

Earls Gate Energy Centre Limited Variation

Application Number PPC/A/1157446/VN02

Draft for Consultation

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1 NON TECHNICAL SUMMARY OF DETERMINATION

Earls Gate Energy Centre Ltd (EGEC) are building a Combined Heat and Power (CHP) plant based on a single line incinerator at Earls Gate Energy Park in Grangemouth, burning non-hazardous waste to provide steam and electricity for the existing users at the Earls Road Chemical complex and for adjacent new industrial users in Earls Gate Park. The scheme is designed so that 100% of steam generated will be consumed. Any surplus electricity not required by the users at the complex will be exported to the National Grid. An agreement reached with the National Grid Electricity Service Operator (ESO) requires the emergency provision of power at short notice, and this will now be provided by the CHP plant.

The proposals for energy recovery met the targets for energy recovery specified in SEPA's Thermal Treatment of Waste Guidelines at the time of Permitting.

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

The incineration line will burn non-hazardous refuse derived fuel (RDF). The RDF is manufactured from municipal and commercial and industrial waste from which recyclable material (plastic, metals, paper, card, glass etc.) have been removed prior to delivery to the site.

A Variation (VN01) to the PPC Permit was granted by SEPA, dated 30 May 2019 to make some minor changes to allow for the proposed phased commissioning of the back-up boilers and the CHP Plant; to remove a small area of land which is not within the EGEC lease boundary; and to change the auxiliary fuel in the CHP Plant to allow for the combustion of fuel oil for start-up and shutdown purposes.

EGEC Limited are now proposing a further Variation to the PPC Permit to allow for ten further changes. These are as follows:

1. Increasing the processing capacity of the CHP Plant from 236,500 tonnes per annum to 274,000 tonnes per annum and increase the instantaneous throughput from 31.8 tonnes per hour to 34.3 tonnes per hour.
2. Extending the potential hours for the delivery of waste to the Facility from those currently permitted from:
 - Monday to Friday (0800 hours to 1800 hours) and Saturday (0800 hours to 1200 hours);to the proposed hours of:
 - Monday to Friday (0700 hours to 2200 hours) and Saturday (0700 hours to 1700 hours).
3. The simultaneous operation of five back-up boilers and the CHP Plant.
4. Include an Air Quality Assessment (AQA) sensitivity analysis to support a revised location of the back-up boiler stack positioned in error during construction.
5. Include an AQA sensitivity analysis to support a revised location of the CHP Plant stack positioned in error during construction.
6. Include an AQA sensitivity analysis to support a revised location of the Odour stack that has been repositioned through the design optimisation process.

7. Optimise (ie correct) the effluent composition from the Facility to include the gas fired back-up boilers and associated plant complete with an updated H1 analysis.
8. Adjust the effluent peak and average discharge capacities from the currently defined “no steam export” capacity to allow for the maximum discharge arrangements associated with the maximum steam export to the Earls Gate Park development. This will also include for amendments to the emission limits for emissions to water to align with the design of the water treatment systems and lead to an increase of 110 m³/day in the quantity of effluent discharged from the Facility.
9. Exclude limits on the volume of rainwater run-off from the Facility.
10. Additional layout changes due to the final optimisation of the Facility.

The proposed increase in the permitted capacity of the CHP Plant is to reflect the maximum capacity of the proposed design of the Facility, to allow for a wider range of calorific value waste fuels, based on what the design of the final moving grate selected can process.

The proposed extension in delivery hours is to allow for a smoother frequency of delivery rates for waste to the CHP Plant, improved traffic flows, and to minimise the potential for queueing. The control of noise and odour during the extended opening hours will be managed in the same manner as described in the original Permit application. To summarise, the facility has been designed so that noisy equipment (air-cooled condenser, the turbine hall and emergency generator) are situated away from the site boundary and the nearby Sensitive Receptors. The majority of the process excluding the package boilers is also located inside process buildings and Steam vents required to protect the boiler from over-pressurisation have silencers fitted to minimise the noise associated with venting.

The proposed simultaneous operation of five back-up boilers and the CHP plant is to allow for EGEN to deliver its obligations under their Capacity Market Agreement if there is a System Stress Event declared by the National Grid as the ESO during a period where there is a national shortage of generation capacity.

The proposed changes regarding revised positions of the stacks, effluent discharge rates and compositions are necessary to enable the PPC permit to reflect the final design of the Facility and represent a worst-case operating scenario for discharges of wastewater from the water treatment and effluent from the back-up boilers.

The changes proposed to the PPC permit as set out within the Variation application are not expected to have a significant impact on human health and the environment.

Glossary of terms

APCr - Air Pollution Control residues
 AQA – Air Quality Assessment
 AQAL – Air Quality Assessment Level
 BAT - Best Available Techniques
 BATC - BAT Conclusions
 BREF - BAT Reference Document
 CHP - Combined Heat and Power
 CO - Coordinating Officer
 ECHA – European Chemicals Agency
 EGEN - Earls Gate Energy Centre limited
 ELV - Emission Limit Value
 ESO - Electricity Service Operator
 EQS – Environmental Quality Standard

IBA - Incinerator Bottom Ash
 IED - Industrial Emissions Directive
 MAC – Maximum Allowable Concentration
 MCR – Maximum Continuous Rating
 NGENSO – National Grid ESO
 PEC – Predicted Environmental Concentration
 PPC 2012 - The Pollution Prevention and Control (Scotland) Regulations, 2012
 RDF - Refuse Derived Fuel
 REACH – Registration, Evaluation, Authorisation and Restriction of Chemicals Regulations
 SU – Start Up
 SD – Shut Down
 TOC - Total Organic Carbon
 TTWG SEPA Thermal Treatment of Waste Guidelines
 WQA – Water Quality Assessment

2 EXTERNAL CONSULTATION AND SEPA'S RESPONSE

Is Public Consultation Required - Yes

<i>Advertisements Check:</i>	<i>Date</i>	<i>Compliance with advertising requirements</i>
Edinburgh Gazette Number 28358	01 July 2020	Yes
Falkirk Herald	03 July 2020	Yes

Officer checking advert:

No. of responses received: None.

Summary of responses and how they were taken into account during the determination:
 Not applicable.

Summary of responses withheld from the public register on request and how they were taken into account during the determination:
 Not applicable.

Is PPC Statutory Consultation Required – Yes

Food Standards Agency: Sent 09 June 2020.
 No response received

Health Board (Forth Valley): Sent 09 June 2020
 No response received

Local Auth (Falkirk Council): Sent 09 June 2020
 No response received

Scottish Water: Not required – no discharge to the SW systems

Health and Safety Executive: Not required – non COMAH site

Scottish Natural Heritage (PPC Regs consultation): Sent 09 June 2020

Response received 02 July 2020.

The consultee stated: *The application is general doesn't have any site specific information. It isn't clear if there is an anticipated impact on the SSSIs which have been screened in by distance. As well as the distance screening, we would also expect screening for CLs at the sites, including deposition and background levels, and individual site exceedance rates.*

If there's only a small change from the original permission and you are content and agree with the conclusions, then we have no comments. We are satisfied that SEPA will identify any other impacts upon the natural heritage and address them without further reference to us. However, if subsequent assessment shows a likely significant effect on any SAC or SPA or likely damage to the natural features of any SSSI, we trust you will consult with us as required by conservation statute.

SEPA ecology was consulted. See section 4.5.2, and confirmed no significant effect likely.

Discretionary Consultation - Yes

Sent 09 June 2020 to Grangemouth Community Council.
No response received.

Enhanced SEPA public consultation

'Off-site' Consultation – Not required

Transboundary Consultation – Not required

Public Participation Consultation -

STATEMENT ON THE PUBLIC PARTICIPATION PROCESS

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

Date draft determination placed on SEPA's Website

29/07/2021

Details of any other 'appropriate means' used to advertise the draft.

Date public consultation on draft permit opened

29/07/2021

Date public consultation on draft permit consultation closed

Number of representations received to the consultation

Date final determination placed on the SEPA's Website

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

3 ADMINISTRATIVE DETERMINATIONS

Determination of the Schedule 1 activity

No changes to the main PPC Part A activities were proposed, ie:

- Section 5.1(b) activity (non hazardous waste incineration)
- Section 1.1 activity (combustion above 50MW).

Determination of the stationary technical unit to be permitted:

The following changes were proposed, which require the Permit STU Conditions (descriptions) to be amended:

- 1.1.4b) – an increase to throughput due to the final technical design of the grate, allowing a greater range of waste calorific values to be incinerated.
- 1.1.4j) – a potentially significant increase in the discharge from additional sources of effluent, after identifying discharges that had been missed off the original permit application and due to a change in the potential operational aspects regarding the simultaneous operation of up to 5 Back up boilers from 2, and which increase the maximum potential effluent volumes and flow rates and water treatment chemicals etc.
- 1.1.4k) – a change to potential use of boilers in additional circumstances including for electrical power supply to the NGESO during a System Stress Event.

The above have been amended in the proposed Variation.

Determination of directly associated activities:

The addition of (a) export of electricity and (b) standby electrical generation, were included in the application as DAAs, however, these are not considered by SEPA to be DAAs. (a) has no direct effect on pollution, and (b) is considered to already be included. They have therefore not been added into the proposed variation.

DAAs include all other activities carried on at the site that have a technical connection and could have an effect on pollution. See section 4.3 below for further information.

Determination of ‘site boundary’

No changes

Officer:

4 INTRODUCTION AND BACKGROUND

4.1 Historical Background to the activity and variation

The Earls Gate Energy Centre Pollution Prevention Control Permit (PPC permit) (Number PPC/A/1157446) was granted by SEPA to the Earls Gate Energy Centre Limited (EGEC) on 7 March 2018.

The site is located in Grangemouth, within the Falkirk Council local authority area, and is located approximately 1.4km west of Grangemouth Town Centre. It will be located on part of the existing Calachem manufacturing site, a Brownfield area.

