



# Asset Management Asset Standard Odour Management Plan

## Slough STW

### SLOUS1ZZ

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### 1.2.1 Document Change Request

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### Owner Review Requirements

Document to be reviewed when any changes are made to the site or processes

### Local Review Requirements

Site Manager should be informed when handwritten amendments are made to this document

### Document Control

Revision No	Reason for Revision	Prepared by	Approved by	Date
1	Creation of OMP in new standard format			October 2013
2	Annual review of OMP			October 2015

2	Roles & Responsibilities updated throughout document		October 2015
2	Environmental Permit replaced by Waste Management Licence – document updated to reflect changes in legislation		October 2015
2	Reference to Sludge Lagoons & Sludge Drying Plant removed		October 2015
2	Additional information added on Digested Sludge Holding Tanks & High Level Pumping Station		October 2015
2	Odour control unit section updated		October 2015
2	Performance Checks & Testing Section updated		October 2015
2	Summary of Critical Odour Issues, Emergency Response and Mitigation Measures updated		October 2015
2	Complaints received on site at Slough STW section updated. Notification of Operations with Potential to Cause an Odour Problem section updated		October 2015
2	Odour Management Action Plan updated		October 2015
2	Communications section updated		October 2015
2	H4 form updated		October 2015
3	Review of OMP		March 2016
4	Updated alongside IED permit application		March 2021
4.1	New Sludge Treatment Centre Permit Application		July 2022

### 1.3 Sign Off

Technical Lead		Date: July 2022
Operations Area Manager		Date: July 2022
Performance Manager		Date: July 2022

### 1.4 Glossary of Terms

TERM	DESCRIPTION
AD	Anaerobic Digestion
BNR	Biological Nutrient Removal
CHP	Combined Heat and Power
CSM	Customer and Stakeholder manager
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016
FFT	Flow to Full Treatment
H4	Environment Agency - How to comply with your permit – H4 Odour Management, March 2011
ICA	Instrumentation Control & Automation
IED	Industrial Emissions Directive
OCU	Odour Control Unit
OMC	Operational Management Centre
OMP	Odour Management Plan
PFT	Picket Fence Thickener
PM	Process Manager
PS	Pumping Station
PST	Primary Settlement Tank
Receptors	Sensitive receptors are any fixed buildings or installations where odour annoyance may occur, such as residential homes, schools, hospital, offices, shops or garden centres. Open areas such as playgrounds and public footpaths should also be listed where these are known to have been effected by odour
SAP	Thames Water's enterprise resource and planning system
SCADA	Supervisory Control And Data Acquisition
SOM	Site Operating Manual
STC	Sludge Treatment Centre
STW	Sewage Treatment Works

TCM	Technically Competent Manager
TM	Team Manager
UWWTD	Urban Waste Water Treatment Directive

## 2 Introduction

This Odour Management Plan (OMP) forms part of Slough STW Best Operating Practice and is a constituent part of the Environmental Management System (EMS). A key related document is the Site Operating Manual (SOM) – this document can be found as a hard copy in the Slough STW administration building and on Thames Water’s database SharePoint, within the EMS pages.

The purpose of this OMP is to define how the potential and actual generation of odour from Slough STW are identified, and how, as far as is reasonably practicable, they are controlled and recorded. It is primarily a management guide; detailed operational procedures are contained within the SOM referred to above.

Changes to OMP procedures are captured in the SOM as part of the periodic reviews of this document.

The effectiveness of the odour control measures will be reviewed annually or sooner if any of the following occur:

- If the site in question acquires any other permitted activity with the potential to increase the risk of odour off site.
- When significant changes are made to the site which may affect odour, e.g. capital spend.
- As a result of a change in pattern of odour complaints, increase in public concern and as soon as possible after a significant incident.
- When the site management changes.
- If there is a material change in relevant regulations or guidance.

This OMP is an operational document that has been developed following a review of the potential risk areas for odour release. It details operational and control measures appropriate to the reduction or elimination of the impact of odours from wastewater treatment works. It provides detail to allow technicians and maintenance staff to understand the operational procedures for both normal and abnormal conditions.

This OMP was updated in 2021 to incorporate appropriate odour control measures for activities that will be newly regulated under an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2016 (EPR), following the principles transposed through the Industrial Emissions Directive. This follows the reinterpretation of the Industrial Emissions Directive in exclusion of UWWTD activities - meaning that anaerobic digestion (AD) on a Sewage Treatment works now needs an Environmental Permit.

The Odour Management plan has been structured to distinguish between the two regulatory regimes, which are fully described in the Site Information chapter. The wastewater treatment process is covered by the Urban Wastewater Treatment Directive (UWWTD). The Environmental Permit for the Sludge Treatment Centre (STC) covers various process including but not limited to, the AD process, combustion of biogas in the CHP plant and the storage of resulting sludge. This OMP responds to odour risks from both UWWTD and STC permitted processes (referred to as the Sludge Treatment Centre Permit).

This OMP is stored electronically on SharePoint within the EMS page. A hard copy is kept on site within the Site Operating Manual.

## 2.1 Relevant Guidance

The following guidance has been used to inform the contents of the OMP where it relates to activities regulated under the Sludge Treatment Centre Permit. This guidance does not apply to UWWTD activities.

- Environment Agency - How to comply with your permit – H4 Odour Management', March 2011 (H4)
- Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (Waste Treatment BAT Conclusions)
- Environment Agency, Appropriate measures for the biological treatment of waste, Consultation draft July 2020.

The EA's H4 Odour Guidance has been used to assist the preparation of this OMP where it relates to activities regulated under EPR. As this guidance does not apply to UWWTD activities, where any wider reference to H4 is made within this document, including use of the guidance's recommended forms, this should not be inferred as H4 being applicable to UWWTD activities

This document also aims to meet the guidelines for Odour Management Plans set down in the DEFRA Code of Practice on Odour Nuisance from Sewage Treatment Works, published April 2006 - now rescinded.

The OMP format used is in line with that adopted for other Thames Water sites.

Copies of the Odour Risk Assessment, Odour Improvement Plan, Customer Communications Plan, Site Drawings, generic site and sludge rounds, and a weekly OCU checklist are included in Appendices 1-7.



## 2 Site Information

### 2.1 Location and Receptors

Site Address:

Slough STW
Wood Lane
Slough
Berkshire
SL1 9EB
EPR Permit number to be included when issued

Slough STW is a large treatment works located a mile or so to the west of Slough. The site is bounded by the M4 to the immediate north, beyond which a large housing development has recently been constructed in Cippenham. To the south and east it is more rural, there being Dorney to the SW and Eton Wick to the south, both within a mile of the site boundary.

Slough STW currently provides wastewater treatment for a population equivalent of 226,000 and receives sewage flows from the catchment area covering Slough, Chalvey, Oakley Green, Burnham, Langley and Eton, Taplow, Hedgerley Hill, Stoke Poges, Eton Wick, Eton College, Dorney and Datchet.

The catchment receives considerable trade waste discharges including food and chemical manufacture.

#### Receptors

The main receptors potentially affected by activities on site are the residents close to the works inlet, the new housing development accessed from Wood Lane, across the M4, which also includes a children's play area close to the M4 bridge to the site. Passing traffic along the M4 can also have the potential to be affected. The receptors have been numbered and listed in table 2.1 and highlighted on the site location plan in Appendix 4 Figure A.

The nearest receptors are the houses by the site entrance and the Wood Lane estate, across the motorway from the STW. Odours could potentially affect drivers on the M4 and shoppers at the local ASDA superstore.

**Table 2.1 - Location of potentially sensitive odour receptors.**

Receptor Number	Receptor Address	Receptor type	Approximate distance to the nearest site boundary (m)	Direction from the site.	Receptor Sensitivity
1	Wood Lane	Residential	Adjacent	Multiple	High
2	Telford Drive	Commercial / Residential	500m	North East	High
3	M4 Motorway	Road	Adjacent	North	Low
4	Haswell Crescent	Residential	200 m	North	High
5	Jubilee River	Open Area	330 m	South	Low
6	F.C Cippenham	Football Club	260 m	North	High
7	Eltham Avenue	Residential	260m	North	High
8	History on Wheels Motor Museum	Museum	950 m	East	High
9	Eton Wick Road (B3026)	Residential	1000 m	South	High
10	Dorney Common	Open Area	1100 m	South West	Low
11	Royal Windsor Racecourse	Racecourse	2000 m	South	High
12	Eton Dorney School	School	1900 m	West	High
13	Lake End Road (B3026)	Residential	1800 m	West	High
14	Mercian Way Park	Open Area	780 m	North West	Low
15	Western House Academy	School	500 m	North	High
16	Lower Cippenham Lane	Residential	850 m	North	High
17	The Westgate School	School	1050 m	North East	High
18	Twinges Lane	Commercial	1200 m	North East	Medium
19	Bath Road Retail Park	Commercial	1600 m	North	Medium
20	Slough Trading Estate	Industrial	2000 m	North	Medium
21	Cippenham School	School	1350 m	North West	High

22	St Andrews Way	Residential	1100 m	North West	High
23	Burnham Train Station	Transport	1950 m	North	Medium
24	Burnham Abbey	Church	1800 m	North West	High
25	Chalvey Grove	Residential	1300 m	East	High
26	Montem Academy	School	1300 m	East	High
27	Church Street	Residential	2000 m	East	High

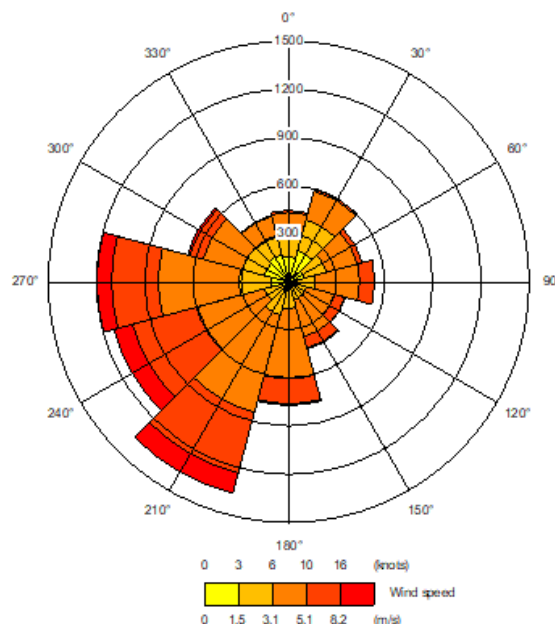
## 2.2 Off-site sources of odour

There have been no other sources identified that may have the potential to generate odour.

## 2.3 Windrose and Weather Monitoring

A wind rose showing the distribution of wind speed and direction close to the site is provided below and shows the predominant wind direction to be south westerly. The data is taken from Heathrow Airport meteorological station, approximate location E 506952 N 176574. Data is recorded in hourly measurements and the information covers the year 2019.

**Figure 2.3.1 Heathrow Wind Rose, 2019**



A windsock is located on site to determine wind direction.

There is a MET office weather station on-site at Slough STW, this is owned by a third party.

Weather on site can be reviewed if complaints are received or during periods of abnormal operations. The internal 'Weather' SharePoint site provides adverse weather information, and the UK Met Office website can also be used.

## 2.4 Site Layout and Treatment Processes

For site plans, see appendix 4. Further details of the site layout and treatment processes are given in the following sections of the Site Operating Manual and are therefore only given summary attention in this OMP:

Section	Description
1	Governance & Control
2	Location, key layout plans and diagrams. Site services, including power, water, drainage, SCADA and ICA. Consent details, process overview, chemical and waste handling.
3	Detailed description of each treatment process, including sludge and odour control.
4	Maintenance
5	Plant control, monitoring, and logging

## 2.5 Process Description

### 2.5.1 UWWTD activities

Flow enters the works from five pumping stations to a raised inlet works where dosed with Ferric Sulphate for odour and struvite control. The flow continues through four 6 mm Lockwood step screens that feed into two Mega washer screening handling units which discharge into two compactor skips.

Screened flow then passes through a 'flow to treatment' penstock. There are two Dorr Detritors for grit removal and an inline 'Magflow' meter that measures the flow to treatment. There are also four balancing tanks that overflow to two storm tanks that discharge to land treatment.

Screened flow passes to four circular PSTs (Primary Settlement Tanks). Sewage passes to six diffused air aeration lanes configured for BNR (Biological Nutrient Removal). Mixed liquors pass to six circular FST (Final Settlement Tanks). Approximately 60 % of FST effluent is treated by four disc filters for solids removal.

### 2.5.2 Activities under Sludge Treatment Centre Permit

The STC comprises an offloading point for permitted imported wastes and it can be found close to the inlet of the sewage treatment works. These wastes are imported by road, normally from tankers and tanker vehicles, and consist of liquids and associated sludges from domestic and municipal sources that are similar in composition to those materials derived from the sewer network and managed via the UWWTD route. These operations are covered by the existing waste management licence at the site.

Indigenous sludge is removed from the primary settlement tanks and pumped to a sludge blending tank via a picket fence thickener (PFT). Thickened indigenous raw sludge is mixed with thickened indigenous SAS and imported sludge from other works within the sludge blending tank.

There are two PFTs on site which receive pumped sludge in parallel from the primary settlement tanks, with each tank pumping dewatered sludges in turn to the sludge blending tank, via a common sludge line. In-line 'munchers' are installed pre- and post-picket fence thickening on the sludge line to reduce rag content of the sludge. Both of the PFT tanks are covered and connected to an odour control unit (OCU) for odour abatement. Liquids from the PFTs weirs out of the tank and drains with the SAS dewatering liquors back to the works inlet.

SAS from the FSTs and aeration lanes gravitates to a common chamber before being pumped to the two belt thickeners within the SAS building, that are used to dewater SAS. Here the sludge is dewatered with the use of a bulk powder polymer, which is added to sludge to aid coagulation. Liquor from the belt thickeners drains to the main pumphouse and is returned along with liquids from the PFTs to the works inlet.

Sludge is pumped via a dedicated sludge line to the sludge blending tank, where it is mixed with thickened raw sludge and imported sludge.

Imported sludge from other waste water treatment sites is imported via two import lines into an imported sludge holding tank which is covered and connected to an OCU. The imported sludge passes through a screen, to remove inorganic material which is discharged into a skip, before the sludge gravitates to the imported sludge holding tank and is then pumped to the sludge blending tank.

Separate sludge lines feed in the thickened raw sludge, thickened SAS and imported sludge to the sludge blending tank. The sludge blending tank is covered and connected to an OCU.

Five sludge transfer pumps transfer sludge to the primary digester tanks. There are six primary digester tanks at Slough STC. The primary digesters are of concrete construction with external clad insulation.

Following treatment over an appropriate number of days within the primary digesters, sludge is transferred to one of two digested sludge holding tanks. These are rectangular tanks of concrete construction, of which one tank is covered and connected to an OCU but the other is uncovered. Sludge is then transferred to one of three, open topped, above ground secondary digestion tanks located at the site. Digested sludge is held in these tanks for an appropriate retention time to ensure that the required level of pathogen kill is achieved in order to comply with digested sludge cake output quality requirements

Digested sludge is then transferred to the site centrifuges where it is dewatered before it is transferred by conveyor to the cake pad for storage prior to removal from site under the Sludge Use in Agriculture Regulations 1989, and in accordance with the Biosolids Assurance Scheme (BAS). Centrate is returned via the site drainage system to the works inlet. Centrate from the centrifuge is returned to the head of the works via the site drainage system, with a set of pumps used to return centrate and surface waters from the High-Level pumping station back to the works inlet.

Biogas from the primary digesters is captured and transferred to a double membrane gas holder (gas bubble) for storage. The biogas transfer pipeline is equipped with condensate pots that capture entrained moisture from the generated biogas, and allow it to be drained into the site drainage system for treatment. The biogas storage holder is fitted with pressure release valves as a safety precaution in the event of over pressurising the system.

The biogas is taken from the storage vessel for combustion in a CHP engine, generating electricity for use both within the site and for export to the grid, and heat to maintain primary digester temperature. This is classified as an 'existing' combustion plant under the Medium Combustion Plant Directive. In the event that additional heating is required for the primary digesters, biogas may be used in the onsite boilers to provide heat to the digesters. In the event there is excess biogas, i.e. more than the

CHP or boilers can utilise, or in the event that the CHP is unavailable, there are two ground mounted emergency flares. These are utilised under 10% of the year or less than 876 hours per year.

