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**Viridor (Glasgow) Limited
Glasgow Recycling and Renewable Energy Centre (GRREC)**

Permit Application to Increase Annual Throughput

PPC/A/1110002

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1 Non-Technical Summary of Determination

Provide a non-technical summary of the process and determination

GRREC is an integrated waste handling facility which has a Materials Recycling Facility (MRF), an Anaerobic Digestion (AD) plant and a residual waste incineration activity, the Advanced Combustion Facility (ACF), which comprises three equal capacity incineration Lines. Municipal Solid Waste (MSW) including 'black bag' waste and similar Commercial and Industrial (C&I) waste is delivered to site and is processed in the MRF to remove recyclable materials. An 'organic' stream is also recovered at the MRF and is directed to the AD plant for treatment. Residual waste from the MRF and digestate solids from the AD plant are mixed and incinerated to produce steam to drive a turbine to produce electricity. The incineration facility is also capable of exporting heat when suitable users are identified. Methane from the AD plant is combusted on site in biogas engines to produce electricity.

The Operator has applied to increase the maximum hourly throughput on each of their three incineration Lines by 1.0t/h from 6.5t/h to 7.5t/h. This is equivalent to an increase from 19.5t.h total throughput to 22.5t/h. In terms of annual throughput, the increase proposed is from 154,000t/a to *197,100t/a. The increase will not result in any significant changes to the incineration plant equipment as there is sufficient capacity in the existing equipment to accommodate the change through adjusting setpoints for combustion parameters and flue gas treatment addition rates etc.

In order to supply the increased waste fuel demand, additional waste deliveries will be received and processed through the MRF and AD plants. The assessments provided consider the effects of increased incineration throughput on the MRF and AD fuel preparation activities, raw material usage and residue production and the impact on the environment and human health.

*Note – the assumed annual running hours has been increased when calculating the annual throughput to present a maximum throughput: the original annual throughput was based on 8000 operational hours per year at a throughput of 19.5t/h = 154,000t/a. For comparison 8000h operation at the proposed new throughput of 22.5t/h would equate to ~180,000t/a. However, this variation assumes 8760 operational hours per year at a throughput of 22.5t/h = 197,100t/a to represent consistent operation at maximum throughput on all Lines for the whole year.

The Scottish Government are considering an overall capacity cap for incineration in Scotland. This is not yet in place.

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Glossary of Terms	
ACF	Advanced Combustion Facility – the incineration facility
AD	Anaerobic Digestion plant
C&I	Mixed waste similar to MSW sourced from Commercial and Industrial premises
CO	Coordinating Officer
BAT	Best Available Techniques
BREF	Best Available Techniques Reference Document
BAT-C	Best Available Technique Conclusions
ELV	Emission Limit Value
MRF	Materials Recycling Facility
MSW	Municipal Solid Waste sourced from domestic properties
PEC	the Predicted Environmental Concentration, the total predicted impact due to emissions from GRREC added to the background concentration already present at that location.
PC	the Process Contribution, the additional predicted impact due to emissions from GRREC

2 External Consultation and SEPA's response		
Is Public Consultation Required? (if no delete rows below)		No
Advertisement Check:	Date	Compliance with advertising requirements
The Scottish Daily Record	27/08/2025	Compliant
Edinburgh Gazette	29/08/2025	Advertising date is slightly beyond the specified period. This is not considered to have affected the consultation. Accepted as compliant.
Officer Checking advert: CO		
No of responses received	No responses were received.	
Summary of responses and how they were taken into account during the determination:		
N/A		
Summary of responses withheld from the public register on request and how they were taken into account during the determination:		
N/A		

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Is PPC Statutory Consultation Required? (if no delete rows below)		Yes
Food Standards Agency:	Consulted 05/08/2025. Responded 28/08/2025 no objection submitted, unacceptable impact considered unlikely.	
Health Board:	Consulted 05/08/2025. Discussed with respondent 22/08/2025. Responded 27/08/2025. Comments were provided on the modelling approach and the human health risk assessment. No objection was raised. Clarification was provided by SEPA on the modelling approach.	
Local Authority	Consulted 05/08/2025, no response received.	
Scottish Water	Consulted 05/08/2025, no response received.	
Health and Safety Executive	Not consulted.	
NatureScot	Consulted. Automated response received, no objection. Re-consultation carried out, no response received.	
Discretionary Consultation required? (if yes provide justification and details below, otherwise delete row)		No
Enhanced SEPA Consultation required? (if yes provide justification and details below, otherwise delete row)		Yes
Consultation hub web page set up to consult on the outcome of the variation application.		
“Off site” consultation required (if yes provide justification and details below, otherwise delete row)		No
Transboundary Consultation required? (if yes provide justification and details below, otherwise delete row)		No
Is Public Participation Consultation Required? (if yes provide justification and details below, otherwise delete rows below)		Yes
Date SEPA notified applicant of draft determination	18/02/2026	
Date draft determination placed on SEPA’s Website	See consultation web page	

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Details of any other 'appropriate means' used to advertise the draft.	N/A
Date public consultation on draft permit opened	See consultation web page
Date public consultation on draft permit consultation closed	See consultation web page
Number of representations received to the consultation	To be populated after public consultation
Date final determination placed on the SEPA's Website	To be populated after public consultation
Summary of responses and how they were taken into account during the determination:	
To be populated after public consultation	
Officer:	CO

3 Administrative determinations	
Determination of the Schedule 1 Activity	
No change to the scope of the permitted Schedule 1 activities	
Determination of the Stationary Technical Unit to be permitted	
No change to the scope of the Stationary Technical Unit	
Determination of Directly Associated Activities	
No change to the Directly Associated Activities	
Determination of Site Boundary	
No change to the scope of the Site Boundary or Installation Boundary	
Officer:	CO

4 Introduction and Background	
4.1 Historical Background to the activity and variation	
<p>GRREC was permitted in 2013 as a non-hazardous residual waste incinerator with associated fuel preparation activities comprising a Materials Recycling Facility and an Anaerobic Digestion plant. The Operator has submitted an application to vary the permit to allow the incineration activity to be operated at a higher throughput rate and supporting information to demonstrate that the higher throughput can be achieved without causing significant impact to human health or the environment and that the energy efficiency of the facility will improve as a result. The permit as originally issued contained a throughput limit of 20t/h to a maximum of 154,000t/year</p>	

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for the incineration process and this proposal would increase that to 22.5t/h and 197,100t/year total throughput.

*Note – the assumed annual running hours has been changed when calculating the annual throughput to present a worst case maximum throughput: the original annual throughput was based on 8000 operational hours per year at a throughput of 19.5t/h = 154,000t/a whereas this variation assumes 8760 operational hours per year at a throughput of 22.5t/h = 197,100t/a.

Reference: S3675-0320-0004 Supporting Information – Permit Variation v5 final

4.2 Description of activity

The facility comprises a Materials Recycling Facility, an Anaerobic Digestion plant and a three Line non-hazardous residual waste incineration activity.

4.3 Outline details of the Variation applied for

An increase of hourly throughput from 6.5t/h to 7.5t/h at each of the three gasification incineration Lines is proposed. This will also result in increased waste reception and processing at the Materials Recycling Facility and the Anaerobic Digestion facility in order to provide the additional residual waste to fuel the incinerators.

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

Not applicable

4.5 Identification of important and sensitive receptors

The facility is located in Polmadie Road in Glasgow. In the locale there are a number of sensitive receptors including schools and domestic properties and in the broader area there are designated environmental sites. The receptors identified are listed in Appendices 1 and 2 and discussed in the appropriate parts of Section 5 and Section 6.

Officer: CO

5 Key Environmental Issues

5.1 Summary of significant environmental impacts

The proposed increased throughput at the incineration plant consequently increases the throughput at the Materials Recycling Facility (MRF) and the Anaerobic Digestion (AD) plant.

The MRF does not operate continuously 24 hours per day and will require to operate at current rates but for longer periods each day to process the incoming waste, current separation

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performance at the MRF will be unchanged. No significant environmental impact is anticipated due to this change.