The Facility consists of a CHP plant, which is currently permitted to combust 236,500 tonnes per annum of waste fuels, and five back-up boilers which are fired on natural gas. This will replace the existing combustion equipment used to generate steam for the adjacent chemical complex, and meet steam use for new/future users at the site. Surplus energy may be exported to the National Grid.

The Facility will export heat and power to the Earls Gate Park development.

The back-up boilers are to provide supplementary heat for export either when the CHP plant is not available or, when there are peaks in the heat demand from the Earls Gate Park development, they will provide supplementary heat to fulfil the heat demands.

A Variation (VN01) to the PPC Permit was granted by SEPA, dated 30 May 2019 to make some minor changes to allow for the proposed phased commissioning of the back-up boilers and the CHP Plant; to remove a small area of land which is not within the EGENC lease boundary; and to change the auxiliary fuel in the CHP Plant to allow for the combustion of fuel oil for start-up and shutdown purposes.

EGEC are now proposing a further Variation to the PPC Permit to allow for ten further changes. (See section 4.3 below). Prior to submission of the application, EGENC was advised by SEPA that the application will be classified as a Substantial Variation and will be therefore subject to PPD requirements.

4.2 Description of activity

The plant falls under Chapter IV of IED for the incineration of waste, and the following activities in Schedule 1 of the Pollution Prevention and Control (Scotland) Regulations, or "PPC 2012".

- For the incineration line in Part A of Section 5.1 paragraph (b) of Chapter 5 in Schedule 1 to the Regulations as incineration of non-hazardous waste in an incineration or co-incineration plant; and
- For the package boilers, the combustion of natural gas to produce steam as described in Part A Section 1.1 of Chapter 1 of Part 1 of Schedule 1 to the Regulations, as burning any fuel in a boiler or furnace with a rated thermal input of 50 megawatts or more.

4.3 Outline details of the Variation applied for

EGEC Limited are now proposing a further Variation to the PPC Permit to allow for ten additional changes. These are as follows:

1. Increasing the processing capacity of the CHP Plant from 236,500 tonnes per annum to 274,000 tonnes per annum and increase the instantaneous throughput from 31.8 tonnes per hour to 34.3 tonnes per hour.

The proposed increase in the permitted potential capacity of the CHP Plant is to reflect the maximum capacity of the final design of the Facility to allow for the full range of calorific value waste fuels which the boiler has been designed to process.

This is covered in more detail in Section 5.2.1 below.

2. Extending the potential hours for the delivery of waste to the Facility from those currently permitted.

Propose to change from:

- Monday to Friday (0800 hours to 1800 hours) and Saturday (0800 hours to 1200 hours);

to the proposed hours of:

- Monday to Friday (0700 hours to 2200 hours) and Saturday (0700 hours to 1700 hours).

The proposed extension in delivery hours is required to allow for a 'normalised and smoother frequency of delivery rates' for waste to the CHP Plant, improved traffic flows within the Facility, and to minimise the potential for queueing within the Facility.

This is covered in more detail in Sections 5.7 on Odour and 5.17 on Noise below.

3. The simultaneous operation of five back-up boilers and the CHP Plant.

The proposed simultaneous operation of five back-up boilers and the CHP plant is to allow for EGEN to deliver its obligations under their Capacity Market Agreement if there is a System Stress Event declared by the National Grid ESO. This is triggered by a national shortage of generation resources.

The applicant also indicated that the supply of standby electrical generation and the export of electricity should additionally be described in the Permit as Directly Associated Activities (DAA). DAAs include all other activities carried on at the site that have a technical connection and could have an effect on pollution. The activities listed in the application have not been included onto the Permit because: (a) the export of electricity itself does not give rise to pollution and is not an additional production stage in the activity process; and (b) the provision of the standby electrical generation does not differ in description to the existing permit activities, and under 1.1.4c, so was also not considered to be a DAA.

This simultaneous operation of up to five boilers is covered in more detail in Sections 4.5 on receptors, 5.2 on point source emissions to air, 5.3 on point source emissions to the water environment, 5.8 on Management, 5.9 on raw materials, 5.12 Water use, 5.13 waste handling and 5.18 on Monitoring, below.

4. Include an AQA sensitivity analysis to support a revised location of the back-up boiler stack positioned in error during construction.

This is covered in more detail in Sections 5.2.2 below.

5. Include an AQA sensitivity analysis to support a revised location of the CHP Plant stack positioned in error during construction.

This is covered in more detail in Sections 5.2.2 below

6. Include an AQA sensitivity analysis to support a revised location of the Odour treatment stack that has been repositioned through the design optimisation process.

The actual stack remains in the same NGR location, however, it is 0.1m higher than proposed originally, aiding dispersion slightly. This is covered in more detail in Section 5.7 below.

7. Optimise the effluent composition from the Facility to include the gas fired back-up boilers and associated balance of plant, complete with an updated H1 analysis.

Effluent streams not previously accounted for have been described and detailed, along with re-use where possible. The remaining discharge volumes and pollutants have been assessed for potential impact on the water environment. This is covered in more detail in Section 5.3 below

8. Adjust the effluent peak and average discharge capacities from the currently defined “no steam export” capacity to allow for the maximum discharge arrangements associated with the maximum steam export to the Earls Gate Park development. This will also include for amendments to the emission limits for emissions to water to align with the design of the water treatment systems and lead to an increase of 110 m³ /day in the quantity of effluent discharged from the Facility.

As for No 7 above. This is covered in more detail in Section 5.3 below

9. Exclude limits on the volume of rainwater run-off from the Facility.

The volume of run-off from the lower risk areas of the site does not require additional control. It comprises of surplus clean surface water run-off from roofs and hard-standing, which is not already used in the rainwater water harvesting. These surface water arisings are collected in a below ground drainage attenuation tank that can take 400m³ from where it will be discharged.

The volume is restricted by the surface water pumping station, which can be isolated in the event of any spillage etc. It is possible to sample this discharge separately should the need arise.

The discharge and sample point details are provided in the proposed amended Permit Table 7.1 – see also section 5.3 below, and are located on the updated Site Plan in Permit condition 1.2.

10. Additional layout changes due to optimisation of the Facility

The minor modifications to layout are covered in more detail in Section 5.2.3 on point source emissions to air, Section 5.7 on odour and Section 5.17 on Noise below.

The proposed changes regarding revised positions of the stacks, effluent discharge rates and compositions are necessary to enable the PPC permit to reflect the changes and optimisation aspects of the final design of the Facility. These also represent a worst-case operating scenario for discharges of wastewater from the water treatment plant, and effluent from the back-up boilers. The variation was requested in order to tie the PPC permit in more closely with the final design of the Facility.

The changes proposed to the PPC permit by the applicant, as set out within this variation application are not expected to have a significant impact on human health and the environment.

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

None

4.5 Identification of important and sensitive receptors

4.5.1 Human health receptors and air quality management area

The installation is located in Grangemouth, with a population of around 18,500. The most sensitive residential receptor locations, bearing in mind the prevailing south westerly wind direction, are considered to be;

- (i) Wood Street and streets further south (south of the site).
- (ii) Grangemouth Town Centre (south, east and north east of site)
- (iii) Grangemouth Auld Town (north and north west of the site)

The nearest residential receptors are located approximately 300 metres to the south and south east of the installation boundary on Wood Street [as detailed in original application] and streets further to the south. A total of 23 sensitive human health receptors were assessed in the initial air quality assessment, human health risk assessment (HHRA) noise and odour impact assessments.

The proposed facility is located within the Grangemouth Air Quality Management Area (AQMA) which has been specified due to a likely breach of the sulphur dioxide (SO₂) 15 minute mean objective, as specified in the Air Quality (Scotland) Regulations 2000. This is considered to be due to emissions from the nearby Petrochemical complex in Grangemouth. An action plan, aimed at achieving a reduction in SO₂ levels within the designated area is currently in place. The local air quality management (LAQM) Annual Progress Report for 2016 from Falkirk Council stated that the SO₂ objective had not been breached for three consecutive years. However, Falkirk Council consider the AQMA remains justified based on the 2014 monitoring results.

Certain pollutants can impact on human health through inhalation, whilst some can also accumulate in the environment, and have other exposure routes, such as ingestion, that can also impact on human health. The main chemicals of potential concern (COPCs), include polyaromatic hydrocarbons (PAHs), dioxins and furans, (PCDD/Fs), benzene, and various heavy metals. The simultaneous operation of five gas boilers and the CHP Plant was not considered in the original AQA. The models have been re-run to consider the maximum impact from these new scenarios. The results were analysed for oxides of nitrogen and carbon monoxide. This does not include the above COPCs, and further assessment is not therefore required for human health aspects.

4.5.2 Special protection Areas, Sites of Special Scientific Interest, and RAMSAR designated sites.

The EGEN facility is situated on the other side of the railway immediately to the north of the Jupiter Wildlife Centre which is managed by Scottish Wildlife Trust.

There are several designated ecological receptors within 15 Km of the proposed facility. The closest of these is the Firth of Forth RAMSAR, Special Protection Area (SPA) and Special Site of Scientific Interest (SSSI) which runs along both sides of the River Forth and is approximately 1.5 Km at the closest point.

SEPA Ecology indicated that a habitats assessment was not necessary due to the insignificance of the change in comparison with the original dispersion modelling.

The AQAL is 40 ug NO_x/m³ annual mean NO_x, set for human health. The 1.3% increase is at the maximum are of ground concentration, and close to the stack. Given that the original dispersion modelling was for continuous operation at the Maximum Continuous Rating (MCR), which equates to a throughput of around 300,000 tpa (as stated in section 3.1, page 76 of the document), and that the actual throughput has increased from 216,000 tpa to 274,000kpa, the conclusions of the original assessment still stand. (See also Section 5.2.1 below).

The revised stack locations have moved by 1 metre and 0.59 metre which will have little impact on the process contributions at the distance from the stack to the nearest ecological receptor (i.e. Firth of Forth).

