394562	804776
23	Balnagask Road	1,101	395777	805019
24	Abbey Place	1,167	395371	805132
25	Nigg Way	1,309	394480	803088
26	Abbotswell Crescent	1,311	394368	803227
27	Torry St Fittick's Parish	1,288	394554	804894
28	Walker Road Primary School	1,230	394658	804910
29	East Tullos Recycling Centre	105	395387	803883
30	Doonies Farm	1,214	396528	803412
31	Loirston Country Park (footpaths)	127	395532	803872
32	Nigg Bay Golf Club	1,386	396008	805236
33	Arnold Clark Volvo	738	394776	803666
34	Peter Vardy Land Rover	850	394607	804087
35	Town & County Porsche Ltd	801	394657	804088
36	Lochside Interiors	806	394657	804118
37	Carwash Greenbank Place	412	395037	803984
38	Airylea Motors	384	395065	803985
39	Car Clinic Hillview Road	695	394835	803643
40	Torry Sports Centre	1,140	394821	804919
41	Wellington Rd AQMA 1	1,064	394456	804350
42	Wellington Rd AQMA 2	1,418	394517	805037
43	City Centre AQMA	1,480	394734	805264

4.4.3 Air Quality Ecological Receptors

A total of 42 (14 Designated Sites and 28 other) discrete ecological receptors have been identified and assessed in the Air Dispersion Modelling Assessment. This assessed the predicted air quality impacts on the surrounding local environment. The receptors were identified based on their designation as follows. Special protection areas (SPAs), special areas of conservation (SACs), Ramsar sites (protected wetlands) and sites of special scientific interest (SSSIs) have been selected within 15km of the EfW while local nature sites (ancient woodland, woodland, heathland, local wildlife sites, waterbodies and watercourses, and national and local nature reserves) have been selected within 2km of the proposed EfW facility.

These receptors are presented in Table 11 and 12 as well as in Figure 8 and 9 of the Air Quality Assessment report provided as part of the application and updated in response to SEPAs Notice requiring further information. These are replicated below for ease. SEPA have determined that the identified receptors accurately represent those at risk within the immediate environment. See Section 13 (Appendix A - SEPA GIS / SE WEB – Local Designation) and Section 16 (Appendix D Nature Conservation Habitats (NCP-01) of this document by way of confirmation.

Figure 8: Ecological receptors (nearest to the EfW facility

Figure 9: Ecological receptors

Table 11: Ecological receptors

Site name	Designation	Sensitive habitats
River Dee	SAC	Freshwater pearl mussel (Margaritifera margaritifera), Atlantic salmon (Salmo salar) and Otter (Lutra lutra).
Red Moss of Netherly	SAC	Active raised bogs, degraded raised bogs still capable of natural regeneration
Cove	SSSI	Maritime cliff and slopes, supralittoral rock
Findon Moor	SSSI	Upland heathland, lowland heathland, dwarf shrub heath
Scotstown Moor	SSSI	Lowland raised bog, lowland meadows, bogs, neutral grassland
Bishop's Loch	SSSI	Lowland beech and yew woodland, upland birchwoods, upland oakwood, lowland mixed deciduous woodland, lowland mixed deciduous woodland, wet woodland, wood-pasture and parkland, upland mixed ashwoods, traditional orchards, broadleaved mixed and yew woodland
Lily Loch	SSSI	
Corby Loch	SSSI	
Kincorth Hill	LNR and LNCS	Gorse scrub, heathland, young coniferous and broadleaved woodland. Gorse/broom and willow scrub with dry heathland.
Tullos Hill	LNCS	Broadleaved woodland, rank neutral grassland, scrub, woodland, bracken, acid grassland and dry heath.
River Dee Corridor	LNCS	Breeding and overwintering birds, insect fauna. Shingle provides spawning areas for salmon.
Balnagask to Cove	LNCS	Coastal cliffs and caves, single beaches, costal and neutral grassland, dry heath and coastal heath.
Deeside Old Railway Line	LNCS	Wildlife corridor between Duthie Park and Peterculter Station consisting of grassland, tall ruderal, woodland, trees and shrubs.
City Parish of Aberdeen (Cat Cairn)	AW	Broadleaved woodland.

Table 12: Ecological receptors: discrete representative locations

ID	Receptor name	Distance from stack (m)	OS grid reference	
			X	Y
E1	Kincorth Hill	1,304	394500	803073
E2	Cat Cairn	311	395343	803676
E3	River Dee	1,190	394329	804370
E4	Tullos Hill c_0	414	395765	804235
E5	Tullos Hill c_10	414	395771	804228
E6	Tullos Hill c_50	419	395799	804199
E7	Tullos Hill c_100	430	395833	804162
E8	Tullos Hill c_200	468	395901	804089
E9	Tullos Hill b_0	87	395506	803902
E10	Tullos Hill b_10	98	395513	803894
E11	Tullos Hill b_50	138	395539	803864
E12	Tullos Hill b_100	187	395571	803826
E13	Tullos Hill b_200	287	395636	803750
E14	Tullos Hill a_0	498	395142	803576
E15	Tullos Hill a_10	500	395149	803568
E16	Tullos Hill a_50	508	395176	803539
E17	Tullos Hill a_100	524	395210	803502
E18	Tullos Hill a_200	567	395277	803428
E19	Balnagask to Cove	1,339	396618	803316
E20	River Dee Corridor	1,047	394413	804121
E21	Deeside Old Railway	1,684	393905	804639
E22	Red Moss of Netherly	13,215	386561	794188
E23	Cove	2,843	395667	801133
E24	Findon Moor	6,194	394173	797907
E25	Scotstown Moor	7,638	393580	811374
E26	Bishop's Loch	11,092	391186	814208
E27	Lily Loch	10,988	392082	814427
E28	Corby Loch	10,740	392379	814260

4.4.4 Human Health Receptors

Human receptors were selected based on the locations of maximum concentrations and deposition as identified by the IRAP model. Five areas where residential exposure may occur have been defined based on residential areas around the proposed facility. Three areas where the potential for farming exists have been defined. These includes areas to the southeast, east and the area of Loirston Country Park. For each type of receptor up to nine locations are selected based on the maximum predicted airborne concentration, maximum predicted wet deposition rate and maximum dry deposition rate for the gas phase, particle phase and particle bound phase. However, often these maxima are co-located. For the assessment, eight Residential receptors and seven Farmer receptors have been assessed.

These receptors are presented in Table 4.1 and Figure 4.1 of the Human Health Risk Assessment report provided as part of the application and updated in response to SEPAs Notice requiring further information. These are replicated below for ease. SEPA have determined that the identified receptors accurately represent those at highest risk within the immediate environment.

FIGURE 4.1 LOCATION OF THE RESIDENT AND FARMER RECEPTORS

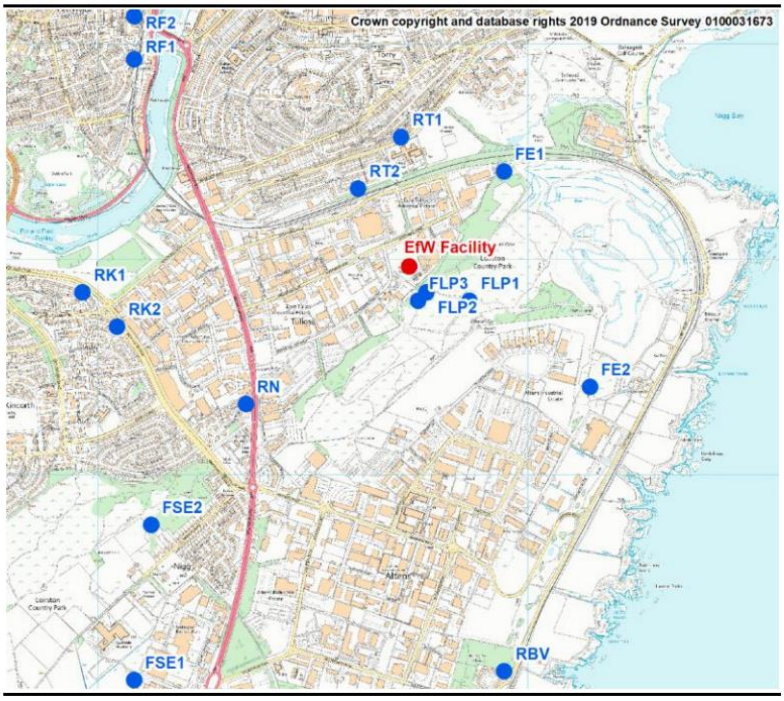


TABLE 4.1 DESCRIPTION OF RESIDENT AND FARMER RECEPTORS

Ref.	Name	Type	Easting	Northing
FE1	Farmer East 1	Farmer	395889	804408
FE2	Farmer East 2	Farmer	396289	803408
FLP1	Farmer Loirston Park 1	Farmer	395729	803808
FLP2	Farmer Loirston Park 2	Farmer	395529	803848
FLP3	Farmer Loirston Park 3	Farmer	395489	803808
FSE1	Farmer Southeast 1	Farmer	394169	802048
FSE2	Farmer Southeast 2	Farmer	394249	802768
RBV	Resident Burnbanks Village	Resident	395889	802088
RF1	Resident Ferryhill 1	Resident	394169	804928
RF2	Resident Ferryhill 2	Resident	394169	805128
RK1	Resident Kincorth 1	Resident	393929	803848
RK2	Resident Kincorth 2	Resident	394089	803688
RN	Resident Nigg	Resident	394689	803328
RT1	Resident Torry 1	Resident	395409	804568
RT2	Resident Torry 2	Resident	395209	804328

4.4.5 Noise

A total of 45 (5 principle and 40 additional) discrete receptors have been identified and assessed in the Noise Assessment report. The principal receptors are the same as those used in the planning process (Environmental Statement). In addition, a further set of residential receptors have been investigated to better assess any potential impact on the wider community.

These receptors are presented in Figures 3 and 4 of the Noise Assessment report provided as part of the application and updated in response to SEPAs Notice requiring further information. These are replicated below for ease. SEPA have determined that the identified receptors provide a good approximation of those at risk within the immediate environment.

Figure 3: Principal receptors used in the assessment

Figure 4: Additional community residential receptors

5 KEY ENVIRONMENTAL ISSUES

5.1 Summary of significant environmental impacts

Potential significant environmental impacts are as listed and are described in greater detail in the relevant sections below:

- Emissions to Air (Section 5.2)
- Emissions to Water (Section 5.3)
- Odour (Section 5.7)
- Waste Handling (Section 5.13)
- Energy (Section 5.5)
- Noise (Section 5.17)

5.2 Point Sources to Air

Information relevant to the point sources to air from the installation is provided in Section 1 (Introduction), Section 2 (Air Quality Assessment), Section 3 (Human Health Impact), Section 4 (Habitats Regulation Assessment) and associated appendices (Appendix B - Air Quality & Appendix D – HHRA) of the Emissions and Impact Report (Issue | 14 August 2019) of the Pollution Prevention and Control Permit Application. The Air Quality Assessment and Human Health Risk Assessment were updated in response to the Notice requiring further information served by SEPA on the 25 November 2020 as well as supplementary information following assessment of the responses provided.

5.2.1 - Air Dispersion Modelling

A significant issue 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 waste and standby fuel, the principal emissions from the incineration line will be oxides of nitrogen (NO_x), sulphur dioxide (SO_2), carbon monoxide, hydrogen chloride and hydrogen fluoride gases, particulate matter (PM), heavy metals, and gaseous and vaporous organic substances known as volatile organic compounds (VOCs) which may include dioxins and furans, dioxin-like polychlorinated biphenyls (dioxin-like PCBs) and polycyclic aromatic hydrocarbons (PAHs).

Overview:

This section provides a summary of the determination undertaken with the complete assessment provided in Section 15, Appendix C - Air Dispersion Modelling / Air Quality Assessment. The air quality assessment provided examines the predicted impacts (environment, human health and designated ecological receptors) from the emissions from the proposed Ness EFW Facility as well as evaluating the impact on the wider air quality in the area. The modelling has involved consideration of:

- Dispersion Model Selection (ADMS & AEROMOD)
- Pollutants of concern
- Source of emissions
- Baseline conditions

- Stack Height Assessment
- Identification and impact on receptors (Human, including a Human Health Risk Assessment HHRA, and Ecological, including deposition rates and need for Habitat Risk Assessment)
- Meteorological conditions (including the consideration of coastal effects)
- Ground conditions (Terrain, Buildings and land use)
- Air Quality Management Areas (AQMA)
- Averaging times
- Model selection impact on receptors
- Review of BAT and BAT Associated Emission Limits (BAT-AELs) with respect to Emission Limit Values (ELVs) and utilised Release Rates;
- Identification of necessary AQS/EQS/EAL

The Following scenarios have been considered:

a) Normal Operation - Short term and annual basis (based on BAT-AELs & IED ELVs); and
b) Abnormal Operation - emissions abatement system is not fully operational or failed, during start-up and shutdown and during commissioning.

A generally conservative approach has been adopted where the worst results obtained were presented. For example, on consideration of:
- Pollutant concentrations (100% of VOCs taken as benzene / PAHs taken as benzo[a]pyrene / Dust taken as PM10 and PM2.5);
- All five years of meteorological data were run with the predicted maximum concentration for the worst year reported for specific receptors;
- for normal operations all plant considered to operate continually at maximum capacity; and
- assessment based on the maximum predicted PCs and PECs.

Significance:

The predicted ground level concentrations, known as the process contribution (PC) from modelling are compared to the long-term (LT) and short-term (ST) AQALs according to the methodology in IPPC H1 to assess impact. Where necessary ambient air concentration 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 known as sensitive receptors. The IPPC H1 methodology for impact assessment of predicted ground level concentrations from emissions to air is summarised as follows:

The emission is to be considered as **insignificant** where the process contribution (PC) for:

a) Human and Ecological Receptors (Designated Sites)
   - Long Term is less than 1% of the LT environmental benchmark / critical level; or
   - Short Term is less than 10% of the ST environmental benchmark / critical level

b) Ecological Receptors (Undesignated Sites)
   - Long and Short term are less than 100% of their relevant environmental standards,

Where not screened out by the above threshold check then emissions are only **considered significant** where the predicted environmental concentration (PEC) for:

c) Human / Ecological Receptors (Designated Sites)
   - Long Term is greater than 70% of the LT environmental benchmark / critical level; or
   - PC Short Term is greater than 20% of the ST environmental benchmark

Results:

Normal Operation - No Significant Impact from any pollutant at any human or ecological receptor for long or short-term objectives.

- Human Receptors

  The assessment showed that there are no pollutants for which the long-term PCs exceed 1% of the EAL and the long-term PEC exceeds 70% of the EAL. Therefore, there are **no significant impacts at human receptors for long-term EALs.**

  For short-term objectives, the 10% threshold was not exceeded for any of the pollutants. Therefore, there are **no significant impacts at human receptors for short-term EALs.**

- Ecological Receptors

  All the undesignated sites have a short-term and long-term PC of less than 100% of the short-term and long-term environmental standard, respectively. Therefore, there are **no significant impacts at non designated ecological receptors**.

  For designated receptors (River Dee), all emissions with the exception of the NOx 24-hour mean, are below the screening threshold of 10%. The NOx 24-hour mean PC is 15% of the short-term standard and PEC (assuming worst case background) would be calculated as 111% of the EAL. Where a more realistic approach to determining background concentration is taken (See Section 11 – Sensitivity Analysis for NO_2), then the PEC would be 60-71.7% of the standard. Furthermore, The River Dee (SAC) and Cove (SSSI) are not sensitive to nutrient nitrogen deposition nor acid deposition. For those ecological receptors sensitive to nutrient nitrogen deposition the maximum impact was predicted at Findon Moor (SSSI) where the PC was predicted to be 0.19% of the CL. **At ecological receptors there are predicted to be no significant impacts.**

Abnormal Operation - No Significant Impact from any pollutant at any human or ecological receptor for short-term objectives.

Abnormal operation only considers Short Term impacts due to the nature and duration of upsets before the plant is shutdown and has been confirmed to include consideration of commissioning emissions as required by Q21 b) of the Notice requiring further information.

5.2.2 – Stack Height

Appendix E (Stack Height Assessment) to Air Quality Assessment Report contains the results of the stack height assessment carried out by the applicant. This original assessment was revised in response to the Notice requiring further information issued on the 25/11/20 (Question 22), received on the 28/07/21. Following assessment of the response, supplementary information was required on the 04/11/21 and following a meeting on the 08/11/21 a revised Appendix E - Stack Height Assessment was received on the 15/11/21. Section 3.2 of the revised report addresses the specific points raised by SEPA.

All aspects of the assessment and modelling methodology have been kept the same as that described in the main air quality assessment report and so examines a worst case predicted emission. Pollutants for use in the assessment were selected on consideration of maximum predicted Process Contribution on a short-term and long-term basis as well as on the local declared, Aberdeen City Council AQMA as a result of exceedances of the annual and short-term objectives for NO_2 and PM_{10}.

The predicted maximum ground level NO_2 and PM_{10} concentrations for the proposed stack have been assessed for stack heights between 50m and 140m, to select an appropriate stack height. The results show that the PC decreases with increased stack height for the pollutants considered.

NO_2 (Annual mean): Point of maximum impact (Table 8, Figure 2 & 3).

- The PC is predicted to be insignificant (<1% of the EAL) at stack height of 100m.
- The PEC is predicted to be insignificant (<70% of the EAL) at a stack height of 60m.
- The 'Knee point' on predicted maximum ground concentration for PC and PEC is at a stack height of 60m. This is the point where there is a clear change in the slope of the graph line on the plat of stack height was ground level concentration.

NO_2 (Hourly mean 98.08th percentile): Point of maximum impact (Table 9 & Figure 4)

- The PC is predicted to be insignificant (<10% of the EAL) at stack height of 90m.
- The PC is predicted to be insignificant (<20% of the EAL) at a stack height of 80m.
- 'Knee point' on predicted maximum ground concentration – not clearly defined.

PM_{10} (Hourly mean 99.79th percentile): Point of maximum impact (Table 10 & Figure 5)

- The PC is predicted to be insignificant (<10% of the EAL) at stack height of 60m.
- 'Knee point' on predicted maximum ground concentration – not clearly defined.

On assessment of costs (Figures 6 to 11 inclusive), a stack height of 60m (annual mean NO_2) and 70m (NO_2 hourly mean (99.79th percentile) & 24-hour mean PM_{10} (98.08th percentile)) are identified as the most cost effective option.

The applicant has concluded that results of the stack height assessment and cost benefit analysis suggest than an 80m stack represents BAT for this site. On consideration of information within this assessment as well as within the wider application.

The Air Quality Assessment has been reviewed by SEPAs Air Modelling experts and all issues identified considered to have been resolved. SEPA considers that a stack height of 80m will ensure no predicted significant impact from any pollutant at any human or ecological receptor for long or short-term objectives and this has been determined to represent BAT.

5.2.3 – Human Health Risk Assessment (HHRA)

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 (now Public Health England) and Health Protection Scotland is that the damage to health from waste incineration plants is likely to be very small and probably not detectable.

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 Human Health Risk Assessment (HHRA). This has been provided in Appendix D of the Emissions and Impact Report (Issue | 14 August 2019) of the Application and a revised Human Health Risk Assessment submitted in response to Q24 of the Notice requiring further information

This has been assessed by SEPAs Human Health Specialist with the assessment conclusions provided in Section 21, Appendix I Human Health Risk Assessment (HHRA). As for the dispersion

modelling study, the HHRA assumed the worst-case operational scenario with all pollutants emitted at ELVs with additional comparison made to impacts at 'typical' emission rates for group 3 metals. 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**.

5.2.4 – Global Warming Potential (GWP) & Photochemical Ozone Creation Potential (POCP)

The Photochemical Ozone Creation Potential for the facility was assessed as being 909.44 tonnes per year, based on the NOx, SO_2 and BaP emitted in the flue gases and the GWP of the operation of the facility was assessed as 136,252.62 tCO2-e/year, based on direct carbon dioxide emissions from the combustion of waste fuel and indirect carbon dioxide emissions from indirect energy use (imported electricity).

The calculation provided does not account for any electricity or heat exported from the site or avoided emissions which would have occurred from the disposal of the waste in a landfill, or from other alternative methods of waste treatment and is therefore considered to be a conservative assessment of greenhouse gas emissions associated with the operation of a thermal treatment facility.

5.2.5 – Plant and Abatement Design

See Section 5.21 Consideration of BAT below for discussion on proposed plant design abatement techniques to be employed.

Permit: Standard Conditions (fixed emissions points, monitoring & submission requirements, quantification of emissions, setting of ELV's) have been included. A series of additional Conditions (Schedule 9) requiring environmental monitoring of dioxins and furans and dioxin-like PCBs and heavy metals in soil, fine particulate matter (PM_{10} and $PM_{2.5}$) in ambient air. See also Section 5.7 Odour for further detail. Compliance with Condition requirements will be confirmed during commissioning and reviewed on inspection.

Considered to be BAT

5.3 Point Source Emissions to Surface Water and Sewer

Information relevant to the point sources to water from the installation is provided in Section 1 (Introduction) and Section 6.1 (Water) and associated appendices (Appendix A - Site and Drainage Plans) of the Emissions and Impact Report (Issue | 14 August 2019). As well as Section 3.2 (Abatement of Point Source Emissions to Surface Water and Sewer) of the supporting Technical Report.

The facility has been designed to segregate different effluent streams as far as possible in order to allow for their reuse within the Installation and ensure that any resultant stream is treated in an appropriate manner. The waste water streams identified are:

1. **Foul Water Drainage** - Foul water from toilets and sinks within the admin block and gatehouse will be collected and discharged to the Scottish Water combined sewer system. These activities are not considered to be part of the permitted Installation and are therefore not considered for control under the Permit.

2. **Process Waste Water** - The facility has been designed to minimise water consumption and maximise reuse of waste water within the process. This includes provision for the collection, storage, distribution, and reuse of produced water and run off from potentially contaminated site areas in order to minimise water consumption and meet the design criteria of a zero liquid discharge. This is achieved through the use of an oil interceptor, collection in a 100m^3 wastewater pit, slag extractor cooling and collection in a 150m^3 process water pit. The collected water is used as conditioning water, for the acid gas treatment reagents or in the IBA extractors as quench water. As there is no aqueous stream from FGC and no treatment of slags or ashes is proposed or permitted at the Installation, IBA will be exported from the facility for treatment at another appropriately permitted site. No discharge of process wastewater from the facility has been identified.

3. **Surface Water** - The surface water drainage system collects run-off from areas where there is minimal risk of surface waters becoming contaminated by waste or other materials (roofs, site road hard standing etc.). Where possible water is reused within the process such as from roof water harvesting. The remaining surface water is collected and treated in a Sustainable Urban Drainage System (SUDS) system before being discharged to the East Tullos Burn culvert, which runs under the western boundary of the site, via a final isolation valve that will automatically close in the event of a fire or a breach of the water discharge ELVs, for Conductivity and Total Organic Carbon, set in the Permit.

The only identified point source emission to water is therefore the low-risk surface water being collected and treated in a SUDS system comprising of an oil interceptor, a vortex separator, a storm water basin (retention pond) equipped with an isolation valve, an abatement flood pond (retention basin) and discharge to the east Tullos Burn Culvert via a final isolation valve that will automatically close in the event of a fire or breach of a pre-set discharge parameter;

The assessment of the site drainage systema including the SUDS system was carried out in conjunction with a local water officer experienced in the regulation of the water environment.

On the 22 October 2020, the applicant confirmed a proposed design change to the surface water drainage and associated SUDS system. Following discussion and request for clarification from SEPA a Technical Addendum (IDOM Report, SUDS comparison: approved layout and what is now proposed in terms of numbers of treatments, and the mitigation indices relative to the hazard indices, Reference: 20200930001/JR R1, dated 03/02/21) was received on the 22/04/21.

The addendum identified a potential pollution risk from the adjacent land stating:

'it has become apparent that the adjoining land may pose a pollution risk via contaminated groundwater. The groundwater has the potential to weep through a retaining wall along the boundary of the site and contaminate the new surface water.'

Before confirming that

'An agreed solution to this potential contaminated ground water issue has now been provided by way of a perimeter drain which would intercept any groundwater and would lead to a closed, holding manhole. For the avoidance of doubt, this perimeter drain would be completely separate to the rest of the normal site drainage'

And

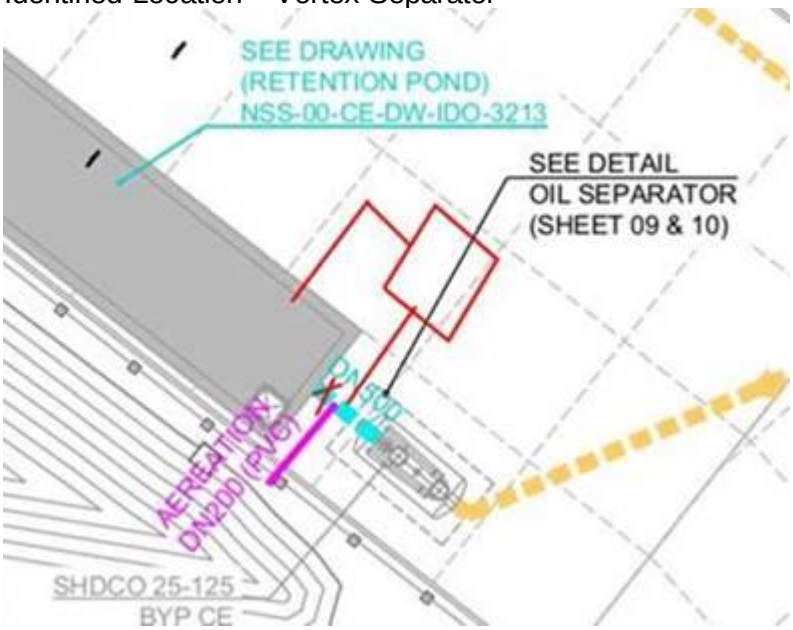
'*Due to spatial constraints, and to avoid the risk of cross contamination between the off-site pollution control perimeter drain and the on-site surface water, it has become necessary to remove the approved perimeter filter drain. The effect on the SuDS mitigation indices is demonstrated in*

the attached re-assessment. The reassessment shows that the SuDS elements alone do not meet the requirement with a shortfall of 0.3 for TSS, Metals and Hydrocarbons.'

The acceptance of a lower level of SUDS treatment, identified as not meeting the required standard, for what is an unqualified risk from a potential offsite source without presenting a robust justification was not considered to be credible. Further justification for the proposed change and information relating to the potential risk from the wider drainage system and the site water balance was therefore sought.

Following further discussions and the submission of further supporting information, it was confirmed that the inclusion of the off-site pollution control perimeter drain was a contractual requirement for NESS and that reduction in the SUDS system was due to 'the available space for trucks circulation, as it is not feasible to reduce the roads width' (Clarification statement received via e-mail 24/11/21). It was subsequently agreed that an additional proprietary treatment stage in the form of a vortex separator would be installed after the oil separator [Ref. discussions and further information received between May-December 2021 including the following: NSS-00-PM-AN-ACC-0004, Ness Drainage System Clarification document, dated 02/07/21 received on the 17/08/21; Clarification statement received via e-mail 24/11/21 and diagram depicting final design proposal in the e-mail dated 22/12/21 – see below]

Identified Location – Vortex Separator



It is deemed that an appropriate level of segregation of wastewater streams has been achieved in order to reduce emissions to water, allowing for reuse within the process, and to ensure an appropriate level of treatment takes place prior to discharge. The level of SUDS proposed for the EfW facility, with the inclusion of the additional vortex separator, is deemed by SEPA to be appropriate and to represent BAT.

Permit Consideration:

Emission Limit Values (ELVs) have been set (Table 7.1: Emissions to Water/Sewer ELVs) and are discussed further in Section 10 below. Condition 7.5.7 requires the operator to ensure that all surface water drainage systems, oil interceptor systems and SUDS are operated, inspected and maintained so as to be fit for purpose. For those aspects not covered by the Condition, the design, management and maintenance of the drainage systems will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques. The implementation,

management and adequacy of the described drainage systems will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.4 Point Source Emissions to Groundwater

Information relevant to the point sources emissions to groundwater from the installation is provided in Section 6.1 (Water) of the Emissions and Impact Report (Issue | 14 August 2019). As well as Section 3.3 (Point Source Emissions to Groundwater) of the supporting Technical Report.

There are no direct discharges (point source emissions) to ground and groundwater of List I & II substances or any other site substance. Accidental discharges are not considered as point sources and steps to minimise probability and consequence of a loss of containment incidents are dealt with in sections 5.8 (Management) and 5.16 (Accidents and Their Consequences) below.

- Subsurface structures, sumps and tanks will be made from concrete specified to appropriate standards with design life of 50 years, fitted. A non-tracking tanking membrane (sheets of water-proof material are applied to walls and floors either above or below ground) will be used to prevent water ingress through substructure slabs, including sumps.

- Drainage routing plans will be maintained and the drainage system and surfaces will be inspected regularly for signs of damage or deterioration and repairs will be scheduled as necessary, in line with a defined preventative inspection and maintenance programme.

Permit: Standard Conditions (fixed emissions points, no discharge to ground or groundwater, prevention of spillages, monitoring and recording of groundwater sampling. See in particular Schedule 7.6 (Protection of Soil and Groundwater) of the draft Conditions.

Considered to be BAT

5.5 Fugitive Emissions to Air

Information relevant to the fugitive emissions to air from the installation is provided in Section 1 (Introduction) and 6.6 (Fugitive Emissions) of the Emissions and Impact Report (Issue | 14 August 2019). As well as Section 3.4 (Control of Fugitive Emissions to Air) and associated appendices (Appendix B1 – Fugitive Emissions Risk Assessment and Appendix B2 – Accident Risk Assessment) of the supporting Technical Report.

The applicant has carried out a comprehensive review of the design of the proposed NESS EfW Facility in order to identify all potential fugitive emissions to air from the plant and the appropriate mitigation measures required to minimise their release. The sources and techniques identified include:

- Vehicles transporting materials to and from the facilities will be appropriately covered or have enclosed containers to minimise fugitive emissions of dust from vehicles.

- Operations that have the potential to give rise to dust emissions will take place within enclosed buildings. This includes the tipping of waste into the waste storage bunker, the handling and loading into vehicles of residual materials from the combustion process including IBA and APCr and the delivery of treatment reagents and the loading of these materials into storage.

- Primary combustion air for the NESS facility will be drawn from the waste bunker area to maintain negative pressure and ensure capture of potentially odorous room air. See Section 5.7 for full details of odour control.

- Additional bunker management procedures, including fast acting roller shutter doors and the inclusion of a daily clean down of the waste reception areas, will minimise the release of litter and dusts.

- Tanks/Silos will be fitted with suitable emission control systems (dust filtration, high level alarms, overfill protection, filled via closed couple delivery pipe connections etc.) that will be appropriately inspected, managed and maintained (covered by the preventative maintenance programme).

- Emergency response procedure in place with trained personnel, equipped to enact containment and clean up measures in the event of a spill/loss of containment.

The identification of potential fugitive releases to air is considered to be robust and the techniques described in order to minimise their release in terms of the proposed design are determined to represent BAT.

Permit: Standard Conditions (fixed emissions points, requirement for an odour management plan, and requirement for a dust management plan, see Schedule 3.6 (Dust Conditions)). The management, performance and maintenance of the proposed EfW facility including those aspects designed to mitigate against fugitive releases to air, where not covered by a specific Condition, will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques, systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.6 Fugitive Emissions to Water

Information relevant to the fugitive emissions to water from the installation is provided in Section 1 (Introduction), 6.2 (Water) and 6.6 (Fugitive Emissions) of the Emissions and Impact Report (Issue | 14 August 2019) and in Section 3.5 (Fugitive Emissions to Surface Water, Sewer and Groundwater), 5.1 (Raw Material Selection), 6.2 (Incinerator Bottom Ash Handling), 6.3 (Fly Ash and Air Pollution Control Residues Handlin) and associated appendices (Appendix B1 – Fugitive Emissions Risk Assessment and Appendix B2 – Accident Risk Assessment) of the supporting Technical Report.

The applicant has carried out a comprehensive review of the design of the proposed NESS EfW Facility in order to identify all potential fugitive emissions to water from the plant and the appropriate mitigation measures required to minimise their release. These sources and techniques identified include:

- All surfacing will be impermeable and designed to standards appropriate to their proposed use and regularly inspected as part of the preventative inspection and maintenance programme.

- All surfacing under operational areas where there is potential for contamination slopes to the sites sealed drainage which discharges to the wastewater tank. This prevents any contamination from these areas leaving the site as surface water and instead is reused within the process. See Section 5.3 of the document for further detail.

- Leak detection to be installed on the wastewater and process water tank, which will initiate interlocks to stop flows into the respective tank and generate alarms in the central control system. Subsurface storage tanks will include level control and alarms for the continuous operation of the system (process control).

- The surface water drainage system collects run-off from areas where there is minimal risk of contamination for reuse within the process or for treatment in a Sustainable Urban Drainage System (SUDS) system before being discharged to the East Tullos Burn culvert. See Section 5.3 of the document for further detail.

- The majority of process equipment / structures are located inside fully enclosed buildings so contact with surface water, groundwater and soils is prevented.

- Drainage routing plans will be maintained, and the drainage system and surfaces will be inspected regularly for signs of damage or deterioration and repairs will be scheduled as necessary, in line with a defined preventative inspection and maintenance programme.

- All surfacing and areas which are required to contain liquids or provide bunding will be the subject of regular inspections and maintenance, set out in a preventative maintenance programme.

- Tanks/Silos will be fitted with suitable emission control systems (dust filtration, high level alarms, overfill protection, filled via contained and closed couple delivery pipe connections etc.) that will be appropriately inspected, managed and maintained (covered by the preventative maintenance programme).

- IBA will be handled inside the IBA storage hall which will have impermeable concrete flooring and Arco-type drainage channels across the centre of the hall and across the two vehicle entrances will capture any water run-off from the IBA. The IBA will be loaded into open-top bulk haulage vehicles within the hall. The vehicles will be sheeted prior to leaving the hall, to prevent fugitive emissions. The loading of the IBA will be monitored by an operator and cleaning equipment will be available for cleaning up any IBA spills.

- All IBCs, drums and bags will be stored on-site within appropriate containment, with spill and clean up kits made available close by.

- Emergency response procedure in place with trained personnel, equipped to enact containment and clean up measures in the event of a spill/loss of containment.

<u>Bunding (Urea and Fuel Oil)</u>

The application description for the bunding arrangements serving the Urea and Fuel Oil (diesel) tanks on site was inconsistent confirming in different parts of the application that:

'The appropriate storage and containment measures for each material will be taken, to avoid any fugitive emission of stored materials. This will include bunding of liquid storage tanks, to 110% of the volume of the largest tank or 25% of the total volume of multiple tanks (whichever is greatest)'

And with reference to the urea and fuel oil tanks:

'This will consist of a double skinned tank with leak detections between the skins.'

Following clarification from the applicant that they did not intend to have an additional bunded area, SEPA confirmed on the 05/11/2020 that 'BAT would generally be regarded as tanks with a pollution potential to be bunded (separate bund wall as opposed to double skinned) to an appropriate recognised standard dependant on contents.'. Following further discussion, supplementary information relating the design and operation of these tanks was received on the 19/01/2022. This included an assessment of risk and associated mitigation measures adopted as well as how any loss of containment would be captured within the wider drainage system (tertiary containment).

The provided information confirms that the tanks are double skinned, fitted with overfill protection and leak detection between the skins (Diesel Tank provided with a level switch with the Urea tank provided with a pressure switch) which on activation will sound an alarm, stop the pump serving the waste water pit, thus retaining the spill in the waste water pit as well as automatically closing the discharge valve to the culvert. Further confirms that all spillages will be captured and contained within the wider drainage system with sufficient capacity to contain any loss from the tanks.

On consideration of the risks presented by a loss of containment event from these tanks, the included mitigation measures described and the provision of adequate tertiary containment as well as on consideration of the limited space available on this area of site and the benefits of locating the tanks to avoid long pipe runs, SEPA has determined that the proposals as described are considered to represent BAT.

The identification of potential fugitive releases to water is considered to be robust and the techniques described in order to minimise their release in terms of the proposed design are determined to represent BAT.

Permit: Standard Conditions (fixed emissions points, Condition 4.4.3 and 4.4.4 as well as Schedule 7.5 (Surface Water Control, Drainage and Surfacing) including Condition 7.5.8 for the use of the wider containment on site.). The management, performance and maintenance of the proposed EfW facility including those aspects designed to mitigate against fugitive releases to water will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques, systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.7 Odour

Information relevant to the emissions of odour from the installation is provided in Section 1 (Introduction), 2 (Air Quality Assessment), 6.6 (Fugitive Emissions) and associated appendices (Appendix B1 - Air Quality Assessment) of the Emissions and Impact Report (Issue | 14 August 2019). As well as Section 2.1 (Municipal waste and raw material management), 2.1.3 (Odour), 3.6 (Odour) and associated appendices (Appendix B1 – Fugitive Emissions Risk Assessment and Appendix B2 – Accident Risk Assessment) of the supporting Technical Report.

Odour Prevention/Mitigation

The potential sources of odour and the techniques identified to minimise the generation of odour and avoid the release of fugitive odour include:

a) Waste Delivery

- All incoming waste will be delivered by enclosed road vehicles which are suitable for bulk transfer of waste. The waste reception area will be a fully enclosed building.

b) Waste Bunker

- The waste bunker room will be an enclosed area separated from the rest of the building. Containment will be achieved by bunker to ceiling walls and fast acting doors on the waste tipping chutes, that will only be opened when waste is tipped from delivery vehicles into the bunker.

