MOTT MACDONALD

Goddards Green Sludge Treatment Centre Environmental Permit Application

Main Supporting Document

December 2024

790101_MSD_Main_GOD

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	April 2022	Olivia Ellson	Shannon Stone	Anita Manns	First Draft
B	May 2022	Olivia Ellson	Shannon Stone	Anita Manns	Second Draft
C	August 2022	Natalia Cunningham	Shannon Stone	Anita Manns	Third Draft
D	September 2022	Natalia Cunningham	Shannon Stone	Anita Manns	Final Draft
E	March 2024	Isobel Moss Shannon Stone	David Dray	Anita Manns	Revision for client comment
F	March 2024	Isobel Moss	Shannon Stone	Anita Manns	Resubmission
G	November 2024	Isobel Moss	Claire Cowdrey	Anita Manns	Updated based on Not Duly Made Request for information November 2024
H	December 2024	Anita Manns	Claire Cowdrey	Anita Manns	Updated based on Not Duly Made Request for Information v2 November 2024

Document reference: | 790101_MSD_Main_GOD December 2024 |

Information class: Standard

Contents

1 Non-technical summary

1.1 Overview of the site and activities

Goddards Green is a Sludge Treatment Centre (STC) (also known as the “Site”) and an associated Wastewater Treatment Works (WTW). The address of the Site is Cuckfield Road, Goddards Green, West Sussex, RH17 5AL, with the National Grid Reference: TQ 28947 20659.

The WTW is operated under the Urban Wastewater Treatment (England and Wales) Regulations 1994 and has a standalone Water Discharge Activity Environmental Permit, this will remain an independent permitted activity.

The STC operation is a non-hazardous waste activity which is currently carried out under registered S1, S2 and U6 exemptions. The waste activity comprises imports, physio-chemical and anaerobic digestion treatment (AD), and the storage of waste, all for recovery purposes. The STC handles waste derived from the wastewater treatment process, either indigenously produced on-site or imported from other Southern Water owned assets.

The Site currently has two Environmental Permits in operation. Permit EPR/WP3695HW is the bespoke waste permit existing on-site, as well as permit EPR/JP3137QB which allows for the running of one combined heat and power (CHP) engine to provide electricity for the site. Several directly associated activities (DAAs) are also permitted and include sludge and cake reception, storage and blending, sludge thickening and dewatering, biogas conversion, storage and combustion.

Southern Water wishes to vary permit EPR/WP3695HW to an installation permit for the Site into a single consolidated permit to include the:

- Anaerobic digestion of sludge
- Liquor treatment plant (biological)
- Acceptance of cess to the head of the works (as a waste activity)

Permit EPR/JP3137QB will be varied to include only the 1.73MWth diesel standby generator serving the WtW – all other assets within this permit will be incorporated, as DAA’s, into the IED permit.

Anaerobic digestion of sludge

As advised by the Environment Agency through consultation at WaterUK Waste and Recycling Network and a letter sent to all Water and Sewage Companies at director level in July 2019, Southern Water is applying to vary permit EPR/WP3695HW into an installation permit and consolidate EPR/JP3137QB. It is intended that non-hazardous imported trade effluent waste disposal activity, specified generator and AD Installation waste recovery activity will be separate listed activities on a single consolidated Installation permit. Following a joint decision made by Environment Agency and Department for Environment, Food and Rural Affairs (DEFRA) that AD treatment facilities at WTW STCs are covered by the Industrial Emissions Directive and can no longer operate under standard environmental permits or exemptions.

The primary permitted installation activity will be the AD treatment facility. The AD facility will treat indigenously produced and imported sludges. Permitted Directly Associated Activities (DAAs) will be the import of waste from other WTW assets; the physio-chemical treatment of imported and indigenously produced sludges; the storage of indigenously produced sludges, imported sludges, thermal hydrolysis plant (THP) and the sludge cake from the AD facility; the storage of biogas derived from the AD treatment of waste and the combustion of biogas in an

on-site CHP plant. In the event the CHP cannot run in an emergency or due to operational issues, biogas will be combusted via an on-site flare stack and/or back-up boiler system.

Liquor treatment plant

Liquors from the STC processes is pumped to the liquor treatment plant; CASS plant. Treated liquor is mixed with settled and crude sewage in the anoxic selector of the oxidation ditch. The LTP (CASS) is a sequence batch reactor treating liquors from the STC.

Acceptance of waste to the head of the works

Southern Water wishes to remain able to accept cess to the head of the works. The cess is discharged to the dedicated cess reception facility, before joining the incoming, indigenous flows, from the sewer network, into the head of works to be treated through the WtW.

1.2 Overview of the STC process

Currently, Goddards Green STC accepts cess and both indigenous and imported sludge and cake waste derived from the wastewater treatment process.

The Site is a sludge treatment centre which has both liquid sludge and sludge cake reception facilities. On average the Site accepts 44 tankers containing sludge, cess, septic, and chemical toilet waste. This consists of approximately 21 tankers per day of liquid sludge imports and an average of 23 tankers of imported cess, septic and chemical toilet waste. All imported liquid waste and sludges are transported in enclosed tankers and liquid sludge is unloaded via a hose.

Indigenous and imported liquid sludge are screened by two Strain Presses and then thickened by two duty / standby drum thickeners. Imported sludge cake is blended with indigenous liquid sludge and then screened in two Strain Presses (Separate). Blended and thickened sludge is mixed and stored in a Thickened Sludge Storage Tank and fed to two conventional mesospheric anaerobic digesters operating at around 37ºC.

Digested sludge is stored in two digested sludge storage tanks before being dewatered by two duty, standby centrifuges. Dewatered digested cake is stored on site in a large, covered cake bay before being recycled to farmland. Biogas produced by the digesters are used by CHP to generate electricity.

Centrate and decant liquor from the drum thickeners is pumped to the liquor treatment Cyclic Activated Sludge System (CASS plant). Treated liquor is mixed with settled and crude sewage in the anoxic selector of the oxidation ditch.

The Site hosts a strategic liquid waste storage facility which is used to take unscheduled emergency sludge imports. This facility consists of two sludge storage tanks with a combined capacity of 5,000m^3. When the tanks are full, a mobile centrifuge is used to dewater the sludge. It can then be pumped back to the sludge reception, as required.

The sludge cake is either treated by the STC or transported off site. The centrate drains to the site return pumping station which is returned to treatment on site. This activity lasts for several weeks each time.

All sludge treatment process are covered or enclosed. Odorous air is extracted by three separate odour treatment units (OCU) which serve the STC area as below:

- OCU 1 Biofilter with pumice media and carbon filter, installed 2012. Approx total air flow 1,281m^3/hr. Serves: centrifuge (& drum thickener/polymer make up) building and thickened sludge tank.

- OCU 2 Carbon filter only. installed 2012. 5,356m^3/hr throughput. Serves: mostly WtW, but Cess reception for this permit and inlet works.
- OCU 3 Biofilter with pumice media and carbon filter installed 2020. 14,318 m^3/hr throughput. Serves: THP silo, auxiliary sludge storage tanks, import cake and sludge bay, mixing tank, 'final' centrifuges and raw liquor tank.

Biogas produced by the digestion process is stored in a double skinned gas holder (920m^3). Biogas is fed to the CHP plant where it is used to generate heat (i.e., to control the temperature of the digestion process) and electricity to power the Site's electrical equipment and processes. The CHP unit has a thermal rated input of 1.79MWth. The specifications of the combustion plant are presented in Table 1.1.

Table 1.1: Combustion plant details

	CHP1	THP Boiler
Make/Model Number	MWM TCG 2016 V16	
Date that MCP became operational/was commissioned	2017	March 2023
Thermal Input (MWth)	1.79	1.11 (when operating on biogas)
Stack height (m)	10	15
Fuel used (biogas, diesel etc)	Biogas	Biogas / Diesel
Estimated total hours of operation per year	8760	8760
MCPD and SG Regs status	Tranche B generator Existing MCP	New MCP

The IED permit will include:

- Sludge reception and cake reception (covered)
- Sludge strainpress
- Cake strainpress
- Storage tanks:
  - 2 No. Post Screening Storage Tanks (500m^3 each) (covered)
  - 2 No. Post Digestion Storage Tanks (312m^3 each) (covered)
  - 2 No. Auxiliary Sludge Storage Tank (2,500m^3 each) (covered)
  - 1 No. Thickened Sludge Storage Tank (400m^3) (covered)
  - 1 No. Cake blending tank (57m^3) (covered)
  - 1 No. Sludge reception tank (98m^3) (covered)
  - 1 No. Liquor Storage Tank (2,626m^3) - raw liquor tank (centre tank) covered; treated liquor tank (outside perimeter) open
- 1 No. Biogas fuelled CHP (1.79 MWth)
- 1 No. Back-up diesel generator (0.64 MWth)
- 1 No. Biogas burner (flare)
- 3 No. Odour Control Units serve the STC area
- 2 No. Primary digesters (1932m^3 each) (covered)

- 1 No. Gas Bag (920m^3)
- 1 No. Liquor Treatment Plant (LTP) (2,500m^3) (covered)
- 1 No. Cake bay (stored in Dutch barn 994m^3) (covered)
- 2 No. Drum thickeners (duty and assist) in centrifuge building (covered)
- 2 No. Centrifuges (duty and standby) in centrifuge building (covered)
- 1 No. Thermal Hydrolysis Plant (THP):
  - 1 No. THP Pulper (4m^3) (covered)
  - 4 No. THP Reactors (2m^3 each) (covered)
  - 1No. THP Flash tank (4m^3) (covered)
- 1 No. THP Feed silo (130m^3) (covered)
- 2 No. Centrifuges (post THP) (covered)
- 1 No. THP Steam Boiler (1.11 MWth when operating on biogas)

The following are outputs from the process:

- Screenings and grit – deposited into skips before being removed off-site.
- Biogas – stored in an existing gas holder, then either
  - burnt in the CHP to generate electricity for use on-site,
  - flared in the waste biogas burner.
- Cake – stored in cake bay (in a Dutch Barn) prior to being shipped off site for recycling to agriculture (soil conditioner).

1.3 Summary of key technical standards

Table 1.2 lists the technical guidance notes (TGNs) used to inform the techniques and measures proposed to prevent and reduce waste arising and emissions of substances, including during periods of start-up and shut down, momentary stoppage and malfunction, and leaks.

Table 1.2: Technical guidance notes

Installation name	**Goddard's Green STC**	
C3 – Installation		
Description of the schedule 1 activity or directly associated activity	**Best available technique (BATC, BREF or TGN reference)**	**Document reference**
Section 5.4 non-hazardous waste installation - anaerobic digestion installation regulated under the Industrial Emissions Directive, utilisation biogas for energy	• Biological waste treatment: appropriate measures for permitted facilities • Non-hazardous and inert waste: appropriate measures for permitted facilities	• https://www.gov.uk/guidance/biological-waste-treatment-appropriate-measures-for-permitted-facilities/1-when-appropriate-measures-apply • https://www.gov.uk/guidance/non-hazardous-and-inert-waste-appropriate-measures-for-permitted-facilities
Section 5.4 non-hazardous waste installation – liquor treatment.		
B4 – Waste activities		
Description of the waste operation	**Appropriate measure (TGN reference)**	**Document reference**
Acceptance of waste to the head of works (Cess)	• Non-hazardous and inert waste: appropriate measures for permitted facilities • Biological waste treatment: appropriate measures for permitted facilities	• https://www.gov.uk/guidance/non-hazardous-and-inert-waste-appropriate-measures-for-permitted-facilities • https://www.gov.uk/guidance/biological-waste-treatment-appropriate-measures-for-permitted-facilities/1-when-appropriate-measures-apply
General		

Installation name	Goddard's Green STC	
All activities	**Guidance**	**Document reference**
	• Monitoring stack emissions: technical guidance for selecting a monitoring approach • M1 sampling requirements for stack emission monitoring • Environment Agency environmental permitting guidance, including: • Risk assessments for your environmental permit • Energy efficiency (Energy efficiency for combustion and energy from waste power plants) • Noise assessment and control • H4 Odour management • H5 Site condition report • Control and monitor emissions for your environmental permit	• https://www.gov.uk/guidance/monitoring-stack-emissions-technical-guidance-for-selecting-a-monitoring-approach • https://www.gov.uk/government/publications/m1-sampling-requirements-for-stack-emission-monitoring • https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit • https://www.gov.uk/guidance/energy-efficiency-standards-for-industrial-plants-to-get-environmental-permits • https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits • https://www.gov.uk/government/publications/environmental-permitting-h4-odour-management • https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report • https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit

1.4 Revisions since 2022 application submission

The application was first submitted in 2022. This Main Supporting Document includes details that have been updated following feedback received over the past three years in relation to IED permit applications for the anaerobic digestion of sewage sludge. Table 1.3 provides a summary of the stand-alone documents included as part of this application, and the amendments where applicable. Where a document has not been amended due to it being applicable, the original reference number remains unchanged. Where a document has been updated this document will supersede any previous versions.