Site drainage from operational areas is captured within the site wide drainage system and returned to the works inlet of the sewage treatment works for treatment within the UWWTD treatment route.

### 3 Site Management Responsibilities and Procedures

#### 3.1 Site Roles

Figure 3.1 - Site Roles

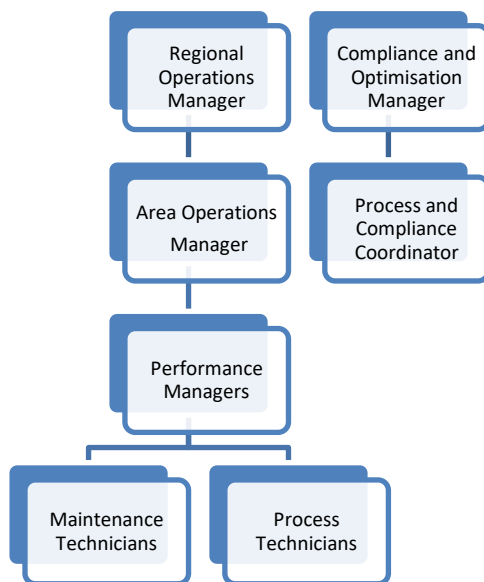


Table 3.1 - Tasks and Responsibilities

Role	Tasks and Responsibilities
Regional Operations Manager	Responsible for the overall performance of STW in this region.
Area Operations Manager	Responsible for overall performance of the STW in the area, including assessing the scope of, and updating the OMP as it is implemented.
Performance Manager	Responsible for overall performance of the STW and will be responsible for <ul style="list-style-type: none"> <li>• Ensuring staff Thames Water staff undergo appropriate training</li> <li>• odour control and management at the site</li> <li>• day to day implementation of the OMP</li> <li>• assessing the scope of, and updating, the OMP as it is implemented.</li> <li>• dealing with customer complaints</li> <li>• day-to-day operation of the STW</li> </ul>
Technically Competent Manager	Hold the required WAMITAB qualification to support the activities on site under the STC Permit, ensuring permit conditions are complied with.
Technician 1 / Operator	Day to day duties include maintaining and operating process equipment.
Customer and Stakeholder Manager	Responsible for managing liaison with all external customers and stakeholders in liaison with customer centre, escalation team, local govt. liaison team etc.

Role	Tasks and Responsibilities
Compliance and Optimisation Manager	Responsible for process investigations and technical assistance
Process Compliance Coordinator	Reports to Compliance and Optimisation Manager. Responsible for process monitoring, improvement and troubleshooting.
Duty Manager	The duty manager is centrally based (off-site) and is responsible for event management across the business.
Customer Centre	Responsible for receiving all customer calls, logging them and passing them to the appropriate operational departments.

The site is manned from 7:30am – 3:30pm on a normal working day and can be attended by standby staff out of working hours.

### 3.2 Key Contacts

Role	Name	Email address	Phone Number
Area Operations Manager			
Performance Manager			
Technically Competent Manager			
Customer and Stakeholder Manager			
Customer Centre			

### 3.3 Operator Training

Staff working on site undergo a site induction that is carried out by the Performance Manager. The site induction includes direction to the presence and location of the various operational procedures which include the SOM and the OMP. In addition, Site Tech 1's undergo a specific programme of training which covers management of activities on site.

All training records are currently held on Learning on Tap where they are accessible by the site Performance Manager and individual members of staff.

## 4 Odour Critical Plant Operation, Monitoring and Management Procedures



## 4.1 Odour Sources, Critical Issues and History

The site has a history of odour complaints over a number of years, and a number of major Capital projects have been funded with a view to addressing these issues. 2 Complaints were received in 2017, 2 in 2018, 0 in 2019, 6 in 2020, 5 in 2021 and 1 in 2022 (YTD).

An Odour Risk Assessment is included as Appendix 1.

An Odour Improvement Plan is included (where applicable) as Appendix 2

Critical Odour Issues, Emergency Response and Mitigation Measures are summarised in Tables 4.2 to 4.6.

## 4.2 Identification of Odour Critical Plant

### 4.2.1 Odour Risk Assessment

An Odour Risk Assessment has been carried out and a copy is included in Appendix 1. The Odour Risk Assessment is not a 'one-off' exercise but an on-going process. The Odour Risk Assessment is reviewed whenever the site undergoes an operational or capital change which could significantly affect odour.

It is constructed in the following manner:

- Each part of the treatment process is considered under different operating modes – e.g. normal, failure, abnormal: system overload, summer conditions, maintenance etc.
- The nearest customers to the particular odour source are identified.
- The likely frequency and duration of occurrence for each eventuality is identified.
- A score is assigned to the severity (0 – 5) of odour under each operating mode.
- A score is assigned to the probability (0 – 5) of causing an odour nuisance for each operating mode.
- Multiplying the severity of odour and probability of causing an odour nuisance generates a 'Current Odour Emission Risk' score. Between 0 (zero risk) and 25 (maximum risk), this is used to decide where mitigation should be applied in the short term, and determine where in the longer term enhanced improvement measures are required. Where improvements are identified as necessary (i.e., where suitable mitigation measures are not already in place), entries are made onto the Odour Improvement Plan.
- The need for operational mitigation, enhanced measures and customer communication is stated and brief details given.

Items scored in the Odour Risk Assessment with a risk score greater than 10, and where existing operational mitigation measures are not sufficiently robust, will have Improvement Plans generated to address the odour issues. The Odour Improvement Plan for Slough STW is included in Appendix 2.

### 4.2.2 Potential Odour Sources

The following list of potential UWWTD odour sources been identified during the risk assessment:

- Incoming Sewers & Reception Wet Well
- Cess Reception, Discharge, Wash down & Drainage
- Storm & Balancing Tanks

- Screens & Screening Conditioning, Drainage & Rag Skip Management
- Grit Removal Equipment, Drainage & Grit Skip Management
- Flow & Distribution to Primary Settlement Tanks
- PSTs
- Fats, Oil & Grease Scum Removal System
- Primary Raw Desludge Pumping
- Flow & Distribution to Secondary Treatment
- Activated Sludge Lanes & Zones
- Final Settlement Tanks
- Scum Removal System
- RAS Chambers & Pumping
- SAS Chambers & Pumping
- Final Effluent
- Inlet Works OCU D
- Western Area Pumping Station OCU B

The following list of potential odour sources under the Sludge Treatment Centre Permit been identified during the risk assessment:

- Sludge Reception, Screening, Wash down & Drainage
- Cess Reception, Discharge, Wash down & Drainage
- Skip management
- Primary Raw Sludge Thickening and Pumping
- SAS Thickening and Pumping
- Sludge Blending and Mixing
- Return Liquors
- Digester Feeding, Mixing and Discharge
- Secondary Digestion, Mixing and Discharge
- Centrifuge
- High Level Pumping Station
- Digested Sludge Holding Tanks
- Cake Pad & Drainage
- Biogas Storage
- CHP
- Boilers
- Waste Gas Burner
- OCUs A, C, E & F

#### 4.2.3 Odour Critical Plant

The following list of odour critical plant<sup>1</sup> has been identified during the risk assessment:

- Storm & Balancing Tanks
- Screens & Screening Conditioning, Drainage & Rag Skip Management
- Sludge Reception, Screening, Wash down & Drainage
- Primary Raw Sludge Thickening & Pumping
- Sludge Blending & Mixing
- OCUs

<sup>1</sup> Odour critical plant is equipment that may cause off-site odour if not operating correctly

#### 4.2.4 Waste Storage for Sludge Treatment Centre Permit

Waste is not stored on site prior to treatment through the UWWTD or AD process. A list of the main tanks relating to the sludge treatment process and their associated volumes and retention times is shown below.

**Table 4.0 Sludge Treatment Centre Permit Tank Inventory**

Tank Purpose	Number	Operational Volume (m <sup>3</sup> )	Construction	Average Retention Time (where available)
Sludge Blending Tank	1	450	Concrete	<12 hours
Imported Sludge Holding Tank	1	450	Concrete	<12 hours
Primary Digesters 1-4	4	2,272 (per tank)	Concrete with steel floating roofs	15 days
Primary Digesters 7 & 8	2	2,272 (per tank)	Concrete with fixed concrete roofs	15 days
Secondary Digester	3	3,197 (per tank)	Steel	7 days
Digested Sludge Holding Tanks	2		Concrete	
Picket Fence Thickener	2	314 (per tank)	Steel reinforced fibreglass	12 hours per day operation time

An inventory of potential odorous materials relating to the Sludge Treatment Centre Permit is shown in Table 4.1 below. Air Emission Points are listed, and the locations shown on the site plan in Figure C of Appendix 4.

**Table 4.1 Odorous materials for Sludge Treatment Centre Permit**

Odorous and potentially odorous material (any solid, liquid or gas)	EWC Codes	Odour potential High Risk / Medium Risk / Low Risk	Maximum quantity on site at any given day	Maximum time held on site (hours or days)	Location of odorous materials on site
Cake	19 06 06	Low	4000 tonnes	90 days	Cake Pad
Biogas	N/A	Low	Gas holder capacity is 3,460m <sup>3</sup>	Continuous operation	Point A18 on Air Emission Point Plan
Liquor	16 10 02	Low	Liquor is continuously pumped to the head of works	Continuous pumping of liquors	Site wide drainage system, high level pumping station

Odorous and potentially odorous material (any solid, liquid or gas)	EWC Codes	Odour potential High Risk / Medium Risk / Low Risk	Maximum quantity on site at any given day	Maximum time held on site (hours or days)	Location of odorous materials on site
Raw imported sludge	19 08 05	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	Imported Sludge Holding Tank & Sludge Blending Tank, and/or Works Inlet
Primary Sludge	19 08 05	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	PFTs and Sludge Blending Tank
Thickened sludge import	19 02 06	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	Imported Sludge Holding Tank and Sludge Blending Tank
Surplus Activated Sludge	19 08 05	Medium/High	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	SAS Dewatering Plant & Sludge Blending Tank
Raw Sludge screenings	19 08 01	Low / Medium	1 Skip	Skips emptied within 1 week of being full	Before Imported Sludge Holding Tank

### 4.3 Odour Control Measures

The SOM referred to above complies with Thames Water's Asset Standards – Operating Standards. It states the operational procedures to be followed in order to maintain and operate plant to agreed company standards. These standards include, where appropriate, procedures for ensuring that generation of odour is kept to a minimum. Refer to risk assessment in Appendix 1 where these measures are summarised.

#### 4.3.1 Odour Control Units

There are currently 6 Odour Control Units on site.

Two OCUs which abate UWWTD activities:

- OCU B; Consisting of a large size carbon filter and 2 direct drive extract fans, it abates the Western Area Pumping.

- OCU D; Consisting of a constantly irrigated large size lava rock bio-filter, a chemical scrubber, 2 polishing carbon filters, and 2 direct drive extract fans, it abates the Inlet Works.

Four OCUs which abate Sludge Treatment Centre activities:

- OCU A; Consisting of a large size carbon filter and 2 direct drive extract fans, it abates the Sludge Blending Tank and Imported Sludge Holding Tank.
- OCU C; Consisting of a large size carbon filter and 2 direct drive extract fans, it abates the High Level Pumping Station.
- OCU E; Consisting of a constantly irrigated large size lava rock bio-filter, 2 polishing carbon filters, and 2 direct drive extract fans, it abates the Digested Sludge Holding Tank.
- OCU F; Consisting of 3 intermittently irrigated medium size calcified seaweed bio-filters, and 2 direct drive extract fans, it abates Picket Fence Thickeners and SAS belts.

#### **4.3.2 Site Specific Measures and abnormal events**

H4 has been used to guide the preparation of this OMP where it relates to activities regulated under the Sludge Treatment Centre Permit. As this guidance does not apply to UWWTD activities, where reference to H4 is made within this document this should not be inferred as H4 being applicable to UWWTD activities. Specific tasks and measures taken in intermittent, abnormal, and emergency events associated with the control of odours at Slough STW are summarised in the tables below.

The routine operational tasks carried out at Slough STW to specifically mitigate against generation of odour are also listed in the tables below.

#### **Tables 4.2-4.6 - Summary of Critical Odour Issues, Emergency Response and Mitigation Measures**

The purpose of Table 4.2-4.6 shall be to identify site specific emergency response procedures and mitigation measures relating to site odour generation and release. They include:

- Generic odour issues and mitigation measures relating to site-specific process stages; and,
- Additional site-specific odour issues and mitigation measures associated with process stages identified under the site Odour Risk Assessment.

Daily and weekly Site Round and Sludge Round checks are also carried out on each part of the process to ensure correct operation, these are shown in Appendix 5 and 6. A weekly checklist is also used to specifically check the odour control units. This is shown in Appendix 7.

**Table 4.2: Summary of routine odour mitigation tasks for assets under UWWTD**

Odour Source	Odour Offensiveness L/M/H	Specific Odour Management Tasks	Responsibility	Monitoring	Monitoring Frequency
General		Housekeeping – keep site clean and tidy, clean spills as soon as possible and filled skips must be removed from site.	Site Tech 1s	Visual Inspection	Daily
Inlet Works	Sewage / Industrial (L)	The whole of the Inlet Works is covered and ventilated to the Inlet Works OCU D.	N/A	Continuous - SCADA	Continuous
		Covers are not removed for longer than is needed if necessary to remove covers to perform certain tasks	Site Tech 1s	Visual Inspection	As required
Cess Reception, Discharge, Wash down & Drainage	Sewage (L)	Discharged directly to inlet works through close coupled connector	TW Biorecycling & Site Tech 1s	Quantity managed by TW Biorecycling	Daily
Storm & Balancing Tanks	Sewage (L)	Due to drainage gradient particular vigilance is required when cleaning the tank.	Site Tech 1s	Visual Inspection	Daily
Screens	Sewage (L)	Screenings are fed into enclosed compacted skip, replaced when full.	Site Tech 1s	Visual Inspection	Daily
Grit Removal	Sewage (L)	Ensure full skips are removed and replaced.	Site Tech 1s	Visual Inspection	Daily
Flow & Distribution to Primary Settlement Tanks	Sewage (L)	Underground pipework. Ferric dosing at end of the inlet controlling hydrogen sulphide release.	Site Tech 1s	Visual Inspection	Daily
Primary Settlement Tanks	Sewage (L)	Clear any hopper blockages. For Scum or sludge build-up on surfaces, sludge dip levels are monitored. This can also be an indication of failure of desludging systems.	Site Tech 1s	Manual visual Inspection	Daily

Fats, Oil & Grease Scum Removal System	Sewage (L)	Clear any hopper blockages.	Site Tech 1s	Visual Inspection	Daily
Primary Raw Desludge Pumping	Sewage (L)	Pipework contained and underground.	Site Tech 1s	Visual Inspection	Daily
Flow & Distribution to Secondary Treatment	Sewage (L)	Underground pipework. Ferric dosing at end of the inlet controlling hydrogen sulphide release.	Site Tech 1s	Visual Inspection	Daily
Activated Sludge Plant Lanes & Zones	Earthy (L)	Ensure correct process control and repairs carried out.	Site Tech 1s	Visual Inspection	Daily
Final Settlement Tanks	Non-offensive (L)	Daily monitoring for sludge levels. Process control and repair.	Site Tech 1s	Units are monitored by the SCADA system for failures	Daily
Scum Removal System	Non-offensive (L)	Daily monitoring for sludge levels. Process control and repair.	Site Tech 1s	Units are monitored by the SCADA system for failures	Daily
RAS Chambers & Pumping	Earthy (L)	Daily monitoring for sludge levels. Process control and repair. Drain and clean.	Site Tech 1s	Units are monitored by the SCADA system for failures	Daily
SAS Chambers & Pumping	Earthy (L)	Daily monitoring for sludge levels. Process control and repair. Drain and clean.	Site Tech 1s	Units are monitored by the SCADA system for failures	Daily
Filtration - Tertiary treatment disc filters	None	Daily monitoring. Process control and repair when required.	Site Tech 1s	Units are monitored by the SCADA system for failures	Daily