The proposed revision to condition 10.2.1 suggested by the applicant is:

When the CHP Plant is operational, no more than two back-up boilers may be operated at any one time unless either of the following scenarios occur:

- *there is a System Stress Event, in which case up to five back- up boilers and the CHP Plant may be operated simultaneously; or*
- *the CHP Plant is transitioning from either start-up or shutdown, in which case up to five back-up boilers and the waste incineration line may be operated simultaneously.*

These two scenarios are occasional short-lived events, and are unlikely to have a significant impact on the level of impact at the ecological receptors, given that the model predictions run for CHP and all 5 boilers operating simultaneously would only result in a very small increase in the annual mean at the maximum impact point. The wording of Condition 10.2.1 is slightly different to the above proposed by the applicant, but essentially allows the same operational conditions as above.

5 KEY ENVIRONMENTAL ISSUES

5.1 Summary of significant environmental impacts

The process utilises a standard moving grate technology to burn non-hazardous waste, using Refuse Derived Fuels (RDF). The increase in the throughput capacity of the waste will increase the overall mass air emissions over time, however Emission Limit Values (ELVs) will continue to be met through management techniques and abatement technology, selected in line with BAT.

The package boilers used to provide back up energy (referred to as Back up Boilers or BuBs) could also be called on when required by the National Grid, triggered by a national shortage of generation resources, and therefore total mass air and potentially water emissions could increase during such periods. Amendments to the volume of process water to be discharged have also been identified, which may increase the overall pollutant loads of the emission discharges. Other key potential impacts such as fugitive emissions (including odour and noise) are discussed in more detail below.

5.2 Implications of the Variation on - Point Sources to Air

There are key areas that will impact on the Point Source emissions to air. This first of these is the increase in capacity, and the second is the potential to operate all 5 BuBs at the same time, rather than the 2 BuBs currently allowed. In addition, several minor changes to locations and layout have been considered and a sensitivity check of these changes has been undertaken.

5.2.1 Increased capacity

The applicant has applied to increase the processing capacity of the CHP Plant from 236,500 tonnes per annum to 274,000 tonnes per annum, and this will mean a corresponding increase in the instantaneous throughput from 31.8 tonnes per hour to 34.3 tonnes per hour. Further information is given in Section 2 of the Supporting Information document and Appendix A (Firing Diagram) submitted with the variation.

Initially, the design capacity, was based on:

1. processing capacity of the nominal design fuel = 27 tonnes per hour;
2. assumed maximum availability = 8,760 hours per annum; and
3. the nominal design of the waste = **10 MJ/kg** Net Calorific Value (NCV).

This gave a theoretical maximum Permitted Capacity = 27 tonnes per hour x 8,760 hours availability = **236,520** tonnes per annum (not accounting for maintenance periods)

Now that the technology provider has provided the detailed design, it is apparent that the proposed final boiler design allows for a wider range of calorific value waste fuels to be processed within the Facility than was presented in the original PPC application.

Although based on the same thermal capacity, the lower end of the range is now extended to enable incineration of wastes with an NCV of between **7 MJ/kg** and 14 MJ/kg. This means that lower NCV fuels can be burned at a higher throughput of 34.3 tonnes/hr (subsequently confirmed as **34,223 tonnes** in Schedule 7 response), whilst still achieving the same thermal output.

34,223 tonnes per hour x 8,760 hours availability = **299,793** tonnes per annum.

This theoretical maximum, (point 6 on the Firing Diagram – see Appendix A of the Supporting Information Report) is based on a continuous operation over 8,760 hours (a year) and then adjusted to consider normal maintenance periods, reducing to 8,000 hours/annum, therefore the modelling is considered to be conservative. Substituting the reduced hours into the calculation, (with the NCV at 7MJ/kg), gives **273,783 tonnes** per annum as a potential maximum waste throughput, and is the basis of the Variation request (rounded up to **274,000 tonnes**).

The average NCV of the waste being incinerated is likely to be higher than this minimum NCV assumption, as the waste will be mixed, and this would also likely reduce the actual throughput tonnage that would be incinerated in any given year from the maximum.

The design point of the system is set to optimise the heat/steam production. Regardless of the incoming NCV, the process control systems adjust to provide waste at an appropriate feed rate to meet the design point, at the MCR, with a normal fluctuation around 1% of the MCR. The system can operate at an overloaded waste throughput for short fluctuations.

The original dispersion modelling was conservatively based on operating continuously at the MCR with an average NCV of 10MJ/kg which equated to an annual throughput of 274,000 tpa. This effectively does not change, and only the range of waste calorific values is extended, therefore, the

results presented in the original AQA remain valid. The higher the NCV of the waste, the less waste is fed, to try to keep to the design set point.

The updated Firing diagram shows the potential for fluctuating around this set control point due to process conditions, which is a normal aspect of the incineration process. Whilst a plant could theoretically become overloaded for short duration fluctuations, it would not be good practice to continuously operate at these conditions, and plant guarantees are based on operating around the design set point and at MCR.

Where the throughput of waste increases, the actual gas volume may increase, along with the velocity of the release, as the stack diameter does not change. This increased velocity aids dispersion as the 'effective release point' is higher.

In addition to the emissions changes, raw material consumption could potentially increase. This is discussed further in Section 5.9 below. Additional waste residues are also discussed in Sections 5.13/5.14 below.

The impact on heat and power is discussed in section 5.15 on energy.

The relevant Conditions of the Permit have been amended to allow for the higher throughput of up to 274,000 tonnes per annum, and with an hourly throughput rate of up to 34.223 tonnes.

The proposed change is acceptable and will have no significant impact on the air quality, or on sensitive human and ecological receptors. Amendments to the Permit regarding capacity tonnage in Permit Conditions 1.1.4b) are required to reflect this change.

5.2.2 Simultaneous CHP plant and Boiler operations (Capacity Market Requirements)

The EGEC facility is subject to a Capacity Market Agreement which means that it is contracted to supply up to 18.83 MW of electrical export when instructed to by National Grid as part of a 'System Stress Event', triggered by a national shortage of generation resources.

In order to ensure that the Earls Gate Park customers still receive energy, in the event of a System Stress Event occurring, EGEC may be required to operate in parallel both the CHP Plant and as many as all 5 of the gas fired BuBs simultaneously to satisfy both the power requirements of National Grid and the heat demand requirements of Earls Gate Park.

System stress events occur when the National Grid (NG) requires additional power due to a shortage of supply that can occur across their systems often at short notice. NG issue a Capacity Market Notice to participants in the scheme who must provide power to the grid within 4 hours.

The last Capacity Market event was in 2014, and two additional notices issued since were subsequently cancelled as the network responded. It is not currently a common event, although it may become more common in time due to changes to renewable power resources in Scotland. In general it is estimated that such events generally last less than 3 hours.

When the CHP Plant or the BuBs are starting up (SU) or shutting down (SD), both will be operational in some way until stable conditions are reached, and the duration of this simultaneous operation could be up to around 16 hours. At present only 2 boilers can be operated at any one time (Permit Condition 10.2.1), and EGEC would want to be able to operate as many as all 5 BuBs in a System Stress event if such an event coincided with peak demand from the Earls Gate Park. This would only be during a system stress event, or during a SU/SD transition of the CHP plant. These events would be recorded and reported.

Under the Capacity Market agreement, during a stress event, steam export cannot be maintained from the CHP at the required level if this coincided with a peak demand from the local heat users.

The BuBs may therefore be required, and it may be that in order to satisfy both the local heat users and the NG requirements, as many as all 5 of the BuBs may need to come into use. This specific point was queried in the Schedule 7 Notice and the response provided in the report dated 27 October 2020.

To support this Variation request, an update to the AQA of the potential impact was provided, as the original permit application had only considered 2 BuBs operating at the same time as the CHP Plant, or the 5 BuBs operating alone, without the CHP operating. This revised AQA focused only on the commonly occurring pollutants, i.e. oxides of nitrogen and carbon monoxide produced by the BuBs, as there would be no change to other pollutant emissions produced only from the CHP Plant.

Table 1 – Air Quality Impact Analysis (extract of table 3 from variation application - updated AQA document)

Pollutant	Averaging period	AQAL	Original PPC Application	5 gas boilers and CHP Plant	Difference
Nitrogen dioxide	Annual mean	40	4.81%	6.11%	1.30%
	99.79th%ile of hourly means	200	3.91%	7.44%	3.53%
Carbon monoxide	8 hour running mean	10000	0.06%	0.11%	0.05%

The Nitrogen dioxide annual mean did not immediately screen out, (see above) and further analysis was required. This concluded that the change in the total Predicted Environmental Concentration (PEC) would be marginal, increasing from 75% to 76% of the Air Quality Assessment Level (AQAL) and this would be considered insignificant. The background Nitrogen dioxide annual mean already forms 70% of the AQAL.

Condition 10.2.1 has been replaced to allow for up to five boilers to operate during system stress events, and during transition from Start up or Shut down. Updated and additional recording and reporting requirements are now in Conditions 10.2.2, 10.2.3 and 10.2.4 to capture these events.

As there would be no exceedance of the AQALs, even under the worst case scenario of all 5 BuBs operating, (which would be infrequent), and no significant impact on sensitive receptors, this is considered to be consistent with BAT.

5.2.3 Layout changes

During construction, the CHP stack and the BuB stack were not installed in the exact point that the modelling had used. A sensitivity analysis provided with the Supporting information AQA concluded that the minor change had no impact on the conclusions of the original AQA.

The AQA sensitivity analysis taking into account the above changes showed that the differences were minimal and did not change the overall conclusions. (see Table 2 below)

Table 2 – Air Quality Impact Analysis (extract of table 5 from variation application updated AQA document).

Pollutant	Averaging period	AQAL	5 gas boilers and CHP Plant	5 gas boilers and CHP Plant – Updated stack locations	Difference
Nitrogen dioxide	Annual mean	40	6.11%	6.07%	0.04%
	99.79th%ile of hourly means	200	7.44%	6.46%	0.98%
Carbon monoxide	8 hour running mean	10,000	0.11%	0.11%	0.00%

A cumulative impact with the Celtic Renewables demonstration plant and the Forsa Gas Peaking plant (2 nearby schemes which also have planning permission), has also been undertaken, (see Section 3.4 and Table 6 of the AQA document submitted with the Variation application). It was confirmed that the total cumulative concentrations remain below the relevant AQALs in the area.

