



# Asset Management Asset Standard Odour Management Plan

## Swindon STW

### SWINS1ZZ

<b>Document Reference</b>	AM-OMP Swindon STW	
<b>Issue Date/Version</b>	November 2024	Version: 7.3
<b>Data Owner</b>	Asset Standards Manager	
<b>Document Author</b>	██████████	
<b>Approved By</b>	██████████	
<b>Document Location</b>	SharePoint	
<b>Reason for Issue</b>	Updated site plan and pfd	
<b>Next Review</b>	November 2025	

## 0 Document Control & Procedures

## 0.1 Contents

0	Document Control & Procedures.....	1
0.1	Contents .....	2
0.2	Document Confidentiality .....	4
0.3	Document Control.....	4
0.3.1	Document Change Request.....	4
0.4	Sign Off.....	5
	Glossary of Terms .....	6
1	Introduction .....	7
2	Site Information.....	9
2.1	Location and Receptors .....	9
<b>2.3</b>	<b>Wind Rose and Weather Monitoring</b> .....	<b>13</b>
2.4	Site Layout and Treatment Processes .....	14
2.4.1	Permitted activities plus description.....	15
2.4.2	UWWTD Activities.....	15
2.4.3	Sludge Treatment Centre Permit Activities .....	15
3	Site Management Responsibilities and Procedures.....	17
3.1	Site Roles .....	17
3.2	Key Contacts .....	18
3.3	Operator Training .....	19
4	Odour Critical Plant Operation, Monitoring and Management Procedures.....	20
4.1	Odour Sources, Critical Issues and History .....	20
4.2	Identification of Odour Critical Plant.....	20
4.2.1	Odour Risk Assessment.....	20
4.2.2	Potential Odour sources.....	21
4.2.3	Odour Critical Plant .....	22
4.2.4	Waste Storage for Sludge Treatment Centre Permit .....	22
4.3	Odour Control Measures .....	24
4.3.1	Site Specific Measures.....	25
4.3.2	Odour Control Units .....	54
4.3.3	Spillages.....	54
4.4	Routine Monitoring .....	54
4.4.1	Performance Checks and Testing.....	54
4.5	Record Keeping.....	56
4.6	Emergency Response and Incident Response Procedures .....	56
5	Maintenance and Inspection of Plant and Processes .....	57
5.1	Routine Maintenance .....	57
5.1.1	General Requirements .....	57
5.1.2	OCU Selection and performance validation.....	58
5.1.3	Maintenance of Odour Control Units.....	59
5.1.4	Records .....	67
5.2	Fault Reporting .....	67
5.3	Emergency Repairs .....	68
6	Customer Communications .....	69
6.1	Customer Odour Complaints Process.....	69

6.2	Customer Communication Plan .....	70
<b>6.3</b>	<b>Investigating a complaint .....</b>	<b>70</b>
6.4	Notification of Operations with Potential to Cause an Odour Problem .....	71
7	Appendices .....	72
	Appendix 1. Odour Risk Assessment.....	72
	Appendix 2. Odour Improvement Plan .....	73
	Appendix 3. Customer Communications Plan .....	75
	Complaints Process.....	75
	Communications .....	76
	Appendix 4. Site Drawings .....	80
	Figure E - Process Block Diagram of EPR Permitted Activities .....	85
	Appendix 5. Site Rounds.....	86
	Appendix 6. Sludge Rounds.....	99
	Appendix 7 Odour sniff testing protocol .....	106

### Figures and Tables:

Table 2.1	Location of potentially sensitive odour receptors. ....	10
Figure 2.3:	Wind rose – Brize Norton meteorological station 2019.....	13
Figure 3.1 -	Site Roles .....	17
Table 3.1 -	Tasks and Responsibilities .....	17
Table 4.0	Sludge Treatment Centre Permit Tank Inventory.....	22
Table 4.1	Odorous materials for Sludge Treatment Centre Permit.....	23
Table 4.2	Odorous raw materials for Sludge Treatment Centre Permit .....	23
Table 4.3:	Summary of routine odour mitigation tasks for assets under UWWTD.....	26
Table 4.4:	Summary of routine odour mitigation tasks for assets under Sludge Treatment Centre Permit.....	36
Table 4.5:	Intermittent, abnormal, and emergency events for assets under UWWTD.....	44
Table 4.6:	Intermittent, abnormal, and emergency events for assets under Sludge Treatment Centre Permit.....	48
Table 4.7:	General Intermittent, abnormal, and emergency events .....	52
Table 5.1	Monthly Health Checks.....	66
Figure A -	Site Location Map with Receptors .....	80
Figure B -	Site Plans .....	80
Figure C -	Site Plan Showing Area of EPR Permitted Activities.....	83
Figure D –	Process Block Diagram of Effluent Stream .....	84

## 0.2 Document Confidentiality

This document and its associated sections will only be disclosed to those of the recipient's employees and contractors who have a need to see it as part of their duties.