- The waste bunker will be maintained under constant negative pressure with suction duct located at ceiling level extracting the room air to provide the combustion air feed to the furnace at a rate of 48,660 Nm^3/h at Design Load Point. The air flow into the waste bunker room will enter via the tipping chutes during tipping and through leakage around the doors when they are not in use, avoiding the movement of odours from the bunker room into the tipping hall.

- Implementation of a Bunker Management Plan will ensure adequate mixing of the waste in the waste storage bunker so as to prevent the generation of odour from the build up from anaerobic conditions as well as even distribution an processing of wastes.

c) Waste Reception Area

- While representing a lower risk than the waste bunker, the tipping activity into the bunker and the potential short-term storage of quarantined waste within the reception building still identified as a potential risk of odour emissions.

- The waste reception building will be contained with fast acting doors on the two vehicle access openings and all person access doors will be kept closed. The reception building will also be maintained under constant negative pressure with the air within the reception building being extracted, via the tipping chute into the waste bunker room. This will create a pressure differential with tipping hall in effect acting as an air lock to the waste bunker.

d) Normal Operation

- During normal operation emissions from the process will be released from the main stack. The Industrial Emissions Directive (IED) requires that any combustion gases passing through a waste incineration plant must experience a temperature of 850°C or more for at least two seconds. Due to the combination of the high temperature/residence time most odorous chemicals will be destroyed. Any surviving odorous chemicals may become trapped on the bag filters. The flue gases from the waste treatment/energy recovery process will be emitted from an 80 meter high stack with any residual odour achieving good dispersion.

e) Planned and Unplanned Shutdown

- When the combustion unit is not available in the event of planned and unplanned outages, the waste bunker will be isolated from the remainder of the building and an extraction system will capture air above the bunker. The extracted air will be passed through a secondary odour abatement (Deodorization) system consisting of an appropriately sized carbon filtration unit (odour absorption system) to remove the odour prior to the discharges

from a discharge vent. In the application documents the carbon filter was to be positioned on the ceiling of the tipping hall. This unit is now to be located at ground level and served by a separate stack. This will improve access for maintenance and carbon bed changes.

- The quantities of waste within the waste bunker will be run down prior to periods of planned maintenance with the normal shutdown period for maintenance lasting for around 2 weeks (336 hours) in any given year. Some smaller outages, unplanned stops or blockages can be accommodated with the combustion plant and primary air fan in use.

- The air extraction rate through the carbon filter will match the extraction rate during full operation of the combustion process. The carbon adsorption system will remove the extracted air and discharge to the atmosphere via a carbon filter.

- Two weeks before planned maintenance the carbon filter will be tested to ensure it is functioning normally and providing adequate time to prepare if not. This will be done via the continuous monitoring system testing the differential pressure across the filter.

- In the event that odour is detected outside of the facility, during the routine odour self-monitoring (i.e. the sniff test), then the secondary abatement (activated carbon filtration) system can be used to increase the quantity of air extracted from the waste storage bunker room and treated prior to discharge. This would be in an exceptional situation and only operated on an 'if and when needed' basis.

f) Emergency Shutdown

- In the event of an emergency requiring the immediate shutdown of the entire plant (loss of site wide power) the design of the plant is such that only plant essentials will be maintained to enact a safe shutdown as quickly as possible. This is the only time where there will be no odour abatement (primary or secondary) provided to the site. Such scenarios are expected to be very infrequent and are expected to last less than 2 hours in duration. On completion of the shutdown, it will be possible to start the secondary odour abatement plant either from the reestablishment of power to the site or the through use of the Emergency Diesel Generator.

g) Management and Monitoring

- The site will have an Odour Management Plan which will set out who is responsible for managing odour effects and it will include documented procedures for routine monitoring of off-site odour

- Odour will be monitored daily by routine odour self-monitoring in line with the SEPA Odour Guidance 2010, and recorded on the Plant Check/Shift Record sheet. The facility's back pressure on the carbon unit will also be monitored to help avoid odour breakthrough.

Impact Assessment and Design Changes

During determination and detailed discussions with the Applicant it became evident that as well confirmation of the issues identified by SEPA, further changes to the design of the proposed installation had been made with the potential to impact on the emission of odour from the proposed facility. These changes primarily related to the secondary odour abatement system. The assessment of odour impact from the secondary abatement plant consisted of a qualitative assessment concluding that the impact of odour was likely to be small, assuming that odour is

minimised at source by use of good bunker management procedures and is controlled through the application of Best Available Techniques (BAT).

SEPA issued a Notice requiring further information on the 25 November 2020. Question 25 of the Notice required the submission of a revised Odour Impact Assessment including confirmation of the design, operation and location of the secondary odour abatement system as well modelling of odour release from this system.

Detailed dispersion modelling was provided on the 25/07/21 to quantify the impact associated with the release of potentially odorous air from the secondary odour abatement system. This has been carried out using CALPUFF. It has been assumed that the odour extraction system from the facility is continually operating however as described above the odour extraction system will only operate when the combustion plant is offline. For planned outages this will be for a period of around 2 weeks (336 hours) in any given year. Assuming the odour extraction system continually operates will ensure that the model captures the operation of the odour extraction system during the worst-case atmospheric conditions for dispersion and can be compared against guideline benchmark values.

The results of the modelling have been compared to the odour exposure criteria set out in the H4 Odour Management Technical Guidance and SEPA Odour Guide, which provides benchmark levels that indicate the likelihood of unacceptable odour pollution. The benchmarks are based on the 98th percentile of hourly average concentrations of odour modelled over a year at the site/installation boundary. The benchmark for most offensive odours was selected at an odour concentration of 1.5 ou/m^3 and is considered as the target to be met at the site/installation boundary.

Figure 6.2 – Contour Plot 98th percentile

The results are presented in Fig 6.2 of the report and show that the level corresponding to 1.5 ou/m^3 is located on the facility. Likewise, level corresponding to 1 ou/m^3 (point of detection) extends

up to a maximum distance of 50-60 m from the boundaries of the facilities, without affecting inhabited sites.

SEPA identified areas of concern for clarification including:

- Justification for the use of the CALPUFF model. While identified in H4, it is recognised as USEPA medium range model puff model which is being used here for a near field impact assessment. While aware of its use elsewhere SEPA has never seen this model used for an odour assessment previously. Recommended to also carry out an ADMS study into odour.
- Use of meteorological data with evident differences with that used in the Air Quality Assessment model;
- Presentation of results to relate to sensitive receptors, with extended contour plots scope and coverage and presentation of 100th percentile to allow an understanding of potential significance of emissions.

Further information was provided on the 12 and 25/11/21

Contour plot presenting 100th percentile (CALPUFF)

Contour Plot 98th percentile – Increased Contour Definition (CALPUFF)

While some of the issues identified have been resolved SEPA continues to have concerns over the justification for the use of the CALPUFF model. While aware of its use elsewhere for odour assessment SEPA has never seen this model used. These concerns are mitigated by the fact that plant will only be called upon for a limited duration. SEPA have required that a confirmatory ADMS study into odour be carried out under Condition 2.8.6 and 2.9.2 j).

The identification of potential sources of point source and fugitive emissions of odour is considered to be robust and the techniques described in order to minimise the generation of odour and then abate their release in terms of the proposed facility, when taken into account with the further confirmation sought by the included draft Conditions, are determined to represent BAT.

Permit: Standard Conditions (fixed emissions points, an odour management plan as well as Schedule 3.2 (Odour Conditions) including Condition 3.2.1 no offensive odour outside the site boundary). In addition to standard Conditions requirement to confirm that significance criteria to be met through odour modelling and monitoring (Condition 2.8.6, 2.9.2 i) and j)). The management, performance and maintenance of the proposed EfW facility including those aspects designed to mitigate against fugitive releases of odour will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques, systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.8 Management

Information relevant to the management of the installation is provided in Section 4 (Management) and associated appendices (Appendix C – Management) of the supporting Technical Report.

The wider organisational commitment to an accredited EMS is demonstrated through the discussion and inclusion of the ISO 14001 certification for both the parent company (Acciona Industrial SA) and proposed operating company (Indaver) (Appendix C2.1 &2.2 respectively). A site-specific Environmental Management Plan is to be developed for the Aberdeen NESS EfW facility drawing on the experience of the systems identified above and appears to include the key features required.

The PPC application describes the management techniques proposed not only in Section 4 where there is an overarching description of the system proposed (policies, procedures, organisational structure, staffing, competence and training, accidents, incidents, non-conformances etc.) but also when describing the techniques employed to address each of the key environmental issues as described in this section of the Decision Document. While not yet accredited the key elements of the EMS are evident and in line with those required by indicative guidance as detailed in UK Technical Guidance, s5.01 Incineration of Waste and Fuel Manufactured from or Including Waste and the Best Available Techniques (BAT) Conclusions for Waste Incineration. Refer also to Section 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc) and determination comments against BAT 1 – Management.

The proposed Energy from Waste facility is defined as a Specified Waste Management Activity under the PPC Regulations. The Operator is therefore also required to meet the Fit and Proper Persons (FAPP) test. The FAPP test requires the Operator to demonstrate technical competency, adequate financial provision is in place, that they have no relevant convictions and that there is valid Planning Permission for the proposed activity. This is described in Section 10 of the Administrative Decision Document, DD-01 and SEPA is satisfied that these requirements have been met with the financial provision and required Parent Company Guarantee being agreed by SEPA and finalised on the 16/02/2022.

The use of an accredited EMS appears well established within the organisation and the aspects described match with that expected from indicative BAT requirements indicated in both the BREF and UK Technical Guidance Note and are determined to represent BAT.

Permit Consideration:
Generally no specific Conditions relating to the overall management or maintenance of the Installation have been considered necessary with reliance placed on the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques' to be sufficient in ensuring the necessary overarching systems / procedures etc. are in place, maintained and adhered to. Conditions capturing the need for specific managements plans in relation to some aspects with the potential to impact on the immediate surrounding environment (including for Odour, Noise, Accidents, Other than Normal Operating Conditions (OTNOC) etc.) or maintenance of some specific systems have been deemed necessary and included within the Permit. The adequacy of any EMS put in place, adherence to it, compliance with those aspects captured within the Permit and any potential for improvement will be assessed both through the commissioning phase as well as through ongoing inspection.

5.9 Raw Materials

Information relevant to the raw materials employed on the Installation is provided in Appendix D1 – H1 Assessment of the Emissions and Impact Report (Issue | 14 August 2019). As well as Section 2.1 (Municipal waste and raw material management) and 5 (Raw Materials) of the supporting Technical Report.

The proposed NESS Energy from Waste Facility is designed to incinerate and recover the energy from non-hazardous, source segregated, municipal solid waste (MSW) and commercial and industrial (C&I) waste streams of a similar nature.

The main raw material is therefore 150,000 tonnes of residual waste delivered to site each year in fully enclosed vehicles. The waste will have had the majority of recyclable material removed, further recovery is either technically or economically unviable. The source segregated MSW is to be sourced from the Aberdeenshire, Moray and Aberdeen City local authority areas with all three of the local authority schemes having received approval from SEPA.

No waste shall be accepted in the Permitted Installation other than the wastes specified in Table 4.1 (Permitted Waste Types) of the draft Conditions and subject to the limitations and exclusions applicable to each waste type described. On determination of the permitted waste types consideration has been given to the nature of the waste (i.e. only solid waste to be accepted / potentiality odorous/putrescible etc.), whether there is an associated mirror entry for the waste type (i.e. a additional management controls needed to ensure no acceptance of hazardous waste), other viable disposal routes (only to be accepted where material is not capable of being directly recycled) and the capability of the plant to treat the waste type in question. See Table 4.1 for full details.

Summary of Significant Raw Materials are detailed in the below table. Various other raw materials will be used in smaller quantities (operational and maintenance purposes) but are not detailed in this document. Storage and containment measures are described in Section 5.6 (Fugitive Emissions to Water) of this decision document.

Raw Material (Significant)	Maximum Quantity Stored on Site	Annual Throughput	Description
MSW	8,700 tonnes	150,000 (tonnes/year)	Waste feed to EfW
Light fuel oil	87 m^3	110 (tonne/year) Variable	Used for plant start-up, shut-down or to maintain temperature requirements
Urea 40% solution	63 m^3	936 (tonnes/year)	SNCR - NOx abatement reagent
Water	Variable	37,760 m^3/year	Feedwater required to run the boiler (demineralisation unit)
		45,760 m^3/year	Domestic / drinking water and service / firewater tank
Ammonium hydroxide 25%	Non Bulk	24 (tonnes/year)	Feedwater alkalisation (steam condensate system)
Sodium Phosphate	Non Bulk	15 (tonnes/year)	Feedwater alkalisation (steam condensate system)
Hydrated lime solution	120 m^3	2,720 (tonnes/year)	APC/FGC reagent used for flue gas cleaning
Powdered activated carbon	50 m^3	76 (tonnes/year)	APC/FGC reagent used for flue gas cleaning

Raw material consumption to be controlled through process optimisation and review. Refer also to Section 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc)

Permit: Standard Conditions (record raw material usage annually and to require a 4 yearly review of resource utilisation to identify methods of reducing raw material consumption as well as Schedule 4.1 (Permitted Types of Waste), 4.2 (Permitted Quantities of Waste) and 4.3 (Waste Acceptance)). Raw material use and process optimisation will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques, systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.10 Raw Materials Selection

Information relevant to the raw materials employed on the Installation is provided in Section 2.1 (Municipal waste and raw material management), 3.1 (Abatement of Point Source Emissions to Air) and 5 (Raw Materials) of the supporting Technical Report.

Limited scope for the selection of the main raw material (residual waste in the form of source segregated MSW is to be sourced from the Aberdeenshire, Moray and Aberdeen City local authority areas) as the NESS EfW is contractually required to accept this waste. Furthermore, any commercial and industrial (C&I) waste streams have to be of a similar nature, fall within the permitted waste types described in the draft Conditions and constitute a much smaller fraction of the overall wase accepted at site that the MSW stream.

With respect to other raw material selection the application confirms in Section 5.1 of the supporting Technical Report that the list of raw materials and the record of their use will undergo a regular review to ensure that consumption is optimised and that opportunities for reduction of use are implemented through the EMS. The procedures for the selection and regular review of raw materials will also be incorporated into the EMS. The selection criteria set out in Sector Guidance Note IPPC S5.01. Specific details on the selection of the reagents to be used for the treatment of the combustion emissions are provided under Section 3.1 (Abatement of Point Source Emissions to Air) citing concerns over safety for the selection of urea over ammonia for example.

Permit: See section 5.10 above. Raw material selection to be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.11 Waste Minimisation Requirements

Information relevant to the raw materials employed on the Installation is provided in Section 2 (In progress Control), 5 (Raw Materials), 6 (Waste Handling) and 7 (Waste Recovery and disposal) of the supporting Technical Report.

Section 2 describes the operation and optimisation of the combustion process to minimise the residual waste during operation, start up and shut down while Sections 5, 6 and 7 describe the proposed materials and waste management practices. The techniques described include:

- Feed-stock homogeneity. The homogenisation process helps to reduce the risk of rapid variation in the calorific value of waste entering the combustion process and any variance in concentrations of the resultant acid gases from combustion. This enables better optimisation of the combustion process 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.

- Optimisation of combustion conditions. This can be achieved by optimising waste feed rates and air flows to achieve burn out requirements for Total Organic Carbon of Loss on Ignition of less than 3% and 5% as dry weight respectively in IBA (bottom ash).

- Optimisation of dosing of lime (calcium hydroxide $Ca(OH)_2$), is achieved through continuous monitoring of the incoming concentrations of hydrogen chloride (HCl) and sulphur dioxide (SO_2) to calculate the amount of lime required to reach the emission targets. In addition, the partial recirculation of residues from the bag filter to the reactor tower minimises fresh lime consumption. This has the additional benefit of minimising the generation of APCr.

- Matching activated carbon injection to flue gas flow to maintain a steady rate of adsorption gaseous metals and dioxins.

- Optimisation of SNCR (urea dosing) through the selection of the optimal location for the dosing points, adjusting the atomization pressure, the temperature setpoint for automatic level selection and the dilution water flow.

- Appropriate segregation of wastewater streams and the reuse of waste water throughout the process. Inclusion of rainwater harvesting to minimise mains water use. See Section 5.12 (Water Use) for further detail.

The techniques described to minimise waste are determined to represent BAT.

Permit: Standard Conditions (to require a 4 yearly review of resource utilisation to identify methods of reducing and improving the efficiency of use of raw materials, water and energy as well as waste minimisation) as well as implementation of Residue Management Plan. Waste minimisation and process optimisation will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques, systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.12 Water Use

Information relevant to the point sources to water from the installation is provided in Section 1 (Introduction) and Section 6.1 (Water) and associated appendices (Appendix A - Site and Drainage Plans) of the Emissions and Impact Report (Issue | 14 August 2019). As well as Section 3.2 (Abatement of Point Source Emissions to Surface Water and Sewer) and 5.4 (Water Use) of the supporting Technical Report.

The water for the site will be provided by water main which will fill the potable water tank. Approximately 45,760 m^3 per year of potable water will be required. With 39,760 m^3 per year of this

being sent to the water treatment plant for demineralisation via reverse osmosis and electrodeionisation (EDI). The treated water will be stored in the demineralised water tank, prior to use in the process.

The facility has been designed to minimise water consumption by using closed loop systems and by reuse of waste water within the process. A total of approximately 24,560 m^3 per year of water will be circulated for reuse and recycling via the process water tank and the waste water tank. The effective use of water avoids the generation of any aqueous emission that would require discharge to the foul sewer or export from the site. This includes the segregation of different effluent streams as far as possible in order to allow for their reuse within the Installation and ensure that any resultant stream is treated in an appropriate manner. The waste water streams and their reuse are described in Section 5.3 (Point Source Emissions to Surface Water and Sewer) of this document. Refer also to Section 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc). Specific techniques employed to minimise water use include:

- Waste-water-free APC/FGC techniques are to be employed at the facility through the use of dry scrubbing with the injection of powdered activated carbon (PAC) and Hydrated Lime in the flue gas reactor tower.

- Use of a closed loop systems, including the boiler, air-cooled condensing and the feed chute cooling systems.

- Rain water harvesting.

- Water consumption metering to monitor the success of the water efficiency measures.

The design and techniques described in the application to minimise water use, including use of a dry abatement system, air-cooled condenser and recycling of effluent are determined to represent BAT.

Permit: Standard Conditions (to require a 4 yearly review of resource utilisation to identify methods of reducing and improving the efficiency of use of raw materials, water and energy as well as waste minimisation). Water use and optimisation will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques, systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.13 Waste Handling

This section is proposed to deal with the waste generated from the activity not the incoming waste which is considered under Section 5.9 (Raw Materials) of this document. Information relevant to waste handling from the installation is provided in Section 6 (Waste Handling) of the supporting Technical Report.

There is no liquid waste generation, during normal operation, from the proposed facility, see Section 5.3 (Point Source Emissions to Surface Water and Sewer) of this document for further detail. The solid residues generated are:

- Incinerator Bottom Ash (IBA) (non-hazardous waste) – is collected at the bottom of the combustion grate transferred to the IBA extractor where the ash is cooled before being

transferred by conveyor belt to the fully enclosed IBA Storage Hall with a capacity of 450 tonnes, prior to being transferred into open top trucks within the hall and sheeted for transfer off-site.

- Boiler Ash (non-hazardous waste) – is collected ash from the second and third empty passes and remaining boiler passes which is then transferred, during normal operation, via an enclosed pneumatic conveyor to either a 150 m^3 boiler ash silo or diverted for mixing with the IBA or transferred to an enclosed collection and bagging system where the normal route is unavailable or for facilitating boiler cleaning activities during outages;

- Air Pollution Control Residue (APCr) (hazardous waste) – is collected via a hopper located below the bag filter housing before being transferred to one of two 170 m^3 silos;

All residues are removed from site for treatment, recycling or disposal. The IBA (including Boiler Ash) and APCr are handled, stored and removed from site separately.

The techniques described for waste handling are determined to represent BAT. Refer also to Section 5.11, 5.14 and 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc)

Permit: Standard Conditions (to require a 4 yearly review of resource utilisation to identify methods of reducing and improving the efficiency of use of raw materials, water and energy as well as waste minimisation) as well as implementation of Residue Management Plan. Waste handling will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

Considered to be BAT

5.14 Waste Recovery or Disposal

This section is proposed to deal with the waste generated from the activity not the incoming waste which is considered under Section 5.9 (Raw Materials) of this document. Information relevant to waste recovery and disposal from the installation is provided in Section 6 (Waste Handling) and 7 (Waste Recovery and Disposal) of the supporting Technical Report.

The IBA (including Boiler Ash) generated is expected to be 37,520 tonnes/year. The application considers that the IBA will be transferred from the facility to one or more appropriately permitted sites, in line with the facility's Duty of Care requirements. The options presented include Rock Solid IBA recycling facility in either Scotland (application submitted for Aberdeen area) or the Netherlands. It is estimated that the Rock Solid process will recover 5% by IBA weight of ferrous metals, 0.5% by IBA weight of non-ferrous metals and generate around 5% residue by IBA weight, which will be sent to landfill.

The APCr (including fly ash) generated is expected to be 8,295 tonnes/year. The application considers that the fly ash and APCr will be shipped by hermetically sealed silo tankers from the facility to one or more appropriately permitted sites, in line with the facility's Duty of Care requirements. The options presented include Carbon8's treatment and aggregate manufacturing facility in Leeds or Salt mines for backfilling purposes.

The techniques described for waste recovery and disposal will need to be further defined during commissioning however they are presently deteremined to represent BAT. Refer also to Section 5.11, 5.13 and 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc)

Permit: Standard Conditions (to require a 4 yearly review of resource utilisation to identify methods of reducing and improving the efficiency of use of raw materials, water and energy as well as waste minimisation) as well as implementation of Residue Management Plan. Waste recovery and disposal will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The final recovery or disposal route will be confirmed at commissioning with ongoing review assessed through inspection.

Considered to be BAT

5.15 Energy

Information relevant to the energy use and efficiency of the installation is provided in Section 8 (Energy) and associated Appendices (A 4.1.2 – Heat and Mass balances, A 4.1.3 – Combustion Firing Diagram, A 4.3 – R1 Calculations, A 4.4 – Sankey diagrams, A 4.5 – Energy Boundary Diagrams and C 5 – FDBR Guidance) of the supporting Technical Report. As well as the separate Heat and Power Plan (HAPP) (Issue: 14 August 2019) and the Energy Efficiency Directive (EED) Cost Benefit Analysis (CBA) technical note date 14 August 2019. Some further information was also provided with respect to this aspect in response to the Notice requiring further information issued on the 25/11/20.

In assessing the measures proposed in the application with respect to energy efficiency an integrated approach has been adopted in line with that described in the Reference Document on Best Available Techniques for Energy Efficiency (September 2021) with the need to balance cross-media effects and energy efficiency being considered for the installation as a whole. On this basis, BAT is the most effective measures to achieve a high level of energy efficiency as a whole.

It should also be noted that the specific questions set in the PPC Application Form Part B, Questions B2.8.1, B2.8.2 and B2.8.3 make reference to sections 'of the relevant technical guidance'. The relevant guidance being referred to is the Horizontal Guidance Note IPPC H2 - Energy Efficiency. While this guidance has subsequently been withdrawn due regard has been given to its contents in this determination

5.15.1 Energy Breakdown

- Section 8 provides a breakdown of the proposed energy consumption and generation by source and end-use.
- Appendix A 4.1.2 provides heat and mass balances (provides a high level heat and mass balance covering several scenarios including; an electrical only case, different thermal load options from 1 to 10MWth and for different points on the combustion firing Diagram.
- Appendix A4.1.3 provides the Combustion Firing Diagram.
- Appendix A4.3 provides an R1 Calculation (Confirmed R1 status is not being applied for).
- Appendix A4.4 provides 2 Sankey Diagrams with a further sankey diagram also provided in Appendix C to the Heat and Power Plan (HAPP).
- Appendix A4.5 provides Energy Boundary Diagrams.

Necessary information provided.

5.15.2 Basic Energy Consumption and Generation (Q B2.8.1 & B2.8.2)

Basic Energy Efficiency Requirements are described in Section 3.8 of the permit application and are consistent with BAT techniques and requirements described in Section 2.7 of the Sector Guidance Note s5.01 . This includes use of high efficiency motors, variable speed drives and high standards of cladding/ insulation etc.

Necessary information provided. Further energy efficiency measures described below.

5.15.3 Heat and Power Plan

A separate Heat and Power Plan (HAPP) for the facility has been provided Ref. 'NESS Energy from Waste, Pollution Prevention and Control Permit Application - Heat and Power Plan, Issue: 14 August 2019'.

SEPA's Thermal Treatment of Waste Guidelines (TTWG) were first issued in 2009 and updated in 2014. The TTWG specify that all new thermal treatment plants must ensure that the recovery of energy from waste takes place with a high level of energy efficiency as required by Regulation 9F of the PPC Regulations 2012, as amended. Specific energy efficiency recovery targets are identified in Annex 1 of TTWG for initial start-up and then again for a period from 5 to 7 years after the cessation of commissioning. The Quality Assurance for Combined Heat and Power (CHPQA) standard published by DEFRA has been adopted in defining how energy recovery efficiencies are calculated.

TTWG also requires 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 of this document for detail on how this is achieved.

Best practice for thermal treatment of residual waste is deriving maximum benefit from it in the form of heat and electrical energy recovery during incineration. The proposed Ness EfW facility will be a Combined Heat and Power (CHP) plant.

The HAPP energy balance calculations have been provided based on a design case of a throughput of 150,000 tonnes/year (approximately 19 tonnes/hour) of source segregated MSW and C&I waste of a similar nature with a LHV (NCV) of 9.3MJ/kg and assuming 8,000 hours operation per annum. It is noted that in the event of a fall in the net calorific value of the waste, for example to an LHV of 7.7MJ/kg, the plant could operate at 23 tonnes/hr (discontinuous) while remaining within the grate's thermal capacity.

The Ness EfW facility has a combustion design capacity of 49.1MWth/hr of feed waste at 100% thermal capacity and is designed to generate approximately 14.3 MWe of electricity in full electricity generating mode (no heat export). Accounting for a parasitic site load of 2.17 MWe means that 12.2 MWe will be available for export to the local grid. The site has received and signed a grid connection offer from Scottish and Southern Electricity Networks for embedded generation, (Ref. Signed Offer Letter included in Appendix B of the HAPP). The site, has been granted 16MW of export capacity, sufficiently sized for the export requirements of the site and is estimated to be

connected to the distribution network on the 1st of April 2021 following upgrade works to the Redmoss substation.

Initial Energy Efficiency

The TTWG specify that all new thermal treatment plants must ensure where thermal treatment plants initially generate power, power and heat, heat only or a fuel then the demonstration should show that the equivalent energy recovery efficiency will be at least 20% (on a gross CV basis). The application confirms that on start up with no heat export the facility is expected to achieve a gross electrical recovery efficiency of 29% (on a gross CV basis).

Further Energy Efficiency Requirements

The TTWG states that the Heat and Power Plan must show how, within a period of seven years from cessation of commissioning, further energy can be recovered over and above the initial operational energy recovery. Specifically, the Heat and Power Plan should provide details of how the applicant proposes to achieve the relevant the QI value or Indicative Efficiency specified in Annex 1 of the TTWG's, and should give an indication of anticipated progress for each year up to the end of the heat plan period. TTWG states that the QI value is to be estimated and calculated in accordance with the relevant Combined Heat and Power Quality Assurance (CHPQA) method for the relevant type of thermal treatment facility and fuel type. The calculation must demonstrate that as a minimum the QI or efficiency values meet the energy recovery targets provided in Annex 1 of the TTWG. Annex 1 of the TTWG requires facilities processing over 70,000 tpa of fuel to meet or exceed the following criteria QI value ≥ 93 or an indicative overall efficiency ≥ 35%, in order to demonstrate best practice for thermal treatment of waste facilities.

Heat Network

Heat will be supplied to end users via the proposed Torry district heating network. The 2016 feasibility report by Ramboll recommended that the first phase of this heat network connects to local authority and housing association properties in the Balnagask Circle. The pipework route for the initial phase is illustrated in Figure 4 of the HAPP with further indicative pipe routes and energy centre locations for future phases are shown in Figure 5 of the HAPP.

The proposed Heat Network will require an initial back-up boiler supply of 8.1MWth, used to back-up planned maintenance outages or unplanned outages of the EfW heat supply. In addition to the boilers, two 150m^3 thermal stores are included in the district heating design. It should be noted that the network including the features above do not form part of the PPC Application and it is not intended for the additional boiler capacity to be installed on the Installation. To be provided by Aberdeen City Council.

The HAPP states that it should be technically possible to export up to approximately 10 MWth from the Ness EfW Facility. However, a higher heat export capacity (greater than 10MWth) would have an adverse impact on power export and power efficiency. Therefore, the heat network would need to be designed to take into account the estimated local demand and economic returns resulting from power generation.

The HAPP further confirms that Aberdeen City Council has stated the construction build out of the proposed heat network will increase the network load in the following tranches:

1. 3MW by 2025

2. 6MW by 2030

3. 10MW by 2035

Based on these timescales the calculated efficiency based on connectable heat timescale is as follows:

Table 8 Summarising how the efficiencies of the plant will change over time

Metric	2025	2030	2035
Heat energy extracted (MWth)	3	6	10
Gross electrical efficiency (%)	28	27	26
Net electrical efficiency (%)	24	23	22
Total combined gross efficiency (%)	34	39	46
Total combined net efficiency (%)	30	35	42

The table indicates that the NESS EfW Facility would be predicted to exceed the indicative overall efficiency threshold, as described in the TTWG, of 35% by 2030. This is in line with the guideline requirements of around 7 years from the cessation of commissioning, if the network plan progresses as is described.

Standard Permit Conditions require annual updates of the HAPP which include a review of progress towards meeting the 7-year Energy Efficiency Recovery Target in TTWG.

5.15.4 Energy Efficiency BATCs

As stated above consideration has been given to the Reference Document on Best Available Techniques for Energy Efficiency (September 2021). As this is a horizontal BREF, BAT needs to be determined more broadly than for a vertical BREF, such as to consider the interaction of processes, units and systems within a site. Process-specific BAT for energy efficiency and associated energy consumption levels are identified in the Waste Incineration BREF and discussed below.

5.15.5 Waste Incineration BATCs — Energy Efficiency Requirements

BAT 2 is to determine the gross electrical efficiency, the gross energy efficiency, or the boiler efficiency of the incineration plant as a whole or of all the relevant parts of the incineration plant. For new plants the gross electrical efficiency should be determined by carrying out a performance test at full load. This has therefore been included as a requirement of the commissioning tests in Condition 2.7.7 and 2.9.2 h) of the Permit.

Prior commissioning condition 2.8.13 is inserted in the Permit to require the methodology for carrying out the performance test required by Condition 2.9.2 h) to be provided in advance of commissioning.

For grate-fired incineration processes, BAT 2 suggests in the absence of an EN standard, that German standard FDBR Guideline RL7 'Acceptance Testing of waste Incineration Plants with

Grate Firing Systems' 2013 is used. Condition 2.8.10 therefore makes reference to this standard. It is also noted that the applicant has included the Guideline in Appendix C5 of the Supporting Technical Report of the Application.

BAT 20 states that in order to maximise energy efficiency, BAT is to use an appropriate combination of the listed techniques. BAT-Associated Energy Efficiency Levels (BAT-AEELs) for the incineration of municipal solid waste are also specified in BAT 20 Table 2. Gross electrical efficiency for the plant (assuming no heat export) is calculated to be 29% which will be confirmed by the test required by Condition 2.9.2 h). This is within the BAT-AEEL range of 25-35% for new plant.

Refer also to Section 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc)

5.15.6 Energy Efficiency Directive

Article 14 of 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. An EED CBA technical note date 14 August 2019 was provided with the application which referenced the fact that a Heat Network was proposed by the local authority and the proposed facility was contractually obliged to provide heat to this network. SEPA consider that this requirement has been met through the provided technical note an and the content of the HAPP submission as well as the contractual requirement to supply heat and that the accompanying SEPA duty to ensure that the proposed use of the heat will therefore be realised

The techniques described for energy efficiency are determined to represent BAT. Refer also to Appendix G – Best Available Techniques (BAT) Conclusions (BATc)

Permit: Standard Conditions (proof of gross energy efficiency, reporting of energy use etc.). Techniques for process optimisation and energy efficiency will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques' and confirmed during commissioning 0an on inspection.

Considered to be BAT

5.16 Accidents and their Consequences

Information relevant to the assessment of accident and their consequences for the installation is provided in Section 4.3 (Accidents Incidents / Non-Conformance), 9 (Accidents) and associated appendices (Appendix B1 – Fugitive Emissions Risk Assessment and Appendix B2 – Accident Risk Assessment) of the supporting Technical Report.

Part of the management system includes implementing processes for identifying, assessing and minimising environmental risks and hazards from accidents and their consequences. Emergency procedures are also developed to respond to incidents. The effectiveness of the emergency response procedures will be revised and updated as required following any major spill/incident etc. and be subject to management review, on an annual basis as a minimum, under the requirements of the EMS.

The applicant has identified a source - pathway - receptor model for the identification and assessment of risks from the activities to be carried out at the proposed facility. The hazard identification was developed in line with indicative guidance (UK Technical Guidance s5.01) and has drawn upon the contracted operators (Indaver) experience of operating similar EfW plants, the applicants (Acciona) experience of managing, planning and developing similar EfW plants in Europe, the manufacturers (Baumgarte) experience in respect of design and building of similar EfW plants in the UK and Europe and the consultants (Arup) experience in preparing permit applications and undertaking assessments of similar operations and waste management activities.

Releases of smaller quantities to be controlled through regular inspections and maintenance procedures as well as in place infrastructure such as containment arrangements including bunding and wider tertiary containment, use of high levels alarms, drainage philosophy etc. See Section 5.6 above for further detail.

Risk from Fire

Significant attention has been given to the assessment of the risks associated with a fire and the preventative and mitigatory measures required, through the need to develop a fire strategy for the design and operation of the proposed facility in line with legal requirements and drawing on appropriate guidance as necessary. The following fire safety design measures will be incorporated in the Aberdeen EfW Fire Strategy.

a) Passive fire protection measures. These include:
   - Main process areas will be constructed as individual fire compartments based on insurers requirements and statutory guidance recommendations.
   - The facility will be constructed using non-combustible materials.
   - External buildings/structures will be separated by a 15m physical separation distance or a fire resisting barrier should be installed.
   - The selection of fire detection devices for each process area will be appropriate for the intended application and hazards present (e.g. point-type smoke detection, aspirating smoke detection, flame detection, heat detection). An infrared thermal imaging system will monitor the waste bunker.

b) Active fire protection measures. These include:
   - Smoke venting will be provided to serve the waste reception hall, waste bunker, boiler hall & flue gas treatment hall and turbine hall.
   - A highlevel automatic sprinkler protection system will be incorporated to protect the structure supporting the roof in the waste reception hall and the waste bunker.
   - Automatic monitor nozzles (water cannons) will cover all areas of the waste bunker. Activation of the monitors will be triggered from an infrared camera sensor, activation of a smoke/fire sensor or manually from the control room.

c) Fire detection and warning system. These include:
   - Automatic fire detection system will be installed to monitor all areas across the facility. Fire alarm system will be fully addressable and all buildings across the facility will be interlinked back to central control point. Detection devices include point-type smoke detection, aspirating smoke detection, flame detection, heat detection, infrared thermal imaging.

d) Means of escape arrangements.
   - Not considered within the determination of this application.

e) Fire-fighting facilities. These include:
   - Provision of a fire water tank, hydrants sprinkler systems etc.

- Systems for the management, collection, and storage of fire water runoff. For example, provision of a fire water tank with a capacity to provide water for 2 hours at maximum flow demand and the final isolation valve exiting the facility will automatically close in the event of a fire allowing for the collection of firewater in the detention basin / bunker. See also section 5.3 of this document.

The techniques described for the consideration of accidents and their consequences are determined to represent BAT. Refer also to Section 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc)

Permit: Standard Conditions are in place with regard to the reporting and recording of incidents and the requirement for an Incident Prevention and Mitigation Plan. Actual risk assessments, procedures and the provision, operation and maintenance of the systems put in place to mitigate the identified risks will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'.

Considered to be BAT

5.17 Noise

Information relevant to the point sources to air from the installation is provided in Section 1 (Introduction), Section 5 (Noise) and associated appendices (Appendix C1 – Noise Assessment) of the Emissions and Impact Report (Issue | 14 August 2019) of the Pollution Prevention and Control Permit Application. As well as Section 10 (Noise) of the supporting Technical Report. The Noise Assessment was updated in response to the Notice requiring further information served by SEPA on the 25 November 2020 as well as supplementary information following assessment of the response provided.

The assessment of the impact from Noise and the design of the plant in relation to this aspect was carried out in conjunction with an officer experienced and specialising in the regulation of Noise.

The noise assessment provided as part of the original application presented information on the predicted noise emissions from the installation, modelled and assessed against recent background levels around the site location. The conclusion reached in this assessment indicated that:

'Noise impacts of the facility are predicted to have no negative effects for the commercial and education receptors. For the nearest residential receptors in Tullos, there is the potential to exceed the background sound level at night-time. In this respect, the facility would not meet the AbCC standards. The guidance states that the method used is not suitable to assess noise when background and noise rating levels are very low, which is the case in this assessment. As such the WHO guideline night-time values have been used to assess these values and have been met. As such, overall, the facility is not predicted to have a negative noise effect, but it is nonetheless recommended that a site management procedure be enforced to assist in minimising sound emission from the facility at all times.'

SEPA raised concerns with the assessment which was then revised in response to the Notice requiring further information issued by SEPA on the 25/11/20. The specific questions raised in the Notice were in relation to:

Question 16 – Provide confirmation that all the main sources of noise and vibration (including infrequent sources) as well as the nearest noise sensitive locations that they impact upon have been described and demonstrate that any potential impact has been fully considered.

