Bexhill and Hastings STC
Odour Management Plan
790101_ERA_OdourMP_HAS

August 2024
V7

from Southern Water

Contents

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
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2	January 2024	Amelia Luk	Shannon Stone	Anita Manns	Version 5 (January 2024)
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Document reference: 790101_ERA_OdourMP_HAS August 2024

Information class: **Standard**

1. Odour Management Plan

1.1. Introduction

The Odour Management Plan (OMP) for Bexhill and Hastings Sludge Treatment Centre (STC) ('the Site') has been developed by Mott MacDonald on behalf of Southern Water Services ('Southern Water' or 'the Operator'). The OMP remains the responsibility of Southern Water Services as the OMP may assume a legal status if it forms part of the planning conditions or other legal agreements with local authorities or other third parties.

The OMP has been designed to be a live working document that forms part of the operational management system of the Site. It is a mitigation and control measure document that operations shall comply with. It demonstrates how odours shall be managed and controlled to prevent odour impacts from activities during normal operation and during abnormal events.

The OMP has been produced in accordance with the Environment Agency's H4 Odour Management guidance[1], Best Available Techniques (BAT) Reference Document for Waste Treatment[2] and Appropriate measures for the biological treatment of waste[3].

1.2. Objectives

The OMP identifies potential odour emissions from site operations and identifies procedures to manage, control and minimise odour impacts. It is based on a plan prepared by Southern Water and provides information about the measures currently implemented to control odour emissions from the Site. It provides sufficient detail to allow operators and maintenance teams to understand the operational conditions.

It is intended to be used as a reference document by operational staff on a day-today basis. The OMP includes the following:

- A description of the Site and catchment, including sources of odour on the Site, and location of sensitive receptors;
- The Site's individual process operation descriptions in order to minimise, manage and control odour;
- Characterisation of odours at different points in the treatment process and assessment of risk, particularly during abnormal operating conditions;
- Southern Water Operation and Management (O&M) procedures for the Site, including housekeeping measures to minimise odour generation and release;
- The mitigation procedures which should be implemented when foreseeable situations, that may compromise the ability to prevent and minimise odorous releases, occur. These can include both breakdowns and external conditions such as extreme weather;
- An odour risk assessment identifying any odorous or potentially odorous areas of the works and immediate and longer-term actions required to eliminate odour complaints;
- Containment, enclosure, ventilation, abatement of odours and emission standards;
- Monitoring of odorous emissions and action plans for investigation, remedial measures and procedural changes in the event of abnormal emissions;
- Management of the sludge reception, dewatering and treatment processes;.

[1] Environment Agency (2011), Environmental permitting: H4 odour management. Available online at: https://www.gov.uk/government/publications/environmental-permitting-h4-odour-management

[2] Joint Research Centre (2018) Best Available Techniques (BAT) Reference Document for Waste Treatment. Available online at: https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf

[3] Environment Agency (2020) Appropriate measures for the biological treatment of waste- Consultation draft July 2020. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/898966/Appropriate_measures_for_the_biological_treatment_of_waste_-_consultation_document.pdf

- Odour control and management procedures during emergencies and maintenance;
- Routine care and maintenance of critical equipment (extraction and odour abatement plant);
- Monitoring, recording and reporting arrangements;
- The management and operator training requirements and records with respect to odour;
- Staffing, responsibilities, training and procedures;
- Communication strategy and complaint management/resolution procedures;
- OMP updating, review and development procedures; and
- An action procedure for complaints.

The primary responsibility for implementation of the OMP lies with the operational site management. Other business functions support the implementation of the OMP across their areas of responsibility.

The OMP outlines the sources of odours and the risks to receptors. It outlines the measures Southern Water will employ on a daily basis and how Southern Water will respond to prevent or minimise odour releases and impacts. The routine assessment of odour and the monitoring and maintenance of plant and equipment at the Site will be carried out according to the schedules given in the Operation & Maintenance (O&M) manual and Environmental Management System (EMS) to ensure that performance is optimised.

The OMP will be reviewed, and amended where necessary, following changes in infrastructure or changes in operation that have an impact on odour at the Site. Otherwise, the OMP will be reviewed annually as a minimum, or as requested by the Environment Agency. The OMP is incorporated into the Site's Environmental Management System.

1.3. Site Location

Bexhill and Hastings Wastewater Works (WTW) and Sludge Treatment Centre (STC) is located south of Worsham Ridge, east of the Pebsham area of Bexhill. The Site was built between 1999 and 2001 and serves the towns of Bexhill, Hastings & St Leonards on Sea and nearby villages with a population of approximately 141,260 (JR18).

Activity address: Bexhill Road, Hastings, East Sussex TN38 8FB.

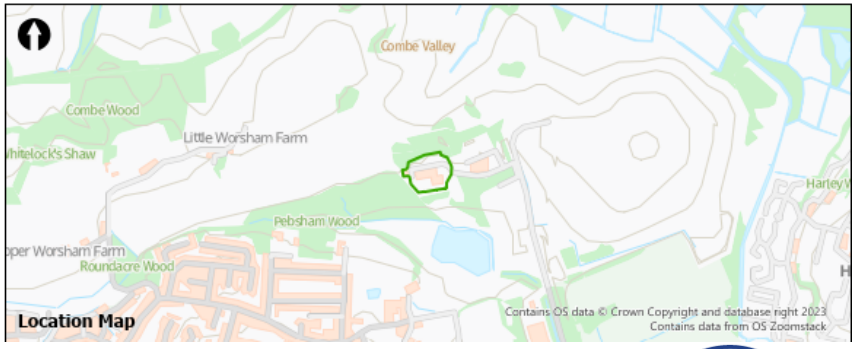
National grid reference: TQ 76590 09381.

The site location and layout are shown in Figure 1.

Figure 1. Location and layout of the Site

Emissions Ref	Emissions Points	Assets Ref	Assets	X	Y
A01	Whessoe Valves 1	1	Anaerobic Digester 1	576567	109412
A02	Whessoe Valves 2	2	Anaerobic Digester 2	576591	109416
A03	Whessoe Valves 3	3	Anaerobic Digester 3	576609	109420
A04	Whessoe Valves 4	4	Post digestion storage tanks	576543	109402
A05	Whessoe Valves 5	5	Post digestion storage tanks	576532	109400
A06	Whessoe Valves 6	6	Gas Holder	576505	109376
A07	CHP Unit	7	CHP & Emission monitoring point	576615	109398
A08	Odour control unit	8	Odour scrubbers 1 and H2S Monitoring point	576610	109364
A09	Boiler	9	Boiler	576590	109390
A10	Flare stack	10	Flare stack	576641	109401
		12	Cake reception building	576595	109378
		13	Centrifuge	576600	109350
		14	Gravity Belt Thickeners	576548	109377
		15	Cake storage silo & cake collection area	576599	109326
		16	Polymer & chemical storage	576587	109355
		17	Screenings storage	576555	109361
		18	Combined sludge storage tank	576530	109340
		19	Combined sludge storage tank	576543	109330
		20	General waste skip	576550	109340
		21	Lime storage & lime dosing plant	576520	109390
		22	Thickened Sludge Storage Tank	576575	109366
		23	Cake silo	576612	109336
W1	Inlet works (context only)			576539	109377
S1	Centrifuge liquors			576599	109350
M1	Centrifuge liquors			576600	109348
S2	Surface water			576557	109319
M2	Surface water			576556	109318
S3	Northern bund drainage			576543	109394
M3	Northern bund drainage			576541	109394
S4	Southern bund drainage			576560	109319
M4	Southern bund drainage			576561	109319
M5	Gravity belt thickener liquors			576547	109376
S5	Gravity belt thickener liquors			576548	109376
S6	Gas condensate			576511	109383
M6	Gas condensate			576510	109383
S7	Boiler blowdown			576590	109389
M7	Boiler blowdown			576589	109389

AX: Air emissions SX: Sewer emission points MX: Monitoring Points



1.4. Best Available Techniques

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.

As the changes are implemented the documentation will be updated to reflect the changes made to meet BAT.

The OMP addresses the following BAT:

- BAT 1: Environmental Management System to include the Odour Management Plan
- BAT 10: Periodically monitor odour emissions
    - Section 5 addresses monitoring
- BAT 12: Implement and regularly review an odour management plan, as part of the environmental management system, including protocols for:
    - Actions and timelines (addressed in Section 4.2 and 5)
    - Conducting monitoring (Section 5)
    - Response to identified odour incidents (Section 7.4 and Appendix A)
    - Odour prevention and reduction (Section 4, 5 and 6)
- BAT 13: Reducing odour emissions through the use of techniques: addressed in Section 4
- BAT 14: Reducing diffuse emissions to air, addressed in Section 3.2
- BAT 33: Control of odour emissions through pre-acceptance, acceptance and sorting the waste addressed in document reference 790101_WasteAcceptance_HAS August 2024
- BAT 34: Reducing channelled emissions, addressed in Section 4.1
- BAT53: Reducing emission of hydrochloric acid (HCl), ammonia (NH_3) and organic compounds to air in Section 4.1.

The OMP is applicable to the STC operations only and any mention of the wider WTW is for context only.

2. Site Operation

2.1. Overview of Site operations

The WTW is operated under the Urban Wastewater Treatment Regulations 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 T21, S2 and U6 Exemptions.

The waste activity comprises imports, physio-chemical and anaerobic digestion (AD) treatment 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 primary permitted installation activity will be the AD treatment facility. The AD facility will treat indigenously produced and imported sludges. Permitted Directly Associated Activities 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 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 Combined Heat and Power plant (CHP). 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.

2.2. Summary of the STC components

Currently the Site accepts indigenous sludge and imported sludge cake derived from the wastewater treatment process.

On average the site accepts 0.5 tankers per day containing pre-digested, liquid sludge.

The site does not accept tankered trade waste, cess or chemical toilet waste.

Below is a brief summary of the components for the Site.

2.2.1. Sludge treatment at the STC

STC Building

The sludge treatment centre (STC) at Bexhill and Hastings treats indigenous primary sludge and imported sludge cake.

The STC Building is a fully enclosed building, which houses the majority of the sludge treatment facilities. This building ensures that odorous air from the enclosed process are effectively captured for treatment.

All activities concerned with the reception of imported sludge are housed within the STC building from which air is extracted to the odour control system. Each sludge process unit and the space within which it sits is enclosed to form an odour-controlled enclosure within the building. Similarly, each vehicle delivery bay associated with the process inputs and waste arisings are enclosed units within the building, from which the air is extracted to the central odour control unit.

Reception and Screening of Indigenous Sludge and Imported Sludge Cake

Sludge cake is imported to the Site from Hailsham WTW and Eastbourne WTW, as well as from other sites under emergency conditions. A maximum of eight tankers of sludge cake are imported daily into the STC in sealed containers. Sludge cake is and discharged into 1 No. feed hopper/blending tank, where it is blended with surplus activated sludge (SAS), which is enclosed to ensure capture of odorous air for treatment.

Indigenous sludge is pumped via 2 No. sludge screens to 2 No. combined sludge storage tanks- which are operated in fill and draw mode.

Sludge Storage

Sludge storage is provided between each of the main sludge processing stages by means of cylindrical storage tanks. Indigenous sludge is first stored in 2 No. screened combined sludge storage tanks, each 552m^3, after primary settlement. After thickening it is then stored in 2 No. thickened sludge storage tanks. After the digestion process is it stored in 2 No. post digestion tanks each 552m^3. Sludge cake is stored in a 100m^3 silo. All of these tanks are enclosed to capture odorous air for treatment.

Air is extracted from each tank to the central odour control system. The sludge storage tanks are mixed using enclosed macerator pumps located outside the digesters. Therefore, there are no mechanical parts inside the tanks requiring access at regular intervals for maintenance purposes. Routine maintenance of the tanks and external mixing pumps would be subject to the Site odour risk assessment. Odour suppressant sprays would be used as necessary during this operation.

Thickening of Liquid Sludges

Sludge thickening is undertaken to increase the solids content of the sludge. This is achieved by means of mechanical equipment that is housed within a building to contain odorous air for treatment.