Title and copyright in the document is vested in Thames Water. This is a controlled document.

Copying is permitted, provided any copy made is clearly marked as 'Uncontrolled copy'.

Reproduction of the whole or part of the document(s) shall not be made without the express permission of TWUL

## 0.3 Document Control

### 0.3.1 Document Change Request

Whilst Standards are mandatory, it is recognised that one process may not cover every eventuality and a document user may identify an improvement that does not compromise the objectives of the procedure; in this instance a change request against the Standard should be raised.

Information exchange is essential in supporting continuous improvement of the Standards, and a common document and data change request process is provided via the "TAPS" application available via the TW Portal. Within TAPS "Service Catalogue" menu option there are links and instructions for raising change requests for a variety of subjects.

Change requests are automatically sent to the Standards Process Team, and will be approved by the team, or escalated to the relevant governance group and/or standards board for approval depending upon the potential impact and complexity of the request.

It is a business requirement to comply with standards. Compliance issues will be escalated to the relevant governance group for further action as appropriate.

For further information/advice, please e-mail: [am.standards@thameswater.co.uk](mailto:am.standards@thameswater.co.uk)

### Owner Review Requirements

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

### Local Review Requirements

Controller of Premises should be informed when handwritten amendments are made to this document

Revision No	Reason for Revision	Prepared by	Approved by	Date
1	Update OMP and Baseline Measures			June 2010
2	Updated for increased H4 compliance and consistency			October 2012
3	Conversion and validation of OMP into new Standard format			April 2014

4	Update of Odour Risk Assessment / Critical Odour Issues & Mitigation / Organisational Design Changes (April 2015) / Update of major works on site		August 2016
4	Section 3.3 Operator training updated		August 2016
4	Section 4.3.2 Odour Control – Building ventilation fans now running on timers as agreed with EA		August 2016
4.1	Updates following Odour Management Plan audit		May 2017
5.0	Updated for new OCU installation and annual review		December 2019
6.0	EA recommendations in CAR Report ID: 100560/0372726 rec. 22-9-2020		October 2020
7.0	IED Permit Application		January 2022
7.1	IED Permit Application Resubmission		November 2023
7.2	Updated Site Plan and PFD		March 2024
7.3	Updated Site Plan		November 2024

#### 0.4 Sign Off

Operations Manager	██████████	Date: November 2024
Performance Manager	██████████	Date: November 2024

## 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
EHO	Environmental Health Officer
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 affected by odour.
SAP	Thames Water's enterprise resource and planning system
SCADA	Supervisory Control And Data Acquisition
SHT	Sludge holding tank
SOM	Site Operating Manual
STC	Sludge Treatment Centre
STW	Sewage Treatment Works
TM	Team Manager
TCM	Technically Competent Manager
UWWTD	Urban Waste Water Treatment Directive

## 1 Introduction

This Odour Management Plan (OMP) forms part of the Swindon 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 Swindon administration building and on Thames Water's asset record database SharePoint, within the EMS pages. Changes to OMP procedures are captured in the SOM as part of the periodic reviews of this document. The Odour Management Plan is to be used by all personnel involved in site operations.

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 Performance Manager changes.
- If there is a material change in relevant regulations or guidance.
- If there is an odour release incident.
- If a contingency measure is triggered.

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

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 operators and maintenance staff to understand the operational procedures for both normal and abnormal conditions.

This OMP was updated in 2022 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 anaerobic digestion (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).

## Regulatory 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)

Where this Odour Management Plan relates to STW activities regulated under the UWWTD this OMP may still draw upon elements of best practice taken from H4 but this should not be inferred as H4 being applicable to these activities.

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, and generic Site and Sludge rounds are included in Appendices 1-6.



## 2 Site Information

### 2.1 Location and Receptors

Site Address:

Swindon STW
Barnfield Road
Swindon
Wiltshire
SN2 2DJ
EPR Permit number: EPR/CB3201HV/V003
What 3 words: grit noon. global

Swindon STW is situated approximately 2km west of the centre of Swindon in Barnfield Road. The site is bordered by an industrial estate to the North/Northeast and there are retail and residential properties to the South and East. The boundaries of the works are formed by Barnfield Road to the south, Kendrick Industrial Estate to the north and B&Q to the east. The STW has a number of commercial and industrial businesses to the south.

Gravity flows from North Swindon are received into the covered inlet works. Pumped and gravity flows from West Swindon are received into a separate on-site terminal pumping station and then pumped to the inlet works.

Swindon STW is located to the north of Barnfield Road, approximately 2.5 km to the northwest of the town centre. It situated within a mixed commercial/industrial setting bordered to the northwest by Shaw Forest Park.