Question 17 – Demonstrate that the methodology employed in the selection of equipment and design of plant and infrastructure at the installation, as well as its proposed operation has included consideration of noise and that the proposed noise abatement techniques and other potential noise control measures proposed constitute Best Available Techniques.

Question 18 - Provide a revised noise impact assessment of the predicted impact from installation activities at each identified potential noise sensitive receptor. The revised assessment shall include consideration of appropriate corrections for tonal and low frequency noise.

Question 19 - Identify any proposed design change made since the submission of the PPC Application with the potential to impact on the assessment of noise from the Installation.

The response to the above questions was received on 28/07/21. Following assessment of the response there remained some outstanding areas of concern that were subsequently discussed with the applicant and their noise consultant and formally confirmed in writing on 08/09/21. The issues included:

- Application of the BS4142 Standard with a minimum character correction of +3dB. It was agreed that the report is to be resubmitted with the +3dB character correction applied to the specific sound to give a rating level and to assess the noise source depending on both increase over background (making a clear statement as per BS4142 e.g., a difference of around +5dB is likely to be an indication of an adverse impact) and the context in which the sound occurs.
- Background and Context. The report states that the context is one of 'very low background', therefore BS4142 doesn't strictly apply and that the present-day background will be higher than the October 2015 levels, making their assessment more conservative. SEPA consider that BS4142 does apply, could find no evidence within the report to support this statement and do not accept this argument.
- BAT Assessment - The BAT report appears to have been written in isolation and without consideration of the noise assessment report. No consistent list of plant could be found and critically no detail around the impact that each possible mitigation option would have on the specific noise level was presented.

Following a meeting on the 13/09/21 it was agreed that the applicant would:

a) Reassess background Levels in context of their assertion would now be higher than 2015 levels;
b) Review the Impact Assessment – ensuring is compliant with BS4142
c) Resubmit BAT assessment taking account of revised background and Impact assessment and targeting/prioritising highest level noise emitters.

The methodology for additional noise monitoring was provided on the 15/09/21 and approved by SEPA on the 21/09/21. The revised Noise assessment report including the results for the additional monitoring, revised plant design and BAT assessment was received on the 16/11/21.

On review of the revised assessment the following areas of note were identified.

- A baseline sound level survey has been undertaken, which updates the information from 2015. While not comprehensive deemed to be sufficient for purpose and identifies a night time background increase at Kirkhill Place from 30 to 32 dBL_{A90}.

- Updated facility design and equipment with plant items such as the chiller, secondary circuit pumps etc. having been removed, other items such as the MV-Switch rooms have been moved inside, additional sources identified new exhaust fans etc. as well as confirmation that the vacuum skid and the ACC have guaranteed at a value of 75dBA at 1m combined. Therefore, only one noise source has been modelled in the worst case location (previously 2).

- The previous submission identified that there were 28 receptors at 3dB or more above background at night time of which 8 were +5dB, but now there are only 3 receptors at 3dB or more above background at night time and all are less then +5dB.

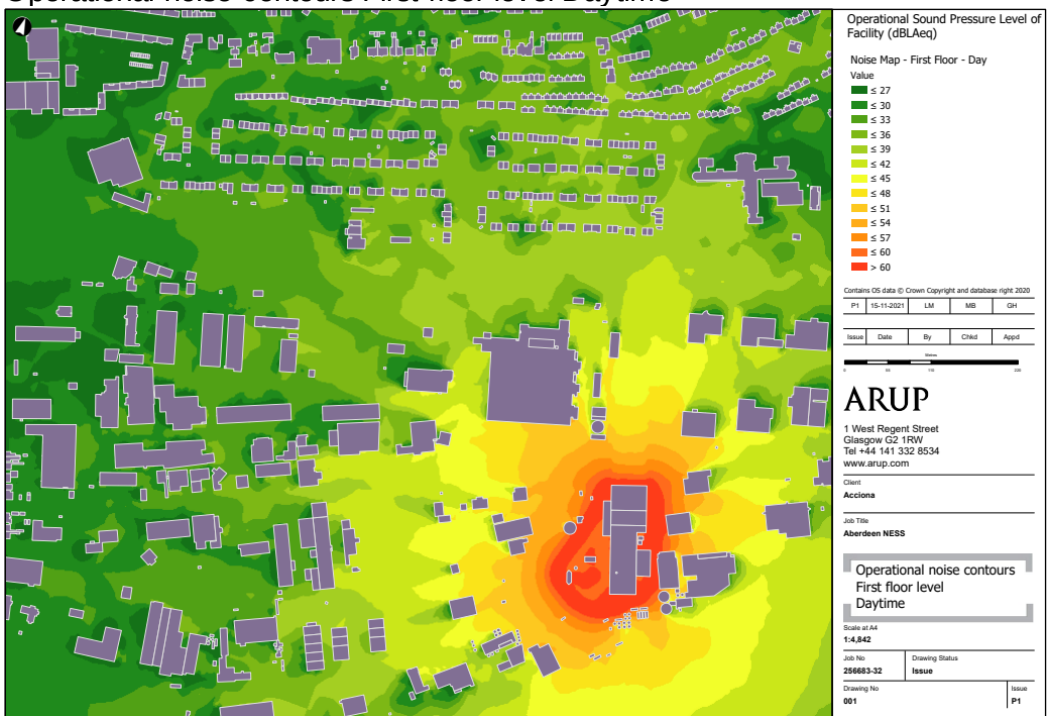
- The BAT assessment includes consideration of whether a particular piece of plant is the quietest available. If, no, the applicant provides discussion around why that piece was chosen and what mitigation has been provided, whether it is indoors or enclosed. Any other possible noise reduction measures are identified and why they have or have not been chosen. Various changes have been made from the original report as detailed above.

Predicted Impact

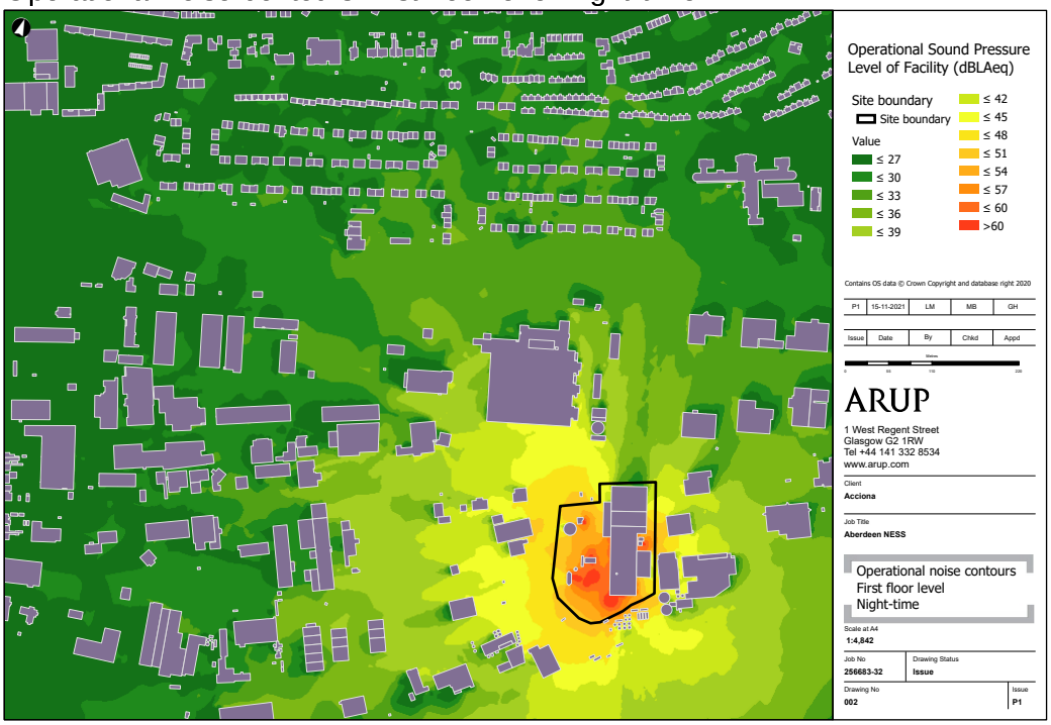
The application confirms that in terms of BS4142, the value predicted for night time at 3 identified receptors of +3dB falls in the area of assessment between the rating level not exceeding the background sound level, indicating a low impact and a difference of around +5 dB, indicating an adverse impact (depending on the context). At all residential receptors during the day, all significance criteria are predicted to be met. The facility is predicted to meet the Aberdeen City Council requirements, stated within the 2016 Environmental Statement (Planning).

The report concludes that overall, the facility is not predicted to have an adverse noise effect, but it is nonetheless recommended that a site management procedure be enforced to assist in minimising sound emission from the facility at all times. This should give consideration of reducing night-time operations when practicable to do so.

Operational noise contours First floor level Daytime



Operational noise contours First floor level Night-time



The identification of potential sources of noise and their subsequent impact is considered to be sufficient and the techniques described in order to minimise the generation of noise from the proposed facility, when taken into account the further confirmation sought by the included draft Conditions, are determined to represent BAT.

Permit: Standard Conditions are in place to require periodic review of noise and vibration emissions, creation and implementation of Noise and Vibration Management Plan. Additional Conditions requiring the submission methodology to be employed to carry out a systematic assessment of noise and vibration emissions (2.8.5) and then completion of the actual monitoring (2.9.2 k)) to confirm that that the specific noise levels of the facility (dB LAeq,Tr) do not exceed those predicted in the above assessment. The techniques described will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques' and confirmed during commissioning and on inspection.

Considered to be BAT

5.18 Monitoring

Information relevant to monitoring from the installation is provided in Section 11 (Monitoring) of the supporting Technical Report.

5.18.1 Emissions to Air

a) Monitoring of Emission - Main EfW Stack (point A1)

Monitoring requirements consistent with IED Annex VI Part 4 for Waste Incineration Plants and with BAT of the Waste Incineration BAT Conclusions have been specified in Schedule 6 of the Permit. The proposed techniques described in the PPC Application for monitoring of emissions to air from the main stack provide assurance that the requirements of Schedule 6 will be met for monitoring, recording, data handling, reporting and calibration. It is further noted that the application confirms that the emissions data will also be published on a web-based platform viewable to anyone with internet access.

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, hydrogen chloride, ammonia and oxygen. Continuous monitoring is also required for nitrous oxide (NO) and hydrogen fluoride (HF) though not in relation to any ELV set.

Periodic monitoring has also been required for all the pollutants described above with the periodic sampling being used to determine compliance with the ELV 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.

Other pollutants to be measured by periodic monitoring are as follows:

- Group 1 metals (cadmium and thallium and their compounds);
- Group 2 metals (mercury and its compounds) subject to prior Conditions 2.8.14 & 6.6.1;
- Group 3 metals (antimony, arsenic, chromium, cobalt, copper, lead, manganese, nickel and vanadium and their compounds);
- Dioxins and furans and Dioxin-like PCBs subject Conditions 2.8.15 & 6.6.2; and,
- Total and speciated PAHs.

The number of runs specified for periodic monitoring in Table 6.2 and Table 6.2b for all parameters 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 periodic monitoring requirements of BAT 4 of the Waste Incineration BAT Conclusions. The frequency for monitoring is quarterly for the first year of operation and then six monthly; this is consistent with the monitoring frequency specified for heavy metals and dioxins and furans in Annex VI Part 6 paragraph 2. 1(c). EN standards for monitoring are generally required to be used where available.

(i) Monitoring of mercury

BAT 31 of the Waste Incineration BATCs specifies a BAT-AEL of <5-20 ug/Nm^3 for continuous or periodic monitoring of mercury, or 1-10 ug/Nm3 for long-term sampling. The technique required must be using CEMS where mercury is not proven to be 'low and stable', otherwise either long-term sampling or periodic monitoring can be carried out. See Conditions 2.8.14 & 6.6.1. The outcome will determine whether mercury emissions can be considered to be low and stable, and therefore whether periodic monitoring is an appropriate compliance method. If this is not confirmed the Operator will be required to fit mercury CEMS.

(ii) Monitoring of dioxins and furans and dioxin-like PCBs

BAT 30 of the Waste Incineration BATCs specifies a BAT-AEL of <0.01-0.06ng I-TEQ/Nm^3 for long-term sampling of dioxins and furans, or <0.01-0.04ng I-TEQ/Nm^3 for periodic monitoring. Long-term sampling is required for monitoring emissions of dioxins and furans unless it can be proved that emissions are sufficiently stable in which case periodic monitoring can be carried out. BAT 4 requires that dioxin-like PCBs are also monitored using long-term sampling together with dioxins and furans where required for dioxins and furans unless the emission is <0.01 ng/Nm^3. The same rule applies for periodic monitoring of dioxin-like PCBs, however, monitoring of dioxin-like PCBs will still be required by Regulation 29(2) of PPC 2012. See Conditions 2.8.15 & 6.6.2. The outcome will determine whether long-term sampling or periodic monitoring is the most appropriate technique for monitoring of dioxins and furans and dioxin-like PCBs:

(iii) Monitoring of PAHs

With the exception of total and speciated PAHs, the pollutants listed above are all required to be monitored by BAT 4 of the Waste Incineration BAT Conclusions. BAT 4 requires only benzo[a]pyrene, a PAH to be monitored on an annual basis. However, monitoring of PAHs, together with dioxin-like PCBs, 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". PPC Regulation 29(2) does not specify which PAHs require to be monitored, nor does the EA Monitoring Technical Guidance Note M2. A list of 16 PAHs, commonly known as the DEFRA 16 list is identified in Section 2.10.1 (Indicative BAT item 11) of the UK Incinerator Sector Guidance Note IPPC S5.01. This is consistent with the suite of 16 PAHs commonly monitored by Stack Monitoring Contractors for existing operational Energy from Waste facilities in Scotland. Monitoring requirements have therefore been specified for Total PAHs expressed as benzo[a]pyrene (BaP), and for 16 speciated PAHs including BaP in Table 6.2 of the Permit.

The frequency specified for monitoring PAHs in Table 6.2 is the same as for dioxins and furans as recommended in Section 2.10. I of S5.01 (Indicative BAT 10) and implied by PPC Regulation 29(2).

b) Monitoring of Emission – Odour Stack (point A2)

A requirement for odour monitoring has been specified both at the site boundary (general sniff test) and at the outlet of the odour extraction system to measure odour control when the incinerator is shut down. The technique specified is BS EN 13725 which requires collection of samples for subsequent analysis by an odour panel with the frequency subject to a report required by Condition 6.6.3. Not a continuous emission source.

During commissioning, tests are required by Condition 2.9.2 (i) to confirm through a programme of monitoring including at the inlet and outlet of the Odour Extraction and Abatement System and Condition 2.9.2 (j) to confirm though the provision of an odour model that the odour emissions at the site boundary and sensitive receptors are below the 1.5 OUE/m3 significance criterion.

c) Monitoring of Emission – EDG Stack (point A3)

Periodic monitoring will be required for NO_x and CO on the gas-oil fired emergency diesel generator (EDG) at the most frequent interval of 1,500 hours of operation, or once every 5 years as detailed in Section 9 below. These monitoring requirements are detailed in Table 10.1

5.18.2 Monitoring of Point Source Emissions to Water

The requirements of IED Article 43(3) and 46(4) and Annex VI Part 6 (3) for monitoring of wastewater discharges from waste incineration plants and BAT 3 of the Waste Incineration BATCs do not apply as the only discharge to the Water Environment is from uncontaminated surface water. Monitoring requirements have been set in line with indicative BAT. See Table 7.2 in the draft Conditions.

5.18.3 Monitoring of Wastes

Monitoring proposals are described by the applicant in section 11.1.3 of the PPC Application. The requirements for assessing the composition of solid residues of IBA and APCr are captured within the draft Conditions. See also Section 5.14 of this document.

5.18.4 Process Monitoring

Monitoring proposals are described by the applicant in section 11.3 of the PPC Application and are captured in Table 6.3 of the draft Conditions. Deemed to be in line with required guidance. Refer also to Section 18, Appendix F (Chapter IV of the Industrial Emissions Directive (2010/75/EU) - Special provisions for waste Incineration plants and waste co-incineration plants & Annex VI and Section 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc).

5.18.5 Environmental Monitoring

Monitoring proposals are described by the applicant in section 11.2 of the PPC Application.

Soil Monitoring

Requirements for environmental monitoring have been specified for dioxins and furans, dioxin-like PCBs and for the following heavy metals: arsenic, cadmium, chromium and nickel 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.

Monitoring of ambient air

Requirements for environmental monitoring have been specified for PM_{10}, $PM_{2.5}$ and 4 heavy metals: cadmium, arsenic, chromium VI and nickel in air in Table 9.1 of the Permit at locations to be agreed in writing with SEPA. This monitoring has been required to check the actual levels of these pollutants in the air.

The monitoring is to be carried out initially prior to commissioning to establish a baseline level in ambient air 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.

Noise monitoring

Initial verification monitoring and then periodic review as described in Section 5.17 of this document above are specified in section 3.1 of the Permit.

The techniques described for monitoring are determined to represent BAT.

Permit: Standard Conditions included with respect to reporting etc. with further detail provided above.

Considered to be BAT

5.19 Closure

Information relevant to monitoring from the installation is provided in Section 12 (Site Closure) of the supporting Technical Report.

This section describes the proposed measures, upon definitive cessation of activities, to avoid any pollution risk and return the site of operation to a satisfactory state. The application describes the design features which will be employed to minimise risks from the operation as well as the decommissioning of the proposed facility. It is identified that a decommissioning plan will be developed and is to be reviewed on a regular basis. The proposals for site closure have been adequately outlined in the application, with consideration in the initial design of the plant given to how it will be decommissioned in the future.

Measures adopted and proposed determined to represent BAT.

Permit: Standard Permit conditions are in place to ensure the required plans are put in place. Checks that the plans are fit for purpose and that the level of management and maintenance of the plans is appropriate will be checked through inspection.

Considered to be BAT

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

Information relevant to the Site condition and Baseline reports was provided as separate appendix to the PPC Application. The Site Condition and Baseline report was updated in response to the Notice requiring further information served by SEPA on the 25 November 2020, Addendum Site Condition and Baseline Report. SCR002, Issue 1 dated 17th December 2020.

In summary, the updated Initial Site Condition Report is considered to have addressed all the previous comments provided on the Initial SCR Checklist and the Applicant has proposed further actions to supplement Baseline information that is still required. These requirements have been incorporated into draft Conditions.

The information provided in support of the application together with the further information which will be obtained through the prior commissioning conditions and the standard permit conditions will

ensure that IED requirements for site condition and baseline reports are met. See also Section 12 Appendix E – Site Condition and Baseline Reports Review.

Measures adopted and proposed determined to represent BAT.

Permit: Standard Conditions (fixed emissions points, no discharge to ground or groundwater, prevention of spillages). No further fixed control required, however additional conditions set to require the monitoring and recording of groundwater sampling. Draft Conditions 2.8.7 to 2.8.10 and Section 7.6 of the Permit. This means that an up-to-date Baseline Report will be in place before the Site begins Commissioning work and brings fuels and chemicals on site. The issue will be checked on inspection and controlled through application of residual BAT where required if standard controls inadequate.

Considered to be BAT

5.21 Consideration of BAT

BAT is discussed against each of the Key Environmental Issues described under Section 5 above. On assessing each aspect consideration has been given to:

- Legislative requirements - Chapter IV of the Industrial Emissions Directive (IED)(2010/75/EU), Special provisions for waste Incineration Plants and waste co-incineration plants & Annex V.

- BREFS and applicable BAT Conclusions

    1. Best Available Techniques (BAT) Reference Document for Waste Incineration, Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control) (2019);

    2. Commission Implementing Decision (EU) 2019/2010 of 12 November 2018 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration, as published in the Official Journal of the European Union on 3 December 2019, these are known as the Best Available Techniques (BAT) Conclusions for Waste Incineration, or the WI BATCs; and

    3. Best Available Techniques (BAT) Reference Document for Energy Efficiency (September 2021) with the need to balance cross-media effects and energy efficiency being considered for the installation as a whole. On this basis, BAT is the most effective measures to achieve a high level of energy efficiency as a whole

- Indicative BAT from all appropriate available guidance including UK Technical Guidance s5.01 Incineration of Waste and Fuel Manufactured from or Including Waste, Issue I Version 5 July 2004.

- the potential impact of emissions on human health and the environment.

The original application document considered BAT against the UK Technical Guidance s5.01 Incineration of Waste and Fuel Manufactured from or Including Waste, Issue 1, 2004 and considered the, at the time, draft BREF for Waste Incineration and associated BAT conclusions. The BAT Conclusions were published shortly after submission of the PPC Application and Notice requiring further information served by SEPA on the 25 November 2020 included Question 29. This required a demonstration that all the appropriate preventative measures are taken against pollution

and in particular through application of the Best Available Techniques. This included confirmation of how the BAT conclusions have been met. The assessment on the applicability of and compliance with the BAT conclusion is provided in Section 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc)

The Notice requiring further information served by SEPA on the 25 November 2020 also included Question 30. Requiring a demonstration of how the requirements of Chapter IV ' Special Provisions for Waste Incineration Plants and Waste Co-Incineration Plants' of Directive 2010/75/EU of the European Parliament and the Council of 24 November 2010 on Industrial Emissions (integrated pollution prevention and control) (Recast), have been met. The assessment on the applicability of and compliance with the Special Provisions is provided in Section 18, Appendix F (Chapter IV of the Industrial Emissions Directive (2010/75/EU) - Special provisions for waste Incineration plants and waste co-incineration plants & Annex VI

Sufficient information was provided in the application (including subsequent provision of additional information) for SEPA to determine that on balance the described techniques, to be employed at the proposed NESS Energy from Waste Facility, represent BAT.

Considered to be BAT

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? No

Justification: See Section 16 'APPENDIX D – NATURE CONSERVATION HABITATS ASSESSMENT (NCP-01)' and SNH consultee response.

Screening distance(s) used – 15km

Other Legislation

Other Legislation Considered	Outcome and Consideration	Officer
The Sulphur Content of Liquid Fuels (Scotland) Regulations 2000 (as amended)	Controls the maximum content of sulphur in fuels. No conflicts have been found in determining the application and preparing the Permit.	[redacted]
Waste Management Licensing Regulations 1994 (as amended) (WML) Environmental Protection Act 1990 (as amended) (Sect.34 - waste management) Waste (Scotland) Regulations 2012 (as amended)	All of these regulations were considered when determining BAT and regulatory compliance for the Installation regarding waste receipt / acceptance, generation, handling, storage and disposal. In addition the Waste (Scotland) Regulations 2012 considered with respect to the Scottish Government's Zero Waste Plan (recycling rates etc.) No conflicts have been found in determining the application and preparing the Permit.	[redacted]
The Water Environment (Controlled Activities)	Employed when considering most appropriate control regimes and associated ELVs for water discharges from site as well as in relation to the control and mitigation from a loss of containment	[redacted]

(Scotland) Regulations 2005 (as amended)	event. No conflicts have been found in determining the application and preparing the Permit.	
Health and Safety at Work Act 1974 (as amended)	SEPA should ensure that the two regimes do not impose conflicting obligations in relation to the same issue. This is of particular relevance when considering conditions within Part A permits in relation to the prevention and/or limitation of accidents and it should be borne in mind that only accidents with an environmental consequence should be considered during a determination. It is a requirement of the PPC Regulations that no condition can be placed within a permit if its sole purpose is to secure the health and persons at work. No conflicts have been found in determining the application and preparing the Permit.	[redacted]

Officer: [redacted]

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?

The applicant confirmed that an Environmental Impact Assessment (EIA) was undertaken for the proposed East Tullos Energy from Waste (EfW) facility as part of the planning process. A copy of the East Tullos Energy From Waste, Environmental Statement (ES), Volume 1, March 2016 is included in Appendix B2 of the application. Planning Permission for the facility was granted by Aberdeen City Council on 10 October 2016 (Ref. 160276) and the ES is also available on Aberdeen City Councils Planning portal.

SEPA has considered the information provided within ES and in particular with respect to the description of the local environment and potential human health and sensitive environmental receptors on consideration of potential impacts from air quality, noise, odour etc.

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?

Not Applicable. It is noted that the Control Of Major Accident Hazards Regulations 2015 (COMAH) have replaced the regulations cited above. The site is not subject to COMAH.

Officer: [redacted]

8 DETAILS OF PERMIT

Do you propose placing any nonstandard conditions in the Permit? – *Yes*

In the main all Conditions have been taken from existing SEPA Permit Templates (General Part A, Waste Incineration Plant Permit Template) or Permits of a similar nature that have been issued and legally reviewed (for example PPC/A/1181922 – Westfield, PPC/A/1187576 – Drumgrey etc.). All changes considered are captured below and have been technically and legally reviewed within SEPA prior to discussion with the applicant and inclusion with the draft Conditions proposed.

Do you propose making changes to existing text, tables or diagrams within the permit? - *N/A*

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Constitutes a New Permit. No existing Permit in place to change. All changes are captured below.

Condition / Term	Wording	Justification
"Boiler Ash"	"Boiler Ash" means ash collected from the boiler as described in Paragraph 1.1.4 (i);	Additional term to ensure capture all ash streams generated at the facility.
"OTNOC"	"Other Than Normal Operating Conditions" or "OTNOC" means the scenarios considered to represent OTNOC for the Permitted Installation, as identified in the OTNOC Management Plan required by Condition 5.4.6 and comprise: a) abnormal operation; and b) start-up and shut-down periods.	Change in current standard term to better reflect what is meant and required by OTNOC in line with published BAT Conclusions and UK Regulators Interpretation Guidance
"Secondary Containment System"	"Secondary Containment System" means a drip tray, an area surrounded by a bund or catchpit, or any other system for preventing any liquid chemical or fuel which is no longer in its container from escaping from the place where it is stored;	Additional term related to Condition 7.5.8. Based on definition from the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended).
2.8.5	At least 1 month prior to the Commencement of Commissioning, the Operator shall submit a report to SEPA confirming the methodology to be employed to carry out a systematic assessment of noise and vibration emissions associated with the Permitted Activities, the purpose of which shall be to confirm that the specific sound level of the facility (dB LAeq,Tr), rated to take account of any character corrections specified by BS 4142, does not exceed those predicted at the identified receptors in report AAc/256683-32/003/ISSUE.	Additional Condition to capture requirement to ensure SEPA receive methodology proposed for noise monitoring to enable any issue to be highlighted prior to monitoring exercise being carried out. See Section 5.17 (Noise) for further detail.
2.8.6	At least 1 month prior to the Commencement of Commissioning, the Operator shall submit a method statement to SEPA confirming the methodology to be employed to carry out verification odour modelling from the odour stack, emission point A2, serving the odour treatment plant as described in Paragraph 1.1.4 q).	Additional Condition to capture requirement to ensure SEPA receive methodology proposed for odour modelling to enable any issue to be highlighted prior to modelling exercise being carried out. See Section 5.7 (Odour) for further detail.
2.9.2 k)	confirm through a programme of monitoring, as agreed by Condition 2.8.5, that the specific noise levels of the facility (dB LAeq,Tr) does not exceed those predicted at the identified receptors in report AAc/256683-32/003/ISSUE;	Linked to Condition 2.8.5 above. Additional Condition to capture requirement to ensure that the specific noise levels of the facility do not exceed those predicted (from modelling) at the identified receptors. See Section 5.17 (Noise) for further detail.
3.1.2	No later than 3 months prior to the Commencement of Commissioning, the Operator shall prepare, implement, maintain and submit to SEPA a plan ("The noise and vibration management plan or NVMP"). The NVMP shall, set out the steps to be taken by the Operator to; a) prevent and reduce emissions of noise and vibration at all times; b) to ensure that Conditions 3.1.1, 3.1.3 and 3.1.4 are complied with; and c) identify the measures in place to ensure that no significant noise and vibration pollution is caused.	Amended Condition with the same requirements but different formatting to allow for easier understanding.

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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: a) to allow entry and exit of vehicles and personnel; or b) where fitted with a louvre to allow the ingress of air to maintain a negative pressure within the tipping hall.	Amended Condition to allow for the ingress of other than from entry/exit of vehicles and personnel. Captures the design principles of the odour extraction and abatement system operation with additional air allowed for through louvers.
5.3.3 j)	~~j) there is a loss of fuel supply to the auxiliary burner;~~	Standard Condition not included. On review considered that this Condition may have unintended problems and force the plant into shutdown (with associated emissions/issues) where could continue in compliant operation while rectify the situation. If interlock called upon because temperature could not be maintained and unavailable then would result in a shutdown in any event.
5.4.2	Without prejudice to Condition 5.3.2(c), In the event of Abnormal Operation, the Operator shall restore normal operation of the failed equipment, or replace the failed equipment as rapidly as possible and shall, under no circumstances, continue to incinerate waste for an uninterrupted period of more than four hours. ~~(was 5.4.2) During a period of Other Than Normal Operating Conditions (OTNOC) identified in Table 5.1, the operator shall restore normal operation of the failed equipment or replace the failed equipment as rapidly as possible.~~ ~~(was 5.4.5) Any period of Abnormal Operation shall be viewed as an incident for the purposes of Conditions 2.5.1 to 2.5.6. The report required by Condition 2.5.6 in respect of any such occasion shall include the matters required to be recorded by Condition 5.4.3.~~ ~~(Was 5.4.8) Without prejudice to Condition 5.4.7, during a period of OTNOC identified in Table 5.1, the ELVs for Emissions to Air in Table 6.2b in Schedule 6 shall apply.~~ ~~(Was 5.4.9) During periods of OTNOC, the following information shall be recorded and reported to SEPA:~~ ~~a) The date, time and duration of operation under OTNOC;~~ ~~b) The cause of the period of OTNOC;~~ ~~c) How the period of OTNOC was brought to a close;~~ ~~d) The results of emission monitoring in comparison with Table 6.2b during the period of OTNOC; and,~~ ~~e) Whether the OTNOC Management Plan required by Condition 5.4.10 requires updating as a result of the period of OTNOC.~~	Amended Conditions. Revised to account for change in definition and appropriate capture of OTNOC which should not be termed an incident and which now falls within the definition of abnormal operation.
5.4.3 c)	justification of why the cause of the period of Abnormal Operation ~~exceedance of the emission limit value~~ was unavoidable;	Amended Condition to better reflect defined term.
5.4.4	5.4.4 The cumulative duration of Abnormal Operation shall not exceed 60 hours in any one year. ~~Where multiple incineration lines are linked by a single abatement plant~~	Amended Condition. Single line so amended wording accordingly.

	~~the 60 hour period shall apply to all such incineration plant.~~	
5.4.6	No later than 3 months prior to the Commencement of Commissioning, the operator shall prepare, implement, maintain and submit to SEPA a risk-based OTNOC Management Plan (the "OTNOC" Management Plan") setting out the steps to be taken by the Operator to reduce emissions to air and water during OTNOC. The OTNOC Management Plan shall include the following: a) a list of potential OTNOC scenarios, including failure of critical equipment and start up and shutdown periods when no waste is burned, their root causes and the potential consequences; b) details of appropriate design of critical equipment identified in Condition 5.4.6 (a); c) details of the preventative maintenance plan for the relevant systems/critical equipment identified in Condition 5.4.6 (a); d) the proposed techniques to reduce the frequency, duration and associated emissions to air, water and/or soil from the occurrence of OTNOC; e) monitoring and recording of emissions caused by OTNOC and associated circumstances; f) periodic assessment of the emissions occurring during OTNOC in terms of frequency of events, duration, amount of pollutants emitted and implementation of corrective actions; and g) details of how the OTNOC Management Plan is integrated into the Environmental Management System for the Permitted Installation.	Additional Condition. Stated in Waste Incineration Plant Template that not required for new plant as covered by Prior Commissioning Conditions 2.8.16. Condition 2.8.16 is not included as a Prior Commissioning Condition in this Permit. The requirements are the same however reformatted and considered more appropriate to capture in this section where linked to Condition 5.4.7 (to review the plan).
5.4.8	No later than 3 months prior to the Commencement of Commissioning, the Operator shall submit a report to SEPA to confirm the proposals for monitoring of emissions to air during the (OTNOC) identified in the OTNOC Management Plan required under Condition 5.4.6 to meet the requirements of BAT 5 in the WI BATCs.	Additional Condition. Requirements are in line with standard Permit Condition 2.8.14. Considered more appropriate to capture in this section and linked to Condition 5.4.6 & 5.4.7 (have and review the plan).
Schedule 6	CONDITIONS APPLYING TO EMISSIONS TO AIR FROM THE INCINERATION PLANT In all Conditions the following terminology has been changed: - where 'limit' or 'concentration limit' is used this has been replaced by the term 'ELV'. - 'half hourly' changed to '30 minute'.	Amended Conditions – ELV is a defined term and considered more appropriate than limit.
6.2.2	Continuous Emissions Monitoring Systems (CEMS) ~~equipment~~ shall be certified in accordance with BS EN 15267-3 and QAL1 of BS EN 14181 and associated Data Handling Acquisition and Handling Systems (DAHS) shall meet the requirements of, and be operated in accordance	Amended Condition. In line with wording used for RWE VN06 as agreed with SEPA technical expert for monitoring.

	with BS EN 17255 parts 1 & 2 and within 18 months of publication, with BS EN 17255 part 3.	
6.2.3	All new CEMS shall have certification as required by Condition 6.2.2 and have a certified range which is not greater than 1.5 times the daily ELV, or as otherwise agreed in writing with SEPA.	Amended Condition. For two parameters (HCl and SO_2) the applicants proposed CEMs certification does not extend to the range required. It is in fact the case for these parameters that no existing analyser on the market have a certification range that could comply with the Condition. SEPA cannot include a Condition that it knows the operator can not comply with. As a compromise and until an analyser becomes available to the market. A different range will be explored for these parameters, to be agreed in writing with SEPA.
6.3.4 c)	c) reflect the most relevant calibration functions following a QAL 2 calibration exercise.	Amended Condition. In line with wording used for RWE VN06 as agreed with SEPA technical expert for monitoring.
6.3.6 b) & 6.3.8	The term 'and OTNOC', deleted from Conditions.	Amended Condition to capture revised consideration of OTNOC.
6.4.1	Whenever periodic monitoring of any substance listed in Table 6.2 is being performed the Operator shall record or cause or require to be recorded: a) the types of waste being fed to the primary combustion zone during the sampling period, and the average feed rate (tonnes per hour of each waste type); b) any ~~abnormal or unusual operating conditions or breakdowns~~ OTNOC that occurred during the sampling period; c) details of ~~any relevant~~ all corrected continuous monitoring reported values for each day of sampling; d) the mass of that substance collected during the said sampling period; e) the volume of gas extracted during the sampling period; f) any periods when auxiliary fuel was being burned during or prior to the sampling period; and g) the percentage of the maximum continuous rating, the steam production rate (tonnes per hour) and the estimated average net calorific value (NCV) of the waste being burned during the sampling period.	Amended Condition to reflect internal SEPA review to better define what is required from periodic monitoring as well as capture changes in definition OTNOC etc.
6.4.5	The Operator shall report to SEPA in writing the results of all periodic monitoring, in accordance with the requirements of BS EN ISO/IEC 17025. Said report shall include: a) the information specified in Condition 6.4.1; b) an assessment comparing the results from periodic monitoring with the CEMs monitoring results for the same period which considers the differences between the results, defines any consequent actions to be taken to investigate the cause of those	Amended Condition to reflect internal SEPA review to better define what is required from periodic monitoring in particular ensuring a comparison to CEMs monitoring results over the immediate and longer term.

	differences and includes the proposed date(s) for submission of the results of the investigation; and c) The submission required by Condition 6.4.5 b) shall include an assessment of the longer-term trend of differences recorded in periodic monitoring exercises.	
6.6.3	Without prejudice to Condition 2.9.2 (i), within 3 months of First Operation the operator shall submit a written report to SEPA on the proposals for the frequency of monitoring of odour at Emission point A2 for occasions when the incinerator is shut down.	Amended Condition based on Condition included in the Drumgray Permit - PPC/A/1187576. Amended so specific to NESS.
Table 6.2	Table 6.2: Emissions to Air ELVs applicable to normal operating conditions and monitoring requirements Notes: 1. Average values include the gaseous and vapour forms of the relevant heavy metal emissions as well as their compounds. 2. Long-term sampling applies where the report submitted under Condition 6.6.1 confirms that the waste feed does not have a proven low and stable mercury content. 3. The limit of <0.01-0.06 ng I-TEQ/Nm3 for long-term sampling applies where the report submitted under Condition 6.6.2 confirms that the emission levels of dioxins and furans and dioxin-like PCBs are not sufficiently stable. 4. Total PAHs to be reported expressed as Benzo(a)pyrene and the following speciated PAHs require monitoring: anthanthrene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo(b)naph(2,1-d)thiophene, benzo(c)phenanthrene, benzo(ghi)perylene, benzo(a)pyrene, cholanthrene, chrysene, cylclopenta (c,d)pyrene, dibenzo[ah]anthracene, dibenzo(ai)pyrene, fluoranthene, indeno(1,2,3-cd)pyrene and napthalene.	Additional notes added in order to ensure BREF requirements adequately captured i.e. with respect to long term sampling etc.
Table 6.5	Table 6.5: Toxic Equivalence Factors for Dioxins, Furans and Dioxin-like PCBs	Updated version of table and associated toxic equivalence factors.
7.5.8	All containers being used to store any liquid chemicals or fuels shall be located in a secondary containment system (SCS). The SCS shall meet equivalent technical standards to the rules specified for the storage of oil under General Binding Rule 28 in Schedule 3 of the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended). ~~7.5.9 The bunded areas and containers shall meet equivalent technical standards to those set out in Water Environment (Controlled Activities) (Scotland) Regulations 2011.~~	Amended Condition to better reflect the requirements expressed in the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) with respect to containment of oil and ensure the same requirements apply to the storage of any liquid chemicals or fuels on site in a manner that is enforceable. See all additional term for 'secondary containment system'.
Schedule 10	CONDITIONS APPLYING TO THE EMERGENCY DIESEL GENERATOR See Schedule 10 of the draft Conditions for detail. Includes: 10.1 Medium Combustion Plant Description 10.2 Start-up and Shut-down	Amended Schedule and associated Conditions to reflect current requirements for Medium Combustion Plant (MCP)

	10.3 Monitoring of Emissions 10.4 Record Keeping Table 10.1: Monitoring of Emissions	

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

Justification:

The general approach adopted in the setting of Emission Limit Values (ELVs) was to consider and compare:

- Legislative requirements (Including BAT-AELs),
- Indicative BAT levels,
- Impact on the receiving environment,
- Likely variation which will arise during normal operation (BAT being employed)/Abnormal Operation,
- Possible future modes and their consequences,
- Capabilities of the monitoring and testing system employed;
- Operational performance/experience from similar systems operated elsewhere.