The AD plant operates continuously 24h per day and will require to operate at higher throughput to accommodate the increased waste input. The additional throughput will not require additional equipment, and the emissions will remain within emission limits. The revised dispersion modelling carried out on the emissions from the site has identified that additional focus is required on the emissions from the biogas engines at the AD plant and this is discussed further in section 5.2.1.3 below. A condition is included in the variation to require additional measures to be implemented to reduce the impact from biogas engine emissions.

Each incineration Line will have the ability to process an additional 1.0t of non-hazardous waste per hour up to a maximum of 7.5t/h depending on the calorific value of the waste combusted. No additional equipment is required to achieve this change, process variables such as airflows will be adjusted to accommodate the increased throughput whilst remaining compliant with current emission limits.

Residue quality will remain within required limits, and a condition is included in the variation to reassess the potential for recycling a portion of the air pollution control residue to minimise the additional raw material use.

Further detail on the predicted impact due to the changes is discussed in sections 5.2 – 5.10 below.

5.2 Emissions to Air

Point Source emissions to air:

5.2.1 Dispersion Modelling Approach

Dispersion modelling has been carried out to evaluate the impact from the proposed change. SEPA has reviewed the modelling methodology used in developing the impact assessments and is satisfied with the approach. Modelling is based on worst case emissions from the incineration activity and also considers where necessary emissions of similar pollutants from the biogas engines associated with the Anaerobic Digestion plant in their current running arrangement discharging via their 26m stacks.

The model assumes both the incineration activity and the biogas engines are operating at their proposed maximum rates and at their maximum permitted emission limit for the whole year as a normal worst case. This is a conservative approach as it assumes that both activities will

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operate at the proposed maximum throughput without interruption for an entire year and also because the emission levels are normally less than the emission limits. During initial assessment it was noted that a number of Sites of Special Scientific Interest (SSSI's) had not been identified and included in the model. The Further Information Notice (FIN) required additional information to be supplied regarding the proposed impact on these designated receptors.

A further report considering abnormal worst-case emissions has also been prepared to consider the impact due to short term operation under abnormal conditions.

A condition will be inserted into the permit to require a review of actual emissions after 12 months of operation and submission of an updated impact assessment based on the actual emissions. This approach mirrors the requirements for new facilities.

Reference: 3675-0320-0007 Dispersion Modelling Assessment_r1, and
3675-0320-0008 Abnormal Emissions Assessment_r1
3675-0330-0003 Response to Further Information Notice

5.2.1.1 Dispersion Modelling Results – Normal Operation

Modelling basis – the model is based on worst case normal emissions from both the incineration and biogas engines activities at the permitted emission limit values for every hour of the whole year and at the maximum permitted throughput. Modelled sensitive receptor locations are copied for ease of reference in Appendix A.

AQAL	the Air Quality Assessment Level against which the predicted impacts are assessed.
PC	the Process Contribution, the additional predicted impact due to emissions from GRREC
PEC	the Predicted Environmental Concentration, the total predicted impact due to emissions from GRREC added to the background concentration already present at that location.
Maxima	the Maximum Concentration predicted by the model at any point in the modelled area whether this is identified as a sensitive receptor location or not.
FIN	Further Information Notice

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Assessment of the predicted impact can be up to three stages and is based on the following criteria:

Stage 1: the impact can be screened out as immediately insignificant, and no further assessment is required if:

- the short-term PC is less than 10% of the corresponding short-term environmental standard for that substance, or
- the long-term PC is less than 1% of the corresponding long-term environmental standard for that substance

Stage 2: if the above criteria is not met then a further assessment is carried out and the impact can be screened out as insignificant, and no further assessment is required if:

- the short-term PC is less than 20% of the corresponding short-term environmental standard for that substance minus twice the long-term background, and
- the long-term PEC is less than 70% of the corresponding long-term environmental standard for that substance

Stage 3: if neither of the above stages indicate the impact is predicted to be insignificant then a further assessment stage is carried out taking into consideration a range of factors to assess the risk of exceedance of an AQAL.

Dispersion Modelling Results By Parameter

Where not discussed below, the modelling predictions indicate that at the first assessment stage the emission impact can be considered insignificant: this includes long term emissions of nitrous oxide, carbon monoxide, hydrogen chloride, hydrogen fluoride, ammonia, mercury, cadmium, thallium. Predicted levels of PaH, dioxins and furans and PCBs are provided and input into the human health risk assessment.

Nitrogen Dioxide (NO₂)

The maximum long term annual mean PC is 11.27% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 71.82% which is slightly above the Stage 2 screening criteria therefore the impact cannot be immediately screened out at Stage 2. (Table 34)

Contribution from the incineration activity at the increased throughput at the point of maxima accounts for 1.30% of the assessment level. The biogas engines contribution at the point of

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maxima is 9.97% indicating that the biogas engines are the main contributor to the NOx long term impact. (Tables 46 and 50).

Considering identified sensitive receptors R34 and R27, which are the closest receptors downwind of the point of maxima.

NO₂ Predicted Long Term Impact at Closest Affected Receptors, Data from Tables 50 and 58

Location	Proposed ACF Only, PC as %AQAL	Proposed Biogas Engines Only, PC as % AQAL	ACF + Biogas Engines, PC as %AQAL	ACF + Biogas Engines, PEC as %AQAL
Maxima	1.3	9.97	11.27	71.82
R27	1.3	3.34	4.64	65.19
R34	1.29	2.77	4.06	64.61

This indicates that a small area around the maxima may be subject to an impact slightly above 70% of the AQAL but that the AQAL is unlikely to be breached and the impact is therefore not significant. It should be borne in mind that the modelling is worst case and assumes operation at maximum throughput for the whole year at the highest permitted emission levels.

The short term hourly maximum PC is 11.64% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 35.86% (Table 35) and the short-term PC is less than 20% of the corresponding short-term environmental standard for that substance minus twice the long-term background therefore the impact can be considered insignificant at stage 2 screening. (Table 36)

The predictions for NOx impact do however indicate that the emissions from the biogas engines requires further consideration, see Section 5.2.1.3 below.

Particulate Matter (PM₁₀ and PM_{2.5})

PM₁₀

The maximum long term annual mean PC is 1.5% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 75.51% which is above the Stage 2 screening criteria therefore the impact cannot be immediately screened out. (Table 34) It should be noted that the background PM level accounts for 74.0% of the AQAL.

Contribution from the increased throughput incineration activity at the point of maxima accounts for 0.11% of the assessment level. The biogas engines contribution at the point of maxima is 1.40% indicating that the engines are the main contributor to the PM long term impact. (Tables 46 and 50).

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Considering identified sensitive receptors R34 and R27 which are the closest receptors downwind of the point of maxima.

PM₁₀ Predicted Long Term Impact at Closest Affected Receptors, Data from Tables 50 and 59

Location	Proposed ACF Only, PC as %AQAL	Proposed Biogas Engines Only, PC as % AQAL	ACF + Biogas Engines, PC as %AQAL	ACF + Biogas Engines, PEC as %AQAL
Maxima	0.11	1.40	1.51	75.51
R27	0.11	0.45	0.56	74.56
R34	0.37	0.48	0.48	74.48

This indicates that the immediate locale may be subject to an impact above 70% of the AQAL and that a small area will be subject to the impact from GRREC but that the AQAL is unlikely to be breached and the impact is therefore not significant. It should be borne in mind that the modelling is worst case and assumes operation at maximum throughput for the whole year at the highest permitted emission levels.

The maximum short term 98.1 percentile of daily means PC is 2.72% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 56.23% and the short-term PC is less than 20% of the corresponding short-term environmental standard for that substance minus twice the long-term background therefore the impact can be considered insignificant at Stage 2 screening. (Table 36)

PM_{2.5}

The maximum long term annual mean PC is 2.72% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 74.02% which is above the stage 2 screening criteria therefore the impact cannot be immediately screened out. (Table 34) It should be noted that the background PM level accounts for 71.3% of the AQAL.

Contribution from the increased throughput incineration activity at the point of maxima accounts for 0.11% of the assessment level. The biogas engines contribution at the point of maxima is 1.40% indicating that the engines are the main contributor to the NO_x long term impact. (Tables 46 and 50).

Considering identified sensitive receptors, R34 and R27 which are the closest receptors downwind of the point of maxima.