To the south, southwest, east, and northeast of the STW are commercial/industrial premises. To the north lies scrub/marshland. The closest residential receptors to the STW are located to the southeast. Nearest receptors include Lidl's supermarket and B&Q DIY Store car parks. These are located to the southeast corner of the site. There are residential receptors in the immediate vicinity of the site at Meadow Road and Barnfield Close.

Topographical features surrounding a site have an influence on the dispersion of air. There are no significant slopes in the vicinity of the site and the topography of the area is relatively flat. Local meteorological data indicates that the prevailing wind in the area is West Southwest.

(For Site Location Map see 'Appendix 4 – Site Drawings')

#### 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 affected by odour.

The nearest receptors are given in Table 2.1.

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

Receptor Number	Receptor Type	Receptor Name	Approximate distance to the nearest site boundary (km)	Direction from the site	Receptor sensitivity
1	School	Westlea Primary School	0.87	South-West	High
2	Institution	The Westlea Fire Station	0.64	South-West	Medium
3	School	Shaw Ridge Primary School	1.12	South-West	High
4	Commercial	Aldi on Shaw Rd	0.70	South-West	Medium
5	Commercial	Lidl on Barnfield Rd	0.05	South	Medium
6	Commercial	Swindon Bus Company	0.05	South	Medium
7	Commercial	CB Autos Swindon	0.05	South	Medium
8	Commercial	Home Bargains	0.05	South	Medium
9	Commercial	B&Q Swindon	0.14	East	Medium
10	School	Even Swindon Nursery School	0.24	South-East	High
11	Residential area	Even Swindon Residential Area (between Great Western Way, Rodbourne Rd and Redcliffe Str)	0.16	South-East	High
12	Open area	Mannington Recreation Ground	0.36	South	Low
13	Commercial	Aldi on Hughes Rd	0.39	South-East	Medium
14	Light Industry	Glenmore Business Park/ Westmead Industrial Estate	0.31	South-West	Low
15	Light Industry	Cheney Manor Industrial Estate	0.26	North-East	Low
16	School	St Mary's Catholic Primary School	0.96	North-East	High
17	Residential area	Rodbourne Residential Area (between Great Western Way, Cheney Manor Rd, Churchward Ave and Northern Rd)	0.53	North-East	High
18	Residential area	Central Swindon North Residential Area (between Great Western Way, Northern Rd,	1.04	North-East	High

		Churchward Ave and Pinehurst Rd)			
19	School	Swindon College & New College Swindon, North Star Campus	1.30	East	High
20	Light Industry	Hawkesworth Trading Estate	0.63	East	Low
21	Institution	BCS, The Chartered Institute for IT	1.27	South-East	Medium
22	Transport	Swindon Train Station	1.60	South-East	Medium
23	Transport	Swindon Bus Station	1.82	South-East	Medium
24	Light Industry	Rivermead Industrial area	0.41	West	Low
25	Residential area	Sparcells Residential Area (between Mead Way and the railway)	1.10	North-West	High
26	School	Nova Hreod Academy	1.05	North	High
27	Open area	Shaw Forest Park	0.67	North-West	Low
28	School	Moredon Primary & Nursery School	1.26	North	High
29	Residential area	Rodbourne Cheney Residential Area (between Akers Way, Purton Rd and Cheney Manor Rd)	0.97	North-East	High
30	School	Swindon Academy	1.72	North-East	High
31	School	Haydon Wick Primary School	2.00	North	High
32	School	Ferndale Community Primary School	1.28	East	High
33	School	Peatmoor Community Primary School	1.55	North-West	High
34	Residential area	Residential area between Mead Way and Brook Field Primary School	0.83	West	High
35	Residential area	Residential area around Peatmoor Community Primary School	1.37	North-West	High
36	Residential area	Residential area between Roughmoor Way/Swinley Dr, Old Shaw Ln, Washpool and Common Platt	1.59	West	High
37	Light Industry	Westerngate & Hillmead Industrial Estate	0.93	North-West	Low