Legislative requirements (Including BAT-AELs) are set where considered to be applicable. Otherwise, an assessment is then made comparing expected impact on the receiving environment, indicative BAT levels from appropriate guidance, manufacturer's data/guarantees with respect to expected performance before establishing site specific BAT and an appropriate ELV.

Emission Limit Values - Air

Legislative Requirements (including BAT-AELs)

1. **Chapter IV of the Industrial Emissions Directive (IED)(2010/75/EU) - Special provisions for waste Incineration Plants and waste co-incineration plants confirms the following & Annex VI**

   Normal Operation

   Annex VI (Part 3) confirms the Emission Limit Values (ELVs) which apply during the normal operation of the waste incineration plant (excludes start up and shutdown periods where no waste is being incinerated). The ELVs specified are for the following averaging periods and detailed in Table 6.2 in Schedule 6 of the Permit:

   a) 30 minute averages for the following parameters which must be monitored on a continuous basis: particulate matter, NOx, SO2, CO, gaseous and vaporous organic substances, HCl and HF after the confidence interval (measurement uncertainty) has been subtracted. Some exclusions apply to continuous monitoring of certain parameters where a justification is provided (see Section 5.18 for further details).
   b) 10 minute averages for CO; and

c) Daily averages of particulate matter, NOx, SO2, CO, gaseous and vaporous organic substances, HCI, HF over the effective operating time based on the mean of the 10 minute averages for CO and the 30 minute averages for all other parameters.

Average emission values over the sampling period where periodic monitoring is undertaken for the following parameters: dioxins and furans, cadmium and thallium, mercury, Group 3 heavy metals and other parameters such as HF where it has been agreed with SEPA that continuous monitoring is not required. Note periodic monitoring is also required for other continuously monitored parameters in Table 6.2. See Section 5.18 Monitoring for further detail.

Abnormal Operation *(Article 46(6) (4 hours correction period) & Article 47 (Breakdown))*

IED Chapter IV also specifies maximum emission limits for particulate matter, gaseous and vaporous organic substances and CO which must not be exceeded following an ELV breach due to disturbances, stoppages or failures of the abatement system or a breakdown — these effectively cover operation over the period it takes to either bring the plant back into compliance, or to shut the plant down. This is known as a period of 'Abnormal Operation' and is limited to a maximum of 4 hours per occasion of abnormal operation, and a total of 60 hours per annum after which any further Abnormal Operation would require an immediate plant shutdown. These ELVs are applied in Table 6.2a in Schedule 6 of the Permit. Specific permit conditions for Breakdown and Abnormal Operation are included in Schedule 5 in Condition 5.4 of the Permit — see Conditions 5.4.1 to 5.4.7.

Refer also to Section 18, Appendix F (Chapter IV of the Industrial Emissions Directive (2010/75/EU) - Special provisions for waste Incineration plants and waste co-incineration plants & Annex VI.

2. The Best Available Techniques (BAT) Conclusions for Waste Incineration (WI BATCs)

These were published on 3 December 2019 and include a list of BAT Associated Emission Levels (BAT-AELs) for new and existing facilities. These are usually specified as a range for either daily average emission values for continuously monitored parameters, or for average emission values over the sampling period where periodic monitoring is undertaken. Because the proposed facility will be permitted after the WI BATC publication date they are classed as a 'New Plant' and therefore the BAT-AELs applicable to new plants must apply when setting ELVs.

Refer also to Section 19, Appendix G – Best Available Techniques (BAT) Conclusions (BATc) For Waste Incineration – Applicability and Compliance.

The BAT-AELs apply during normal operation take precedence over IED ELVs for the same averaging periods. The specific ELVs based on BAT-AELs which have been set in the Permit are included in Table 6.2 in Schedule 6. There are some operating conditions known as "Other Than Normal Operating Conditions" (OTNOC) where BAT-AEL-based ELVs no longer apply, and compliance reverts to the IED Annex VI ELVs (Abnormal Operation) in Table 6.2a of Schedule 6 of the Permit. Specific permit conditions for OTNOC are included in Schedule 5 in Condition 5.4 of the Permit — see Conditions 5.4.2 and 5.4.8 to 5.4.10.

In addition emissions for which no basis for ELVs are included in either IED or the WI BATCs, but for which monitoring is required in the WI BATCs, are nitrous oxide and benzo(a)pyrene. Regulation 29(2) of PPC 2012 also requires that the monitoring requirements for dioxins and furans referred to in Part VI paragraph 2.1 (c) in Annex VI of IED are taken to include polycyclic aromatic hydrocarbons (PAHs) and dioxin-like polychlorinated biphenyls (PCBs). Monitoring requirements for a suite of PAHs including benzo(a)pyrene and dioxin-like PCBs as well as nitrous oxide have therefore also been included in Table

6.2 and Table 6.2a of the Permit, but no ELVs have been set. See Section 5.18 for further details of monitoring requirements for emissions to air.

Refer also to Section 20, Appendix H (Emissions to Air ELV Comparison and Selection) for actual ELV selected and rational.

3. Medium Combustion Plant

The Emergency Diesel Generator with a net rated thermal input of around 3.5 MW is a Medium Combustion Plant, described in Condition 1.1.3(b) of the draft Conditions. The generator is expected to operate well below 500 hours per annum and as such no ELVs apply. Periodic monitoring is required for NO_x and CO at whichever is most frequent; 1,500 hours of operation or once every 5 years. The specific requirements for the standby generator are detailed in Schedule 10 of the draft Conditions.

The ELVS set for the proposed NESS EfW Facility are confirmed in Section 20 (Appendix H - Emissions to Air ELV Comparison and Selection) of this document. These levels have since been agreed with the applicant. As they are in line with legislative requirements and as there is no significant impact on the receiving environment, they have been determined to represent BAT for the proposed installation.

Details of any equivalent technical parameters adopted to supplement or replace ELVs: None

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: No, Not Applicable

Details of any temporary derogation for the use of emerging techniques: None

Emission Limit Values - Water

The facility has been designed to minimise water consumption and maximise reuse of waste water within the process. This includes provision for the collection, storage, distribution, and reuse of produced water and run off from potentially contaminated site areas in order to minimise water consumption and meet the design criteria of a zero liquid discharge. No discharge of process waste water from the facility has been identified. A surface water collection and treatment system for the uncontaminated surface water runoff in the form of a Sustainable Urban Drainage System (SUDS) prior to discharge to the east Tullos Burn Culvert is provided for and the applicant has proposed the monitoring of the following parameters for which ELVs have been set.

Parameter / Substance	Emission Benchmark	ELV	Rational
Flow (litres/second)	No applicable benchmarks identified as the discharge represents a non-continuous surface water discharge of low pollution risk .	15.9 l/s	The emission represents a non-continuous surface water discharge from areas of low pollution risk and as such the proposed ELVs have been set in line with the understood system capabilities and limiting any offsite impact.
pH		6 to 9	
Temperature (°C)		30 °C	
Total suspended solids (mg/l)		60 mg/l	

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Total Organic Carbon (mg/l)		40 mg/l	**These levels have since been agreed with the applicant. As there is no significant impact on the receiving environment, they have been determined to represent BAT for the proposed installation.**

Details of any equivalent technical parameters adopted to supplement or replace ELVs: None

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: No, Not Applicable

Details of any temporary derogation for the use of emerging techniques: None

Emission Limit Values - Land

None Set

Details of any equivalent technical parameters adopted to supplement or replace ELVs: None

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: No, Not Applicable

Details of any temporary derogation for the use of emerging techniques: None

Emission Limit Values – Noise and Vibration

None Set

Details of any equivalent technical parameters adopted to supplement or replace ELVs: None

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: No, Not Applicable

Details of any temporary derogation for the use of emerging techniques: None

10 PEER REVIEW

Has the determination and draft permit been Peer Reviewed? **Yes**

Name of Peer Reviewer and comments made:

[redacted]

Comments were received on all aspects of the determination from the discussion on specific aspects of the proposed design; interpretation of legal and BAT requirements; the selection, amendment, and creation of the draft Conditions to the recording of the justification for the determination reached on the technical and legal assessment of the proposed facilities design, operation, management and maintenance. Comments were provided against draft version of the documents produced which were reviewed, discussed as necessary and then incorporated on agreement.

In summary all decisions made, and justifications provided are in line with SEPA Guidance, relevant legislation, BAT requirements and similar permitted activities in Scotland.

11 FINAL DETERMINATION

Issue of a Permit - Based on the information available at the time

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,
- Planning permission for the activity is in force,
- 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.

Officer: [redacted]

12 REFERENCES AND GUIDANCE

Permit Application

4. EFW NESS Limited (SC627853), PPC/A/184630, Draft Conditions – PPD.
5. PPC Permit Application (duly made) made by EFW NESS Limited (SC627853) on the 7 October 2019, for a permit under the Pollution Prevention and Control (Scotland) Regulations 2012 (the Regulations) to operate a Part A Installation for an Energy from Waste (EFW) Facility.
6. Response submitted by EFW NESS Limited (SC627853) following the issue of a Notice requiring further information on the 25 November 2020. No single formal response was received instead responses to each of the question raised were received between the period of 27/04/21 to 12/01/22).
7. The following addendums to the application were received following review of the information provided in response to the Notice requiring further information as detailed below:

- Updated Noise assessment Report 16/11/21.
- Updated Air Quality Assessment 17/11/21.
- Necessary Financial Provision Information 17/12/21.
- Drainage design layout confirmation 22/12/21.
- Required Parent Company Guarantee agreed and signed by all required parties 16/02/22.

8. Information provided supplementary to the application through specific meetings (videocall) as well as via e-mail.

Legislation / Permits / Templates / Authorisations etc.

9. Environmental Statement (ES), Volume 1, March 2016 from the Environmental Impact Assessment (EIA) submitted to Aberdeen City Council for the proposed East Tullos Energy from Waste (EfW) facility as part of the planning process.
10. PPC/A/1181922 – Westfield Energy Recovery Limited, Westfield Energy Recovery Facility.
11. PPC/A/1187576 – FCC Recycling (UK) Limited, Drumgray Energy Recovery Centre.
12. SEPA Permit Templates (General PPC Part A and Waste Incineration Plant).
13. Chapter 4 "Special provisions for Waste Incineration Plants and Waste Co-incineration Plants" of the Industrial Emissions Directive (IED) Dir 2010/75/EU.

Guidance

14. Commission Implementing Decision (EU) 2019/2010 of 12 November 2018 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council, for waste incineration, as published in the Official Journal of the European Union in 3 December 2019, these are known as the Best Available Techniques (BAT) Conclusions for Waste Incineration, or the WI BATCs.
15. Draft UK Interpretation Document for the 2019 Waste incineration BAT Conclusions, V0.28, 30/09/21.
16. UK Technical Guidance s5.01 Incineration of Waste and Fuel Manufactured from or Including Waste, Issue 1, Version 5 July 2004.
17. IPPC Environmental Assessment and Appraisal of BAT, Horizontal Guidance Note H1 Environment Agency, V6, July 2003. (Discontinued)
18. UK Gov Website - Risk assessments for specific activities: environmental permits - Risk assessments for your environmental permit - https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits
19. Air Quality in Scotland Web Site - https://www.scottishairquality.scot/
20. Releases from waste incinerators, Guidance on assessing group 3 metal stack emissions from incinerators, Environment Agency Version 4, 28 June 2016.
21. Reference Document on Best Available Techniques for Energy Efficiency (September 2021).
22. IPPC H 2 Horizontal Guidance Note – Energy Efficiency (Discontinued).
23. Thermal Treatment of Waste Guidelines 2014, SEPA, May 2014.
24. WAT-RM-08 Sustainable Urban Drainage Systems, SEPA, v6.4, July 2019.
25. WAT-SG-12 General Binding Rules for Surface Water Discharges, SEPA, v4.1, March 2016.
26. A Sampling and Testing Protocol to Assess the Status of Incinerator Bottom Ash", Ref. WRc Report Reference UC 9390.05, published by the Environmental Services Association, January 2018, as amended.
27. Monitoring stack emissions: technical guidance for selecting a monitoring approach, EA, 11 Feb 2021 (Formerly M2).
28. SEPA Odour Guidance, Version 1, January 2010.

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

29. H4 Horizontal Guidance Note, EA - Odour Management.

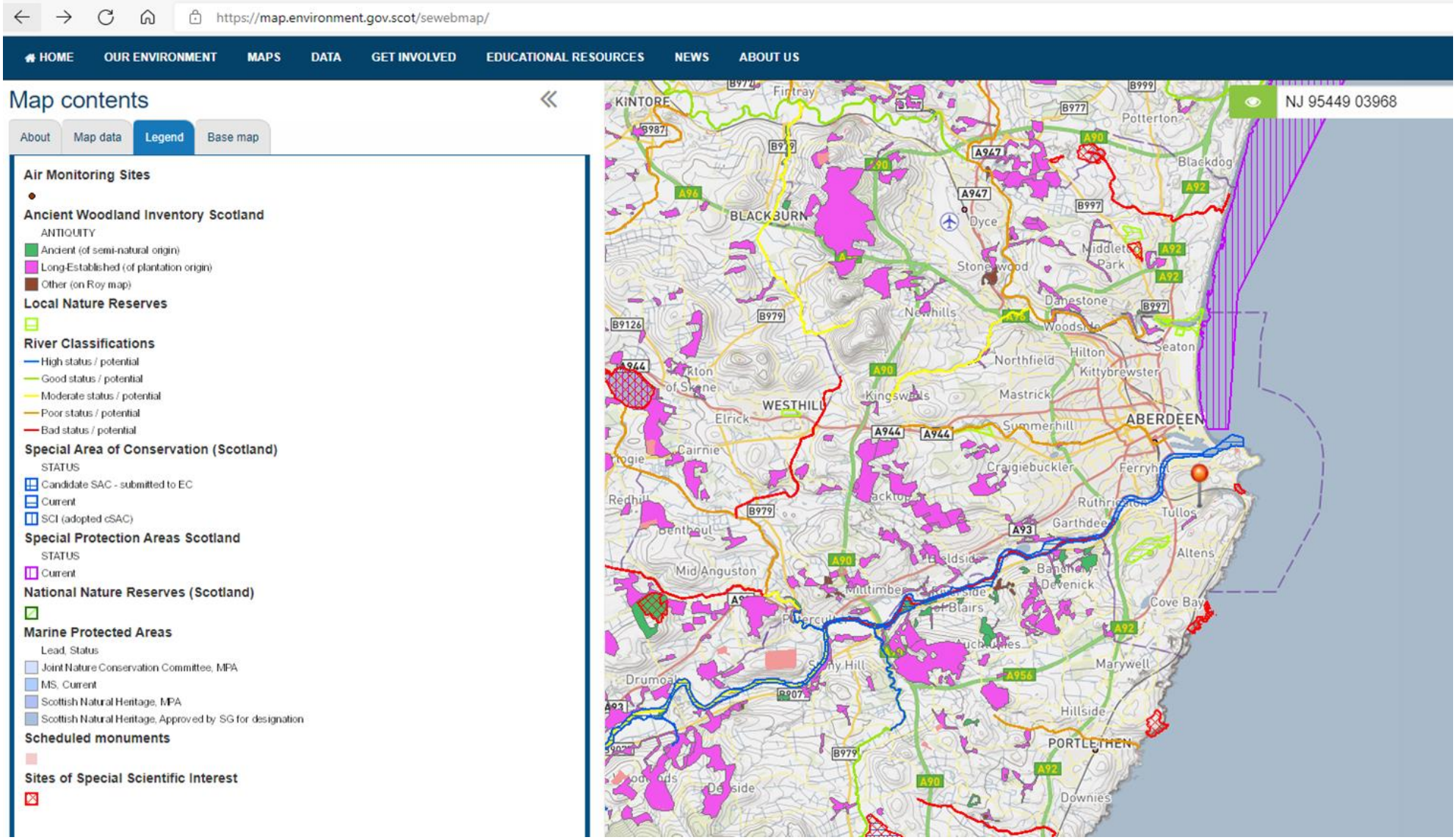
13 APPENDIX A – SEPA GIS / SE WEB - LOCAL DESIGNATIONS

Originally a search was completed for a 10km and 15km radius from the site of SEPAs GIS tool. This was subsequently lost in the cyber-attack suffered by SEPA and on reinstatement of IS systems GIS was unavailable. A search for designated sites was then completed on Scottish Environment Web (**HTTPS://WWW.ENVIRONMENT.GOV.SCOT/**) for inclusion by way of verification of the designated sites within the vicinity of the proposed development (A.1).

Recent reinstatement of a version of the SEPA GIS system has allowed for a designated site search to be included with additional detail of the designated sites identified (A.2).

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

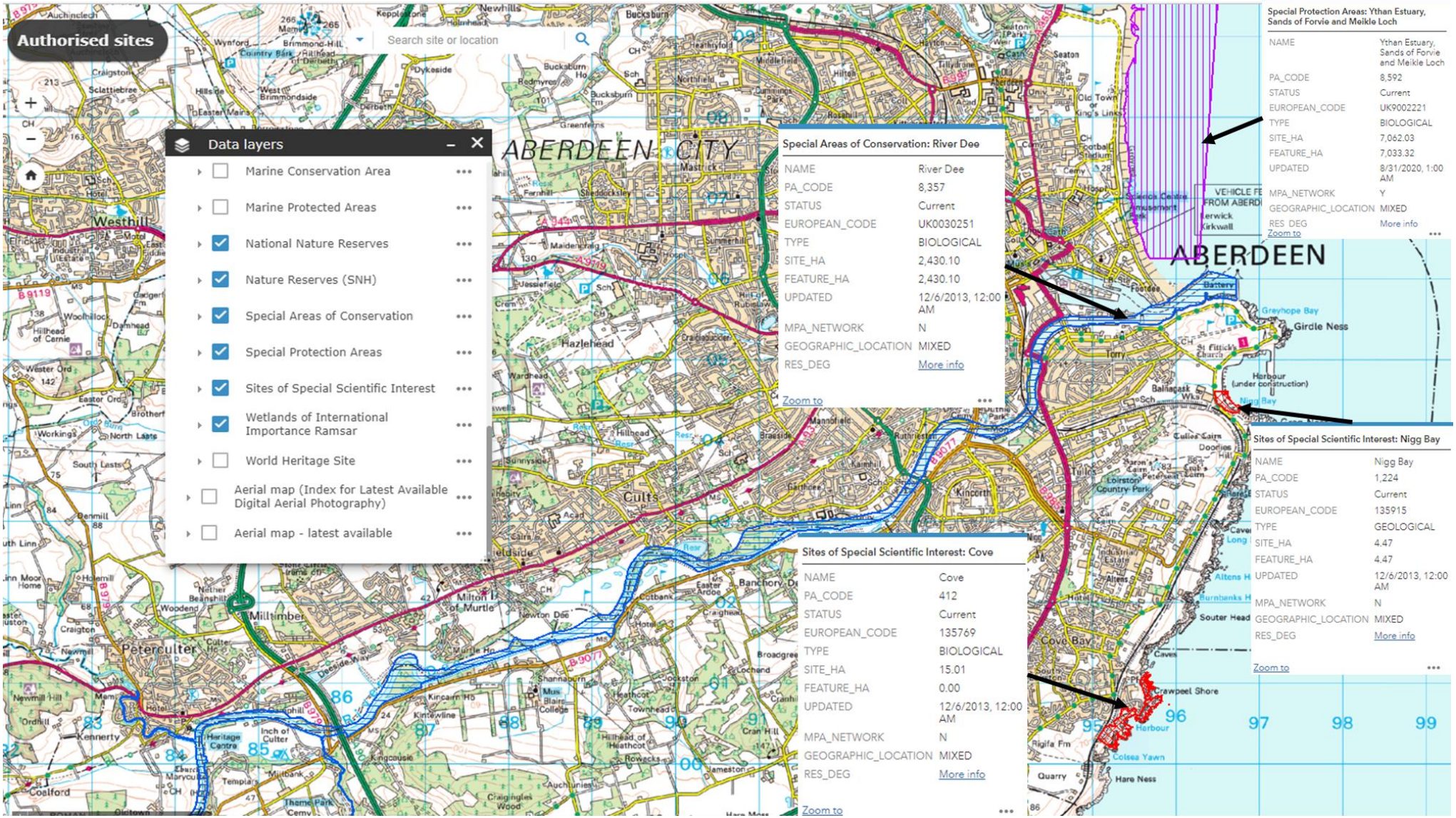
A.1 - Scottish Environment Web - Designated Sites Search



Part A Permit Application or Variation Dec. Doc (Pt. 2)	Form: IED-DD-02	V 1	Page no: 82 of 173

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

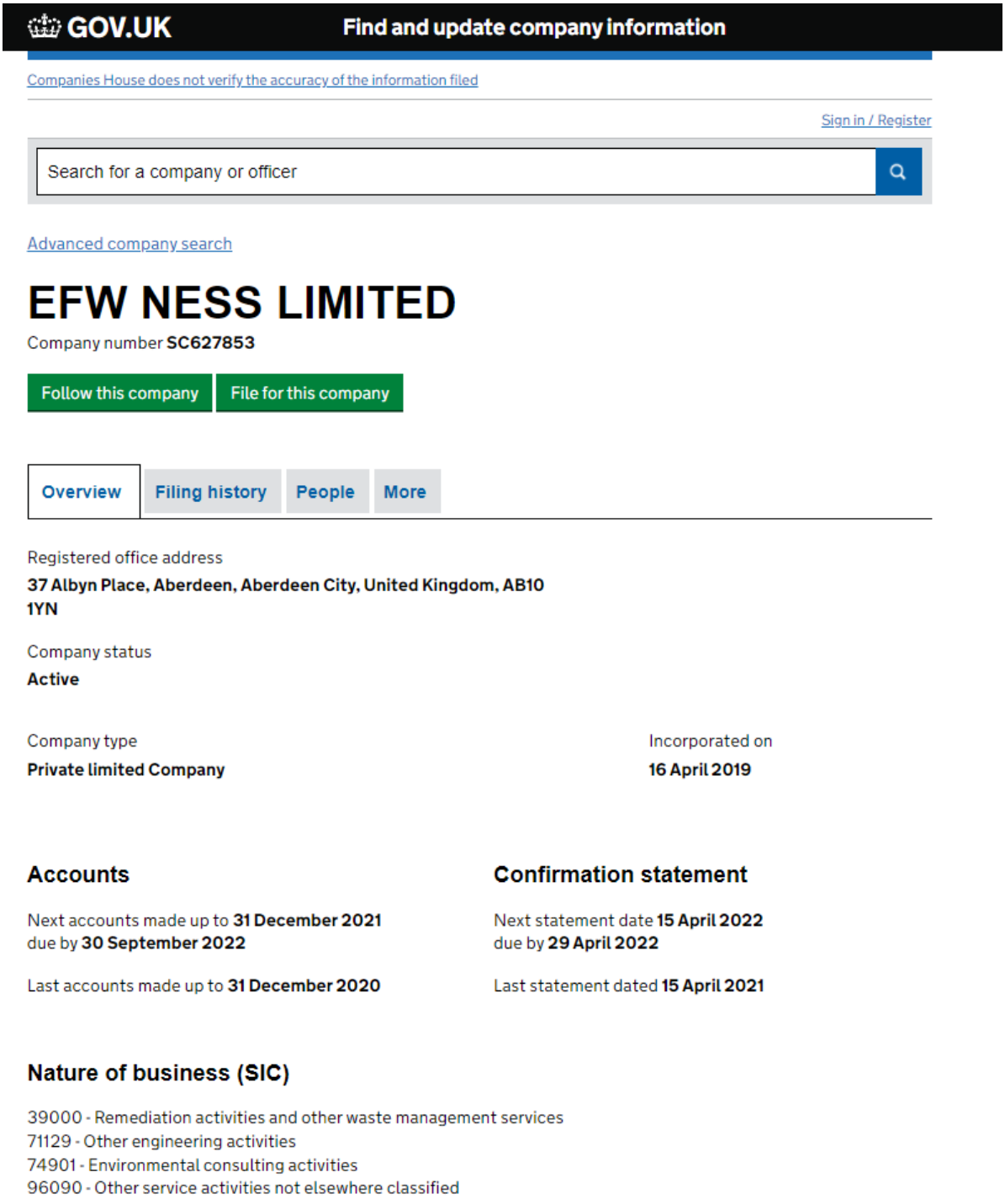
A.2 – SEPA GIS - Designated Sites Search



Part A Permit Application or Variation Dec. Doc (Pt. 2)	Form: IED-DD-02	V 1	Page no: 83 of 173

14 APPENDIX B – COMPANIES HOUSE / EDINBURGH GAZETTE

B.1 Companies House – EFW NESS Ltd (SC627853)



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Advanced company search

EFW NESS LIMITED

Company number **SC627853**

Follow this company | File for this company

Overview | Filing history | People | More

Registered office address
37 Albyn Place, Aberdeen, Aberdeen City, United Kingdom, AB10 1YN

Company status
Active

Company type
Private limited Company

Incorporated on
16 April 2019

Accounts

Next accounts made up to **31 December 2021**
due by **30 September 2022**

Last accounts made up to **31 December 2020**

Confirmation statement

Next statement date **15 April 2022**
due by **29 April 2022**

Last statement dated **15 April 2021**

Nature of business (SIC)

39000 - Remediation activities and other waste management services
71129 - Other engineering activities
74901 - Environmental consulting activities
96090 - Other service activities not elsewhere classified

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Companies House does not verify the accuracy of the information filed

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Advanced company search

EFW NESS LIMITED

Company number **SC627853**

Follow this company | File for this company

Overview | Filing history | People | More

Officers | Persons with significant control

1 active person with significant control / 0 active statements

Acciona S.A. ACTIVE

Correspondence address
Avda. De Europa, 18, Parque Empresarial La Moraleja, 28108 Alcobendas, Madrid, Spain

Notified on
16 April 2019

Governing law
Spanish Law

Legal form
Sociedad Anónima

Place registered
Commercial Registry Of Madrid

Registration number
A08001851

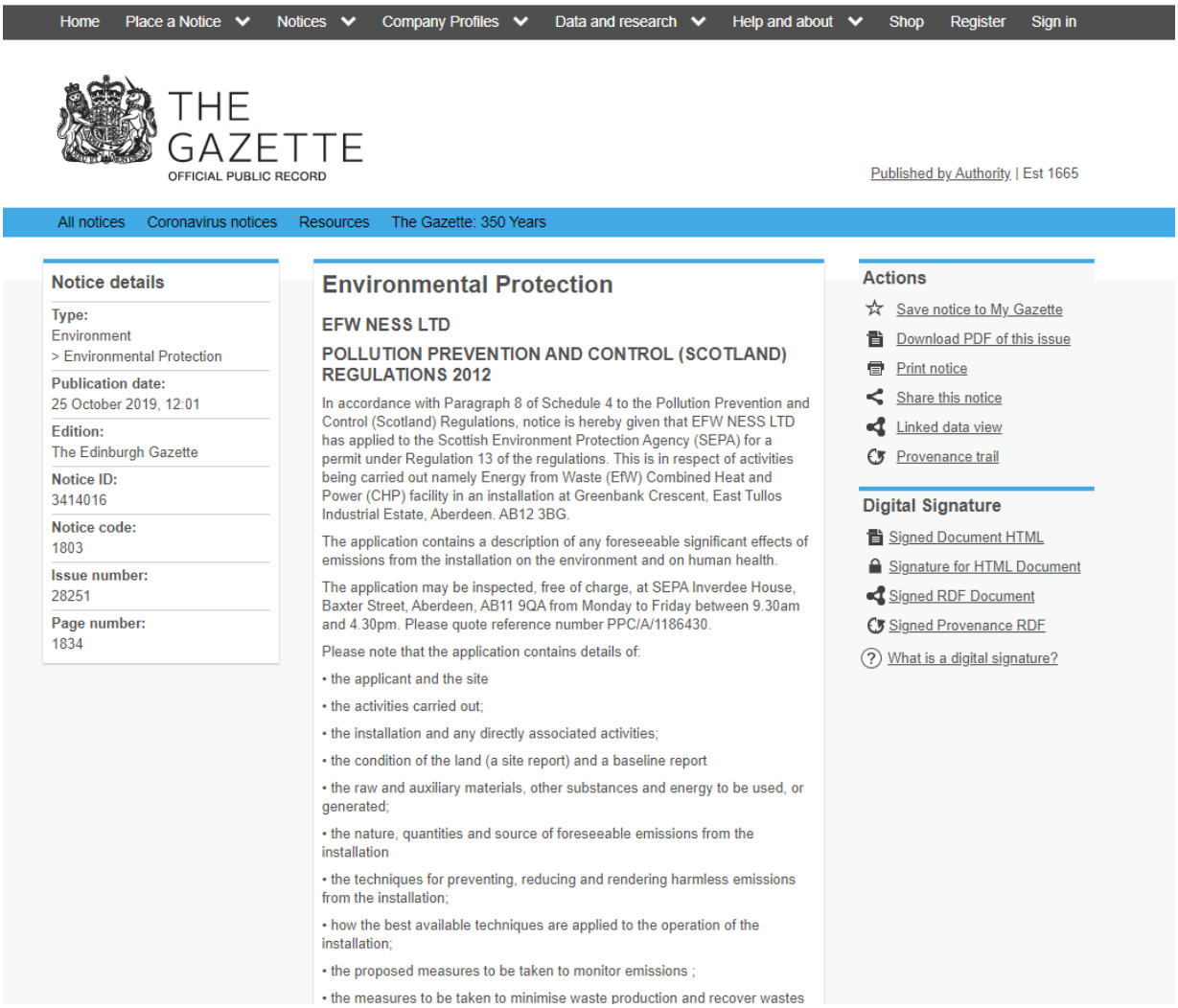
Nature of control
Ownership of shares – 75% or more

Ownership of voting rights - 75% or more

Incorporated in
Spain

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

B.2 Edinburgh Gazette – EFW NESS Ltd (SC627853) – PPC Application PPC/A/1186430



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Notice details

Type:
Environment
> Environmental Protection

Publication date:
25 October 2019, 12:01

Edition:
The Edinburgh Gazette

Notice ID:
3414016

Notice code:
1803

Issue number:
28251

Page number:
1834

Environmental Protection

EFW NESS LTD

POLLUTION PREVENTION AND CONTROL (SCOTLAND) REGULATIONS 2012

In accordance with Paragraph 8 of Schedule 4 to the Pollution Prevention and Control (Scotland) Regulations, notice is hereby given that EFW NESS LTD has applied to the Scottish Environment Protection Agency (SEPA) for a permit under Regulation 13 of the regulations. This is in respect of activities being carried out namely Energy from Waste (EfW) Combined Heat and Power (CHP) facility in an installation at Greenbank Crescent, East Tullos Industrial Estate, Aberdeen. AB12 3BG.

The application contains a description of any foreseeable significant effects of emissions from the installation on the environment and on human health.

The application may be inspected, free of charge, at SEPA Inverdee House, Baxter Street, Aberdeen, AB11 9QA from Monday to Friday between 9.30am and 4.30pm. Please quote reference number PPC/A/1186430.

Please note that the application contains details of:

• the applicant and the site

• the activities carried out;

• the installation and any directly associated activities;

• the condition of the land (a site report) and a baseline report

• the raw and auxiliary materials, other substances and energy to be used, or generated;

• the nature, quantities and source of foreseeable emissions from the installation

• the techniques for preventing, reducing and rendering harmless emissions from the installation;

• how the best available techniques are applied to the operation of the installation;

• the proposed measures to be taken to monitor emissions ;

• the measures to be taken to minimise waste production and recover wastes

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15 APPENDIX C – AIR DISPERSION MODELLING / AIR QUALITY ASSESSMENT

C.1 Determination - Material Reviewed

The following source material has been reviewed in the assessment below.

1. *PPC Application, Emissions and Impact Report, Appendix B1 Air Quality Assessment*

   Acciona Industrial, NESS Energy from Waste Facility, Pollution Prevention and Control Permit Application - Emissions and Impact Report, Issue | 14 August 2019, ARUP

2. *Further Information Response (Question 21 to 26 inclusive)*

   In particular - Acciona Industrial, NESS Energy from Waste Facility, Pollution Prevention and Control, Air Quality Assessment, AQA update, Issue | 26 July 2021, ARUP

3. *Supplementary Information to FIR Response (Provided 15/11/21 & 17/11/21)*

   Additional Information and an amended Air Quality Assessment report was provided following identification of areas for clarification in the AQA update provided in response to the FIR. The receipt of the additional information is summarised below and addressed in full in the below table.
   - Revised Air Quality Assessment Report and appendices (tracked changes and accounting for full year operation, clarification on model treatments, background discussion on NO_2 (worst case background concentration) and stack height assessment clarification) (Received 15/11/21)
   - Additional Air Quality Contour Plots (Received 17/11/21)

C.2 Checklist

An assessment checklist was included in the modelling reports provided for both the original application and in response to the Further Information Notice. The stated reports are referenced under Section C.1 above, points 1 and 2 respectively.

Item	Yes/No	Application Report	FIR Report	FIR Amended November Report
Location map	Yes	Figure 1	Figure 1	Figure 1
Site plan	Yes	Figure 4	Figure 4	Figure 4
List of pollutants modelled and relevant air quality guidelines	Yes	2.2, 2.4, 4.1.1	2.2, 0, 4.1.1	2.2, 0, 4.1.1
Details of model scenarios	Yes	4.2	4.2	4.2
Details of relevant ambient concentrations used	Yes	5.2.3	5.2.3	5.2.3
Model description and justification	Yes	4.2.1	4.2.1	4.2.1
Special model treatments used	Yes	4.2	4.2	4.2
Table of emission parameters used	Yes	Table 5, 6, 7	Table 6, 7, 8	Table 6, 7, 8
Details of modelled domain and receptors	Yes	4.2.9	4.2.9	4.2.9
Details of meteorological data used (including origin) and justification	Yes	4.2.3	4.2.3	4.2.3
Details of terrain treatment	Yes	4.2.7	4.2.7	4.2.7
Details of building treatment	Yes	4.2.5	4.2.5	4.2.5
Details of wet/dry modelling	Yes	4.2.10	4.2.10	4.2.10
Sensitivity analysis	Yes	6.2, 6.3, 6.4	6.2, 6.3, 6.4	6.2, 6.3, 6.4
Assessment of impacts	Yes	6.5, 6.6	6.5, 6.6	Section 6.6 & 6.7
Model input files	Yes	To be supplied - Model input files were available as part of the original application however following the cyber-attack on SEPA and subsequent re submission of the application model input files could only be received in PDF format at the time of resubmission. They remain available to SEPA should it be necessary to obtain them. It has been deemed as unnecessary at this time.		