Back Wash Returns	None	Daily monitoring. Process control and repair when required.	Site Tech 1s	Units are monitored by the SCADA system for failures	Daily
Final Effluent	None	Daily sampling and corrective process control action.	Site Tech 1s	Units are monitored by the SCADA system for failures	Daily
Western Area Pumping Station OCU B	Sewage (L)	All routine site checks as per SOM.	Site Tech 1s	As Described in SOM	Weekly
		Odour control units are subject to regular preventative maintenance, checked on a monthly basis monthly by specialist Framework contractors who Monitor performance, through pH and H2S measurements and report to TL.	Contractor	As Described	Monthly
		Units are monitored by the SCADA system for failures	N/A	SCADA	Continuous
		Media is replaced as per TWUL asset standards and recommendation from monitoring contractor to asset standard.	Site Tech 1s	As described in Asset Standard	As required
Inlet Works OCU D	Residual odours (L) and Earthly odours (L)	All routine site checks as per SOM.	Site Tech 1s	As Described in SOM	Weekly
		Odour control units are subject to regular preventative maintenance, checked on a monthly basis monthly by specialist Framework contractors who Monitor performance, through pH and H2S measurements and report to TL.	Contractor	As Described	Monthly
		Units are monitored by the SCADA system for failures	N/A	SCADA	Continuous
		Media is replaced as per TWUL asset standards and recommendation from monitoring contractor to asset standard.	Site Tech 1s	As described in Asset Standard	As required

**Table 4.3: Summary of routine odour mitigation tasks for assets under Sludge Treatment Centre Permit**

Odour Source	Odour Offensiveness L/M/H	Specific Odour Management Tasks	Responsibility	Monitoring	Monitoring Frequency
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Sludge Reception, Screening, Wash down & Drainage	Sludge (H)	The reception tanks and screens should remain covered at all times.	Site Tech 1s	Visual Inspection	Daily
		Area is ventilated to an OCU A	N/A	Continuous - SCADA	Continuous
Cess Reception, Discharge, Wash down & Drainage	Sewage (L)	Discharged directly to inlet works through close coupled connector	TW Biorecycling & Site Tech 1s	Quantity managed by TW Biorecycling	Daily
Skip Management	Sludge (L)	Skip management	Site Tech 1s	Visual Inspection	Daily
Primary Raw Sludge Thickening and Pumping	Sludge (M)	The PFTs are kept covered at all times; the inspection covers are used for observation only.	Site Tech 1s	Visual Inspection	Daily
		In the event of plant failure or sludge inversion, then the tanks must be emptied.	Site Tech 1s	Visual Inspection	As required
		Area is ventilated to OCU F.	N/A	Continuous - SCADA	Continuous
SAS Thickening and Pumping	Sludge (L)	Connected to OCU F	Site Tech 1s	OCU monitored by SCADA, Visual Inspection	Daily
Sludge Blending and Mixing	Sludge (M)	Area is ventilated to an OCU A. Follow events procedure when cleaning.	Site Tech 1s	OCU monitored by SCADA, Visual Inspection	Daily
Return Liquors	Sludge (L)	Underground pipework, covered.	Site Tech 1s	SCADA, process control, visual inspection	Daily
Digester Feeding, Mixing & Discharge	Sludge (L)	Ensure spills are cleaned up ASAP and events procedure followed in any sludge event, plant failure. Covered tanks.	Site Tech 1s	Visual Inspection	Daily
Secondary Digestion, Mixing & Discharge	Digested sludge (L)	Constant monitoring as part of site operation procedure. Uncovered secondary digesters are located far from sensitive receptors on the south-east of the site.	Site Tech 1s	Visual Inspection	Daily
Centrifuge	Earthy (L)	Constant monitoring as part of site operation procedure	Site Tech 1s	Visual Inspection	Daily

Digested Sludge Holding Tanks	Earthy (L)	Area is ventilated to an OCU E.	N/A	Continuous - SCADA	Continuous
Cake Pad & Drainage	Earthy (L)	Cake removal is carried out. Vehicles covered.	Site Tech 1s	Visual Inspection	Daily
High Level Pumping Station	Earthy (L)	Covers are not removed for longer than is needed if necessary to remove covers to perform certain tasks	Site Tech 1s	Visual Inspection	As required
		Area is ventilated to a OCU C.	N/A	Continuous - SCADA	Continuous
Vehicle Movements & Wash Down	None	Daily checks by site staff	Site Tech 1s	Visual Inspection	Daily
Biogas Storage	Residual sulphur compounds (L)	Follow process control and ensure swift repair in any failure, such as whesso venting due to blockage.	Site Tech 1s	Visual Inspection	Daily
CHP, Boilers & Waste Gas Burner	Residual sulphur compounds (L)	Follow process control and ensure swift repair in any failure.	Site Tech 1s	Visual Inspection	As required
		Burner design to ensure low NOx and VOC emissions, with odours removed by passage through the biogas system, with biogas contained in line.	N/A	N/A	N/A
Sludge Blending Tank and Imported Sludge Holding Tank OCU A	Residual odours (L) and Earthly odours (L)	All routine site checks as per SOM.	Site Tech 1s	As Described in SOM	Weekly
		Odour control units are subject to regular preventative maintenance, checked on a monthly basis monthly by specialist Framework contractors who Monitor performance, through pH and H2S measurements and report to TL.	Contractor	As Described	Monthly
		Units are monitored by the SCADA system for failures	N/A	SCADA	Contiguous
		Media is replaced in line with the TW asset standards and recommendation from monitoring contractor to asset standard.	Site Tech 1s	As Described in Asset Standard	As Required
High Level Pumping Station OCU C	Residual odours (L) and Earthly odours (L)	All routine site checks as per SOM.	Site Tech 1s	As Described in SOM	Weekly
		Odour control units are subject to regular preventative maintenance, checked on a monthly basis monthly by specialist Framework contractors who Monitor performance, through pH and H2S measurements and report to TL.	Contractor	As Described	Monthly
		Units are monitored by the SCADA system for failures	N/A	SCADA	Contiguous

		Media is replaced in line with the TW asset standards and recommendation from monitoring contractor to asset standard.	Site Tech 1s	As Described in Asset Standard	As Required
Digested Sludge Holding Tank OCU E	Residual odours (L) and Earthly odours (L)	All routine site checks as per SOM.	Site Tech 1s	As Described in SOM	Weekly
		Odour control units are subject to regular preventative maintenance, checked on a monthly basis monthly by specialist Framework contractors who Monitor performance, through pH and H2S measurements and report to TL.	Contractor	As Described	Monthly
		Units are monitored by the SCADA system for failures	N/A	SCADA	Contiguous
		Media is replaced in line with the TW asset standards and recommendation from monitoring contractor to asset standard.	Site Tech 1s	As Described in Asset Standard	As Required
Picket Fence Thickeners & SAS Belts OCU F	Residual odours (L) and Earthly odours (L)	All routine site checks as per SOM.	Site Tech 1s	As Described in SOM	Weekly
		Odour control units are subject to regular preventative maintenance, checked on a monthly basis monthly by specialist Framework contractors who Monitor performance, through pH and H2S measurements and report to TL.	Contractor	As Described	Monthly
		Units are monitored by the SCADA system for failures	N/A	SCADA	Contiguous
		Media is replaced in line with the TW asset standards and recommendation from monitoring contractor to asset standard.	Site Tech 1s	As Described in Asset Standard	As Required

**Table 4.4: Intermittent(Int), abnormal (Ab), and emergency events (E) for assets under UWWTD**

Process stage	Event	Status (Frequent, Rare, Planned)	Ops mitigation	Odour risk after mitigation
Incoming Sewers & Reception Wet Well	Inlet uncovered.	P	Restore covers as soon as possible.	Medium
Cess Reception	Spills	R	Cleaned up by Site Tech 1s ASAP	Low

Storm & Balancing Tanks	Poor drainage / Residual Sludge	F	Tank cleaning	High
Screens	Failure of compactor, resulting in wet screenings.	F	Repair and act to ensure no build up; filled skips must be removed from site. Remove skips more often.	Medium
Grit Removal Equipment, Drainage & Grit Skip Management	Skips over fill, missing	R	Replace skips	Medium
Western Area Pumping Station OCU B	OCU Failure	R	Repair equipment at earliest opportunity. ERG carry out regular monthly inspections. OSIL make recommendations on remedial actions to take.	Low
Primary Settlement Tanks	Hopper blockage and plant failure	R	Repair, unblock, drain. Jet wash down to clean the exterior walls of tank.	Medium
Primary Settlement Tanks	Planned maintenance	P	Complete work ASAP	Medium
Fats, Oil & Grease Scum Removal System	Hopper blockage, pollution, plant failure	R	Repair, unblock and drain.	Low
Activated Sludge Plant Lanes & Zones	Filamentous, Pollution, High ML, Blower failure	R	Process control, repair.	Low
Inlet Works OCU D	Failure of unit or fan	R	Repair equipment at earliest opportunity. ERG carry out regular monthly inspections. OSIL make recommendations on remedial actions to take. Standby fan.	Low
Final Settlement Tanks	Failure of a component of the tank	R	Drain and clean as soon as possible	Low
Scum Removal System	Scum pump failure	R	Drain and clean as soon as possible	Low
Final Effluent	Blanket spill from final tank	R	Process control and corrective action	Low

**Table 4.5: Intermittent (Int), abnormal (Ab), and emergency events (E) for assets under Sludge Treatment Centre Permit**

Process stage	Event	Status (Rare, Planned, Frequent)	Ops mitigation	Odour risk after mitigation
Sludge Reception	Spills	R	Spillages are cleaned up by the driver/site staff promptly	Medium
Cess Reception	Spills	R	Cleaned up by Site Tech 1s ASAP	Low
Skip Management	Overfilled	R	Skip management. Waste removal at the earliest opportunity.	Low
Primary Raw Sludge Thickening and Pumping	Inversion, blockages, Plant failure	R	Process control, repair, tanks emptied.	Medium
SAS Thickening & Pumping	Plant failure, blockages	R	Process control, monitor and repair at earliest opportunity	Low
Sludge Blending & Mixing	Planned maintenance	P	Complete work ASAP	Medium
Sludge Blending & Mixing	OCU failure (During Sludge event, plant failure, blockages, Digester inhibition)	R	Tanker cleaning. Stop imports. Event procedure.	High
Return Liquors	Plant failure, blockages	R	Process control, repair at earliest opportunity.	Low
Digester Feeding, Mixing & Discharge	Spills / foaming around skirt	R	Spillages are cleaned up ASAP. Tanker cleaning.	Medium
	Blowing Whesso	R	Stop imports. Event procedure.	Medium
Secondary Digestion, Mixing & Discharge	Sludge event, plant failure, blockages, failure of dewatering plant, failure of pumping equipment	R	Process control, repair.	Low

Centrifuge	Plant failure	R	Stop imports, Process recovery. Liquid export, hire temporary equipment.	Medium
Cake Pad & Drainage	Poor DS, adverse weather.	R	Stop imports. Process control. Should any odorous digested sludge cake be produced, this will be subject to process checks undertaken to identify root cause of production and removed from site expediently.	Low
Biogas Storage	Whessoe venting due to blockage, Plant failure	R	Follow process control and repair	Low
CHP	Plant failure	R	Follow process control and repair. Use waste gas burner.	Low
Boilers	Plant failure	R	Follow process control and repair	Low
Waste Gas Burner	Failure of CHP and Waste Gas Burner	R	Repair at the earliest opportunity.	Medium
Standby Generators	Operating	R	N/A	Low
OCU A, C, E & F	Plant failure, power failure, washwater failure, ductwork or cover failure.	R	Repair equipment at earliest opportunity. ERG carry out regular monthly inspections. OSIL make recommendations on remedial actions to take.	Medium

**Table 4.6: General Intermittent (Int), abnormal (Ab), and emergency (E) events**

Incidents and emergencies	Event	Status	Ops mitigation	Odour risk after mitigation
Fire	Potential loss of power leading to loss of odour control	E	Emergency power generation for critical activities until power restored. Within Thames Water's incident response planning, arrangements are already in place with a supplier for temporary generators. This agreement has a Service Level Agreement for provision within 24 hours.	Low
Severe weather	High flows coming into works	E	No mitigation when once flow exceeds sites capability with persistent severe weather	Medium
Flooding	Flooding causing process or equipment problems	E	Event unlikely. Site incident procedures would be followed.	Low

Illness/absence of key staff	Accumulation of sludge/loss of odour control etc.	E	Task allocation is independent of individual staff.	Low
Power cuts	Loss of power to fans leading to loss of odour control	E	Emergency power generation for critical activities until power restored. Within Thames Water's incident response planning, arrangements are already in place with a supplier for temporary generators. This agreement has a Service Level Agreement for provision within 24 hours.	Low

### 4.3.3 Spillages

Spillages significant enough to cause odorous emissions will be cleared as soon as practicable. The person discovering the spillage will inform site management, who will utilise resources as required to clear it.

## 4.4 Routine Monitoring

Overall plant performance is assessed daily as part of the generic Site and Sludge inspection rounds, which apply to Thames Water large STW sites, and have been included in appendices 5 and 6, respectively.

The objective of these are to ensure that treatment processes, including odour control, are checked for effective operation as per the SOM. Any of the checks that result in performance of the process outside of the limits defined in the SOM or a fault being detected will require an Operator to change the process to bring the plant back into acceptable limits or the fault needs to be logged and reported for follow up maintenance/repair.

Various process parameters are monitored using a combination of online instruments (to measure flows, temperatures, pressures, levels); samples that are taken to our UKCAS accredited laboratories or run through sampling tests at the on-site laboratories (%DS, pH, alkalinity, ammonia).

The online instruments all have signals that are taken back to the site SCADA system and these 'alarm' if the readings are outside pre-set trigger points. Similarly, laboratory analysis samples will have expected ranges, which if outside of these, a notification is sent to the site process controllers.

In all instances that parameters are out of 'range', the operational teams will carry out an investigation to understand the cause and initiate corrective actions. If the reasons are not obvious, the process optimisation team is contacted to evaluate further.

Additionally, each week the various recorded parameters are recorded in the site Cockpit reports to look at trends. These are used to establish if there are gradual changes in performance over time so that early intervention can be carried out.

A range of process parameters are subject to routine monitoring or checking to ensure that the digestion process is operating optimally so that the required sewage cake output quality is achieved.

- pH: At a conventional digestion site such as Slough the processes is maintained around pH 7 but within the range 6.72 – 7.6 (this is % dry solids and digester load dependant) for healthy operation.
- alkalinity: Levels dependant on feedstock characteristics (primary sludge: surplus activated sludge (SAS) ratio). Conventional digestion typically, 3,500 - 5,000mg/litre range.
- temperature: minimum target of 38°C. This is maintained within the range 36-40°C.
- HRT (hydraulic retention time): minimum target is 15-days, there is no upper limit. Retention times shall not be less than 12-days during plant outages to keep the product pathogen kill efficiency control.
- OLR (organic loading rate): see table below - this is dependent on the



primary/SAS ratio. Slough fits into the first row of the table.

- Dry solids feed: see table below, Slough has a target of 6%DS, but this can vary between 3-8%DS and impacts the HRT.

Type of Digestion	0%- 35% SAS <sup>x</sup>	36%- 45% SAS	46%- 50% SAS	51%- 55% SAS	>55% SAS	Max Feed %DS
MAD* in Conventional Digestion	3	2.5	2	1.75	n/a	6
MAD after Pre-pasteurisation	4.5	4	3.5	3	n/a	7
MAD after Acid Hydrolysis	4.5	4	3.5	3	n/a	7
MAD after Thermal Hydrolysis	7	6.5	6	5.5	5.5	14

\* mesophilic anaerobic digestion

<sup>x</sup> surplus activated sludge, arising from the UWWTD treatment route.