Table 1.3: Summary of revisions

Document name	Latest document reference	Summary of amendments
Main supporting document	790101_MSD_Main_GOD December 2024	Resubmitted – updated to include wider feedback from the Environment Agency and response to Request for Information v2 November 2024.
Environmental Risk Assessment	790101_ERA_GOD November 2024	Resubmitted – updated to include complaints recorded since 2020 and addendum to air quality risk assessment.
Environmental Constraints Maps	790101_ERA_Maps_GOD March 2024	Resubmitted. Human receptor map screening distance increased to 2km.
Bio-aerosol Risk Assessment	790101_ERA_BioaRA_GOD March 2024	Resubmitted – updated to include bio-aerosol monitoring proposals and new windrose.
Odour Management Plan	790101_ERA_OdourMP_GOD December 2024	Resubmitted – updated to include new windrose, updated complaints recorded since 2020 and feedback from the Environment Agency and response to Request for Information v2 November 2024.
Climate Change Risk Assessment	790101_ERA_CCRA_GOD	No change. To be included as part of the management system for the site.
Air Quality Dispersion Report	790101_MSD_AirQualityDispersion Report_GOD	No change.
Air Quality Dispersion Report Technical Note	790101_MSD_AirQualityDispersion Report_GOD Technical Note November 2024	Addendum provided based on changes on the Site
Site Condition Report	790101_MSD_SCR_GOD November 2024	Resubmitted – in response to Request for Information November 2024.
BAT analysis	790101_MSD_BAT_GOD November 2024	Resubmitted – updated to include changes by Southern Water, inclusion of the LTP and THP BAT and wider feedback from the Environment Agency.
Site Layout and Location Plan	790101_MSD_SiteLayoutPlan_GOD November 2024	Resubmitted – updated to reflect proposed secondary containment, liquor transfer point, liquor sampling point and changes to point source emissions and response to Request for Information November 2024..
Drainage Plan	790101_MSD_DrainagePlan_GOD	No change
Schematics	790101_MSD_Schematics_GOD March 2024	Resubmitted – updated to include separation of AD and waste activities in response to Request for Information November 2024
Environmental Management System Certificate	790101_MSD_EMS December 2023	Resubmitted. Certificate has been renewed.
Relevant Offences	790101_MSD_RelevantOffences February 2024	Updated.
Details of Directors	790101_MSD_Directors March 2024	Updated to time of resubmission.
Competency assessment certificates	790101_MSD_CompetencyAssessmentCertificates_GOD	Retracted, and replaced with Competency Management System.
Competency Management System	790101_MSD_CMS December 2023	Substitutes CoTC assessment certificates

Table 1.3: Summary of revisions

Document name	Latest document reference	Summary of amendments
Material Safety Data Sheets	790101_MSD_MSDS_GOD March 2024	Updated document
Leak Detection and Repair Plan	790101_MSD_LDAR_GOD March 2024	Additional document
Duty of Care	790101_MSD_DutyofCare_GOD March 2024	Additional document but superseded by the Waste Acceptance document listed below.
Waste acceptance	790101_WasteAcceptance_GOD November 2024	Additional document - updated as part of response to Request for Information November 2024
CIRIA assessment	790101-MMD-IED-GOD-CA-C-001-IED ADBA tool P03	Additional document. updated as part of response to Request for Information November 2024 Supersedes: 790101-MMD-IED-GOD-SIM-M-101 Do-nothing(Tank Failure Only) 790101-MMD-IED-GOD-SIM-M-102 Do-nothing(With Rainfall) 790101-MMD-IED-GOD-SIM-M-103 Option 1 (Tank Failure Only) 790101-MMD-IED-GOD-SIM-M-104 Option 1 (With Rainfall) 790101-MMD-IED-GOD-SIM-M-105 Option 1a (Tank Failure Only) 790101-MMD-IED-GOD-SIM-M-106 Option 1a (With Rainfall) 790101-MMD-IED-GOD-SIM-M-107 Do-nothing(Tank Failure Only) 790101-MMD-IED-GOD-SIM-M-108 Option 2 (Rainfall Included) 790101-MMD-IED-GOD-SIM-M-109 Option 3 (Tank Failure Only) 790101-MMD-IED-GOD-SIM-M-110 Option 3 (Rainfall Included)
Residue Management Plan	790101_MSD_ResidueMP_GOD November 2024	Additional document - updated as part of response to Request for Information November 2024.
Accident Management Plan	790101_MSD_AMP_GOD November 2024	Additional document, - amended in response to Request for Information November 2024.
Revised containment plan (ABDA Tool)	790101-MMD-IED-GOD-CA-C-001 - P02 IED Goddards Green ADBA Tool (Feb 24)	Superseded by 790101-MMD-IED-GOD-CA-C-001-IED ADBA tool P04
Implementation Plan	790101_MSD_ImplementationPlan December 2023	Additional document
Form Part A	790101_App_PartA_GOD	No change
Form Part B4	790101_App_PartB4_GOD November 2024	Additional document, in response to Request for Information November 2024
Form Part C2	790101_App_PartC2_GOD	No change
Form Part C2.5	790101_App_PartC2.5_GOD	No change
Form Part C3	790101_App_PartC3_GOD	No change
Form Part C6	790101_App_PartC6_GOD	No change
Form Part E2	790101_App_Part_E2_GOD December 2024	Additional document - in response to Request for Information v2 November 2024

Table 1.3: Summary of revisions

Document name	Latest document reference	Summary of amendments
Form Part F1	790101_App_PartF1_GOD	No change
Envirocheck Report	790101_MSD_SCR_GOD_AppB_Envirocheck	Additional document, updated as part of response to Request for Information November 2024
Waste transfer notes	790101_WasteTransferNotes_GOD November 2024	Additional document, updated as part of response to Request for Information November 2024
Sampling proposal	790101_Sampling proposal_GOD December 2024	Additional document, updated as part of response to Request for Information v2 November 2024
Appropriate Measures Assessment	790101_Appropriate Measures_GOD November 2024	Additional document, updated as part of response to Request for Information November 2024

2 Introduction

2.1 Overview

This document has been prepared to support the application to vary the existing bespoke waste activity permit into a bespoke installation Environmental Permit (hereafter referred to as 'the Permit'), EPR/WP3695HW for the Goddards Green Wastewater Treatment Works (WTW) and Sludge Treatment Centre (STC) ('the Site') on behalf of Southern Water Services Limited ('Southern Water' or 'the Operator').

Following the joint Environment Agency and DEFRA decisions that AD treatment facilities at WTWs and STCs are covered by the Industrial Emissions Directive (IED) the intent of the application is to ensure the Site is permitted in line with the IED and the EPR 2016, as amended.

This document contains a description of the Site, the proposed permitted activities and Directly Associated Activities (DAAs), an assessment of the possible effects of these activities and responses to questions in Parts A, B4, C2, C2.5 C3, C6, E2 and F1 of the application documentation (plus supporting information where required). Completed forms Part A, B4, C2, C2.5 C3, C6, E2 and F1 are included as separate documents.

2.2 Document content and structure

The following application forms have been complete to support the application and have been submitted as stand-alone documents:

- Part A: About You (Document reference 790101_App_PartA_GOD)
- Part B4: New bespoke waste operation (Document reference 790101_App_PartB4_GOD November 2024
- Part C2: Varying a bespoke permit (Document reference 790101_App_PartC2_GOD)
- Part C2.5: Application for an environmental permit Part C2.5 – Variation to a bespoke permit to add or vary a MCP/SG permitted activity at an installation or to vary an existing MCP/SG standalone permit (Document reference 790101_App_PartC2.5_GOD November 2024)
- Part C3: Variation to bespoke installation permit (Document reference 790101_App_PartC3_GOD)
- Part C6: vary a water discharge activity, groundwater activity, or point source emission to water from an installation (Document reference 790101_App_PartC6_GOD)
- Part E2: Surrender application (installations, waste operations, mining waste operations, medium combustion plant/specified generator and mobile plant only) (Document reference 790101_App_Part_E2_GOD November 2024)
- Part F1: Charges and declarations (Document reference 790101_App_PartF1_GOD)

The main body of the Permit application document ('the Main Supporting Document') includes all the supplementary information required in response to relevant questions within the Part A, Part B4, Part C2, Part C2.5, Part C3, Part C6, Part E2 and Part F1 application forms for which there was insufficient space on the forms to answer the questions in full.

The Environmental Permit variation application document ('the Main Supporting Document') consists of two main parts:

- Chapter 5 provides the general information required to inform Part C2 relating to the variation of bespoke permit; and

- Chapter 6 provides the more detailed information required to inform Part C2.5, Part C3, Part B4 and Part E2 relating to the variation of a bespoke installation permit

Part F1 covers the required financial information required for payment of the application fee.

Additional information included as part of this submission and not as stand-alone documents, are found in the following appendix:

- Appendix A – European Waste Catalogue (EWC) Codes

3 Process Description

3.1 Wastewater Treatment Works

This subsection has been provided for context only.

Goddard's Green catchment serves the towns of Burgess Hill, Hassocks and Hurstpierpoint and surrounding villages. The sewage is collected by gravity sewers and pumped by 22 wastewater pumping stations. All sewage to the treatment works is pumped from four terminal pumping stations. Despite the long rising mains, sewage received is usually not particularly septic. No septicity control measures are adopted in the catchment.

All sewage received passes through two 6 mm 2D screens operated as duty, assist, each rated at 480 l/s, with a 10 mm 2D bypass screen. Screened flow pass through a Detritor. Following screening and grit removal, flows in excess of permitted Flow to Full Treatment (FFT), 305.5 l/s overflow to four storm tanks. Flows up to the FFT gravitate to the primary tank distribution chamber. Cess is received from a dedicated cess reception facility with a cess reception tank, a cess balance tank, stone trap and a strain press.

Flows up to 305.5 l/s including cess, site returns and surplus activated sludge (SAS) pass through two circular Primary Settlement Tank (PST). Flow combines with treated STC liquor and return activated sludge (RAS) in the anoxic selector tank of the oxidation ditches. A ferric dosing system consists of two 15m^3 chemical storage tanks and duty/standby dosing pumps is designed to dose ferric chloride to the PST distribution chamber for phosphorus removal. The system is modified to dose ferric chloride to the Final Settlement Tank (FST) distribution chamber to avoid alkalinity dosing.

Secondary treatment is provided by two oxidation ditches. Mixed liquor is settled in four radial final tanks. RAS is returned to the selector tank of the oxidation ditch by a screw pumping station. SAS is returned to the primary tank for co-settlement. Secondary effluent gravitates to the disk filter feed chamber and split to two Disk Filters. Treated effluent is discharged to the River Arun.

3.2 Overview of the STC process

3.2.1 Anaerobic digestion of sludge

The Site is a sludge treatment centre which has both liquid sludge and sludge cake reception facilities. On average, 60m^3 of raw cake and 1,830m^3 of liquid sludge are imported each week (according to annual average values of 2021 and 2022).