38	School	Brook Field Primary School	1.33	West	High
39	Residential area	Residential area between Haydonleigh Dr, The St, Purton Rd and Westfield Way	1.56	North	High
40	Residential area	Residential area between The St/High St, Thames Ave and Moredon Rd	1.40	North	High
41	Residential area	Residential area West from Whitworth Road Cemetery up to Pen Cl/Stour Walk	1.85	North-East	High
42	Residential area	Residential area between Beech Ave, Cypress Gr, B4006 Rd and Pinehurst Rd	1.55	North-East	High
43	Residential area	Residential area between Beech Ave, Pinehurst Rd, Tovey Rd and River Ray	1.29	North-East	High
44	Recreation	Versatile Bootcamps Swindon (Skatepark/Football pitch)	1.24	East	High
45	Residential area	Residential area between Paddington Dr, Redcliffe St and Penzance Dr	0.94	South-East	High
46	Residential area	Residential area between B4289 Rd, Birch St and Dean St	1.27	South-East	High
47	Residential area	Residential area between A4289, Okus Rd and Redposts Dr	1.69	South-East	High
48	Residential area	Residential area between A4289, B4289/Farington Rd, Milton Rd/Commercial Rd and Victoria Rd	1.69	South-East	High
49	Residential area	Residential area between Church Pl/Briston St/London St, Station Rd, Milton Rd/Commercial Rd and Princess Rd/Corporation St	1.36	South-East	High
50	Residential area	Residential area between County Rd, Fleming Way, Corporation St, Station Rd	1.88	South-East	High

51	Residential area	Wastlea residential area	0.69	South-West	High
52	Residential area	Shaw residential area	0.66	South-West	High
53	Residential area	Toothill residential area	1.48	South-West	High
54	Residential area	Residential area between B4534, B4553, Pevensey Way/Freshbrook Way and Gainsborough Way	1.58	South-West	High
55	Residential area	Residential area between B4534, Tewkesbury Way, Garage Park Way and Hay Ln	1.60	South-West	High
56	Residential area	Middleleaze residential area	1.65	West	High

## 2.2 Off-site sources of odour

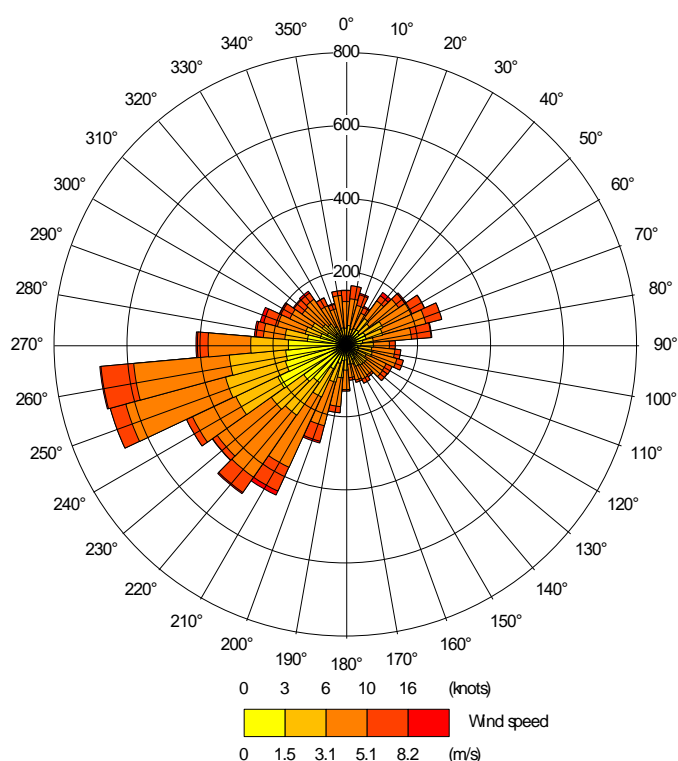
There are other waste management businesses in the area including to the Northeast of the sewage treatment works in Kendrick Trading Estate which borders the STW and Cheney Manor Industrial Estate which is to the north. These off-site industrial activities have the potential to generate odour.

Other potential contributors of odour in the area include the adjacent municipal waste site and odours from agriculture. This is not an exhaustive list.

## 2.3 Wind Rose and Weather Monitoring

Brize Norton meteorological station (approximate location NGR E 428928 N 205863) is located approximately 25.6 km northeast of the site and is considered the closest most representative meteorological monitoring station to the site. Data is recorded at the meteorological station in hourly measurements and the figure below presents the relationship between the frequency and speed of wind from compass point directions for the year 2019. The figure illustrates the predominant wind direction to be west-southwesterly, which means receptors east-northeast of the site would have the highest probability of experiencing potential increases in odour emissions.

**Figure 2.3: Wind rose – Brize Norton meteorological station 2019**



There is no on-site weather station at Swindon. 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.

### **2.4.1 Permitted activities plus description**

The Environmental Permit for the sludge treatment activities also covers the reception of imports to the head of the works and non-indigenous sludge waste imported by tanker. Figure 2.2C shows the area where the permitted activities take place.

### **2.4.2 UWWTD Activities**

Swindon STW serves a Population Equivalent of 221,000 increasing to 247,000 by 2026.

Flow is received at the works inlet from two Pumping Stations (Barnfield Road, Nine Elms), together with flow from storm water return and inlet works drainage.

Flows (up to 6 times dry weather flow (DWF) pass through screens; the screenings are washed and compacted for disposal into skips via a Megawasher unit and two standby Washpactor units.