PM_{2.5} Predicted Long Term Impact at Closest Affected Receptors, Data from Tables 50 and 60

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Location	Proposed ACF Only, PC as %AQAL	Proposed Biogas Engines Only, PC as % AQAL	ACF + Biogas Engines, PC as %AQAL	ACF + Biogas Engines, PEC as %AQAL
Maxima	0.21	2.51	2.72	74.02
R27	0.11	0.21	1.01	72.31
R34	0.21	0.87	0.48	72.17

This indicates that the immediate locale may be subject to an impact above 70% of the AQAL and that a small area will be subject to the impact from GRREC but that the AQAL is unlikely to be breached and the impact is not significant. It should be borne in mind that the modelling is worst case and assumes operation for the whole year at the highest permitted emission levels whereas the installation typical running hours are ca 90% of the available hours in a year and that emission levels will be below the maximum emission level allowed.

The results do however indicate that the impact due to emissions from the biogas engines requires further consideration, see Section 5.2.1.3 below.

Volatile Organic Compounds (VOC)

The impact of VOC is estimated assuming as a worst case that all VOC will be in the form of benzene and the impact is assessed against the AQAL for benzene.

The maximum long term annual mean PC is 29.73% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 47.27% which is below the Stage 2 screening criteria but the long-term PC is greater than 20% of the corresponding short-term environmental standard for that substance minus twice the long-term background therefore the impact cannot be immediately screened out at Stage 2 screening. (Table 36) (Table 34)

Contribution from the incineration activity at increased throughput at the point of maxima accounts for 1.27% of the assessment level. The biogas engines contribution at the point of maxima is 28.46% indicating that the engines are the main contributor to the VOC long term impact. (Tables 46 and 50).

Considering identified sensitive receptors, R34 and R27 which are the closest receptors downwind of the point of maxima.

VOC Predicted Impact at Closest Affected Receptors, Long Term Assessment Level, Data from Tables 50 and 61

Location	Proposed ACF Only, PC as %AQAL	Proposed Biogas Engines Only, PC as % AQAL	ACF + Biogas Engines, PC as %AQAL	ACF + Biogas Engines, PEC as %AQAL
Maxima	1.27	28.46	29.73	47.27

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R27	1.27	8.81	10.08	27.62
R34	1.26	7.3	8.56	26.10

This indicates that a small area will be subject to the impact from GRREC but that the AQAL is unlikely to be breached and the impact is therefore not considered significant. It should be borne in mind that the modelling is worst case and assumes operation for the whole year at the highest permitted emission levels.

The maximum daily mean VOC PC is 26.19% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 29.99% and the short-term PC is not less than 20% of the corresponding short-term environmental standard for that substance minus twice the long-term background therefore the impact cannot be considered insignificant at Stage 2 screening. (Table 36)

VOC Predicted Impact at Closest Affected Receptors, Short Term Assessment Level, Data from Tables 50 and 61 and FIN Table 18.

Location	Proposed ACF Only, PC as %AQAL	Proposed Biogas Engines Only, PC as % AQAL	ACF + Biogas Engines, PC as %AQAL	ACF + Biogas Engines, PEC as %AQAL
Maxima	1.63	24.56	26.19	29.99
R27	0.97	5.65	6.07	9.87
R34	0.87	4.54	5.25	9.05

This indicates that a small area will be subject to the impact from GRREC but that the AQAL is unlikely to be breached and the impact is therefore not significant. It should be borne in mind that the modelling is worst case and assumes operation for the whole year at the highest permitted emission levels whereas the installation typical running hours are ca 90% of the available hours in a year and that emission levels will be below the maximum emission level allowed.

The results do however indicate that the impact due to emissions from the biogas engines requires further consideration, see Section 5.2.1.3 below.

Sulphur Dioxide (SO₂)

The maximum daily mean SO₂ PC is 19.88% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 25.39% and the short-term PC is not less than 20% of the corresponding short-term environmental standard for that substance minus twice the long-term background therefore the impact cannot be considered insignificant at Stage 2 screening. (Table 36, extract below)

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Pollutant	Quantity	Headroom ($\mu\text{g}/\text{m}^3$)	Proposed GRREC PC	
			$\mu\text{g}/\text{m}^3$	As % of headroom
Sulphur dioxide	99.18th %ile of daily means	118.1	24.85	21.04%
	99.73rd %ile of hourly means	343.1	38.69	11.28%
	99.9th %ile of 15 min. means	259.1	42.10	16.25%

Oxides of Sulphur Daily Mean Predicted Impact at Closest Affected Receptors, Short Term Assessment Level, Data from Table 50 and FIN Table 15.

Location	Proposed ACF Only, PC as %AQAL	Proposed Biogas Engines Only, PC as % AQAL	ACF + Biogas Engines, PC as %AQAL	ACF + Biogas Engines, PEC as %AQAL
Maxima	0.93	18.95	19.88	25.39
R27	0.7	4.58	4.96	10.47
R34	0.81	3.94	4.64	10.21

This indicates that a small area will be subject to the impact from GRREC but that the AQAL is unlikely to be breached and the impact is therefore not considered significant. It should be borne in mind that the modelling is worst case and assumes operation for the whole year at the highest permitted emission levels.

The results do however indicate that the impact due to emissions from the biogas engines requires further consideration, see Section 5.2.1.3 below.

The maximum 99.73rd percentile of hourly mean SO₂ PC is 11.11% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 13.07% (Table 35) but the short-term PC is less than 20% of the corresponding short-term environmental standard for that substance minus twice the long-term background therefore the impact can be considered insignificant at Stage 2 screening.

Oxides of Sulphur Hourly Mean Predicted Impact at Closest Affected Receptors, Short Term Assessment Level, Data from Table 51 and FIN Table 16.

Location	Proposed ACF Only, PC as %AQAL	Proposed Biogas Engines Only, PC as % AQAL	ACF + Biogas Engines, PC as %AQAL	ACF + Biogas Engines, PEC as %AQAL
Maxima			11.11	13.07
R27	4.05	2.95	6.08	8.04
R34	3.88	2.38	5.42	7.39

This indicates that a small area will be subject to the impact from GRREC but that the AQAL is unlikely to be breached and the impact is therefore not considered significant. It should be borne

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in mind that the modelling is worst case and assumes operation for the whole year at the highest permitted emission levels.

The maximum 99.9th percentile of 15-minute mean SO₂ PC is 17.00% which is above the Stage 1 assessment criteria and cannot be immediately screened out as insignificant. The PEC for the maxima location is 19.59% (Table 35) but the short-term PC is less than 20% of the corresponding short-term environmental standard for that substance minus twice the long-term background therefore the impact can be considered insignificant at Stage 2 screening.

Visible Plume

Combustion plumes contain water vapour which may, during certain weather conditions, condense shortly after leaving the stack to give a visible plume. For this installation, modelling predicts there will be a visible plume for less than 10% of daylight hours and that the maximum predicted plume length will extend beyond the installation boundary up to ca 315m from the stack. The average plume length is approximately 35m which is similar to the predictions for the current operation. Guidance indicates that visible plumes are unavoidable in some cases and assessment on the predicted plume length and frequency suggests the predicted impact is likely to be low – medium, similar to the current operation and that it can be considered acceptable.

GRREC Emission Impact On The Air Quality Management Area

An Air Quality Management area is present in Glasgow City Centre. The AQMA is defined due to the concentration of oxides of nitrogen and particulate matter. The predicted annual mean maximum impact due to GRREC for these substances is 0.36% and 0.04%/0.07% (PM₁₀ / PM_{2.5}) respectively (Tables 58 – 60). The predicted impact of GRREC emissions on the 3 AQMA can therefore be considered insignificant.

Emissions Of Metals

Flue gas emissions may contain a number of metals not included in the assessment above which has already considered mercury, cadmium and thallium. Additional assessment is therefore carried out for other metals including arsenic, antimony, chromium, cobalt, copper, lead, manganese, nickel and vanadium.

A multistage assessment has been carried out to assess the long term and short-term impacts:

Metals Assessment Summary, Long Term Emissions (Table 53)

Stage 1 – assuming as a worst case each metal is emitted at the emission limit value. Screening out impacts lower than 1% PC eliminates all metals from further consideration except arsenic, chromium (VI) and nickel.

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Stage 2 – assume each metal is emitted at levels indicated in guidance. Screening out impacts lower than 1% PC eliminates chromium (VI) from further consideration leaving arsenic and nickel.