5.2.4 Summary

The changes to air quality were not considered to be significant, and the AQALs are met. A habitats assessment was not necessary, due to the insignificance of the changes and the short term nature of the potential additional emissions. The impact on Human Health was also negligible, as the potential additional pollutants emitted during these short term events (Carbon monoxide and Nitrogen dioxide) are not considered to be Chemicals of Potential Concern (COPCs). See Section 4.5.1 and 4.5.2 above also.

5.3 Implications of the Variation on - Point Source Emissions to Surface Water and Sewer

There will be an increase in the volume of effluent discharged from the activity processes, as described below. The Facility will generate various effluent streams, and the PPC permit already includes conditions on the effluent discharged from the water treatment plant for the incineration plant, as per the original application.

All discharges from the process, along with the uncontaminated surface water discharges from the Facility and domestic effluent, discharge into the Calachem “weak effluent” (Calachem WS) stream drainage system at the adjacent Calachem chemical manufacturing facility, permit Number PPC/A/1008834, and from there the ultimate discharge is into the tidal waters of the Firth of Forth (middle estuary).

Additional design work on the EGEC Facility after Permitting, identified that certain heat/steam export scenarios in the process and the treatment of additional incoming water were not identified within the original PPC application, and these will result in increases in the overall volumes of effluent generated by the water treatment plant. In addition to this, effluent generated by the operation of the Back-up Boilers (BuBs) had not been identified in the overall calculations either.

The currently Permitted volume of effluent does not reflect that in the original determination (Schedule 4 Further Information Notice Response dated 17th November 2017), the volumes did not include any allowance for excess surface water run-off, although the description does include the surface water run-off, therefore effectively limiting the amount of process water allowed during excessively wet periods. EGEC cannot comply with the flow rate stated on the permit when surface

runoff is discharging. This was not realised during the Operator Review of the original Permit during determination.

The proposed changes to the effluent discharge arrangements are detailed within section 5 of the Supporting Information document submitted with this Variation application, along with the initial Water Quality Assessment in Appendix D of the document. This considered the impact on water quality associated with the discharge of effluent from the Facility, and further updates on the water quality impacts from the Facility following receipt of a Schedule 7 Request from SEPA for further information.

The applicant has proposed the following arrangements for the discharge of process effluents separating out the sources of the effluents, with the following release points:

1. CHP Plant (W1);
2. Back-up Boilers (BuBs) (W2);
3. Uncontaminated excess surface water run-off (W3); and
4. Domestic effluents (W4).

The applicant has also requested that limits on the volumes of effluent which can be discharged from the Facility are applied only to discharges W1 and W2. This is accepted due to the low volume of Domestic effluent into the system, and the uncontaminated surface water run-off volumes are outwith the control of the Operator, however, the instantaneous volume is controlled by the surface water pump capacity, and the pump can be isolated remotely.

A revised emission point drawing showing each of the above discharges, as well as the existing emission points, was provided in Appendix B of the clarification document received 12 July 2021 by SEPA, and has been used in the updated Permit Variation, replacing the previous site plan.

For the purposes of the assessment, the following information was used for the receiving waters:

1. The location of the release point into the Forth Estuary (coastal waters) is more than 50m off-shore;
2. The release point into the Forth Estuary is between 3 and 7m depth below the sea level depending on the height of the tide; and
3. The grid reference for the discharge point into the Forth Estuary is NS 94430 84250.

The volumes of discharge provided in the current Permit only relate to the discharge of process effluents from the Reverse Osmosis (RO) plant (demineralisation) (without the effluent from the BuBs or water softening), and also did not include volumetric allowances for domestic effluent or excess surface water run-off, (which would normally be subject to regulation under the Controlled Activities Regulations (CAR)).

The volume and flow rate of trade effluent generated from the CHP plant, will fluctuate significantly, dependant on the steam demands from the processes within the Earls Gate Park development. As this is not controlled by EGEC, the applicant has requested a limit on the flow rate and the associated monitoring requirements based on the maximum and worst-case effluent discharge, thereby allowing for variations in heat demand.

There are 3 different operational scenarios identified with “worst-case volumes” of effluent that could be released from the Facility. These are as follows:

- Scenario 1 – CHP plant only;
- Scenario 2 – Five BuBs operating simultaneously; and
- Scenario 3 – CHP Plant and 5 Back-up boilers operating in parallel.

The CHP plant discharge via W1 is the reject effluent from the CHP plant's two-stage softening and demineralisation water treatment plant, which provides boiler water for the CHP plant. (The volume from the softening treatment for BuBs was not previously accounted for in the original permit application). The potable water supply is treated in the RO plant, and the reject stream discharged at W1. The more highly contaminated waste water arisings from the CHP plant process including the blow down effluent, are re-used in the ash quench system (as described in the original permit decision document).

The BuBs discharge, via W2, will include blow down water from the boilers, which could have acids, alkalis and salts present, and condensate from the BuB final heat exchanger (economiser). Some of the blow down water and condensate can be recycled within the CHP plant process (ash quench) whenever that is online. When the CHP plant is offline, all of the BuBs effluent needs to be discharged. As not all of this appears to be reused or recycled, the Variation will have an upgrade condition (7.7.1) to revisit this aspect so see what else can be done to minimise water use and effluent generation.

Reject water from water treatment for the BuBs feedwater, was missed from the original PPC application, and will also discharge to W2 initially. The BuBs feedwater does not require demineralisation, although it will pass through the same water softener as the feedwater for the CHP Plant. The BuBs will export steam, and the volumes of reject effluent from the water softening process will fluctuate dependant on and proportional to the steam demand from the Earls Gate Park development.

The flue gases from the combustion of natural gas within the BuBs pass through a series of heat exchangers, which will recover heat for export as steam to the Earls Gate Park development. As the flue gases pass through the final heat exchanger, condensate collects, which will be drained and will discharge via W2. Some of this effluent can also be recycled within the CHP plant process when operating and this will also be reviewed under the upgrade condition (see above).

Additionally, the 2 main processes generating the bulk of trade effluent (i.e.: the CHP plant and the BUBs) will have different commissioning periods, flow regimes and compounds, and require separate limits and sampling. This will provide information for mass emissions as required by the permit also.

The applicant has proposed a new maximum combined potential discharge of 495 m³ /day, to allow for the simultaneous operation of the CHP plant and all five BuBs:

- CHP Plant – 300 m³ /day; and
- BuBs - 195 m³ /day.

The original permit application, (Schedule 4 Response - dated 17 November 2017), stated that the maximum daily average discharge would be 385 m³ /day of process effluent. The new total discharge would be an increase of up to 110 m³ /day.

The proposed average daily discharge information from the different operational scenarios is provided in the Variation Application supporting document.

Table 3 – effluent flow rates under different scenarios (extract copy of Tables 8, 9 and 10 from the supporting document submitted with the variation application).

Table 8: Scenario 1 – CHP Only

Effluent	Daily Average Effluent Flow rate (m ³ /s)
Reject effluent from demineralisation	0.003254
Reject effluent from water softener	0.000230
Total effluent volumes	0.003484

Table 9: Scenario 2 - Five Back-up boilers

Effluent	Daily Average Effluent Flow rate (m ³ /s)
Back-up boiler economiser condensate	0.001034
Back-up boiler Blowdown	0.001025
Reject from softener	0.000201
Total effluent volumes	0.002260

Table 10: Scenario 3 - CHP and five Back-up boilers

Effluent	Daily Average Effluent Flow rate (m ³ /s)
Back-up boiler economiser condensate	0.000952
Back-up boiler Blowdown	0.000915
Reject from softener	0.000201
Reject from demineralisation	0.000074
Total effluent volumes	0.002142

1: As the CHP plant will not be exporting steam to the Earls Gate Park development in this scenario, the volumes of reject from demineralisation will be significantly reduced compared to Scenario 1.

In the above tables, Scenario 3 uses less than the sum of Scenarios 1 and 2 combined. This is due to effluent re-use identified within the CHP plant.

The Supporting Information and the Water Quality Assessment (WQA) supplied with the Variation application used the H1 Assessment tool. Following a review of the submission, further Information was requested via a Schedule 7 Notice, because there was evidence that Lead and Mercury EQS for Marine waters were already being exceeded; the WQA showed these additional discharges as 'insignificant' however, it could not be concluded that this was correct; some information was missing in the electronic files (possibly corrupt data); correct EQSs for a Marine environment had not been used; and further information on the surface water and domestic discharges was also required. The response to the Schedule 7 questions included a revised WQA, as Appendix D.

In the revised WQA, following H1 methodology, Test 1, using the pollutants that had an EQS, (based on the SEPA Guidance document 'Supporting Guidance (WAT-SG-53) Environmental Quality Standards and Standards for Discharges to Surface Waters', dated September 2019), concluded that several pollutants could not be screened as 'insignificant', as the release concentration was above the EQS. The following pollutants were identified as requiring further assessment:

- Boron;
- Chloride;
- Copper;
- Lead;
- Cadmium;
- Chromium III;
- Cyanide;
- Mercury;
- Nickel;
- Zinc.
- Sulphate;

H1 - Test 2 indicated that all of the above pollutants screened out in the second stage.

On 07 December 2020, following a review of the revised WQA (Appendix D) submitted in response to the Schedule 7 Notice, it was noted that the negative values for the Effluent Volume Flows for lead and mercury are due to the measured background concentration exceeding the EQS, and therefore cannot be considered “insignificant”.

A quick assessment of Initial Dilution (ID, which occurs between the effluent leaving the outfall and reaching the surface) and Secondary Mixing (between the surface boil and the edge of the mixing zone (MZE), assuming the water depth to be 3m and the discharge rate 3.47l/s), leads to an ID of just below 50x as a 95%ile. The average dilution at the MZE is likely to be around 400x, depending on the ambient currents.