Screened flows up to 3 times DWF pass through the Dorr/Oliver detritor for grit removal. Flows above this rate are diverted to the storm tanks until capacity becomes available.

Screened sewage then enters the Inlet Sewage Pumping Station Wet Well from which the flow is pumped to 12 Primary settlement tanks (PSTs) for primary treatment. Pre-precipitation dosing into PST distribution chamber be completed AMP6 under eight2O Swindon growth project.

### **Effluent Treatment**

Settled sewage from the PSTs flows to a 5 lane Activated Sludge Plant. In addition, ferric sulphate is dosed for phosphate removal. The activated sludge plant is followed by 11 final settlement tanks (FSTs). GAC plant has been decommissioned and disc filters to be refurbished under Capital delivery to cater growth in the catchment delivered AMP6.

### **2.4.3 Sludge Treatment Centre Permit Activities**

The STC treats both indigenous sludges and imported sludges. Indigenous sludge is generated from the incoming flow to the STW, which passes through the aerobic treatment process, under the UWWTD. Indigenous primary sludges derived from the main flow are thickened via Primary Sludge Thickening Plant and pumped to the Sludge Blending Tank. Indigenous SAS is pumped to a SAS Buffer Tank (UWWTD) before the sludge is thickened via SAS Thickening Plant and pumped to the Sludge Blending Tank. Thickening liquors are all returned to the Works Inlet for additional treatment via the site drainage and the Liquor Return Pumping Station 1. Thickened indigenous sludges are separately pumped to the Sludge Blending Tank, where the sludge is blended with imported sludges from other works.

Imports of sludge from other works are delivered to a Sludge Import Tank from tankers. Sludge imports are then pumped to the Sludge Blending Tank and mix with indigenous sludges. All such imports are subject to appropriate waste pre-acceptance and acceptance checks, prior to acceptance.

The STC comprises an offloading point for permitted imported tankered wastes at the works inlet of the sewage treatment works. The waste arrives at the STC via tanker and is discharged to the inlet, where it combines with other sewer derived materials and subject to aerobic treatment, under the UWWTD. All imports will be assessed using the Thames Water standard waste pre-acceptance checks to ensure that they are appropriate for treatment via the UWWTD. Once pre-approved as suitable for treatment via the UWWTD route, the waste carriers are approved. Wastes will be subject to appropriate waste

acceptance checks in accordance with Thames Water procedures. Incoming tanker vehicles are directed to the inlet offloading point, which is an impermeable surfaced area, equipped with sealed drainage.

The Head of Works import is located upstream of the rag and grit screens and storm offtake and discharged wastes are passed from tankers to the urban waste water treatment processes.

From the Sludge Blending Tank, mixed sludge is pumped to the Acid Phase Digester Tank. Sludge is pre-treated within the Acid Phase Digester Tank over an appropriate number of days with the addition of heat before the treated sludge is pumped to the Acid Phase Digestion Buffer Tank and further pumped to one of the Primary Digester Tanks at the site.

Following treatment over an appropriate number of days within the Primary Digester Tanks, digested sludge is transferred to one of the Secondary Digester Tanks. Sludge is held in the Secondary Digester Tanks for an appropriate retention time to ensure that the required level of pathogen kill is achieved in order to comply with the digested sludge cake output quality requirements. Sludge is then removed from the Secondary Digester Tank and subject to dewatering by Digested Sludge Dewatering Plant, before it is deposited on the adjacent cake pad. Digested sludge cake is stored on Cake Pad A prior to removal from the site, or transfer to one of the two other cake pads present at Swindon STC. Digested sludge cake is removed from the site under the Sludge Use in Agriculture Regulations (SUiAR)1989, and in accordance with the Biosolids Assurance Scheme (BAS). Dewatering liquors from dewatering the digested sludge is returned to the Works Inlet for additional treatment via the site drainage and the Liquor Return Pumping Station 2.

This OMP includes a waste activity for the import of treated sludge cake from other works, for temporary storage on the site cake pad, pending offsite recovery. All such imports will be subject to appropriate waste pre-acceptance and acceptance checks, prior to import, including checking whether the incoming cake complies with the requirements of SUiAR and BAS.

Imported treated sludge cake is offloaded onto an area of the cake pad so as to be stored separately from indigenous sludge cake. The waste stream is the same as that arising from the treatment of sludge within the Swindon STC with the same characteristics, composition and eventual end use - application to land. As such, the infrastructure which is acceptable for use for site cake is appropriate for the imported material.

Cake is stored on an impermeable cake pad, for the shortest time practicable, the duration depending on factors such as prevailing weather and availability of the landbank.