Stage 3 – screening out where the PEC is less than 70% screens out both arsenic and nickel indicating the emissions of metals can be considered insignificant.

Metals Assessment Summary Short Term Emissions (Table 56)

Stage 1 – assume each metal is emitted at the emission limit value. Screening out impacts lower than 10% PC eliminates all metals except copper.

Stage 2 – assume each metal is emitted at levels indicated in guidance. Screening out impacts lower than 10% PC eliminates copper indicating the emissions of all metals can be considered insignificant.

Reference: 3675-0320-0007 Dispersion Modelling Assessment_r1

5.2.1.2 Dispersion Modelling Results – Abnormal Operation

Under abnormal operating conditions a short period of operation of up to 4 hours per occasion up to a maximum total of 60 hours per year at higher emission limits as set out in permit table 6.2a is allowed. Permit Table 6.2a contains limits for carbon monoxide and total organic carbon (TOC), these limits are the same as during normal operation and the impact due to these emissions is discussed in 5.2.1.1 above where necessary. During normal operation an emission limit value of 30mg/Nm³ is applied as a 30-minute average for particulate matter, during abnormal operation this emission limit is changed to 150mg/Nm³ and the impact due to this is discussed below.

As the elevated emission is permitted for only a short period, assessment against short term Air Quality Assessment Levels is most appropriate assuming 4 hours emission and against longer term AQAL assuming 60 hours total emission at the elevated emission limit value per year. It is also assumed that all three incinerator Lines are operating abnormally at the same time which is unlikely. This is therefore a conservative worst-case assessment.

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Particulate Matter (PM₁₀)

Short Term Impact Summary (Table 4, background taken from Table 48 of dispersion submission)

Normal Operation Short Term Process Contribution, %AQAL	Abnormal Operation Short Term Process Contribution, %AQAL	Normal Operation Short Term Predicted Environmental Concentration, %AQAL	Abnormal Operation Short Term Predicted Environmental Concentration, %AQAL
0.28	1.63	53.84	56.54

This indicates that no assessment thresholds are breached, and the emission can be considered as insignificant.

Long Term Impact Summary (Table 4, background taken from Table 48 of dispersion submission)

Normal Operation Short Term Process Contribution, %AQAL	Abnormal Operation Short Term Process Contribution, %AQAL	Normal Operation Short Term Predicted Environmental Concentration, %AQAL	Abnormal Operation Short Term Predicted Environmental Concentration, %AQAL
0.11	0.14	33.58	33.65

This indicates that no assessment thresholds are breached, and the emission can be considered as insignificant.

Other Parameters

A number of other parameters are modelled at estimated maximum plausible emission levels to provide information on theoretical emission levels in the case of a significant process excursion. It should be noted that any breach of an emission limit should result in immediate action to prevent, or where that is not practical, reduce emissions from the incineration process and restore compliance in the shortest possible time: the 4 hour allowance discussed above does not apply except to the specific parameters noted above where the incineration plant is operating in Abnormal Operation. In addition, if any permit emission limit breach poses immediate danger to human health, then operation must be suspended until compliant operation can resume.

Generally, the process contribution impacts are below the relevant assessment thresholds where they may be considered immediately insignificant. For those parameters where the predicted PC means the impact cannot immediately be considered insignificant, the PEC remains below the Air Quality Assessment Level which, given the conservative nature of the assessment, suggests the risk of breach of an Air Quality Assessment Level is low.

Reference: 3675-0320-0008 Abnormal Emissions Assessment_r1

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5.2.1.3 AD Biogas Engines

The original operational design mode for the AD plant was for the AD digestate to be partially dried in a digestate dryer which used the waste heat in the biogas engine flue gases to dry the digestate. The exhaust gases from the dryer laden with odour, moisture and particulate were to be transferred into the odour abatement system for treatment before being discharged via the 70m odour abatement stack in the main windshield. However, the dryer has not been commissioned, and the biogas engines currently continuously discharge via their 26m direct emission stacks.

In the original air impact modelling assessment, it was assumed that the engines would discharge via the direct emission stacks for only a short period on startup until digestate was being produced and the dryer was started. Modelling has now been updated to assume that the biogas engines discharge via the bypass stack continuously to reflect the current operation. Assessment of the revised model has resulted in a requirement to modify the permit controls.

Pollutant levels in the emissions from the engines may be considered to meet anticipated guidance but the modelled impact resulting from these emissions indicates the impacts are not considered to represent BAT and additional pollution control measures are required. The shaded cells below indicate where predicted the process contribution (the emissions from GRREC) exceed either long term (annual) or short term (daily or shorter period) significance thresholds. The thresholds for insignificance are below 1% of the Air Quality Assessment Level (AQAL) for long term and below 10% for short term.

Table 1: Biogas engines dispersion modelling results – PPC Permit variation application

Pollutant	Quantity	Units	AQAL	Pt of max impact		Max impact at receptor	
				Conc.	% of AQAL	Conc.	% of AQAL
Nitrogen dioxide	Annual mean	µg/m ³	40	4.51	11.27%	1.34	3.34%
	99.79th %ile of hourly means	µg/m ³	200	22.68	11.34%	10.26	5.13%
Sulphur dioxide	99.18th %ile of daily means	µg/m ³	125	24.85	19.88%	10.90	8.72%
	99.73rd %ile of hourly means	µg/m ³	350	38.69	11.05%	17.36	4.96%
	99.9th %ile of 15 min. means	µg/m ³	266	42.09	15.82%	19.68	7.40%
Particulates (PM ₁₀)	Annual mean	µg/m ³	18	0.27	1.51%	0.08	0.45%
	98.1st %ile of daily means	µg/m ³	50	1.47	2.95%	0.89	1.78%
Particulates (PM _{2.5})	Annual mean	µg/m ³	10	0.27	2.72%	0.08	0.81%
Carbon monoxide	8 hour running mean	µg/m ³	10,000	173.23	1.73%	83.68	0.84%
	Hourly mean	µg/m ³	30,000	200.16	0.67%	116.02	0.39%
VOCs (as benzene)	Annual mean	µg/m ³	3.25	0.97	29.73%	0.29	8.81%
	Daily mean	µg/m ³	30	7.86	26.19%	3.17	10.57%

The AD plant is currently running down in preparation for a planned shutdown for cleaning, maintenance and overall condition assessment, and therefore the engines are not in use as gas production rates are very low and the small quantity of biogas produced is being intermittently flared. The length of the shutdown is currently uncertain and dependant on the condition of the plant when inspected. Discussion with the Operator indicates that development of a detailed improvement plan will take some time and, as the engines will not resume operation until the AD plant restarts, new conditions are proposed which require that improvement measures are implemented within ca 9 months of date of issue of this variation or, in the case the AD plant remains shutdown for maintenance on this date, by the date where the wet feed preparation operation restarts.

Reference: 3675-0320-0007 Dispersion Modelling Assessment_r1

5.2.1.4 Human Health Risk Assessment

In assessing the risk to human health, the outputs from the air dispersion study are used. The air dispersion model assumes worst case conditions in predicting the impact of the GRREC activities. The methodology used in assessing the risk to human health has been reviewed and

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is acceptable. Based on the outcomes of the assessment, the risk to human health is insignificant.

Reference: 3675-0320-0009SMN Dioxin Pathway Assessment_r1

5.2.2 Fugitive emissions to air:

There will be no change to the arrangements for controlling fugitive emissions to air. It is therefore anticipated that there will be no change to the impact due to the throughput increase proposed.

5.2.3 Odour:

There will be no change to the arrangements for reception, treatment and temporary storage of odorous non-hazardous waste awaiting treatment and eventual incineration. Areas containing odorous waste will continue to be extracted to an odour abatement system as they currently are. It is therefore anticipated that there will be no change to the odour impact due to this proposal and no change to the current permit conditions controlling odour are proposed.

5.3 Emissions to Water

Point Source Emissions to Surface Water and Sewer:

Discharges to sewer via permitted discharge point W1 are controlled by conditions in Schedule 7 of the permit. This discharge is mainly filtered AD digestate liquid treated in a Sequenced Batch Reactor (SBR) to reduce residual pollutants in the digestate liquor including COD and ammonia. With increased throughput it is anticipated that additional digestate liquor will be produced but this will not exceed the design capacity of the SBR treatment system. Therefore, the concentration-based discharge emission limits set in Table 7.1 and the continuous monitoring requirements for pH, flow and temperature which were recently reviewed as part of an assessment to ensure Best Available Techniques were being deployed remain appropriate.