Based on discharging effluent 385 (=500/1.3) times the Lead EQS concentration, the lead component of the discharge would likely be compliant in that the concentration would drop below the 1.3ug/l threshold by the MZE, assuming zero background. However, the background concentration already exceeds the EQS.

For mercury, only 4x dilution is required for the mercury concentration to drop below the Maximum Allowable Concentration (MAC) Environmental Quality Standard (EQS) of 0.07ug/l. This will quickly be achieved within the plume.

An inconsistency in the revised WQA calculations was also noticed. Lead was indicated in the Supporting Information to be a potential contaminant originating from the BuBs (via W2) – with a release concentration of 500µg/l. However, it was assessed for the CHP discharge (W1) in error and not from the BUBs. The CHP discharge volume (3.48l/s) was used in error, instead of 2.26l/s and skewed the loading calculations. Similarly, boron and copper also needed revised for the same reason. It was also not clear if total or dissolved lead was being used in the calculations. The consultant was contacted in writing to clarify these errors, and query the origin of the lead.

A Clarification document, dated 11 December 2020, was submitted by email to SEPA confirming that there had been an error in the calculations and that these substances had been erroneously assigned to the incorrect discharges. Corrected assessment calculation tables were then provided.

These were further assessed, and it was concluded that there was a lower risk to the environment as both copper and boron were now unlikely to breach the EQS at the edge of the mixing zone. It had already been noted that the background water concentration for lead was above EQS and that the revised discharge data, even with the reduction in load in the assessment provided in the Clarification document, would not change this.

The high lead background data in the estuary is unexplained, however, there has historically been heavy industry in the catchment, associated with potentially contaminating discharges of heavy metals such as power generation, mining etc.

The Clarification document confirmed that the lead figures are presented as a worst-case estimation, taken from laboratory analysis of samples of the incoming potable water supply for the Calachem site, which showed that the filtered and total lead levels were both below the limit of detection (LOD) of 0.01mg/l. To be conservative, the incoming lead levels in the potable water were assumed to be 0.01mg/l, i.e. at the limit of detection for the purposes of the calculation. This is a very conservative approach. For comparison, the drinking water limit in Scotland for lead is currently 10mg/l. It was also confirmed that the water treatment chemicals used at the Facility will not contain any lead, and any lead which may be present will likely be from the historical water supply system, which is present throughout the wider Calachem site, as prior to the 1970s, lead pipes were extensively used for water supply.

In the BuBs blowdown, a 2% blow down of the boiler feedwater is assumed and would increase the concentrations of all pollutants within the incoming water. Therefore the concentrations of lead within the effluent would likely be 0.5 mg/l equivalent to 500 µg/l.

For the CHP Plant, any lead present in the incoming potable water supply would be removed by treatment in the RO plant, and would be discharged to effluent via the RO reject stream. The RO reject stream flowrate is estimated at 3.25 l/s (compared to an incoming flowrate of 20.1 l/s.) The reject stream accounts for approximately 15-16 % of the incoming flow and therefore any lead in the incoming water will be concentrated up in the RO reject stream. Assuming lead levels of 0.01 mg/l in the incoming potable water, the concentrations of lead within the effluent would be expected to be approximately 0.067 mg/l, equivalent to 67 µg/l, which was then used in the assessments.

The corrected water quality assessments were provided for the Annual Average EQS (WQA Table 1) and the MAC EQS (WQA Table 2). (Background data was not available for boron and cyanide, so a conservative surrogate level of 95% of the relevant EQS was used for these pollutants in the calculations).

During a review of the compounds that may be discharged, SEPA requested further information on the ecotoxic limits for chemicals that didn't have any EQS from the applicant on 30 April 2021.

A further revision (v3) of the WQA (dated 20 May 2021) was provided to SEPA on 21 May 2021 to take into account the chemicals that are considered to be ecotoxic by the European Chemicals Agency (ECHA) under the Registration, Evaluation, Authorisation and Restriction of Chemicals Regulations (REACH). The ECHA database sets Predicted No Effect concentration (PNEC) values for ecotoxicity, and these have been used as EQS substitutes for antimony, manganese, and phosphorous pentoxide and the H1 assessment method was re-run. Test 1 indicated several pollutants that discharged at concentrations above EQS, (ammonia; boron; cadmium; copper; cyanide; fluoride; iron; lead; manganese; mercury; nickel; phosphorus pentoxide; selenium; and zinc, and these were further assessed. Test 2 doesn't apply to tidal waters, (Tests 3 and 4 are not applicable as the discharge does not require to be modelled based on the dilution discharge point information above >50m offshore, and between 3m and 7m depth).

The WQA concluded that Test 5 is passed for all species where an EQS applies, including those species where surrogate background concentration values have been applied. Additionally, Test 5 is passed for all species where a PNEC has been applied using surrogate background concentrations with the exception of phosphorus pentoxide. Phosphorus pentoxide would pass Test 5 for background concentrations below 0.33 µg/l.

Phosphorus pentoxide turns to liquid easily, and has a very short residence time in water, converting to phosphoric acid almost immediately in water, (which is not identified as ecotoxic). The ECHA database provides the half-life for hydrolysis of phosphorus pentoxide as 0.6 seconds, meaning that all of the phosphorus pentoxide will have decomposed to phosphoric acid prior to discharge from the boilers, and the impact would be considered to be insignificant by the point of discharge to the estuary. Phosphoric acid is not identified as ecotoxic in the ECHA database.

It was also noted that despite being included in the list of substances in the composition of the effluent (Table 1 of the revised WQA), that aluminium results were not provided, and chromium VI has a marine EQS which had not been taken into consideration. This was queried with the applicant, and a further WQA revision (v4) provided, which indicated that chromium VI would not exceed the EQS. Although the aluminium has no obligatory EQS, there is a non-statutory EQS for reactive aluminium, so an Emission Limit Values (ELV) has been included for this, taking into consideration the dilution.

The Original Permit (Table 7.1) used the maximum concentration and flow data that was provided by the applicant in the original WQA, set as the ELVs in order to ensure the proposed facility operated within the envelope allowed for by the quantitative impact assessment that was provided. The revised concentrations and additional effluent volumes have been reassessed, and several ELVs have been amended. Although not all of the substances have EQSs, these ELVs will continue

to be used as controls on the discharges, despite the discharges going via the Calachem WS before ultimately discharging into the River Forth.

As the EGEC discharge goes via the Calachem drainage system “weak stream”, it has been assessed as if it was a direct and undiluted discharge (via the ultimate discharge point in the Forth Estuary), to demonstrate that it could not exceed the relevant standard (EQS/PNECs), or where it did that the dilution would be such that there would be no significant environmental impact.

The Calachem “weak stream” is generally too weak to require any treatment, and could bypass the treatment plant there, however, at least 40% of it is generally fed into the Calachem “strong stream” primarily for hydraulic balancing and also to control temperature of the strong stream effluent prior to biological treatment, and release to the combined outfall. The discharge from Calachem has limits set for chromium, nickel, zinc, copper, cadmium and lead in addition to several other key pollutants including BOD, COD, ammoniacal nitrogen, phenols and pH. There is no limit on mercury, although it does have to be monitored, as does toxicity. Should any incident at the Calachem plant cause the Total Carbon or Total Organic Carbon emissions to spike in the “weak stream” effluent, which is monitored continuously, the “weak stream” effluent is diverted to a tank and then tested further and drip fed back to the “strong stream” treatment line at a suitable rate.

As the lead from EGEC was of most concern, and the background already exceeded the EQS, the treated effluent discharge from Calachem, which is routinely monitored for various compounds, including dissolved lead in 24 hour composite samples, was reviewed. The lower limit for lead is set at 2 Kg/day and the upper limit at 4 Kg/day. SEPA Results from the Calachem discharge sampling undertaken between January 2014 and January 2020, indicate that concentrations were well below the lower limit of 2 Kg/day, and it is therefore unlikely that any additional dissolved lead that may be released from the EGEC discharge via the Calachem discharge will impact the Calachem results significantly.

EQS information is taken from the current SEPA guidance WAT-SG-53 (Version: v7.1 Released: April 2020)

The surface water composition was discussed in the original permit application, and uncontaminated surface waters are harvested and re-used as far as practicable, with excess collected into the 400m³ attenuation tank, and discharging via W3. Contaminated surface water from high risk areas goes via a petrol interceptor and can also be isolated should there be a spillage. This also discharges from W3.

Currently Permit Condition 7.1.5 requires a sampling plan – which has been submitted to SEPA, but had no information on what pollutants are being sampled, whether they are spot or composite samples, or any frequency. This Condition has been amended to require more detail. In addition there is a new requirement (Condition 7.1.8) to sample W1 and W2 for 12 months, and then review all substances and volume against the concentrations provided in the Variation information, as an updated WQA. Should this flag any issues or discrepancies, the relevant ELVs will be reviewed by SEPA.

As this discharge is not directly to the water environment, consideration was given to relevant emission benchmarks to ensure that there is no deterioration in the estuary status due to this discharge which goes via Calachem. The ELVs are set out in permit Table 7.1, and are based on the latest values used in the quantitative impact assessment of emissions to water provided during the Variation determination process, including the discharges that had not previously been considered. This is to ensure that emissions to water are controlled to within the 'envelope' allowed for by the quantitative water impact assessment.

New Condition 7.7.1 requires that a further assessment on potential water use reduction and effluent minimisation is undertaken because of the changes due to the BuB discharges. Some of this may be re-used in the incineration process when it is operating, but when the incineration is

offline, and the excess that is not re-used even when the incineration is online, require investigation as to any other potential re-use prior to final design.

It should be noted that during the original Permit application justification was provided to discharge all effluent via the Calachem WS system due to excessive cost of treatment infrastructure or any alternative connection to the strong stream system due to complex routing through the Calachem sites and the need to cross the public highway. This also provided reasoning for not segregating the different effluents further for treatment. However, during the determination, additional requirements were asked for, including design changes to re-use all contaminate wastewaters from the process within the ash quench system, (except for the wastewaters from RO plant due to high salt content) and a rainwater harvesting scheme was to be introduced for the site, reducing the surface water run-off volumes as far as practicable.