Biogas from the Acid Phase Digester Tank and from the Primary Digester Tanks is captured and transferred to the double membrane Biogas Storage holder. The biogas transfer pipeline is mostly above ground and 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, Acid Phase Digester Tank, Acid Phase Digestion Buffer Tank and Primary Digest Tanks are fitted with Pressure Release Valves (PRVs) as a safety precaution in the event of over pressurising the system.

The biogas is taken from the Biogas Storage holder for combustion in the CHP Engine, generating electricity for use both within the site and for export to the grid. Heat generated by the CHP Engine is used to maintain Primary Digester Tank temperatures via heat exchange, with two auxiliary Boilers available to provide additional heating as required. Boilers are dual fuelled by both biogas and natural gas.

In the event there is excess biogas, i.e. more than the CHP Engine or Boilers can utilise, or in the event that the CHP Engine or Boilers are unavailable, there is one ground mounted Emergency Flare. The Emergency Flare is utilised under 10% of the year or less than 876 hours per year.



### 3 Site Management Responsibilities and Procedures

#### 3.1 Site Roles

Figure 3.1 - Site Roles

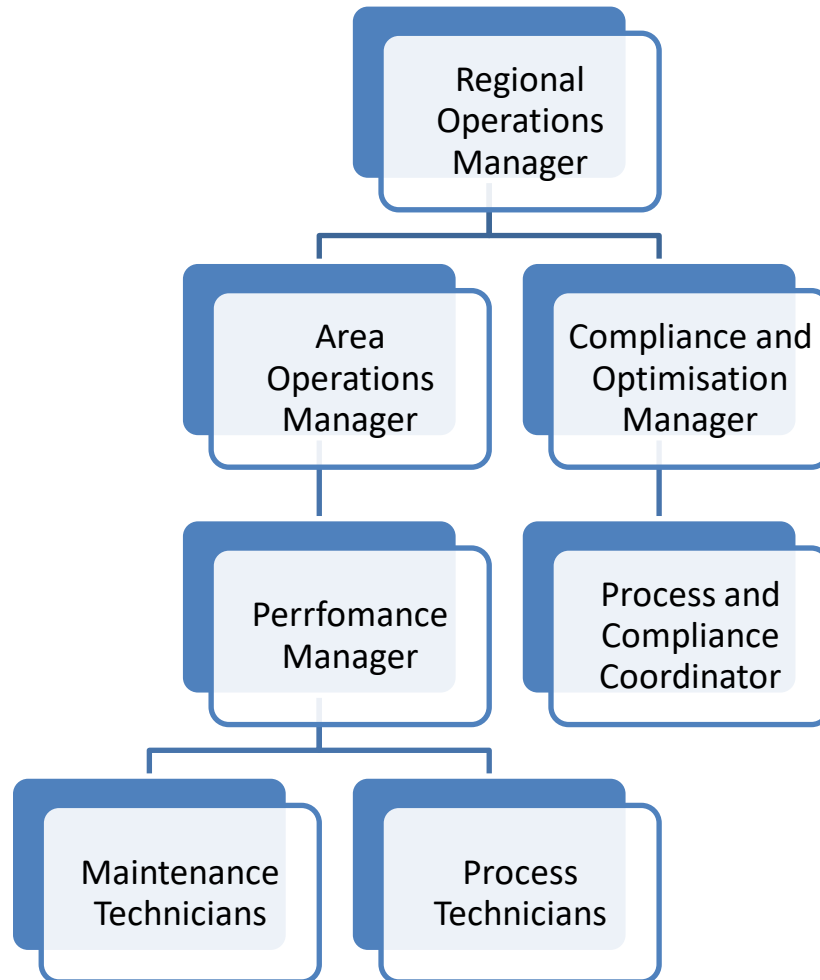


Table 3.1 - Tasks and Responsibilities

Role	Tasks and Responsibilities
Area Operations Manager	Responsible for the overall performance of the STW and catchments areas.

Role	Tasks and Responsibilities
Performance Manager	Responsible for overall performance of the STW and will be responsible for <ul style="list-style-type: none"> <li>• odour control and management at the site</li> <li>• day to day implementation of the OMP</li> <li>• dealing with customer complaints</li> <li>• assessing the scope of, and updating, the OMP as it is implemented.</li> <li>• day-to-day operation of the STW</li> <li>• Ensuring staff Thames Water undergo appropriate training</li> </ul>
Technically Competent Manager	Hold the required WAMITAB qualification to support the activities on site under EPR, ensuring permit conditions are complied with.
Technician 1/Operator/ Maintenance and Process Technicians	Day to day duties include maintaining and operating process equipment.
Process Compliance Coordinator	Reports to Process Optimisation Manager. Process monitoring, improvement, and troubleshooting.
Compliance and optimisation manager	Responsible for process investigations and technical assistance.
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.
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 during 07.30 – 15.30 Monday to Friday.