Indigenous and imported liquid sludge are screened by two Strain Presses and then thickened by two duty / standby drum thickeners. A thermal hydrolysis plant (THP) receives sludge from post screened sludge tanks (PSSTs) via a feed silo connected to the OCU to thicken the sludge to 16.5% dry solids (DS). It then passes through the cambi reactors and is then fed to the digesters.

The THP is monitored by quality measurements of the boiler water, the DS feed, temperature and pressure. The thermal hydrolysis of sludge generates "process gas". The process gas unit is equipped with 2 No. (duty/standby) process gas eductors which continuously extract process gas from the THP pulper vessel. The process gas is drawn through a cooler, with condensate from the cooler gravitating back into the pulper. Cooled, non-condensable gases. A compressed process gas drum is used for short-term containment of the compressed process gas. The pressure in the compressed process gas drum is controlled by intermittently opening an

actuated valve on the process gas drum outlet, thereby injecting a volume of compressed process gas into the digester feed lines. Although a small amount of the process gas may be biologically degraded within the digesters, most of the process gas will be incorporated into the biogas (although only representing a very small volumetric fraction of it).

Imported sludge cake is blended with indigenous liquid sludge and then screened in two Strain Presses (Separate). Blended and thickened sludge is mixed and stored in a Thickened Sludge Storage Tank and fed to two conventional mesospheric anaerobic digesters operating at around 37ºC. THP vessels are fitted with a set-pressure/rated burst disc, short pipe and subsequent pressure relief valve (PRV). The pipe section is fitted with a pressure sensor.
If the burst disc is breached the pressure sensor will identify the issue, record as alarm on SCADA and automatically commence a safe shut down. Depending on the cause the PRV may operate to mitigate the overpressure risk. The release occurence and duration would be identifiable from SCADA data.

Digested sludge is stored in two digested sludge storage tanks before being dewatered by two duty/standby centrifuges. Dewatered digested cake is stored on site in a large storage bay before being recycled to farmland. The cake bay is held in a Dutch Barn which was constructed in Summer 2023.

Biogas produced by the digesters are used by CHP to generate electricity.

The centrate is discharged to the LTP and treated prior to discharge to the WtW.

All sludge treatment process are covered or enclosed. Odorous air is extracted by three separate OCUs, which serve the STC area and associated assets.

3.2.2 Liquor Treatment Plant

Centrate and decant liquor from the drum thickeners and centrifuges is pumped to the liquor treatment plant; CASS plant. Treated liquor is mixed with settled and crude sewage in the anoxic selector of the oxidation ditch. The LTP (CASS) is a sequence batch reactor treating liquors from the STC. The plant is currently operating but is being reviewed for supplementary equipment or replacement as part of Southern Water's asset strategy.

The CASS Liquor Treatment Plant (LTP) has a maximum throughput of 1200m^3 day (~1,200 onnes/day) and consists of three storage volumes.

Liquor treatment plant capacity is 2500m^3. This consists of four aeration blowers (operating on duty/assist/assist/standby) connected to diffusers in the bottom of the tank. This tank is uncovered and is being reviewed for the technical feasibility of covering it.

The liquor storage tank is formed of two concentric tanks operating independently. The centre tank is a raw liquor buffer tank with a capacity of 1342m^3 and is covered and connected to OCU 3. The outside tank is an uncovered treated liquor buffer storage tank with a capacity of 1284m^3. Therefore, total tank volume is 2626m^3.

Combined liquors (from drum thickeners, centrifuges, strain-presses and sludge cake bays) are received into the raw liquor buffer tank, transferred through the liquor treatment plant, and back to the treated liquor buffer storage area.

The treated liquor is discharged into the main inlet flume (oxidation ditch distribution chamber) in the WtW and continues through the treatment process.

The LTP operates on a cycle of six hours of air blowing, 1 hour for settling and 1 hour for transfer. The SAS from the LTP is pumped to the post screened storage tank, thus remaining within STC IED permit boundary.

The Site hosts a strategic liquid waste storage facility which is used to take unscheduled emergency sludge imports. This facility consists of two sludge storage tanks with a combined capacity of 5,000m^3. When the tanks are full, a mobile centrifuge is used to dewater the sludge. It can then be pumped back to the sludge reception, as required.

3.2.3 Acceptance of waste to the head of the works

Cess is accepted into the site and is discharged to the dedicated cess reception facility, before joining the incoming, indigenous flows, from the sewer network, into the head of works to be treated through the WtW.

4 Part A – About you

4.1 Question 5c: details of directors

The details of directors at Southern Water Services Limited (Company number: 02366670) are provided in stand-alone document 790101_MSD_Directors March 2024.

4.2 Question 7: Contact details

Whereby the contact disclosed in 7a (Anita Manns, Mott MacDonald) is not available the Environment Agency should contact one of the secondary contacts:

Name: Claire Cowdrey

Address: Mott Macdonald, Mountbatten House, Grosvenor Square, Southampton, S015 2JU

Phone number: 023 8062 8523

Email: claire.cowdrey@mottmac.com

5 Part C2 – General – Varying a new bespoke permit

5.1 Questions 2 – Table 1: Changes to existing activities

The variation application is to

- Consolidate the waste activity 16 10 02 authorised under the permit reference EPR/WP3695HW.
- Add the scheduled activity s5.4 for anaerobic digestion.
- Add the scheduled activity s5.4 for the liquor treatment plant.
- Surrender the CHP, boilers and 0.43MWth back up generator from the MCP permit reference EPR/JP3137QB and vary this to be applicable only to the 1.73MWth diesel generator serving the WtW.
- Add the CHP and new 0.64MWth back up generator to the installation permit as DAA's
- waste operation activity for acceptance of liquid sludge waste (digestate) at post digestion, for dewatering.

It is intended that non-hazardous imported effluent waste disposal activity, combustion activities and AD and LTP installation activities will be separate listed activities on a single consolidated Installation permit.

5.2 Questions 3a: Relevant offences

Details of the relevant convictions are provided in the document reference 790101_MSD_RelevantOffences_GOD December 2023 (produced by Southern Water).

5.3 Question 3b: Technical ability

Operational management is provided by qualified individuals and considered to be technically competent. All staff on-site are trained to manage and operate activities without causing pollution.

The Site has two Certificate of Technical Excellence (CoTC) holders, Andrew Frost and Andrew Mattinson.

Future competency, in terms of the requirements of the environmental permit, will be ensured through the appropriate training of all staff, covering:

- Awareness of the regulatory implications of the Permit for the permitted activity and their own work activities
- Awareness of all potential environmental effects from operation under normal and abnormal circumstances
- Awareness of the need to report any deviation from the Permit
- Prevention of accidental emissions, and action to be taken when accidental emissions occur

All staff are aware of the implications of activities undertaken including the operation of the Site. Skills and competencies necessary to work on-site are documented and records of training needs and training received for these posts are maintained.

Southern Water is currently working on an accredited Competency Management System under the Competent Operator Scheme, based on the Anglian Water Services-developed technical

competency course to demonstrate that personnel have the appropriate technical skills and knowledge to manage the activities undertaken. This will be independently certificated and audited, through a third-party certification body to ensure it meets the requirements of the Competence Management System Standard, developed by Energy & Utility Skills[1]. The Competence Management System (CMS) enables Operators to demonstrate technically competent management on the basis of corporate competence and employees' individual competence. Individual competence remains a key component with each employee having the relevant technical competences required to carry out their role.

An e-learning course is being developed and certification is due to be undertaken by LRQA (see document reference 790101_CMS December 2023). The CMS is to be certified within the first 12 months from issue of a permit for the STC.

5.4 Questions 3c: Finances

No relevant persons within Southern Water have current or past bankruptcy or insolvency proceedings against them.

5.5 Question 3d: Management System

The Site operates under the company-wide Environmental Management System (EMS 684981), which is certified to ISO 14001:2015 and is applicable to water supply and wastewater treatment assets at operational sites (wastewater treatment works, water supply works and water booster stations). The EMS is effective for three years from July 2023, until July 2026. The EMS is accredited by the British Standards Institution (BSI).

Demonstrable procedures are outlined in the Site Process Activity Manual (SPAM) and Operating Plan. Any monitoring of emissions to air, land and water is undertaken according to Monitoring Certification Scheme (MCERTS) Standards where the permit requires it, where suitable and available.

As a part of the EMS the Operator has an internal audit programme that takes places every 12 months. During this annual programme operational sites are selected as a subsample and audited. Suppliers and business areas area also audited. An annual report is produced as part of the management review, and this is signed off by Senior Management. In addition, the EMS is subject to audit by the inspection and certification company BSI (for accreditation purposes) each year, and a full certification audit is conducted every three years.

The EMS addresses the following to ensure staff understand their roles and responsibilities to comply with environmental legislation and protect the environment and human health:

- Resources, roles, responsibility and authority
- Legal and other requirements in protecting the environment and human health
- Competence, training and awareness requirements
- Explanation of the Non-conformance, Corrective and Preventative Action Procedures
- Details of the significance of Environmental Aspects and Impacts
- EMS Review and auditing procedure and requirements
- Monitoring and measurement requirements
- Record keeping procedures

[1] Energy and Utility Skills (2021) Competence Management System. Available online at: https://www.euskills.co.uk/about/our-industries/waste-management/competence-management-system/

To accompany the Permit the Site will have its own Management System in line with the Environment Agency guidance. This identifies all the applicable procedures under the accredited EMS but includes additional site-specific information and procedures.

One of the key tasks for Southern Water during the permit determination process is the development of the management system arrangements to cover additional requirements in relation to the permitted operations. This may include the Climate Change Risk Assessment (CCRA) (document reference 790101_ERA_CCRA_GOD) to address measures to adapt to predicted additional pressure from changes in external operational conditions (such as weather and flooding), if required. Climate change and climate resilience will be included in the ongoing future updated to the EMS.

5.5.1 Accident Management Plan

In addition to the environmental elements of the management system, Southern Water also has a health and safety management system which includes relevant procedures to follow with regards to accidents and the reporting of incidents and near misses. The health and safety manual is designed to comply with the Health and Safety Executive's (HSE) Managing for health and safety guide (HSG65)[2].

The Site operates under an Incident Management Plan which is incorporated into Southern Water's Environmental Management System to prevent and manage environmental related accidents. The IMP includes an inventory of substances stored at the site, details on storage facilities, inventory of pollution prevention equipment (spill kits and fire extinguishers), inventory of waste and storage capacities, contact details of internal contacts (Site manager, Environmental Governance Manager and key HSE staff), national and regional (where appropriate) contact details of emergency services and environmental regulators. The IMP is distributed to key staff, to supervise the implementation of the Plan, and shared with external contacts (emergency services and the Environment Agency). The IMP is accompanied by a site plan that identifies the locations of designated storage areas (and their maximum storage capacity), location of spill kits and fire extinguisher and storage locations and hazards posed by chemical substances.

The IMP references procedures to comply with environmental legislation and protect the environment and human health in regard to potential accidents:

- Spill prevention and management, and operation of safety valves
- Procedure for recovering spilled product
- Procedures for the prevention of overfilling vessels, management of plant and equipment failures
- Fire prevention and responses to fires, including fire water containment procedures
- Security measures to prevent unauthorised access, arson and vandalism
- Competence, training and awareness requirements
- Monitoring and measurement requirements
- Record keeping procedures for the recording of incidents, accidents and near misses
- Emergency procedures to notify relevant authorities, emergency services and neighbours

There are several different document types referenced in the IMP. These have been listed below:

- EMS – Environmental Management System

[2] Health and Safety Executive (2013), Managing for health and safety (HSG65). Available online at: https://www.hse.gov.uk/pubns/books/hsg65.htm.

- FEC – Field Event Co-ordinator's Manual
- IMP – Incident Management Plan
- BCP – Business Continuity Plan
- CCM – Control Centre Manual
- SIB – Safety Instruction Book
- CAT – Catastrophe Plans

Table 5.1 below provides a list along with a brief description of each of the procedures which form part of the IMP.