Liquor from the thickening process is returned to the WTW for further treatment.

The sludge is thickened in three duty/standby gravity belt thickeners (GBTs). The GBT's are automatically operated 24 hours a day, 7 days a week and receive sludge at approximately 1% Dry Solids (DS) and raise it to 7% DS. Polyelectrolyte's are added to aid the thickening process. The thickeners are covered and extracted to odour control system.

The thickened sludge is stored in 2 No. thickened sludge storage tanks, before being fed to the anaerobic digesters.

Digesters

There are 3 No. primary anaerobic digesters (2513m^3 each) operating between 33 to 38^{o}C, the temperature is automatically maintained by heat exchangers. Biogas from the process is stored in a double skinned gas bag (900m^3). Biogas is fed to the 1 No. CHP plant where it is used to generate heat (i.e. to control the temperature of the digestion process) and electricity for the Site.

The anaerobic digestion process provides a controlled environment where micro-organisms (including bacteria and fungi) can grow, multiply and break-down organic material, releasing water, carbon dioxide and methane (biogas). Gas production, gas pressure and digester temperature are monitored and logged on the SCADA system. The produced gas is stored in one biogas holder, which is a double skinned, expandable, hemispherical container. A biogas flare is provided for periods when, for example, the CHP are unavailable during maintenance or downtime, to control and manage excess gas during these periods.

In instances where the gas pressure is too high the pressure relief valve system de-pressurises the system. These pressure relief valves are located at the connection point with the biogas distribution system pipework at the top of each digester. Opening of the pressure relief valves is an emergency response of the system to maintain safety and would be rare, short lived events. Pressure levels are monitored in the gas system and linked to the SCADA system. This is provided with an alarm which can alert operators to increased pressure. The performance of the digesters is monitored daily, through the sampling of inlet and outlet sludge quality.

Combined Heat and Power Unit (CHP)

A CHP plant is installed at the Site, designed to use biogas. The biogas produced in the digestion process is fed to the CHP unit and standby boiler (powered by biogas and gas oil) to generate electricity and heat. The electricity is used to partially power the Site and heat is to be recovered and used to heat the digesters. There is also a back-up flare for use when the CHP engine is on downtime for maintenance.

Post Digestion

Digested sludge is stored in two post digestion sludge tanks (552m^3) prior to being dewatered by two centrifuges.

Dewatering

Dewatering takes place in 2 No. centrifuges (one standby, one duty). Dewatering further reduces the volume of sludge by reducing the water content from around 96% to 75%. Lime solution is dosed into the feed line of the centrifuges by 1 No. lime dosing rig consisting of 1 No. lime storage tank and 2 No. peristaltic dosing pumps (duty and standby). Limed cake is stored in a 100tonne silo before being transported off site for recycling to agriculture.
Liquor from the dewatering plant is returned to the WTW for further treatment.

Centrifuges are operated on a duty/standby system (one duty, one standby) to ensure that processing continues during periods of maintenance and repair. The centrifuges are housed within a building. The centrifuges are maintained as part of the framework maintenance contract which also provides an emergency response.

Cake storage

Dewatered digested sludge cake is stored in the form of a cake in a 100tonne silo, the cake silo is only ever filled to 80% and is emptied on a daily basis.

Odour control unit

Many of the facilities and processes on the Site are enclosed, with the exception of the aeration lanes and final settlement tanks. All sludge treatment processes are covered or enclosed.

There is a central odour control unit (OCU) on the Site which treats extracted odorous air from the main control and process building, the screens, grit and grease removal process, sludge reception area, sludge thickeners, sludge holding tanks and centrifuges.

Odour is controlled via one current Odour Control Unit (OCU), a single stage, dual tower wet chemical scrubber system with a total flow rate of 90,000 m^3/hour of foul air when both towers are in operation. Foul air enters the towers and passes through a column of plastic media to enable mass transfer of odorous compounds to the liquid phase. A liquid containing chemicals (sodium hypochlorite) is circulated through the column to destroy odorous compounds and turns them into odourless and soluble salts, which are then returned to the wastewater treatment system. Chemical dosing is

controlled by a redox and pH system, in order to maintain optimum conditions for the chemical reaction caustic is added to the towers and controlled by pH probes.

Filtered odour streams are discharged into the environment through OCU stack as shown by A08 in Figure 1 and are monitored hourly to ensure the absence of odorous compounds. The OCU treats air from the sludge treatment building and the sludge reception tank.

Chemical dosing for each odour control tower is set by a set of duty standby dosing pumps, in the case of a duty pump failure an alarm is raised on SCADA and the standby pump automatically takes over.

There are three Honeywell Chemkey systems installed on Site which monitor the concentration of H_2S in the stacks every 15 minutes, all monitors are equipped with sample conditioning systems fitted with flow fail alarms and are located close to sampling points to allow the shortest possible sample lines. A fourth system is installed in the aeration lane to monitor H_2S in ambient air, this system automatically generates an alarm if the concentration exceeds a preset value.

A schematic for the odour control unit can be found in Appendix B.

Other relevant STC components

- Feed hopper / blending tank 1 No. (20m^3)
- Sludge screens 2 No.
- Combined sludge storage tanks 2 No. (552m^3)
- Gravity belt thickeners 3 No.
- Thickened sludge storage tanks 2 No. (512m^3)
- Digesters 3 No. (2513m^3 each)
- Digested sludge storage tanks 2 No. (552m^3)
- Dewatering plant 1 No.
  - 2 No. Centrifuges
- Lime stabilisation 1 No.
  - 1 No. Lime dosing rig
  - 1 No. Lime storage tank (25,000litres)
  - 2 No. peristaltic dosing pumps (one duty and one standby)
- CHP unit 1 No. (thermal input of 1.84MWth)
- Boiler (dual fuel) (thermal input of 1.48MWth)
- Gas bag holder 1 No. (490m^3)
- Biogas burner (flare) 1 No.
- Odour control unit (OCU) 1 No.
  - wet chemical scrubber system
- Cake storage silo (100m^3)
  - Two ro-ro's for emergency cake storage (i.e if the silo is out of action).

The following are the outputs from the process:

- Screenings and grit – deposited into skips before being removed off-site.
- Bio-gas – stored in an existing gas holder, then either
  - Burnt in the CHP or back-up boilers to generate electricity for use on-site
  - Flared in the waste biogas burner
- Lime treated cake – stored in 1 No 100m^3 sludge silo prior to being shipped off site for recycling to agriculture (soil conditioner).

3. Potential Odour Sources

3.1. Overview of the mechanisms for odour generation

The generation of odour from the processing of sewage is primarily associated with the release of odorous Volatile Organic Compounds (VOCs) that are generated as a result of the anaerobic breakdown of organic matter by micro-organisms.

Since the main source of odour and VOCs is the solid organic matter, the most intense and offensive odours tend to be generated from the operations involving the handling of sludge i.e. the processes applied to dewater, treat and store raw sludge. These processes are generally considered to present the greatest risk of odour impact off-site unless adequate controls are put in place. Depending on the quality of the sewage presented to the works, aspects of the treatment process involved in the handling of raw sewage (e.g. preliminary and primary treatment stages) may also contribute to offensive odours.

Odours generated from the sewage treatment processes downstream of the primary sludge removal stage (e.g. the activated sludge processes and final settlement) present a significantly reduced risk of odour impact. This is due to the fact that the majority of odorous biogenic material has been removed from the flow at this point, and the treatment processes applied to remove any remaining contaminants in the sewage are aerobic, which inhibits the formation of the majority of the reduced sulphur compounds which are responsible for offensive sewage odours.

The rate of odour release from sewage and sludge sources is primarily dependent on the temperature of the material, and the surface area exposed to the atmosphere. As a result, odorous emissions from sewage treatment operations tend to be highest during the summer months. Furthermore, activities that lead to increases in the surface area of odorous material exposed to the atmosphere (e.g. due to turbulence generated by sewage handling processes and agitation of sludge) will inevitably lead to an increase in the magnitude of odour released.

Southern Water acknowledges that high levels of odour arising from wastewater and sludge treatment are not acceptable and that reasonable and practicable measures must be taken to minimise any nuisance caused to the general public. Southern Water does not operate under a single defined odour exposure standard. Each site is considered individually taking into account the relevant legislation and the local authority's conditions. Site specific factors such as site history with regard to odour complaints, potential future encroachment by residential or business developments, and the presence of particularly odour sensitive receptors within the vicinity of the Site are also taken into consideration.

3.2. Potential odour sources

Table 1 identifies the plant, equipment and activities which have the potential to generate odours under normal operational conditions. Odour sources under emergencies and abnormal operating conditions are addressed in section 4.3.3 Abnormal conditions.

Wastes accepted to the STC, under the Environmental Permit, are listed in Appendix C.

Due to the nature of the site activities, the hedonic tone of odours is neutral at best, whereas most odours generated on site will have a negative hedonic score (therefore deemed offensive). As the local population has already become sensitised to this, it is prudent to reduce the benchmark of the rating associated with sludge treatment. The hedonic score of the material will improve through the sludge treatment process as organic material is digested.

Table 1: Identified odour sources

Process or activity	Plant or equipment	Potential source of odour	Odour controls in place	Potential for odour emissions during normal conditions
Sludge reception	Sludge reception TQ 76597 09379	Sludge cake	Sludge cake is imported in sealed or covered containers and is discharged into the feed hopper which is enclosed within the main process building from which air is extracted to the central OCU. Shutters are kept closed on the building unless a vehicle is moving through them. Sludge cake is processed immediately. Hose wash facilities are used at waste receptions. Doors to the building are closed at all times other than providing access to vehicles. Maximum storage: 40 tonnes Retention time: 6 hours	Low
Sludge treatment	Sludge treatment building TQ 76592 09418 TQ 76614 09419 TQ 76571 09414	Sewage sludge	Sludge treatment activities are enclosed, and air is extracted to the central OCU. Building doors are kept closed, except when access is required. Maximum storage: 5026m^3 (total)	Low
	Anaerobic digesters pressure release valve TQ 76567 09412 TQ 76591 09416 TQ 76609 09420	Biogas	Digesters are covered, and the process is closely monitored and regularly maintained. Planned preventative maintenance undertaken on equipment Opening of the pressure relief valves (whessoe valves) is rare and events are recorded on the SCADA system. Maximum storage: 2513m^3 each	Low
	Sludge storage tanks TQ 76544 09402 TQ 76533 09399	Liquid sludge	All sludge storage tanks are covered and enclosed air is extracted to the central OCU. The process is monitored and regularly maintained.	Low
	Centrifuges TQ 76601 09349	Sludge cake	Centrifuges are enclosed in the process building and air is extracted to the central odour control plant. Small amount of gas released from sludge at the centrate discharge point, this is collected through extraction to the central OCU.	Low

	Odour control unit TQ 76610 09364	Untreated air	There is one Odour control unit at the Site to treat air and remove odorous compounds. These are process monitored and planned preventative maintenance is regularly undertaken on equipment	Low
	Liming TQ 76514 09386	Sludge cake	Limed cake is removed from the centrifuges into a covered conveyor where it is then dropped into ro-ro bins which are enclosed in the digested cake discharge area.	Low
	Cake silo TQ 76599 09326	Sludge cake	Cake is stored in a silo which is enclosed, cake is moved around the site via enclosed pipes and conveyors. Maximum storage: 100m^3	Low
Biogas combustion	Gas holder TQ 76505 0937	Biogas	This is a sealed system Maximum storage: 900m^3	Very low
	Combined Heat and Power (CHP) unit TQ 76615 09398	Biogas	Planned preventative maintenance undertaken on equipment. If CHP unit is down, gas is burnt in flare	Low
	Boiler TQ 76609 09383	Biogas	Planned preventative maintenance undertaken on equipment	Low
	Flare TQ 76642 09402	Biogas	Planned preventative maintenance undertaken on equipment	Low
Cake export	Cake export	Sludge cake	Lorries/trailers are covered before leaving or sealed skips are used. Covers only removed when inside building and loading of cake is taking place. Cake is exported to farms which occurs outside.	Medium

3.3. Odour impact

3.3.1. Adjoining land use

The Site is surrounded by wooded areas to the west and the north. To the north, agricultural areas are present by beyond 75m north of the Site. Hastings Household Waste and Recycling Site is located approximately 300m south east, there is a residential estate approximately 250m south west of the Site as well as an industrial facility (catering supplies) located approximately 200m south of the Site.