This discharge is also subject to controls applied through a Trade Effluent Consent (TEC) granted by Scottish Water for this discharge to sewer including concentration-based emission limits, flow and temperature limits. Scottish Water regulate this consent and would take any necessary action where required, the throughput increase is not anticipated to affect compliance with the TEC.

Point source emissions to surface water and discharged to the local Sustainable Urban Drainage (SUDs) system via permitted discharge point W2 comprise rainwater collected from

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areas of the facility with low risk of contamination and the proposed increase in throughput will not affect these areas.

Point Source Emissions to Groundwater:

There will be no emissions of pollutants to soil or groundwater as a result of this proposed change and no change to the current permit conditions controlling emissions to ground and groundwater are proposed.

Fugitive Emissions to Water:

There will be no fugitive emissions of pollutants to water as a result of this proposed change and no change to the current permit conditions controlling fugitive emissions to the water environment are proposed.

5.4 Noise

The increased throughput will result in increased vehicle movements to deliver additional waste fuel and raw materials and remove recyclates and residues. This is given as one additional vehicle movement per hour on average during daytime hours. Deliveries are not usually received during evenings or overnight.

The additional vehicle movements are not assessed as likely to significantly increase the noise impact and no additional controls are proposed.

5.5 Resource Utilisation

Water use

Additional water use is indicated, and this represents an additional 30m³/day or ca 1.25m³/hour assuming a pro rata increase scaled on throughput. SEPA will maintain the usage under review via the submissions against the existing resource reporting requirements (Condition 2.6.4).

Material	Current Annual Usage, t	Proposed Annual Usage, t
Water	39820	51000

Reference: Application Supporting Information S3675-0320-0004KLH, Section 3.2

Energy use and generation

A revised heat and power plan has been generated to reflect the energy balance at the higher throughput. This indicates that with no heat exported from the site (some heat is used within the site) the overall energy efficiency is predicted to be 20.1% which is above the 20% startup threshold in SEPA’s Thermal Treatment of Waste Guidelines. The TTWG also contains longer

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term energy efficiency thresholds and export from GRREC of ca 7MW_{th} of heat would be required to meet the minimum long term energy efficiencies. It should be noted that although individual Lines and electricity export started earlier, consistent three Line incineration operation first started in late 2019 with 2020 therefore being the first year of operation where the scope of the Heat and Power Plan could be fully realised. It is anticipated that compliance with the long-term energy efficiencies in the TTWG would be achieved in around 7 years.

The Waste Incineration BAT conclusions also contain thresholds for gross energy efficiency: the calculated efficiency for electricity only generation (no heat export) is within the BATc efficiency range. Export of heat reduces the steam available for electricity generation and consequently reduces the electrical efficiency however the overall energy efficiency of the facility (electricity + heat export) increases.

The throughput trial suggested that although operation at higher throughput requires more parasitic energy (energy used to operate the process equipment) it also results in increased steam production with consequent higher electrical energy production at the steam turbine and electrical energy export to the grid. The net effect is assessed to result in better overall electrical energy efficiency.

The permit already contains conditions to require operation such that energy recovery takes place with a high degree of energy efficiency (Condition 2.7.1). Submission of an annual Heat and Power Plan is required (Condition 2.7.2) and this will be used to monitor progress against energy efficiency targets.

In the case of a modification which could significantly affect energy efficiency, Condition 2.7.7 requires a performance test to be completed. The Operator will be required to carry out a performance test within 6 months of issue of this variation, and a condition is included to that effect.

Throughput

The change in approach to calculation of the theoretical annual throughput results in a significant change in the headline throughput for the plant from 154000t/a to 197100t/a. This is a worst-case approach in assuming continuous operation at the proposed throughput for the whole year uninterrupted.

The throughput achievable is dependent on the heating value (calorific value or CV) of the waste being combusted. Lower CV waste can be combusted at higher rates without thermally overloading the heat recovery system or mechanically overloading the fuelling systems and

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grate. Viridor have provided information from trials on the plant systems and in the response to the Further Information Notice to confirm that systems such as those which prevent mechanical or thermal overload of the incinerators and that pollution control systems such as for lime and activated carbon dosing to combustion flue gases are capable of ensuring compliant operation at the maximum proposed throughput. The revised firing diagram (Figure 2 in the Heat and Power Plan) indicates waste in the range 8 – 10MJ/kg could be charged to each Line up to a maximum 7.5t/h. Higher CV waste can only be charged at lower throughputs.

It is proposed to allow the increase in incineration throughput and Condition 4.2.2 is adjusted to suit as set out in section 8 below.

Reference: Heat and Power Plan S3675-0320-0005

Further Information Notice Response to Question 4, Description of loading controls

Raw Materials Selection and Use

Increased raw material use is required at higher throughput rates, particularly for flue gas abatement materials: lime and activated carbon with consequent increase in residue production. Again, this is calculated assuming a pro rata increase scaled on throughput. SEPA will maintain the usage under review via the submissions against the existing resource reporting requirements (Condition 2.6.4).

The automatic control system will adjust the dosing rate of the flue gas treatment materials to ensure emission limits are met with the minimum materials usage.

Existing permit Condition 8.2.1 requires a review of the potential for reuse of a portion of the Air Pollution Control residue (APCr) generated by the flue gas treatment system. APCr is a mixture of lime and activated carbon added to the combustion gases to abate pollutants and is filtered out of the flue gas stream prior to discharge. The abatement capability of the APCr is not exhausted during the first contact with flue gases and a portion may be recycled for reuse which reduces the demand for raw materials. This assessment will require to be repeated to ensure the use of raw materials is minimised and the date for the next review of the potential for recycling APCr is adjusted to require the assessment be repeated within 6 months of the date of issue of this variation.

Material	Current Annual Usage, t	Proposed Annual Usage, t
Lime	2800	3600
Activated carbon	98	125

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There is no proposal to change the type of abatement materials in use at this facility, and this is accepted.

Reference: Application Supporting Information S3675-0320-0004KLH, Section 3.3

5.6 Waste Management and Handling

Waste Minimisation

Due to the increase in residual waste processed and the requirement for increased use of flue gas treatment materials, increased residue quantities will be produced. Again, this is calculated assuming a pro rata increase scaled on throughput. This will continue to be dispatched to licensed waste treatment facilities for recycle or disposal.

Residue	Current Annual Arisings, t	Proposed Annual Arisings, t
Incinerator Bottom Ash (IBA)	28385	36500
Air Pollution Control residue (APCr)	12144	15500

It should be noted that the quantity of IBA generated is dependent on the quality of the waste received for incineration and the efficiency of the Materials Recycling Facility in removing incombustible constituents of the waste, such as metals, prior to incineration. GRREC are expected to discuss the quality of the waste received with their suppliers to ensure where practical incombustible wastes are excluded from the waste stream.

Existing permit Condition 8.2.1 requires a review of the potential for reuse of a portion of the Air Pollution Control residue generated by the flue gas treatment system. This is a mixture of lime and activated carbon filtered out of the flue gas stream prior to discharge. This assessment will require to be repeated to ensure the use of raw materials is minimised and the date for the next review of the potential for recycling APCr is adjusted to require the assessment be repeated within 6 months of the date of issue of this variation.

Reference: Application Supporting Information S3675-0320-0004KLH, Section 3.3

Waste Handling

There are no planned changes to waste handling arrangements: IBA will continue to be quenched and stored on impervious flooring until removed from site and APCr will be filtered out of the flue gases and stored in an above ground silo until removed from the facility.

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Additional incoming waste will be received and temporarily stored in the reception hall, processed in the MRF and transferred to the fuel bunker for feeding the incinerators.

An 'Organic fraction' recovered in the MRF is pretreated in the wet preparation area to produce the feed for the anaerobic digesters.

The current facilities are suitable for the increased throughput.

Reference: Application Supporting Information S3675-0320-0004KLH, Section 3.3

Waste Recovery or Disposal

Where practical IBA will be recycled through offsite recovery of IBA Aggregate and disposed of in a licensed facility.