Table 5.1: Incident Management Plan procedures

SUPPORTING EMERGENCY PROCEDURES – IMP

Procedure Reference	Brief summary
EMS 234 Chemical and Oil Storage	Specifies the standard for storage of chemicals and oils. Outlines the amounts of substances that can be stored on site without consent from the Local Authority, and details how these substances should be safely stored. Also includes Information on the auditing, training requirements and any associated documents.
EMS 260 Pollution Prevention (standard)	Specifies the standard for managing and reducing the risk of land contamination. Outlines the tasks a manager should complete i.e., ensuring spill kits are available, and who to contact in the event of an incident. The document also lists the measures that Southern Water should take to prevent pollution incidents. Also includes Information on the auditing, training requirements and any associated documents.
EMS 265 Discharges (Standard)	Sets the minimum standard of operation in managing effluent and potable water process discharges. Details definitions which relate to the procedure and outlines the standard. Also includes Information on the auditing, training requirements and any associated documents.
EMS 360 Pollution Prevention Procedure	Outlines the responsibilities of staff in relation to the procedure. The Procedure includes details on items such as site drainage, working on or near watercourses and excavations. As well as addressing different spill types; chemical, oil and sludge/sewage. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 361 Chemical Risk Assessment (Procedure)	Defines the procedure for assessing the environmental risk rom bulk chemicals. Outlines the procedure for undertaking a risk assessment, and where required which EMS procedures need to be followed. Also addresses risk mitigation and employee awareness as well as the auditing, training requirements, reporting forms and any associated documents.
EMS 362 Environmental Fire Risk Assessment Procedure	Specifies the procedure for minimising the environmental consequence of a fire. Outlines the responsibilities of staff in relation to the procedure and provides a procedure for an Environmental Fire Risk Assessment. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 363 Procedure for Managing oil spills on sites	Outlines the responsibilities of staff in relation to the procedure. The procedure details how to determine the severity of the spill for different scenarios; land, inland waters and coastal waters/beaches, and how to prevent, control and remediate the environmental damage caused by spillages from the site. Information on the

SUPPORTING EMERGENCY PROCEDURES – IMP

Procedure Reference	Brief summary
	auditing, training requirements, reporting forms and any associated documents.
EMS 364 Lime Spill Management Procedure	Outlines the procedure for managing lime chemical spills at STCs. Defines the responsibilities of staff, and the procedure for managing the spill including the spill assessment and notification and escalation. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 365 Discharges Procedure	Defines the procedure that must be adopted when managing intermittent discharges. Outlines the responsibilities of staff in relation to the procedure and outlines the procedure where an emergency discharge is foreseeable for both emergency and stormwater and potable water. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 381 Operational Waste Procedures	Specifies the procedure for managing wastes. The procedure addresses the definitions of different waste types and outlines a general procedure for managing waste. Identifies where further procedures should also be followed for specific waste types e.g., asbestos, WEEE and waste oils. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 382 Hazardous Waste Procedures	Specifies the procedure for moving hazardous waste between different sites. The procedure addresses identifying hazardous waste, storage of hazardous waste, consignment notes and record keeping. Information on the auditing, training requirements, reporting forms and any associated documents.
EMS 461 Chemical Risk Assessment (Form)	A template for a chemical risk assessment including the following: • Site details • Chemical details • Chemical classification • Risk activity • Risks for health, fire/dsear and environment • Handling, usage and storage requirements • Management of spills • Disposal • Safety data sheet.
EMS 480 Waste Descriptions	Provides written descriptions of different waste types covering the following: • Process giving rise to the waste, • Waste characteristics, • Handling advice, • Containment • Disposal. • Name of waste • Waste classification • Producer and registered office details • EWC • Controlled Waste Regulations 2012 description • Waste type • Form

SUPPORTING EMERGENCY PROCEDURES – IMP

Procedure Reference	Brief summary
	• Temperature; and • SIC code. • Information on the auditing, training requirements, reporting forms and any associated documents.
FEC 307 Reporting of Unauthorised Access, Including Loss, Theft and Vandalism	Outlines the responsibilities of staff in relations to the reporting these incidents, and the procedure to be followed. Also includes Information on the auditing, training requirements and any associated documents.
FEC 320 Process Related Incidents	Specifies the procedures to follow in responding to process-related pollution incidents. Responsibilities of staff are outlined in the procedure, as well as contacting the FEC, FEC actions and reporting procedures. Information on the auditing, training requirements, reporting forms and any associated documents.
FEC 322 – Spillage Procedure	Outlines the responsibilities of staff in relation to the procedure. The procedure outlines the process for handling spillages on site including: • Spillage assessment • Notifications and Escalation • Containment • Awareness and Training • Information on the auditing, training requirements, reporting forms and any associated documents.
IMPO_101 – Overview of the Incident Management Plan	This document sets out the overall structure of the Incident Management Plans and provides a short overview of each of the main plans.
IMP 217 and IMP 218 Team Roles – Objectives and Responsibilities	Sets out the Objectives and Responsibilities for roles within the Incident Management Team and provides guidance for the ELT Representative. IMP 217 identifies when Southern Water should contact the Environment Agency, and IMP 218 identifies the process for contacting other authorities.
BCP 415 Guidance on Reporting Potential Media Interest	Sets out the types of incidents to be reported back by Field Operations Staff & Contract staff working on behalf of Southern Water that will potentially attract media interest, including contact numbers.
CCM 302 Procedure Following the Receipt of a Fire Alarm	Provides a consistent regional approach to dealing with any formal notification of a fire alarm within the Company. Outlines the responsibilities of staff, the procedure for when a fire alarm notification is received, inspections/audits, training and any associated documents.
SIB 603 Risk Assessment and Safety Instructions for Fire Awareness	Covers the following: • Training needs of staff and fire wardens • What Managers must provide (i.e. fire safety meetings, plans) • Inspections • Safety instructions for occupied sites, unoccupied sites, and company vehicles • Firefighting procedure • Records to be completed
CAT 303 Actions Following Severe Weather or Flood Warnings	Outlines the plan of actions that should be undertaken following severe weather or floor warnings and the responsibilities of the staff under these circumstances. The procedure details checklists for the following scenarios: impending severe weather, flood watch, flood

SUPPORTING EMERGENCY PROCEDURES – IMP

Procedure Reference	Brief summary
	warning, severe flood warning, and an all clear checklist. Also includes Information on the auditing, training requirements and any associated documents.
Environmental Emergencies Poster (EMS)	A poster which should be displayed on all sites. The poster lists the type of emergency (fires, spills etc) and both the action which should be undertaken the contact phone number which should be called. The poster also highlights a list of things which should be checked prior to work starting such as the H&S notice boards, environmental notice boards and continuity plans.
Pollution 30 Minute Plan	Outlines a five-step plan for responding to a pollution incident in 30 minutes and outlines what should be done at each of the five stages.
Site Chemical Risk Register	Southern Water electronic database containing an inventory of hazardous substances used and stored by Southern Water and those relevant to individual sites, helping Southern Water to control substance use and comply with the COSHH regulations.
Alternative Response Coordinators Booklet	These documents provide flowcharts and a step-by-step guide for completing the Alternative Response tasks.

The EMS certification can be found in Document reference 790101_MSD_EMS December 2023.

5.6 Question 5a: Site layout plan and process diagram

Plans provided, to satisfy question 5a, can be found in the following stand-alone documents:

- Site Layout and Location Plan – Document reference 790101_MSD_SiteLayoutPlan_GOD December 2024
- Drainage Plan – Document reference 790101_MSD_DrainagePlan_GOD
- Schematics/process flow diagram – Document reference 790101_MSD_Schematics_GOD November 2024

5.7 Question 5b: Site condition report

In accordance with Environment Agency requirements, a Site Condition Report (SCR) has been produced to demonstrate the condition of the land and groundwater at the Site on issue of the proposed permit. The SCR included the following details (section 1 to 4 of the Environment Agency template)[3].

- Site details
- Condition of the land at permit issue
- Permitted activities
- Changes to the activity

A copy of the SCR can be found as document reference 790101_MSD_SCR_GOD November 2024.

[3] Environment Agency (2013). Environmental permitting: H5 Site condition report. Available online at: https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report

5.8 Question 6: Environmental risk assessment

As part of the application for an environmental permit, operators must assess the risk to the environment and human health from the activities that they propose to undertake, using the methodology outlined in the Environment Agency's 'Risk assessments for your environmental permit'[4].

The Environmental Risk Assessment (ERA) sets the requirements for the management of the permitted area, emission control measures etc. It assesses the risks to the environment, amenity and human health. All control measures within the rules must be adhered to in order to obtain the permit.

The ERA assesses the impacts from the following environmental concerns:

- Point source and fugitive emissions to air
- Point source and fugitive emissions to water and land
- Noise and vibration
- Odour
- Litter, mud and debris
- Vermin and insects (pests)
- Human health and environment safety (i.e. visual impacts, site security, flood risk)
- Natural habitats and ecology

Where emissions result in insignificant effects these have been screened out and where further detailed assessments of potential environmental impacts are required this is noted.

A copy of the ERA can be found as document reference 790101_ERA_GOD December 2024. Constraints maps have been updated to demonstrate human receptors to a radius of 2km, as shown in document reference 790101_ERA_Maps_GOD March 2024.

[4] Environment Agency (2023) Risk assessments for your environmental permit. Available online at: https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

6 Part C3 – Variation to a bespoke installation permit

6.1 Question 1: Table 1a: Activities applied for

Table 6.1: Question 1, Table 1a: Activities applied for

Installation name	Schedule 1 or other references	Description of the Activity	Activity capacity	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non-hazardous waste treatment capacity
Goddards Green STC	S5.4, Part A (1), (b) and (i)	Anaerobic digestion	Annual: 328,233 wet tonnes Daily: 899 wet tonnes	Recovery or a mix of recovery and disposal of non-hazardous waste with a biological treatment capacity exceeding 100 tonnes per day if the only waste treatment is anaerobic digestions. R3 – Recycling/ reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) R13 – Storage of waste pending any of the operations numbered R1 to R12.	0	Annual: 328,233 wet tonnes Daily: 899 wet tonnes
	Schedule 25B – Specified generator	Biogas CHP engine As per EPR/JP3137QB	1.79 MWth	Unlimited, but its use if for when the CHP Engine Specified generator is not running		
		Back-up generator	0.64 MWth	A back-up generator operated for the purpose of testing for no more than 50 hours per year		

Installation name	Schedule 1 or other references	Description of the Activity	Activity capacity	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non-hazardous waste treatment capacity
	S5.4, Part A (1), (b) and (i)	Liquor treatment plant	Annual: 438,000 wet tonnes Daily: 1,200m^3 wet tonnes	Recovery or a mix of recovery and disposal of non-hazardous waste with a biological treatment capacity exceeding 100 tonnes per day if the only waste treatment is anaerobic digestions. R3 – Recycling/ reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes) R13 – Storage of waste pending any of the operations numbered R1 to R12.	0	Annual: 438,000 wet tonnes Daily: 1,200m^3 wet tonnes
Directly associated activities						
	Physical treatment of waste (including the THP)	Recycling/reclamation of organic substances which are not used as solvents		R3		
	Waste reception	Import of liquid sludge and cake		R3 D9		
	Use of biogas	Use principally as a fuel or other means to generate energy. As per EPR/JP3137QB		R1		
	Use of standby flares	Incineration on land		D10		
	Steam boiler (part of THP but	Used for emergency only		D10		

Installation name	Schedule 1 or other references	Description of the Activity	Activity capacity	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non-hazardous waste treatment capacity
	used for AD)					
	Use of pressure release values	Used for emergency only,				
	Storage	Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced).		R13		
	Raw material storage	Storage of raw materials including chemicals, lubrication oil, antifreeze, diesel, activated carbon		R05		
	Discharge of condensate	Condensate from the CHP exhaust, flare gas pipelines, gas storage bag from collection to the point of discharge at the adjacent WTW.				
For installations that take waste	Total storage capacity	18,435m^3				
	Annual throughput	74,048 wet tonnes for indigenous 132,356 wet tonnes for impors 121,830 additional capacity 100,776 digester feed				

Table 6.2: B4 Table 1a: Activities applied for (waste operation activity)

Name of waste operation	Description of the waste operation	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non - hazardous waste treatment capacity
Head of works activity	Existing activity under permit EPR/WP3695HW	No change	N/A	No change
For all waste operations	Total storage capacity	No change		

Name of waste operation	Description of the waste operation	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity	Non - hazardous waste treatment capacity
	Annual throughput (tonnes each year)	No change		

The variation application is to vary permit EPR/WP3695HW to include combustion activities and AD installation waste recovery activity in a single consolidated installation permit.