3.3.2. Sensitive receptors

Receptors sensitive to odour include users of the adjacent land, which may vary in their sensitivity to odour. The level of sensitivity will be defined using the Institute of Air Quality Management guidance[4].

- High sensitivity receptors e.g. residential dwellings, hospitals, schools/education and tourist/cultural.
  - users can reasonably expect enjoyment of a high level of amenity; and
  - people would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.
- Medium sensitivity receptor e.g. places of work, commercial/retail premises and playing/recreation fields.
  - users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level of amenity as in their home; or
  - people wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.
- Low sensitivity receptor e.g. industrial use, farms, footpaths and roads.
  - the enjoyment of amenity would not reasonably be expected; or
  - there is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.

The magnitude of risk relates to[5]:

- Frequency: How often an individual is exposed to odour
- Intensity: The individual's perception of the strength of the odour
- Duration: The overall duration that individuals are exposed to an odour over time
- Odour unpleasantness: Odour unpleasantness describes the character of an odour as it relates to the 'hedonic tone' (which may be pleasant, neutral or unpleasant) at a given odour concentration/ intensity. This can be measured in the laboratory as the hedonic tone, and when measured by the standard method and expressed on a standard nine-point scale it is termed the hedonic score.
- Location/Receptor sensitivity: The type of land use and nature of human activities in the vicinity of an odour source. Tolerance and expectation of the receptor. The 'Location' factor can be considered to encompass the receptor characteristics, receptor sensitivity, and socio-economic factors.

There are two sensitive receptors within 500m of the potential emission sources at Bexhill and Hastings WTW and STC. As demonstrated in Figure 2 the receptor closest to a potential emission source is an industrial facility, which is located approximately 220m south the PSTs and biological aeration tanks.

Table 2 and Figure 2 identify the sensitive receptors within 500m of the Site.

[4] Institute of Air Quality Management (2018) Guidance on the assessment of odour for planning V1.1. Available online at: https://iaqm.co.uk/text/guidance/odour-guidance-2014.pdf

[5] Institute of Air Quality Management (2018) Guidance on the assessment of odour for planning V1.1. Available online at: https://iaqm.co.uk/text/guidance/odour-guidance-2014.pdf

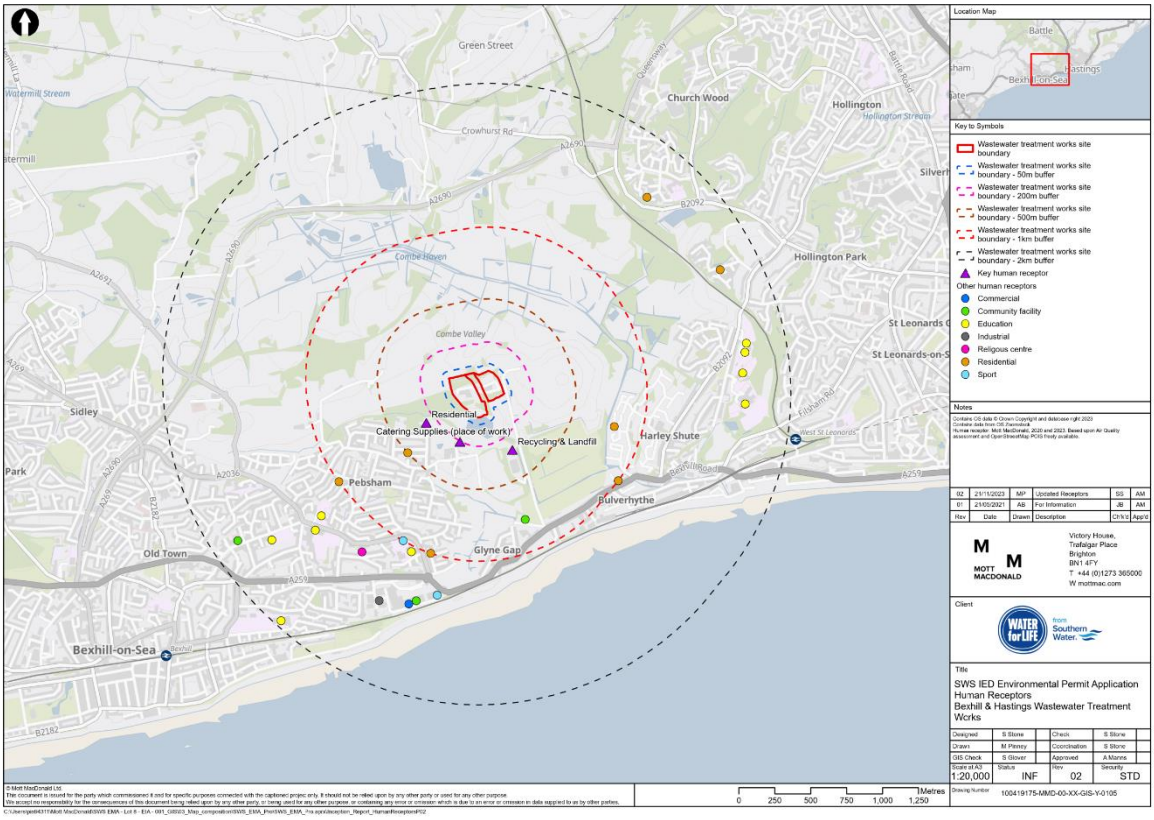
Table 2: Receptors within 500m of potential emission sources at the Site

Receptor	Nearest potential emission source to receptor	Process	Distance (m) from nearest potential emission source	Direction of receptor from closest emission source
Receptor 1 – Industrial facility south of the Site	Primary sludge treatment building	Cake reception and sludge treatment	320	South east
	Two sludge storage tanks	Sludge treatment	350	South east
	Anaerobic digesters	Sludge treatment	340	South east
	Post digestion sludge storage tanks	Sludge treatment	390	South east
	Centrifuge building	Sludge treatment	**290**	**South east**
	Digested sludge cake silo	Sludge treatment	295	South east
	Biogas holder	Biogas combustion	405	**South east**
	CHP	Biogas combustion	320	South east
	Flare	Biogas combustion	**315**	**South east**
Receptor 2 – Residential property south west of the Site	PSTs and biological filters	Wastewater treatment	435	South west
	FSTs	Wastewater treatment	415	South west
	Primary sludge treatment building	Cake reception and sludge treatment	240	South west
	Two sludge storage tanks	Sludge treatment	**220**	**South west**
	Anaerobic digesters	Sludge treatment	295	South west
	Post digestion sludge storage tanks	Sludge treatment	260	South west
	Centrifuge building	Sludge treatment	270	South west
	Digested sludge cake silo	Sludge treatment	290	South west
	Biogas holder	Biogas combustion	**225**	**South west**
	CHP	Biogas combustion	320	South west
	Flare	Biogas combustion	350	South west

Note: (a) Distance from source to receptor is rounded to the nearest 5m

(b) Value in **bold** represents the nearest potential emission source for each process which is closest to a sensitive receptor.

Figure 2: Sensitive receptors within 2km of the Site



Source: Mott MacDonald (2023)

3.4. Odour modelling

The effectiveness of the pathway for odour impacts associated with the Bexhill and Hastings WwTW and STC has been assessed using wind data and the locations of the nearest sensitive receptors relative to the Site. Modelled wind data for the years 2018-2022 were derived for the Site from an atmospheric hindcast model (Vortex). The nearest high-sensitivity receptors to the Site include residential receptors located between Buckholt Avenue and Filsham Drive which are approximately 310m south west of the Site.

During 2018-2022, the residential receptors located between Buckholt Avenue and Filsham Drive were downwind of the Site approximately 16% of the time. Based on the distance between these receptors and the Site, and the frequencies of wind to disperse odours towards these receptors, the pathway for odour impacts from the Site to the residential receptors between Buckholt Avenue and Filsham Drive is considered slightly effective.

It is considered that the pathway for odour impacts from the Site to nearby sensitive receptors is slightly effective and therefore the potential for odour impacts from the Site cannot be scopped out on the basis of this simple assessment.

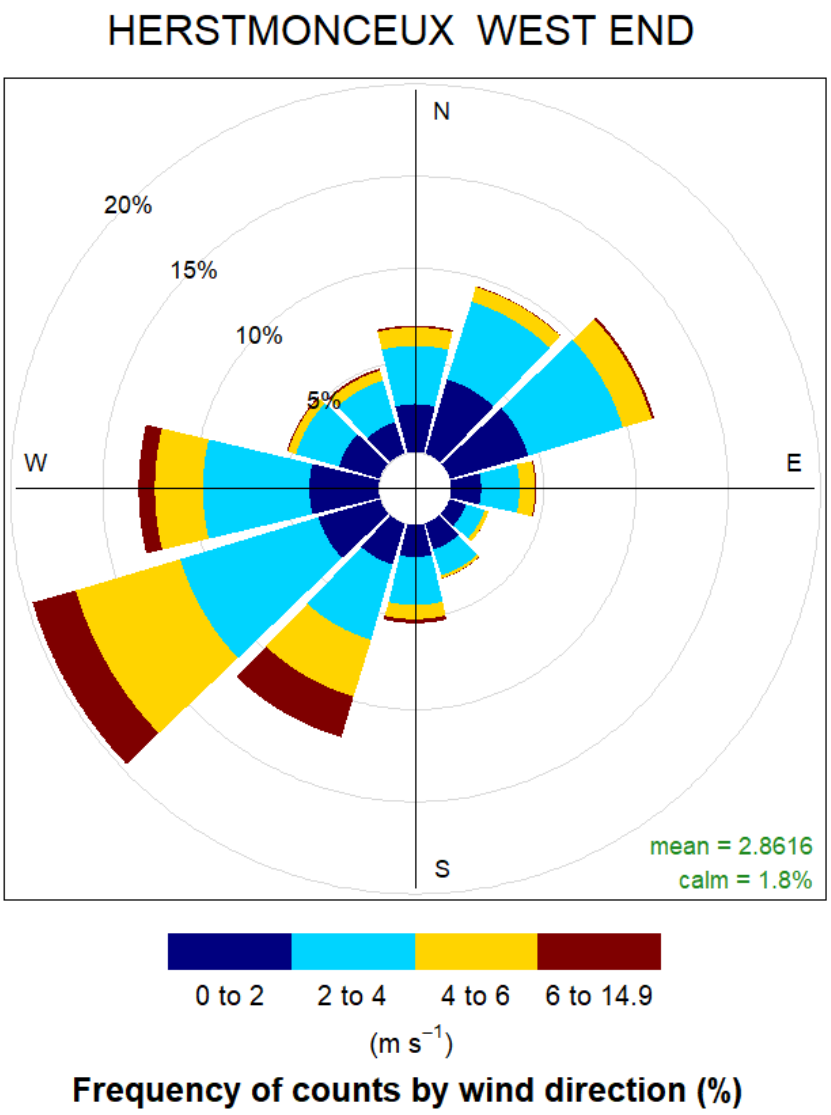
No further specific odour modelling has been commissioned for this site and modelling has not been undertaken prior to the application for a bespoke installation permit because the OMP consolidates existing odour control measures and will form part of the Operation Techniques. The Site does not meet the criteria for the listed suggestions for odour modelling according to the Environment Agency H4 guidance:

- to predict the impact of a new proposal: The Site is an existing site and structural changes are not proposed as part of the variation application. The sources of odour and their controls are already known;
- to assist in the investigation of the cause of odour complaints. The causes of odour were identified and resolved with no requirement for further investigation to establish significant changes in odour management.
- compare the cost effectiveness of odour mitigation options: Southern Water are not seeking at the time of the Bespoke Installation Permit application to implement additional odour mitigation measures that require capital investment;
- work out emission limits for point source emissions: The Site presents a low odour risk to sensitive receptors and an Odour Control System is in operation, which will be compliant with design standards or as specified in the Environmental Permit, see Section 5.7;
- indicate how much improvement is needed or size abatement equipment: improvements to odour control is implemented through the OMP. 15 odour complaints have been received between 2018 and 2023.
- calculate a suitable chimney height to provide an acceptable exposure at receptors: the chimney heights are fixed structures, since the Site is low risk of odour it is not justified to alter existing odour control structures.