### 3.2 Key Contacts

Thames Water Website – [www.thameswater.co.uk](http://www.thameswater.co.uk)

Role	Name	Email address	Phone Number
Operations Area Manager	[REDACTED]	[REDACTED]	[REDACTED]
Performance Manager	[REDACTED]	[REDACTED]	[REDACTED]
Technically Competent Manager	[REDACTED]	[REDACTED]	[REDACTED]

Role	Name	Email address	Phone Number
Customer and Stakeholder Manager	[REDACTED]	[REDACTED]	[REDACTED]
Customer Centre		<a href="mailto:customer.feedback@thameswater.co.uk">customer.feedback@thameswater.co.uk</a>	0800 316 0800

\*Anticipated

### 3.3 Operator Training

All Technicians /operators have received training appropriate to their grade including Introduction to Sludge Processes which includes an element of training and assessment in the control of odour.

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.

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

Odour prevention and reduction is achieved at Swindon through at least an annual review, or sooner as mentioned in Section 1, of the Odour Risk Assessment, Odour Improvement Plan and Odour Management Plan. In combination with the maintenance and monitoring carried out on site mentioned in sections 4 and 5.

Through our Odour Management Plans and maintenance procedures, the primary focus is on effective process control to minimise the risk of off-site odour nuisance. Similarly, our site-based frontline Wastewater Treatment Operations team are focussed on effectively managing the on-site process.

### 4.1 Odour Sources, Critical Issues and History

Critical Odour Issues, Emergency Response and Mitigation Measures are summarised in Table 4.3-7.

#### Odour complaints

- 2019, 12 complaints and EHO complaints. Nine Elms no chemical dosing until Sept 19 as this site was being refurbished. Eight20 project delivered new OCU details below. Still have uncovered skips at inlet which are an issue. PST need to keep managing sludge levels as we have been doing recently.
- 2020, 6 complaints received, of these 3 were not substantiated and indeed 2 were from EA stating they were looking at odours for the area and not specifically the STW.
- 2021, 3 complaints received which were all odours from the area and not specifically the STW.
- 2022, 6 complaints were formally recorded which were believed to be related to Hayden End and Nine Elms Pumping stations low flows and high retention times.

### 4.2 Identification of Odour Critical Plant

#### 4.2.1 Odour Risk Assessment

The Odour Risk Assessment is not a 'one-off' exercise but an on-going process. The Odour Risk Assessment should be 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 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, are classified as Odour Critical Plant, 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 Swindon 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:

- General Odour
- Site Drainage
- Screens
- Grit Removal
- Storm tanks
- Scum Removal System
- RAS Chambers & Pumping
- Cess Reception, Discharge, Wash down & Drainage
- Skips
- Inlet Works – Hayden End SPS, Nine Elms SPS
- Inlet Pumping Station
- Primary Settlement Tanks
- Primary Raw Desludge Pumping chamber
- Activated sludge plant lanes
- Final settlement tanks
- Filtration
- OCU

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

- Sludge import tank
- Primary raw sludge thickening and pumping
- SAS thickening and pumping
- Digester feeding, mixing and discharge
- Secondary digestion
- Sludge Blending & Mixing
- Odour Control Units

- Cake Pads 1, 2 and 3
- Vehicle movement and wash down
- Klampress/temporary centrifuge
- Cess reception area
- Biogas storage
- CHP
- Boiler
- Waste gas burner
- OCUs

#### 4.2.3 Odour Critical Plant

The following list of odour critical plant has been identified during the risk assessment:

- OCUs
- Sludge import tank
- Primary raw sludge thickening and pumping
- Works inlet – nine elms and hayden end SPS
- Cess reception
- Skips
- Primary raw desludge

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

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

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.

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.

Tank Purpose	Number	Operational Volume (m <sup>3</sup> unless otherwise stated)	Material	Average retention time (where applicable)
Sludge Import Tank	1	315	Steel	2 days
Sludge Blending Tank	1	500	Steel	8 hours
Acid Phase Digester Tank	1	1,075	Steel	2 days
Acid Phase Digestion Buffer Tank	1	100	Steel	5 hours
Primary Digester Tanks	3	1,672	Steel	11 days
Secondary Digester Tanks	3	1,686	Steel	12 days

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

Odorous and potentially odorous material (any solid, liquid or gas)	Location of odorous materials on site	Maximum quantity on site at any given day	Maximum time held on site (hours or days)	EWC Codes	Type of emission	Odour potential High Risk / Medium Risk / Low Risk
Cake (including imports)	Cake Pad(s)	3,510 m <sup>3</sup>	30 days	19 06 06	Diffuse	Low
Biogas	see air emissions plan.	Digester roof storage	Continuous operation	N/A	Point Source	Low
Liquor	site wide drainage system	continuously pumped to head of works	continuously pumped to head of works	16 10 02	Diffuse	Low
Raw imported sludge	Sludge import tank	-	-	19 08 05	Point Source (see OCU entry)	Medium/High
Indigenous Sludge (primary /SAS)	Sludge Blending Tank	Refer to Table 4.0 Site Tank Inventory	Retention times for each stage of the process are detailed in Table 4.0	19 08 05	Point Source (see OCU entry)	Medium/High
Odour Control Unit	See section 5.1.2	See Section 5.1.2	NA	NA	Point Source	Low/medium