APCr from this facility is not currently recycled and must be disposed of as hazardous waste.

Due to its content of plastics and other contaminants, the anaerobic digestate produced at this plant is not of suitable quality for use on agricultural land or for land remediation. AD digestate solids are added to the residual waste output from the MRF and incinerated.

Reference: Application Supporting Information S3675-0320-0004KLH, Section 3.3, Appendix I

5.7 Management of the site

Environmental Management System

The proposed increase in throughput will not require revision of the facility Environmental Management System. The processes and procedures will continue to be applicable to the activities at their increased scale.

Reference: Application Supporting Information S3675-0320-0004KLH, Section 3.9, Appendix I

Accidents and their Consequences

No new accident scenarios are introduced by the proposed throughput increase. It is possible that average and peak waste storage quantities may increase which could increase the severity of some accidents such as a waste fire in the fuel bunker. Incident prevention, detection and response systems will continue to be effective: the maximum permitted waste quantities which may be held at the facility and the locations of the waste are unchanged.

Closure

There will be no new equipment required to facilitate the throughput increase and no increased risk to soil and groundwater which could result in change to the site condition. It is therefore

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anticipated that the increased throughput will not result in any additional concerns re closure of the facility at the end of its life.

5.8 Site Condition report

No changes are proposed to the measures to protect soil and groundwater and the nature of the wastes handled and the activities carried out is also unchanged. It is therefore anticipated that there will be no additional risk to soil and groundwater.

Periodic review of the inspection and maintenance of measures required to protect soil and groundwater will continue e.g. bund condition, floor and floor joint condition etc.

5.9 Monitoring

Air

Extensive continuous and periodic emission monitoring and reporting requirements are already contained in the permit for ongoing operation. These were recently reviewed and updated to meet the expectations of Best Available Techniques (BAT) and continue to represent BAT at increased throughput. In the short-term during early operation at increased throughput additional monitoring has been required for some periodically monitored substances, see Section 5.10 below for further details.

Reference: Application Supporting Information S3675-0320-0004KLH, Appendix I

Water

Continuous and periodic emission monitoring and reporting requirements are already contained in the permit. These were recently reviewed and updated to meet the expectations of Best Available Techniques (BAT) and continue to represent BAT at increased throughput.

Soil and Groundwater

No changes are proposed to the measures to protect soil and groundwater and the proposed increase in throughput does not increase the risk to soil and groundwater. Conditions are in place to protect soil and groundwater and to require soil and groundwater monitoring. These were recently reviewed and updated to meet the expectations of Best Available Techniques (BAT) and continue to represent BAT at increased throughput.

Waste

Monitoring and reporting requirements in respect of the main waste arisings, APCr and IBA, are already contained in the permit for ongoing operation. These were recently reviewed and updated to meet the expectations of Best Available Techniques (BAT) and continue to represent

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BAT at increased throughput. In the short-term during early operation at increased throughput additional monitoring has been required for Total Organic Carbon content in Incinerator Bottom Ash, see Section 5.10 below for further details.

5.10 Consideration of BAT and compliance with BAT-Cs if appropriate

MRF

The MRF is designed to be shut down for a period each day to facilitate cleaning and maintenance and therefore does not operate continuously 24/7. It is intended to operate the MRF for a longer period each day to achieve the increased throughput rather than running the MRF at higher throughput. Therefore, the efficiency of the MRF operation in terms of separation of recoverable materials is not anticipated to change and changes to the equipment are not required.

Longer operation reduces the time available for cleaning and maintenance of the MRF, and this could in the long-term affect the MRF performance. The impact of longer operational hours will be kept under review via the requirement to submit an annual MRF report (Condition 4.5.1).

A typographical error is noted in the heading to Table 4.6 of the permit, and this opportunity will be taken to correct it from 4.1.74.1 to 4.5.1.

Anaerobic Digestion (AD)

Unlike the MRF, the AD plant is designed to operate 24/7 and increased throughput and production of 'organic stream' will require the AD plant throughput to increase. No increase in the permitted limit for organic waste treatment is requested and therefore operation at the increased throughput will remain within the existing operational and permitted envelope where the waste throughput and biogas production rate etc are within design and permit parameters. No changes to equipment are required to facilitate the increase.

Biogas Engines Emissions

Review of the impact due to emissions from the biogas engines suggest the engines are the major contributor for NO_x, PM and VOC. It should be borne in mind that the impact assessment is based on emission at the emission limit value as a worst case and not at the normal actual emission levels which are generally lower than the ELVs.

The current permit emission limits are set based mainly on MCPD and BAT requirements.

A requirement to provide further information was included in the Further Information Notice to require the Operator to review and report on how emissions from the biogas engines and therefore impact due to their operation could be reduced and minimised and provide an

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improvement plan. The review included consideration of stack height, operational changes and abatement technology for NO_x, SO_x, PM and VOC. Following discussion, taking into account a planned shutdown where the biogas engines will not be operating, a new permit condition is proposed to require that the impact from the AD biogas engines be reduced within a defined timeframe or, should the planned startup date be delayed, improvements to reduce the biogas engine impact must be implemented before the AD plant restarts, see section 5.2.1.3 above for further discussion.

Incineration Plant

Review of the actual emissions during the trial period as monitored by CEMs and periodic monitoring indicate that the incineration plant will continue to be able to meet the current permit BAT conclusions based limits at the proposed increase in throughput and the change in impact will be small and tolerable.

Air Emissions

Oxides of Nitrogen

NO_x reduction in the incineration Lines at GRREC is based on flue gas recirculation and close control of combustion conditions to minimise emissions. Other NO_x reduction technologies such as Selective Catalytic Reduction (SCR) or Selective Non-Catalytic Reduction (SNCR) are not currently deployed. An existing permit condition is in place to require the Operator to carry out trials to establish whether NO_x emissions can be reduced further and the outcomes of the trial will be used to assess whether additional NO_x reduction measures should be deployed.

The current NO₂ daily average limit is set at the top of the BATc range at 180mg/Nm³. Following the submission of the updated air dispersion modelling assessment based on real emissions and the NO_x reduction trial submission, the potential for further reduction of the NO_x emission limit will be considered.

Use of lime and activated carbon remain appropriate for acid gas, metals and dioxin and furan abatement. An assessment will be required into the feasibility and benefits of recirculation of a portion of the APCr.

Incineration Plant Flue Gas Residence Time

Increased throughput has the potential to affect the residence time within the incinerator. Regulations require that incineration flue gases for non-hazardous waste incinerators are normally held at 850°C for a residence time of at least 2 seconds to denature pollutants.

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Measurement of the residence time on each separate Line was carried out during trials to assess the residence time at the higher throughput rates and a report was provided. The information in the initial report was insufficient, and the Further Information Notice and subsequent informal requests required resubmission with additional information. The submission confirms that a worst-case residence time of 2 seconds will be achieved at the higher throughput rates. A Condition is proposed to require the residence testing to be repeated during an early stage of higher rate operation to revalidate the results as the testing during the trial found inconsistencies in the residence times for the three identical Lines and one instrument was malfunctioning during a test.

The frequency of periodic monitoring for dioxin and dioxin like materials in flue gases and for Total Organic Carbon in bottom ash is increased temporarily until the residence time tests are repeated to ensure that emissions remain compliant.