The 2019-2023 wind rose for the meteorological site at Herstmonceux West End, the nearest representative meteorological site to the Site (located approximately 14km north west of the Site), is shown in Figure 3. This monitoring site experiences strong prevalent winds from the south west with occasional mild winds from the north east. However, as this meteorological site is approximately 14km from the Site, and atmospheric hindcast model (Vortex) has also been used to assess the wind conditions at the Site.

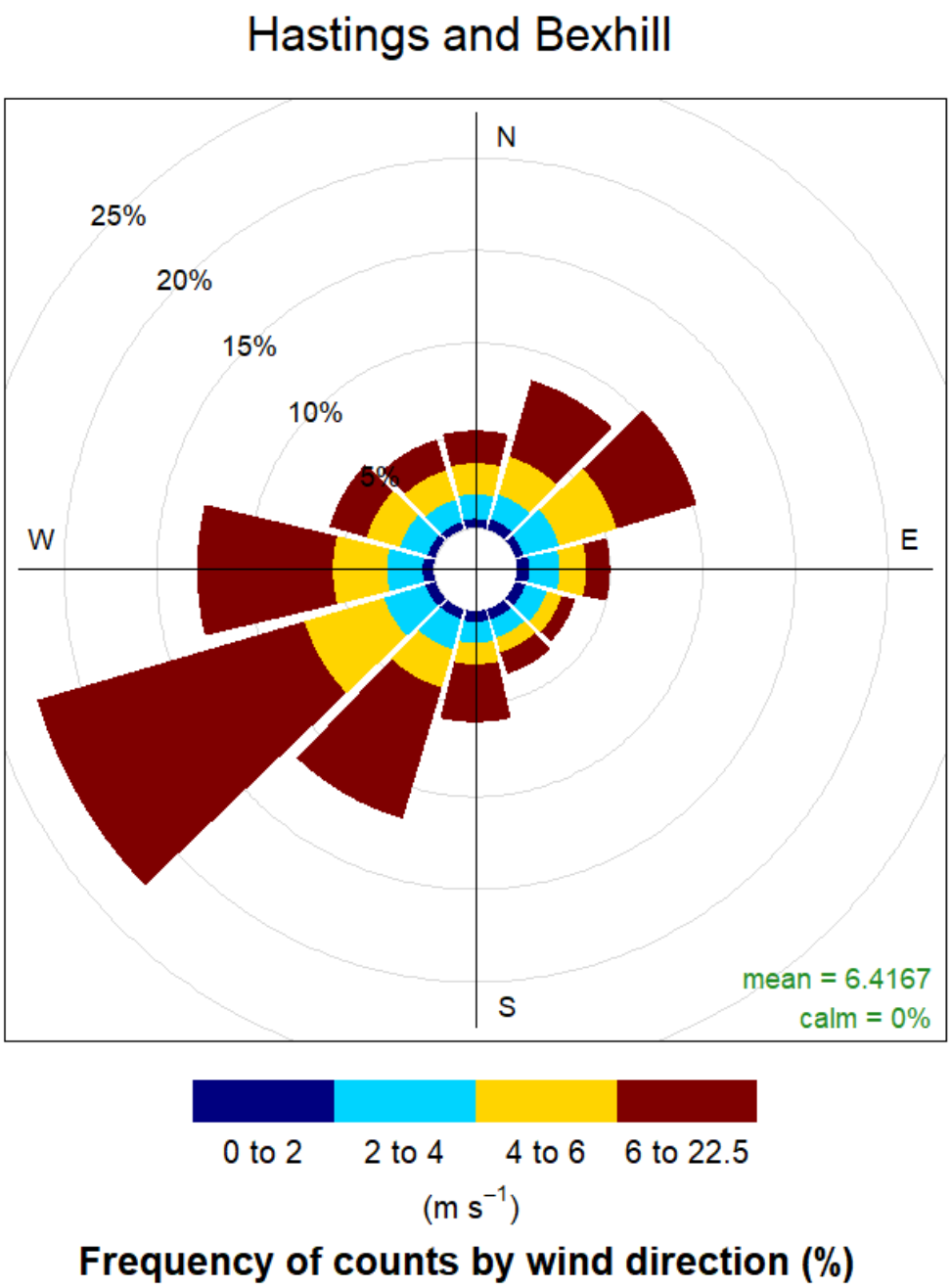
Figure 4 presents the wind rose generated for the Site from the Vortex model for the period from 2019-2023. The wind rose demonstrates that historically, this location experiences strong prevailing winds from the south west. This suggest that sensitive receptors located to the north east of the Site would be at the greatest risk from bioaerosol emissions from the Site as they would be downwind of the prevailing wind direction.

Figure 3: Average wind rose for Herstmonceux West End meteorological site, 2019 – 2023



Source: NOAA Integrated Surface Database (ISD) (2021)

Figure 4: Average wind rose for the Site from the Vortex model, 2019-2023



Source: NOAA Integrated Surface Database (ISD) (2021)

4. Odour Management and Control

4.1. Odour control system

All sources of odour identified at the Site have been either covered or are enclosed within buildings and the air is extracted continuously to the odour control units.

There is one OCU on site which is currently operating for the main control and process building.

Odorous air is extracted from the main control and process building, the screens, grit and grease removal processes, sludge reception area, sludge thickeners, sludge holding tanks, and centrifuges and is treated at the central OCU. The central OCU is a dual tower wet chemical scrubber system.

Treated air is then released to the atmosphere.

There are also three Honeywell Chemkey systems installed on Site which monitor the concentration of H_2S in the stacks every 15 minutes, and fourth which is installed in the aeration lane to measure H_2S concentration in the ambient air.

Portable odour suppression spray systems are used to control odours during maintenance.

The key parameters of the odour control system are described in Table 3

Table 3: Odour Control Unit details

Specification	OCU Description
Model type	Chemical scrubber
Stack height	18m
Total Flow m^3/hr	Combined 90,000m^3/h

A process flow diagram showing which assets are covered by the OCU can be found in Appendix B.

Odour control checklists can be found in Appendix D.

The use of odour atomisers during loading of cake from the silo is in place. The removal of biosolids off-site will be undertaken as soon a practically possible whilst considering prevailing weather conditions.

Leak detection by means of a methane gas analyser is installed on biogas holder/s to ensure any leaks from the inner bag are detected. Any leaks detected on the biogas system would always be fixed immediately by Southern Water due to the process safety risk posed by biogas.

4.2. Odour control in normal and abnormal conditions

All operating practices must be compliant with the Sites O&M manuals, Southern Water company practices and management systems and the OMP.

In order to achieve overall odour containment and thus to minimise unplanned releases of odour to atmosphere, it is essential that:

- The integrity of all covers over process units is maintained continuously, other than during periods of essential maintenance.

- All doors in buildings ventilated to the odour control system remain closed except when access is required and that the integrity of the buildings fabric is ensured.
- Imports of pre-digested cake are to be offloaded within buildings with closed doors and OCU extraction operating.
- Any imports to the head of works to be undertaken as quickly as possible to limit odour emissions. Additional imports to the head of works are on an emergency basis, for example if pumping station goes down or there is a burst rising main, the waste would be transferred via tanker to the head of works and only from assets that would already discharge to the Site (indigenous).

Where routine, planned and emergency maintenance of plant items has to be carried out and there is a high risk of odour being released to atmosphere in quantities sufficient to result in detection off-site, a detailed risk assessment of the activity is conducted, as part of which issues of odour generation, release and control are considered. Where the risk of an off-site odour event occurring is judged to be high, the Southern Water Customer Services call centre will be informed, together with the Environment Agency.

4.2.1. Normal conditions

There will be regular occasions throughout the year when routine, planned and reactive maintenance are carried out in order to ensure continued optimum operation of wastewater treatment and sludge recycling. Routine and planned maintenance tasks are divided into different classifications according to the level of complexity, speciality and frequency. The classifications are:

- Routine Operations: the daily and weekly routine operations are schedule regionally through weekly and quarterly programmes of work. Site operators are responsible for carrying out the tasks and the Field Performance Manager (FPM) for checking completion and quality.
- Planned Maintenance (Ellipse): the programmes for planned maintenance are generated regionally. Jobs are sent direct to qualified mechanical or electrical technicians via electronic communication. Start and completion of tasks, including work done, are logged direct to Ellipse, which produces records of plant performance. Site and regional mechanical and electrical staff, in conjunction with specialist contractors, are responsible for carrying out the tasks and the FPM for checking completion and quality.
- Contractor Maintenance (CM): the programmes for planned maintenance of some categories of specialist equipment (centrifuges, odour control equipment, odour control monitoring equipment, etc.) are generated regionally. Paper records of work carried out, completion and approval are kept on-site and by the Supply Agreement Leader.
- Local Plant Monitoring (LPS): Specific monitoring (for example, hydrogen sulphide at some sites) is carried out by online instrumentation. Information is recorded on SCADA. The plant records (daily plant spreadsheet) are created by site operators and process scientists. Site operations staff are responsible for carrying out the tasks and FPMs for checking completion and quality.
- Contractors Records (CR): Records of sludge deliveries are recorded in real time on-site via an electronic logging system and reported monthly. Records are available via online database.
- Material Delivery and Removal: Records of sludge deliveries are recorded electronically in real time. Chemical delivery records are maintained on site logs. Bulk chemical deliveries and consumption are also recorded on SCADA in real time.

Minor repairs and routine maintenance work are carried out continuously throughout the year during the working day, avoiding evenings and weekends, except in emergencies. Where possible, more major maintenance tasks are carried out in a planned manner according to priority and resources. Odour sensitive major maintenance tasks will be aimed to be undertaken during the winter period (between October and April), where appropriate. The emphasis in planning this maintenance is to minimise the time required to carry out the work, ensuring as far as possible, that odours are contained or abated during the work and to deploy alternative odour suppression systems, if required.

Where a maintenance operation is likely to release quantities of odour likely to be detectable off-site, the relevant authorities and the Southern Water Regional Call Centre would be informed in advance.

Table 4 highlights the typical maintenance activities for the wastewater and sludge treatment processes.

Table 4: Typical maintenance for wastewater and sludge treatment activities

Process	Period	Typical maintenance activities
Preliminary treatment	Daily	Checks on plant and equipment as per operating plan
	2-3 times/week	Removal of grit/screening skips
	Weekly	Operational checks on screens, compactors and associated equipment as per operating plan
	Monthly	Checks by mechanical/electrical (M&E) engineers as per regional maintenance schedules.
	Annually	Maintenance of plant and equipment
Primary Treatment	Annually	Drain-down of and repairs to the tanks
Secondary Treatment	Daily	SCADA and Visual checks by operations personnel, checks of dissolved oxygen and bubble pattern along with daily sampling.
	Weekly	Clean and check dissolved oxygen probes.
	Dictated by operational performance	Drain and clean lane, replace failed diffuser membranes.
Sludge Import	Ad-hoc	Regular checks on deliveries and operation of exhaust extraction and ventilation, removal of skips from sludge and cess screens.
	Weekly	Routine checks on equipment. Tasks carried out and records maintained under the Site operating and monitoring plan.
	Monthly	Checks by M&E. Tasks carried out and records maintained under regional maintenance schedules.
	Annually	Checks by M&E. Tasks carried out and records maintained under regional maintenance schedules.
Sludge Storage	Daily	Monitoring of levels. Tasks carried out and records maintained under the Site operating and monitoring plan.
	Weekly	Visual inspection of plant & equipment. Tasks carried out and records maintained under the Site operating and monitoring plan.
	Dictated by operational performance	As required drain down and clean tank, inspect structure. Tasks carried out and records maintained under regional maintenance schedules.
Sludge Thickening	Daily	Routine daily checks.
	Weekly	Routine weekly checks and maintenance.
	Monthly	Maintain and adjust plant to maintain efficiency.
	Annually	Checks by M&E as per regional maintenance schedules.
	Daily	Feed Volume, Temperature, Dry solids Test, and Visual Inspections (levels and Equipment) monitoring.