6.1.1 Question 1: Table 1b: Types of wastes accepted

Southern Water requires the permit for Goddards Green STC to be authorised to accept sludge waste to undergo anaerobic digestion to comply with the Industrial Emissions Directive. It is requested that the annual quantity of indigenous sludge and liquid imports to be accepted is 328,233 wet tonnes for anaerobic digestion and 438,000 wet tonnes for the liquor treatment plant. None of the requested wastes are hazardous. The types of waste accepted are shown in Appendix A.

6.2 Question 2: Point of source emissions to air, water and land

6.2.1 Emissions to air

Table 6.3: Part C3, Question 2, Table 2: Point source emissions to air

Installation name	Goddards Green STC			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
Stack 1 (A02) TQ 29015 20647	CHP engine (MWM TCG 2016 V16) exhaust stack burning biogas As per EPR/JP3137QB	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	190	mg/m^3
Stack 2 (A03) TQ 28950 20640	Waste gas burner (flare stack)	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	150	mg/m^3
		Carbon monoxide	50	mg/m^3
		Total VOCs	10	mg/m^3
Stack 3 (A04) TQ 28987 20753	0.64 MWth STC bfr 355 Diesel generator As per EPR/JP3137QB	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	No limit set	
Stack 4 (A14) TQ 29014 20678	THP Boiler	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	190	mg/m^3
Odour Control Unit 1 (A05) TQ 29011 20692	Channelled emissions to air	Ammonia	20	mg/m^3
		H_2S	No limit specified	
		Odour concentration	1000	Oue/Nm^3

Installation name	**Goddards Green STC**			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
Odour Control Unit 2 (A06) TQ 28936 20602	Channelled emissions to air	Ammonia	20	mg/m^3
		H_2S	No limit specified	
		Odour concentration	1000	Oue/Nm^3
Odour Control Unit (A07) TQ 28932 20656	Channelled emissions to air	Ammonia	20	mg/m^3
		H_2S	No limit specified	
		Odour concentration	1000	Oue/Nm^3
Gas holder (A12) TQ 28965 20642	2 No. gas holder pressure relief valves	Biogas release and operational events	No limit specified	
2 No. Pressure relief valves PDST 1 and 2 (A08 & A09) TQ 28977 20673 TQ 28988 20672	Biogas release and operational events	Biogas release and operational events	No limit specified	
2 No. Pressure relief valves primary Digester 1 and 2 (A10 & A11) TQ 28975 20659 TQ 28993 20659	Biogas release and operational events	Biogas release and operational events	No limit specified	
6 No. Pressure relief values THP vessels (A15) –TQ 28966 120739	Biogas release and emergency events (in close proximity to each other so not possible to provide separate points)	Biogas release and emergency events	No limit specified	

The emission points are shown in drawing reference 790101_MSD_SiteLayoutPlan_GOD December 2024.

6.2.2 Emissions to water (other than sewers)

The drainage network sends water to the head of the works for treatment.

There will be no point source emissions from the Site and no direct discharge of wastewater to controlled waters from STC.

There are no direct potentially contaminated discharges to groundwaters.

Accidental releases of materials to the environment are controlled through adequate containment measures and working procedures in accordance with the EMS. Spill procedures are in place under EMS363 and 364 as well as pollution prevention procedure EMS360. All spillages are recorded in the site diary including actions taken.

6.2.3 Emissions to sewers, effluent treatment plants or other transfers off-site

The release of liquors from the sludge treatment process is considered to be a point source emissions or direct discharges to controlled waters or public sewers, as part of the permit

operation. The site layout plan, drawing reference 790101_MSD_SiteLayoutPlan_GOD December 2024, identifies the point at which liquors leave the site to enter the WTW at the inlet. A sampling location has also been identified on the site layout plan, although sampling will be undertaken as part of a wider implementation plan under BAT and IED. An implementation plan is shown in document reference 790101_MSD_ImplementationPlan December 2023. It is therefore, considered that this will be added as Improvement Conditions to the permit.

Any liquid waste will either be reused or discharged to the drainage system of the adjacent Goddards Green WTW and will undergo treatment through the works before being discharged under the existing water discharge permit.

On-site WTW effluent will meet the requirements of the existing discharge consent. The water used at the Site will be contained in a closed circuit; all wastewater streams will either be recycled within the process of captured and rerouted to the adjacent WTW.

Discharges will be minimal, typically arising from periodic maintenance/cleaning operations. As such, there are no direct potentially contaminated discharges to controlled surface waters and no significant impacts. All drainage (surface water or foul water) will be captured by the on-site drainage system and returned to the head of the WTW. A drainage plan of the Site is presented in document reference 790101_MSD_DrainagePlan_GOD.

The stormwater drainage of potentially contaminated areas from within the Site boundary will be routed into the sewage treatment process with no discharge outside of the Site. There will therefore be no risk of polluted runoff affecting off-site features due to the creation of a new hardstanding area.

Due to the anticipated very low levels of contamination of the water and the volumes involved, no monitoring of its composition is proposed prior to discharge to the WTW.

Any areas of the Site, where there is a risk of contamination of surface water, groundwater or discharge of process waters are located on impermeable concrete surface. All surface water from these areas drain to the WTW internal drainage system and are returned to the head of the works for treatment prior to discharge as final effluent.

A list of the point source emissions to sewers, effluent treatment plants and other transfers off-site is included as Table 6.4.

Table 6.4: Part C3, Question 2, Table 2: Point source emissions to sewers, effluent treatment plants or other transfers off-site

Emission point reference, and location	Source	Characteristics	Monitoring / mitigation measures prior to final discharge and emission point discharge.
C3- Schedule activity (anaerobic digestion)			
Drum Thickeners (S12) TQ 28989 20713	Process liquors from drum thickener	Variable, from processes	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M12 on site layout plan (TQ 28991 20712)
Centrifuges (AD) (S11) TQ 28997 20713			Discharged to adjacent WTW via LTP. Monitoring point for sampling as M11 on site layout plan (TQ 29000 20713)
Auxiliary Sludge reception	Tankered waste entering from reception point	Variable	Discharged to adjacent WTW via LTP.

Emission point reference, and location	Source	Characteristics	Monitoring / mitigation measures prior to final discharge and emission point discharge.
(S4) TQ 28868 20683			Monitoring point for sampling as M4 on site layout plan (TQ 28869 20680)
Centrifuges (THP) (S1) TQ 28953 20772	Centrifuge liquor from THP centrifuges	Variable	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M1 on site layout plan (TQ 28956 20772)
Rainwater (bund 1) (S9) TQ 28862 20666	Run off from impervious surfaces.	Clean rainwater from runoff	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M9 on site layout plan (TQ 28865 20666)
Rainwater (bund 2) (S10) TQ 28924 20655	Run off from impervious surfaces	Clean rainwater from runoff	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M10 on site layout plan (TQ 28927 20655)
Washwater Dependent n equipment washed down – samples taken from various locations as listed	From the washing down of mechanical equipment during maintenance activities	Variable.	Discharged to adjacent WTW via LTP.
Gas condensate 1 (S6) TQ 20914 20646	Condensate from CHP	Condensate with slightly elevated levels of H_2S dissolved from the biogas, resulting in a low level of acidity	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M6 on site layout plan (TQ 29015 20646)
Gas condensate 2 (S7) TQ 28962 20648	Condensate from the gas pipelines and gas storage bag	Condensate with slightly elevated levels of H_2S dissolved from the biogas, resulting in a low level of acidity	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M7 on site layout plan (TQ 28963 20647)
Gas condensate 3 (S8) TQ 28996 20669	Condensate from both digesters	Condensate with slightly elevated levels of H_2S dissolved from the biogas, resulting in a low level of acidity	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M8 on site layout plan (TQ 28997 20668)
Cake strainpress (S2) TQ 28955 20687	Liquors from cake strainpresses	Variable.	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M2 on site layout plan (TQ 28956 20686)
Cake blending tank (S3) TQ 28931 20685	Liquors from cake blending tank	Variable.	Discharged to adjacent WTW via LTP. Monitoring point for sampling as M3 on site layout plan (TQ 28932 20683)
Boiler Maintenance	Boiler blow down to minimise damage from high mineral content water.	High purity water with traces of chemicals (used for boiler dosing).	Discharged to adjacent WTW via LTP

Emission point reference, and location	Source	Characteristics	Monitoring / mitigation measures prior to final discharge and emission point discharge.
Drain down of plant (Dependent n equipment drained down – samples taken from various locations as listed	Occurs during maintenance when it is necessary to drain down the feed water, hot well or boiler shell.	High purity water with traces of chemicals (used for boiler dosing).	Discharged to adjacent WTW via LTP.
C3- Schedule activity - Liquor treatment plant			
Treated liquors (S13) TQ 28829 20678	Process liquors from the STC (dewatering liquors, cess liquors)	Variable, from processes	Discharged to adjacent WTW via inlet works TQ 28969 20586) Monitoring point for sampling as M13 (same location as S13) on site layout plan (TQ 28829 20678)
C3- Schedule activity - Liquor treatment plant			
Cess reception (S5) TQ 29008 20581	Sampling for waste acceptance	Variable	Discharged to adjacent WTW via inlet works (TQ 28969 20586) Monitoring point for sampling as M5 on site layout plan (TQ 29010 20580)

Please refer to the ERA (document reference 790101_ERA_GOD December 2024) on the environmental risk the water emissions pose and how these are mitigated, where relevant.

6.2.3.1 Incidents of storming

The returns from the STC and cess reception enter the WtW process downstream of the storm separation point. Therefore, all returns from the installation will go through the WtW treatment and cannot be directly discharged during storm conditions.

Southern Water will provide a wastewater and digestate buffer storage plan (listed in regard to BAT 4 in the Implementation Plan, document reference 790101_MSD_Implementation Plan December 2023). The Plan's purpose is to propose and describe site contingency arrangements to provide appropriate storage capacity or other appropriate measures to prevent or minimise emissions of wastewater or digestate being discharged off site during any occasions when the receiving wastewater treatment works is in storm overflow operating conditions. It is understood the Plan will be required to include, but not be limited to:

- Proposals for additional storage capacity with secondary containment within the site boundary for wastewater and/or other digestate during any occasions when the receiving wastewater treatment works is in storm overflow operating conditions.
- Procedures to cease discharges during these conditions.
- Calculation of a reasonable contingency capacity of wastewater and/or other digestate during any occasions when the receiving wastewater treatment works is in storm overflow operating conditions.
- A description and design specification of the buffer storage infrastructure and secondary containment measures. The design shall be completed by an appropriately qualified engineer and secondary containment shall be designed in line with CIRIA C736.

- A program of works with timescales for the implementation and construction of the buffer storage.
- A preventative maintenance and inspection regime.

6.2.4 Emissions to land

There is no point source to land. Condensate is sent back to the raw tank and to aeration lanes for treatment in the WTW.

Indigenous sewer grit and screenings are collected in separate skips and removed off-site by road vehicle and transported to a suitably Permitted facility.

Grit and screenings generated from the tankered waste reception points and collected in separate skips and removed off-site by road vehicle and transported to a suitably permitted facility.

Releases of raw materials to land are considered to be negligible due to adequate containment of the materials within suitable storage vessels, the provision of bunding and the presence of a contained drainage system.

Please refer to the ERA (doc ref 790101_ERA_GOD December 2024) on the environmental risk the water emissions pose and how these are mitigated, where relevant.