- VFA (volatile fatty acid) concentration: There is no specific range for VFAs as it depends on the feedstock. It is used as an indicator of digester health rather than a process control. The production of organic acids depends on the volume of solids fed to the digester. The typical range for VFAs in a primary digester is between 50 and 800 mg/L. When VFA concentrations climb above 1000 mg/L, the digester could be overloaded or experiencing other problems.
- Ammonia - Ammonia concentrations of 50 to 1000 mg/L are beneficial, but ammonia levels of 1500 to 3000 mg/L (pH greater than 7.4) could be inhibitory but not always. An ammonia concentration higher than 3000 mg/L for prolonged period is toxic.
- VFA to Alkalinity ratio: Very important parameter to monitor for digestion process. The VFA to alkalinity ratio of below 0.4 is good and above this threshold value means diminishing alkalinity and low pH i.e. sour digester content. As long as this ratio is maintained higher VFA and alkalinity digester content can be acceptable and the digestion process is deemed healthy. Anaerobic digestion process is always controlled based on holistic parameters based but not based on single parameter.

Odour monitoring is carried out following receipt of an odour complaint. See section 6.3 Investigation a complaint for full details.

Further details of routine monitoring tasks are included in the Site Operating Manual.

## 4.5 Record Keeping

Records of routine monitoring, site and sludge inspection rounds and sludge blanket checks are kept on SAP . Records of skip management, which collect wastes generated from UWWTD activities, and any spillages and remedial actions are held in the Waste Transfer Notes. Sludge blanket levels are recorded on ELogbook and electronically via the Cockpit.

There is a SCADA system on this site.

A monthly condition report on the OCUs is sent to the team manager by the contractor and stored on SharePoint.

- PST Sludge Blanket Depths - records of PST sludge blanket levels are held within Site Cockpit and ELogBook.
- Performance of OCU - records of OCU testing will be kept by the site manager
- Gas Flare Check – records kept on the Site Cockpit
- Sludge Cake Movement – Records maintained by Thames Water Bio Recycling.
- Cockpit – Site operational data is stored on the Site Cockpit. This was introduced in 2009 and is stored electronically on the Portal.

#### **4.6 Emergency Response and Incident Response Procedures**

Emergencies such as fire, flood and severe weather are managed by Thames Water's Incident Management and Business Resilience team. The processes employed can be found on Thames Water's SharePoint site and are entitled: 'Incident Management Arrangements'. This is a company confidential document and therefore, is not included in the Appendices of this document.

Hazard reporting and accidents are all recorded on the Health and Safety software database SpheraCloud (<https://sphera.com>) and monitored by Thames Water's Safety, Health & Wellbeing team.

In the event of power failure, there are backup generators on site.

Absence of key staff should not affect the running of Slough STW, as Tech 1s from other sites can be called upon to cover, if required.

Odour mitigation for emergency events have been detailed in Table 4.6. The purpose of Table 4.2-4.6 shall be to identify site specific emergency response procedures and mitigation measures relating to site odour generation and release as well as additional site-specific odour issues and mitigation measures associated with process stages identified under the site Odour Risk Assessment.

## 5 Maintenance and Inspection of Plant and Processes

### 5.1 Routine Maintenance

#### 5.1.1 General Requirements

Site staff have a schedule to ensure routine maintenance for key mechanical items. In addition, a dedicated maintenance team provide additional support for more specialised equipment, e.g. regular calibration of Dissolved Oxygen probes.

In addition to the routine operational tasks, planned preventative and defect maintenance of plant is carried out. Plant which may have an impact on odour release is assigned an appropriate criticality rating to ensure effective performance is maintained. Plant assessed to be odour critical is listed in Section 4.2.3 above.

All maintenance procedures are detailed in the SOM, and when carried out is captured on the corporate system SAP, which generates work requests for the various activities for the treatment process assets at the appropriate frequency.

#### 5.1.2 Maintenance and Monitoring of Odour Control Units

Operation and maintenance of OCUs is delivered in accordance with the Company's Asset Standards and Equipment Maintenance Standards. This is either delivered in house by Operations or outsourced to contractor. Refer to the Odour Control Unit Asset Standard and Site Operating Manual for more information.

Condition of the media in the OCU is monitored by performance checks and by additional testing as required. Air quality is assessed to ensure that the units are working correctly.

Comprehensive maintenance of OCUs is managed by an external contractor. Slough STW is visited on a monthly basis and OCUs are inspected for defects. A report is provided to the site manager detailing the findings of each monthly visit. Figure 5.1 below highlights the scope of work required from our OCU Maintenance Contractors through their monthly visits. Monitoring during the visits is as follows:

- Monthly – flow (m<sup>3</sup>/h), differential pressure(kPa) and hydrogen sulphide(ppm) at both the inlet and outlet. Where applicable, monitoring may also include fan hours run and removal efficiency of hydrogen sulphide.
- Quarterly – VOC(ppm) and mercaptans(ppm) at the inlet and outlet.

>50ppb hydrogen sulphide will be used as a threshold value for media change out.

**Figure 5.1 – Monthly OCU Health Checks**

**Monthly Health Checks**

**Biofilter**

Please enter any comments you may have in the yellow comments boxes

Number	Task	Comments
1	Examine ductwork for any signs of damage or leaks and check condensate drains are free flowing	
2	Visually inspect the Odour control system will be made and any defects or deterioration of the housings will be reported	
3	Check the airflow through the system and any anomalies investigated	
4	Measure the pressure drop across the system by measuring the inlet and outlet pressure. Record any abnormalities	
5	Measure the contaminate levels (primarily H2S) at the inlet and at the stack	
6	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	
7	Examine the irrigation system to ensure correct operation including spray pattern, clean the strainer and unblock nozzles or replace as deemed necessary	
8	Take a sample of the drainage water and measure the pH value and compare to target pH value (this is not pH 7 for modern biotech)	
9	Check all hatches and doors for integrity and ensure they are closed	

**Chemical Scrubber**

Please enter any comments you may have in the yellow comments boxes

Number	Task	Comments
1	Examine ductwork for any signs of damage or leaks and check condensate drains are free flowing	
2	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	
3	Visually inspect the Odour control system will be made and any defects or deterioration of the housings will be reported	
4	Check the airflow through the system and any anomalies investigated	
5	Measure the pressure drop across the system by measuring the inlet and outlet pressure. Record any abnormalities	
6	Measure the contaminate levels (primarily H2S) at the inlet and at the stack	
7	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	
8	Examine the recirculation pumps and distribution pipework to ensure correct operation, clean the strainer and check trough / distributor	
9	Carry out a functional check of the dosing system ensuring target pH and Redox are achieved, and validate the probe calibration using a handheld unit	
10	Calibrate if necessary	
11	Visually check the seals of all hatches note any leaks	
12	Visually check the wet scrubber housing, note any significant deterioration	
13	Scrubber dosing cabinet - Check chemical dosing pumps for leaks	
14	Scrubber dosing cabinet - Check that dosing rates are correct	
15	Scrubber dosing cabinet - Check all valves, instruments and pipe-work for leaks	
16	Scrubber dosing cabinet - Check inside of cabinet for chemical residue and dirt and wash if necessary	
17	Scrubber dosing cabinet - After wash down check catch-pot high level alarm is working before draining	

**Carbon Adsorber**

Please enter any comments you may have in the yellow comments boxes

Number	Task	Comments
1	Examine ductwork for any signs of damage or leaks and check trapped condensate drains are free flowing. If a manual drain valve is provided, operate the valve until the flow of condensate ceases and leave valve in closed position	
2	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	
3	Visually inspect the Odour control system will be made and any defects or deterioration of the housings will be reported	
4	Check the airflow through the system and any anomalies investigated	
5	Measure the pressure drop across the system by measuring the inlet and outlet pressure. Record any abnormalities. Read off Delta-P gauge if fitted or using a portable manometer	
6	Measure the contaminate levels (primarily H2S) at the inlet and at the stack	
7	Check visually all fans, check for excessive noise and report any necessary maintenance to be undertaken as applicable	

### **5.1.3 Records**

Maintenance history records are kept electronically on TW SharePoint system. Records from the monthly inspections are held on site by the Performance Manager.

## **5.2 Fault Reporting**

Faults identified during routine inspections are reported to the Performance Manager, who assesses criticality before entering the task into the job scheduling system for allocation to an appropriate person and to a timescale appropriate to the criticality. Temporary solutions are implemented where possible, to keep OCUs in service.

## **5.3 Emergency Repairs**

24-hour maintenance cover is available at the discretion of the Performance Manager or Duty Manager, with planned follow up.

Less urgent repairs are assessed for criticality and dealt with during normal working hours.

## 6 Customer Communications

### 6.1 Customer Odour Complaints Process

Customer contacts regarding Slough STW will be made via the Customer Services Centre, Operations will investigate and take appropriate action. Complaints may also be received from the local council and Environment Agency.

Customers / residents are encouraged to communicate with local Thames Water Operations via the Customer Centre to report if they are noticing odour from Slough STW, to ensure that all contacts are recorded and actioned. Customers have 3 main options to report complaints to Thames Water:

1. Thames Water Website – “Report A Problem” at <https://www.thameswater.co.uk/contact-us/report-a-problem/report-a-problem-online>.
2. Email - [customer.feedback@thameswater.co.uk](mailto:customer.feedback@thameswater.co.uk) with the subject ‘Slough Sewage Treatment Works’
3. Telephone - Thames Water Customer Services 0800 316 9800

If the customer / resident would prefer to contact either Slough Borough Council or the Environment Agency instead, their contact details are as follows:

Slough BC – Environmental Services  
Telephone: 01753 475111 option 4

For Permitted sites:  
Environment Agency  
Incident hotline: 0800 80 70 60  
Email: [incident\\_communications\\_service@environment-agency.gov.uk](mailto:incident_communications_service@environment-agency.gov.uk)

Customer contacts regarding Slough STW that are received directly on site are responded to by the local Operations team. The Performance Manager, at the earliest opportunity, will inform the Customer and Stakeholder Manager (CSM) of the contact details in order that they can ensure the complaint is captured and recorded at the Customer Services Centre.

#### **Complaints received via Customer Services Centre:**

- Complaint information is logged electronically by the Customer Services Centre.
- An action is raised to Waste Operations Control Centre (WOCC) who contact the CSM by telephone and email the complaint information to both the CSM and Performance Manager
- The Performance Manager and CSM will review the complaint and take action to investigate (see section 6.3)
- The CSM is responsible for contacting the customer and updating them on the outcome of the investigation.
- Any problems are noted and remedial work actioned. An update of action taken and feedback given to the customer is emailed to the WOCC by the CSM.
- The WOCC update the electronic complaint report and it is closed down.

#### **Complaints received via email or post:**

- Complaint information is logged electronically by Customer Relations and allocated a Case Manager.
- The complaint is emailed to the CSM who reviews the complaint and investigates with the Performance Manager (see section 6.3).
- Actions taken are emailed back to the Case Manager who updates the electronic system and updates the Customer.

#### **Complaints received via Customer Centre out of normal working hours**

- For a large number of calls, or serious concerns, the Out of Hours Coordinator will be contacted to respond.
- For all other calls Slough STW site management will investigate and respond the next working day.

## **6.2 Customer Communication Plan**

The Customer Communication Plan in Appendix 3 identifies how and when contact will be made with customers and stakeholders in relation to stable, abnormal and emergency site operation.

## **6.3 Investigating a complaint**

Upon receiving a complaint Thames Water have 24 working hours to respond to the customer with an update. Within these 24 hours, the Customer & Stakeholder Manager will contact the Performance Manager who will carry out an investigation to determine whether the odour source is coming from the Thames Water site. If the odour is decided to be from the Thames Water site, then the root cause is investigated.

Should the source of the odour be confirmed as coming from the Thames Water Operations then the Performance Manager will review all activities currently taking place on site, including any maintenance, cleaning, and non-standard activities to identify the root cause, and ensure appropriate mitigation measures are in place.

If the Performance Manager cannot identify the source of the odour, but complaints persist, the Customer & Stakeholder Manager will ensure the customer who made the complaint is contacted, and obtain further details. These details include their address in relation to the site location, the time of occurrence and for how long. If odour problems continue to persist, Thames Water may even ask the customer to keep a detailed odour diary to ensure their issue can be fully addressed.

The root cause investigation may include site walkaround checks, which look for irregularities such as spillages / open doors and hatches, ensuring appropriate measures such as detailed in table 4.2 are in place. It may also include off-site visits to the Customer location.

When the root cause of the odour is found, the customer will be updated with an explanation and provided with a timescale for its resolution. Furthermore, the situation is assessed for hazards to determine any possibility of health risk to the local community.

To ensure any limitations regarding everyday staff becoming desensitised to the odour, if site odour complaints persist with no result in locating its source, personnel who do not spend prolonged time on a single site, such as the Area Operations Manager, will participate in the walkaround checks.

#### **6.4 Notification of Operations with Potential to Cause an Odour Problem**

Where operations may impact on local residents, notification will be made to the Customer Centre who will log the details on their Bulletin Board. This will be used to provide information directly to customers who call with queries. Letter drops may also be used.

The Environmental Health Officer of Slough BC (01753 475111), will be contacted directly if there are risks of odour generation from UWWTD activities. NOTE: This will only take place on known sensitive sites where Local Authorities and the EHO are already involved.

For assets under STC permit, we notify the EA in accordance with the permit conditions and notifications procedure, see Appendix 3.

If notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, Thames Water shall investigate and carry out a review of the OMP and appropriate measures if deemed necessary.



## Appendices

### Appendix 1. Odour Risk Assessment



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ERV%20Odour%20Ris

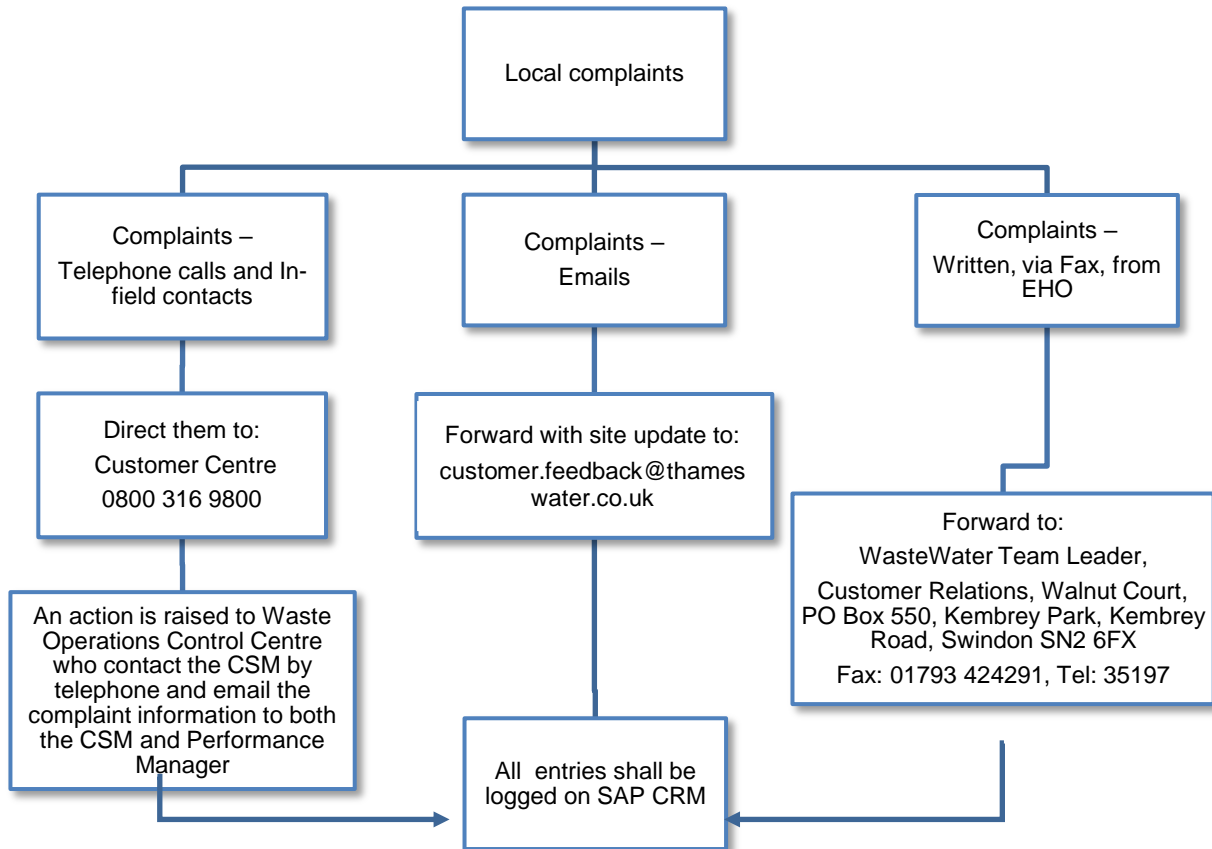
## **Appendix 2. Odour Improvement Plan**

There is no formal Odour Improvement Plan for Slough STW.