Process	Period	Typical maintenance activities
Digester and degassing tanks	Monthly	Checks of pressure relief valves and plant. Routine maintenance of systems.
	Annually	Checks and service of gas systems.
Centrifuge	Daily	Centrifuge check routine as advised by supplier.
	Weekly	Centrifuge check routine as advised by supplier.
	Monthly	Checked in line with routine service agreement by appointed service provider.
	Annually	Checked/Serviced every six months by appointed service provider.
Odour control unit	Daily	Routine daily checks.
	Weekly	Inspection and maintenance routines in accordance with both the frequency and task specified in the regional maintenance schedules.
	Monthly	Inspection and maintenance routines in accordance with both the frequency and task specified in the regional maintenance schedules (including monitoring of pressure, flow rate for both gas and liquid, the pH/ OPR of scrubbing liquid, inlet gas temperature, pressure differential, inlet gas moisture content, and leak check monitoring)
	Annually	Annual service by the Odour control service provider in line with contracted maintenance requirements, including checks on the gas pipes of the scrubber and cleaning of the nozzle of liquid feeding system and demisters

Diffuse emissions from open storage areas, are minimised by ensuring optimisation of the digestion process to limit bioaerosol potential of post-digested sludge. The aeration lanes have a Honeywell Chemkey system installed to monitor H_2S in ambient air, which automatically generates an alarm if the concentration exceeds a preset value.

To minimise odour nuisance, it is important to ensure that the Site is operating as designed. Covers and hatches are replaced to maintain the integrity of enclosures provided to collect odours air.

4.2.2. Odour risk assessment

Unless it is in an emergency situation, an odour risk assessment will be undertaken before carrying out maintenance tasks with high odour risk and high odour sensitivity. Examples of such activities are:

- Shutdown of odour control systems for an extended period for maintenance;
- Non-routine draining down of large open process tanks with potential to generate odour;
- Lifting of odour control covers, opening of hatches or keeping doors of odour-controlled building open for an extended period;
- Commissioning of new odour sensitive processes or equipment where odour risk may not be adequately mitigated; and
- Significant flow diversion outside odour-controlled processes for an extended period.

A flowchart to identify when an activity requires a separate odour risk assessment is provided in Appendix E.

An odour risk assessment matrix will be used to determine the odour risk for planned and unplanned maintenance work commonly performed. Where an unusual activity not contained in the matrix is

planned, a site-specific risk assessment will be carried out according to a standard procedure. The matrix also includes foreseeable situations for emergency breakdown and situations arising as a result of dealing with an emergency where the ability to improve control of or minimise odorous release is compromised. The advice given by the odour risk assessment matrix will be followed, as appropriate, taking into account site conditions.

Table 5 provides an example of a risk assessment for routine maintenance operations, which are reviewed and updated at least annually. The key contact group (the Environment Agency and Southern Water Customer Services) will be informed for high-risk activities, in relation to odour, at least 3 days before work is due to commence.

The Regional Control Centre (RCC) will be informed in advance of the nature and duration of maintenance work and measures to be undertaken when a significant odour risk is identified from the Odour Risk Assessment

Table 5: Example of risk assessment for routine maintenance operations

Event	Implications	Odour Risk (High, Medium, Low)	Proactive Actions	Responsive Actions
Maintenance of processes within STC	Opening of hatches, and exposure of process units to building.	Low	Processes contained within the WTW which itself is odour controlled.	Minimise number of hatches open at any one time.
Maintenance on sludge treatment process (not biogas system)	Potential for odour release if any sludge exposed to atmosphere.	High	Divert or minimise sludge throughput in process area.	Carry out during winter months where possible, if required during summer use portable odour reduction sprays.
Maintenance of odour control system	Reduced capacity for period of maintenance risk of odour release if input peaks received	Medium	Control processes to minimise risk of high peaks of H_2S reaching odour control unit.	Carry out during winter months where possible, if required during summer assess need to use portable odour reduction sprays

4.2.3. Abnormal conditions

There will also be unanticipated breakdowns of equipment which require unplanned and emergency maintenance. During periods of abnormal conditions, the normal odour standard and emission standards may not be able to be fully complied with, and/or there may be fugitive emissions of odour from parts of the Site where there are normally none. Exemption would be required for these operations.

In the event of plant failures or emergency situations, this would raise an alarm on the Site's SCADA or telemetry systems, which will be reacted to by on-site or regional control room operators and FPM.

Depending upon the nature of the fault or emergency, a mechanical or electrical technician, both of whom are on-call 24-hours, would be contacted and will attend the Site as soon as practicable if required. Where the on-call technicians are already engaged upon other response work, there is the facility to access staff from other Southern Water geographic divisions, coordinated by the FPM. All faults, breakdowns and emergencies are logged electronically together with records of the action taken and the solutions reached.

Waste arriving at Site is quarantined in any of the following circumstances:

- Hazard Analysis Critical Control Point (HACCP) critical limit breach
- Maximum Acceptable Concentration (MAC) sample failure
- Measured cake DS% onsite has dropped below 20% (the 20% has to be confirmed by 2nd sample)

If any of these take place, then material will need to be quarantined in line with the procedure below.

If quarantining is required, then the location of the quarantined material be placed in an empty bay on site. If a storage bay is not available, then the Biosolids Compliance Team should be contacted to arrange alternative storage.

When the breach is HACCP or MAC failure related the cake will be held at the quarantine location until compliant results are received from the lab provider. After bacti compliance is confirmed the relevant stakeholders will be notified by a certificate of compliance that cake from the site in question can be recycled to land.

When the breach is related to DS% content of the cake being below 20% then the affected will be held in quarantine until alternative treatment or disposal can be arranged by SWS.

Table 6 provides an example of a risk assessment for abnormal and emergency operations, which are reviewed and updated as required. The key contact group (the Environment Agency and Southern Water Customer Services) is informed, for high-risk activities, relating to odour, as soon as event occurs.

Table 6: Risk Assessment for Emergencies and Abnormal Operating Conditions

Event	Potential source of odour	Potential impacts	Odour risk	Measures to prevent or minimise risk	Actions to be taken
Breach of odour-controlled area (excluding sludge containing structures)	Untreated air	Effectiveness of foul air extract system compromised, risk of odour release until repairs completed	Medium	Minimise odour generating activities in area	Temporary containment pending full repair Ensure any interconnecting doors etc secure Minimise odour generating activities in area Assess odour impact with local survey, use portable odour reduction sprays if requirement identified
Breach of odour-controlled area sludge containing structure	Untreated air	Effectiveness of foul air extract system compromised, risk of odour release until repairs completed	High	Review sludge handling operations divert or minimise for duration of breach	Minimise area exposed to atmosphere and surround with portable odour sprays as appropriate
Breach of biogas system/ loss of biogas containment	Leaks from membrane	Uncontrolled release of biogas, risk of odour release until repairs completed Double membrane system with gas pressure between the membranes regulated and monitored. Methane detectors operated with alarms to alert operators of any leakage.	High	Minimise activities for duration of containment loss	Minimise sludge processing, divert to controlled release point via the combined vacuum and pressure release valve Surround with portable odour sprays as appropriate Diversion of biogas to CHP plant or Gas Burner Inspection maintenance and repairs as appropriate Record details and actions taken in site diary Report to the Environment Agency Emergency response from gas maintenance contractor
Failure of odour control plant	Untreated air	High risk of release of abnormal operational	High	Routine maintenance.	Assess need to use portable odour reduction sprays

Event	Potential source of odour	Potential impacts	Odour risk	Measures to prevent or minimise risk	Actions to be taken
		odours direct to atmosphere until repaired		Regular monitoring of equipment performance. Duty standby functionality. Standby capacity in the media beds. Emergency call to odour system maintenance contractor. Control processes to minimise risk of high peaks of H2S reaching odour control unit. Design provides for degree of redundancy.	Investigate and repair
Spillage of sludge on site	Liquid sludge	High risk of odour until cleaned up. Low volume spillage likely to go directly to drain which returns to the WTW for treatment.	High	Regular site inspections and monitoring the system through SCADA to detect any spills. Priority to clean up as and when detected. Pipe work and tanks undergo regular inspections. Planned maintenance on equipment	Stop source of spill and immediately wash down area Repair or bypass if possible. If incident prolonged use portable odour sprays until cleared. Record spillage and actions taken in site diary
Sludge thickeners	Sewage sludge	Thickeners are enclosed and air extracted to OCU	Medium	Sludge dosed with polymer as required	
High pressure conditions in digesters	Release from Pressure Relief Valve	Biogas would be vented at high pressure to aid dispersion	Medium	Gas pressure is regulated and monitored	Diversion of biogas to Gas Burner Record details and actions taken in site diary
High pressure conditions in biogas holder	Release from Pressure Relief Valve	Biogas would be vented at high pressure to aid dispersion	Medium	Gas pressure is regulated and monitored.	Diversion of biogas to Gas Burner

Event	Potential source of odour	Potential impacts	Odour risk	Measures to prevent or minimise risk	Actions to be taken
					Record details and actions taken in site diary
Sludge reception unit roller shutter door failure	Release from behind the shutter door in sludge reception	Effectiveness of odour control measures compromised, risk of odour release until repairs completed	Medium	Minimise sludge reception activities until repairs have been completed	Record details and actions taken in site diary
Failure of treatment process	Release from untreated sludge	Risk of odour from incomplete biological treatment until plant recovery achieved	Medium	Process monitoring and having closed covers. Immediate involvement of process support team to identify cause of process failure and aid recovery	Assess need to use portable odour sprays spread around process unit
Prolonged hot and dry period	High strength / septic sludge	Potential for septicity to develop throughout the works. Issues with temperature sensitive components	High	Increased monitoring. Planned maintenance on equipment	Record details and actions taken in site diary
Very high rainfall	Flooding causing failure of odour control equipment	Flooding on site causing failure of equipment	Low	Increased monitoring. Installing new equipment above water levels, if known to be an issue on site Planned maintenance on equipment	Check the performance of the Odour Control Unit when water levels drop and replace media as required (if media has been flooded it may need replacing)

5. Monitoring

5.1. Routine monitoring

As part of the general operation of the Site, control room operators monitor the SCADA outputs on a routine basis in order to ensure that individual process units on and off the Site are performing within specification. In the event of an out-of-specification plant item or an alarm being initiated, appropriate remedial actions would be instigated and this is dealt with in subsequent sub-sections.

In the event of an out-of-specification plant item is operating beyond normal operating ranges, the process parameters are outside optimum or an any other alarm being initiated, appropriate remedial actions would be instigated. Operatives will follow the Awareness Raising Instruction in Appendix A, and further measures are dealt with in subsequent sub-sections.

Any odour detected on-site during normal operation will be rectified using measures described in Table 6 to implement actions and prevention protocol. Routine sniff tests at the potential odour sources listed in Table 1 are in place to proactively mitigate odour reaching and exceeding the site boundary. If detected, investigation into odour source is undertaken and contingency measures listed in Table 6 are implemented. Temporary use of odour suppression system (spray) is available to be operated while contingency measures are being prepared.

Site personnel periodically assess the performance of odour containment and extraction systems utilising specialist equipment (such as but not limited to Optical Gas Imaging) to compare actual vs. designed air changes per hour, or to identify leakage points on systems. Any issues identified will be addressed and then a re-assessment performed to confirm issue resolution.