C.3 Modelling Report Assessment (PPC Application, FIR Response & Supplementary Information)

ELEMENT	ASSESSMENT COMMENT
A) Introduction and Scope General information relating to the assessment, including purpose of the study, description of the site and modelled scenarios.	The report provided examines the predicted impacts (environment, human health and designated ecological receptors) from the emissions from proposed Ness EFW Facility as well as evaluating the impact on the wider air quality in the area. The modelling has involved consideration of: - Dispersion Model Selection (ADMS & AERMOD) - Pollutants of concern - Source of emissions - Baseline conditions - Stack Height Assessment - Identification and impact on receptors (Human, including a Human Health Risk Assessment (HHRA), and Ecological, including deposition rates and need for Habitat Risk Assessment) - Meteorological conditions (including the consideration of coastal effects) - Ground conditions (Terrain, Buildings and land use) - Air Quality Management Areas (AQMA) - Averaging times - Model selection impact on receptors - Review of BAT and BAT Associated Emission Limits (BAT-AELs) with respect to Emission Limit Values (ELVs) and utilised Release Rates; - Identification of necessary AQS/EQS/EAL The site is briefly described in Section 1 of the report however there are detailed site and process descriptions provided elsewhere within the PPC application, FIR response and supplementary information provided. See the Supporting Technical Report and associated appendices and drawings, in particular. The Following scenarios have been considered: a) Normal Operation. Short term and on an annual basis (based on BAT-AELs & IED ELVs); and b) Abnormal Operation. Where the emissions abatement system is not fully operational or failed / during start-up and shutdown / commissioning (see FIR query below). A generally conservative approach has been adopted where the worst results obtained were presented. For example, on consideration of: - Pollutant concentrations (100% of VOCs taken as benzene / PAHs taken as benzo[a]pyrene / Dust taken as PM_{10} and $PM_{2.5}$); - All five years of meteorological data were run with the predicted maximum concentration for the worst year reported for specific receptors; - for normal operations all plant considered to operate continually at maximum capacity; and

ELEMENT	ASSESSMENT COMMENT
	- assessment based on the maximum predicted PCs and PECs. An exception to presenting the worst-case scenario was identified within the report on the selection of Background values used for the assessment of NOx. **FIR Queries:** **Q21. Provide clarification on what was modelled as part of the air quality impact assessment and provide a demonstration that this has appropriately captured abnormal events …. include but not be restricted to** **b) Consideration of emissions during commissioning activities as an abnormal event and a demonstration as to the potential impact from any such release;** **FIR Response** – further information provided on assessment of abnormal events. No specific statement made on the inclusion of emissions during commissioning as being considered within abnormal emissions. During subsequent discussions with the applicant, it was confirmed that emissions during commissioning had been considered. To ensure this issue has been adequately captured an additional Prior Commissioning Condition (Condition 2.8.4) was included. **Query resolved (deemed sufficient)**
b) Location Map A map showing the location of the process in relation to nearby features and urban conurbations and indicating the extent of the modelled domain. The map should use National Grid Referencing and indicate terrain contours, e.g. Ordnance Survey Landranger Series (1:50,000 scale).	A location map is provided. The local environment is described with local receptors including designated areas and potential human receptors identified and presented on several maps throughout the report (Human Receptors - Section 4.2.9.1 & Fig 7. Ecological Receptors - Section 4.2.9.2 & Fig 8 & 9) and wider application. A screening distance of 15km was used in identifying significant ecological receptors with a smaller distance of 3km used in identifying human receptors and in the HHRA. Further information on the local area and receptors is provided throughout the application.
c) Pollutants and air quality guidelines A list of pollutants modelled. The pollutants under consideration in the assessment should be clearly identified, including chemical specification (e.g. oxides of nitrogen, halogenated compounds). Discussion of relevant air quality standards and objectives appropriate to the modelled pollutants. These will include the relevant standards and objectives contained in Tables D1, D2 and D3 of H1, such as those in the National Air Quality Strategy (NAQS), guidelines from other sources, e.g. World Health Organisation (WHO) and Environmental Assessment Levels.	The following pollutants were identified to be modelled: - Nitrogen oxides (NOx) and nitrogen dioxide (NO_2); - Carbon monoxide (CO); - Total organic compounds (TOC) as benzene; - Sulphur dioxide (SO_2); - Fine and very fine particulate matter (PM_{10} & $PM_{2.5}$); - Hydrogen fluoride (HF) and Hydrogen chloride (HCl); - Ammonia (NH_3); - Dioxins (polychlorinated dibenzo-p-dioxins, PCDDs) and furans (polychlorinated dibenzofurans, PCDFs); - Polychlorinated biphenyls (PCB), and polycyclic aromatic hydrocarbons (PAHs) as 1,3-benzo(a)pyrene; and - Trace metals: lead (Pb), arsenic (As), cadmium (Cd), nickel (Ni), thallium (Tl), mercury (Hg), antimony (Sb), chromium (Cr and CrVI), cobalt (Co), copper (Cu), manganese (Mn) and vanadium (V).

ELEMENT	ASSESSMENT COMMENT
	Air quality criteria, Air Quality Objectives (AQOs) or Air Quality Standard (AQSs) employed when considering the protection of human health and the wider environment are detailed in Section 2.2 and Table 1 of the report for those pollutants where such values exist. These have been verified against the list of Air Quality Standards and Objectives as described on the **AIR QUALITY IN SCOTLAND** web site. Where no AQO or AQS exist then Environmental Assessment Limits (EALs) have been presented in Table 2. These have been verified against H1 and the **GOV.UK** website for air emissions. There are no air quality objectives, European limit values or EALs for dioxins (polychlorinated dibenzo-p-dioxins, PCDDs) or furans (polychlorinated dibenzofurans, PCDFs). Dioxins, furans and trace metals in soil were assessed in a Human Health Risk Assessment (HHRA) which has been provided and assessed separately. See Section 5.2 of this document. The air quality criteria employed for consideration of deposition and the Critical Levels for the protection of ecosystems, is detailed in Section 2.4, Table 5 of the report.
d) Ambient/background levels For all pollutants under consideration an appropriate value for background concentration should be determined. This may take the form of ambient monitoring data from local authorities or maps of ambient concentration produced by NETCEN, however the source and validity of information used should be justified by the Applicant. Future predictions of ambient levels should be also addressed if appropriate for the assessment.	Section 5 of the report highlights the approach taken in reviewing of the existing air quality conditions present in the local area and available source material in order to establish a representative set of background concentration values for the pollutants being considered. Background concentrations used in the assessment and the justification for the way they are used is presented in Section 5.2.3 and Summary background data in Tables 24 (NO_2), 25 (heavy metals) and T26 (other). The values were obtained on consideration of the following: a) Local Authority Data - Review and assessment reports and local air quality monitoring data; b) Air Quality in Scotland website - LA background data, predicted background pollutant concentrations and details of AQMAs; c) UK Monitoring Networks - Ammonia, Acid Gases and Aerosols, and Heavy Metals; and d) Additional Sources – identified as road traffic and industrial sources. Following review no significant points sources identified and all associated emissions considered to be captured within existing background data. Short-term background concentrations In line with available guidance (H1) short term background concentrations have been generated by taking twice the annual mean background concentration

<table>
<tr><th>ELEMENT</th><th>ASSESSMENT COMMENT</th></tr>
<tr><td></td><td>Air Quality Management Areas

It is noted in the report that Aberdeen City Council (ACC) declared three Air Quality Management Areas (AQMAs) due to exceedances of NO_2 (annual mean) and PM_{10} (annual mean & 24 hour mean). These are (distance form site):
- Aberdeen City Centre AQMA (2km);
- Wellington Road AQMA (2km); and
- Anderson Drive AQMA (3 km).
Local monitoring data from ACC has been used in determining the background concentrations for (NOx, NO_2, PM_{10} and $PM_{2.5}$)

Additional Clarification – SEPA Requested sensitivity check for long and short-term NO_2 concentrations using worst case background concentrations.

See Section 11 – Sensitivity Analysis for response. Query resolved (deemed sufficient)</td></tr>
<tr><td>e) Model description

The choice of model used in the assessment should be justified and a description of the chosen air dispersion model given. Information should include model name, type of model (Gaussian, new generation, etc.), supplier and version of model used. Models must be fit for purpose, based on established science, and be validated and independently reviewed.</td><td>For assessment of emissions from the proposed EfW facility, ADMS 5 (version 5.2.4.0) atmospheric dispersion model has been used. ADMS has been used to predict long-term and short-term concentrations, at discrete receptors and across a gridded domain, and results have been compared with the relevant assessment criteria.

A sensitivity test carried out for the modelling exercise as part of the planning process (ESAQ) demonstrated that use of the ADMS model led to higher predicted concentrations than use of an alternative model, AERMOD. This sensitivity analysis was not repeated as part of the application and instead the earlier demonstration was included and referenced. Deemed proportionate and conclusions reached remaining valid.

It is also considered that the ADMS model would be preferred, in this instance, for its more realistic treatment of terrain.</td></tr>
<tr><td>f) Emission parameters

Stack Location (NGR)
Stack height (m)
Pollutant emission rate (g/s)
Exit diameter (m)
Exit temperature (K, °C)
Efflux velocity (actual), and/or (m/s)
Volumetric flow rate (actual) (m3/s)
Appropriate Correction for STP</td><td>All relevant emission data including stack and release parameters have been provided and are presented in:

<table>
<tr><th>Source</th><th>Information Provided</th></tr>
<tr><td>Table 6</td><td>physical stack properties used for modelling including stack gas conditions allowing for correction to reference conditions</td></tr>
<tr><td>Table 7</td><td>Normal Operation - pollutant emission concentrations and corresponding release rates</td></tr>
<tr><td>Table 8</td><td>Abnormal Emissions - pollutant emission concentrations and corresponding release rates</td></tr>
</table>

Some discrepancies in the data presented in the original application were noted and further changes identified through discussion with the applicant with respect to</td></tr>
</table>

ELEMENT	ASSESSMENT COMMENT
	proposed design/layout changes. Addressed through the issue of a further information request (FIR). **FIR Queries:** **Q20. Provide confirmation of the emission limit values (ELVs) that the proposed Installation is designed to meet, justifying the values adopted and demonstrating that the plant can meet them. This confirmation shall include as a minimum but not be restricted to:** **a) A justification for the selection of the emission limit values (ELVs) proposed ….** **FIR Response** – further information & justification provided. Confirmation that plant performance is likely to be less than the upper value of the BAT AEL range however the manufacturers guarantee provided is for the upper range value. No significant impact predicted from the model at these levels. See Appendix H - Emissions to Air ELV Comparison and Selection, of this document for further detail. **Query resolved (deemed sufficient)** **b) Clarification of the proposed ELV concentration for $PM_{2.5}$ and PM_{10} that the plant is described as designed to meet …** **FIR Response** – confirmation that plant is designed to achieve 4 mg/m^3 and guaranteed to meet 5mg/m^3 as opposed to the 10mg/m^3 stated in the original application. This is within the appropriate BAT AEL range with corresponding release rate appropriately modelled. **Query resolved** **c) A demonstration that the proposed plant can meet the proposed ELVs described …** **FIR Response** – further information & justification provided. Confirmation on expected performance and manufacturers guarantee. See Appendix H, of this document for further detail. **Query resolved (deemed sufficient)** **Q26. Provide a revised Air Quality Impact Assessment. The revised assessment shall include consideration any design change made since the submission of the PPC Application …** **b) Physical characteristics of the stack, such as the stack diameter, location etc.;** **FIR Response** – confirmation of change to stack location (minor) and physical characteristics (diameter) etc. Appropriately captured in the revised Air Quality Assessment carried out. **Query resolved**

ELEMENT	ASSESSMENT COMMENT
	c) Discharge characteristics such as velocity, volumetric flowrate or temperature etc. **FIR Response** – confirmation of change to release characteristics. Appropriately captured in the revised Air Quality Assessment carried out. **Query resolved**
g) Modelled domain/receptors The extent of the modelled domain (i.e. the modelled area), and the resolution of the model receptor grid used should be reported and justified by the Applicant. The assumed height above ground level for the receptors (flagpole height) should be reported if appropriate. Details of any discrete receptors used to assess impact at sensitive locations should be reported.	Section 4.2.9 identifies that the model was set up to consider residential properties, schools, hospitals and community facilities in the area as well as other sensitive locations such as designated ecological sites. In addition, the assessment of emissions has also been predicted at locations over a Cartesian grid of 4km x 4km, centred on the proposed stack location. The gridded output at a height of 1.5m, with a resolution of 40m has been used for contour plotting of modelled concentrations. Humas Receptors - 43 discrete human receptors in the vicinity of the proposed EfW facility, at locations around the proposed site were identified and are shown in Figure 7 with details presented in Table 10 of the report. These human receptors have been modelled at a height of 1.5m, representative of inhalation height at ground level and at third floor respectively. Ecological Receptors - 28 discrete ecological receptors locations have been selected based on a search radius from the proposed EFW facility of: - 15km for designated sites (Special protection areas (SPAs) / special areas of conservation (SACs) / Ramsar sites (protected wetlands) / sites of special scientific interest (SSSIs)); and - 2km for local nature sites (ancient woodland, woodland, heathland, local wildlife sites, waterbodies and watercourses, and national and local nature reserves) The location of the selected ecological receptors is shown in Figure 8 and 9 with details presented in Table 11 and 12. A representative set of receptors is deemed to have been considered and appropriately represented.
h) Meteorology/surface characteristics The choice of meteorological data used in the model should be discussed in detail and justified by the Applicant. Information should include the location of the chosen met station in relation to the modelled domain, the number of years included in the assessment, and the source of the data. The format of the met data used (either hourly sequential or long-term statistical) should be reported and justified and a windrose presented for purposes of clarity. Information relating to the surface characteristics at both the meteorological station and within the modelled domain should be reported. This is	Section 4.2.3 identifies that the meteorological data was obtained from the Aberdeen (Dyce) Airport synoptic meteorological station (11.5km to the NNW), considered the most appropriate station for use in this assessment and the Inverbervie meteorological station (32km to SSW) to allow for better consideration of coastal influences. The modelling used five years of data from each of these sites (2013 to 2017), to allow for sensitivity testing between the two stations and examination of the inter-annual variability in predicted concentrations for the permitting assessment. Figure 2 and Figure 3 show the windroses for each of the years of data from Aberdeen and Inverbervie, respectively.

ELEMENT	ASSESSMENT COMMENT
usually related to the relevant land-use classification(s) however the values of parameters (e.g. roughness length, albedo, Bowen ratio/Priestly-Taylor parameter) describing the classifications used in the model should also be reported.	
i) Treatment of terrain The Applicant should justify the inclusion or not of terrain treatment in the assessment and report the source, format and processing of digital terrain data used in the model.	Section 4.2.7 confirmed that a sensitivity test carried out for the modelling exercise as part of the planning process (ESAQ) demonstrated that that terrain data should be included as an input to the ADMS model and it has therefore been included in this assessment. Terrain data has been obtained from the Ordnance Survey (OS), covers a domain of 6.45km x 6.45km (centred on the stack) and is shown in Figure 6.
j) Treatment of Buildings and site plan The Applicant should justify the inclusion or not of building treatment in the assessment and report the location and dimensions of all buildings included in the model (i.e. NGR, height, width, rotation). A site plan showing the location and relative orientation of buildings and their dimensions should be included.	The most significant buildings (EFW facility and adjacent United Fish Industries (UK) Ltd plant (UFI) have been identified with their locations and appropriate dimensions included. See section 4.2.5, Figure 4 and Table 9 for further detail. Plans are available in the main supporting technical report and associated appendices. **Q26. Provide a revised Air Quality Impact Assessment. The revised assessment shall include consideration any design change made since the submission of the PPC Application …** **b) Site layout, such as the building dimensions, location etc.** **FIR Response** – confirmation of changes. Appropriately captured in the revised Air Quality Assessment carried out. **Query resolved**
k) Sensitivity analysis This should include a discussion and quantification of model sensitivity to meteorological data (e.g. different met sites, inter-annual variation, surface characteristics), emission parameters (stack parameters, pollutant release rate, different plant operating scenarios), receptor grid resolution, and treatment of terrain and buildings. A final quantification of model uncertainty should be reported taking the above into account.	Section 6 of the report confirms the operational assessment carried out including the results from the sensitivity analysis undertaken. Sensitivity analysis was carried out for the following effects: Meteorological Data (Section 6.2) - The results from the sensitivity test are provided in Table 27, 18 & 29. The results presented demonstrate that there is little variation in maximum values between the meteorological years for Aberdeen and Inverbervie data, respectively. The meteorological data and year giving the highest concentrations for each statistic/averaging period has been used in the modelling for the main assessment. Buildings (Section 6.3) - A comparison between modelling the EfW building only and the EFW and UFI building was carried out with the results presented in Table 30. There was little variability in the results with the EFW only scenario representing worst case and being taken forward.

ELEMENT	ASSESSMENT COMMENT
	Coastal Effects (Section 6.4) - The results presented (Table 31) provide a comparison of the results with and without the input of the surface roughness file used to represent coastal effects. Some variation is evident and the model run giving the highest concentrations for each statistic/averaging period has been used in the modelling for the main assessment. The following sensitivity analysis was carried out for the modelling exercise as part of the planning process (ESAQ) and while not repeated as part of this application, the earlier demonstration has been referenced in this report and as such is mentioned below. This is deemed a proportionate approach with the conclusions reached considered to remain valid: Model Selection - use of the ADMS model led to higher predicted concentrations than use of an alternative model, AERMOD. Terrain Data - demonstrated that that terrain data should be included as an input to the ADMS model and so included in this assessment. **Additional Clarification – SEPA Requested sensitivity check for long and short-term NO_2 concentrations using worst case background concentrations** NO2 background concentration (Section 6.5) –. A sensitivity test for NO_2 background concentrations has been undertaken whereby a worst-case scenario using a conservative background concentration is used. Table 32 describes the maximum process contribution (PC) at any modelled human receptor and the worst case predicted environmental concentration (PEC) by taking the worst-case background concentration (46.0µg/m^3) identified in Section 5.2.3.1. For the short-term objective, the PC does not exceed the 10% threshold and therefore there are no significant impacts. For long-term objective, however, the PC exceeds 1% of the EAL and the long-term PEC exceeds 70% of the EAL. This therefore indicates a potential significant impact. The outcome of a significant impact is only reached due to the use of the highest recorded background concentration (46.0µg/m^3) being considered for all receptors. The use of this roadside data from the AQMA 2km from the proposed site is considered as unrealistic for the characterisation of ambient background conditions across the entire study area. More representative background concentrations to the receptor under consideration have been used and is discussed further in Section 4 (Ambient/background levels)

ELEMENT	ASSESSMENT COMMENT
	and Section 13 (Assessment of impacts). **Query resolved (deemed sufficient)**
l) Special treatments This should include relevant information on specialised model treatments, for instance short-term (puff) releases, coastal models, fluctuations, photochemistry, wet/dry deposition, flare releases, etc.	Coastal Effects considered. See Section 11 - Sensitivity Analysis, for details.
m) Assessment of impacts • A discussion on the post-processing of relevant percentile values and addition of background concentrations should be provided including conversion factors for different averaging times if appropriate. • Any assumptions relating to pollutant conversion processes (e.g. NO/NO2 photochemistry) for different averaging times should be justified. • Results should be presented in tabular form, indicating total (process plus background) concentration values and locations of maximum air quality impacts and the process contribution to this. The percentage impact upon the relevant air quality standard or objective should also be reported. • Contour plots should be provided for each air quality objective being assessed. These should indicate pollutant name and modelling scenario, averaging time and appropriate percentile plotted and should clearly indicate areas of exceedance. The same colour scale should be used for all contour plots relating to a particular air quality objective. • Discussion should address any potential breaches of relevant air quality standards or objectives. This should take into account model uncertainty, assessment of different stack heights and emission characteristics and different process operation scenarios.	**1. Significance** In line with available guidance the report identifies that for: The emission is to be considered as **insignificant** where process contribution (PC) for: (Human / Ecological Receptors - Designated Sites) - Long Term > 1% of the Long Term (LT) environmental benchmark / critical level; or - Short Term > 10% of the Short Term (ST) environmental benchmark / critical level (Ecological Receptors – Undesignated Sites) - Long and Short term are less than 100% of their relevant environmental standards, Where not screened out by the above threshold check then emissions are only **considered significant** where the predicted environmental concentration (PEC) for: (Human / Ecological Receptors - Designated Sites) - Long Term > 70% of the LT environmental benchmark / critical level; or - PC Short Term > 20% of the ST environmental benchmark **2. Overview** **No Significant Impact from any pollutant at any human or ecological receptor for long- or short-term objectives.** <u>Human Receptors</u> The assessment showed that there are no pollutants for which the long-term PCs exceed 1% of the EAL and the long-term PEC exceeds 70% of the EAL. Therefore, there are **no significant impacts at human receptors for long-term EALs.** For short-term objectives, the 10% threshold was not exceeded for any of the pollutants. Therefore, there are **no significant impacts at human receptors for short-term EALs.** <u>Ecological Receptors</u>

ELEMENT	ASSESSMENT COMMENT

All the undesignated sites have a short-term and long-term PC of less than 100% of the short-term and long-term environmental standard, respectively. Therefore, there are **no significant impacts at non designated ecological receptors**.

For designated receptors (River Dee), all emissions with the exception of the NOx 24-hour mean, are below the screening threshold of 10%. The NOx 24-hour mean PC is 15% of the short-term standard and PEC (assuming worst case background) would be calculated as 111% of the EAL. Where a more realistic approach to determining background concentration is taken (See Section 11 – Sensitivity Analysis for NO_2, then the PEC would be 60-71.7% of the standard. Furthermore, The River Dee (SAC) and Cove (SSSI) are not sensitive to nutrient nitrogen deposition nor acid deposition. For those ecological receptors sensitive to nutrient nitrogen deposition the maximum impact was predicted at Findon Moor (SSSI) where the PC was predicted to be 0.19% of the CL.

At ecological receptors there are predicted to be no significant impacts.

3. Specific Pollutants

3.1 Nitrogen Dioxide (NO_2)

A sensitivity check was carried out using the worst-case background concentration and the results included below. Where the worst-case background concentration is used then the AQS/EAL is breached with a PC of 1.6% and a PEC of 116.6%. The use of the concentration (roadside data) from the AQMA 2km from the proposed site is considered as unrealistic for the characterisation of ambient background conditions across the entire study area. It demonstrates that the worst-case background concentration form the AQMA would represent a breach of the AQS/EAL in its own right, irrespective of any process contribution.

NO_2 ug/m^3 - Predicted maximum Impact					
		Human Health		**Ecological**	
Source Conc.		**Annual Mean**	**1 hr Mean**	**Annual Mean**	**24 hr Mean**
AQS/AEL		40	200	30	75
Normal Operation – Worst Case Background					
Background		46	92	-	-
Max Conc. (Tab 32)	PC	0.63 **(1.6%)**	12.82 (6.4%)	-	-
	PEC	46.63 **(116.6 %)**	104.82 (52.4%)	-	-
Normal Operation – Representative Background					
Background		23	46	23	46
Max Conc.	PC	0.63 (1.6%)	12.82 (6.4%)	0.63 (2.1%)	12.82 (17.1%)

ELEMENT	ASSESSMENT COMMENT

(Tab 33)	PEC	23.63 (59.1%)	58.82 (29.4%)	23.63 (78.8%)	58.82 (78.4%)
Abnormal Operation					
Max Conc. (T35)	PC	-	25.63 (12.8%)	-	25.63 (34.2%)
	PEC	-	71.63 (35.8%)	-	71.63 (95.5%)

Note:- Abnormal operation only considers Short Term impacts due to the nature and duration of upsets before plant is shutdown

Where a more representative background concentrations is used it can be seen that while the PC remains above the relevant threshold (>1%) at 1.6%, the corresponding PEC falls to 59.1% and is below the significance threshold of 70% of the AQS/EAL.

The maximum 1 hr mean ground level concentration is identified as being insignificant with a PC of 6.4% and a PEC of 29.4% of the AQS/EAL

Human Receptors (Table A2.1)

Identified receptors that exceed the Long-Term PC significance threshold of 1% of the AQS/EAL are listed below. The corresponding PEC when using a representative, still conservative, background are all below the PEC significance threshold of 70% AQS/EAL.

No receptors exceed the 1 hr mean concentration (short term) PC significance threshold of 10% with a maximum value of 6.4% of the AQS/EAL. The highest PEC recorded is at 49.3% at Wellington Rd AQMA 1.

A2.1 - Nitrogen Dioxide (NO_2) – Annual /Long Term

ID	Name	PC/AQO (%)	PEC /AQO (%)
4	Kirkhill Crescent 2	1.28	58.8
5	Tullos Primary School	1.56	59.1
16	Farquhar Avenue	1.1	58.6

It is noted that the AQS/EAL is breached at two receptors (41 - Wellington Rd AQMA 1 and 42 - Wellington Rd AQMA 2) both of which are recorded at 115.4%. This is however dominated by the background concentration with the process contribution representing only 0.17 and 0.15 % of the AQS/EAL respectively.

Where the worst-case background concentration is used then the AQS/EAL is breached at every identified receptor. The use of this roadside data from the AQMA 2km from the proposed site is considered as unrealistic for the characterisation of ambient background conditions across the entire study area and demonstrates that the worst-case background concentration form the AQMA would represent a breach of the AQS/EAL in its own right., irrespective of any process contribution. More representative background concentrations to the receptor under consideration have

ELEMENT	ASSESSMENT COMMENT

been used and are discussed further in Section 4 (Ambient/background levels) returning the results highlighted above.

Ecological - River Dee (SAC)

For designated receptors (River Dee), all emissions with the exception of the NOx 24-hour mean, are below the screening threshold of 10%. The NOx 24-hour mean PC is 15% of the short-term standard and PEC (assuming worst case background) would be calculated as 111% of the EAL. Where a more realistic approach to determining background concentration is taken (See Section 11 – Sensitivity Analysis for NO_2, then the PEC would be 60-71.7% of the standard. Furthermore, The River Dee (SAC) and Cove (SSSI) are not sensitive to nutrient nitrogen deposition nor acid deposition. For those ecological receptors sensitive to nutrient nitrogen deposition the maximum impact was predicted at Findon Moor (SSSI) where the PC was predicted to be 0.19% of the CL.

Not significant.

3.2 Carbon Monoxide (CO)

All predicted emission concentrations, including those at all identified human receptors (Table A2.1), are below the relevant significance thresholds.

CO ug/m³ – Predicted maximum Impact			
		Human Health	
Source Conc.		8hr Mean	1 hr Max
AQS/AEL		10,000	30,000
Background		360	360
Normal Operation			
Max Conc. (Tab 33)	PC	8.51 (0.09%)	12.65 (0.04%)
	PEC	368.51 (1.3%)	372.65 (1.52%)

Not significant.

3.3 VOCs (Benzene)

Maximum annual PC for VOC is above significance threshold (>1%) at 2.29% of the AQS/EAL. The corresponding PEC is below the significance threshold (>70%) at 9.1% of the AQS/EAL. Several predicted emission concentrations at identified human receptors (Table A2.3), are above the below relevant significance threshold for PC but all are well below the PEC significance threshold (>70%) with the maximum recoded at 9.1% of the AQS/EAL, as detailed above. All other predicted emission concentrations (short term) are below relevant significance thresholds.

ELEMENT	ASSESSMENT COMMENT

VOC ug/m³ - Predicted maximum Impact			
		Human Health	
Source Conc.		1hr Mean	Annual
AQS/AEL		195	3.25
Background		0.44	0.2
Normal Operation			
Max Conc. (Tab 33)	PC	2.53 (1.3%)	0.07 (2.29%)
	PEC	2.97 (1.52%)	0.29 (9.1%)

Not significant.

3.4 Sulphur Dioxide (SO_2)

Maximum annual concentration at a single identified ecological receptor (Table B1.2) (non-designated) for SO_2 is above significance threshold (>1%) at 1.6% of the AQS/EAL. The corresponding PEC is below the significance threshold (>70%) at 21.6% of the AQS/EAL. All other predicted emission concentrations, including those at all identified human receptors (Table A2.4), are below relevant significance thresholds.

SO_2 ug/m³ - Predicted maximum Impact					
		Human Health			Ecological
Source Conc.		15 min Mean	1 hr Mean	24 hr Mean	Annual Mean
AQS/AEL		266	350	125	20
Normal Operation					
Background		8	8	8	4
Max Conc. (Tab 32&34)	PC	19.91 (7.5%)	18.09 (5.2%)	10.90 (8.7%)	**0.314 (1.6%)**
	PEC	27.91 (10.5%)	26.09 (7.5%)	18.90 (15.1%)	4.314 (21.6%)
Abnormal Operation					
Max Conc. (T35)	PC	**35.05 (13.2%)**	31.83 (9.1%)	**19.19 (15.4%)**	-
	PEC	43.05 (16.2%)	39.83 (11.4%)	27.19 (21.8%)	-

Not significant.

3.5 Dust (PM_{10})

All predicted emission concentrations, including those at all identified human receptors (Table A2.5), are below relevant significance thresholds. It is noted that the Annual PEC is at 78% of the AQS/EAL however the background is wholly dominant with the maximum the PC representing only 0.2% of the AQS/EAL.

PM_{10} ug/m³ - Predicted maximum Impact	
	Human Health

ELEMENT	ASSESSMENT COMMENT

Source Conc.		24hr Mean	Annual
AQS/AEL		50	18
Background		28	14
Normal Operation			
Max Conc. (Tab 33)	PC	1.28 (2.6%)	0.04 (0.2%)
	PEC	29.28 (59%)	14.04 (78%)
Abnormal Operation			
Max Conc. (T35)	PC	1.00 (2.0%)	-
	PEC	29.00 (58.0%)	-

Not significant.

3.6 Dust ($PM_{2.5}$)

All predicted emission concentrations, including those at all identified human receptors (Table A2.6), are below relevant significance thresholds. It is noted that the Annual PEC is at 80% of the AQS/EAL however the background is wholly dominant with the maximum the PC representing only 0.4% of the AQS/EAL.

$PM_{2.5}$ ug/m^3 - Predicted maximum Impact		
		Human Health
Source Conc.		Annual
AQS/AEL		10
Background		8
Max Conc. (Tab 33)	PC	0.04 (0.4%)
	PEC	8.04 (80%)

Not significant.

3.7 Hydrogen Fluoride (HF)

All predicted emission concentrations, including those at all identified human (Table A2.7) and ecological (Table B1.4) receptors, are below relevant significance thresholds.

HF ug/m^3 - Predicted maximum Impact					
		Human Health		Ecological	
Source Conc.		1 hr Mean	Monthly	Weekly Mean	24 hr Mean
AQS/AEL		160	16	0.5	5
Normal Operation					
Background		0.08	0.08	0.08	0.08
Max Conc. (Tab 32)	PC	0.51 (0.3%)	0.01 (0.1%)	<0.01 (0.3%)	0.11 (2.3%)
	PEC	0.59 (0.4 %)	0.09 (0.6%)	0.08 (16.3%)	0.19 (3.9%)
Abnormal Operation					
	PC	7.84	-	-	-

ELEMENT	ASSESSMENT COMMENT

Max Conc. (T35)		(4.9%)			
	PEC	7.92 (5.0%)	-	-	-

Not significant.

3.8 Hydrogen Chloride (HCl)

All predicted emission concentrations, including those at all identified human (Table A2.8) receptors, are below relevant significance thresholds.

HCl ug/m³ - Predicted maximum Impact		
		Human Health
Source Conc.		1 hr Mean
AQS/AEL		750
Background		0.72
Max Conc. (Tab 33)	PC	7.59 (1.0%)
	PEC	8.31 (1.1%)
Abnormal Operation		
Max Conc. (T35)	PC	**167.68 (22.4%)**
	PEC	168.40 (22.5%)

Not significant.

3.9 Ammonia (NH_3)

Maximum annual concentration at a single identified ecological receptor (Table B1.3) (non-designated) for NH_3 is above significance threshold (>1%) at 3.5% of the AQS/EAL. The corresponding PEC is below the significance threshold (>70%) at 56.8% of the AQS/EAL. All other predicted emission concentrations, including those at all identified human receptors (Table A2.9), are below relevant significance thresholds.

NH_3 ug/m³ - Predicted maximum Impact				
		Human Health		Ecological
Source Conc.		1 hr Mean	Annual Mean	Annual Mean
AQS/AEL		2500	180	3
Background		3.2	1.6	1.6
Max Conc. (Tab 32)	PC	3.16 (0.13%)	0.07 (0.04%)	0.105 (3.49%)
	PEC	6.36 (0.25%)	1.67 (0.93%)	1.705 (56.8%)

Not significant.

3.10 Dioxins and Furans

ELEMENT	ASSESSMENT COMMENT
	The maximum predicted long-term PC (annual mean) across all receptors from 2013 to 2017 is 2.72x10^{-}10 µg/m^3, which is predicted at receptor 5 in 2014. There are no air quality strategy objectives, European limit values or EALs for dioxins (polychlorinated dibenzo-p-dioxins, PCDDs) or furans (polychlorinated dibenzofurans, PCDFs). Assessment of impact from Dioxins and Furans is carried out via the Human Health Risk Assessment (HHRA), described in Section 5.1 of the Decision Document; **Not significant.** **3.11 Benzo(a)pyrene** All predicted emission concentrations, including those at all identified human (Table A2.11) receptors, are below relevant significance thresholds. **Not significant.** **3.12 Group I metals - Cd and Tl** Maximum annual PC for Cd is above significance threshold (>1%) at 2.98% of the AQS/EAL. The corresponding PEC is below the significance threshold (>70%) at 4.78% of the AQS/EAL. All other predicted emission concentrations below relevant significance thresholds. **Not significant.** **3.13 Group II metals – Hg** All predicted emission concentrations below relevant significance thresholds. **Not significant.** **3.14 Group III metals - Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V** In line with available Environment Agency Guidance on waste incinerators and impact assessment for group 3 metals EA Releases from waste incinerators - Version 4 a staged assessment has been adopted. Stage 1 As an initial screen it is assumed that each Group III metal is emitted at the IED emission limit value (worst case). As above, if the Process Contribution (PC) does not exceed 1% of a long term or 10% of a short term AQS/EAL, then the

ELEMENT	ASSESSMENT COMMENT
	impact is not considered to be significant. Where these significance thresholds are exceeded, consideration is given to the PEC and if it is greater than 70% of the relevant AQS/EAL, then the assessment proceeds to Stage 2. At this stage: - Both Cr(VI) and As have a PC > 1% and a PEC > 70%; - PC for Cd (2.98%), Ni (11.2%) and Mn (1.49%) are above significance threshold (>1%) of the AQS/EAL. The corresponding PECs, Cd (4.78%), Ni (14.0%) and Mn (3.02%) are below the significance threshold (>70%) of the AQS/EAL. - All other predicted emission concentrations are below relevant significance thresholds. <u>Stage 2</u> Cr(VI) and As proceeded to Stage 2 which assumes (in line with available guidance) that emissions of Group III metals are at the maximum values found from an analysis of 18 municipal waste incinerators, all of which meet the IED ELVs. On this basis Cr(VI) predicted emission concentration is below the relevant significance thresholds and while the PC for As (3.72%) is above significance threshold (>1%) of the AQS/EAL. The corresponding PEC for As (13.7%) is below the significance threshold (>70%) of the AQS/EAL. **Not significant.** **Other Related Impacts** a) The Human Health Risk Assessment (HHRA) is described in Section 5.1 of the Decision Document; and b) The Nature Conservation Habitats Assessment (ecological assessment of deposition) is described in Section 5.1 and 16 (Appendix D) of the Decision Document.
c) Model input files Input files for the air dispersion model used in the assessment should be included as an Appendix to the report, usually on computer disk. These should be sufficient that model configuration and the parameter values used to define all source and meteorological inputs to the model can be audited	To be supplied - Model input files were available as part of the original application however following the cyber-attack on SEPA and subsequent re submission of the application model input files could only be received in PDF format at the time of resubmission. They remain available to SEPA should it be necessary to obtain them. It has been deemed as unnecessary at this time.

16 APPENDIX D – NATURE CONSERVATION HABITATS ASSESSMENT (NCP-01)

Record of the assessment of the conservation implications of EFW NESS LIMITED (SC627853), NESS Energy from Waste Facility, Greenbank Crescent, East Tullos Industrial Estate, Aberdeen, Scotland, AB12 3BG: PPC/A/1186430

The following document has been prepared by the Scottish Environment Protection Agency as the Competent Authority for the above proposal.

This report should be read in conjunction with the following documents:

- Application forms and Appendices (Includes EIA from Planning)
- Non-technical summary
- Supporting technical report
- Emissions and impact report

(These can be found through the SEPA website Ness-efw-facility-efw-application)

Coordinating Officer: [redacted] Specialist I (PPC & COMAH), Waste and Industry
Ecology advice: [redacted] and [redacted] (Senior Ecologists)
Date of completion: 13th December 2019

Project and site description	
Brief description of the project	The proposed EfW facility located within the East Tullos Industrial Estate on the south side of Aberdeen: - NGR: NJ 95426 03997 and OS grid reference E 395427 N 803991. Facility to produce heat for distribution to housing, using a district network of hot water pipes. The proposed plant will have operating treatment capacity of 150,000 tonnes of waste per year and would operate for around **8000 hours** per year. It utilises a moving grate and is designed to treat source segregated residual municipal solid waste (MSW) from the Aberdeenshire, Moray and Aberdeen City local authority areas as well commercial and industrial (C&I) waste streams of a similar nature. The proposed facility will include the following activities: - Delivery of MSW and C&I waste. - Waste reception and handling including blending of the incoming wastes to produce a consistent waste fuel feed

<table>
<tr><td></td><td>
- Incineration/Combustion
- Generation of electricity via a steam turbine generator and ability to provide heat offsite;
- Treatment of Incineration gases before release via stack.
- Raw material and ash storage and handling.
The legal applicant is EfW NESS Limited, owned by Acciona Industrial, which is a wholly owned subsidiary of Acciona, a global group that operates predominantly in two main business areas, energy and infrastructure.
</td></tr>
<tr><td>Special Areas of Conservation or Special Protection Areas within the screening distance of the project</td><td>
<table>
<tr><th>Name</th><th>Distance (km)</th><th>Designation</th><th>Easting</th><th>Northing</th></tr>
<tr><td>River Dee</td><td>1.157</td><td>SAC</td><td>394341</td><td>804392</td></tr>
<tr><td>Red Moss of Netherley</td><td>13.239</td><td>SAC</td><td>386549</td><td>794168</td></tr>
</table>

NOTE: Comprehensive list of sites available in Applications section – EIA Environmental Statement – Section 8
</td></tr>
<tr><td>Qualifying interests for the SAC/SPA (habitats and/or species) and site condition (and date of assessment) for each of these interests</td><td>
River Dee SAC for the following Annex II species
<table>
<tr><th>Qualifying interest</th><th>Latest assessed condition</th><th>Negative pressures</th></tr>
<tr><td>Atlantic Salmon</td><td>21 July 2011
Favourable Maintained</td><td>Agricultural Operations, Invasive species,
Water Management and Water Quality</td></tr>
<tr><td>Freshwater pearl mussel (Margaritifera magaritifera</td><td>07 August 2003
Unfavourable No change</td><td>Development, Invasive species, Water management and Other to be identified</td></tr>
<tr><td>Otter (Lutra lutra)</td><td>06 Oct 2012
Favourable declining</td><td>No negative pressures</td></tr>
</table>

Red Moss of Netherley SAC
<table>
<tr><th>Qualifying interest</th><th>Latest assessed condition</th><th>Negative pressures</th></tr>
<tr><td>Active raised bog</td><td>10 August 2015 Unfavourable Recovering</td><td>Invasive species</td></tr>
<tr><td>Degraded raised bog</td><td>10 August 2015 Unfavourable Recovering</td><td>Invasive species</td></tr>
</table>
</td></tr>
</table>

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

SSSIs and their designated features within the screening distance of the project

Name	Distance (km)	Easting	Northing	Designated features - biological
Nigg Bay	1.169	396502	804450	Geological Only
Cove	2.873	395670	801128	Dickie's bladder-fern 12 Jul 2013 Favourable Maintained Wildlife crime Negative pressure Maritime cliff Favourable declining 03 June 2013
Findon Moor	6.224	394174	797894	Lowland dry and wet Heath. Favourable Maintained 14 Aug 2012 no negative pressures
Scotstown Moor	7.465	393732	811261	Springs (including flushes) 07 July 2005 Unfavourable Declining Negative pressure is invasive Bracken and Gorse
Corby,Lily and Bishops Lochs	10.609	392466	814178	Eutrophic loch 21 Aug 2013 Unfavourable Recovering Invasive species , Water Management and Water quality Mesotrophic loch. 23 Jun 2004 Unfavourable Declining. Invasive species and Water Management. Hydromorphological mire range 03 Sep 2013 Unfavourable Declining Invasive species. Open water transition fen 03 Sep 2013. No negative pressures. Favourable Maintained 03 Sep 2013
Red Moss of Netherley	13239	386549	794168	Raised bog 10 Aug 2015 Unfavourable Recovering Invasive species Water management.
Balmedie Quarry	13985	394486	817944	Geological only

Cove SSSI is located on the east coast of Scotland, 5 km south of Aberdeen harbour. It comprises a section of maritime cliff and adjacent slopes with coastal grassland, wet flushes and coastal heath. Cliff ledges here support colonies of a rare plant, Dickie's bladder-fern Cystopteris dickieana, discovered here in 1838.