References: Application Supporting Information S3675-0320-0004KLH, Appendix I

Appendix F - GRREC Throughput Trial 3 Full Report

Further Information Notice Responses to Question 1, Residence Time Report

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 sites designated under the above legislation?	Yes
If yes, provide information on the action and justification below:	
Appendix 2 lists the ecological receptors identified in the original model and additional receptors considered in the response to the further information notice.	
The assessment methodology and outcomes have been reviewed and appear valid: no significant impact is predicted at any ecological receptor.	
Screening distance(s) used	15 km

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Is there any other legislation that was considered during determination of the permit (for example installations that may be impacted by the requirements of legislation involving Animal By Products, Food Standards, Waste, WEEE regulations etc).	Yes
If yes, provide information on the legislation, action and justification below:	
The throughput increase will require additional waste to be received at the installation. The nature and quality of the waste will be similar to current waste. Incidental items of Waste Electrical and Electronic Equipment may be anticipated to be in this waste stream. Source separation by the consumer and removal of larger items of WEEE in the waste before processing will minimise the quantity of WEEE incinerated.	
Officer	CO

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?	
An EIA has not been required for this change. 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?	
The COMAH Regulations do not apply to this installation.	
Officer:	CO

8 Details of the permit	
Do you propose placing any non-standard conditions in the Permit?	Yes
Do you propose making changes to existing text, tables or diagrams within the permit?	Yes
Outline the changes required and provide justification below:	

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Schedule Ref No	Proposed Condition Number:	Proposed Change:	Justification:
1	2.7.10	<p>A new Condition is inserted as follows:</p> <p>2.7.10 Within 6 months of the date of issue of variation VAR03 the Operator shall have carried out a Performance Test as defined in Condition 2.7.7 with the results of the test reported within three months of the test being carried out.</p>	<p>Where there is a change which could affect the energy efficiency a repeat of the gross energy efficiency Performance Test is required. This condition specifically requires the test be completed within 6 months of issue of the variation and reported three months after test completion.</p> <p>Existing condition 2.7.8 requires submission of a test protocol three months prior to the test being carried out.</p>
2	4.2.2	<p>Existing The aggregate amount of the wastes specified in Condition 4.1.1 that may be incinerated in the Permitted Installation shall not exceed 154,000 tonnes in any calendar year and shall not exceed an average of 6.5 tonnes per hour per line in any calendar day</p> <p>Proposed The aggregate amount of the wastes specified in Condition 4.1.1 that may be incinerated in the Permitted Installation shall not exceed 197,100 tonnes in any calendar year and shall not exceed 7.5 tonnes per hour per line.</p>	<p>Allows increased throughput up to 7.5t/h and the annual equivalent (7.5t/h x 3 lines x 8760h/year)</p>

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3	Table 4.6	<p>Existing <u>Required by Condition 4.1.74.1</u></p> <p>Proposed <u>Required by Condition 4.5.1</u></p>	To correct a typographical error, the reference to Condition 4.1.74.1 is changed to 4.5.1.
4	5.5.2	<p>New Conditions are inserted as follows:</p> <p>5.5.2 Within 8 months of the date of issue of variation VAR03 additional Residence Time Tests shall be performed on all incineration Lines and a detailed report containing the results of the Residence Time Test shall be submitted.</p> <p>5.5.2.1 An interim summary report on the outcome of the Residence Time Tests required by condition 5.5.2 may be submitted before the detailed report required by condition 5.5.2 is submitted.</p>	This condition requires residence time testing and reporting to be completed within 8 months of the throughput increase.
5	6.5.2	<p>A new Condition is inserted as follows:</p> <p>6.5.2 Within 12 months of Date of issue of this variation the Operator shall submit in writing to SEPA, an updated air dispersion modelling assessment and updated Human Health Risk Assessment for NO₂, SO₂, PM₁₀ and PM_{2.5}, VOCs as benzene, VOCs as 1,3 butadiene, dioxins and furans, dioxin-like PCBs and Group 1, 2 and 3 heavy metals based on emissions at actual</p>	This condition is based on the template condition for new facilities. The submission date is timed to allow a period of ca 9 months to achieve stable operation at the increased throughput.

		concentrations from Emission Points A1, A2 and A3 at the point of maximum deposition and at sensitive receptors. The report shall include modelling of speciated Group 3 metals based on results of periodic monitoring from Emission Points A1, A2 and A3.	
6	Table 6.2	See Appendix 3 below for details.	Periodic monitoring of 'Polychlorinated dibenzo-p-dioxins and furans (PCDD/F) (I-TEQ)', 'PCDD/F (WHO-TEQ Humans/Mammals, Fish, Birds)', 'Dioxin-like PCBs (WHO-TEQ Humans/Mammals, Fish, Birds)' and 'Specific individual polycyclic aromatic hydrocarbons (PAHs)' in emissions to air are increased in frequency to once per month until condition 5.5.2 or 5.5.2.1 above is satisfied to ensure emissions remain in compliance during the early period where throughput is increased and until confirmation of the residence time test results is provided.
7	Table 8.1	See Appendix 3 below for details.	Periodic monitoring for Total Organic Carbon in Incinerator Bottom Ash is increased in frequency temporarily until condition 5.5.2 is satisfied to

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			ensure residue quality remains in compliance during the early period where throughput is increased and until confirmation of the residence time test results is provided.
8	10.3.1	<p>Existing condition 10.3.1 requiring modelling is deleted and New Conditions are inserted as follows:</p> <p>10.3.1 By 30 September 2026 or, where this is later, before the anaerobic digestion wet preparation feed plant resumes operation, the Operator must implement additional measures to decrease the impact due to emissions of NOx, SOx, VOC and PM from the biogas engines discharging via Emission Points A6 and A7.</p> <p>10.3.1.1 The Operator must submit an improvement plan 3 months before the additional measures are planned to be installed which defines and justifies the additional measures to be implemented including where necessary a Sensitivity Analysis and/or a Cost Benefit Analysis and which defines the anticipated impact reduction which will be achieved.</p>	<p>The impact due to emissions from the AD engines is modelled above the thresholds of insignificance for some parameters and improvement is required to ensure that necessary and cost-benefit justified improvements are implemented to reduce the impact from the emissions. Improvements are required within ca 9 months from issue of the variation. The feed preparation area for the AD plant known as the wet preparation plant is offline for plant maintenance, and the restart date depends on the maintenance work to be completed. Where the AD plant has not restarted by 30 September 2026, the condition requires the improvements to be implemented prior to restart. In either case SEPA requires to be informed of the planned measures via the need for prior</p>

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			submission of an improvement plan.
9	Table 2.1	<p>See Appendix 3 below for details.</p> <p>Existing In Table 2.1 the existing entry for Condition 8.2.1 requires submission of a reassessment of the potential for recirculation of APCr by 30 November 2024 and every 4 years thereafter.</p> <p>Proposed The due date for submission of the next reassessment will be changed to ~6 months after issue of this variation.</p>	<p>The rows in Table 2.1 for Conditions '8.1.6 & table 8.1', and '8.2.1' are deleted and replaced with new rows to ensure reporting matches the proposed changes to these conditions already discussed above.</p> <p>Increased throughput will result in increased use of raw materials including flue gas abatement chemicals, and the increase may be partially offset though recirculation of APCr. This will also reduce the quantity of APCr which requires to be disposed of a hazardous waste.</p>
10	Table 2.1	See Appendix 3 below for details.	Table 2.1 collects the reporting requirements and requires updating to reflect the changes. Where submissions are required by the above changes, Table 2.1 will be updated to define the reporting requirements.

Officer:	CO
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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
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Outline the changes required and provide justification below:

ELVs were reviewed as part of the determination. No changes to the current ELVs are proposed as a consequence of the proposed change. Review of the actual emissions at the increased throughput may be carried out once sufficient data has been generated at the new operating conditions to assess whether performance-based emission limit reductions may be implemented.

Officer: CO

10 Peer Review

Has the determination and draft permit been Peer Reviewed?	Yes
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Comments made:

Comments were provided during the drafting of the Variation Notice and Decisions Documents and have been incorporated.