6.3 Question 3a: Operating techniques

This section provides a technical overview of the components, the proposed techniques and measures to prevent and reduce waste arising and emissions of substances and heat, including during periods of start-up or shut-down, momentary stoppage and malfunction, and leaks. Specifically, consideration is made of:

- The technology to be used
- The process, in terms of how it will be operated and controlled
- In-process controls and Best Available Techniques (BAT) Assessment
- Measures implemented to control emissions to air, water, sewer and land

Table 6.5 lists the technical guidance notes (TGNs) used to inform the techniques and measures proposed to prevent and reduce waste arising and emissions of substances, including during periods of start-up and shut down, momentary stoppage and malfunction, and leaks.

The technical guidance and BAT requirements will also be addressed within Southern Water's Goddards Green Working Plan, as part of the EMS, to be made available to staff to ensure compliance with a permit, which covers the following:

- Management of activities, including security and staffing
- Emissions and monitoring, including:
  - Point sources to air, water and land
  - Fugitive emissions
  - Site drainage
  - Storage of waste
  - Odour, noise and vibration
- Site record keeping

Table 6.5: Part C3, Question 3a, Table 3: Technical standards

Installation name	**Goddard's Green STC**	
C3 – Installation		
Description of the schedule 1 activity or directly associated activity	**Best available technique (BATC, BREF or TGN reference)**	**Document reference**
Section 5.4 non-hazardous waste installation - anaerobic digestion installation regulated under the Industrial Emissions Directive, utilisation biogas for energy	• Biological waste treatment: appropriate measures for permitted facilities • Non-hazardous and inert waste: appropriate measures for permitted facilities	• https://www.gov.uk/guidance/biological-waste-treatment-appropriate-measures-for-permitted-facilities/1-when-appropriate-measures-apply • https://www.gov.uk/guidance/non-hazardous-and-inert-waste-appropriate-measures-for-permitted-facilities
B4 – Waste activities		
Description of the waste operation	**Appropriate measure (TGN reference)**	**Document reference**
Temporary storage of imported cake (raw or digested) Acceptance of liquid sludge waste (digestate) at post digestion, for dewatering	• Non-hazardous and inert waste: appropriate measures for permitted facilities • Biological waste treatment: appropriate measures for permitted facilities	• https://www.gov.uk/guidance/non-hazardous-and-inert-waste-appropriate-measures-for-permitted-facilities • https://www.gov.uk/guidance/biological-waste-treatment-appropriate-measures-for-permitted-facilities/1-when-appropriate-measures-apply
General		
All activities	**Guidance**	**Document reference**
	• Monitoring stack emissions: technical guidance for selecting a monitoring approach • M1 sampling requirements for stack emission monitoring • Environment Agency environmental permitting guidance, including: • Risk assessments for your environmental permit • Energy efficiency (Energy efficiency for combustion and energy from waste power plants) • Noise assessment and control • H4 Odour management • H5 Site condition report • Control and monitor emissions for your environmental permit	• https://www.gov.uk/guidance/monitoring-stack-emissions-technical-guidance-for-selecting-a-monitoring-approach • https://www.gov.uk/government/publications/m1-sampling-requirements-for-stack-emission-monitoring • https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit • https://www.gov.uk/guidance/energy-efficiency-standards-for-industrial-plants-to-get-environmental-permits • https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits • https://www.gov.uk/government/publications/environmental-permitting-h4-odour-management • https://www.gov.uk/government/publications/environmental-permitting-h5-site-condition-report • https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit

A copy of the process flow diagram describing the operation and process can be found in document reference 790101_MSD_Schematics_GOD November 2024.

6.3.1 BAT Assessment

An assessment against the BAT Conclusions set out in the 2014/738/EU: Commission Implementing Decision of 9 October 2014 establishing best available techniques (BAT) conclusions, under the Industrial Emissions Directive 2010/75/EU has been undertaken for all the 16 sites, as a whole, and the outcome of these conclusions can be found in document reference 790101_MSD_BAT_GOD December 2024. This document reflects the existing

arrangement at site and any commitments Southern Water has already made during the ongoing application process. It is acknowledged that it does not fully meet BAT in some instances. Changes to site will be undertaken and completed to meet BAT, where applicable. The changes required will be submitted to the Environment Agency, in plans to be submitted as part of Improvement Conditions within the permit, for their agreement and Southern Water's subsequent implementation. An implementation plan has shown in document reference 790101_MSD_ImplementationPlan December 2023.

Included in the Implementation Plan is for the wastewater inventory monitoring to be undertaken as per BAT 2, and further information is addressed in Section 6.2.3. On-going monitoring is proposed to be in line with BAT AELs and monitoring frequencies are applicable to treatment of water-based liquid waste and biological treatment of waste, these are outlined in Table 6.1 and Table 6.2 of the BAT assessment.

The Odour Management Plan (document reference 790101_ERA_OdourMP_GOD December 2024) has also been prepared in accordance with the following BAT conclusions, in additional to the H4 guidance:

Supplementary documents for the BAT assessment are provided:

- BAT 1, 21 and 38: Accident Management Plan (AMP) is provided in 790101_MSD_AMP_GOD November 2024. Catastrophic failures, of tanks for example, will be included in the AMP once final designs are agreed based on the findings in CIRA/ABDA assessment.
- BAT 1, 11, 22 and 35: Residues Management Plan (RMP) is provided in 790101_MSD_ResidueMP_GOD November 2024.
- BAT 1, 8, 10, 12, 13, 14, 33, 34 and 52: Odour Management Plan (OMP) is provided in 790101_ERA_OdourMP_GOD December 2024.
- BAT 1: Environmental Management System is provided in 790101_EMS Certificate December 2023.
- BAT 2 and 52: Description of the waste acceptance and pre-acceptance procedures provided in 790101_WasteAcceptance_GOD November 2024.
- BAT 3, 6, 7 and 20: Sampling commitment and proposal for characterisation is provided in 790101_Sampling proposal_GOD December 2024.
- BAT 14: Leak Detection and Repair Plans (LDAR) are provided in 790101_MSD_LDAR_GOD March 2024.
- BAT 14: Bio-aerosols Risk Assessment (BRA) is provided in 790101_ERA_BioRA_GOD_March 2024.
- BAT 17: Environmental Risk Assessment (ERA) is provided in 790101_ERA_GOD December 2024.
- BAT 19 and 38: ABDA Tool and proposed containment solution is provided in 790101-MMD-IED-GOD-CA-C-001 - IED Goddard's Green ADBA Tool P04 and the site layout plan 790101_MSD_SitelayoutPlan_GOD December 2024.
- BAT 19: Covering of tanks is provided in the Implementation Plan, 790101_MSD_Implementation Plan December 2023.
- BAT 19: Drainage is provided in 790101_ERA_Drainage Plan_GOD Nov 2021.
- BAT 23: Energy Efficiency is provided in 790101_MSD_Main_GOD December 2024
- BAT 34: Reducing channelled emissions, addressed in the Odour Management Plan (OMP), provided in 790101_ERA_OdourMP_GOD December 2024.

- BAT 53: Reducing emission of hydrochloric acid (HCl), ammonia (NH_3) and organic compounds to air addressed in the Odour Management Plan (OMP), provided in 790101_ERA_OdourMP_GOD December 2024.

6.3.2 Appropriate measures assessment

In addition to the Bref and associated BATc, the appropriate measures will form part of the technical standards the Site operates:

- Non-hazardous and inert waste: appropriate measures for permitted facilities
- Biological waste treatment: appropriate measures for permitted facilities

As the Site is existing some aspects of the Appropriate Measures do not apply, as the Site was built and operated prior to the issue of the guidance. Southern Water are committed to develop the application of the key principles from the guidance into Site operation and associated management plans as soon as practicable, to ensure the following:

- Reducing or preventing contamination
- Preventing cross contamination by segregation
- Maintaining appropriate primary and secondary containment
- Ensure the Site does not exceed site capacity (design and permitting constraints)
- General management:
  - Operate with a Management System
  - Operate with applicable specific management plans (odour, accident and residue plans)
  - Inspection, maintenance and monitoring regimes
  - Maintaining and reviewing staff competency requirements
  - Maintaining appropriate security measures across the Site
  - Record keeping procedures
  - Contingency plans
- Maintaining appropriate waste storage and suitable segregation, to prevent environmental impacts. Includes tank inspection and maintenance regimes
- Operate and calibrate process monitoring systems
- Record keeping of process outputs, and appropriate handling of residues
- Emissions controls, including prepare an emissions inventory
- Apply process efficiency measures for energy, raw materials, water use and waste minimisation.

As per document reference 790101_Sampling proposal_GOD December 2024, sampling and analysis in relation to permitted waste operations, other than those related to Scheduled Activities, will be undertaken in line with ‘Non-hazardous and inert waste: appropriate measures for permitted facilities’ guidance text, using an MCERTS accredited, or equivalent, laboratory, where available. This commitment is related to the acceptance of imported wastes to the post digestion at the Site.

Acceptance of waste to the head of the works

A high-level assessment against the appropriate measures for inert and non-hazardous waste has been undertaken and is presented in document reference 790101_Appropriate Measures_GOD November 2024.

6.4 Question 3b: General requirements

6.4.1 Overview

This section provides an overview of the measures in place at the Site for controlling fugitive emissions, noise and odour. An ERA has been completed and is provided with the application (Document reference 790101_ERA_GOD December 2024). The response to this question relates to Table 4 in the Part C3 form.

6.4.2 Control of fugitive emissions to air

There are no significant fugitive emissions to air of gases, vapours or particulates as part of normal Site operations.

Details of the procedures Southern Water follows with regards to the control of mud and debris and potentially polluting leaks and spillages are addressed in the EMS.

An Air Quality Risk Assessment has been undertaken at the time of the application for permit EPR/JP3137QB to assess the impacts from point sources emissions at the site (document reference 790101_AQRA_GOD November 2024). An addendum to this AQRA is provided as 790101_AQRA_GOD November 2024_addendum.

The existing approaches and relevant procedures presented in the EMS and operational procedures are considered to adequately address the emissions that may present a risk, and, therefore, an Emission Management Plan is not considered be required.

6.4.2.1 CHP and flare

Southern Water acknowledges that the flare is appropriate for emergency use (such as breakdown and maintenance). Southern Water confirms that they plan to keep the existing CHP and flare at Goddard's Green as it meets the requirements for biogas combustion. However, work is likely to be required to be fully BAT compliant for access, ports and measuring/monitoring devices.

Gas modelling shows the site is not expected to flare outside of maintenance or emergency scenarios.

The available gas modelling shows flaring would be for around 0.2% of the year for maintenance activities.

The existing flare and CHP are to be retained at this site, but additional work is anticipated to be required to fully meet BAT (note, this is with respect to non-emissions or frequency of flare use considerations, eg. access to testing ports). The detail of this is under review and any identified scope will be completed in AMP8.

The Goddards meter is currently not operating as required (fault) and is scheduled for replacement under BAU by Ops, this is not linked to IED timescales/scope.

This site has been undertaking THP commissioning, this poses an additional challenge in collation and reporting of data for steady-state operation (BAU).

Temperature data is available (but direct recording of operating hours is not), this data infers there was a maximum potential of 1222 hours operation for the last year (7.17%) however this does not reflect actual hours as the data records an occurrence within a given hour, when in reality the flare is highly unlikely to operate for the full hour, thus overestimating the flare use.

The meter replacement will ensure all required signals for data collation and reporting are provided.

The flare use data forms part of wider data collation and reporting (IT) system improvements planned to meet BAT 2c for inventory, BAT 11 energy and has an influence on BATs 15b, 16b and 21c for incident reporting (re. PVRVs and gas system management).

Further information is being collated in line with discussions with the SSD LIA (KS) on 3/12/24 and will be provided in due course (regarding asset replacement plans and timescales but will be provided for all sites even though no asset replacements are required here).

6.4.2.2 Odour

The Site has an Odour Management Plan (OMP), produced in November 2024, which identifies potential odour emissions from site operations and procedures to manage, control and minimise odour impacts. It sets out the procedures for engaging with neighbours and how the Operator will manage complaints, and the actions to be taken in the case of pollution events.