The site also contains a diverse mix of coastal grassland, wet flushes and coastal heaths. Of particular interest are the herb-rich grasslands on base-rich areas which form a colourful mixture of calcium-loving plants such as kidney vetch Anthyllis vulneraria, bloody crane's-bill Geranium sanguineum, burnet rose Rosa pimpinellifolia, common rock-rose Helianthemum nummularium and the rare purple milk-vetch Astragalus danicus along with maritime plants such as thrift Armeria maritima, sea campion Silene maritima and sea plantain Plantago maritima.

	Findon Moor SSSI is an area of heathland on the east coast of Aberdeenshire, 15 km north of Stonehaven. The heathland has developed on Dalradian Grits which are more acidic in nature than the Old Red Sandstone towards Stonehaven. Coastal heathland is rare in Aberdeenshire and Findon Moor is one of the largest areas remaining and the best example in south Aberdeenshire. The site is exceptional in the diversity of habitats present, from the rocky shore to the heath. The main heathland vegetation type at Findon is dry heath dominated by ling heather *Calluna vulgaris* with patches of crowberry *Empetrum nigrum* and bell heather *Erica cinerea* and with lichen and moss communities (e.g. *Cladonia furcata, Evernia prunastri, Hypogymnia physodes*) on rocky knolls. Wet heath dominated by cross-leaved heath *Erica tetralix* and ling heather also occurs, along with wet flushes dominated by bog asphodel *Narthecium ossifragum* and common cotton-grass *Eriophorum angustifolium*. On the seaward slopes the heathland grades through turf dominated by ling heather, crowberry and mat grass *Nardus stricta* to coastal grassland. Heath spotted-orchid *Dactylorhiza maculata*, early-purple orchid *Orchis mascula* and fragrant orchid *Gymnadenia conopsea* frequently occur on the moor. Scotstown Moor SSSI is located about 3 km to the north-east of the mouth of the River Don, in north Aberdeen. The mixture of wetland includes fen-meadow, wet heath and springs and flushes. The mineral-rich springs and flushes provide habitats for a number of plant species now rare in the north-eastern lowlands, including black bog-rush *Schoenus nigricans*, lesser butterfly orchid *Platanthera bifolia*, greater sundew *Drosera anglica* and lesser tussock sedge *Carex diandra*. Corby, Lily and Bishops' Lochs SSSI are located 4km north-east of Aberdeen. These three lochs together with their fringing reedbeds and bogs provide one of the best and least disturbed wetland sites in the north-eastern lowlands. Corby and Lily lochs also show an excellent hydroseral progression from open water to woodland. The lochs' nutrient status range from mesotrophic (Bishops' Loch) to eutrophic (Corby Loch). Corby and Lily lochs' aquatic vegetation includes at least five species of pondweed Potamogeton. The fringing reedbeds are dominated by common club-rush Schoenoplectus lacustris, bottle sedge Carex rostrata and common reed Phragmites australis. Red Moss of Netherley SAC/SSSI is located 12 km north of Stonehaven. It comprises a raised bog, modified by peat cutting in the past. A central area of uncut deep peat is surrounded by re-vegetated peat-cuttings with a fairly extensive fringe of poor-fen, and birch and willow fen-woodland. It is the best example of a lowland raised bog in the Aberdeen area and one of the largest in the north-east. It has a good representation of bog vegetation associated with the eastern lowlands of Scotland, being dominated by ling heather *Calluna vulgaris* and hare's-tail cotton grass *Eriophorum vaginatum*. Locally, towards the centre of the site, the

	bog is actively regenerating. Here, bog myrtle *Myrica gale* is frequent and major peat-building bog mosses, *Sphagnum papillosum* and most notably *S. magellanicum*, are abundant.
Is the proposal directly connected with, or necessary to, conservation management of the SAC/SPA?	The proposal is not directly connected with, or necessary to the conservation management of the River Dee SAC or the Red Moss of Netherley SAC. Therefore further consideration and an assessment of likely significant effect is needed.
Assessment of likely significant effect	
Identify the individual elements or phases of the overall project that would give rise to a likely significant effect. Clearly identify any element of the project where the scale or magnitude of effect is not known or cannot be determined at this stage.	During operation, nitrogen and sulphur compounds, arising from combustion processes and emitted from a stack at 80 metres above ground level, could have an adverse impact on sensitive habitats located downwind. The applicant has provided modelled predictions of the amount of each pollutant at each designated conservation site due to the proposed activity; this is called the process contribution (PC). It is literally the contribution of pollutant due to the combustion process. Predicted process contributions were obtained by running ADMS 5 to enable assessment of likely significant effect. At this stage, the process contribution and background values for each designated nature conservation site are obtained for the point on the site boundary which is closest to the emission point. In this document the term benchmark is used to encompass the critical level for pollutant gas concentrations and the critical load for acid or nutrient nitrogen deposition to the habitat. Critical loads are habitat-specific. The relevant critical load can be obtained from the Site Relevant Critical Load section of the APIS database (www.apis.ac.uk); critical levels and background values are also available on the APIS website. During screening, the critical level and the lowest of the European range for critical load of the most sensitive designated feature for each site are used in the assessment. The background plus process contribution, i.e. the total amount of pollutant expected to be experienced by the receptor, is called the Predicted Environmental Contribution (PEC). Where the PEC is less than the benchmark, or where the process contribution is less than 1% of the benchmark then it is considered unlikely that there will be a significant effect on the designated site as a consequence of the proposed regulated activity. Summary of results:

	The full results, i.e. the PC and PEC for all sites, expressed both as a percentage of the critical load and in kg N/ha/year (or μg/m3 for gas concentrations), are presented in Appendix B (Model Results at Ecological Receptors) of the Air Quality Assessment (from page 153 of the submission). The modelled 24-hour mean NOx PC and PEC do exceed the benchmark for the River Dee SAC (see Table 34 and written text on page 71 of the submission (which cites 15.2% PC and 104% PEC as a percentage of the short-term critical level of 75 $\mu g/m^3$). However, the background NO_x concentration used was a conservative choice (obtained from the nearest urban monitoring point in a Local Air Quality Management area). The background concentration predicted by the Concentration Based Emission and Deposition model, and obtained from APIS Search By Location for the grid reference of the point on the River Dee closest to the proposed EfW site, was 27.92 $\mu g\ NO_x/m^3$; doubling this value for assessment of short term emissions would result in a value of 55.84 then by adding the process contribution of 11.4 $\mu g/m^3$ to this value, results in a PEC of 67.24 $\mu g/m^3$, which is 90% of the critical level. The critical level for nitrogen oxides applies to all vegetation, however, the River Dee designated features are aquatic animal species that live in the river, specifically freshwater pearl mussel, otter and Atlantic salmon. It is therefore considered unlikely that the SAC qualifying interest species would be affected by the slight exceedance of the 10% PC benchmark. This is particularly the case because the majority of the SAC is not located within the prevailing deposition direction. Overall the results show that a significant effect due to the proposal can be ruled out as unlikely for all designated nature conservation sites, based on the criteria described above.
Identify any likely direct, indirect or secondary impacts of the project, in combination with other plans or projects, on the SAC/SPA.	Results of in-combination assessment: According to section 9.1 of the Air Quality Assessment (Appendix B of the submission), there are no consented developments that would give rise to significant new emissions to air whose emissions are not detected in the background monitoring and modelling. Therefore, in-combination effects of this proposal with other projects should not occur. Summary Screening Result: Initial screening is passed for all European nature conservation sites due to the process contribution for all relevant atmospheric deposition and air pollutant concentrations being less than 1% of the critical load and critical level or due to the sum of the background and the process contribution being less than the critical load or level.

Identify any likely direct, indirect or secondary impacts of the project on any relevant SSSIs.	Results of in-combination assessment: According to section 9.1 of the Air Quality Assessment (Appendix B of the submission), there are no consented developments that would give rise to significant new emissions to air whose emissions are not detected in the background monitoring and modelling. Therefore, in-combination effects of this proposal with other projects should not occur. <u>Summary Screening Result:</u> Initial screening is passed for all SSSIs due to the process contribution for all relevant atmospheric deposition and air pollutant concentrations being less than 1% of the critical load and critical level or due to the sum of the background and the process contribution being less than the critical load or level.
Conclusion of assessment of likely significant effect	
Is the plan/project likely to have a significant effect on the SAC/SPA, either alone or in combination, with other plans or projects?	**It is SEPA's view that the proposal will not have a likely significant effect on the River Dee SAC and Red Moss of Netherley SAC. No further assessment is required.**

17 APPENDIX E – SITE CONDITION AND BASELINE REPORT REVIEW

Report comments provided via e-mail on the 9th July 2021.

I have completed revision of the NESS Energy from Waste Facility. Pollution Prevention and Control - Addendum Site Condition and Baseline Report. SCR002, Issue 1 dated 17th December 2020 and have the following comments:

This addendum report satisfactorily addresses all the further information requests on the notice with regards to information missing from the Site Condition Report such as:

- List of Relevant Hazardous Substances and details on their volumes and storage locations,
- Identification of pollution risks to the environment setting (geology, hydrology and hydrogeology) associated to the proposed PPC EfW activities,
- Reference to implementation of management, maintenance and equipment check plans to ensure adequate containment on site to avoid pollution,
- Revised conceptual site model
- Proposals for ground investigation works to collect relevant soil and groundwater samples at adequate locations (i.e. bunker, fuel oil and urea tank area, IBA, APCr and boiler ash silos, etc.) The proposed location of six boreholes has been agreed with SEPA in September 2020 and presented on Drawing No. NSS-00-PM-LW-IDO-1001. General Arrangement Plan, and
- Statement of Site Condition

In summary:

All the required information for this site regarding the Site Condition report has been provided in the Addendum Site Condition Report; additionally, the six proposed exploratory borehole locations have also been agreed back in September 2020 and they are considered suitable for collection of soil and groundwater samples to set baseline and to be used as the permanent boreholes to provide the soil and groundwater monitoring through the life of the permit.

SEPA now need to wait until the further ground investigation works are undertaken to set baseline prior to commencing operations on site and the baseline information should be used to update the CSM, geology, hydrogeology and any contaminants concentrations that are required as per the tables below (these should be included on the permit).

Groundwater monitoring requirements

Relevant hazardous substance	Activity to be monitored	Frequency
pH	Storage areas, waste water treatment plant area , waste bunker area and decantation pit area	5 years
Chemical Oxygen Demand	Storage areas and waste water treatment plant area, waste bunker area and decantation pit area	5 years

Calcium Dihydroxide (Hydrated Lime)	Silo storage area and area of direct feed into the flue gas treatment system	5 years
Sodium Hydroxide	IBC/Carboy storage area and waste water treatment plant area	5 years
Ammonia	Tank storage area and area of direct feed into boiler system	5 years
Hydrochloric acid	IBC storage area and waste water treatment plant area	5 years
Sulphuric acid	IBC storage area and waste water treatment plant area	5 years
TPH CWG aliphatic and aromatic split	Tank storage area and area of direct feed into boiler system	5 years
Heavy metals	APCr silo area, IBA storage bunker area, waste bunker area and decantation pit area	5 years
PAH USEPA 16	APCr silo area, IBA storage bunker area, waste bunker area and decantation pit area	5 years

Soil monitoring requirements

Relevant hazardous substance	Activity to be monitored	Frequency
pH	Storage areas, waste water treatment plant area, waste bunker area and decantation pit area	10 years
Calcium Dihydroxide	Silo storage area and area of direct feed into the flue gas treatment system	10 years
Sodium Hydroxide	IBC/Carboy storage area and waste water treatment plant area	10 years
Ammonia	Tank storage area and area of direct feed into boiler system	10 years
Hydrochloric acid	IBC storage area and waste water treatment plant area	10 years
Sulphuric acid	IBC storage area and waste water treatment plant area	10 years
TPH CWG aliphatic and aromatic split	Tank storage area and area of direct feed into boiler system	10 years
Heavy metals	APCr silo area, IBA storage bunker area, waste bunker area and decantation pit area	10 years
PAH USEPA 16	APCr silo area, IBA storage bunker area, waste bunker area and decantation pit area	10 years

Additionally, I thought worth sharing with you the Condition wording below that have been used for Drumgray:

- 2.8.32 No later than 9 months prior to the first introduction of chemicals, fuels or other raw materials or wastes at the Permitted Installation, the Operator shall submit to SEPA the Soil and Groundwater Monitoring Plan required by Condition 7.6.7, for agreement. Said plan shall include the following:
  a) A drawing of the Permitted Installation showing the exploratory locations (trial pits and boreholes) and justification for location selection, a timeframe for undertaking and completion of the exploratory works, details of proposed depths for trial pits and boreholes with justification for depth proposals relevance, trial pit and borehole exploratory logs presenting information in metres Above Ordnance Datum (mAOD) and metres below ground level (mBGL), details of the selection for soil sampling depth and relevance for chemical testing.
  b) A drawing of the Permitted Installation showing the borehole locations and justification for location selection, a timeframe for undertaking and completion of the exploratory works, details of proposed depths for boreholes with justification for depth proposals, boreholes exploratory logs presenting information in mAOD and mBGL, details of the selection for groundwater sampling depth and relevance for chemical testing.

- 2.8.33 No later than 6 months prior to the first introduction of chemicals, fuels or other raw materials or wastes at the Permitted Installation and, following SEPA's agreement of the Soil and Groundwater Monitoring Plan locations referred to in Condition 2.8.32, the groundwater monitoring boreholes and trial pits referred to in Condition 2.8.32 shall be commissioned as agreed. In addition to the soil samples from trial pits referred to in Condition 2.8.32, soil samples shall also be collected from all of the said boreholes during their construction, for subsequent analysis, as required by Condition 2.8.32.

- 2.8.34 Within 1 month of completion of the boreholes and trial pits required by Conditions 2.8.32 and 2.8.33, a report shall be submitted to SEPA with details of their construction. Said report shall include all borehole and trial pit construction logs and the depth of all soil samples and groundwater encountered during their installation. All depths are to be recorded in mAOD and mBGL.

- 2.8.35 No later than 2 months prior to the first introduction of chemicals, fuels or other raw materials or wastes at the Permitted Installation, the first assessment of the Relevant Hazardous Substances (RHS) in the groundwater, as required by Condition 7.6.5, and in the soil, as required by Condition 7.6.6, shall be submitted to SEPA and will be considered as Baseline.

- 7.6.5 The Operator shall monitor the groundwater for the Relevant Hazardous Substances (RHS) specified in Table 7.3, at the frequency specified in Table 7.3, the purpose of which shall be to identify groundwater contamination associated with the activities specified in Table 7.3 by those Relevant Hazardous Substances. Each Assessment shall be recorded and reported to SEPA within one month of completion. The first assessment shall be completed 2 months prior to first introduction of chemicals, fuels or other raw materials or wastes as required by Condition 2.8.35. The assessment shall include interpretation of the results with reference to previous monitoring undertaken, (including the site and where applicable baseline reports) and operations at the Permitted Installation and details of corrective actions that are required to protect groundwater and remedy any contamination that has occurred as a result of Permitted Activities.

- 7.6.6 The operator shall monitor the soil at the site for the Relevant Hazardous Substances specified in Table 7.4 at the frequency specified in Table 7.4, the purpose of which shall be to identify soil contamination associated with the activities specified in Table 7.4 by those Relevant Hazardous Substances. Each assessment shall be recorded and reported to SEPA within one

month of completion. The first assessment shall be completed 2 months prior to first introduction of chemicals, fuels or other raw materials or wastes as required by Condition 2.8.35. The assessment shall include interpretation of the results with reference to previous monitoring undertaken (including the site and where applicable baseline reports) and operations at the permitted installation and details of corrective actions that are required to protect soil and remedy any contamination that has occurred as a result of Permitted Activities.

- 7.6.7 The Operator shall submit a detailed soil and groundwater monitoring plan, for the monitoring required by conditions 7.6.5 and 7.6.6 to SEPA at least three months in advance of carrying out the monitoring, which shall include the locations at which monitoring shall be carried out and the frequency and methodology which shall be used.

- 7.6.8 The operator shall carry out the monitoring required by conditions 7.6.5 and 7.6.6 in accordance with the soil and groundwater monitoring plan required by condition 7.6.7.

- 7.6.9 The operator shall review the plan required by Condition 7.6.7 no later than 6 months after each monitoring event. The purpose of the review shall be to determine whether any changes to monitoring locations, frequency or parameters are required and where changes are proposed, submit a revised plan to SEPA.

- 7.6.10 Notwithstanding the requirements of Condition 2.2.2, all plans, monitoring and assessments reports undertaken in accordance with Conditions 7.6.4, 7.6.5, 7.6.6 and 7.6.8 shall be preserved until the permit is surrendered.

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Applicant: NESS EFW Limited (SC627853)

18 APPENDIX F – CHAPTER IV OF INDUSTRIAL EMISSIONS DIRECTIVE (2010/75/EU) - SPECIAL PROVISIONS FOR WASTE INCINERATION PLANTS AND WASTE CO-INCINERATION PLANTS & ANNEX VI

The below table details the requirements of IED Chapter 4 (Special provisions for waste incineration plants and waste co-incineration plants) before commenting on their applicability to the NESS EfW Facility as described and how the proposed design and application documents meet the applicable requirements.

Article	Requirement	Comment
Article 42 – Scope		
42 (1)	Defines what plant the chapter applies to (incineration plants and waste co-incineration plants which incinerate or co-incinerate solid or liquid waste.) and what plant it doesn't (gasification or pyrolysis plants, if the gases resulting from this thermal treatment of waste are purified to such an extent that they are no longer a waste prior to their incineration and they can cause emissions no higher than those resulting from the burning of natural gas) Further defines what is considered within the definition of Incineration Plant (incineration lines, waste reception, storage, waste-, fuel- and air-supply systems, boilers etc.)	Considered to be a waste incineration plant and to fall within the scope of Chapter IV.
42 (2)	Confirms what would be considered excluded plant based on a) plant treating specific waste types and b) experimental plant with a throughput of <50 tonnes.	No applicable exclusions apply.
Article 43 - Definition of residue		
43	'residue' shall mean any liquid or solid waste which is generated by a waste incineration plant or waste co-incineration plant.	Definition noted
Article 44 - Applications for permits		
44	An application for a permit for a waste incineration plant shall include a description of the measures which are envisaged to guarantee that the following requirements are met: (a) the plant is designed/equipped/maintained/operated to meet the requirements of this Chapter; (b) the heat generated during the incineration process is recovered as far as practicable through the generation of heat, steam or power; (c) the residues will be minimised in their amount and harmfulness and recycled where appropriate; (d) the disposal of the residues which cannot be prevented, reduced or recycled will be carried out in conformity with national and Union law.	The application documents associated reports and appendices as well as the response to SEPAs Further Information Notice are considered sufficient to satisfy the requirements of this Article. See the response to below Articles for confirmation. **Article Met**
Article 45 – Permits conditions		

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Article	Requirement	Comment
45 (1)	The permit shall include the following: (a) a list of all types of waste which may be treated …European Waste List …; (b) the total waste incinerating capacity of the plant; (c) the limit values for emissions into air and water; (d) the requirements for the pH, temperature and flow of wastewater discharges; (e) the sampling and measurement procedures / frequencies … for emission monitoring; (f) the maximum permissible period of any technically unavoidable stoppages, disturbances, or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values	The draft Conditions included within the draft Permit are considered to cover all of the aspects detailed here and so satisfy the requirements of this Article. Note no process effluent as using dry abatement so ELVs to water don't apply. **Article Met**
45 (2)	In addition to the requirements set out in paragraph 1, the permit granted to a waste incineration plant or waste co-incineration plant using hazardous waste shall include the following:.	Not proposed to or permitted to incinerate hazardous waste. **Article Not Applicable**
45 (3)	Member States may list the categories of waste to be included in the permit which can be co-incinerated in certain categories of waste co-incineration plants	Not a co-incineration plant. **Article Not Applicable**
45 (4)	The competent authority shall periodically reconsider and, where necessary, update permit conditions.	The adequacy of Permit Conditions are considered on an ongoing basis and are reviewed in entirety on a periodic basis. **Article Met**
Article 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.	An appropriate air quality assessment has been undertaken that includes consideration / BAT demonstration on the proposed stack height. Considered sufficient to satisfy the requirements of this Article. See Section 5.2. of this document for further detail. **Article Met**

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Article	Requirement	Comment
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.	Emission limit values have been set in the draft Permit (Schedule 6). and meet or are more stringent than those expressed here. Considered sufficient to satisfy the requirements of this Article. See Sections 5.2. and 9 of this document for further detail. Not a co-incineration plant and second paragraph not considered to apply. **Article Met**
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.	Waste-water-free FGC techniques are to be employed at the facility The facility has been designed to minimise water consumption and maximise reuse of waste water within the process to meet the design criteria of a zero liquid discharge and for there to be no channelled emissions of process water. **Articles Not Applicable**
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. When waste waters from the cleaning of waste gases are treated outside the waste incineration plant … Under no circumstances shall dilution of waste water …	
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.	The necessary measures have been described within the application documents, associated reports and appendices as well as in the response to SEPAs Further Information Notice. The measures proposed are considered sufficient to satisfy the requirements of this Article. See Section 5.6. of this document for further detail. **Article Met**

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Article	Requirement	Comment
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.	These requirements are implemented by Condition 5.4.2 (4 hours operation) and 5.4.4 (60 hours in a year) in the draft permit with further supporting requirements included in Condition 5.4. Considered sufficient to satisfy the requirements of this Article. **Article Met**
Article 47 – Breakdown		
47	In the case of a breakdown, the operator shall reduce or close down operations as soon as practicable until normal operations can be restored.	This requirement is implemented via Condition 5.4.1 in the draft Permit. Considered sufficient to satisfy the requirements of this Article. **Article Met**
Article 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	Emissions to air are covered in Schedule 6 of the draft Permit and include monitoring Conditions. Considered sufficient to satisfy the requirements of this Article. **Article Met**
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.	These requirements are implemented via Schedule 6 in the draft Permit. Considered sufficient to satisfy the requirements of these Articles. **Articles Met**
48 (3)	The competent authority shall determine the location of the sampling or measurement points to be used for monitoring of emissions.	
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.	
48 (5)	As soon as appropriate measurement techniques are available within the Union, the Commission shall, by means of delegated acts in accordance with Article 76 and subject to the conditions laid down in Articles 77 and 78, set the date from which continuous measurements of emissions into the air of heavy metals and dioxins and furans are to be carried out.	Requirement of the Article is for the Commission to act on. **Article Not Applicable**
Article 49 – Compliance with emission limit values		

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Article	Requirement	Comment
49	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.	Emission limit values have been set in the draft Permit in Schedule 6 (air) and Schedule 7 (water) although it is noted that there will be no channelled emissions of process water and as such these specific ELVS to water are not considered to apply. Considered sufficient to satisfy the requirements of this Article. See Sections 5.2. and 5.3 of this document for further detail. **Article Met**
Article 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.	This requirement is implemented via Schedule 5 and Condition 5.1.1 a) in the draft Permit. Considered sufficient to satisfy the requirements of this Article. **Article Met**
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. Waste co-incineration plants shall …. If hazardous waste ….	This requirement is implemented via Schedule 5 and Condition 5.1.1 c) & d) in the draft Permit. Considered sufficient to satisfy the requirements of this Article. Not a co-incineration plant and not permitted to take Hazardous waste so second and third paragraphs not considered to apply. **Article Met**

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Article	Requirement	Comment
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 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 (OJ L 121, 11.5.1999, p. 13.), liquefied gas or natural gas.	This requirement is implemented via Schedule 5 and Condition 5.1.2 and 5.1.3 in the draft Permit. Considered sufficient to satisfy the requirements of this Article. **Article Met**
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	This requirement is implemented via Schedule 5 and Condition 5.3.2 in the draft Permit. Considered sufficient to satisfy the requirements of this Article. **Article Met**
50 (5)	Any heat generated by waste incineration plants or waste co-incineration plants shall be recovered as far as practicable.	This requirement is implemented via Schedule 2.7 (all Conditions) and is also a requirement of wider PPC requirements and SEPAs TTWGs. Considered sufficient to satisfy the requirements of this Article. **Article Met**
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 proposed to or permitted to incinerate infectious clinical waste. **Article Not Applicable**

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Article	Requirement	Comment
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.	SEPA can only grant a Permit to someone that is in control of the installation and Schedule 2.12 and Condition 2.12.3. Considered sufficient to satisfy the requirements of this Article. **Article Met**
Article 51 – Authorisation to change operating conditions		
51 (1)	Conditions different from those laid down in Article 50(1), (2) and (3) and as regards the temperature, paragraph 4 of that Article and specified in the permit for certain categories of waste or for certain thermal processes, may be authorised by the competent authority provided the other requirements of this Chapter are met. Member States may lay down rules governing these authorisations	No Conditions different from those laid down in Article 50(1), (2) and (3) and as regards the temperature, paragraph 4 are being proposed. Not a co-incineration plant and no bark boilers. **Articles Not Applicable**
51 (2)	For waste incineration plants, the change of the operating conditions shall not cause more residues or residues with a higher content of organic polluting substances compared to those residues which could be expected under the conditions laid down in Article 50(1), (2) and (3).	
51 (3)	Emissions of total organic carbon and carbon monoxide from waste co-incineration plants … Emissions of total organic carbon from bark boilers within the pulp and paper industry co-incinerating waste…	
51 (4)	Member States shall communicate to the Commission all operating conditions authorised under paragraphs 1, 2 and 3 and the results of verifications made as part of the information provided in accordance with the reporting requirements under Article 72.	
Article 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.	Information on reception of waste is included within the application as well as the response to SEPAs Further Information Notice. This requirement is implemented via Schedule 4 in the draft Permit. Considered sufficient to satisfy the requirements of this Article. **Article Met**

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Article	Requirement	Comment
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.	This requirement is implemented via Schedule 3.3 and associated Conditions in the draft Permit. Considered sufficient to satisfy the requirements of this Article. **Article Met**
52 (3)	Prior to accepting hazardous waste at the waste incineration plant or waste co-incineration plant, the operator shall collect available information about the waste for the purpose of verifying compliance with the permit requirements specified in Article 45(2). That information shall cover the following:	Not proposed to or permitted to incinerate hazardous waste. **Article Not Applicable**
Article 53 – Residues		
53 (1)	Residues shall be minimised in their amount and harmfulness. Residues shall be recycled, where appropriate, directly in the plant or outside	Information on residue handling and confirmation of offsite treatment is included within the application as well as the response to SEPAs Further Information Notice. See section 5.13 & 5.14 of this document for further detail. This requirement is implemented via Schedule 8 in the draft Permit. Considered sufficient to satisfy the requirements of this Article. **Articles Met**
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.	
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.	
Article 54 – Substantial change		
54	A change of operation of a waste incineration plant or a waste co-incineration plant treating only non-hazardous waste in an installation covered by Chapter II which involves the incineration or co-incineration of hazardous waste shall be regarded as a substantial change.	Noted
Article 55 – Reporting and public information on waste incineration plants and waste co-incineration plants		
55 (1)	Applications for new permits for waste incineration plants and waste co-incineration plants shall be made available to the public at one or more locations for an appropriate period to enable the public to comment on the applications before the competent authority reaches a decision. That decision, including at least a copy of the permit, and any subsequent updates, shall also be made available to the public.	Measures are in place to ensure that the original application documents, SEPAs draft determination (including draft Conditions and associated decision document) are made available to the public for consideration and

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

Article	Requirement	Comment
55 (2)	For waste incineration plants or waste co-incineration plants with a nominal capacity of 2 tonnes or more per hour, the report referred to in Article 72 shall include information on the functioning and monitoring of the plant and give account of the running of the incineration or co-incineration process and the level of emissions into air and water in comparison with the emission limit values. That information shall be made available to the public.	comment. All reports provided in connection with the draft Permit will be made available on SEPAs Public Register. This includes making monitoring data publicly available. Considered that the requirements of this article are met. **Articles Met**
55 (3)	A list of waste incineration plants or waste co-incineration plants with a nominal capacity of less than 2 tonnes per hour shall be drawn up by the competent authority and shall be made available to the public.	Not relevant to this application. **Article Not Applicable**
ANNEX VI - Technical provisions relating to waste incineration plants and waste co-incineration plants		
Part 1	Definitions (considered New Plant)	**Noted**
Part 2	Equivalence factors for dibenzo-p-dioxins and dibenzofurans	**Noted**
Part 3	Air emission limit values for waste incineration plants, sections 1. Applicable ELVs and reference conditions – Normal Operation 2. Applicable ELVs when Article 46(6) (4 hours correction period) & Article 47 (Breakdown)	**Noted - Applied**
Part 4	Determination of air emission limit values for the co-incineration of waste	**Not Applicable**
Part 5	Emission limit values for discharges of waste water from the cleaning of waste gases	**Not Applicable**
Part 6	Monitoring of emissions	**Noted - Applied**
Part 7	Formula to calculate the emission concentration at the standard percentage oxygen concentration	**Noted**
Part 8	Assessment of compliance with emission limit values	**Noted**

19 APPENDIX G – BEST AVAILABLE TECHNIQUES (BAT) CONCLUSIONS (BATC) FOR WASTE INCINERATION - APPLICABILITY AND COMPLIANCE

Identification of key determinations regarding interpretation and applicability of Best Available Techniques (BAT) Conclusions for Waste Incineration at the proposed EFW NESS Limited (SC627853), NESS EFW Facility at Greenbank Crescent, East Tullos Industrial Estate:

1. Waste Incineration

   The stated scope within the BAT Conclusions cover certain industrial activities specified in Section 5.1, 5.2 and 5.3 of Annex I to Directive 2010/75/EU, more specifically for this installation '5.1 Disposal or recovery of waste in waste incineration plants: (a) for non-hazardous waste with a capacity exceeding 3 tonnes per hour;'.

   The proposed activities carried out at the installation have been identified as including:

   a) the incineration of source segregated municipal solid waste (MSW) and commercial and industrial (C&I) waste of a similar nature, in a single line moving grate Incinerator with an operational capacity of 150,000 tonnes of waste per year and a combustion design capacity 49.1 MWth per hour of waste feed at 100% thermal capacity being an activity described in Part A (b) Section 5.1 of Chapter 5, of Part 1 of Schedule 1 of the Regulations as the incineration of non-hazardous waste with the exception of waste which is biomass or animal carcasses in an incineration or co-incineration plant;

   This activity description, above, from the Pollution Prevention and Control (Scotland) Regulations 2012, SSI 2012 No. 360 (as amended) is concurrent with the Directive activity description and as such the proposed facility is considered to be within scope of the BAT Conclusions.

   Outcome 1: SEPA consider the proposed NESS EFW Facility to be a Waste Incineration Installation falling within the scope of and subject to the applicable BAT conclusions for Waste Incineration

2. New Plant

   A new plant is defined as 'A plant first permitted following the publication of these BAT conclusions or a complete replacement of a plant following the publication of these BAT conclusions. A Draft Determination for the proposed NESS EFW Facility will be reached in February 2022 whereas the BAT Conclusions were published on the 12 November 2019.

   Outcome 2: SEPA consider that the incineration plant at the proposed NESS EFW Facility be considered as 'new plant' with respect to the BAT conclusions.

3. Municipal Solid Waste

   Municipal solid waste (MSW) is defined in the BAT Conclusions as 'Solid waste from households (mixed or separately collected) as well as solid waste from other sources that is comparable to household waste in nature and composition.

   Outcome 3: SEPA consider that the proposed NESS EFW Facility has applied for and will only be permitted to incinerate MSW.

4. Combustion Plant and Medium Combustion Plant Directive (MCPD)

   The BAT conclusions do not make any specific provision for combustion plant. None of the identified plant at the proposed NESS EFW facility is considered to be Large Combustion Plant (LCP)(>50MWth) and for medium combustion plant (MCP)(> 1MWth and < 50MWth) does not include combustion plants covered by Chapter IV (Special provisions for Waste Incineration plant) of the Industrial Emissions Directive.

Outcome 4: SEPA considers that while the MCPD will not apply to the Incineration plant and associated auxiliary burners, the requirements for MCPD do apply to other combustion plant with a net rated thermal input of between 1 and 50MW at the proposed NESS EFW Facility (Emergency Diesel Generator).

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Applicant: NESS EFW Limited (SC627853)

BAT Conclusions Assessment Table:

BATC No.	BATC Description	Type	Requirement /Compliance Evidence/ Permit Review Consideration	Considered BAT
1.1 - Environmental Management Systems				
1	Environmental Management Systems (EMS)	Narrative	**In order to improve the overall environmental performance, BAT is to elaborate and implement an environmental management system (EMS) that incorporates all of the following features (see points (i) to (xxviii) under BAT1):** Information relevant to how the applicant intends to meet each of the features described against BAT 1 is provided in The BAT Conclusions Checklist, Section 2.1, Table 3, provided in response to the FIR Question 29 c). This response cross-references the relevant sections and appendices in the main Permit Application, Supporting Technical Report, in the main Section 4 Management. The wider organisational commitment to an accredited EMS is demonstrated through the discussion and inclusion of the ISO 14001 certification for both the parent company (Acciona Industrial SA) and proposed operating company (Indaver) (Appendix C2.1 &2.2 respectively). A site-specific Environmental Management Plan is to be developed for the Aberdeen NESS EfW facility drawing on the experience of the systems identified above and appears to include the key features required under BAT 1. **Permit Consideration:** No specific Conditions relating to the overall management or maintenance of the Installation have been considered necessary with reliance placed on the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques' to be sufficient in ensuring the necessary overarching systems / procedures etc. are in place, maintained and adhered to. Conditions capturing the need for specific managements plans in relation to some aspects with the potential to impact on the immediate surrounding environment, such as odour, noise, accidents etc. have been deemed necessary and included within the Permit. The adequacy of any EMS put in place, adherence to it, compliance with those aspects captured within the Permit and any potential for improvement will be assessed both through the commissioning phase as well as through ongoing inspection.	**Yes**
1.2 - Monitoring				
2	Energy Efficiency	Narrative	**BAT is to determine either the gross electrical efficiency, the gross energy efficiency, or the boiler efficiency of the incineration plant as a whole or of all the relevant parts of the incineration plant. (see also BAT 20)** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.2, Table 4, provided in response to the FIR Question 29 c). In the case of a new incineration plant either the gross electrical efficiency, the gross energy efficiency, or the boiler efficiency needs to be determined by carrying out a performance	**Yes**

<table>
<tr><td></td><td></td><td></td><td>test at full load. With respect to the performance test, it is noted that while no EN standard is available for the determination of the boiler efficiency of incineration plant, for grate-fired incineration plants, the FDBR guideline RL 7 may be used.

The need to carry out a performance test at full load is acknowledged by the applicant and is to be undertaken during the commissioning of the plant. The gross electrical efficiency of the plant is stated to be 29.22% when operating in power only mode, Section 8.1.2, Table 5 of the main Permit Application, Supporting Technical Report.

Permit Consideration:
The following specific Conditions have been considered:

Condition 2.8.13 - to require the methodology for carrying out the performance test to be provided in advance of commissioning. In the absence of an EN standard for carrying out the performance test, BAT 2 explains this may follow FDBR Guideline RL7 'Acceptance Testing of waste Incineration Plants with Grate Firing Systems' 2013. Condition 2.8.10 therefore makes reference to this standard.

Condition 2.9.2 h) – requires the determination of the gross electrical efficiency.

It should also be noted that there are additional drivers for ensuring energy efficiency than those described in the BAT Conclusions. These include the PPC Regulations, Energy Efficiency Directive and compliance with SEPAs Thermal Treatment of Waste Guidelines (TTWG). Further detail on the compliance with these aspects including the details of heat supply to a local district heating scheme can be found in Section 5.15 Energy of this document. Compliance and potential for wider energy efficiency improvements will be assessed both through the commissioning phase as well as through ongoing inspection.</td><td></td></tr>
<tr><td>3</td><td>Monitoring of Process Parameters</td><td>Narrative</td><td>BAT is to monitor key process parameters relevant for emissions to air and water including those given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.2, Table 4, provided in response to the FIR Question 29 c).