### Appendix 3. Customer Communications Plan

#### Complaints Process

All locally received complaints are re-directed to the Customer Centre. Please see below for details.



<b>IMPORTANT NOTE:</b>	
Any communications received from the local Member of Parliament or senior council officers need to be forwarded to the Local/Regional Government Liaison person:	
Name:	[REDACTED]
Telephone:	[REDACTED]

**Communications**

<b>Level 1</b>	Stable operations: Compliant with Operational Asset Standards.			
<b>Communications Approach</b>	Standard contact with key stakeholders.			
<b>Stakeholders External</b>	<b>Frequency of Contact</b>	<b>Method of Contact</b>	<b>Aim of Contact</b>	<b>TW Contact/Level</b>
Local council(s) Environmental Health Department	As required but at least quarterly	Telephone / email / meeting	Update on operational activity on site	Performance Manager and Customer & Stakeholder Manager
Environment Agency	As required	Telephone / email / meeting	Update on operational activity on site	Performance Manager and environmental permitting team
Local residents associations ( <i>if applicable</i> )	As required but at least annually	Telephone / email / meeting	Update on operational activity on site	Performance Manager and Customer & Stakeholder Manager
<b>Stakeholders Internal</b>	<b>Frequency of Contact</b>	<b>Method &amp; Level of Contact</b>	<b>Aim of Contact</b>	<b>TW Contact/Level</b>
Press Office	As required	Report sent out by operations to the business	Update the business on operational activity on site	Duty Manager
Customer Centre (Swindon)	As required	Report sent out by operations to the business	Update the business on operational activity on site	Duty Manager
Customer Engagement Manager	As required	Telephone / email / meeting	To keep External Communication team updated	Operations Manager
Odour Working Group	Monthly	Feedback odour report / email / telephone / meeting.	To monitor the level of complaints, highlight any odour issues (present and future)	Area Progress Manager
Area Process Manager	Weekly	Email / phone / meeting	To keep Manager up to date of odour issues at Slough	Team Manager

<b>Level 2</b>	Unstable operations: <ul style="list-style-type: none"> <li>Non-compliant with Operational Asset Standards on one or more sub-processes leading to increased odour risk.</li> </ul>			
<b>Communications Approach</b>	As Level 1 plus: <ul style="list-style-type: none"> <li>Use of Contact Centre Bulletin Boards / Briefing Contact Centre agents / Briefing statement with Q&amp;A prepared for the press office (to use reactively).</li> <li>Monthly discussions with, and quarterly visits from, the EHO.</li> <li>Commence proactive communications with other stakeholders in conjunction with the Customer and Stakeholder Manager</li> </ul>			
<b>Stakeholders External</b>	<b>Frequency of Contact</b>	<b>Method &amp; Level of Contact</b>	<b>Aim of Contact</b>	<b>TW Contact/Level</b>
Local council(s) Environmental Health Department	Immediately then monthly	Telephone / email / meeting	Report unstable operation with action plan	Performance Manager and Customer & Stakeholder Manager
Local residents associations ( <i>if applicable</i> )	Immediately then monthly	Telephone / email / meeting	Report unstable operation with action plan	Performance Manager and Customer & Stakeholder Manager
Environment Agency	Potential for notification procedure	As required as per notification procedure	As required as per notification procedure	Pollution desk
<b>Stakeholders Internal</b>	<b>Frequency of Contact</b>	<b>Method of Contact</b>	<b>Aim of Contact</b>	<b>TW Contact/Level</b>
Press Office	Immediately	Q&A prepared for press office by Operations	To enable the press office to deal with queries from the press (reactive only).	Duty Manager
Customer Centre (Swindon)	Immediately	Telephone / email	To enable the Customer Centre to deal with queries from the press (reactive only).	Duty Manager
<b>Other areas/stakeholders outside Slough STW potentially impacted</b>				
<b>Stakeholder</b>	<b>Frequency of Contact</b>	<b>Method of Contact</b>	<b>Aim of Contact</b>	<b>TW Contact/Level</b>
Local businesses	Immediately then monthly	Telephone / email / meeting	Report unstable operation with action plan	Performance Manager and Customer & Stakeholder Manager

<b>Level 3</b>	Emergency <ul style="list-style-type: none"> <li>Temporary or transient activities not deemed to be compliant with Operational Asset Standards. High risk of odour emitting plant.</li> </ul>			
<b>Communications Approach</b>	As level 2 plus: <ul style="list-style-type: none"> <li>Odour event set up internally (including OOH's cover from OMC (Kemble Court)).</li> <li>Weekly discussions with EHO.</li> <li>Monthly Stakeholder meetings, (internal and external – include MPs, Councillors, schools, businesses etc.).</li> <li>Press release may be required.</li> </ul>			
<b>Stakeholder External</b>	<b>Frequency of Contact</b>	<b>Method of Contact</b>	<b>Aim of Contact</b>	<b>TW Contact/Level</b>
Local residents associations (if applicable)	Immediately then monthly	Telephone / email / meeting	Report emergency event with action plan and update with progress	Performance Manager and Customer & Stakeholder Manager
Councillors / MPs for local areas	Immediately then monthly	Telephone / email / meeting	Report emergency event with action plan and update with progress	Level 5 Manager (Operations Manager) / Level 4 Manager (Regional Operations Manager)
Local council(s) Environmental Health Department	Immediately then weekly	Telephone / email / meeting	Report emergency event with action plan and update with progress	Level 5 Manager (Operations Manager) / Level 4 Manager (Regional Operations Manager)
Environment Agency	As required as per notification procedure	As required as per notification procedure	As required as per notification procedure	Pollution desk
<b>Stakeholders Internal</b>	<b>Frequency of Contact</b>	<b>Method of Contact</b>	<b>Aim of Contact</b>	<b>TW Contact/Level</b>
Press Office	Immediately then daily	Q&A and press release prepared by press office	To enable the press office to deal with reactive queries from the press and prepare a media strategy if required.	Duty Manager
Customer Centre (Swindon)	Immediately then daily	Telephone / email	To enable the Customer	Duty Manager

			Centre to deal with queries from customers (reactive only)	
<b>Other areas/stakeholders outside Slough STW potentially impacted</b>				
<b>Stakeholder</b>	<b>Frequency of Contact</b>	<b>Method of Contact</b>	<b>Aim of Contact</b>	<b>TW Contact/Level</b>
Local businesses	Immediately then monthly	Telephone / email / meeting	Report emergency event with action plan and update with progress	Process / Site Manager

### Appendix 4. Site Drawings

Figure A - Site Location Map



AM-OMP Slough STW

UNCONTROLLED WHEN PRINTED



Figure B - Site Plan

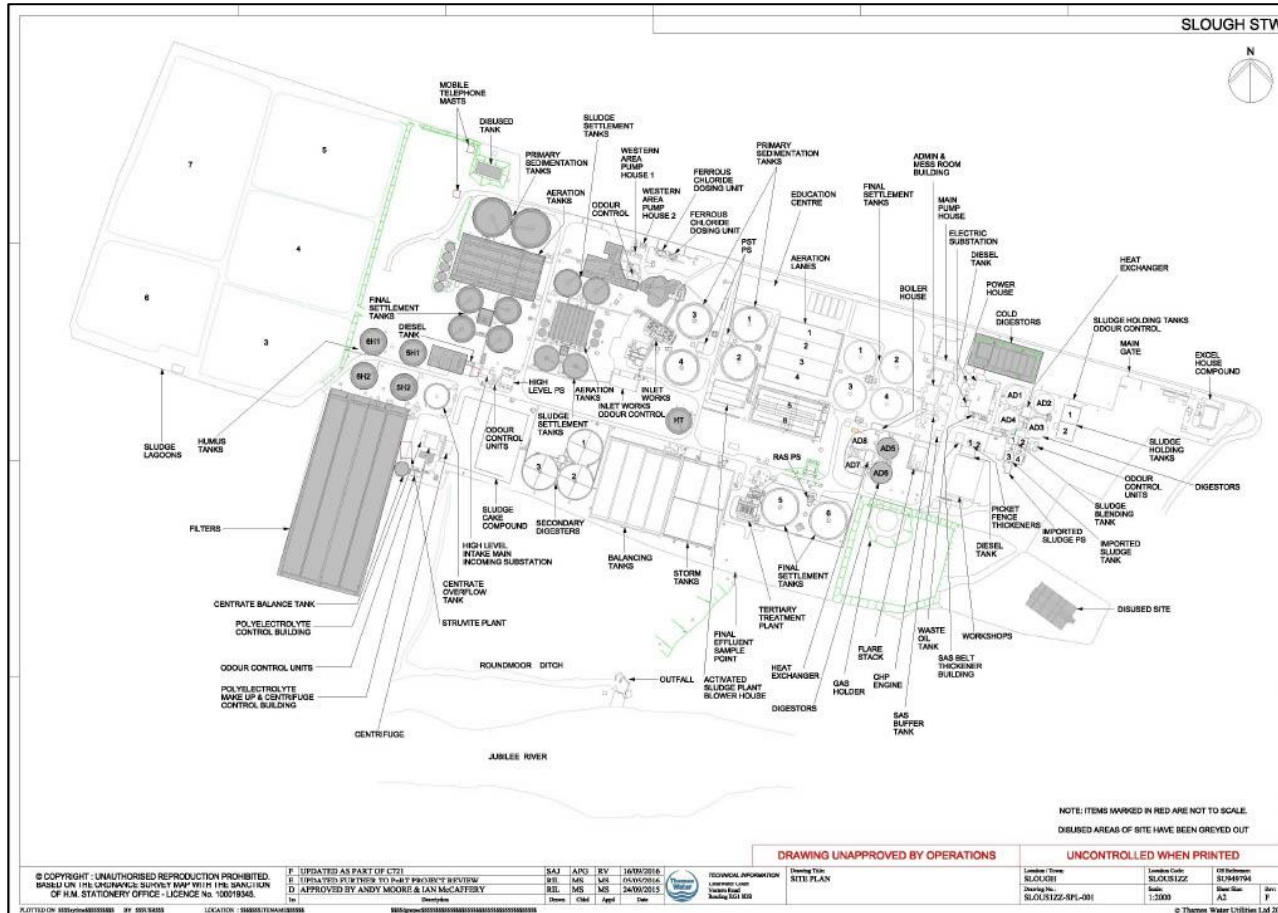


Figure C - Area permitted under Sludge Treatment Centre Permit (reference number to be added with issued permit)