Officer: PR

11 Final Determination

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

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

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

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Appendix 1: Modelled Sensitive Human Receptor Locations

Table 5: Sensitive Receptors

ID	Receptor name	Location		Maximum height modelled (m)	Distance from the ACF Stack (km)
		X (m)	Y (m)		
R1	Mayfield Nursery	258958	662208	1.5	0.7
R2	Holyrood Secondary School	259176	662209	4.5	0.5
R3	Holybrook School	258990	662678	4.5	0.7
R4	Holy Cross R C Primary School	258897	662632	4.5	0.8
R5	Victoria Primary School and Nursery	258950	662798	1.5	0.8
R6	Bright Beginnings Nursery	259028	661653	1.5	0.9
R7	Hapden Primary School	259793	663073	1.5	0.8
R8	St Brigid's R C Primary School	260108	661693	1.5	0.8
R9	Ardnahoe Nursery School	259793	661585	1.5	0.7
R10	Toryglen Primary School	260336	661566	4.5	1.0
R11	Annette Street Primary School	258555	662684	10.5	1.1
R12	King's Park Primary School	259560	660901	4.5	1.4
R13	Bankhead Primary School	260654	661183	4.5	1.5
R14	Sacred Heart Primary School	260830	663580	4.5	1.7
R15	Langside College	258409	661520	10.5	1.5
R16	Govanhill Health Centre	258694	662740	4.5	1.0
R17	New Victoria Hospital	258380	661830	10.5	1.3
R18	The Priory Hospital	257727	661598	10.5	2.0
R19	Dixon Road	259245	662289	4.5	0.4
R20	Govanhill Street	259225	662592	4.5	0.5
R21	Prospecthill Drive	259036	661770	4.5	0.8

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ID	Receptor name	Location		Maximum height modelled (m)	Distance from the ACF Stack (km)
		X (m)	Y (m)		
R22	Kerrycroy Avenue	259463	661548	4.5	0.8
R23	Prospect Hill Road	259745	662156	4.5	0.2
R24	Crossbank Drive	259962	662223	4.5	0.3
R25	Crossbank Crescent	259917	662091	4.5	0.4
R26	Kilbride Terrace	259629	663113	10.5	0.8
R27	Inchgarvey Loan	260118	662817	16.5	0.7
R28	Prospect Hill Oval	259676	662075	10.5	0.2
R29	Orchard Grove Care Home	259750	661956	4.5	0.4
R30	Orchard Grove Care Home	259690	661917	4.5	0.4
R31	Myrtle View Road	259151	661885	22.5	0.6
R32	Newhall Street	260599	663320	4.5	1.4
R33	Richmond Park Gardens	260065	663150	10.5	0.9
R34	Old Polmadie Road	260010	663005	10.5	0.8
R35	Greenhead Street	260475	663495	7.5	1.5
R36	Reid Street	260820	663750	7.5	1.9
R37	Springfield Road	261400	663105	7.5	1.9
R38	Barrowfield Drive	261440	663985	4.5	2.5
R39	Ruby Street Tower Block	261060	663670	49.5	2.0
AQMA	Glasgow City Centre AQMA	259410	664450	1.5	2.1
A1	Kings Acre Allotment Gardens	259549	661205	1.5	1.1
A2	Mansewood Allotments	255637	660176	1.5	4.5
A3	Merrylee Allotments	257433	660479	1.5	2.9
A4	Berridale Allotments	258518	660406	1.5	2.2
A5	Holmlea Gardens Allotments	258534	660950	1.5	1.7
A6	Westhorn Allotments	262485	663156	1.5	3.0
A7	Queen's Park Allotments	257880	662015	1.5	1.8
A8	Malls Mire Community Garden	259650	662150	1.5	0.2

Note:

All receptors have been modelled at 0 and 1.5 m and then at 3 m intervals until the maximum height modelled. For instance R2 has been modelled at 0, 1.5 and 4.5 m, and R36 has been modelled at 0, 1.5, 4.5, and 7.5 m.

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Appendix 2: Modelled Sensitive Ecological Receptor Locations

Original Modelled Ecological Receptors

Table 6: Sensitive Ecological Receptors

ID	Name	Location		Distance from stack at closest point (km)
		X (m)	Y (m)	
European and UK designated sites				
E1	Black Cart Moss SPA and SSSI	248690	668050	12.4
E2	Inner Clyde SPA and SSSI	249270	669635	12.7
E3	Waukenwae Moss SAC and SSSI	267990	651650	13.5
E4	Cart and Kittoch Valleys SSSI	258750	658410	4.0
E5	Possil Marsh SSSI	258450	669510	7.3
E6	Calder Glen SSSI	266500	656250	9.2
E7	Bothwell Castle Grounds SSSI	268510	659830	9.2
E8	Cadder Wilderness SSSI	259325	671600	9.3
E9	Bishop Loch SSSI	268180	666620	9.6
E10	Blantryre Muir SSSI	266030	652915	11.4
E11	Woodend Loch SSSI	270150	666760	11.4
E12	Hamilton Low Parks SSSI	271250	658350	12.3
E13	Brother and Little Lochs SSSI	250870	653145	12.7
E14	Mugdock Wood	255340	675750	14.1
E15	South Braes	261550	676950	14.8
Local sites				
E16	Malls Mire LNR	Maximum across site		0.5

Additional Assessed Ecological Receptors in Further Information Notice Response

Table 1: Additional SSSIs included in assessment

ID	Name	Type	Location		Distance from stack at closest point (km)
			X (m)	Y (m)	
E17	Bargeny Hill	Biological	260801	673962	11.7
E18	Mollinsburn Road Cutting	Geological	271180	671707	14.8
E19	Boylestone Quarry	Geological	249428	659727	10.5
E20	Rouken Glen	Geological	254731	658284	6.3
E21	Waulkmill Glen	Geological	252245	658536	8.3
E22	Fossil Grove	Geological	253826	667308	7.7
E23	Manse Burn	Geological	253078	673256	12.8

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Appendix 3: Draft Variation Conditions – Large Tables (See section 8 above)

Point 6 in Section 8 - Updated Table 6.2 Entries

Emission Point	Parameter	Emission Limit Value (including unit)	Reference period	Monitoring frequency Note 7	Monitoring standard or method
A1, A2 and A3	Polychlorinated dibenzo-p-dioxins and furans (PCDD/F) (I-TEQ)	0.06 ng I-TEQ/Nm ³	Single measurement of 6 to 8 hours	Periodic Measurement each month until Condition 5.5.2 or 5.5.2.1 is satisfied, then once every 6 months	BS EN 1948-1,2 and 3
	PCDD/F (WHO-TEQ Humans / Mammals, Fish, Birds)	None set			
A1, A2 and A3	Dioxin-like PCBs (WHO-TEQ Humans / Mammals, Fish, Birds)	None set	Average value over single measurement of 6 to 8 hours.	Periodic Measurement each month until Condition 5.5.2 or 5.5.2.1 is satisfied, then once every 6 months	BS EN 1948 Parts 1, 2 and 4
A1, A2 and A3	Specific individual poly-cyclic aromatic hydrocarbons (PAHs) Note 6	None set	Average value of three consecutive measurements of at least 30 minutes each	Periodic Measurement each month until Condition 5.5.2 or 5.5.2.1 is satisfied, then once every 6 months	BS ISO 11338-1 and BS-ISO 11338-2.

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Point 7 in Section 8 - Updated Table 8.2 Entry

Substance	Residue stream	Monitoring frequency	Monitoring standard or method*	Reporting Requirements
TOC (dry weight)	IBA and other boiler ash / slag from each line sampled and analysed separately.	Monitored each month until Condition 5.5.2 is satisfied, then Quarterly or as required under Condition 8.1.2 e) and 8.1.5.	BS EN 14899 and either EN 13137 or EN 15936 for TOC	Immediately on receipt of analytical results until Condition 5.2.2 is satisfied, then Quarterly except where above threshold in Condition 5.1.1 a). Where above the threshold report as an incident as required under Condition 2.5.

Point 9 in Section 8 - Revised Table 2.1 Entries

Summary of information to be recorded/reported	Condition	Review Frequency	Date first records due to be completed	Date reports due
Reassessment of the potential for recirculation of APCr	8.2.1	Every 4 years	As right	30 September 2026 and every 4 years thereafter
TOC of bottom ash	8.1.6 & Table 8.1	Each month until Condition 5.5.2 is satisfied, then Quarterly	from First Operation	Within 3 weeks of the end of the month for monthly samples until Condition 5.5.2 is satisfied, then First date of 31 January, 30 April, 31 July or 31 October for previous calendar quarter

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Point 10 in Section 8 - Additional Table 2.1 Entries

Summary of information to be recorded/reported	Condition	Review Frequency	Date first records due to be completed	Date reports due
Results of Performance Test	2.7.10	Single report	As right	6 months after date of issue of variation VAR03
Residence Time Test full report	5.5.2	Single report	As right	8 months after test completed
Residence Time Test interim report	5.5.2.1	Optional Single report	As right	8 months after test completed
Updated air dispersion model and human health risk assessment based on actual emissions	6.5.2	Single report	As right	12 months after date of issue of variation VAR03
AD Biogas engines improvement plan	10.3.1.1	Single report	As right	30 June 2026 or, where this is later, 3 months before the AD wet preparation feed plant resumes operation