<table>
<tr><th>Stream/Location</th><th>Parameter(s)</th><th>Monitoring</th><th>Comment</th></tr>
<tr><td>Flue-gas from the incineration of waste</td><td>Flow, oxygen, pressure, temperature, water vapour content</td><td rowspan="2">Continuous</td><td rowspan="2">The applicant has identified the need to monitor these process parameters at the specified location and frequency.
This has been formally captured in the Permit.</td></tr>
<tr><td>Combustion chamber</td><td>Temperature</td></tr>
</table></td><td>Yes</td></tr>
</table>

Waste water from wet FGC	N/A – Process not carried out at site – dry Scrubbing proposed as BAT and no process waste water to be generated.
Waste water from bottom ash treatment plants	N/A – Process not carried out at site – ash removed from site for treatment elsewhere.

Permit Consideration:
Necessary Conditions to ensure capture of the BAT conclusion requirements for key process parameters for relevant emissions to air are contained within the Permit (Schedule 5 and 6, Table 6.3). The process parameters for relevant emissions to water are not deemed to apply and as such not considered within the Permit. On site monitoring provision will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

4	Monitoring of Emissions to Air	BAT-AEL	**BAT is to monitor channelled emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2. 2, Table 4, provided in response to the FIR Question 29 c). The applicant has confirmed that they will monitor the following parameters at the following frequency to the specified method in the SEPA Waste Incineration Permit Template:	**Yes**

Substance / Parameter	Frequency	Comment
NO_X	Continuous	None
NH_3	Continuous	None
N_2O	Continuous	Note: Application states not applicable. However while not a fluidised bed the proposed facility is to use SNCR with urea and as such monitoring required. BATc requires a minimum monitoring frequency of once per year however following discussions with the applicant they have confirmed that their CEMS will cover N_2O.
CO	Continuous	Typographical error in that when confirming provisions will be included for CEMS refers to NOx in comments as opposed to the parameter. Subsequently confirmed appropriate CEMS to be installed for specified parameters.
SO_2	Continuous	
HCl	Continuous	
HF	Continuous	
Dust	N/A	Requirement for bottom ash treatment to be monitored once per year. Not deemed applicable as no bottom ash treatment carried out on site.

					Continuous			
				Metals and metalloids except Hg (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Tl, V)	Once every 6 months			
				Hg	Continuous / Once every 6 months	The BAT Conclusions allows for plants incinerating wastes with a proven low and stable mercury content to monitor periodically with a minimum frequency of once every six months as opposed to continuously. Information was provided by the applicant in order to demonstrate that the waste feed stock is of low and stable content. This included reference to two difference plants of similar technology and waste type to the proposed NESS project that are in commercial operation. This was not deemed sufficient at the determination stage and a programme of mercury monitoring to determine whether emissions are low & stable has been incorporated in the permit. Should it be required the necessary arrangements to allow for continuous monitoring of Hg has been provided for.		
				TVOC	Continuous			
				PBDD/F	Once every 6 months	Not deemed applicable as no waste containing or injection of Bromine. Applicant has stated that future provision accounted for should it be required.		
				PCDD/F	Short Term Once every 6 months			
					Long Term Once per month	The monitoring does not apply if the emission levels are proven to be sufficiently stable. A programme of dioxin/furan and dioxin-like PCB monitoring to determine whether emissions are stable has been incorporated in the permit.		
				Dioxin-like PCBs	Short Term Once every 6 months			
					Long Term Once per month	The monitoring does not apply if the emission levels are proven to be sufficiently stable. A programme of dioxin/furan and dioxin-like		

		PCB monitoring to determine whether emissions are stable has been incorporated in the permit.
Benzo[a]pyrene	Once every year	

Section 11.1 of the main Permit Application, Supporting Technical Report confirms that the CEMS equipment will be certified to the MCERTS standard.

As detailed in the Table above both dioxins and furans and mercury monitoring require further consideration to determine whether long-term sampling, and continuous monitoring respectively are appropriate. See Section 5.18 of this document for further details. The response also provides compliance with the monitoring requirements in IED Annex VI Part 6 2.1 a) and c). These monitoring requirements have been incorporated into Table 6.2 in Schedule 6 of the PPC permit.

Permit Consideration:
Necessary Conditions to ensure the monitoring of channelled emissions to air in line with the BAT conclusion requirements are contained within the Permit (Schedule 5 and 6, Table 6.2). The following additional conditions have been included with respect to monitoring requirements for mercury and dioxin/furan and dioxin-like PCB respectively:

4.6.1 Programme of mercury monitoring to determine whether emissions are low & stable
4.6.2 Programme of dioxin/furan and dioxin-like PCB monitoring to determine whether emissions are stable

On site monitoring provision will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

5	Monitoring of Emissions to Air during OTNOC	BAT-AEL	**BAT is to appropriately monitor channelled emissions to air from the incineration plant during OTNOC.** The BAT Conclusions allows for monitoring to be carried out by direct emission measurements …or by monitoring of surrogate parameters if this proves to be of equivalent or better scientific quality … Emissions during start-up and shutdown while no waste is being incinerated, including emissions of PCDD/F, are estimated based on measurement campaigns, e.g. every three years, carried out during planned start-up/shutdown operations. The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.2, Table 4, provided in response to the FIR Question 29 c). The applicant has stated that during the period that the combustion process is operating the continuous emission monitoring system (CEMS) will operate, including during OTNOC. **Permit Consideration:**	**Yes**

			Necessary Conditions to ensure the monitoring of channelled emissions to air during OTNOC in line with the BAT conclusion requirements are contained within the Permit (Schedule 5 and 6, Table 6.2a). On site monitoring provision will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	
6	Monitoring of Emissions to Water	BAT-AEL	**BAT is to monitor emissions to water from FGC and/or bottom ash treatment with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.1, Table 4, provided in response to the FIR Question 29 c). The applicant has confirmed that: a) The FGC system will be a semi dry process, that will not result in any aqueous emissions. b) There is no IBA treatment on site. All IBA will be exported and treated off site, at an appropriately permitted treatment facility. c) There will be no aqueous process emission from the EfW facility. **BAT Conclusion not considered applicable.**	**N/A**
7	Monitoring of unburnt substances	BAT-AEL	**BAT is to monitor the content of unburnt substances in slags and bottom ashes at the incineration plant with at least the frequency given below and in accordance with EN standards.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.2, Table 4, provided in response to the FIR Question 29 c) with further detail provided in Section 6.1 of the Permit Application, Supporting Technical Report. The applicant has confirmed that the necessary testing sampling and testing protocols will be followed. **Permit Consideration:** Necessary Conditions to ensure the required sampling and monitoring for monitoring of unburnt substances in slags and bottom ashes in line with the BAT conclusion requirements are contained within the Permit (Schedule 8). On site monitoring procedures and provision will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	**Yes**
8	Monitoring of Persistent Organic Pollutants (POPs)	BAT-AEL	**For the incineration of hazardous waste containing POPs, BAT is to determine the POP content in the output streams (e.g. slags and bottom ashes, flue-gas, waste water) after the commissioning of the incineration plant and after each change that may significantly affect the POP content in the output streams.** No Hazardous waste is either proposed or permitted to be incinerated at the Installation. **BAT Conclusion not considered applicable.**	**N/A**

1.3 - General environmental and combustion performance

9	Prevent and reduce emissions to air when using a sour water steam stripping unit.	Narrative	**In order to improve the overall environmental performance of the incineration plant by waste stream management (see BAT 1), BAT is to use all of the techniques (a) to (c) given below, and, where relevant, also techniques (d), (e) and (f).** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.3, Table 5, provided in response to the FIR Question 29 c) with further detail provided in Section 2.1 and associated procedures of the Permit Application, Supporting Technical Report.	**Yes**

Item	Technique	Comment
(a)	Determination of the types of waste that can be incinerated	The proposed facility is restricted to the acceptance of source segregated municipal solid waste from a scheme that has received approval by SEPA and commercial and industrial waste of a similar nature. This means only residual waste is accepted at site. The types of waste and the procedures governing its acceptance is further restricted and controlled by the contractual requirements placed upon the operation of the facility. The applicant has detailed a list of EWC waste codes that has been considered and is replicated in the PPC Permit. The list of EWC codes will characterise the properties and makeup of the waste. The applicant has confirmed that procedures are to be implemented for the pre acceptance and acceptance of waste to site. A proposed waste acceptance protocol (WAP) is included in Appendix C6.2.2. Consideration has also been given to the tracking and inspection requirements for incoming loads including the provision of a quarantine area for unsuitable waste streams. Details of all authorised vehicles, including those delivering Contract Waste, non-contract waste or collecting rejected waste, recyclates or ash residues will
(b)	Set-up and implementation of waste characterisation and pre-acceptance procedures	
(c)	Set-up and implementation of waste acceptance procedures	
(d)	Set-up and implementation of a waste tracking system and inventory	

<table>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td></td><td></td><td>be maintained on the Management Information System (MIS).</td></tr>
<tr><td>(e)</td><td>Waste segregation</td><td>N/A – As only source segregated municipal solid waste and commercial and industrial waste of a similar nature can be accepted on site. This means that the only residual waste is accepted and no further pre-treatment is proposed.</td></tr>
<tr><td>(f)</td><td>Verification of waste compatibility prior to the mixing or blending of hazardous wastes</td><td>N/A - No Hazardous waste is either proposed or permitted to be incinerated at the Installation.</td></tr>
</table>

It is considered that the applicant has adopted all applicable techniques.

Permit Consideration:
Necessary Conditions, for example, to ensure only the identified waste types in line with the BAT conclusion requirements are contained within the Permit (Schedule 4). The implementation of the above applicable techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.
</td><td></td></tr>
<tr><td>10</td><td>Improve Env performance of IBA treatment plant</td><td>Narrative</td><td>In order to improve the overall environmental performance of the bottom ash treatment plant, BAT is to include output quality management features in the EMS (see BAT 1).

No IBA plant is either proposed or permitted at the Installation.

BAT Conclusion not considered applicable.</td><td>N/A</td></tr>
<tr><td>11</td><td>Waste Deliveries</td><td>Narrative</td><td>In order to improve the overall environmental performance of the incineration plant, BAT is to monitor the waste deliveries as part of the waste acceptance procedures (see BAT 9(c)) including, depending on the risk posed by the incoming waste, the elements given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.3, Table 5, provided in response to the FIR Question 29 c).

<table>
<tr><th>Waste Type</th><th>Waste delivery monitoring</th></tr>
<tr><td>Municipal solid waste and other non-hazardous waste</td><td>Monitoring including the weighing of the waste deliveries, visual inspection and periodic sampling and analysis of key properties/substances is proposed.</td></tr>
</table>
</td><td>Yes</td></tr>
</table>

					With respect to the provision of Radioactivity detection, the proposed facility is restricted to the acceptance of source segregated municipal solid waste from a scheme that has received approval by SEPA and commercial and industrial waste of a similar nature. SEPAs opinion is that in general terms UK radioactive substances regulation is sufficiently robust so as to minimise the risk of radioactive material inadvertently being sent to incinerators, therefore source segregated MSW poses a low risk. Due to the location of the proposed EfW facility and potential for additional sources of radioactive material from the oil and gas sector the applicant has taken additional measures with respect to pre acceptance procedures to ensure that all non-contract waste is subject to individual contracts with detailed specification as to the materials contained within each waste stream. Waste will not be accepted from industries where there is the potential for radioactive material to be present in the waste stream, such waste from the oil and gas industry or medical waste. These pre acceptance controls together with regular checking of the waste stream on arrival at the EfW means that the risk of radioactive materials being present in the waste stream is very low to negligible. SEPA consider that the low general risk along with the additional measures proposed means that radioactivity detection does not represent BAT for the Installation and is not required.		
				Sewage Sludge	N/A – Waste type not accepted		
				Hazardous waste other than clinical waste	N/A – Waste type not accepted		
				Clinical waste	N/A – Waste type not accepted		
				It is considered that the applicant has adopted all applicable monitoring requirements. **Permit Consideration:** Necessary Conditions to allow for monitoring requirements, for example to allow for the weighing and inspection of incoming waste loads, in line with the BAT conclusion requirements are contained within the Permit. The implementation of the above monitoring requirements will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.		

<table>
<tr>
<td>12.</td>
<td>Reception, Handling and Storage of Waste</td>
<td>Narrative</td>
<td>
In order to reduce the environmental risks associated with the reception, handling and storage of waste, BAT is to use both of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.3, Table 5, provided in response to the FIR Question 29 c) with further detail provided in Section 2.1,2.2, 3.5 and 5.4 and associated Appendices of the Permit Application, Supporting Technical Report.

<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Impermeable surfaces with an adequate drainage infrastructure</td><td>All waste reception, handling and storage areas are provided with impermeable surfacing and served by an appropriate drainage infrastructure. See section 5.3 of this document for further detail regards the drainage infrastructure. The integrity of all impermeable surfacing will be confirmed on commissioning and then periodically through inspection. The applicant has confirmed the need to maintain the impermeable surfacing and the civil infrastructure (including drainage).</td></tr>
<tr><td>(b)</td><td>Adequate waste storage capacity</td><td>Adequate waste storage capacity has been provided for the maximum waste storage capacity of the waste bunker confirmed at 8700 tonnes. The quantity of waste is to be regularly monitored against the maximum storage capacity to ensure the stated capacity is not exceeded. This is Conditioned within the Permit (4.2.1, 4.2.2 & 4.2.3)

The applicant has proposed measures to manage the waste loading on site during periods of planned maintenance as well as for extended periods of closure.

The maximum waste to be stored at any one time is also linked to financial provision requirements / re-evaluation (2.13).</td></tr>
</table>

It is considered that the applicant has adopted the necessary techniques.

Permit Consideration:
Inclusion of standard Conditions to capture the techniques described above for example with respect to the maintenance of civil infrastructure (3.8) and drainage (7.5) as well as maximum storage capacity (4.2.1, 4.2.2 & 4.2.3). The implementation of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.
</td>
<td>Yes</td>
</tr>
</table>

<table>
<tr><td>13</td><td>Storage and handling of clinical waste</td><td>BAT-AEL</td><td>In order to reduce the environmental risk associated with the storage and handling of clinical waste, BAT is to use a combination of the techniques given below.

No acceptance of clinical waste proposed or permitted at the Installation.

BAT Conclusion not considered applicable.</td><td>N/A</td></tr>
<tr><td>14</td><td>Incineration Performance</td><td>BAT - AEL</td><td>In order to improve the overall environmental performance of the incineration of waste, to reduce the content of unburnt substances in slags and bottom ashes, and to reduce emissions to air from the incineration of waste, BAT is to use an appropriate combination of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.3, Table 5, provided in response to the FIR Question 29 c) with further detail provided in Section 2.2, 2.3, 2.6 and 2.8 as well as associated Appendices of the Permit Application, Supporting Technical Report.

<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Waste blending and mixing</td><td>The applicant has confirmed that the overall operation of the facility will be governed by an automatic Control Management Systems (CMS) with the option for local manual controls as/when required and monitored from the central control room.

The applicant has confirmed that waste mixing will be carried out within the bunker (automated grab cranes with manual override as required) to ensure the waste introduced to the combustion chamber is as homogeneous as possible. To this end the bunker is divided into waste discharge zones, and mixing/feeding zones. Only waste from feeding zones shall be fed into the feeding hopper of the furnace. A Bunker Management Plan will be developed that will follow predetermined mixing patterns that ensure a homogeneously mixed feedstock with the bunker.

The waste charging rate will also be monitored and recorded by the CMS, using automatic weighing cells fitted into the waste cranes that feed the waste into the furnace hopper.</td></tr>
<tr><td>(b)</td><td>Advanced control system</td><td>The CMS will control the main process areas of the facility; furnace (incineration) and boiler, flue gas treatment as well as the overall balance of the plant processes. In addition, it will</td></tr>
</table>
</td><td>Yes</td></tr>
</table>

		control the automatic emissions, process monitoring and waste interlocks etc. The components of the CMS are provided. A backup control system is also provided to allow operation of the key areas remotely and will enable emergency shut-down of the facility where required.
(c)	Optimisation of the incineration process	The application confirms that the design and the operation of the furnace will ensure effective combustion of waste through control of the waste feed rate (ensure homogenised as well as quantity/thickness on grate at any point), the supply of primary and secondary combustion air and the grate speed. These will be regulated by an advanced CMS which measures the steam flow rate, flue gas oxygen content and combustion temperature and controls the combustion process to ensure burnout of the waste, and minimisation of polluting emissions whilst maintaining the rate of steam generation constant. The application further identifies that optimisation of the incineration process will form a key part of commissioning.

BAT-associated environmental performance levels for unburnt substances in slags and bottom ashes from the incineration of waste

Parameter	Unit	BAT-AEPL	Comment
TOC content in slags and bottom ashes	Dry wt-%	1–3	The applicant has confirmed that the TOC of the IBA will be monitored
Loss on ignition of slags and bottom ashes	Dry wt-%	1–5	

Footnote (1) to the above Table confirms that either the BAT-AEPL for TOC content or the BAT-AEPL for the loss on ignition applies. It is the position of UK regulators that this means a single method needs to be adopted. Following discussion with the applicant it was confirmed that they will measure TOC. It is considered that the applicant has adopted all the necessary techniques and can meet the necessary BAT-AEL.

Permit Consideration:
Inclusion of standard Conditions with respect to TOC levels (5.1.1 a)) otherwise the performance and efficiency of the Incineration process will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

15	Reduction in emissions to air – Plant Settings	Narrative	**In order to improve the overall environmental performance of the incineration plant and to reduce emissions to air, BAT is to set up and implement procedures for the adjustment of the plant's settings, e.g. through the advanced control system (see description in Section 2.1), as and when needed and practicable, based on the characterisation and control of the waste (see BAT 11).** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.3, Table 5, provided in response to the FIR Question 29 c) with further detail provided in Section 2.2, 2.3, 2.6 and 2.8 as well as associated Appendices of the Permit Application, Supporting Technical Report. The applicant has confirmed that the overall operation of the facility will be governed by an automatic Control Management Systems (CMS) with the option for local manual controls as/when required and monitored from the central control room. The system will control and/or monitor the main features of the plant operation in order to optimise these processes, as described in the response to BAT 14 above. Emissions to air will be reduced by the adjustment of the plants settings through the advanced control system: for example, for SNCR can adjust atomization pressure, temperature setpoint for automatic level selection, dilution water flow, reagent flow in order to minimise ammonia slip. It is considered that the proposed facility is designed to allow for the adjustment of the plant's settings to comply with the requirements of BAT 15. **Permit Consideration:** No specific Conditions included as the performance and efficiency of the Incineration plant will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	**Yes**
16	Reduction in emissions to air – Start Up Shut Down	Narrative	**In order to improve the overall environmental performance of the incineration plant and to reduce emissions to air, BAT is to set up and implement operational procedures (e.g. organisation of the supply chain, continuous rather than batch operation) to limit as far as practicable shutdown and start-up operations.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.3, Table 5, provided in response to the FIR Question 29 c) with further detail provided in Section 4.1, 4.2 and 8.2 as well as associated Appendices of the Permit Application, Supporting Technical Report. The applicant has confirmed that they intend to operate continuously with planned periods of downtime to allow for maintenance. In addition, there will be periods of unplanned shutdown due to plant upset. These periods are to be minimised through the careful and efficient running if the plant. See also BAT 1 on EMS. As well as avoiding periods of start up / shutdown it is confirmed that where necessary, operational control procedures will be developed to ensure efficient operation of equipment particularly during start up and shut down when energy usage is at its maximum.	**N/A**

			It is considered that the proposed facility is in place to comply with the requirements of BAT 16. **Permit Consideration:** Standard conditions relating to Start Up and Shut Down. Primarily, the management, performance and maintenance of the Incineration plant will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above systems and procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	
17	Reduction in emissions to air & water – FGC / Water Treatment design	Narrative	**In order to reduce emissions to air and, where relevant, to water from the incineration plant, BAT is to ensure that the FGC system and the waste water treatment plant are appropriately designed (e.g. considering the maximum flow rate and pollutant concentrations), operated within their design range, and maintained so as to ensure optimal availability.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.3, Table 5, provided in response to the FIR Question 29 c) with further detail provided in Section 3.1 and 3.2 as well as associated Appendices of the Permit Application, Supporting Technical Report. Appropriate consideration has been given to the potential pollutant loading and subsequent design of the FGC and waste water treatment (no wastewater discharge) systems. Systems to be managed and maintained (See BAT 1) to ensure necessary availability. Considered to comply with the requirements of BAT 17. See also section 5.2 and 5.3 of this document. **Permit Consideration:** No specific Conditions considered. The management, performance and maintenance of the FGC system and waste water treatment plant will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above systems will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	**Yes**
18	Reduction in emissions - OTNOC	Narrative	**In order to reduce the frequency of the occurrence of OTNOC and to reduce emissions to air and, where relevant, to water from the incineration plant during OTNOC, BAT is to set up and implement a risk-based OTNOC management plan as part of the environmental management system (see BAT 1) that includes all of the following elements:** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.3, Table 5, provided in response to the FIR Question 29 c) with further detail provided in Section 2.9, 3.1, 4.2 and 11.2 as well as associated Appendices (B4 & C10) of the Permit Application, Supporting Technical Report.	**Yes**

			A risk-based OTNOC management plan is to be incorporated into the site EMS (See BAT 1) that incorporates the elements described in BAT 18. - identification of potential OTNOC, root causes and potential consequences… - appropriate design of critical equipment (e.g., for the proposed facility compartmentalisation of the bag filter, consists of six compartments, each with a set of filter bags, arranged to one side of this duct. Where one filter compartment can be isolated for emergency maintenance purposes whilst maintaining adequate particulate removal efficiency at the nominal load) - set-up and implementation of a preventive maintenance plan and strategy which will define the maintenance schedule of all (critical) operating plant, based on the facility's operation & maintenance requirements - monitoring and recording of emissions during OTNOC and associated circumstances fully investigated "Other Than Normal Operating Conditions" or "OTNOC" means the scenarios considered to represent OTNOC for the Permitted Installation, as identified in the OTNOC Management Plan required by Condition 5.4.6 and comprise: a) abnormal operation; and b) start-up and shut-down periods. "Abnormal Operation", for the purposes of Schedule 5 of this Permit, means any technically unavoidable stoppages, disturbances or failures of the plant or measurement devices which results in, or may result in, any ELV specified in Table 6.2 in this Permit being exceeded. Considered to comply with the requirements of BAT 18 **Permit Consideration:** Standard conditions relating to OTNOC have been deemed necessary and included within the Permit (definition/scenarios, requirement for OTNOC Plan etc – see Section 5.4). Otherwise, the general management, performance and maintenance of the Incineration plant will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The measures and systems implemented to reduce the frequency of the occurrence of OTNOC as well as any associated emissions will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	
1.4 - Energy Efficiency				
19	Heat Recovery Boiler	Narrative	**In order to increase the resource efficiency of the incineration plant, BAT is to use a heat recovery boiler.**	Yes

<table>
<tr><td></td><td></td><td></td><td>The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.4, Table 6, provided in response to the FIR Question 29 c) with further detail provided in Section 2.6, 2.7 and 8.1 as well as associated Appendices of the Permit Application, Supporting Technical Report.

The applicant intends to use a heat recovery boiler to produce steam which is used to produce electricity. The steam turbine will be equipped with three bleeds serving the combustion air preheaters, the deaerator and a controlled bleed used in a condensate preheater and for the provision to export heat to local users / proposed local district heating scheme. Considered to meet BAT 19 requirements.

Permit Consideration:
Standard permit conditions in 2.7 cover the requirements for a heat and power plan which require the Operator to provide annual reports on their progress towards outlets for heat recovery and compliance with the energy efficiency targets in SEPA's Thermal Treatment of Waste Guidelines.

Standard Condition 5.2.5 requires that a record is kept of all times when the incineration plant is operating and the heat recovery system is not utilised with the reason for the non-utilisation. This is subject to a quarterly reporting requirement.

The installation and efficiency of the heat recovery boiler will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.</td><td></td></tr>
<tr><td>20</td><td>Energy efficiency</td><td>BAT-AEL</td><td>In order to increase the energy efficiency of the incineration plant, BAT is to use an appropriate combination of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.4, Table 6, provided in response to the FIR Question 29 c) with further detail provided in Section 2.3, 2.5, 2.6, 8.1 and 8.2 as well as associated Appendices of the Permit Application, Supporting Technical Report.
<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Drying of sewage sludge</td><td>N/A – Waste type not accepted</td></tr>
<tr><td>(b)</td><td>Reduction of the flue-gas flow</td><td>Technique adopted through the design of plant including reduced flow and flue gas recirculation.</td></tr>
<tr><td>(c)</td><td>Minimisation of heat losses</td><td>Technique adopted through the design of plant including:
- minimising heat losses via the use of an integrated 3 pass waste heat boiler with the incinerator furnace;
- stated high standard of thermal insulation to be used throughout;
- flue gas recirculation</td></tr>
</table></td><td>Yes</td></tr>
</table>

						Also considered within the preventative maintenance plan where thermographic inspections of cladding & insulation to identify 'hot/cold spots' where insulation is lacking/degraded and in need of repair, is proposed.		
				(d)	Optimisation of the boiler design	Technique adopted through the optimisation of the boiler design to improve heat transfer including; - Three vertical radiation passes. - One horizontal convective pass with evaporators and superheaters. - Protective evaporator. - Superheater bundles. - A vertical economiser. (Optimise thermal cycle efficiency) - Water/steam circulation - Provision of an efficient on-line heating surface cleaning (rapping system for the horizontal convective pass and shot ball cleaning system for economiser pass.		
				(e)	Low-temperature flue-gas heat exchanger	A flue gas condenser downstream the FGT was not considered necessary to meet the BAT-AEEL and is not included on the design. Also consider to ensure better dispersion of flue gas and avoid the risk of plume visibility		
				(f)	High steam conditions	Technique adopted through the - the selection and inclusion of materials of construction able to withstand high pressures & temperatures; - High steam conditions (above 45 bar, 400 °C) at 63 bar and 425°C, to increase electricity conversion efficiency;		
				(g)	Cogeneration	Technique adopted as the facility has been designed to be able to produce both heat and power and will have the capacity to provide heat to local users/potential district heating scheme. The applicant is contractually obliged to provide heat to the local authority District Heating Scheme. Subject to finalisation and commercial agreements with heat users, a scheme for the export of heat will be implemented.		
				(h)	Flue-gas condenser	A flue gas condenser downstream the FGT was not considered necessary to meet the BAT-AEEL and is not included on the design. Also not taken forward to ensure better dispersion of flue gas and avoid the risk of plume visibility		
				(i)	Dry bottom ash handling	Applicant does not consider is feasible as proposing that IBA extractors will be filled with water to create a seal against air leak		

				into the furnace to optimise combustion conditions and to ensure that the IBA will be cooled below 60°C.	

Table 2 - BAT-associated energy efficiency levels (BAT-AEELs) for the incineration of waste

BAT-AEEL	Gross electrical efficiency	Comment
Municipal solid waste, other non-hazardous waste and hazardous wood waste	New Plant 25-35%	The applicant has confirmed that the facility will have an electrical efficiency of 29.2% when operating in power only mode. This is in the mid range of the BAT-AEEL

It is deemed that an appropriate combination of the above techniques have been employed such that the requirements of BAT 20 have been met. This is confirmed as the proposed design is expected to meet the lower end of the BAT-AEEL range for gross electrical efficiency (GEE) (25%) as well as meet the requirements of SEPA's Thermal Treatment of Waste Guidelines. See Section 5.15 of this document for further detail.

Permit Consideration:
Inclusion of standard Conditions with respect to demonstration can achieve the gross electrical efficiency predicted and in relation to provision of a heat and power plan (Section 5.15 of this document for further detail) otherwise the efficiency of the Incineration process will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The implementation and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

1.5 - Emissions to air				
21	Diffuse emissions, Odour	Narrative	**In order to increase the energy efficiency of the incineration plant, BAT is to use an appropriate combination of the techniques given below.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.5, Table 7, provided in response to the FIR Question 29 c) with further detail provided in Section 2.1, 3.1 and 3.6 as well as associated Appendices of the Permit Application, Supporting Technical Report.	Yes

Item	Technique	Comment

<table>
<tr>
<td></td>
<td></td>
<td></td>
<td>
<table>
<tr><td>(a)</td><td>store solid and bulk pasty wastes that are odorous and/or prone to releasing volatile substances in enclosed buildings under controlled sub atmospheric pressure and use the extracted air as combustion air for incineration or send it to another suitable abatement system in the case of a risk of explosion;</td><td>Technique adopted through the design of the facility including use of enclosed buildings for waste reception/bunker etc with fast acting roller doors, that are maintained under negative pressure extracted air as combustion air. No expected risk of explosion from waste types proposed / permitted.</td></tr>
<tr><td>(b)</td><td>store liquid wastes in tanks ….</td><td>N/A – Waste type not accepted</td></tr>
<tr><td rowspan="4">(c)</td><td colspan="2">control the risk of odour during complete shutdown periods when no incineration capacity is available, e.g. by</td></tr>
<tr><td>sending the vented or extracted air to an alternative abatement system, …</td><td>Secondary abatement system (activated carbon filtration system) provided for with separate discharge point (see Section 5.7).</td></tr>
<tr><td>minimising the amount of waste in storage, e.g. by interrupting, reducing or transferring waste deliveries, as a part of waste stream management (see BAT 9)</td><td>Technique to be addressed through the required Odour Management Plan as well as wider EMS.</td></tr>
<tr><td>storing waste in properly sealed bales.</td><td>N/A – Waste type not accepted</td></tr>
</table>

It is deemed that an appropriate combination of the above techniques have been employed such that the requirements of BAT 21 have been met.

Permit Consideration:
Inclusion of standard Conditions with respect to Odour (no offensive Odour out with Installation Boundary / requirement Odour management plan etc. (Section 5.7 of this document for further detail) otherwise the management and maintenance of such systems will be considered against the overriding regulatory requirement that ‘all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques’. The implementation and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.
</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Diffuse emissions, Gas & Liquid Waste, Odour</td>
<td>Narrative</td>
<td>In order to prevent diffuse emissions of volatile compounds from the handling of gaseous and liquid wastes that are odorous and/or prone to releasing volatile substances at incineration plants, BAT is to introduce them into the furnace by direct feeding.

No acceptance of separate gaseous or liquid wastes proposed or permitted at the Installation. Any gaseous or liquid wastes incinerated will form part of the MSW feed and as such be incinerated directly in the furnace in any case.</td>
<td>N/A</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>BAT Conclusion not considered applicable.</td><td></td></tr>
<tr><td>23 &24</td><td>Diffuse emissions, Dust, Ash Treatment</td><td>Narrative</td><td>BAT 23. In order to prevent or reduce diffuse dust emissions to air from the treatment of slags and bottom ashes, BAT is to include in the environmental management system (see BAT 1) the following diffuse dust emissions management features:
- identification of the most relevant diffuse dust emission sources (e.g. using EN 15445);
- definition and implementation of appropriate actions and techniques to prevent or reduce diffuse emissions over a given time frame.

BAT 24. In order to prevent or reduce diffuse dust emissions to air from the treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques given below: (a) to (f) inclusive.

No treatment of slags or ashes proposed or permitted at the Installation, IBA will be exported from the facility for treatment at another appropriately permitted site, however techniques as they relate to the identification and prevention or reduction of dust emissions from slag/ash handling have been considered. These include handling and loading operations taking place within an enclosed building and vehicles being sheeted/ cleaned prior to leaving the hall. See section 5.5 of this document.

BAT Conclusion not considered applicable.</td><td>N/A</td></tr>
<tr><td>25</td><td>Channelled Emissions – Dust & Metals</td><td>BAT-AEL</td><td>In order to reduce channelled emissions to air of dust, metals and metalloids from the incineration of waste, BAT is to use one or a combination of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.5, Table 7, provided in response to the FIR Question 29 c) with further detail provided in Section 3.1 as well as associated Appendices of the Permit Application, Supporting Technical Report and in response to the FIR.

<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Bag filter</td><td>Technique adopted – provision of a fabric bag filter system for the collection and removal of particulate matter & heavy metals. Consists of six compartments each housing a set of 576 reverse air injection filter bags with the ability to isolate one filter compartment to enable emergency maintenance whilst maintaining adequate particulate removal efficiency</td></tr>
<tr><td>(b)</td><td>Electrostatic precipitator</td><td>N/A – technique not proposed / deemed necessary</td></tr>
<tr><td>(c)</td><td>Dry sorbent injection</td><td>Technique adopted - injection of powdered activated carbon (PAC) and hydrated lime in the flue gas reactor tower upstream of the fabric</td></tr>
</table>
</td><td>Yes</td></tr>
</table>

		bag filter for the abatement of dioxins/furans, other volatile organic compounds, heavy metals and acid gases respectively
(d)	Wet scrubber	N/A – technique not proposed / deemed necessary
(e)	Fixed- or moving-bed adsorption	N/A – technique not proposed / deemed necessary. Note applicant has identified the techniques and systems described against (c) above against this technique also however not considered to meet the technique requirements.

Table 3 - BAT-associated emission levels (BAT-AELs) for channelled emissions to air of dust, metals and metalloids from the incineration of waste

Parameter	BAT-AEL (mg/Nm^3)	Averaging Period	Comment
Dust	< 2–5	Daily average	The applicant has confirmed that the facility is cable of meeting the upper range of the specified BAT AELs respectively (5, 0.02 and 0.3 mg/Nm^3) and confirmed a performance guarantee in place to achieve this. The value at the upper range has been used for modelling when considering potential impacts from emissions and has been adopted as the associated ELVs in the Permit on the averaging period described.
Cd+Tl	0,005–0,02	Average over the sampling period	
Sb+As+Pb+Cr+Co+ Cu+Mn+Ni+V	0,01–0,3	Average over the sampling period	

It is deemed that an appropriate combination of the above techniques has been employed such that the requirements of BAT 25 have been met. This is confirmed as the proposed design is expected to meet the upper end of the BAT-AEL range.

Permit Consideration:
Inclusion of standard Conditions with respect setting and monitoring specified ELVs otherwise the adequacy and management of the techniques described will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The management and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

<table>
<tr>
<td>26</td>
<td>Channelled Emissions – Dust, Ash Treatment</td>
<td>BAT-AEL</td>
<td>
In order to reduce channelled dust emissions to air from the enclosed treatment of slags and bottom ashes with extraction of air (see BAT 24(f)), BAT is to treat the extracted air with a bag filter (see Section 2.2).

Table 4 - BAT-associated emission levels (BAT-AELs) for channelled dust emissions to air from the enclosed treatment of slags and bottom ashes with extraction of air
<table>
<tr><th>Parameter</th><th>BAT-AEL (mg/Nm^3)</th><th>Averaging Period</th><th>Comment</th></tr>
<tr><td>Dust</td><td>2–5</td><td>Average over the sampling period</td><td>N/A</td></tr>
</table>
No treatment of slags or ashes proposed or permitted at the Installation, IBA will be exported from the facility for treatment at another appropriately permitted site.

BAT Conclusion not considered applicable.
</td>
<td>N/A</td>
</tr>
<tr>
<td>27</td>
<td>Channelled Emissions – HCl, HF and SO_2</td>
<td>BAT-AEL</td>
<td>
In order to reduce channelled emissions of HCl, HF and SO_2 to air from the incineration of waste, BAT is to use one or a combination of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.5, Table 7, provided in response to the FIR Question 29 c) with further detail provided in Section 3.1 as well as associated Appendices of the Permit Application, Supporting Technical Report and in response to the FIR.
<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Wet scrubber</td><td>N/A – technique not proposed / deemed necessary</td></tr>
<tr><td>(b)</td><td>Semi-wet absorber</td><td>N/A – technique not proposed / deemed necessary</td></tr>
<tr><td>(c)</td><td>Dry sorbent injection</td><td>Technique adopted - injection of powdered activated carbon (PAC) and Hydrated Lime in the flue gas reactor tower upstream of the fabric bag filter for the abatement of dioxins/furans, other volatile organic compounds, heavy metals and acid gases respectively</td></tr>
<tr><td>(d)</td><td>Direct desulphurisation</td><td>N/A – technique only applicable to fluidised bed furnaces</td></tr>
<tr><td>(e)</td><td>Boiler sorbent injection</td><td>N/A – technique not proposed / deemed necessary</td></tr>
</table>
It is deemed that an appropriate combination of the above techniques has been employed such that the requirements of BAT 27 have been met.
</td>
<td>Yes</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>Permit Consideration:
See BAT 28 below.</td><td></td></tr>
<tr><td>28</td><td>Channelled Emissions – HCl, HF and SO_2</td><td>BAT-AEL</td><td>In order to reduce channelled peak emissions of HCl, HF and SO2 to air from the incineration of waste while limiting the consumption of reagents and the amount of residues generated from dry sorbent injection and semi-wet absorbers, BAT is to use technique (a) or both of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.5, Table 7, provided in response to the FIR Question 29 c) with further detail provided in Section 2.3.8, 3.1.7, 3.1.8 and 11.1 as well as associated Appendices of the Permit Application, Supporting Technical Report and response to the FIR.