There is no return condensate from the provision of steam to the other existing users at the Earls Gate site as the original layout was not suitably configured for this to occur, and it was not technically or economically feasible to retrofit such a system. Also, the return condensate may be contaminated through use. New users may need to consider if they can return the condensate for re-use. The cleaning and re-use of condensate return would reduce the volume of water needed from the public water supply, however, this will remain high at the EGEC plant due to this existing situation, much of which is beyond the control of EGEC.

The IED Chapter IV on incineration requires only that discharges to the aquatic environment from wastewater from the cleaning of gases (eg from a wet scrubber) should be limited, and at the point of discharge from the incineration plant. This is not applicable at EGEC, which uses a dry scrubbing system. (dry urea injection SNCR; dry scrubbing using solid hydrated lime or sodium carbonate, followed by Carbon injection and bag filters).

In summary, the most significant discharges are reused in the process, and checks to see if this can be further extended with the new discharge will be put in place via Conditions. In addition, rainwater harvesting techniques are proposed. Remaining discharges which go via Calachem WS will be insignificant and unlikely to lead to a deterioration of the estuary status. (The discharge from Calachem must also ultimately be met, and this is not under the control of EGEC.)

SEPA is satisfied that the above is consistent with BAT.

5.4 Implications of the Variation on - Point Source Emissions to Groundwater

No change.

There are no planned direct emissions to ground or groundwater from the installation activities. Waste handling will be on impervious surfaces only, as detailed in the Permit application decision document, and there are no proposed changes in the Variation that would impact this.

5.5 Implications of the Variation on - Fugitive Emissions to Air

There is a potential for noise releases for a longer period due to the extended delivery hours – This is discussed further in Section 5.15 on noise below.

There is also a potential for additional odour releases for a longer period due to the extended delivery hours. However, during normal operations, the air from within the plant will be used in the combustion process and maintained under negative pressure, and it is therefore unlikely that there will be other emissions to air. When the incineration process is not operational, there is an alternative arrangement for dealing with odour. This is discussed in more detail in Section 5.7 on odour below.

5.6 Implications of the Variation on - Fugitive Emissions to Water

Surplus uncontaminated surface water arisings not utilised in the rainwater harvesting system and all potentially contaminated surface water are collected in a below ground drainage attenuation tank, and subsequently discharged via the Calachem WS. This discharge can be remotely isolated at the Surface Water pumping station in the event of contamination, e.g. a spillage.

The control by isolation of the pump is sufficient to prevent fugitive releases and is consistent with BAT.

5.7 Implications of the Variation on – Odour

The proposed variation to increase the opening hours gives a potential increase to the duration where odour could be emitted from the activities within the facility. However, the techniques for odour control were discussed at length in the original permit decision and there are no planned changes to the techniques that were permitted that would lead to an increase in odour concentrations from the activities here, which is the key issue.

The key techniques for odour control include depositing waste only inside the reception area, which is maintained under negative pressure, and the air re-used in the incineration process; The reception has fast acting roller doors which operate only to allow for entry/egress; Bunker management procedures to mix waste, and to periodically clean the area are in place; When the incineration line is not in use, (for planned or unplanned maintenance) the odorous air will be extracted via carbon filters and discharged via a 47m stack; No storage of baled waste is allowed. The effectiveness of the air extraction system will be assessed using smoke testing as per Permit Condition 3.2.9. Procedures for inspection of individual loads of waste and bunker offloading following an extended unplanned shutdown are currently under review by SEPA, although this is not part of the variation.

Variation change number 6 made reference to a minor change in location of the odour abatement plant. The position of the vent location was queried with the applicant. The vent position for the resulting emissions remains unchanged, as confirmed in the Clarification response dated 12 July 2021, submitted to SEPA. The only slight difference is that the vent elevation has increased marginally by 0.1m, which will increase the release height, aiding dispersion.

The above techniques were considered to meet BAT, and there are no requirements for changes to these proposals as a result of this variation.

5.8 Implications of the Variation on – Management

Due to the nature of the Market Capacity agreement, and stress events, there will be process changes to be considered, including those required for SU/SD operations, with key documentation and training changes needed to reflect this.

Changes in raw material consumption and residue generation from the different processes will have to be considered against a timescale for purchase/removal once operational. Additional recording and reporting of stress events to SEPA will also be required, as per new Permit Conditions 10.2.3 and 10.2.4. Condition 10.2.1 has also been amended to include allowing more than 2 Boilers to be in use during the System Stress events.

Additional monitoring of the discharges will be required and is discussed further in Section 5.18 On monitoring

As the Operator has a Management system in place, the above requirements will need to be reflected in the appropriate procedures and records, and will be checked through inspections. This is consistent with a BAT approach.

5.9 Implications of the Variation on - Raw Materials

The proposed increase in plant capacity discussed in section 5.2 above, will result in the consumption of additional quantities of the raw materials consumed during the operation at the Facility, based on updated design details associated with the potential maximum capacity of the Facility. This does not affect storage arrangements.

Table 4– Raw material consumption (excerpt from Table 1 of supporting information document submitted with the variation)

Raw Material	Raw Material consumption based on original PPC application (tonnes per annum)	Proposed Raw Material consumption (tonnes per annum)
Urea	380	440
Lime	2,600 ¹	10,500 ¹
Activated Carbon	80	105
Note: 1. Whilst this indicates a significant increase in lime consumption, it is understood that this was not correct in the original PPC application. Therefore, the increase in raw material consumption presented is not representative of the actual increase in raw material consumption associated with the increase in the processing capacity.		

The seemingly very high increase in lime compared to the other abatement chemicals, is due to a change in the expected fuel mix, and the proposed tonnage in this Variation was based on the potential worst case composition for incoming waste, assuming a high sulphur and chlorine content rather than any changes to the Flue Gas Treatment system. This was clarified by email in the Schedule 7 response, and also confirms that assuming that the waste is not at the upper end of Sulphur or Chlorine content, it is anticipated that consumption is likely to be closer to 2,600 tonnes, as per the original application.

Due to the seemingly very high increase in lime figures, the Activated Carbon was also queried, as these abatement compounds are often linked in the overall delivery rates and the Clarification document, dated 11 December 2020, confirmed that the above data was correct and the Carbon use increased in line with the potential flue gas volumes from the increased throughput.

Peak effluent and water use have not increased (See section 5.12 on Water Use). The additional water softening chemicals, however, had not been included for the previously missed effluent stream, in either the variation application or the initial schedule 7 response. This was queried further with the applicant, who confirmed in the clarification document of 12 July 2021, that each of the three softener streams will consume 160 kg of sodium chloride per regeneration, and each stream will require a regeneration every 8 hours, for a period of 1.5 hours, when operating at the design flow rate. Therefore, the Facility is expected to consume approximately 440 tonnes of sodium chloride per year as a worst-case estimation based on 3 streams operating. However, the softening plant will typically operate with 2 streams in service and the third in either standby or regeneration.

To facilitate operation of the CHP plant burners on fuel oil, the capacity of the fuel oil tank was increased to 100 m³ during the first variation of the Permit. This information is not specified in

VN01 but was mentioned in the Variation application and queried in the Schedule 7 Further Information Notice.

5.10 Implications of the Variation on – Raw Materials Selection

There is no change to the raw materials selected for the incineration line or package boilers, as was discussed in detail during the permit application process, and was considered to be consistent with BAT.

5.11 Implications of the Variation on - Waste Minimisation Requirements

This was discussed in the permit application and there are no significant changes to the techniques and controls that will be in place. The Standard Permit Conditions for Resource Utilisation 2.6.1 require a regular systematic review of all raw materials, energy and waste, along with opportunities to improve the efficiency of their use and minimising waste.

The proposed techniques are considered to meet BAT.

5.12 Implications of the Variation on - Water Use

Additional water use was not identified, and was queried with the applicant confirmed that there would be no increase in water volumes used (Schedule 7 clarification document 12 July 2021). The “Peak export” water cycle submitted with the original PPC Permit application quoted a maximum water use of 1967.7 m³ /day whilst the most recent water usage information received from the technology provider, CNIM indicates a maximum water use of 1,955 m³ /day.

5.13 Implications of the Variation on - Waste Handling

The residues may increase from the process due to the maximum design capacity changes described in Section 5.2 above. This was detailed in Table 2 of the Supporting Report document as below. This does not change the storage arrangements for each residue, and there will be no additional residue tonnages on site at any given time, therefore no changes are required under the SWMA Financial Provision arrangements.

Table 5 – Residues generated (excerpt from Table 2 of supporting information document submitted with the variation)

Residue	Current residue generation based on the original PPC application (tonnes per annum)	Proposed residue generation (tonnes per annum)
APCr	12,960	15,700
Incinerator Bottom Ash	43,200	52,340

The capacity of IBA storage on site in the original permit application was 790m³, and this remains unchanged, although the footprint of the allocated area for the IBA building itself has marginally increased, as describe in the Schedule 7 response. There will be an increase in frequency of disposal of the residues to compensate for any higher throughput of waste generating more residues.

The arrangements are unchanged and therefore still consistent with BAT.

5.14 Implications of the Variation on - Waste Recovery or Disposal

This was covered during the permit application in more detail. Incinerator Bottom Ash (IBA) and Air Pollution Control residues (APCr) will be segregated waste streams, and IBA is to be recycled as secondary aggregate once it is classified as non-hazardous (this is undertaken during commissioning).

APCr is not yet widely recycled and may need to be landfilled to a hazardous landfill site until a recycling or reprocessing option is available. The Standard Permit Condition 8.1.1 requires this to be reviewed periodically and steps taken to recycle or recover it when that option becomes available.

The waste water from the processes at EGEC goes via the Calachem treatment facility – where some of it is used for hydraulic balancing and cooling of the strong stream effluent. Up to 110m³ more waste water could be generated per annum. (see section 5.3 above).