5.1.1. General duties

Operators shall carry out routine duties according to the relevant operational and maintenance schedules and procedures to ensure effective operation of plants. Specific tasks include:

- Perform daily, weekly and monthly maintenance tasks as scheduled;
- Make regular observation of critical processes and equipment including odour sensitive and odour control systems;
- Carry out routine performance tests and recording;
- Order and take deliveries of chemicals and other consumables; and
- Report performance issues or equipment problems promptly to Process Scientists, Mechanical & Electrical (M&E) technicians, Instrumentation, Control & Automation (ICA) technicians or Specialist Contractors as appropriate.

5.1.2. Duties for odour control

Operators shall carry out the following tasks:

- Undertake and record any inspections in the site diary, along with any actions undertaken.
- Investigate odour complaints following the Complaints Procedure as shown in Appendix F.
- Record actions taken in respect of odour investigations.
- Conduct weekly sniff tests.
- Record and report incidents that caused significant odorous emission, and follow the Awareness Raising Instruction in Appendix A.
- Produce other records as required by the OMP.
- Undertake the Site odour monitoring and controls listed in Table 7.

Drivers delivering odours loads shall carry put the following tasks:

- Ensure loads are sealed and covered when arriving the Site and approaching the sludge reception.
- Covers to only be removed within the sludge reception building with the doors closed.
- Follow the spillage management procedures set out in Section 5.1.6 if odour materials are spilled.
- Any wastes that are not authorised to be accepted must not enter the Site (as referred to in the Duty of Care).

Table 7: Site odour monitoring and detection processes

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
Inlet & pumping station	Check condition of sewage entering works for unusual odours	Low	Daily	Increased Odour from sewage	Noticeable odour from sewage Follow the Awareness Raising Instruction, Appendix A.	Take sample and get analysed for BOD, COD etc. Check consented discharge	Low
Raw sludge reception	Avoid excessive turbulence (open tanks) Ensure doors are closed before discharging or unloading Connect foul air exhaust to hose before loading Ensure vehicles cleaned after loading/unloading. Hose down any spillage after each load/unload Clean contaminated wheels before leaving Site. Doors closed after unloading/discharging	Medium	Daily		Follow the Awareness Raising Instruction, Appendix A.	Stringent loading and unloading procedures. Extracted air from the tanker loading area is treated by odour control unit. If necessary, implement special odour mitigation measures to reduce the risk of odour nuisance. Make contractor aware of requirements in OMP.	Low

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
Transportation	Ensure only sealed or covered skips/trailers used. No removal of covers whilst parked waiting to load/unload Monitor odours during cake loading	Medium	Daily		Follow the Awareness Raising Instruction, Appendix A.	If necessary, implement special odour mitigation measures to reduce the risk of odour nuisance. Make contractor aware of requirements in OMP	Low
Sludge holding tanks	Minimising retention time Monitor odour levels around tank	Medium	Daily	Increased odour from tank	Noticeable odour from tank Follow the Awareness Raising Instruction, Appendix A.	Increase sludge treatment rate to reduce retention Hose spillage's Increase de-sludge ops up stream Run odour masking system (Short term)	Low
Sludge thickening/ blending	Minimise retention prior to thickening, dewatering or digestion; Discharge sludges and liquors, including imported sludges, to covered tanks, with displaced air passed through an Odour Control Units; Prevention of sludge accumulation in off-line tanks; and Proactive identification of	Medium	Daily	Increased odours from area	Noticeable odour from area and/or complaint received Follow the Awareness Raising Instruction, Appendix A.	Process is undertaken in an enclosed building with appropriate odour abatement	Low

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
	potential problems and tankering of sludges to other sites with odour abatement.						
Secondary Digesters	Check for strong and uncharacteristic odours	Low	Daily	Investigate unusual odours	Investigate and report strong/unusual odours to FPM and Scientist Follow the Awareness Raising Instruction, Appendix A.	Regular checks and investigative action	Low
Centrifuge	Check for strong and uncharacteristic odours	Low	Daily	Investigate unusual odours	Investigate and report strong/unusual odours to FPM and Scientist Follow the Awareness Raising Instruction, Appendix A.	Regular checks and investigative action	Low
	Check polymer dosing	Low	Daily	Polymer dosing rates exceeds set limits	Polymer dosing exceeds upper or lower threshold limits	Take remedial action to return polymer dosing to correct rate	Low

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
					Follow the Awareness Raising Instruction, Appendix A.		
Gas Flare Stacks	Complete biogas combustion should give clean emissions with blue or non-visible flame	Low	Daily	Occasional orange flame or black smoke visible	Constant orange flame or black smoke visible Follow the Awareness Raising Instruction, Appendix A.	Routine M&E checks or maintenance to clean nozzles of carbon build-up	Low
Skip conveyer feed gates	Visual check to ensure skips not over filling	Low	Daily		Follow the Awareness Raising Instruction, Appendix A.	Engage M&E to rectify if malfunctioning	Low
Whessoe valves on digesters	Check they are clear from foam residue	Low	Daily		Not seating correctly Follow the Awareness Raising Instruction, Appendix A.	Engage service contractor to resolve any problems	Very low
OCU	Check pH Check media condition	Medium	Daily	pH>3	pH >3 Sudden drop in performance Follow the Awareness	Ensure media is damp Change media as per schedule	Low

Potential Odour Source	Routine Actions Required	Risk pre-control measures	Monitoring Frequency	Attention Level	Action level	Preventative Action	Risk post-control measures
					Raising Instruction, Appendix A.		
Whole site	Doors to operational buildings will remain closed and hatches will be latch closed.	Medium	Daily	Increased odours	Follow the Awareness Raising Instruction, Appendix A.	Doors and hatches will only be opened for minimum periods while access is required for planned operational and maintenance activities.	Low

5.1.3. Visual and olfactory inspections

There will be a daily walkover survey incorporating a “sniff-test”. Sniff testing will be undertaken at the security fence boundary, starting at an upwind location. Where possible, the sniff testing will be carried out by a person who is not accustomed to the odour generated by on site activities i.e. a person who has recently entered the Site boundary such as an FPM.

During each walkover, the person undertaking the “sniff-test” must stand nearby to each potential source of odour identified in Table 1 and at least one location for the north, south, east and west of the site boundary (as close to the perimeter as practicable) and note on a map the location of the perimeter checks. Checks in each location should be undertaken for at least 20 seconds and the monitoring form completed, see Appendix G.

During the walkover, over a period of approximately 30minutes, perceptive “sniff-testing” of the ambient atmosphere is conducted and observations are recorded on a daily check sheet. If odour is likely to exceed the Site’s boundary and, therefore, has potential to cause a complaint, the procedure in Appendix A will be followed.

The results of the sniff test will be recorded in the site diary or an appropriate form. Sniff testing is designed to detect any abnormal plant odour emissions. In addition, it is important to document any potential contribution from other off-site sources of potential odour nuisance located outside of the facility boundary.

In the event that abnormal plant odour is detected, the source of the odour will be investigated, as appropriate, and remedial action taken, as necessary, following measures addressed in the OMP. The approximate extent of the downwind odour will be established to determine whether this reaches the downwind post and rail fence boundary. During maintenance and/or emergency conditions which are likely to result in release of odours, the frequency of “sniff-testing” will be increased to twice daily, or more frequently as appropriate.

Actions for remediation will be assigned by the FPM following the issue of an odour record. Once actions are completed, additional sniff tests at least once a day for minimum three days at the source of the odour will be carried out to determine whether further actions are required. Whereby odour is no longer detected the record will be closed. If odour remains the OMP and maintenance records will be reviewed to determine alternative actions to be taken, this process will continue until the odour issue is no longer on-going.

5.1.4. House keeping

Good housekeeping improves efficiency, creates a pleasant environment to work within and makes the Site less likely to cause odour nuisance. Operators have a responsibility to keep sites clean and tidy. The “Top 10 Tips to Minimise Odour Impact” will be communicated to the Site.

- Ensure that your odour control plants are fully operational and maintained
- Keep all doors and hatches latch closed at all times to contain odour
- Clean up debris / spillages as soon as practicable
- Monitor sludge levels within Primary Treatment to avoid septicity
- Hose down and clean process tanks / channels after draining
- Monitor digesters / Whessoe valves and gas flares
- Report any odour activity caused by Contractors to your Senior Manager
- Where possible, don’t undertake odour sensitive work if it cannot be completed before or continued during the weekend

- Follow business procedures and respond to all odour complaints
- If you See it, Smell it, do something about it (Don't ignore it)

Additional reminder signs will be displayed in prominent positions at the Site where open-doors, covers and skips present an odour risk and include:

- Keep all doors shut
- Keep all covers / lids latch closed
- Clean up spills immediately using disinfectant if required
- Monitor odour control systems
- All rubbish / waste to be disposed of immediately to relevant skip

5.1.5. Meteorological observations

Southern Water will record daily in the Site's diary the following meteorological data:

- Air temperature
- Relative Humidity
- Wind Direction
- Wind Speed
- Rainfall

Meteorological data will be reviewed in advance of activities that may present an odour concern, such as movement of sludge cake, to consider suitable measure to limit odour. For example, time such activities when wind speed is low.

Meteorological data will also be available to complete odour records to establish potential trends.

5.1.6. Spillage management

All staff on-site have a responsibility to maintain good housekeeping and clear spillages at the earliest opportunity to prevent odour. If a spillage occurs from a process, operators will carry out clean up as soon as possible (using disinfectant, where necessary). If a spillage is caused by a lorry or tanker, the driver is responsible to clean up before leaving the Site. If a lorry or tanker left a spillage behind, operators will log and report any incident observed. The driver or company involved will be asked to return to the Site immediately to clean up. Significant spillage incidents will be recorded in the site diary.

Key areas at risk from spillage (and the control measures):

Sludge reception area

- Tanker drivers are responsible for cleaning up spillages after every load. Hose is supplied.

Cake bay area

- Drivers are responsible for cleaning up spillages after every load.

Inlet works

- Spillages around the inlet area must be cleaned up immediately.

Digester

- Anti-foam used to suppress foaming of sludge within the digester or dewatering process.

Entire site

- Routine site inspections by FPM and site manager – a minimum of once per month.

5.1.7. Accident management

The Site operates under a site-specific Accident Management Plan, and associated Site Emergency Incident Plan, to prevent and manage environmental related accidents. The site-specific AMP (790101_MSD_AMP_HAS August 2024) includes a description of nominated key personnel and their responsibilities, emergency response procedures, contact details of internal contacts (Works Manager, Team Leader, Process Technician, Regional Control staff and key H&S staff), national and regional (where appropriate) contact details of emergency services and environmental regulators.

The AMP is distributed to key staff, to supervise the implementation of the Plan, and shared with external contacts (emergency services and the Environment Agency). The AMP is accompanied by a site plan that identifies the locations of designated storage areas (e.g. for chemicals, flammable compounds, bottled gas etc), spill kits, firefighting equipment, site entrances and access routes, gas bags and gas pipeline routes, gas isolation valves, major electrical equipment and possible isolation points, and other significant plant items.

The key procedures relating to environmental accident and incident management are set out in Southern Water's ISO14001 accredited Environmental Management System (EMS).

The relevant procedures in the EMS relating to environmental accident and incident management includes:

- EMS234 – Chemical and oil storage
- EMS240 – Nuisance management
- EMS260 – Pollution prevention
- EMS275 – Emissions to air
- EMS308 – Site housekeeping checklist
- EMS340 – Nuisance management procedure
- EMS341 – Air quality/odour management procedure
- EMS360 – Pollution prevention procedure
- EMS363 – Procedure for managing oil spills on sites
- EMS364 – Lime spill management
- EMS381 – Operational waste procedure
- EMS387 – Procedure for the acceptance of tankered commercial waste
- EMS388 – Waste permit breaches and near miss reporting procedure

5.2. Monitoring of the odour abatement system

Table 8 identifies the parameters and monitoring requirements in relation to the odour control system that needs to be undertaken at the Site.