<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Optimised and automated reagent dosage</td><td>Technique adopted - In order to optimise the consumption of hydrated lime, the incoming concentrations of hydrogen chloride (HCl) and sulphur dioxide (SO_2) will be continuously measured by means of analysers at the reactor inlet. The information will be used to calculate the amount of lime required to reach the emission targets, which will inform the control of the automatic lime dosing system. Continuous emissions monitoring of HCl, HF and SO_2 is undertaken.</td></tr>
<tr><td>(b)</td><td>Recirculation of reagents</td><td>Technique adopted - partial recirculation of residues from the bag filter to the reactor tower to minimise the consumption of reagents e.g. Hydrated Lime</td></tr>
</table>

Table 5 - BAT-associated emission levels (BAT-AELs) for channelled emissions to air of HCl, HF and SO2 from the incineration of waste (Note – BAT AELs for New Plant apply)

<table>
<tr><th>Parameter</th><th>BAT-AEL (mg/Nm^3)</th><th>Averaging Period</th><th>Comment</th></tr>
<tr><td>HCl</td><td>< 2–6</td><td>Daily average</td><td rowspan="2">The applicant has confirmed that the facility is cable of meeting the upper range of the specified BAT AELs respectively (HC 6, HF 1 and SO_2 30 mg/Nm^3) and confirmed a performance guarantee in place to achieve this.</td></tr>
<tr><td>HF</td><td><1</td><td>Daily average or Average over the sampling period</td></tr>
</table>
</td><td>Yes</td></tr>
</table>

SO_2	5–30	Daily average	The value at the upper range has been used for modelling when considering potential impacts from emissions and has been adopted as the associated ELVs in the Permit on the averaging period described.	

It is deemed that an appropriate combination of the above techniques has been employed such that the requirements of BAT 28 have been met. This is confirmed as the proposed design is expected to meet the upper end of the BAT-AEL range for each of the parameters described.

Permit Consideration:
Inclusion of standard Conditions with respect to the setting and monitoring of specified ELVs otherwise the adequacy and management of the techniques described will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The management and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.

29	Channelled Emissions – NOx, CO & NH_3	BAT-AEL	**In order to reduce channelled NOX emissions to air while limiting the emissions of CO and N2O from the incineration of waste and the emissions of NH3 from the use of SNCR and/or SCR, BAT is to use an appropriate combination of the techniques given below.**	Yes

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.5, Table 7, provided in response to the FIR Question 29 c) with further detail provided in Section 2.2, 2.3 and 3.1 as well as associated Appendices of the Permit Application, Supporting Technical Report and response to the FIR.

Item	Technique	Comment
(a)	Optimisation of the incineration process	Technique adopted - Primary NOx (and CO-reduction) reduction measure, the furnace is designed to assure a complete combustion/oxidation of the flue gases in the complete absence of hot spots. CFD modelling has been employed to ensure an effective design including the determination of the location , number and dimensions of the secondary air nozzles and flue gas recirculation nozzles etc. Advanced control and monitoring system in place governing the regulation of primary air and operational oxygen content in order to provide sufficient oxygen for complete combustion even

					during peak demand. See also BAT 14 for further detail on incineration process optimisation.		
			(b)	Flue-gas recirculation	Technique adopted - Flue gas recirculation has been employed and is injected below the secondary air to minimise the formation of thermal NOx. Due to the lower oxygen content of the flue gas, when compared to air it is the applicant expects that the FGR will result in a 15-20% decrease in NOx emissions as well as improve the thermal efficiency of the process		
			(c)	Selective non-catalytic reduction (SNCR)	Technique adopted – the facility is to use selective non-catalytic reduction (SNCR), using a 40% urea-solution, to convert the nitrogen oxide to nitrogen and water vapour and includes the following features: - Target ELV 120 mg/Nm³ NOx with an ammonia slip in the stack below 10 mg/Nm³, and nitrous oxide slip in the stack below 20 mg/Nm³. - Optimization of SNCR-control through adjusting the atomization pressure, the temperature setpoint for automatic level selection and the dilution water flow. - 4 automatically controllable injection levels with 6 lances per level. - CFD modelling has been employed to ensure an effective design (number/ & location) of injection points.		
			(d)	Selective catalytic reduction (SCR)	N/A – technique not proposed / deemed necessary		
			(e)	Catalytic filter bags	N/A – technique not proposed / deemed necessary. Application states there is a reagent and PAC coating on the outer surface of the filter bags to provide a reaction site for pollutants. However, no discussion of actual catalytic filter bags.		
			(f)	Optimisation of the SNCR/SCR design and operation	Technique adopted – See (c) above.		
			(g)	Wet scrubber	N/A – technique not proposed / deemed necessary		

Table 6 - BAT-associated emission levels (BAT-AELs) for channelled NOX and CO emissions to air from the incineration of waste and for channelled NH3 emissions to air from the use of SNCR and/or SCR (Note – BAT AELs for New Plant apply)

Parameter	BAT-AEL	Averaging Period	Comment

<table>
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<table>
<tr><th></th><th>(mg/Nm^3)</th><th></th><th></th></tr>
<tr><td>NOx</td><td>50–120</td><td>Daily average</td><td rowspan="3">The applicant has confirmed that the facility is cable of meeting the upper range of the specified BAT AELs respectively (NOx 120, CO 50 and NH_3 10 mg/Nm3) and confirmed that a performance guarantee is in place to achieve this.
The value at the upper range has been used for modelling when considering potential impacts from emissions and has been adopted as the associated ELVs in the Permit on the averaging period described.</td></tr>
<tr><td>CO</td><td>10–50</td><td>Daily average</td></tr>
<tr><td>NH_3</td><td>2–10</td><td>Daily average</td></tr>
</table>

It is deemed that an appropriate combination of the above techniques has been employed such that the requirements of BAT 29 have been met. This is confirmed as the proposed design has been guaranteed to meet the upper end of the BAT-AEL range for each of the parameters described. Expected to operate within the range.

Permit Consideration:
Inclusion of standard Conditions with respect to the setting and monitoring of specified ELVs otherwise the adequacy and management of the techniques described will be considered against the overriding regulatory requirement that ‘all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques’. The management and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.
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<tr>
<td>30</td>
<td>Channelled Emissions – PCDD/F and PCBs</td>
<td>BAT-AEL</td>
<td>
In order to reduce channelled emissions to air of organic compounds including PCDD/F and PCBs from the incineration of waste, BAT is to use techniques (a), (b), (c), (d), and one or a combination of techniques (e) to (i) given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.5, Table 7, provided in response to the FIR Question 29 c) with further detail provided in Section 2.1.2, 2.6, 3.1.3 and 3.1.6 as well as associated Appendices of the Permit Application, Supporting Technical Report and response to the FIR.
<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Optimisation of the incineration process</td><td>Technique adopted – The combustion chamber and boiler has been designed and will be operated (combustion temperature and residence time) to minimise the formation of dioxins and furans as follows (with</td></tr>
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</td>
<td>Yes</td>
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</table>

						any dioxins and furans that are formed being removed from the flue gas by the PAC injected upstream of the bag filter): - The second and third vertical passes will be equipped with a "constructive baffle wall" in the middle, splitting the pass in two equal parts and providing benefits that include encouraging more linear air flow and therefore reducing the potential for areas of low velocity gas flow etc. - Provide good combustion conditions by control and distribution of the combustion air requirements. Primary combustion air supply into the individual grate zones and secondary combustion air supply to the injection nozzles will be provided by separate, variable speed controlled fans and modulating dampers. - Minimising as far as practicable the residence time in the 450°C to 200°C reformation zone. To achieve this the design of the boiler will maintain critical surface temperatures below the desorption temperature, therefore resulting in a quick reduction in temperature to below the de novo temperature region through the economiser pass. - Utilisation of an SNCR system which inhibits dioxin formation and promotes their destruction. - CFD modelling has been employed to ensure an effective design to optimise the furnace and boiler configuration to ensure a progressive yet complete combustion process, ensures gas velocities are in a range that negates the formation of stagnant pockets/low velocities, avoids internal flue gas recirculation, minimises dust entrainment from the combustion zone and maximise heat transfer. - Prevent boundary layers of slow-moving gas along boiler surfaces via good design and regular maintenance. See also BAT 14 & 29 for further detail on incineration process optimisation.		
				(b)	Control of the waste feed	N/A – technique not applicable as the facility will only incinerate residual municipal solid waste and C&I waste of a similar nature. N/A – technique only applicable to fluidised bed furnaces		
				(c)	On-line and off-line boiler cleaning	Technique adopted - A cleaning package unit with its own control system linked to the central control system has been provided. This		

		allows for the review and adjustment of the operating parameters of the different cleaning systems. The cleaning system will reduce the boiler deposits through the provision of on-line cleaning, which will further reduce the potential for dioxin formation within the boiler.
(d)	Rapid flue-gas cooling	Technique adopted - Boiler feed water will be delivered to the generator at 130°C with sufficient economiser surface area to allow for rapid cooling of the flue gas to a nominal temperature of 145 - 160°C (below the identified threshold of 250 °C) at the boiler outlet, prior to the dust abatement. The rapid drop in temperature will limit the potential for de-novo formation of dioxins and furans.
(e)	Dry sorbent injection	Technique adopted - injection of powdered activated carbon (PAC) and Hydrated Lime in the flue gas reactor tower upstream of the fabric bag filter for the abatement of dioxins/furans, other volatile organic compounds, heavy metals and acid gases respectively
(f)	Fixed- or moving-bed adsorption	N/A – technique not proposed / deemed necessary
(g)	SCR	N/A – technique not proposed / deemed necessary. SNCR proposed.
(h)	Catalytic filter bags	N/A – technique not proposed / deemed necessary. See BAT 29 (e) above
(i)	Carbon sorbent in a wet scrubber	N/A – technique not proposed / deemed necessary

Table 7 - BAT-associated emission levels (BAT-AELs) for channelled emissions to air of TVOC, PCDD/F and dioxin like PCBs from the incineration of waste (Note – BAT AELs for New Plant apply)

Parameter	BAT-AEL	Averaging Period	Comment
TVOC	< 3–10 (mg/Nm^3)	Daily average	The applicant has confirmed that the facility is cable of meeting the upper range of the specified BAT AELs respectively (TVOC 10 mg/Nm^3 and PCDD/F 0.04 ng I-TEQ/Nm^3 (see note 1 below) as a daily average (see note 2 below) and confirmed that a performance guarantee is in place to achieve this.
PCDD/F	< 0,01–0,04 (ng I-TEQ/Nm^3)	Average over the sampling period	
	< 0,01–0,06 (ng I-TEQ/Nm^3)	Long-term sampling period	

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<table>
<tr><td rowspan="2">PCDD/F + dioxin-like PCBs</td><td>< 0,01–0,06 (ng I-TEQ/Nm^3)</td><td>Average over the sampling period</td><td rowspan="2">The value at the upper range has been used for modelling when considering potential impacts from emissions and has been adopted as the associated ELVs in the Permit on the averaging period described.</td></tr>
<tr><td>< 0,01–0,08 (ng I-TEQ/Nm^3)</td><td>Long-term sampling period</td></tr>
</table>
It should be noted that the BAT AELs have two associated notes associated with them:
1. Either the BAT-AEL for PCDD/F or the BAT-AEL for PCDD/F + dioxin-like PCBs applies. In this case the BAT-AEL for PCDD/F has been selected.
2. The BAT-AEL for Long-term sampling period does not apply if the emission levels are proven to be sufficiently stable - Condition 6.5.2 requires a programme of monitoring to determine whether the dioxin and furan emissions are sufficiently stable; this will be used to determine whether periodic monitoring is acceptable, or whether long-term sampling is required for dioxins and furans.

It is deemed that an appropriate combination of the above techniques has been employed such that the requirements of BAT 30 have been met. This is confirmed as the proposed design is expected to meet the upper end of the BAT-AEL range for each of the parameters described.

Permit Consideration:
Inclusion of standard Conditions with respect to the setting and monitoring of specified ELVs otherwise. Additional Condition referenced above regards establishing if emissions levels are sufficiently stable. The adequacy and management of the techniques described will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The management and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.
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<tr>
<td>31</td>
<td>Channelled Emissions – Hg</td>
<td>BAT-AEL</td>
<td>
In order to reduce channelled mercury emissions to air (including mercury emission peaks) from the incineration of waste, BAT is to use one or a combination of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.5, Table 7, provided in response to the FIR Question 29 c) with further detail provided in Section 2.1.2 and 3.1 as well as associated Appendices of the Permit Application, Supporting Technical Report and response to the FIR.
<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Wet scrubber (low pH)</td><td>N/A – technique not proposed / deemed necessary</td></tr>
<tr><td>(b)</td><td>Dry sorbent injection</td><td>Technique adopted - injection of powdered activated carbon (PAC) and Hydrated Lime in the flue gas reactor tower upstream of the</td></tr>
</table>
</td>
<td>Yes</td>
</tr>
</table>

		fabric bag filter for the abatement of dioxins/furans, other volatile organic compounds, heavy metals and acid gases respectively
(c)	Injection of special, highly reactive activated carbon	N/A – technique not proposed / deemed necessary
(d)	Boiler bromine addition	N/A – technique not proposed / deemed necessary
(e)	Fixed or moving-bed adsorption	N/A – technique not proposed / deemed necessary

Table 8 - BAT-associated emission levels (BAT-AELs) for channelled mercury emissions to air from the incineration of waste

Parameter	BAT-AEL (ug/Nm^3)	Averaging Period	Comment
Hg	< 5–20	Daily average or average over the sampling period	The applicant has confirmed that the facility is cable of meeting the upper range of the specified BAT AEL (Hg 20 ug/Nm^3) (see note 1 below) as a daily average (see note 2 below) and confirmed that a performance guarantee is in place to achieve this. The value at the upper range has been used for modelling when considering potential impacts from emissions and has been adopted as the associated ELVs in the Permit for the averaging period described.
	1–10	Long-term sampling period	

It should be noted that the BAT AELs have two associated notes associated with them:

1. Either the BAT-AEL for daily average or average over the sampling period or the BAT-AEL for long-term sampling period applies. In this case the BAT-AEL for the Daily Average has been selected.
2. The BAT-AEL for long-term sampling may apply in the case of plants incinerating waste with a proven low and stable mercury content (e.g. mono-streams of waste of a controlled composition). - Condition 6.5.1 requires a programme of monitoring to determine whether the mercury emissions are proven to be low and stable; this will be used to determine whether periodic monitoring is acceptable, or whether long-term sampling is required.

It is deemed that an appropriate combination of the above techniques has been employed such that the requirements of BAT 31 have been met. This is confirmed as the proposed design is expected to meet the upper end of the BAT-AEL range for each of the parameter described.

			Permit Consideration: Inclusion of standard Conditions with respect to the setting and monitoring of specified ELVs. Additional Condition referenced above regards establishing if emissions levels are sufficiently stable. The adequacy and management of the techniques described will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques'. The management and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	
1.6 - Emissions to Water				
32	Segregation of Waste Water Streams	Narrative	**In order to prevent the contamination of uncontaminated water, to reduce emissions to water, and to increase resource efficiency, BAT is to segregate waste water streams and to treat them separately, depending on their characteristics.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.6, Table 8, provided in response to the FIR Question 29 c) with further detail provided in Section 3.2 as well as associated Appendices of the Permit Application, Supporting Technical Report and in the response provided to the FIR. The facility has been designed to segregate different effluent streams as far as possible in order to allow for their reuse within the Installation and ensure that any resultant stream is treated in an appropriate manner. The waste water streams identified are: 4. **Foul Water Drainage** - Foul water from toilets and sinks within the admin block and gatehouse will be collected and discharged to the Scottish Water combined sewer system. These activities are not considered to be part of the permitted Installation and are therefore not considered for control under the Permit. 5. **Process Waste Water** - The facility has been designed to minimise water consumption and maximise reuse of waste water within the process. This includes provision for the collection, storage, distribution, and reuse of produced water and run off from potentially contaminated site areas in order to minimise water consumption and meet the design criteria of a zero liquid discharge. This is achieved through the use of the collected water as conditioning water, for the acid gas treatment reagents or in the IBA extractors as quench water. No discharge of process waste water from the facility has been identified. 6. **Surface Water** - The surface water drainage system collects run-off from areas where there is minimal risk of surface waters becoming contaminated by waste or other materials (roofs, site road hard standing etc.). Where possible water is reused within the process such as from roof water harvesting. The remaining surface is collected and treated in a SUDS system before being discharged to the East Tullos Burn culvert, which runs	Yes

<table>
<tr><td></td><td></td><td></td><td>under the western boundary of the site, via a final isolation valve that will automatically close in the event of a fire or breach of a pre-set discharge parameter.

It is deemed that an appropriate level of segregation of waste water streams has been achieved in order to reduce emissions to water and to increase resource such that the requirements of BAT 32 have been met.

Permit Consideration:
The design, management and maintenance of the drainage systems will be considered against the overriding regulatory requirement that ‘all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques. The implementation, management and adequacy of the described drainage systems will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.</td><td></td></tr>
<tr><td>33</td><td>Waste Water Minimisation</td><td>Narrative</td><td>In order to reduce water usage and to prevent or reduce the generation of waste water from the incineration plant, BAT is to use one or a combination of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.6, Table 8, provided in response to the FIR Question 29 c) with further detail provided in Section 3.1.7, 3.2.1, and 5.4.1, as well as associated Appendices of the Permit Application, Supporting Technical Report and response to the FIR.

<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Waste-water-free FGC techniques</td><td>Technique adopted – no wet scrubbing employed. Dry scrubbing using injection of powdered activated carbon (PAC) and Hydrated Lime in the flue gas reactor tower upstream of the fabric bag filter for the abatement of dioxins/furans, other volatile organic compounds, heavy metals and acid gases respectively.</td></tr>
<tr><td>(b)</td><td>Injection of waste water from FGC</td><td>N/A – No waste water from FGC – see above</td></tr>
<tr><td>(c)</td><td>Water reuse/recycling</td><td>Technique adopted - The facility has been designed to minimise water consumption by using closed loop systems, and through the reuse of waste water within the process such as conditioning water for the acid gas treatment reagents or in the IBA extractors as quench water.</td></tr>
<tr><td>(d)</td><td>Dry bottom ash handling</td><td>N/A – technique not proposed / deemed necessary</td></tr>
</table>

It is deemed that an appropriate combination of the above techniques has been employed such that the requirements of BAT 33 have been met.</td><td>Yes</td></tr>
</table>

			Permit Consideration: The design, management and maintenance of the systems associated with the above techniques will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques. The implementation, management and adequacy of the described techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	
34	Channelled Emissions – Water	BAT-AEL	**In order to reduce emissions to water from FGC and/or from the storage and treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques given below, and to use secondary techniques as close as possible to the source in order to avoid dilution.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.6, Table 8, provided in response to the FIR Question 29 c) with further detail provided in Section 3 and 5 as well as associated Appendices of the Permit Application, Supporting Technical Report and response to the FIR. As noted under BAT 33, waste-water-free FGC techniques are to be employed at the facility through the use of dry scrubbing with the injection of powdered activated carbon (PAC) and Hydrated Lime in the flue gas reactor tower. The facility has been designed to minimise water consumption and maximise reuse of waste water within the process. This includes provision for the collection, storage, distribution, and reuse of produced water and run off from potentially contaminated site areas in order to minimise water consumption and meet the design criteria of a zero liquid discharge. As such it is not considered that there is an aqueous stream from FGC for the described techniques to apply. Furthermore, no treatment of slags or ashes is proposed or permitted at the Installation, IBA will be exported from the facility for treatment at another appropriately permitted site. As such there are no channelled emissions of process water from the Installation with the only potential emission to water from fugitive release from the handling and storage of ash (designed to minimise potential release) or in the event of an accidental release (measures in place to capture and remove from site). It is not considered that this BAT Conclusion applies to such releases and that they are covered elsewhere. **Table 9 - BAT-AELs for direct emissions to a receiving water body** **Table 10 - BAT-AELs for indirect emissions to a receiving water body** It should be noted that emissions to surface water and associated potential discharges to the environment are captured within the Permit including the setting of appropriate ELVs (see section 5.3 & 5.6 of this document), This is separate to the requirements of this BAT Conclusion and as the applicant has confirmed that: a) The FGC system will be a dry process, that will not result in any aqueous emissions.	**N/A**

			b) There is no IBA treatment on site. All IBA will be exported and treated off site, at an appropriately permitted treatment facility; and c) There will be no channelled aqueous process emission from the EfW facility. then BAT 34 is not considered to apply. **BAT Conclusion and associated BAT AELs are not considered applicable.**	
1.7 – Material Efficiency				
35	Ash Separation	Narrative	**In order to increase resource efficiency, BAT is to handle and treat bottom ashes separately from FGC residues.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.7, Table 9, provided in response to the FIR Question 29 c) with further detail provided in Section 6 of the Permit Application, Supporting Technical Report and response to the FIR. It is considered that the applicant has adopted all applicable techniques. **Permit Consideration:** Standard Condition 8.1.8 included requiring that bottom ash and air pollution control (APC) residues are not mixed. Design features and necessary procedures will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.	**Yes**
36	Slag and Bottom Ash Treatment	Narrative	**In order to increase resource efficiency for the treatment of slags and bottom ashes, BAT is to use an appropriate combination of the techniques given below based on a risk assessment depending on the hazardous properties of the slags and bottom ashes.** The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.7, Table 9, provided in response to the FIR Question 29 c) with further detail provided in Section 7.2 of the Permit Application, Supporting Technical Report and response to the FIR. The applicant has confirmed that there is no slags or bottom ash (IBA) treatment on site. All IBA will be exported and treated off site, at an appropriately permitted treatment facility. **BAT Conclusion not considered applicable.**	**N/A**
1.8 - Noise				

<table>
<tr>
<td>37</td>
<td>Noise Emissions</td>
<td>Narrative</td>
<td>In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to use one or a combination of the techniques given below.

The necessary response / signposted information is provided in the BAT Conclusions Checklist, Section 2.8, Table 10, provided in response to the FIR Question 29 c) with further detail provided in Section 10 (particularly 10.1) as well as associated Appendices of the Permit Application, Supporting Technical Report and the response to the FIR (particularly Appendix I –NSS00-ME-DE-ACC-0002_BAT Noise Justification.
<table>
<tr><th>Item</th><th>Technique</th><th>Comment</th></tr>
<tr><td>(a)</td><td>Appropriate location of equipment and buildings</td><td>Technique adopted – The applicant has where possible considered the siting of plant with respect to potential for noise emissions. Wherever possible plant identified as a potential source for noise emission was located indoors. On consideration of plant outside the scope of locating plant is limited due to the small site footprint however examples include locating the Air Cooled Condensers (ACC) and Fin Fan Coolers (FFC) to the South of the site at the greatest distance from identified offsite receptors.</td></tr>
<tr><td>(b)</td><td>Operational measures</td><td>Technique adopted – The applicant has confirmed that a series of operational measures including the following have been adopted in order to minimise noise emissions:
- Plant and equipment will be subject to regular inspection and maintenance, in line with the EMS proactive maintenance schedule;
- Operating philosophy to shutdown / throttle back plant not in continuous operational use;
- Fast open and shut doors provided that will only be opened for transit and will be kept shut at all times when not in use;
- Vehicle movements limited the hours specified in planning: 07:00 to 19:00 hrs Mon to Friday and 07:00 to 13:00 hrs on Sat.
- External one-way system to minimise reversing (inside only); and
- Plant visitors/staff reminded of site rules and responsibility to neighbours.</td></tr>
<tr><td>(c)</td><td>Low-noise equipment</td><td>Technique adopted – The applicant has confirmed that during the selection process for new plant and equipment consideration has been given to the minimisation of noise. A contractual requirement meant that as a minimum all equipment had to have a maximum noise level of 85dB(A) at 1m distance) from the source The applicant further</td></tr>
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<td>Yes</td>
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</table>

					confirms that in order to meet BAT further design improvements have been implemented in order to decrease noise emissions below these contractual guaranteed values. Focus was given to those items of plant identified as the main noise emission sources. For example, selection of low noise ACCs.		
				(d)	Noise attenuation	Technique adopted – Consideration has been given to propagation measures and while centred on protecting on site staff and occupied buildings consideration has also been given to offsite receptors. While limited by available site footprint (See point a)) examples include locating noisy plant to the south of the site and includes the selection of ground cover such as gravel beneath the ACC fans.	
				(e)	Noise-control equipment / infrastructure	Technique adopted – The applicant has identified that where necessary potentially noisy plant will be fitted with appropriate noise control equipment / infrastructure including: - Silencers and mufflers - Noise dampeners (ID-fan to avoid sound propagation to the stack) - Insulation (turbine casing etc.) - isolation pads to limit transition of vibration and noise - installation of noise abating shelters (compressors etc.) Specific Plant examples include the Steam Turbine where have utilised – noise insulation around the turbine / noise blanket on the gearbox and use of a an enclosure for the generator.	
			It is deemed that an appropriate combination of the above techniques has been employed such that the requirements of BAT 37 have been met. **Permit Consideration:** Inclusion of standard Conditions with respect to Noise (requirement of a Noise management plan, restriction of operating hours etc. see Section 5.17 of this document for further detail) as well as additional Conditions 2.8.5 and 2.9.2 k) requiring monitoring to be undertaken to demonstrate that actual noise levels of the Installation don't exceed those predicted. Otherwise, the management and maintenance of such systems will be considered against the overriding regulatory requirement that 'all the appropriate preventative measures are taken against pollution, in particular through application of the best available techniques. The implementation, management and adequacy of the above techniques will be confirmed at commissioning with ongoing compliance and any potential for improvement to be assessed through inspection.				

Permit (Application) Number: PPC/A/1186430
Applicant: NESS EFW Limited (SC627853)

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20 APPENDIX H – EMISSIONS TO AIR ELV COMAPRISON AND SELECTION

Parameter	BREF (2006)	Chapter IV IED	BAT-AELs (New Plant)	Averaging Period	NESS Performance Guarantees (FIR Q20)		Revised AQ Assessment (FIR Q21)	ELV Selected	Notes
					Expected	Guaranteed	Modelled		
Dust (mg/Nm³)									
Daily (used for PM_{10} and $PM_{2.5}$)	1 - 5	10	< 2 - 5	Daily average	4	5	5	**5**	
1/2 hourly (100%)	1 - 20	30			30	30	30	**30**	
1/2 hourly (97%)		10			10	10	30	**10**	
Periodic								**30**	Set in line with the 100% 1/2hrly ELV. If set at 2x Daily Limit in line with other pollutants the potential exists for the periodic ELV not to be met while all other ELVs set are compiled with. Considered achievable
Dust (Abnormal Operation) (mg/Nm³)									
1/2 hourly (100%)		150						**150**	Article 46(6) (4 hours correction period) & Article 47 (Breakdown) with associated ELVs in Part 3 of Annex VI
NOx (mg/Nm³)									
Daily	40 - 100	200	50 - 120	Daily average	115	120	120	**120**	

1/2 hourly (100%)	40 - 300	400			400	400	400	**400**	The lower end of the BAT-AEL range can be achieved when using SCR. UK regulators pushing for new plant to meet 100mg/Nm^3. Due to the date of application with detailed design and procurement being progressed prior to this decision being reached alongside the fact that the impact is predicted to be insignificant it was not considered applicable in this instance. Performance of the plant is to be reviewed with a view reducing the NO_2 ELV over time.
1/2 hourly (97%)		200			200	200	400	**200**	
Periodic								**200**	2x Daily Limit (expected new plant ELV – see above). Considered achievable
Sulphur dioxide (mg/Nm^3)									
Daily	1 - 40	50	5 - 30	Daily average	27	30	30	**30**	
1/2 hourly (100%)	1 - 150	200			200	200	200	**200**	
1/2 hourly (97%)		50			50	50	200	**50**	
Periodic								**200**	Set in line with the 100% 1/2hrly ELV. If set at 2x Daily Limit in line with other pollutants the potential exists for the periodic ELV not to be met while all other ELVs set are compiled with.

									Considered achievable
VOC (mg/Nm³)									
Daily	1 - 10	10	< 3 - 10	Daily average	5	10	10	**10**	
1/2 hourly (100%)	1 - 20	20			20	20	20	**20**	
1/2 hourly (97%)		10			10	10	10	**10**	
Periodic								**20**	2x Daily Limit Considered achievable
VOC (Abnormal Operation) (mg/Nm³)									
1/2 hourly (100%)		20						**20**	Article 46(6) (4 hours correction period) & Article 47 (Breakdown) with associated ELVs in Part 3 of Annex VI
HCl (mg/Nm³)									
Daily	1 - 8	10	< 2 - 6	Daily average	5.5	6	6	**6**	[The lower end of the BAT-AEL range can be achieved when using a wet scrubber; the higher end of the range may be associated with the use of dry sorbent injection.]
1/2 hourly (100%)	1 - 50	60			60	60	60	**60**	
1/2 hourly (97%)		10			10	10	60	**10**	
Periodic								**12**	Set in line with the 100% 1/2hrly ELV. If set at 2x Daily Limit in line with other pollutants the potential exists for the periodic ELV not to be met while all other ELVs set are compiled with. Considered achievable

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HF (mg/Nm³)									
Daily	<1	1	<1	Daily average or Average over the sampling period	1	1	1	**N/A**	The continuous measurement of HF may be replaced by periodic measurements with a minimum frequency of once every six months if the HCl emission levels are proven to be sufficiently stable. CEMS for HF has been installed however it is to be utilised for monitoring purposes only with ELV compliance reliant on the periodic ELV in line with BAT requirements. Every 3 months selected for 1st year and then every 6 months thereafter.
1/2 hourly (100%)	<2	4			4	4	4	**N/A**	
1/2 hourly (97%)		2			2	2	4	**N/A**	
Periodic								**1**	
CO (mg/Nm³)									
Daily (mg/Nm3)	5 - 30	50	10 - 50	Daily average	20	50	50	**50**	
1/2 hourly (100%)	5 - 100	100			100	100	100	**100**	
1/2 hourly (95% of 10-min averages in 24 hours)		150			150	150	100	**150**	
1-hour average for fluidised bed plants		100			N/A	N/A	N/A	**N/A**	

Periodic								**100**	2x Daily Limit Considered achievable
CO (Abnormal Operation) (mg/Nm³)									
1/2 hourly (100%)		100						**100**	Article 46(6) (4 hours correction period) & Article 47 (Breakdown) with associated ELVs in Part 3 of Annex VI
Ammonia (mg/Nm³)									
Daily	<10		2 - 10	Daily average	10	10	10	**10**	The lower end of the BAT-AEL range can be achieved when using SCR. The lower end of the BAT-AEL range may not be achievable when incinerating waste with a high nitrogen content.
Periodic								**20**	2x Daily Limit Considered achievable
Nitrous oxide (N2O) (mg/Nm³)									
Daily				Daily average				**N/A**	No ELV set. Monitoring only.
Periodic									
Cadmium+Thallium (mg/Nm³)									
Periodic	0.005 - 0.05	0.05	0.005 - 0.02	Average over the sampling period	0.02	0.02	0.02	**0.02**	
Grp III metals (Sb + As + Pb + Cr + Co + Cu+ Mn + Ni + V) (mg/Nm³)									
Periodic	0.005 - 0.5	0.5	0.01 - 0.3	Average over the	0.2	0.3	0.3	**0.3**	

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				sampling period					
Mercury (ug/Nm^3) Either the BAT-AEL for daily average or average over the sampling period, or the BATAEL for long-term sampling period, applies. The BAT-AEL for long-term sampling may apply in the case of plants incinerating waste with a proven low and stable mercury content (e.g. mono-streams of waste of a controlled composition).									
Daily average of average over sampling period	<50	50.00	<5 - 20	Daily average or average over the sampling period	10	20	20	**20**	The lower end of the BAT-AEL ranges may be achieved when: - incinerating wastes with proven low and stable mercury content (e.g. mono-streams of waste of a controlled composition), or -using specific techniques to prevent or reduce the occurrence of mercury peak emissions while incinerating non-hazardous waste. The higher end of the BAT-AEL ranges may be associated with the use of dry sorbent injection. As an indication, the half-hourly average mercury emission levels will generally be < 15–40 µg/Nm3 for existing plants (Regulators' note - indicative limits only - not BAT-AELs)
Long-term sampling			1 - 10	Long-term sampling period	N/A	N/A		10	
1/2 hourly				1/2 hourly average	N/A	N/A			
Dioxins and Furans (PCDD/F) (ng ITEQ/Nm^3)									
Periodic	0.01-0.1	0.10	<0.01 - 0.04	Average over the	0.04	0.04	0.04	**0.04**	Either the BAT-AEL for PCDD/F or the BAT-AEL for PCDD/F + dioxin-like PCBs applies.

				sampling period					
Long-term sampling			<0.01 - 0.06	Long-term sampling period				**0.06 (unstable)**	The BAT-AEL does not apply if the emission levels are proven to be sufficiently stable. Link to Protocol
Dioxins and Furans (PCDD/F) & Dioxin like PCBs (ng WHOTEQ/Nm^3)									
Periodic			<0.01 - 0.06	Average over the sampling period				**0.06 (unstable)**	Either the BAT-AEL for PCDD/F or the BAT-AEL for PCDD/F + dioxin-like PCBs applies.
Long-term sampling			<0.01 - 0.08	Long-term sampling period				**0.08 (unstable)**	The BAT-AEL does not apply if the emission levels are proven to be sufficiently stable.
Smoke (Ringlemann)									
During start up								**Shade 1**	
Odour (Odour units OU_E)									
Backup odour abatement plant in use								**N/A**	No ELV set. Monitoring only. As required by Condition 3.2.14 / when the incinerator is shut-down – Emission Point A2

21 APPENDIX I – HUMAN HEALTH RISK ASSESSMENT (HHRA)

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NESS Energy from Waste (EfW) facility is to be located at East Tullos Industrial Estate, Aberdeen.

The areas surrounding the facility include suburban areas of Aberdeen such as Torry (including Tullos) to the north, Kincorth to the west, Nigg to the southwest and Ferryhill to the northwest. Within these study areas, five residential areas are identified as nearest to the proposed facility.

In response to SEPA's request the applicants carried out human health risk assessment of emissions of dioxins PCDDs/furans PCDFs, dioxin-like PCBs and soil depositions of cadmium (Cd), arsenic (As) and nickel (Ni) from the facility, using the US EPA HHRAP methodology and the associated IRAH model to predict risk of exposure.

The exposure and resultant risk to residential locations (within 3km of the 80 metres stack) at points of maximum concentrations has been reviewed by the current author.

Dioxins (PCDDs), furans (PCDFs) and dioxin-like PCBs (surrogates Aroclor 1016/1254)

Emission limit values for PCDD/Fs was calculated from the congener profile contained in the HMIP report and the value of 0.04ng I-TEQ m^{-3} falls within the new BAT-AELs range for dioxins. Considering that the profile was carried out before the introduction of strict emission limit value, the emission value of 0.04ng I-TEQ m^{-3} is not too low for a modern and cleaner EfW plant.

Assessment criteria for PCDD/Fs & dioxin-like PCBs

Whilst it is agreed that the UK COT TDI should be retained, the applicants made further comparisons with the WHO TDI exposure criteria of 1 pg I- TEQ kg-BW^{-1} d^{-1} and the EFSA TWI 2 pg I- TEQ kg-BW^{-1} d^{-1} for PCDD/Fs and dioxin-like PCBs assessment.

Cadmium (Group 1 metals)

The new BREF limit value for new plant is 0.02 mg Nm^{-3} for group 1 metals (cadmium and thallium). The assessment assumes Cd will be emitted from the from the facility at 50% of the BAT-AEL (i.e. 0.01 mg Nm^{-3}).

Arsenic and nickel (part of Group 3 metals)

For arsenic and nickel (part of group 3 metals), the operators have relied on the Environment Agency's assessment of group 3 metals and have based the assessment on emissions of arsenic to be 0.025 mg Nm^{-3} and nickel assumed at 0.055 mg Nm^{-3}.

Assessment criteria for Cd, As, Ni

The soil quality criteria, Cd 3mg kg^{-1}, As 50mg kg^{-1}, Ni 50mg kg^{-1} were used to assess the risk of soil depositions for these metals.

Air dispersion and deposition (Outputs of ADMS model / IRAP model)

The ADMS air dispersion model does not account for the effects of dry and wet depositions. The IRAP model is developed from the US EPA HHRAP methodology and uses the US EPA ISCST air dispersion model output

to account for the effect of deposition. The ISCT model is not used in the UK. The applicants have adjusted the outputs of the ADMS model to comply with the ISCST output files of the IRAP model.

The latest version of the ISCST model (i.e. ISCST3 model) and AERMOD are used in most situations to conduct air dispersion and deposition modelling, for use in a risk assessment. The IRAP Version 5.1.0 model used in the current assessment is updated with the ISCST3 model. The model adjustment is acceptable.

The IRAH model uses US EPA default values however site-specific data such as annual average precipitation, runoff, wind velocity, time period deposition of 30years, etc, have been taken into consideration by the applicants. Also, the default value of 15kg has been adjusted with 20kg for the weight of a child at residential locations. The adjusted values are acceptable.

Residential locations exposure to PCDD/Fs & dioxin like PCBs

Human receptors were selected based on the locations of maximum concentrations and deposition as identified by the IRAP model.

Figure 4.1 and table 4.1 identify the proximities of the study locations to the facility. Key residential locations include Torry (RT1, RT2) , Nigg (RN), Kincorth (RK1, RK2), and Ferryhill (RF1, RF2). It is noted that exposures at these locations are well below the assessment criteria, less than 0.1%. The contribution from the facility is insignificant and poses no risk to health.

Also, the contribution of the facility to total intake (i.e. the sum of incremental exposure and mean daily intake, MDI) exceeds the TDI (table 4.3, total intake as % of TDI). This is because the population background exposure, mean daily intake (MDI) already exceeds the TDI.

At the key residential locations at Torry (i.e. RT1 & RT2) adults at these locations are not exposed to releases from the facility whilst a child exposure is insignificant at less than 0.1% of the TDI.

Metal Concentrations in soil

The IRAP model was used to estimate the concentration of cadmium, arsenic and nickel in soil for each receptor. The results are compared to the Soil Quality Criteria; cadmium 3mg kg^{-1}, arsenic 50mg kg^{-1}, nickel 50mg kg^{-1}.

Exposure at key residential locations at Torry (RT1, RT2), Nigg (RN), Kincorth (RK1, RK2), and Ferryhill (RF1, RF2) identified in the location map, figure 4.1 of the report, are well below the metal criteria values suggesting no risk posed to health of people living at the locations.