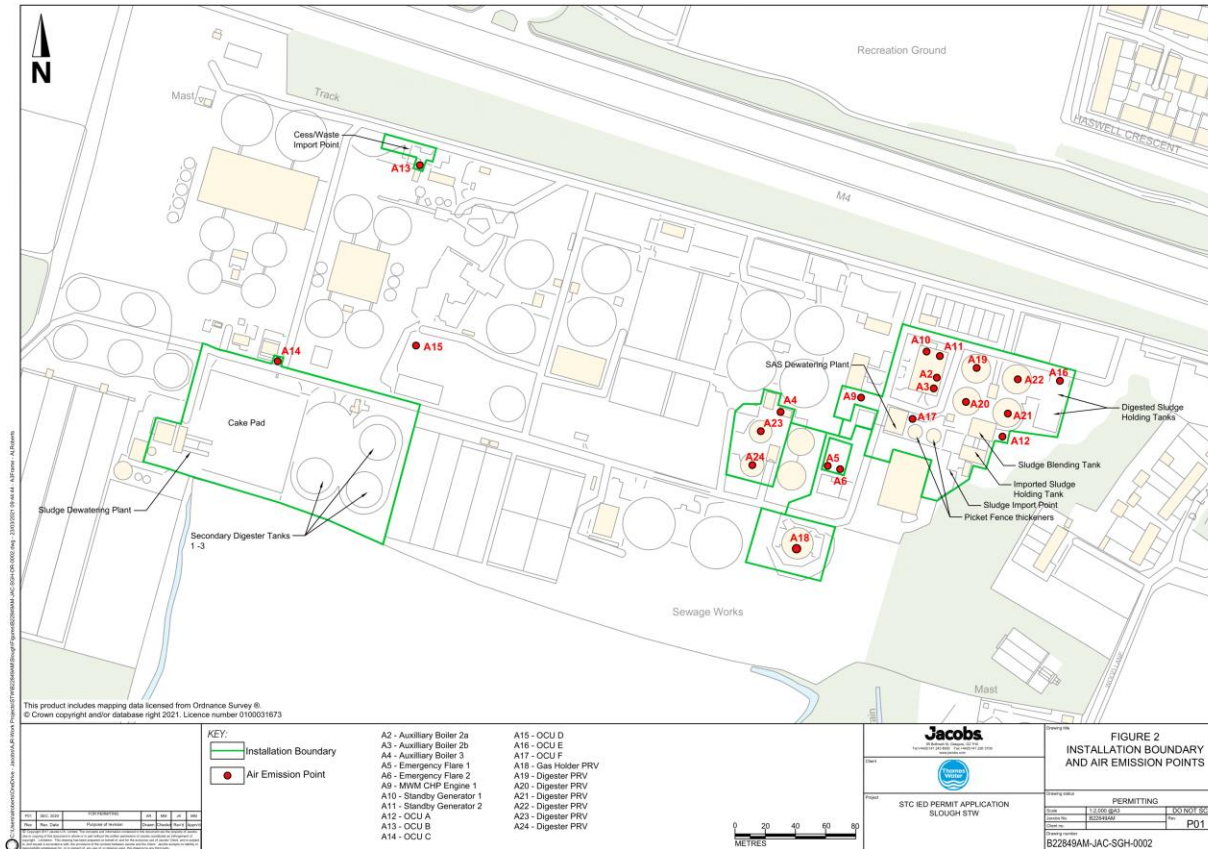


Figure D1 - Process Block Diagram for full site

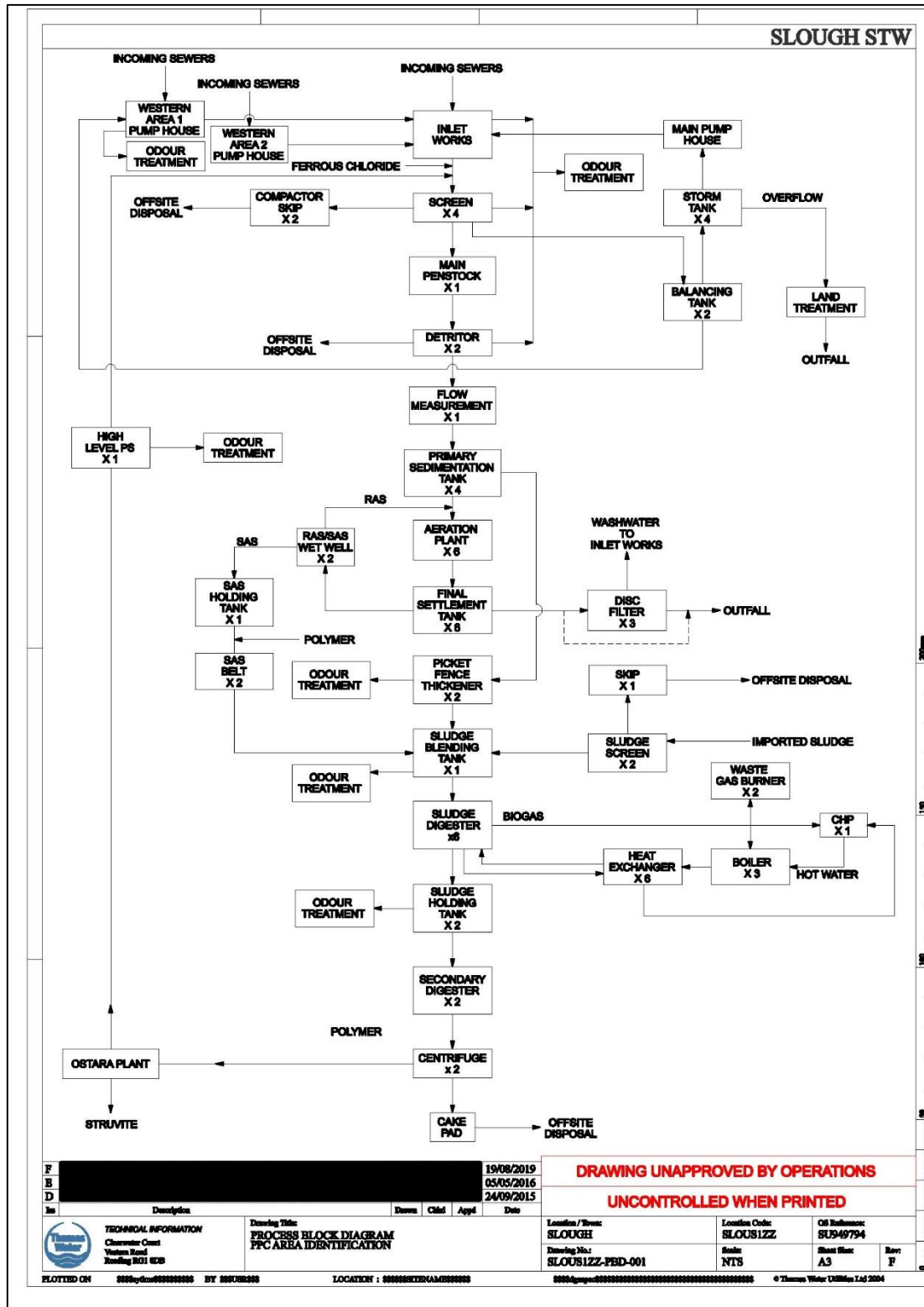
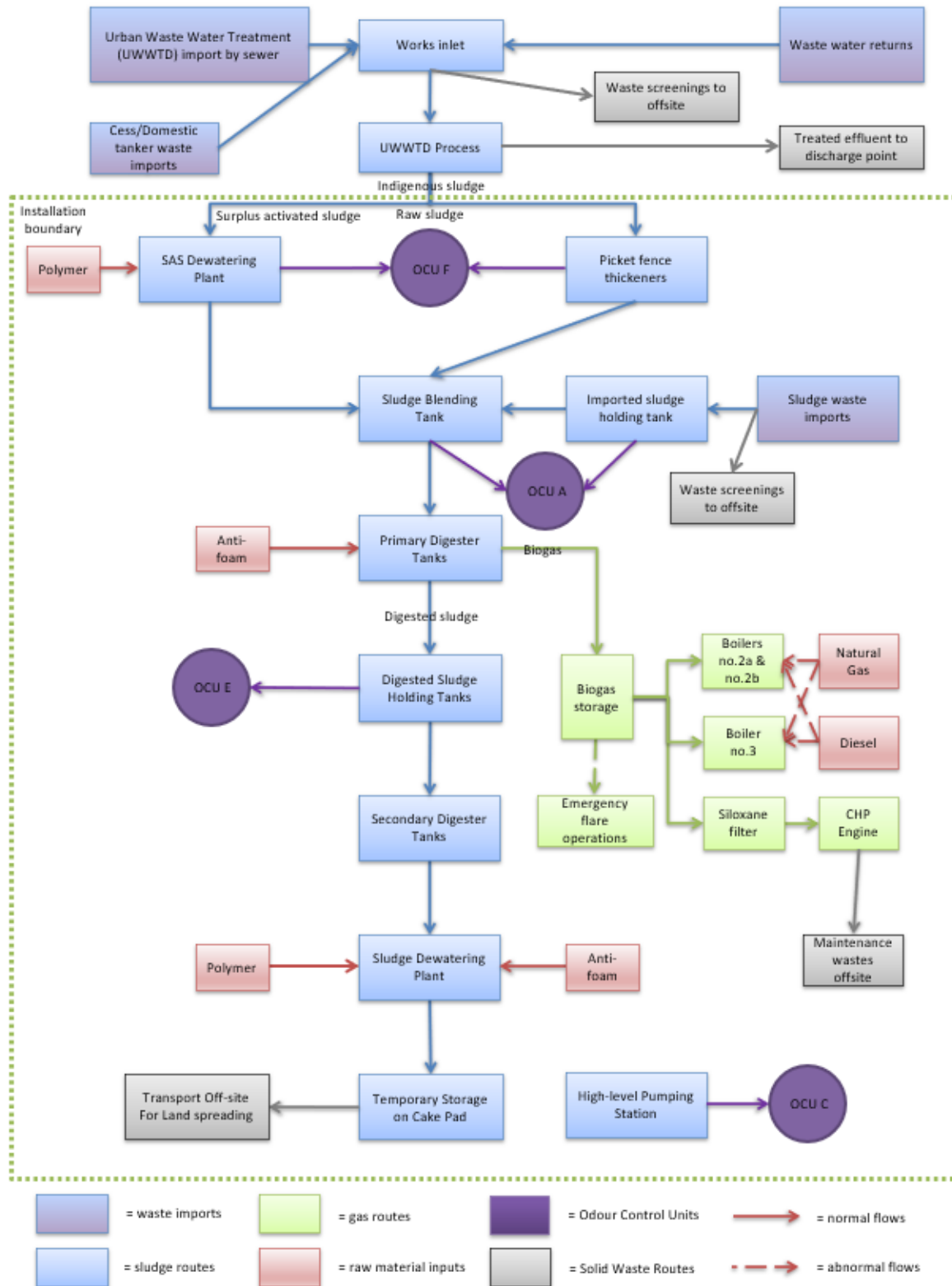


Figure D2 - Process Block Diagram for permitted activities



## Appendix 5. Site Rounds

ID	Instruction	Daily	Weekly
<b>1</b>	<b>Final Effluent</b>		
<b>a)</b>	Check the effluent quality at the sample point. Sample (ammonia, phosphorus, temperature & turbidity) in accordance with SOM. Record in site log book & via Direct Text.	X	
<b>b)</b>	Check final effluent sampling point is accessible. Highlight to manager if need to clean inline monitor, channel/chamber.	X	
<b>c)</b>	Check storm sampling point is accessible. Highlight to manager if need to clean inline monitor, channel/chamber.	X	
<b>d)</b>	Visual check on point of discharge to the watercourse if accessible. Check operability of outfall flap valve if fitted.	X	
<b>e)</b>	Check storm discharge point, if shared & if accessible.	X	
<b>f)</b>	Compensation water pumps. Check and clear ultrasonic head of cobwebs etc.	X	
<b>g)</b>	Check data and operation of inline monitor. Check inline monitor installation for damage, take appropriate action where required.	X	
<b>h)</b>	Remove and clean inline monitor probe.		X
<b>i)</b>	Check flow meter & flume is clear of debris. Take appropriate action.	X	
<b>2</b>	<b>Preliminary Treatment</b>	Daily	Weekly
<b>a)</b>	Check Crude sewage appearance. Does it look normal for the site?	X	
<b>2.1</b>	<b>Cess Waste Reception Point</b>		
<b>a)</b>	Note any suspicious activity or discharges as required	X	
<b>b)</b>	Check logger system is operating correctly	X	
<b>c)</b>	Check all pipework is in good condition	X	
<b>d)</b>	Where a macerator is fitted, check operation and oil reservoir	X	
<b>e)</b>	Where a manual stone trap is fitted, clear of accumulated material	X	
<b>f)</b>	Check grit bins are available and stocked with grit for winter	X	
<b>g)</b>	Carry out general housekeeping, remove litter, clear debris, washdown any spillages, empty bins	X	
<b>h)</b>	Ensure all signage is in good condition, clean and legible	X	

ID	Instruction	Daily	Weekly
i)	Check washdown equipment is operating correctly	X	
<b>2.2</b>	<b>Inlet / storm pumping station</b>	Daily	Weekly
a)	Check Ammeter reading, Too high could indicate a blockage. Too low could indicate an air lock or impeller damage. Where reading is unusual ensure appropriate action is taken.	X	
b)	Check the well level is within the normal operating limits taking into account the flow conditions at the time (such as storm conditions & peak flow to site). If level is too low or high, this could indicate control issues or pumping issues.	X	
c)	Check condition of the wet well. Does it have more than the usual scum or debris floating on top that will indicate the need for a wet well clean?	X	
d)	Check fault light(s) are not on, take appropriate action as required.	X	
e)	Check flow rate (where meter is fitted); is it within the normal operating range?	X	
f)	Inspect buildings, kiosks and control/switchgear panels for general condition, damage and that they are securely locked. Clean and tidy the interior of the buildings and/or Kiosks. Remove rubbish from site or if large volume arrange for collection.	x	
g)	Listen for undue pump noise and check for undue vibration by safely touching the lifting chain or guide rail.	X	
h)	Check non-return valve is operating correctly Non return valves prevent water from flowing back through the pump when it is not in operation. If a weighted arm is fitted is it at the usual angle? If it is low and chattering it could indicate the pump is blocked.	X	
i)	Check operation of the ultrasonic level control. Is it reading correctly? Compare the well level with the normal readout from the display. Check hard wired control floats, clean as required. Are floats weighed down with rag or debris preventing them from lifting if the water level rises?	X	
j)	Check pumps, pipelines and couplings for leaks where possible.		X
k)	Start the cleaning cycle manually where required.	X	
l)	Pumps - Log hours run		X
m)	Pumps - Log kWhrs		X
<b>2.3</b>	<b>Screen(s) / macerator(s)</b>	Daily	Weekly



ID	Instruction	Daily	Weekly
a)	Check inlet channel level is normal taking into account the flow conditions at the time (such as storm conditions & peak flow to site).	X	
b)	Check screen operation and check for screenings carryover. Check for blockages and blinding (hairpinning) on screen panels and remove where necessary. Check for rag rolling or rag balls upstream of the screen and remove where necessary. Check for any grit build up in front of screen	X	
c)	Inspect debris disposal mechanism for correct operation and verify screenings are being removed. Check & clean any obstructions impeding the operation of screen mechanisms.	X	
d)	Check screens bypass is available and clean	X	
e)	Clean area around screen. Check & clean screen panels of any obstructions.		X
f)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action to replace them if needed. Inspect grease pots and fill them when level is below the standard. Use grease nipples to lubricate required parts of screen.	X	
g)	Visually check unit and its associated equipment for the following: Safety & security with all panels locked & guards secure and in good condition. Excessive noise or vibration Overheating External damage, leaks, missing fixings Where applicable, ensure main and brush drives turn and that brushes are spinning	X	
h)	Check operation of wash water system for screens Ensure wash water pressure of spray bar is correct. Check the inline filter is present, clean and feeding the spray bars (where applicable). Check the spray bar pattern and clean the spray bar nozzles as required.	X	
i)	Check & clean accumulation of screenings and fat from debris disposal mechanism Check & clean launder chutes and channels for accumulation of grit, sand, rag, fat,	X	
j)	Check the lip, labyrinth or other seals between the screen and the channel wall are making an effective seal.	X	
k)	Visual check on the screenings removal brushes for blinding and wear. Clean the brushes as required. Ensure the brushes are in correct contact with the screen and that screenings are being removed.	X	

ID	Instruction	Daily	Weekly
l)	Check and clean instrumentation probes, floats and ultrasonic heads (where applicable).	X	
<b>2.4</b>	<b>Screenings handling</b>	Daily	Weekly
a)	Check control system and amps on panel for normal levels / operation, take appropriate action as required. Jumping amps indicates a blockage.	X	
b)	Where installed, visual check for normal operation of macerator. Look for visible blockages/build up on unit, high flows in front of macerator. Listen for unusual noise. Take appropriate action as required.	X	
c)	Where installed, check and empty stone trap.	X	
d)	Clean area around screenings handling units and skips.		X
e)	Check operation of wash water system for screenings handling. Check the inline wash water filter is present, clean and feeding the spray bars (where applicable) Ensure wash water pressure of spray bar is correct. Check the inline filter is present, clean and feeding the spray bars (where applicable). Check the spray bar pattern and clean the spray bar nozzles as required.	X	
f)	Check screenings product quality and quantity, Check level of screenings in skip and change skip when full.	X	
g)	Check operation of auto drain.		x
h)	Where installed check operation of the trough desludge system. Check for grit build-up in trough - hose out where required.		x
i)	Visual check on condition and operation of brushes (ensure trough is being cleaned). If blinding occurs regularly have wear on screw brushes checked.		x
j)	Check screw conveyor and brushes for wear and central running.		x
k)	Clean and check mesh for blinding and hairpinning.		x
<b>2.5</b>	<b>Grit removal</b>	Daily	Weekly
a)	Check mechanical plant is operating correctly. Check equipment– Compressor, Rake, Detritor & Pista grit.	X	
b)	Check manually de-gritted constant velocity channels for build-up of grit, take appropriate action as required.	X	
c)	Check inflow and outflow for normal rate of flow and correct distribution.	X	
d)	Check volume, dryness and quality of grit produced.	X	
e)	Remove rag from the areas around baffles and mechanical equipment	X	



ID	Instruction	Daily	Weekly
f)	Log manual de-gritting operations where required.	X	
g)	Log abnormal grit volumes.	X	
h)	Clean grit channel as required. Check grit build up in inlet channels and clean out if necessary.		X
i)	Check operation of wash water system and check the inline filter is present, clean and feeding the spray bars (where applicable)	X	
j)	Check aerated grit channels for air flow and bubble pattern (where applicable).	X	
<b>2.5</b>	<b>Skips</b>	Daily	Weekly
a)	Check skip capacity is adequate, and inform contractor when skip is full.	X	
b)	Rake skip where required.	X	
c)	Remove excess water if there is a facility to do so.	X	
d)	Ensure only prescribed material is in the skip. Remove any materials not prescribed.	X	
<b>2.6</b>	<b>Storm separation and treatment</b>	Daily	Weekly
a)	Check Flow To Full Treatment penstock is set at correct level.	X	
b)	Check storm return system is operational, manually return storm contents where required.	X	
c)	Check storm tanks cleaning system, check level sensors, check tanks are clean and empty outside of storm conditions.	X	
d)	Check and clear storm screens where required. (automatic clearance and manual clearance linked to safe system of work)	X	
e)	Check screens bypass is available and clean	X	
f)	Check and clear/replace any outlet screening sacks		X
g)	Check separation weirs and clean where required.		X
h)	<u>During storm</u> check that the flow to treatment is normal. (Treating Flow To Full Treatment)		X
i)	Log abnormal flows. Log storm discharge flows. Log storm flows in dry weather conditions.		X
j)	Log storm events.		X
k)	Remove any debris in the system.		X
l)	Storm LTA – Visually check area is clean and operating within site parameters. Remove any debris.		X
m)	Storm LTA – Check for short circuiting during operation. Inspect banks for leakage		X
<b>2.7</b>	<b>Flow measurement</b>	Daily	Weekly

ID	Instruction	Daily	Weekly
a)	Check site is within flow permit (treating Flow To Full Treatment before going to storm). Check that flow is going through site as expected.	X	
b)	Check flow meter and flume and clean where required	X	
c)	MCERTS – Log & record flow meter readings	X	
d)	Check EDM (Event Duration Monitor) sensor is clean and weir is free of debris	X	
<b>3</b>	<b>Primary Treatment- Primary Settlement Tanks</b>	Daily	Weekly
a)	Check and log sludge level by dipping tanks (Mon/Wed/Fri)	X	
b)	Check bridge/scrapper operation	X	
c)	Check de-sludge pump(s) and timer for normal operation	X	
d)	Check scum boards for breaks or carry under	X	
e)	Check scum trap for normal operation and clean/hose out	X	
f)	Check settled sewage quality (visual check only)	X	
g)	Check stilling chamber for rag, clear as necessary	X	
<b>4</b>	<b>Secondary Treatment</b>		
<b>4.1</b>	<b>Secondary Treatment – Activated Sludge</b>	Daily	Weekly
a)	Check air filters indicators for normal readings. Check blower control panel. Check the blowers for normal operation. Check there are no illuminated fault lights.	X	
b)	Check and record dissolved oxygen (D.O) readings, where probes are installed.	X	
c)	Sample, measure and record Mixed Liquor Suspended Solids (MLSS) /RASS concentration and sludge settleability (Stirred Specific Volume Index) (SSVI), (Monday/Wednesday/Friday)	X	
d)	Vent condensate from air lines		X
e)	Check SAS pump(s) are operating correctly	X	
f)	Check and record sludge return from the final settlement tanks (RAS rate)	X	
g)	Check D.O probe and / or timers are carrying out the correct control functions. Aeration control function.	X	
h)	Check flow distribution to aeration lanes if more than one lane present	X	
i)	Log changes to RAS rate, Log flows (where meters are fitted), Log KWh, Log SAS Rate.	X	
j)	Check and record bubble pattern and size of the bubbles	X	
k)	Check mixers for rotation in anoxic (un-aerated) zones	X	