Table 8: Parameters and monitoring requirements in relation to the odour control system to be undertaken at the Site

Emission point type	Parameter	Monitoring frequency	Monitoring standard or method
Channelled emissions to air (scrubbing system)	Hydrogen chloride	Once every 6 months	As per design and manufacturer's specifications Southern Water are to initially undertake characterisation of emissions from the odour control units, in line with BAT 3, to demonstrate if TVOC and HCI are present in the waste gas stream. If TVOC and HCI are identified as relevant in the waste gas streams Southern Water will monitor these emissions in line with BAT requirements and the Environmental Permit.
	TVOC	Once every 6 months	
	Ammonia	Once every 6 months	As per design and manufacturer's specifications
	H_2S		Maintenance undertaken by service provider, or otherwise as specified in the Environmental Permit
	Efficiency checks	Annual	Maintenance undertaken by service provider, or otherwise as specified in the Environmental Permit
	Gas stream flow	Continuous	As per design and manufacturer's specifications and SCADA, or otherwise as specified in the Environmental Permit
	Overall operation, including air circulation	Daily	Visual assessment or otherwise as specified in the Environmental Permit

Service visits for the OCU are undertaken by a contractor (currently ERG). A service visit report is issued after each visit which identifies priority actions required, other faults and comments as well as condition monitoring and observations. A copy of the latest site visit report (November 2023) is presented in Appendix H.

6. Training

6.1. Staff training

Southern Water provides a comprehensive programme of Health and Safety and operational awareness training which is carried out for new starters and as an ongoing programme of refresher courses.

All new starters receive a comprehensive programme of health and safety training and on-going refresher courses. All staff receive training to cover operations at the Site. On the job training is provided to all staff through a rolling training programme.

Southern Water has developed its own Competency Management System (CMS), which identifies the training required for different roles on site.

Training on the following technical subjects relevant to odour control will be provided to operational staff according to needs and site requirements:

- Wastewater treatment processes.
- Sludge treatment processes.
- Checks for odour control equipment.
- Risk assessment of odour sensitive maintenance activities.
- Deployment of temporary odour control measures, for sites where these are present.
- Site requirements in relation to the Odour Management Plan.

The training needs of each individual are assessed during personal performance appraisal and reviews.

Formalised training for all grades of staff on the Site is undertaken relevant to job role. All staff are made fully aware of the need to be constantly vigilant with regard to site odour control and management procedures.

Records for training received by all staff are held electronically. Records of environmental training are kept in the Southern Water EMS.

Relevant components of the OMP should form part of the induction process for all site staff and contractors, to ensure they are aware of the procedures and responsibilities in relation to odour.

7. Communication

The objective of communication in odour management is to raise the profile and awareness of the importance of odour control and to keep stakeholders informed of odour incidents, and management practices. Appendix A provides an example of an awareness raising instruction.

7.1. Internal communication

Odour control will be regularly included by FPMs as an agenda item for team meetings.

Statistics of odour complaints and progress of actions to address odour issues will be updated monthly and communicated to Wastewater and Network Area Managers and other key personnel with odour management responsibilities.

7.2. External communication

Southern Water is committed to working closely with stakeholders to achieve sustainable reduction of odour nuisance. Southern Water is committed to making available relevant records and information to regulatory and local stakeholders, where appropriate, and communicating and engaging, in advance, with stakeholders where appropriate, any relevant activities that may generate odours.

7.3. Reporting

Southern Water will send all reports and notifications required by the Environmental Permit, or upon request by the Environment Agency, within the given timescales.

7.4. Complaints management and resolution procedure

All customer complaints about odour are entered on the Southern Water Customer Services Management System (CSMS), the details of which are detailed in Appendix F.

8. Reviews and Auditing

8.1. Reviews

8.1.1. Periodic reviews

A review of this OMP will be carried out by the FPM annually, unless agreed otherwise, and in accordance with the Environment Agency's H4 guidance (or current existing guidance should this change).

8.1.2. Ad-hoc reviews

This OMP will be reviewed when any significant changes in operational practice are made and on completion of any significant capital scheme which could impact the OMP.

8.2. Auditing

The regulatory authorities, where required, will be provided with reasonable access, in order to audit the implementation of the OMP upon request.

8.3. Records

The following records will be maintained:

- Record of complaints are stored on CSMS;
- Reports of investigations are held electronically;
- Odour issues which require a capital scheme to be raised to resolve them; and
- Odour issues which require a capital scheme to be raised to resolve them.

A. Awareness Raising Instruction

Activities that may result in an odour nuisance

All Process Operations staff must ensure that if a failure of plant, equipment or a system occurs, which may lead to complaints from customers, that the RCC/Customer Services are informed in a timely manner.

Listed below (but not limited to) are some examples of the type of incident that are to be reported.

- Odour control plant failure;
- Spillage of wastewater/sewage;
- Spillage of sludge or sludge cake;
- Failure of chemical dosing systems;
- Odour monitoring equipment failure;
- STC flare stack ignition failure.

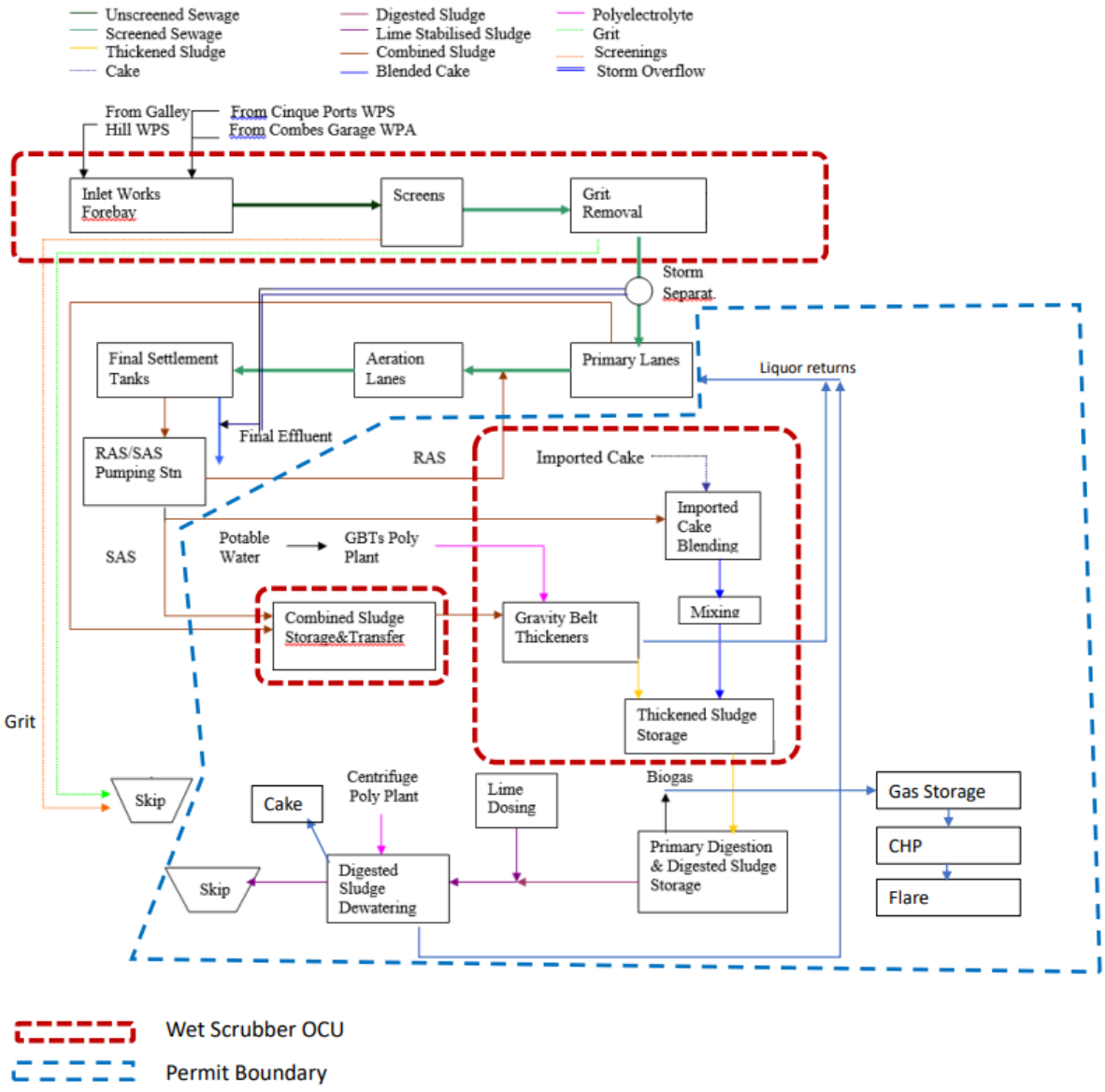
If the RCC or Customer Services are made aware of the problem, it means that they give a more constructive response to the person making the enquiry/complaint.

- In normal working hours contact Customer Services on 01903 272685;
- Outside normal working hours contact the RCC and request information is added to the 24-hour report.

Every effort must be made to carry out the above request, a short phone call to share information with colleagues dealing directly with the Customer will greatly help them deliver a more valid and informed response.

Be proactive, not reactive!

B. Odour schematic



C. Waste Codes

C.1 Wastes imported for Anaerobic Digestion

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)	Pre-digestion AD	Raw – imported	
19 08	**wastes from waste water treatment plants not otherwise specified**			
19 08 05	sludges from treating urban wastewater	AD	Indigenous/Imported	

C.2 Other wastes accepted to the site

C.2.1 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 a permit

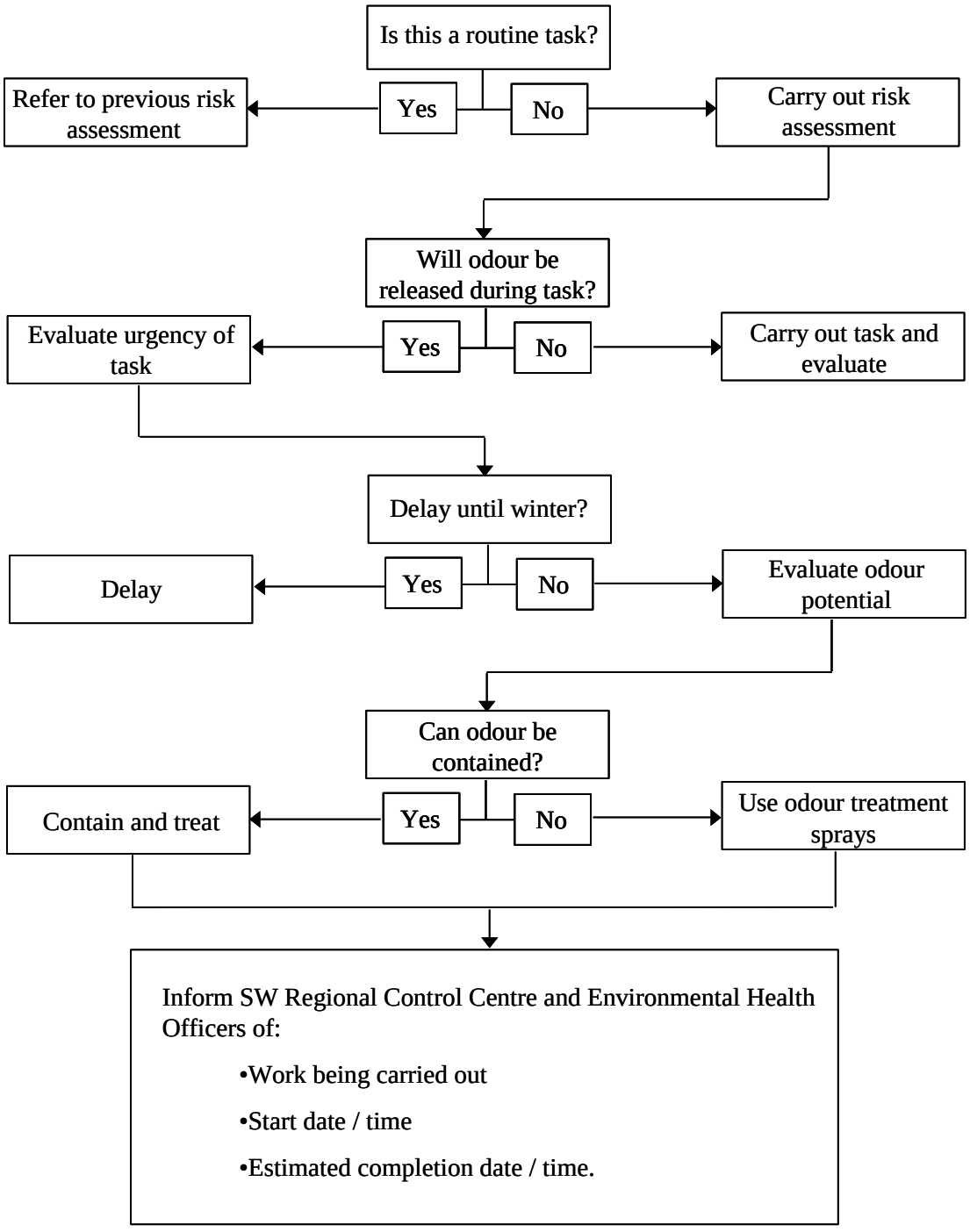
D. Odour checklist

This is a generic checklist applicable to all sites and aspects that are not applicable to a particular site should be ignored.