The OMP also describes the monitoring and maintenance procedures to maintain the control measures. The EMS 341 air quality and odour management also sets out the process for responding to odour complaints arising from customer contact.

The Site has not received any odour complaints in the last five years (2019-2023).

All sludge treatment processes and sludge storage tanks are covered or enclosed, with exception of the LTP.

The inlet works, sludge treatment centre and dewatering buildings are odour controlled by three odour control units. Two of the odour control units are biofilters followed by activated carbon filters. The odour control unit for the sludge dewatering building is an activated carbon filter only. Odours are drawn from covered process tanks and buildings to the odour control units where odorous chemicals are removed by biological actions and absorption.

The removal of biosolids off-site will be undertaken as soon a practically possible whilst considering prevailing weather conditions.

The Site has an Odour Management Plan (OMP), reviewed and updated in November 2024, which identifies potential odour emissions from site operations and procedures to manage, control and minimise odour impacts. It sets out the procedures for engaging with neighbours and how the Operator will manage complaints, and the actions to be taken in the case of pollution events. The OMP also describes the monitoring and maintenance procedures to maintain the control measures.

The OMP was written in accordance with the Environment Agency's H4 Odour Management guidance (2011). The level of odour risk from the Site is considered to be low, as shown in Appendix B of the ERA (document reference 790101_ERA_GOD December 2024), and the Site's OMP provides sufficient mitigation.

The OMP can be found in document reference 790101_ERA_OdourMP_GOD December 2024

6.4.2.3 Noise

The Site has received eight noise complaints in the past five years, five of which were received in 2020. Complaints received in 2020 related to alarms sounding from the WTW assets and it was reported that such sounds kept a resident awake. In order to reduce noise disturbance from alarms on site, most are turned off, except the gate, ferric bund and fire alarm.

Initial screening has been carried out for the Site. Since the Site is not undergoing changes to equipment and vehicle movements prior to application submission, a Noise Impact Assessment (NIA) is not considered to be required. Appropriate mitigation for noise and vibration impacts are provided by the ERA.

A Noise and Vibration Management Plan would be required whereby the NIA concludes that noise and vibration requires management, such as monitoring and maintaining abatement measures. Since noise and vibration impacts are considered to be appropriately mitigated in the ERA, a Noise and Vibration Management Plan is also not considered to be required.

6.4.2.4 Dust and particulates

There are not considered to be any significant dust or particulate sources from the Site as identified in the ERA document reference 790101_ERA_GOD December 2024.

6.4.2.5 Bio-aerosols

A bioaerosols risk assessment has been undertaken for the Site and considers there not to be any significant risks. The Bio-aerosol Risk Assessment can be found in 790101_ERA_BioRA_GOD March 2024.

6.4.3 Control of fugitive emissions to surface water, sewer and groundwater

There are not considered to be any fugitive emissions to surface water, sewers or groundwater. According to the Operator's pollution incident register, in the past five years (2019-2023), there have been no pollution incidents to controlled waters, within 1km of the Site, that are confirmed or substantiated as being related to the STC.

There are no groundwater source protection zones (SPZ) or groundwater abstractions within 250m (or within 1km) of the Site.

All drainage water including surface or foul water is captured by the drainage network which returns all water to the head of the works for treatment.

There will be no direct discharge of wastewater to controlled waters from the STC.

There are no direct potentially contaminated discharges to groundwaters. Condensate from the flare, CHP and the biogas is captured in condensate pots and is discharged to drainage and directed to the inlet works.

Accidental releases of materials to the environment are controlled through adequate containment measures and working procedures.

The existing approaches and relevant procedures presented in the EMS and operational procedures are considered to adequately address the emissions that may present a risk, and therefore, an EMP is not considered to be required.

6.4.4 Control of fugitive emissions to land

Details of waste generated at the Site is demonstrated in document reference 790101_MSD_ResidueMP_GOD November 2024.

6.5 Site security

Activities are managed and operated in accordance with the management system.

The Site is fully enclosed by chain link fencing approximately 6ft in height, and a 2.5-3m steel palisade at the 2m metal gate controlled via the control room or key fob. The site is staffed 14 hours a day, and the remaining 10 hours are covered by staff on standby. For visitors and unauthorised personnel, an intercom system at the Site entrance is used. The Site also benefits from a CCTV system. There are 8 CCTV cameras, which comprise a combination of thermal imaging and number plate recognition. Two cameras cover the front gate (CCTV and ANPR), two cover the inlet (CCTV and thermal), 2 cover the large fuel tank and generator (CCTV and

thermal) and two cover the hydrogen peroxide store under the Archimedean screws. All cameras are monitored and controlled from a control room. Site floodlighting is provided at all reception facilities to give good visibility at all times of the day and night.

Regular inspections of the boundary fencing and buildings are undertaken to ensure that these have not been compromised and continue to prevent easy access to Site. Repairs are undertaken in accordance with the EMS requirements.

Other risks relating to human health and the environment are presented in the ERA in document reference 790101_ERA_GOD December 2024.

6.6 Complaints procedure

All complaints received relating to any aspect of the Site and its activities will be recorded and acted upon. Complaints, and actions taken, will be either recorded in the Site Diary or on a complaints record form. If a Site receives a complaint, this form should be completed and shown to the Environment Agency when they next inspect the Site. The forms will be used as evidence that any complaints received have been taken seriously and that actions have been taken to rectify any problems identified.

Complaints will be investigated promptly and any appropriate remedial action taken. The complainant and anyone else likely to have been affected, should be informed about what has been found and actions taken in a timely manner. The details of the complaint and the actions taken will be recorded in the Site Diary or log.

The aim will be to undertake measures to prevent complaints from being raised. However, where this is not possible, proactive measures will be taken to prevent further complaints from being made. For example, if a complaint is made with respect to dust, the Site Manager will arrange for dust suppression equipment to be used. The Site Manager will assess whether further control measures will be required to ensure that the risk of recurrence is minimised. The details of the complaint will be recorded in the Site Diary and the complaints register. If a complaint is received Southern Water will be informed as soon as is practicable and the complaints procedure will be followed. Confirmation will be recorded in the Site Diary or inspection log. The Site Manager will inform the Environment Agency of the complaint, if appropriate.

Any drivers who regularly cause a dust or mud and debris nuisance as a result of mismanagement of their vehicles will be discussed and advice will be sought from the Site Manager, if relevant.

If a complaint is made with respect to insects the Site Manager will investigate whether any of the activities at the Site could be the source of the nuisance.

If a complaint is made with respect to litter, the Site Manager will arrange for litter pickers to clear up as appropriate and will assess whether further control measures will be required to ensure that the risk of recurrence is minimised. The details of the complaint will be recorded in the Site Diary and the complaints register.

Any complaints relating to fugitive emissions and the actions taken will also be recorded in the Site Diary and copies of the incident reports (including those provided to the Environment Agency) retained on-Site.

If a complaint is made with respect to vermin or an infestation is suspected, where normal treatment activities appear to be unsuccessful, the Site Manager will discuss and agree any further measures required with the pest control firm. The complaint reporting procedure will be followed as described below.

If a complaint is made with respect to noise or vibration, the Site Manager will assess the cause of the complaint and will report the findings. If the noise or vibration leading to the complaint has been caused by a continuing operation, additional noise or vibration surveys may be required to confirm the degree of impact upon the receptor. The Site Manager will make any recommendations for further noise or vibration control to the Management Team and shall inform the Environment Agency of the complaint as soon as it is practicable to do so.

If a complaint is made with respect to odour, the Site Manager will investigate the source of the odour and take steps to reduce its impact. If the source appears to come from the Site, then appropriate actions to reduce the odour will be taken.

6.6.1 Complaints investigation procedure

In the event of any complaint, this section deals with the complaint assessment procedures. The primary role of this assessment will be to ascertain whether the complaint is associated with any Site operations and what action should be taken to prevent or minimise the probability of a recurrence.

It is important that any person acting on behalf of Southern Water is appropriately trained and that all steps and decisions are documented.

Step 1 – Complaint received

The Site operator or Environment Agency receives a complaint regarding the STC. Details logged within the Customer Services Management System (CSMS).

Step 2 – How to respond

Complainant is contacted to inform them the complaint has been received and request further information, where required.

The primary reasons for investigation of complaints are to identify the likely cause and source for the complaint and it is important to gather as much information about the complaint as possible. At the outset of any investigation, the Site Manager is to determine the priority for responding to the complaint.

If possible, someone from the Environment Agency will attend after a complaint has been made so that they can carry out an effective and subjective appraisal of the complaints and note any results into the CSMS.

Step 3 – Determine what to record and how

The complaint details and the investigation outcomes and actions taken are to be recorded in the CSMS. This information must be filled in on Site at the time of notification of the complaint.

Step 4 – Follow-up investigation

In order to resolve any problems successfully, it is essential to understand fully the source, reason and the operational conditions that led to the complaint. The first step in the investigation will be to select the most appropriate methodology for assessment. All the information collected should be filled in on the internal complaints form and a note made referencing this in the CSMS.

Step 5 – Communication with the complainant

The Site Manager or contractor tasked with addressing the complaint is responsible for collecting all the information and providing feedback to the complainant, or the Customer

Contact Centre will contact the complainant. Wherever possible an explanation of the actions taken and the reasons for the decision should be made to the complainant.

If it is decided that there was no ground for the complaint this should be clearly explained to the complainant, along with information about what they should do if they are unhappy with the response.

Step 6 – Monthly complaints records

A full report of the complaints logged within the CSMS is produced to present to the relevant Technician to allow a review of potential trends.

6.7 Question 3c: Types and amounts of raw materials

Details of raw materials is demonstrated in document reference 790101_MSD_ResideuMP_GOD November 2024.

6.8 Question 4: Monitoring

This section provides a summary of the proposed monitoring at the Site.

6.8.1 Emissions to air

Stack emissions monitoring will be undertaken for each stack in accordance with M5 monitoring guidance, MCERTs BS EN 14792 and the requirements of the environmental permit issued for the Site, where suitable and available.

Periodic monitoring will be undertaken on an annual basis as part of the routine maintenance programme. No abatement technology is required, and continuous monitoring is not considered necessary. Sample monitoring will be carried out after each maintenance period on the CHP and boiler, in order to ensure compliance with ELVs as required in the Environmental Permit.

Once permitted monitoring will be undertaken in accordance with the relevant standards. It is anticipated the monitoring standards required are as follows:

Table 6.6: Monitoring of air emissions

Emission point type	Parameter	Reference period	Monitoring frequency	Monitoring standard or method
Stacks on engines Burning biogas	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	periodic over minimum 1-hour period	Annual	In accordance with TGN M5 – Monitoring of stack emissions to air
	Carbon monoxide			
	Sulphur dioxide			
	Total volatile organic compounds including methane			
Boilers (dual fuel)	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	periodic over minimum 1-hour period	Annual	In accordance with TGN M5 – Monitoring of stack emissions to air
Channelled emissions to air (biofilters and carbon filters)	Ammonia	periodic over minimum 1-hour period	Once every 6 months, or more frequent if stated in the permit.	Emissions of pollutants into the environment through any kind of duct, pipe, stack, etc
	H_2S			

Emission point type	Parameter	Reference period	Monitoring frequency	Monitoring standard or method
	Odour concentration			BS EN 13725
Flare	Operational hours	Recorded duration and frequency.	Continuous	Operational record including date, time and duration of use shall be recorded
Pressure relief valves	Biogas release and operational events	Recorded duration and frequency.	Daily inspection	Operational record including date, time duration of pressure relief events and calculated annual mass release. Linked to SCADA.

Southern Water acknowledges that the flare is appropriate for emergency use (such as breakdown and maintenance).

6.8.1.1 Assessment of the sampling locations

Southern Water will employ sub-contractors accredited to MCERTS to monitor the emissions points in accordance with the permit requirements, where suitable and available. An assessment of sampling locations is therefore not appropriate as this will be the responsibility of the sub-contractors. Where suitable and available, any monitoring, sampling and analysis of emissions to air or water is undertaken according to MCERTS, or equivalent standards, by MCERTs accredited contractors.