ID	Instruction	Daily	Weekly
l)	Check recycle pumps are running, as required (Biological Nutrient Removal -BNR plants)		X
m)	Check redox monitor is operating correctly (BNR plants)		X
n)	Check VFA / liquor return (BNR plants)		X
o)	Check and record rate and frequency of SAS removal	X	
p)	Withdraw the D/O probe from the tank and remove clean		X
<b>4.2</b>	<b>Secondary Treatment – Biological Filters</b>	Daily	Weekly
a)	Visually check for correct flow distribution across the filter (radial distribution)	X	
b)	Keep filter surface clear of all debris and any significant moss or weed growth. Deal with ponding as appropriate.	X	
c)	Where recirculation is installed, check for normal operation at the correct flow rate	X	
d)	Check all air vents and under drains are clear and not flooded	X	
e)	Clear distribution arm orifices and or weir plates of debris	X	
f)	Remove end caps and rod/flush arms - clear debris from open channel arms	X	
g)	Check for appropriate flow distribution between filters to suit filter size	X	
h)	Check operation of distributor arms (uniform speed of rotation)	X	
i)	Check for leakage at the centre column seals and end caps. Short circuiting etc.	X	
j)	Check rotation timer. Check alignment of rotation alarm sensor and target plate	X	
<b>5</b>	<b>Secondary Settlement – Humus Tanks / Final Settlement Tanks</b>	Daily	Weekly
a)	Check correct operation of desludging pump(s) or valve(s)	X	
b)	Check scraper/bridge operation where installed	X	
c)	Check and log blanket level with portable blanket meter where detectors not fitted. (Monday, Wednesday, Friday)	X	
d)	Check tank surface for buildup of floating debris. Visually check effluent quality over the weir for solids carry over	X	
e)	Check RAS pump(s) are operating correctly (FSTs only)	X	
f)	Check Bellmouth and de-rag where required	X	
g)	Check effectiveness of weir brushes, chains, "other systems" where fitted	X	
h)	Check scum boards for breaks or carry under	X	

ID	Instruction	Daily	Weekly
i)	Check scum removal system for correct operation, clear any fouling where necessary	X	
j)	Check flow of recirculation bleed back/constant draw off where used	X	
k)	Check operation of fixed blanket detectors and alarms		X
l)	Check operation of Mallard pump by test running in hand, where installed		X
m)	Clear overflow weirs and launder channels of any build-up that will affect the tanks or effluent performance	X	
<b>6</b>	<b>Chemical Dosing</b>	Daily	Weekly
a)	Check that chemical is discharging, rather than dosing pump running dry (any nozzles blocked?)	X	
b)	Check chemical storage tank level - reorder as required. Log level in storage tank, Log discharge rate.		2 days a week
c)	Check for excessive vibration in the dosing pump		2 days a week
d)	Check the level in the internal bund and empty as required. Report any abnormalities.		2 days a week
e)	Visual check for leaks on tanks and visible chemical lines		2 days a week
f)	Check the trace heating system		2 days a week
g)	Check external storage tank bund for rainwater and/or chemical. Empty as appropriate.		X
<b>7</b>	<b>Tertiary Treatment</b>		
<b>7.1</b>	<b>Low Head Sand Filter</b>	Daily	Weekly
a)	Check smooth movement of bridge, unusual sounds and vibrations, and abnormal flow patterns	X	
b)	Check water level in each filter, compare with other units and relate to flow rate, and last backwash	X	
c)	Check unit isn't in bypass	X	
d)	Check for evidence of chemical leaks	X	
e)	Check cleanliness of carriage & filter area	X	
f)	Check sodium hypochlorite level in the bridge tanks where fitted and fill from bulk tank	X	
g)	Check sodium hypochlorite bulk tank level	X	
h)	Check the amount of sand in the wash water	X	
i)	Check the colour of the backwash water	X	
j)	Check the correct amount of hypochlorite is being dosed	X	

ID	Instruction	Daily	Weekly
k)	Check water level in each filter, compare with other units and relate to flow rate, and last backwash	X	
l)	Log backwash timer settings and head loss	X	
m)	Log flows and flow rate, where meters are fitted	X	
n)	Clean the level sensor head		X
o)	Log clarity of feed (compare with final effluent)	X	
<b>7.2</b>	<b>Disc Filter</b>	Daily	Weekly
a)	Log backwash pressure	X	
b)	Check frequency of backwash is within correct range		X
c)	Check bypass is not working during normal operations	X	
d)	Check depth in and out of the drum for normal operation	X	
e)	Check drum is rotating in correct mode and sounds normal	X	
f)	Check all ancillaries are operating normally	X	
g)	Log flows and flow rate where meters are fitted	X	
h)	Sample and record turbidity on feed (compare with final effluent)	X	
i)	Inspect inside filter for large pieces of debris		X
j)	Check for accumulation of weed in backwash trough		X
k)	Check and clean backwash water strainer.		X
l)	Check for soundness of mesh panels by lifting inspection panels		X
m)	Check wash water pressure and nozzles for normal operation		X
<b>8</b>	<b>Raw Sludge Holding &amp; Thickening</b>		
<b>8.1</b>	<b>Sludge Holding Tanks</b>	Daily	Weekly
a)	Check mixing regime is correct	X	
b)	Log levels in tank(s)	X	
c)	Decant liquors	X	
d)	Check tank(s) for ragging and blockages and clear or remove (where safe access is possible)	X	
e)	Check that holes on sludge cage(s) are clear where fitted, Clean sludge cage(s) dewatering holes (where safe access is possible)	X	
f)	Log tanker movements and compare with schedule	X	
g)	Ensure any crust build up does not interfere with any control equipment/alarm floats	X	
<b>8.2</b>	<b>Picket Fence Thickener</b>	Daily	Weekly
a)	Check fence is rotating & “stop, look, listen,” for mechanical issues.	X	

ID	Instruction	Daily	Weekly
b)	Check weir overflow quality and the surface of the unit. Clear any buildup of debris	X	
c)	Log blanket measurements / pump timers	X	
d)	Sample from discharge pump (run manually if necessary) and assess product quality. Sample, analyse and record % dry solids entering the PFT. Sample, analyse and record % dry solids out (Monday, Wednesday, Friday)	X	
e)	Check control system is operating normally	X	
f)	Log any changes to settings or duty	X	
g)	Log sludge flows in (where meters fitted) and out	X	
h)	Visually assess the dry solids & flow entering the PFT	X	
i)	Log hours run meters	X	
j)	Remove buildup of debris on the rake	X	
<b>8.3</b>	<b>Belt Thickeners</b>	Daily	Weekly
a)	Check for good floc formation. Check sludge on the top belt and assess the conditioning of the sludge. Check belt drainage and filtrate quality	X	
b)	Check product quality & quantity. Check condition of hopper	X	
c)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
d)	Sample, analyse & record % Dry Solids on feed and sludge/cake (Monday, Wednesday, Friday)	X	
e)	Check sludge feed rate and log	X	
f)	Check poly dosing system. Log polymer usage, note each bag change/delivery. Make adjustments to optimise	X	
g)	Ensure wash water pressure is available at a minimum of 6 bar	X	
h)	Clean belt steering paddles and check they are functioning correctly	X	
i)	Clean hopper level probes and check they are functioning correctly	X	
j)	Wash Station - Check formation of spraying fans, rotate internal brush to clean spray nozzles. (Minimum twice daily)	X	
k)	Visual Check - Hydraulic Power Pack - Check oil level and top up using clean equipment and fresh oil as required, maintain as close to full level as possible. Oil level must not be allowed to fall below 3/4 as this will cause serious damage	X	
l)	Jet wash clean the belt filter.	X	
m)	Use low pressure water hose to clean complete machine, frame, rollers and hoppers.	X	

ID	Instruction	Daily	Weekly
n)	Check condition of Belt Filter for blinding / blockages / good filtration	X	
o)	High pressure steam clean the belt from underside.		X
p)	High pressure steam clean complete machine, frame rollers and hoppers avoiding all electrical and instrumentation equipment		X
q)	Check condition of Belt Filter for wear i.e. Creasing / condition of seam to avoid failure / breakage and damage to other components		X
<b>8.4</b>	<b>Drum Thickeners</b>	Daily	Weekly
a)	Check for good floc formation. Check sludge feed rate. Check product thickness (visually). Check filtrate quality	X	
b)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
c)	Sample for % dry solids analysis and record (Monday, Wednesday, Friday)	X	
d)	Check spray bar nozzles to ensure they are clear and spraying correctly. Check spray bar wash water pressure	X	
e)	Clean probes in discharge hopper, hose down and carry out cleaning duties	X	
f)	Log polyelectrolyte used – each drum/bag change	X	
g)	Log sludge inlet flow meter, monitor throughput	X	
h)	Check & clean flocculator tanks		X
i)	Check appearance of mesh, adjust cleaning and cleaning pause intervals if necessary.	X	
j)	Clean dry solids monitors sensors		X
k)	Clean foot valves on washwater suction lines		X
l)	Clean mechanical filter on washwater booster set		X
m)	Clean washwater booster secondary screen in channel		X
n)	Jet/remove fat deposits from thickened sludge discharge pipework		X
o)	Log hours run		X
<b>9</b>	<b>Odour Control</b>	Daily	Weekly
	<b>Tasks for all Odour Control Units</b>		
a)	Check covers, hatches and doors are closed	X	
b)	Confirm duty fan running and standby fan availability	X	
c)	Check damper position to ensure they have not been tampered with	X	
d)	Check ductwork for any signs of damage or leaks	X	

ID	Instruction	Daily	Weekly
	<b>Specific tasks for Biofilter OCU</b>		
e)	Check the spray pattern from the irrigation nozzles and clean nozzles where required. (If possible)	X	
f)	Check for free discharge of effluent water to drain	X	
g)	Check for free discharge on any condensate removal points	X	
	<b>Specific tasks for Chemical Scrubber OCU</b>		
h)	Check water softener availability, check salt reservoir level, and top up if required.	X	
i)	Check stocks in bulk chemical tanks and reorder if required – tanker delivery	X	
j)	Check that the Redox and pH are within the agreed range – on dosing skid	X	
k)	Check duty and standby dosing pumps are available for each bulk chemical	X	
l)	Check the duty scrubber liquor recirculation pump is running and the standby is available in auto	X	
m)	Check that there is free drainage of scrubber blow-down liquor to drain	X	
n)	Check differential pressure gauges are within design range (if fitted)	X	
o)	General check for leaks in the scrubber liquor recirculation and dosing system – raise follow on work if any defects are identified	X	
	<b>Specific tasks for Carbon OCU</b>		
p)	Examine ductwork for any signs of damage or leaks and check trapped condensate drains are free flowing. If a manual drain valve is provided, operate the valve until the flow of condensate ceases and leave valve in closed position.	X	
q)	Check differential pressure gauge for over-pressure (if provided) – indicates media fouling	X	
<b>10</b>	<b>On Site Pumping</b>	<b>Daily</b>	<b>Weekly</b>
a)	Pumping System(s) (Drainage, Interstage, Washwater, Recirculation, Return Liquors etc.) operating correctly?	X	
b)	Check Ammeter reading - too high could indicate a blockage. Too low could indicate an air lock or impeller damage.	X	
c)	Check the well level is within the normal operating limits - taking into account the flow conditions at the time. If level is too low or high, this could indicate control issues or pumping issues.		
d)	Check condition of the wet well- does it have more than the usual scum or debris floating on top that will indicate the need for a wet well clean?		



ID	Instruction	Daily	Weekly
e)	Check fault light(s) are not on	X	
f)	Check flow rate (where meter is fitted); is it within the normal operating range?	X	
g)	Check for undue pump noise and vibration by safely touching the lifting chain or guide rail.	X	
h)	Check non-return valve. Non return valves prevent water from flowing back through the pump when it is not in operation. If a weighted arm is fitted, is it at the usual angle? If it is low and chattering it could indicate the pump is blocked	X	
i)	Check operation of the ultrasonic level gauge. Is it reading correctly? Compare the well level with the normal readout from the display.	X	
j)	Check pumps, pipelines and couplings for leaks. Check for visible leaks.	X	
k)	Start the cleaning cycle manually where required	X	
l)	Pumps - Log hours run	X	
m)	Pumps - Log kWhrs	X	
n)	Check hard wired control floats - are floats weighed down with rag or debris preventing them from lifting if the water level rises.	X	
o)	<b>Washwater Pumping</b> - Check the pipe line pressure from a gauge (where installed) on the pressure vessel or the pipe line manifold. Possible indication of strainer blockage	X	
p)	<b>Washwater Pumping</b> - Check operation of surge vessels (where installed).	X	
q)	<b>Washwater Pumping</b> - Check the strainers. If necessary, put automatic strainers in manual clean and inspect the manual strainers where local conditions allow.	X	
r)	<b>Washwater Pumping</b> - Check automatic filters are operating correctly	X	
<b>11</b>	<b>Distribution Chambers</b>	Daily	Weekly
a)	Inspect all weirs and brush clean. Remove any debris, scum, algal growth, blanket weed, grit, etc. from the chamber. Check flow split is correct.	X	
b)	Ensure any rag is removed, especially from around the penstocks, gate valves and their spindles. Ensure none of this passes over the weir.	X	
c)	Check that all valve, penstock and weir operating positions are correctly set.	X	
d)	Check chamber for any visible leaks	X	

## Appendix 6. Sludge Rounds

	Instruction	Daily	Weekly
<b>1</b>	<b>Liquid Sludge Import Facilities</b>	Daily	Weekly
<b>a)</b>	Check sludge logger device is fully operational	<b>X</b>	
<b>b)</b>	Check that the pattern of imports is in line with site requirements/agreement with tanker operators.	<b>X</b>	
<b>c)</b>	Check general area is clean and tidy	<b>X</b>	
<b>d)</b>	Check reception tank for rag/grit build up		<b>X</b>
<b>2</b>	<b>Sludge Screen</b>	Daily	Weekly
<b>a)</b>	Check sludge screen operation	<b>X</b>	
<b>b)</b>	Check screened sludge quality	<b>X</b>	
<b>c)</b>	Check / clean moisture sensor	<b>X</b>	
<b>d)</b>	Visually check unit and its associated equipment for the following: Safety & security with all panels locked & guards secure and in good condition. Excessive noise or vibration Overheating External damage, leaks, missing fixings	<b>X</b>	
<b>e)</b>	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action to replace them if needed. Inspect grease pots and fill them when level is below the standard. Use grease nipples to lubricate required parts of screen.	<b>X</b>	
<b>f)</b>	Carry out checks on cold weather operation systems before frost sets in	<b>X</b>	
<b>g)</b>	Check screenings quality & quantity		<b>X</b>
<b>h)</b>	Check general area is clean and tidy		<b>X</b>
<b>i)</b>	Check washwater is operating correctly during period of sludge discharge Ensure wash water pressure of spray bar is correct. Check the inline filter is present, clean and feeding the spray bars (where applicable). Check the spray bar pattern and clean the spray bar nozzles as required.		<b>X</b>
<b>j)</b>	Clean steel probes on rotamat screen		<b>X</b>