This is consistent with BAT.

5.15 Implications of the Variation on – Energy

The proposed increase in the annual processing capacity potential does not alter the efficiency of the CHP Plant in relation to the recovery of energy from the waste derived fuels. This is because the thermal output is still based around the same design point.

This was confirmed in section 4 and Table 2 of the response to the Schedule 7 notice using revised Gross Calorific Values (GCVs) and throughputs of waste to recalculate.

Table 6 - facility energy consumption and export (excerpt from Table 2 of Schedule 7 response)

Parameter	Unit	PPC Application Value	Revised Value
Operational hours	hours	8,000	8,000
Availability	hours/hours	91.3%	91.3%
Annual throughput (nominal design capacity)	tonnes/year	216,000	274,000
Average GCV	MJ/kg	11.6	9.11
Gross thermal input - fuel	MWh/year (GJ)	693,000 (2,494,800)	693,000 (2,494,800)
Gross electrical generation (fully condensing)	MWh/year (GJ)	172,800 (622,080)	172,800 (622,080)
Parasitic load (including electrical and support fuel)	MWh/year (GJ)	21,600 (77,760)	21,600 (77,760)
Heat export capacity ¹ from the Facility	MWh/year (GJ)	268,000 (964,800)	268,000 (964,800)
Z factor	MW/MW	3.53	3.53
Net electrical export (CHP mode at design case)	MWh/year (GJ)	75,300 (271,000)	75,300 (271,000)

¹Calculated in accordance with system boundaries specified in Annex 3 of SEPA's TTWG 2014.

There is no change to the energy efficiency which was already considered to be consistent with BAT.

5.16 Implications of the Variation for - Accidents and their Consequences

This aspect was covered in detail during the Permit application. Emergency procedures will be developed as part of the documented environmental management system required at the site, and Standard Permit conditions 2.5.7 and 2.5.8 require the development and maintenance of an Incident Prevention and Mitigation plan.

The techniques and permit conditions are consistent with BAT and the changes in this variation do not require any difference to the key proposals.

5.17 Implications of the Variation for – Noise

5.17.1 Change to operational delivery times

Condition 3.1.10 of the PPC permit granted, allows for HGV deliveries of feed material (waste) to the Facility between Monday and Friday (0800 hours to 1800 hours) and Saturday (0800 hours to 1200 hours).

EGEC Limited are applying to extend the hours of waste deliveries to the Facility within this Variation application, so that the deliveries may take place between 0700 hours and 2200 hours Monday to Friday, and 0700 hours and 1700 hours on Saturdays only.

Section 3 and Appendix C in the Supporting information document submitted with the Variation application gives further information.

The techniques for the management of noise during the extended hours will not differ to the noise assessment report, dated 28/11/2017, submitted with the original Permit application. To summarise, the facility has been designed so that noisy equipment (including the Air Cooled Condenser (ACC), the turbine hall and emergency generator) are situated away from the site boundary with Sensitive Receptors (including housing on Wood Street and the Jupiter Wildlife Centre) beyond, and is screened by process buildings, and where necessary, acoustic enclosures will be utilised e.g. on the turbine. The majority of the process excluding the package boilers is also located inside process buildings including the abatement equipment for emissions to air and storage and handling of IBA. Steam vents required to protect the boiler from over-pressurisation have silencers fitted to minimise the noise associated with venting. Noise emissions will also be partly mitigated by utilisation of white noise reversing sensors on delivery vehicles at the Facility.

The extended hours would have no effect on the operational facility and related sound sources. HGV deliveries were already considered within the extended period now being applied for, so the sound level assessments made for these sources remain unchanged from those previously accepted.

There are no specified Planning controls on the operating hours at the site.

Appendix C of the Supporting Information consisted of a noise assessment update note (dated 22 Jul 2019) from Sharps Redmore regarding the additional hours (This Company undertook the assessment for the original Permit for EGEN). The Note confirms (item 11) that the original assessment included potential noise during the period 0600 to 0700 (night-time) periods in addition to the extended times applied for, and all periods were shown to be low impact at Sensitive Receptors. (The 0600-0700 period is not being requested as part of the Variation).

The updated assessment note also confirms (Item 17) that even by doubling HGV movements, that the sound rating level of the combined operational facility and HGV activity is predicted to be below the lowest background sound level at all noise sensitive receptors identified. In accordance with the BS 4142:2014, this represents a low impact from noise. In addition, (Item 6) a 3m bund is to be constructed alongside the access road, which will also reduce sound levels to Sensitive Receptors to the south from the HGV movements.

A number of changes to design were noted by SEPA in the Variation application, and questions about the impact on the noise assessment were raised in the Schedule 7 Further Information Notice which was served on EGEN Ltd on 25 August 2020. The response document (Section 5) confirmed more details, including that the electrical rack will not have noise emissions and is simply being moved to an external location due to a lack of space. The roof mounted air conditioning coolers (ACCs), which provide cooling for auxiliary equipment, are to be constructed closer together, and will still be mounted on the roof.

5.17.2 Other changes

Several other minor changes were also noted in the final layout, including positioning of fans, the turbine exhaust pipe diameter and positions, ACC design, electrical transformer dimensions, and the placing of 3 silencers on the BuBs safety vents on the BuB building.

These changes are considered unlikely to impact the overall findings of the original noise modelling report by the applicant, however, prior to construction of the new Incineration plant, an updated modelling report has been requested in new Prior Commissioning Condition, 2.8.26, to ensure that any changes to the final locations and design of the plant are fully considered, along with the construction of the proposed bund at the plant. Should this updated modelling identify that additional measures are required, this will be caught prior to final design work and commissioning.

Condition 2.8.21 of the current PPC Permit already requires the submission of a noise report to SEPA at least 6 months in advance of commissioning, confirming the techniques to be used for the control of emissions to noise and vibration from the Facility during normal, abnormal and emergency conditions. Under 2.8.21, the noise reporting requirements for the Back-up Boilers is

separate, as Variation VN01 allowed for earlier commissioning of these, prior to the main EFW commissioning.

The required prior operating conditions for submission of a Noise & Vibration Monitoring Plan (Condition 3.1.2) has already been fulfilled by the submission of the Plan.

New Condition 2.8.26 requires that the noise modelling undertaken in 2017 is updated prior to the commissioning of the incineration plant to include the changes to design and locations and the addition of the bund so that if there are any issues predicted, these can be addressed prior to final design.

Following the commissioning of the plant, validation of the modelling will be undertaken and reported within 3 months to SEPA, which now requires that the updated modelling information in 2.8.26 and final BAT equipment and techniques are all taken into account. An assessment of the performance will be undertaken and reported back to SEPA under existing Condition 3.1.6 within a further 2 months.

In addition to the above, Condition 3.1.8 of the current Permit requires that noise limits set out in Table 3.1 are not exceeded, and these are unchanged in this Variation

The above changes to Permit Conditions and current controls in place are considered consistent with BAT.

5.18 Implications of the Variation for – Monitoring

There is additional monitoring and sampling of the discharge from W2 required, as per the updated Tables 7.1 and 7.2. At discharges W3 and W4 although there are no specific monitoring requirements, these should as a minimum be regularly inspected, and a more limited sampling programme put in place as a management tool.

5.19 Implications of the Variation for – Closure

No likely changes predicted, as key pollutants remain unchanged, and no key changes to infrastructure are identified that would make a substantial difference to the original permit application information on closure.

5.20 Implications of the Variation for - Site Condition Report

No likely changes predicted, as key pollutants remain unchanged.

5.21 Implications of the Variation for - Consideration of BAT

From consideration of the information provided in the Variation application, the Schedule 7 response and the 2 clarification documents, SEPA believes that the operator will use all appropriate preventative measures against pollution, in particular through the application of BAT and that it is unlikely that significant pollution will be caused by the operation of this plant.

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: A habitats assessment was not necessary due to the insignificance of the change in comparison with the original dispersion modelling.

Screening distance(s) used – Original was 15km.

Officer:

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?

There was no change to the Planning required for this variation so this is not applicable.

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?

COMAH is not applicable to this site.

Officer:

8 DETAILS OF PERMIT

Do you propose placing any non standard conditions in the Permit Variation - yes

Outline of change: In Schedule 2, new Condition 2.8.26 is inserted:

By 6 months before commissioning of the Incineration Plant, update the noise modelling provided in the 'Sound Level Assessment Report' by Sharps Redmore Acoustic Consultants, dated 28 November 2017 and accompanying maps for the site to include any changes to the design which could materially affect the noise emissions, including changes to structures, fan and emission point locations, alongside proposed changes to HGV movements and the construction of a bund along the southern boundary.

Details including justification: This is to ensure that changes in the design are taken into account and the model re-run to ensure that that these do not impact on the noise outputs, or if they are, additional mitigation can be designed into the construction phases.

Outline of change: In Schedule 7, the following new Condition 7.1.8 is inserted:

Following the first 12 months of sampling of each of the effluent discharges W1 and W2, as required by Condition 7.1.5, and Tables 7.1 and 7.2, an updated assessment report on all effluent volumes and pollutant concentrations (as specified by the relevant ELV to each discharge), shall be made to confirm the composition assumptions used in the Water Quality

Assessment (WQA) v4 dated 09 July 2021. Said report shall be submitted to SEPA within two months of the final sample being taken.

Details including justification: As the discharge goes via the Calachem weak stream which is largely untreated, the assumptions provided on the composition of the various discharges are to be checked to ensure that these are within the modelled calculations. If these are higher, SEPA may review the ELVs.

Outline of change: In Schedule 7, new Condition 7.7 and its sub-conditions are added:

7.7 UPGRADE CONDITION

7.7.1 No later than 12 months following First Operation of the back-up boilers, identified in Schedule 1, paragraph 1.1.4 sub-paragraph k), the Operator shall review the operation of said boilers to assess options to further minimise the projected mains water consumption requirements and associated effluent arisings. A report on the said review shall be submitted in writing to SEPA with details of any changes proposed to the design and operation, and a proposed timescale for implementation of those changes. The report shall include:

- a) the potential for reducing further the volume of boiler blow down effluent from the back-up boilers, or re-using the effluent and condensate as far as is practicable, including when the CHP plant is offline; and

The report shall provide details of all options considered, including any limitations, together with a cost benefit analysis to identify potential cost savings.