Area of works	Potential issue		Follow up action
Odour management plan (OMP)	Is the Site operated according to the OMP?	YES / NO	Make changes to site operation to minimise odour production and release
Site - general	Are all covers in place?	YES / NO	Put back covers and close hatches as required
	Are all access hatches closed?	YES / NO	
Inlet works	Is the crude sewage black and/ or smelly?	YES / NO	Check incoming sewage for septicity (in communication with Operations Support Team)
			Check for potential septic discharges
Screening	Are there any spilled screenings?	YES / NO	Clean up spills
	Are the compacted screenings clean	YES / NO	Optimise operation of screenings hand ling equipment
Grit removal	Is there any spilled grit?	YES / NO	Clean up spills
	Is the grit clean	YES / NO	Optimise operation of grit handling equipment
Screening and Grit Skips	Do the screening skips smell?	YES / NO	Check that screenings are clean and free from organic material;
	Do the grit skips smell?	YES / NO	Check that grit is clean and free from organic material; optimise grit cleaning system if needed
	Are the screenings skips too full?	YES / NO	Empty skip(s)
	Are the grit skips too full?	YES / NO	Empty skips as needed
Primary tanks	Are the tanks black and / or smelly?	YES / NO	Check inlet for septicity
	Are the tanks gassing?	YES / NO	Check levels of sludge in the tank and increase de-sludge rate if needed.
	Is there excess scum on the surface	YES / NO	Remove excess scum

Area of works	Potential issue		Follow up action
Biological filtration	Are the aeration vents blocked?	YES / NO	Unblock aeration vents
	Is there any ponding?	YES / NO	Consider increasing flushing rate and/ or forking media
Activated sludge	Do the dissolved oxygen levels in the aeration lanes match the setpoint(s) ?	YES / NO	Adjust dissolved oxygen levels as requ ired
	Do the MLSS fall within the timelines for the Site?	YES / NO	Increase / decrease RAS rate as needed
Final settlement tanks	Are the tanks black and/or smelly	YES / NO	Check inlet of tanks for septicity
	Are the tanks gassing?	YES / NO	Check levels of sludge in the tank and increase de-sludge rate if needed
	Is there excess scum on the surface	YES / NO	Remove excess scum
Tertiary treatment	Any there any site-specific issues?	YES / NO	Investigate and rectify
Sludge treatment	Are there any sludge spills?	YES / NO	Clean up spills
Imports and Exports	Does the tanker filling and emptying process cause significant release of odour?	YES / NO	Investigate whether the process can be modified to reduce odour emissions
			Consider changing timing of tanker operations to reduce nuisance potential
Sludge Thickening and Storage	Are all covers in place?	YES / NO	Put back covers and close hatches as required
	Are all access hatches closed?	YES / NO	
	Are the doors to sludge treatment buildings / sludge cake stores kept closed?	YES / NO	Close doors as required
Anaerobic Digestion	Is all excess gas flared?	YES / NO	Contact contractor to investigate
	Is flare stack ignition immediate and reliable?	YES / NO	
	Are the Whessoe valves / pressure relief valves operating prematurely?	YES / NO	
	Are the seals on the condensate trap s intact?	YES / NO	
Odour abatement	Is there any detectable odour downwind of the stack?	YES / NO	Check OCU using additional checklist
	Is the fan(s) working?	YES / NO	Arrange for fan to be repaired
General	Are there any outstanding actions fro m a previous investigation?	YES / NO	Complete actions

E. Risk Assessment Flowchart



F. Complaints Management

F.1 Management of odour complaints

F.1.1 System overview

Southern Water operates an integrated process to receive and record odour complaints by members of the public. It is designed to ensure complaints are dealt with promptly and consistently and a comprehensive record is kept. The following system ensures these objectives are achieved:

- A unique and recognised point of contact for members of public and Southern Water staff to report odour incidents and issues
- A straightforward process for operational staff to investigate and mitigate odour issues after a complaint is received.
- A recognised point to provide feedback to customers
- A mechanism to review recent odour complaints and actions
- A database to capture trends and potentially serious problems to guide future improvement

The following sections describe how odour complaints are received and handled. This procedure may be augmented by local arrangement to provide a tailored service to meet local council requirements.

F.1.2 Receipt of odour complaints

The Customer Services is the first point of contact for members of the public to report odour incidents during normal working hours.

The Regional Control Centre can deal with odour complaints out of hours.

When a member of the public phones in to report odour from a Southern Water site, relevant information will be taken from the caller, including name, phone number, address, time, duration, the characteristics of the odour experienced and whether the customer would like to receive a feedback by phone. Each call is assigned a unique CSMS number. The information is entered into the CSMS Database under a designated sort code.

Verification of the complaint is made through identification of the caller's property and the Southern Water site in question on electronic GIS maps. Following verification, a CSMS summary sheet is generated and transmitted immediately to the relevant FPM or the Regional Controller.

Where odour complaints are received directly by other Southern Water staff, the receiver of the call will contact Customer Services to log the call on behalf of the caller. The caller will be provided with the telephone number for Customer Service for future use.

All CSMS records of odour complaints are stored in the Corporate Information System to ensure transparency, visibility and consistency of the information.

F.1.3 Follow up actions

Initial action by Field Performance Manager

The FPM or Regional Controller upon receiving a CSMS summary of odour complaint will investigate the issue as soon as practicable. Based on the sensitivity of the Site, the investigation may range from remotely checking the Site alarms to the assignment of an operator to conduct a site investigation. Site investigation will be guided by and recorded on a site odour incident form if available or on a generic Odour Risk Checklist. Where possible, actions will be undertaken by the operator to improve control of odour emission. Following the investigation, the FPM or the investigator

will forward the findings to the Customer Liaison Officer during normal working hours at other times. If required in the site specific OMP, FPM will also produce reports to the regulator within an agreed time period.

Feedback to the customer from Customer Liaison Officer

Unless the customer had indicated that they would not wish to receive a feedback, a feedback will be provided at the earliest opportunity by the Customer Liaison Officer. The Customer Liaison Officer will then close the CSMS call.

Action by Process Scientist

If requested by a FPM, a process scientist will carry out a further investigation where a site has received reoccurring odour complaints. Process scientists will advise FPMs of available options to mitigate odour, e.g., re-adjusting sludge disposal activities or process parameters. Process scientists will provide technical support if such measures are adopted. Process scientists will produce a written report for each investigation and follow up any further actions.

Action by Southern Water Managers

Managers will carry out regular reviews of odour complaints to all SWS sites and inform relevant FPMs where a trend is developing. Southern Water Managers will deploy additional monitoring resources where necessary to support the resolution of significant odour issues.

G. Odour Monitoring Form

Odour Monitoring Form

Date:	
Name:	**Visitor or staff:**

Intensity
0 – No odour
1 – Very faint odour
2 – Faint odour
3 – Distinct odour
4 – Strong odour
5 – Very strong odour
6 – Extremely strong odour

Receptor Sensitivity
Low (e.g. footpath, road)
Medium (e.g. Industrial or place of work)
High (e.g. housing)

Location	Time	Weather conditions (dry, rain, snow etc)	Temperature (very warm, mild) *Use degrees when known*	Wind strength (light, strong) *Use Beaufort scale if known*	Wind direction (e.g. SE)	Intensity *(See above)*	Duration	Constant or intermittent in this period or persistence	Receptor sensitivity *(See above)*	Is source evident?	Any other comments or observations

H. ERG OCU Service Report

ERG (Air Pollution Control) Ltd
Bridge House Environmental Centre, Five Oaks Road, Slinfold,
Horsham, West Sussex, RH13 0QW, UK Tel: +44 1403 292 000
e-mail: maintenance@ergapc.co.uk web: www.ergapc.co.uk

Visit

Service Visit Report: 10 of 12 – November 2023

Project Name	Southern Water Maintenance	**Project Number**	**AM7143**

Visited	Bexhill	[redacted]	
Company	Southern Water		
Contacts	[redacted]		
		Date	06/11/2023
		Reviewed By:	TJS
		Copy To:	HMcW, RW, MB, SB, GL, TJS
Purpose of Visit	**Monthly Service Visit of Chemical Scrubber OCU and Carbon filters**		

1. **ACTIONS REQUIRED:**

1.1. **Scrubber S2**, there is a sign of a leak at the bottom base of the scrubber. The leak needs to be monitored and investigated further before it becomes worse. A leak has also been identified at the bottom fitting of the blowdown pipe.

1.2. **Scrubber S1:** On arrival, the unit was foaming and showing 14pH. ERG introduced anti-foam to the system, increased the water make-up. Shut off all dosing to S1 (manually in MCC). Once foaming was no longer an issue, ERG turned down water make-up and ensured the pH value was dropping. Site need to monitor the condition of S1, once values have stabilised, dosing can be restarted.

2. **Other faults and actions required:**

2.1. **Scrubbers:** Scrubber 1 & 2 differential pressure gauges have seized. New gauges required. Range: 0-2000Pa. WIKA 10869 scale 0-2000pa.

2.2. **Caustic Dosing pump 4** (GKPD2200) for S2 has an oil leak from End 2 side of the pump on the pump head. Pump inlet and outlet connection has signs of a leak. Pump GKPD2100 has a dry leak near the inlet of the pump. Pump GKPD2100, GKPD1200 cabinet is very full of dry caustic. This needs to be monitored.

2.3. **Sample lines:** Flow sensors for the sample lines to S1 & S2 have failed. Electrical investigation is required.

2.4. GL PD 2100 behind the hypo pump one of the unions is showing signs of a small leak. ERG will monitor.

2.5. **S1 –** One of the outlet H_2S monitor floats is stuck in its tube. This visit, ERG removed condensation from all impulse lines. The small pump inside the cabinet is pumping liquor throughout the system. Manufacturer needs to attend to rectify and service the unit.

2.6. Water line labelled: HC-EPO-2146 (Fire hose) has a leak on the union which is located on 1st floor next to stairs.

3. Other comments:
N/A

Observations & other information:

- H_2S monitor OCU inlet: 0 ppm
- Outlet H_2S monitor: S1 = 0 ppb, S2 = 0 ppb
- Caustic tank HMI level: 1.934 m
- Hypo tank HMI level: 2.399 m (P.N: temporary dosing).
- Scrubber 1 pH & Redox: 12.28 pH & -181 mV
- Scrubber 2 pH & Redox: 8.60 pH & -192 mV
- Water softener: Salt in the tank: full, water tested soft.

3. Extra info, sizes, and equipment:

3.1. Belt type: SPB4000 2x motors / 3 per motor / 14 belts spares.
4 x pH probes
1 x Redox probe
1 x Controller
1 x 1m redox Cable leads.
1 x 2m redox Cable lead.
1x 2m pH Cable lead.