	Instruction	Daily	Weekly
<b>3</b>	<b>Sludge Buffer &amp; Blending Tanks</b> “Sludge Blending Tank” refers to a tank, into which more than one type of sludge is fed, requiring mixing: normally immediately prior to sludge digestion or dewatering. It may on some sites be referred to as a sludge holding tank or digester feed tank.	Daily	Weekly
<b>a)</b>	Check that mixer is operating correctly. Mixers are normally inhibited if the sludge level falls below a set level to protect the impellor, pump or blower.	X	
<b>b)</b>	Check for signs of stratification or poor mixing and rectify where necessary	X	
<b>c)</b>	Check pH and if less than 5 attempt to reduce septicity and freshen sludge	X	
<b>d)</b>	Check for ragging and blockages and clear or remove (where safe access is possible)	X	
<b>e)</b>	Check amps on mixer motor		X
<b>f)</b>	Check tank control system		X
<b>4</b>	<b>Sludge Treatment Inter Process Pumping</b>	Daily	Weekly
<b>a)</b>	Check Ammeter reading, Too high could indicate a blockage. Too low could indicate an air lock or impeller damage. Where reading is unusual ensure appropriate action is taken.	X	
<b>b)</b>	Check flow rate (where meter is fitted); Is it within the normal operating range?	X	
<b>c)</b>	Check the well level is within the normal operating limits taking into account the flow conditions at the time. If level is too low or high, this could indicate control issues or pumping issues.	X	
<b>d)</b>	Check operation of the ultrasonic level gauge. Is it reading correctly? Compare the well level with the normal readout from the display.	X	
<b>e)</b>	Listen for undue pump noise and check for undue vibration by safely touching the lifting chain or guide rail.	X	
<b>f)</b>	Check pumps, pipelines and couplings for visible leaks	X	
<b>g)</b>	Check non-return valve is operating correctly Non return valves prevent water from flowing back through the pump when it is not in operation. If a weighted arm is fitted is it at the usual angle? If it is low and chattering it could indicate the pump is blocked.	X	

	Instruction	Daily	Weekly
<b>5</b>	<b>Pasteurisation</b>	Daily	Weekly
<b>a)</b>	Check batch rates according to sludge levels	X	
<b>b)</b>	Check digester temperatures in relation to pasteurisation plant	X	
<b>c)</b>	Check hmi panel	X	
<b>d)</b>	Check operation of biotherm reactor aeration blower package.	X	
<b>e)</b>	Check heat exchanger performance	X	
<b>f)</b>	Check digested sludge buffer tanks	X	
<b>g)</b>	Check blended sludge buffer tanks	X	
<b>h)</b>	Check operation of biotherm reactor mixer	X	
<b>i)</b>	Check operation of heat exchanger mixer	X	
<b>j)</b>	Check operation of scum cutter	X	
<b>k)</b>	Check pump and valve operation	X	
<b>l)</b>	Log and record flows, pressures and temperatures	X	
<b>m)</b>	Check % ds of feed sludge to pasteurisation plant (Monday, Wednesday, Friday)	X	
<b>n)</b>	Check, remove and clean temperature probe		X
<b>6</b>	<b>Primary Sludge Digestion</b>	Daily	Weekly
<b>a)</b>	Check sludge discharge to limpet chambers, where installed. Clear any blockages	X	
<b>b)</b>	Check digester feed system is working Clear any blockages	X	
<b>c)</b>	Check digester heating system is working & temperatures are within HACCP range.	X	
<b>d)</b>	Check digester mixing system is operating correctly	X	
<b>e)</b>	Log digester temperatures (HACCP) Log inlet and outlet temperatures of each boiler Log inlet and outlet temperatures of sludge and water in heat exchangers	X	
<b>f)</b>	Log sludge feed volumes into each digester and establish the retention time (HACCP)	X	
<b>g)</b>	Check operation of sludge and water recirculation pumps Check pumps, pipelines and couplings for leaks where possible.	X	
<b>h)</b>	Monitor water supply where glycol is not used to heat exchanges that are exposed to elements,	X	

	Instruction	Daily	Weekly
	Ensure water is drained when heat exchanges are not in use.		
i)	Log use of secondary fuel within boilers.	X	
j)	Sample sludge into and out of digester. Analyse and record % dry solids. (Monday, Wednesday, Friday.) Analyse and record % volatile matter. (3 times a week Monday – Thursday)	X	
k)	Check digesters for foaming on the top.		X
l)	Remove grit from base of digester if facility is provided. <b>Do not</b> leave grit removal operation unattended and ensure valve is fully closed before leaving task.		X
m)	Sample, measure and record pH of digested sludge		X
<b>7</b>	<b>Secondary Sludge Digestion</b>	Daily	Weekly
a)	Check mixing system, for short-circuiting or separation, Mix before transfer to the next process, where facilities exist	X	
b)	Decant supernatant liquor when required	X	
c)	Log status of each tank	X	
d)	Record number of day's storage	X	
<b>8</b>	<b>Biogas Handling, Storage, &amp; Utilisation.</b>	Daily	Weekly
a)	Check all condensate traps manually and drain or top up if necessary. This check is required <b>twice daily</b> in prolonged periods of warm weather. Check automatic u-tubes visually, to ensure that there are no gas leaks or freezing Check automatic drain traps working correctly. Use manual drains if automatic drains not working, report defects	X	
b)	Check glycol pressure relief valve and ensure liquid level visible in sight glass	X	
c)	Check pressure/vacuum relief (whessoe) valves are not passing biogas. Listen for gas passing, note any unusual smell, visual check of valve.	X	
d)	Check for genuine operation of flare stack / waste gas burner, e.g. chp is at full power and there is excessive gas make	X	
e)	Check and record dehumidifier temperature	X	
f)	Log gas volumes: produced, flared, to chp, to boilers	X	
g)	Sample, monitor & record methane composition of biogas	X	

	Instruction	Daily	Weekly
<b>h)</b>	Manually check gas isolation valve handle operation by closing & opening valve.		<b>X</b>
<b>9</b>	<b>CHP &amp; Biogas Power Management</b>	Daily	Weekly
<b>a)</b>	Check automatic drain traps working correctly. Use manual drains if automatic drains not working, report defects	<b>X</b>	
<b>b)</b>	Check for genuine operation of flare stack / waste gas burner, e.g. CHP is at full power and there is excessive gas make	<b>X</b>	
<b>c)</b>	Check glycol pressure relief valve and ensure liquid level visible in sight glass	<b>X</b>	
<b>d)</b>	Check & log hours run	<b>X</b>	
<b>e)</b>	Check & log kwh exported (where relevant)	<b>X</b>	
<b>f)</b>	Check & log kwh generated	<b>X</b>	
<b>g)</b>	Check & log kwh used on site	<b>X</b>	
<b>h)</b>	Check & log use of secondary fuel	<b>X</b>	
<b>i)</b>	Check & log gas used	<b>X</b>	
<b>j)</b>	Check & log heat liberated from engine, heat dumped, heat liberated from boilers	<b>X</b>	
<b>k)</b>	Check & log engine temperatures and pressures, by exception	<b>X</b>	
<b>l)</b>	Check & log gas stream for methane composition		<b>X</b>
<b>m)</b>	Check automatic u-tubes to ensure that there are no gas leaks or freezing		<b>X</b>
<b>n)</b>	Check pressure/vacuum relief (whessoe) valves are not passing biogas. Listen for gas passing, note any unusual smell, visual check of valve.	<b>X</b>	
<b>10</b>	<b>Liquor Treatment</b>	Daily	Weekly
<b>a)</b>	Check return liquors and return rate	<b>X</b>	
<b>11</b>	<b>Chemical Dosing</b>	Daily	Weekly
<b>a)</b>	Check that chemical is discharging, not just dosing pump running (any nozzles blocked?)	<b>X</b>	
<b>b)</b>	Check chemical storage tank level - reorder as required	<b>X</b>	
<b>c)</b>	Check for excessive vibration in the dosing pump	<b>X</b>	
<b>d)</b>	Check the level in the internal bund and empty as required	<b>X</b>	
<b>e)</b>	Check for leaks on visible chemical lines	<b>X</b>	
<b>f)</b>	Check the trace heating system	<b>X</b>	

	Instruction	Daily	Weekly
<b>g)</b>	Check external storage tank bund for rainwater and/or chemical. Empty as appropriate.		<b>X</b>
<b>h)</b>	Check the correct amount of chemical is being delivered for the conditions		<b>X</b>
<b>i)</b>	Check storage tank can take delivery before delivering		<b>X</b>
<b>12</b>	<b>Sludge Dewatering – Belt Press</b>	Daily	Weekly
<b>a)</b>	Check poly dosing system, Log polymer usage, note each bag change/delivery, Make adjustments to optimize	<b>X</b>	-
<b>b)</b>	Check sludge feed rate and log	<b>X</b>	
<b>c)</b>	Check sludge on the top belt and assess the conditioning of the sludge, Check belt drainage and filtrate quality	<b>X</b>	
<b>d)</b>	Check product quality & quantity, Check condition of stockpile	<b>X</b>	
<b>e)</b>	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	<b>X</b>	
<b>f)</b>	Ensure wash water pressure is available at a minimum of 6 bar	<b>X</b>	
<b>g)</b>	Clean belt steering paddles and check they are functioning correctly	<b>X</b>	
<b>h)</b>	Clean hopper level probes and check they are functioning correctly	<b>X</b>	
<b>i)</b>	Wash station - check formation of spraying fans, rotate internal brush to clean spray nozzles. (minimum twice daily)	<b>X</b>	
<b>j)</b>	Visual Check - Hydraulic power pack - check oil level top up using clean equipment and fresh oil as required, maintain as close to full level as possible. Oil level must not be allowed to fall below 3/4 as this will cause serious damage	<b>X</b>	
<b>k)</b>	Jet wash clean the belt filter.	<b>X</b>	
<b>l)</b>	Use low pressure water hose to clean complete machine, frame, rollers and hoppers.	<b>X</b>	
<b>m)</b>	Check condition of belt filter for blinding / blockages / good filtration	<b>X</b>	
<b>n)</b>	Steering flaps - check condition and correct operation for activation of the hydraulic steering mechanism and check for wear and replace as required	<b>X</b>	
<b>o)</b>	Sample, analyse & record % dry solids on feed and cake, (Monday, Wednesday, Friday)	<b>X</b>	
<b>p)</b>	High pressure steam clean the belt from underside.		<b>X</b>

	Instruction	Daily	Weekly
q)	High pressure steam clean complete machine, frame rollers and hoppers avoiding all electrical and instrumentation equipment		X
r)	Check condition of belt filter for wear i.e. Creasing / condition of seam to avoid failure / breakage and damage to other components		X
<b>13</b>	<b>Sludge Dewatering – Centrifuge</b>	Daily	Weekly
a)	Check condition of stockpile, Check quality of product	X	
b)	Check kwh, amps and hours run	X	
c)	Check poly dosing system	X	
d)	Check quality of centrate	X	
e)	Check sludge feed rate, Check quality of product in feed	X	
f)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
g)	Log hours run	X	
h)	Log kwh hours run	X	
i)	Log polymer usage, note each bag change/delivery	X	
j)	Log sludge flow rate	X	
k)	Log volume of cake produced	X	
l)	Make adjustments to get optimum throughput, product quality and poly dosing	X	
m)	Sample, analyse & record % dry solids on feed and cake (Monday, Wednesday, Friday)	X	
<b>14</b>	<b>Poly Make Up, Storage, &amp; Dosing – Liquid</b>	Daily	Weekly
a)	Poly make up storage & dosing – liquid - check supply of polymer held in IBC; Top up, replace, order as appropriate	X	
b)	Liquid - check dosing pumps & settings	X	
c)	Liquid - check dilution water is available	X	
d)	Liquid - clean up any spillages of liquid	X	
e)	Liquid - log usage of polymer i.e. IBCs level	X	
f)	Liquid - log settings of dosing pumps	X	
g)	Liquid - log type of polymer	X	
h)	Liquid - check polymer flowmeter pressure – if above 3 bar clean filter and mixer		X
i)	Liquid - check made up solution appears ok	X	



	Instruction	Daily	Weekly
j)	Liquid - check bunded area for spillages	X	
<b>15</b>	<b>Poly Make Up, Storage, &amp; Dosing – Powder</b>	Daily	Weekly
a)	Dry powder - check dosing pumps & settings	X	
b)	Dry powder - check supply of polymer held in silo; Top up, replace, order as appropriate	X	
c)	Dry powder - check bunded area for spillages	X	
d)	Dry powder - check dilution water	X	
e)	Dry powder - check dry room / silo is heated, dry and doors are closed	X	
f)	Dry powder - check made up solution appears ok	X	
g)	Dry powder - check polymer is dry and flowing, look at screw drive and discharge to wetted head – “JETWET”	X	
h)	Dry powder - clean up any spillages	X	
i)	Dry powder - log settings of dosing pumps	X	
j)	Dry powder - log type of polymer, check using correct polymer.	X	
k)	Dry powder - log usage of polymer i.e. bags used	X	
l)	Dry powder - check polymer flowmeter pressure – if above 3 bar clean filter and mixer		X
<b>16</b>	<b>Sludge Cake Transfer</b>	Daily	Weekly
a)	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
b)	Check conveyor rollers & keep clear	X	
c)	Check drive bearings for wear & operation	X	
d)	Check electric trip wire emergency stop wire	X	
e)	Keep general area clean. Clear up any spillages	X	
f)	Check belt condition	X	
<b>17</b>	<b>Sludge Cake Storage</b>	Daily	Weekly
a)	Ensure silo not filled above 70% capacity. Inform Bio-recycling of any changes to sludge production.	X	
b)	Keep general area clean to minimise odour	X	
c)	Log & record each storage pad bay activity and status if applicable	X	
d)	Check wheel wash is operational	X	

## Appendix 7. Weekly OCU checklist

### OCU Round – Slough STW

Date:

Odour Control Unit Routine Checks. PLEASE MAKE A RECORD FOR EVERY CHECK

F - PFT Bio-trickling Filters OCU	Checked Ok?	Not Ok? (Make Comment)	Comments: Feedback to Performance Manager
Check that the fans are running			
Check that there is water draining from all the working units (3)			
Check that the hatches on the PFT's are closed secured			
Visually check that all the green covers and ducting are undamaged			
Check the wind sock – what is the odour down wind of the stacks?			

A - Digester Feed Tank OCU	Ok?	Not Ok? (Make Comment)	Comments
Check that fans are running			
Visually check that all the green covers and ducting are undamaged			
Is the differential pressure gauge reading high – record it & check			
Check the wind sock – what is the odour down wind of the stacks?			

E - Digested Sludge Buffer Tank OCU	Ok?	Not Ok? (Make Comment)	Comments
Is there water draining from the water tower cascade?			
Is the trace heating for the water supply operating?			
Are the fans running?			
Is the in line moisture “pre heater” working?			
Open the two drain valves to allow water out from the two filters			
Visually check that all the green covers and ducting are undamaged			
Check the wind sock – what is the odour down wind of the stacks?			

**OCU Round – Slough STW**

**Date:**

Odour Control Unit Routine Checks. PLEASE MAKE A RECORD FOR EVERY CHECK

<b>C - <del>Centrate</del> &amp; Liquors Return Pumping Station OCU</b>	<b>Checked Ok?</b>	<b>Not Ok? (Make Comment)</b>	<b>Comments: Feedback to Performance Manager</b>
Check that the fans are running			
Visually check that all the green covers and ducting are undamaged			
Check the wind sock – what is the odour down wind of the stacks?			

<b>D - Inlet Works OCU</b>	<b>Ok?</b>	<b>Not Ok?</b>	<b>Comments</b>
Is there water draining from the water tower cascade?			
Is the trace heating for the water supply operating?			
Are the chemical dosing pumps running?			
Are the chemical scrubber recirculating pumps running?			
Is there water draining from the chemical <del>scrubber</del> tower?			
Is there adequate hypo and caustic in the storage tanks?			
Are the fans running?			
Is the in line moisture “pre heater” working?			
Open the two drain valves to allow water out from the two filters			
Visually check that all the green covers and ducting are undamaged			
Check the wind sock – what is the odour <u>down wind</u> from the stacks?			

<b>B - Inlet Pumping Station Wet Well OCU (WASPS)</b>	<b>Ok?</b>	<b>Not Ok?</b>	<b>Comments</b>
Check the fans are running			
Visually check that all the green covers and ducting are undamaged			
Check the wind sock – what is the odour down wind of the stacks?			

---- End of OMP----