Details including justification: The requirement in the Permit for a review of the water use and potential reduction in effluent required in Condition 2.8.12 was undertaken prior to the variation where the changes to water use and waste water discharges due to the BUBs was considered. This new Conditions will ensure that a further review which includes the changes is undertaken with a view to further reduction or re-use in line with BAT and the requirement for continual improvement at a PPC installation.

Outline of change: In Schedule 10, the following new Condition 10.2.3 is inserted

10.2.3 Whenever a System Stress Event occurs, EGEN shall notify SEPA within 24 hours, and shall record all such periods, including details of which back-up boilers were used for the duration of the event.

Details including justification: As only 2 BuBs are normally in use, and System Stress Events are infrequent occurrences, it is important that SEPA is made aware of this abnormal operation at the time.

Outline of change: In Schedule 10, the following new Condition 10.2.4 is inserted

10.2.4 The records required by 10.2.3 shall be reported to SEPA on a quarterly basis

Details including justification: This ensures that SEPA are aware of System Stress events, and that details of the number of boilers in use are properly captured. Any trends in use can then be considered in future.

Do you propose making changes to existing text, tables or diagrams within the Permit Variation?
 - yes

Outline of change: In the “Interpretation of terms”, the following new term is added:

“System Stress Event” – an event declared by the National Grid Electricity Service Operator (ESO) triggered by a national shortage of generation resources;

Details including justification: System Stress Events are an unusual situation for the facility, but need to be defined as they are very specific, and only in certain circumstances can more than 2 BuBs operate.

Outline of change: In Schedule 1, paragraph 1.1.4, sub-paragraph b) is deleted and replaced.

1.1.4b) incineration of waste at temperatures above 850°C with a minimum 2 second residence time in a CNIM-MARTIN reverse moving grate incinerator and associated combustion chamber. Two dual-fuel gas oil/ gas-fired low NOX auxiliary burners support the combustion temperature. Incinerator bottom ash is quenched in a water bath prior to conveying to an ash storage hall. The single line is capable of burning up to 274,000 tonnes per annum of non-hazardous residual refuse derived fuel based on 8000 hours operation. The incinerator is fed from a water-cooled waste feeding chute from where a hydraulically driven feed ram feeds the waste onto the grate via a feed table; primary air feed is drawn from the waste reception area and fed via the underside of the grate; secondary air feed is injected above the flame body on the grate;

Details including justification: This is to allow for the change in the range of NCV in the waste allowing a potentially greater throughput of waste, although the thermal output does not change. The annual tonnage as requested in the Variation, is based on 8000 hours per annum, allowing for normal maintenance periods.

Outline of change: In Schedule 1, paragraph 1.1.4 sub-paragraph j) is deleted and replaced

Excess reject effluent from the reverse osmosis plant and the water softener, blowdown from the heat recovery boiler, described in c) above, and excess boiler blowdown and condensate from the economisers from the five back up boilers, described in k) below, will be discharged into the Calachem Weak Stream downstream of a 400m³ capacity surface water attenuation tank. All other process effluent undergoes pH treatment and settlement in an underground decantation pit prior to reuse in the bottom ash quench with any excess being collected and recycled again in a closed loop.

Details including justification: The corrections are required following identification of the additional waste water streams for the BuBs, and to clarify which is discharged and which re-used.

Outline of change: In Schedule 1, paragraph 1.1.4 sub-paragraph k) is deleted and replaced.

k) five 12MWth input gas-fired low NOX back-up boilers, venting via a common 35 metre stack to provide steam during peak demand and System Stress Events, during Start up or Shut Down of the incinerator, or when the incinerator is off-line;

Details including justification: This is required to confirm additional scenarios under which the BuBs can be in use.

Outline of change: In Schedule 1, the Site Plan at 1.2 is deleted and replaced with a new site plan.

Details including justification: Not all discharge points were shown on the site plan in the Permit, and this needed to be updated to show all 4 discharge points as these are now referred to in the Variation.

Outline of change: In Schedule 2, Condition 2.8.14, the words “Emission Point W1” are replaced with the words “Emission Points W1 and W2....”

Details including justification: As there are now two different discharge points, W2 has been added.

Outline of change: In Schedule 2, Condition 2.8.25, sub-condition d) is deleted and replaced

d) conditions 2.8.21b), 2.8.22, 2.8.23 and 2.8.26

Details including justification: This is to take into account the addition of the new non-standard condition in paragraph 2.8.26.

Outline of change: In Table 2.1 additional new rows have been inserted to capture the new reporting requirements under new conditions 7.1.8, 7.7.1, 10.2.3 and 10.2.4.

Details including justification: These are new conditions and have new reporting requirements.

Outline of change: In table 2.1, under Condition 7.1.5, a revised Emissions to Water sampling plan is required by 31 October.

Details including justification: the Emissions to Water sampling plan requires additional information, and a new plan is required.

Outline of change: In Schedule 3, Condition 3.1.5, after “dated 28 November 2017” the following new words are added “and the updated modelling required by Condition 2.8.26”

Details including justification: This is to ensure that any changes due to new paragraph 2.8.26 are captured in the updated noise modelling.

Outline of change: In Schedule 3, in Condition 3.1.10, the days and times for accepting waste are amended to:

Monday to Friday	0700 hours to 2200 hours
Saturday	0700 hours to 1700 hours

Details including justification: The applicant has requested the extension to hours to enable a smoother delivery and prevent queuing, and is acceptable, as discussed in Sections 5.7 on Odour and 5.17 on Noise.

Outline of change: In Schedule 4, Condition 4.2.2, is deleted and replaced.

4.2.2 The aggregate amount of the waste specified in Condition 4.1.1 that may be incinerated in the Permitted Installation shall not exceed 274,000 tonnes in any calendar year, and shall not exceed 34.223 tonnes in any one hour.

Details including justification: The annual tonnage as requested in the Variation, is based on 8000 hours per annum, allowing for normal maintenance periods, and is included in the condition, along with the hourly throughput. The above change is to allow for the potentially higher tonnages should the overall NCV of the waste be lower than anticipated.

Outline of change: In Schedule 7, Condition 7.1.5 is deleted and replaced:

7.1.5 By 31 October 2021, a revised monitoring and sampling plan for every discharge (W1, W2, W3 and W4), shall be agreed in writing with SEPA based on the report required by Condition 2.8.14, and shall be maintained and reviewed annually. Said sampling plan shall detail the discharges to be sampled and monitored; the sampling point numbers, the NGR and description; the pollutants to be sampled; the method of sampling (spot or composite); the frequency of sampling; and how measurements for the determination of concentrations of water polluting substances shall be carried out representatively. The reviewed sampling plan shall be reported to SEPA each year for the forthcoming calendar year.

Details including justification: The sampling plan did not contain sufficient detail, so the additional information required is now included, along with a date by when the updated document must be received.

Outline of change: In Schedule 7, Table 7.1 is deleted and replaced.

Details including justification: All 4 discharges from the facility are described now, and where appropriate, ELVs are in place, predominantly for the process effluents at W1 and W2.

Outline of change: In Schedule 7, Table 7.2 is deleted and replaced.

Details including justification: This is to cover the requirements for sampling at each of the sample points, as all 4 discharge points are now described on the Variation.

Outline of change: In Schedule 10, Condition 10.2.1 is deleted and replaced

10.2.1 When the CHP Plant is operational, no more than two back-up boilers may be operated at the same time, unless there is a System Stress Event, or when the CHP Plant is transitioning from either start-up or shutdown, in which case up to five back-up boilers and the waste incineration line may be operated simultaneously.

Details including justification: This amended condition indicates the circumstances under which more than 2 BuBs can be operated, which is the normal operational condition at the facility. It allows for maintenance, Start up and Shut down, and for use during System Stress Events, when called on by the National Grid whenever there is a National shortage of generating power available.

Outline of change: In Schedule 10, Condition 10.2.2 shall be deleted and replaced.

10.2.2 The Operator shall record which back-up boilers are in operation whenever the incineration line is operational, including when transitioning from either start up or shut down.

Details including justification: The records will provide confirmation to SEPA that the BuBs are only be operated under specified circumstances, as included in 10.2.1.

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 – for discharges to the Water environment

Justification:

As this discharge is not directly to the water environment, consideration has been given to relevant emission benchmarks to ensure that there is no deterioration due to this discharge which goes via Calachem. These ELVs are set out in revised permit Table 7.1 ; These ELVs are based on the latest values used in the quantitative impact assessment of emissions to water provided during the Variation determination process, including the discharges that had not previously been considered. This is to ensure that emissions to water are controlled to within the 'envelope' allowed for by the quantitative water impact assessment.

10 PEER REVIEW

Has the determination and draft permit been Peer Reviewed? Yes

11 FINAL DETERMINATION

Issue a Permit Variation– 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 is operated so as to comply with the conditions of the Permit,
- The applicant is a fit and proper person (specified waste management activities only),
- Planning permission for the activity is in force (specified waste management activities only),
- That the operator is in a position to use all appropriate preventative measures against pollution, in particular through the application of best available techniques.
- That no significant pollution should be caused.

Officer:

12 REFERENCES AND GUIDANCE

Industrial Emissions Directive (IED – Chapter IV)
 PPC Regulations 2012 (as amended)
 CAR a practical guide v8 – 04 Oct 2019 (SEPA) (CAR is Controlled Activities Regulations)
 IED PPG TG4 - PPC-Part A – A Practical Guide (SEPA)
 WAT-SG-53 Environmental Quality Standards and Standards for Discharges to Surface Waters (SEPA)
 Calachem chemical manufacturing facility, SEPA permit Number PPC/A/1008834
 EGE Permit number PPC/A/1157446 and Variation number VN01