6.8.1.2 Sampling locations and BS EN 15259

Southern Water does not believe the BS EN 15259 applies at the Site due to the diameter of circular ducts. Under Environment Agency's Method Implementation Document for EN 15259:20072, circular ducts with diameters <1.13m are not required to meet BS EN 15259.

6.8.2 Emissions to water (other than sewers)

There are no direct releases to controlled waters of emissions arising from the STC. As such, no monitoring or reporting is required.

6.8.3 Emissions to sewers, effluent treatment plants or other transfers off-site

The release of liquors from the sludge treatment process is considered to be a point source emissions or direct discharges to sewers, as part of the permit operation. The site layout plan, drawing reference 790101_MSD_SiteLayoutPlan_GOD December 2024, identifies the point at which liquors leave the site to enter the WTW at the inlet. A sampling location has also been identified on the site layout plan, although sampling will be undertaken as part of a wider implementation plan under BAT and IED.

Southern Water confirms that they will undertake a chemical analysis of their wastewater, from the STC entering the adjacent WTW, which tests all pollutants they expect to find in the discharge to fully characterise the emissions to water. They propose a minimum of 12 sampling runs over a 12-month period (1 full sampling spec per month) initially to establish a baseline, in accordance with the surface water pollution risk assessment guidance or other applicable guidance such as MCERTS or ISO standards, where appropriate. Southern Water will then take an informed viewpoint of the determinants the samples contain demonstrating those that are not in the sample. An H1 assessment to screen out any that are not applicable or relevant

will be completed. Sampling and analysis will be undertaken using a UKAS accredited, or equivalent, laboratory. This commitment falls within the Implementation Plan for meeting BAT and IED compliance. An implementation plan is shown in document reference 790101_MSD_ImplementationPlan December 2023. It is therefore, considered that this will be added as Improvement Conditions to the permit.

Condensate from the CHP exhaust discharges into the raw tank then aeration lanes, which are discharged directly to the adjacent Goddards Green WTW and will undergo treatment through the works before being discharged under an existing environmental permit for discharge to water. There are no direct releases to public sewer or other transfers off-site of emissions arising from the STC.

6.8.4 Emissions to land

There are no direct releases to land of emissions arising from the STC. As required by the Southern Water EMS various housekeeping and waste management practices are in place to monitor waste emissions. These include segregation of wastes according to their classification and nature, labelling waste and using designated storage containers.

In accordance with the Southern Water EMS Policy solid waste is disposed of in accordance with 'Duty of Care' Regulations. The composition of the waste, its hazard characteristics and any relevant precautions are clearly stated on the transfer notes provided to licensed waste contractors removing waste from Site for recycling and/or disposal. Records are maintained on-site and reported to the regulator as required by the Permit.

6.9 Environmental impact assessment

The proposal is not subject to an environmental impact assessment under Council Directive 85/337/EEC of 27 June 1985 [Environmental Impact Assessment] (EIA).

6.10 Question 6: Resource efficiency and climate change

6.10.1 Basic energy requirements

Southern Water aims to maximise the efficiency of the energy flows from its processes ensuring that, where possible, heat is recovered, and energy is not wasted.

There are a number of pieces of infrastructure and equipment that use electrical energy supply including:

- Fans, coolers and heating
- Motors and motor drivers and drive systems
- Aeration
- Pumps/boosters/conveyors
- Facilities – heating and lighting
- Sludge handling and management e.g. AD, dewatering and polymer dosing equipment
- Ventilation and odour control/abatement systems

Biogas is used to provide energy, produced by burning in a CHP engine, for the Site's processes.

6.10.2 Question 6a: Basic measures for improving energy efficiency

Biogas is a renewable gas, produced from organic waste and is reused on-site to power its energy requirements. A key objective of the Southern Water EMS is to reduce energy consumption from the grid. Southern Water have a specific Energy and Carbon Manual which

contains objectives for the energy consumption. Southern Water recognise that target setting for, and measurement of, energy and carbon reduction is pivotal to reducing energy use and carbon emissions in new and existing installations. Southern Water is currently in the process of better understanding economic levels of energy efficiency, renewable energy generation and carbon reduction (embodied and operational), which will help the company develop and set company and project level reduction targets.

Southern Water is dealing with the measurement and reporting of operational carbon emissions in existing installations through:

- Monitoring of energy use from electricity meters
- Quarterly estimation and reporting of operational carbon emissions for internal reporting purposes
- Annual estimation and reporting of operational carbon emissions for regulatory reporting (Southern Water Annual Report, Ofwat and SECR (Streamlined Energy & Carbon Reporting)
- ESOS audit reporting – the Energy Savings Opportunity Scheme (ESOS) is a regulatory requirement to undertake a company-wide audit of energy efficiency opportunities. This is approved by a Lead Assessor and completion is subsequently registered with the Environment Agency. Reporting is every four years.

Energy efficiency measures implemented at the Site include (but not limited to) the following:

- The combustion temperature is maintained relatively constant for reduced NOx emissions and increased efficiency
- The engines are equipped with turbochargers, further increasing energy efficiency
- Ongoing monitoring of plant operating parameters is carried out to ensure process is operating optimally and to enable constant optimisation to increase the plant's efficiency
- Good housekeeping measures are employed, and regular preventative maintenance will ensure the operations, and therefore energy efficiency is optimised
- Low cost measures in place to avoid inefficiencies of excessive heating or cooling include:
  - Insulation of main hot water pipes
  - Insulation of heating equipment such as hot water heat exchanger, boiler feed water tank and boiler feed water pumps and pipework
- Utilising low energy equipment for lighting such as:
  - High frequency fluorescent lighting, high pressure sodium or LED
  - Allowing for local or modular switching, where appropriate
- Consideration of energy recovery and the deployment of renewable energy systems, including:
  - Micro-hydro applications
  - Advanced sludge digestion
  - CHP
  - Use of solar panels and wind generation

Heat generated from the CHP is used in the AD process. The energy created by burning of biogas in the CHP engine is used to supply the Site to reduce the need to import electricity from the grid.

The development of an energy efficiency plan will be considered once the Site is permitted; this will determine areas of improvement and will be developed under Southern Water's Environmental Policy and EMS.

Southern Water carries out planned maintenance as a means to ensure operations are energy efficient. Overall, the energy use is relatively low, and the purpose of the installation is to produce energy by supplying biogas, no further measures are identified at this stage to improve upon energy efficiency. Nevertheless, Southern Water will regularly review energy use and disclose potential opportunities to reduce energy consumption from the four-yearly (or more frequent) energy reviews as required by a varied permit. In addition, Southern Water implements optimisation measures across all its sites in a proactive approach to ensuring efficiency measures across all its site operations meet optimal and efficient operating requirements.

6.10.3 Question 6b: Changes to the energy the permitted activities use up and create

There will not be any changes to the energy that the permitted activities use or create.

6.10.4 Question 6c: Climate change levy agreement

Southern Water is not a participant to the Climate Change Levy (CCL) agreement.

6.10.5 Question 6d: Raw and other materials, other substances and water use

Details of raw materials is demonstrated in document reference 790101_MSD_ResidueMP_GOD November 2024.

6.10.6 Question 6e: Reducing production of waste

Details of waste generation and reduction measures are demonstrated in document reference 790101_MSD_ResidueMP_GOD November 2024.

7 Part F1 – Charges and declarations

7.1 Question 1: Working out charges

Table 1, Table 2 and Table 3 are completed on the Part F1 form.

7.2 Question 2: Payment

Payment will be made by BACS.

7.3 Question 4: Confidentiality and National Security

Southern Water do not wish to claim confidentiality with this application.

7.4 Question 6: Application checklist

Table 7.1 provides a list of section/document references included in the application.

Table 7.1: Part F, Question 6, Table 4: Application checklist

Question reference	Document title	Documents reference
Part A – Q5c Part A – Appendix 1 Part C2 – Appendix 2	Details of Directors	790101_MSD_Directors February 2024
Part C2 – Q3a Part C2 – Appendix 2	List of Relevant Offences	790101_MSD_RelevantOffences February 2024
Part C2 – Q3b	Competency Management System Agreement	790101_MSD_CMS December 2023
Part C2 – Q3d	Environmental Management System Certificate	790101_MSD_EMS December 2023
Part C2 – Q5a Part C2.5 – Q4b Part E2 – Q3a	Site Location Plan	790101_MSDS_SiteLayoutPlan_GOD December 2024
	Site Layout Plan	
	Drainage Plan	790101_MSD_DrainagePlan_GOD
Part C2 – Q5b Part E2 – Q4a	Site Condition Report	790101_SCR_GOD November 2024
Part C2 – Q6	Environmental Risk Assessment	790101_MSD_ERA_GOD November 2024 790101_MSD_Maps_GOD March 2024
	Climate Change Risk Assessment	790101_ERA_CCRA_GOD
	Air Quality Dispersion Report	790101_MSD_AirQualityDispersionReport_GOD
Part C2.5 – Q2	Air Quality Risk Assessment	790101_AQRA_Addendum GOD November 2024
Part B4 – Q1b Part C3 – Q1b Part C4 – Q1b	Waste Codes	Appendix A of 790101_MSD_GOD December 2024
	Annual throughput data	790101_AnnualThroughput_GOD November 2024
	Waste Transfer Notes	790101_MSD_WasteTransferNotes_GOD November 2024
Part C3 – Q3a Part C3 – Q3c Part C4 – Q3a	Schematics/Process flow diagram	790101_MSD_Schematics_GOD November 2024
	BAT Analysis	790101_MSD_BAT_GOD December 2024
	Implementation Plan	790101_MSD_Implementation Plan December 2023
	Leak detection and repair Plan	790101_MSD_LDAR_GOD March 2024
	Residues Management Plan	790101_MSD_ResidueMP_GOD November 2024
	Accident Management Plan	790101_MSD_AMP_GOD November 2024
	Duty of care (waste acceptance)	790101_WasteAcceptance_GOD November 2024
Part B4 – Q3b	Odour Management Plan	790101_ERA_OdourMP_GOD December 2024

Question reference	Document title	Documents reference
Part C3 – Q3b Part C4 – Q3b	Bioaerosol Risk Assessment	790101_ERA_BioRA_GOD March 2024
Part B4 – Q4a	Monitoring	790101_Sampling proposal_GOD December 2024
Part C3 – Q3c, Table 5	Materials Safety Data Sheets	790101_MSD_MSDS_GOD March 2024
Part A – Q7 Part B4 – Q1,2,3 Part C2 – Q2,3,5,6 Part C2.5 – Q3,4 Part C3 – Q1,2,3,4,6 Part C4 – Q1,2,3,4 Part F1 – Q1,2,6	Main Supporting Document	790101_MSD_Main_GOD December 2024

A. Waste Codes

A.1 Wastes imported for Anaerobic Digestion

It is requested that the annual quantity of indigenous sludge and liquid sludge imports to be accepted is 328,233m^3.

EWC Code	Description	Where accepted	Indigenous or imported	Justification for use
19 02	**wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**			
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05 (sewage sludge only)	AD	Indigenous/ Imported	Pre-AD
19 08	**wastes from waste water treatment plants not otherwise specified**			
19 08 05	sludges from treating urban wastewater	AD	Indigenous/ Imported	Pre-AD

A.2 Wastes received under the Controlled Waste Regulations 2012

EWC Code	Description	Where accepted	Indigenous or imported	Justification for use
20 03	**Other municipal wastes**			
20 03 04	septic tank sludge	Head of works	Imported	
20 03 06	waste from sewage cleaning	Head of works	Imported	

*Southern Water acknowledge these waste codes will not be included in the permit

A.3 Wastes to import to head of works under a waste activity permit

EWC Code	Description	Where accepted	Indigenous or imported	Justification for use
16 10	**aqueous liquid wastes defined for off-site treatment**			
16 10 02	aqueous liquid wastes other than those mentioned in 16 10 01; sewage sludge liquor and chemical toilet waste	AD/Head of works	From adjacent STC processes	The waste for this code will be cess as currently accepted under permit .

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