**Table 4.2 Odorous raw materials for Sludge Treatment Centre Permit**

Raw Material	Odorous	Storage	Mitigation	Odour Risk
--------------	---------	---------	------------	------------

1.Flopam.FO4698SSH 2.Flopam EM840TBD 3.Flopam EM640 LOB 4.Flopam FO4698XXR	Mild odour	1.3,000 kilograms stored within 4x 750 KG bulk bags 2.3,000 litres stored within 3x 1,000 litre IBCs on portable bunds. 3.3,000 litres stored within 3x 1,000 litre IBCs on portable bunds. 4.3,000 kilograms stored within 4x 750 KG bulk bags	1.store within a building 2.fully contained 3.fully contained 4. within a building	Low
FLOFOAM 681F	Mild odour	3,000 litres stored within 3x 1,000 litre IBCs on portable bunds.	Fully contained	Low
Morris GEO Ultra 40	Oil	2,400 litres. 1,200 litres of clean oil and 1,200 litres of dirty oil stored in two tanks within the CHP engine container.	Fully contained	Low
Texaco Delo XLC 40/60	Solvent	2,000 litres, stored within 2x 1,000 litre IBCs on portable bunds	Fully contained	Low

*Low odour raw materials are chosen for use, as far as practicable.*

### 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 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.

The routine operational tasks carried out at Swindon STW to specifically mitigate against generation of odour are listed in the above SOM.



#### **4.3.1 Site Specific 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 as 'Normal Mitigations'.

The routine operational tasks carried out at Swindon STW to specifically mitigate against generation of odour are listed in the above SOM. Specific odour control measures include an odour control unit. In addition, iron dosing is primarily used for phosphorus removal, however, has the added benefit of reducing odour from the PSTs and sludge processes.

**Table 4.3: Summary of routine odour mitigation tasks for assets under UWWTD**

Odour source	Odour and offensiveness L/M/H	Specific odour management tasks	Responsibility	Monitoring	Monitoring Frequency	Trigger for action	Remedial action and timescales
General		Ensure site is kept clean and tidy	Site Tech 1s Team Manager	Visual Inspection	Daily	Spillage identified	Clean up as soon as possible and no later than the end of the day
		Any spillages to be cleaned up as soon as practicable	Site Tech 1s	Visual Inspection	Daily	Spillage identified	Clean up as soon as possible and no later than the end of the day
		Site odour acceptability	Site Tech 1s	Qualitative assessment	Daily	Elevated odour on site identified.	Reports to Performance Manager at team huddle/SAP Plus entry where corrective action identified. For a spillage; immediate/asap resolution

Works inlet	H2S (L)	Dosing in place at Haydon End PS and Nine Elms Ps Works inlet covered with OCU	Site Tech 1	Visual inspection	Daily	Elevated odour on site identified.	Check odour control unit is operating correctly.  Check with Network Waste Pumping Teams that Chemical dosing is working correctly.  Check all covers are in place on covered inlet works.
Works inlet pumping station Linked tasks in appendix 5 section 2.2	Sewage (L)	Routine tankering to remove fat	Site Tech 1	Visual inspection	Daily	Elevated odour on site identified.	Engage tanker to remove fat and any surface debris
Cess Reception, Discharge, Wash down & Drainage Linked tasks in appendix 5 section 2.1	Sewage/septic (High)	Inlet covered, 1 odour control unit - biofilter and carbon filter (1 routine odours & 1 peak loading)	PM	Visual Inspection	Daily	Spillage identified	Clean up as soon as possible.

<p>Skips Linked tasks in appendix 5 section 2.3 and 2.4</p>	<p>highly loaded with organic matter (faecal matter odours) (High)</p>	<p>Skips changed regularly</p>	<p>PM</p>	<p>Visual Inspection</p>	<p>Daily</p>	<p>Elevated odour around rag skips</p>	<p>Ensure megawashers are functioning correctly and increase skip removals through the summer months to reduce odour and do not store any full skips on site.</p> <p>Also ensure Megawasher bypass skip is kept empty.</p> <p>Clearance of any screenings outside of skip is made throughout operational hours given generation of screenings is continuous (potential source of pests as well odour). Skip location will be adjusted slightly in any cases where capture is not sufficient</p>
---	--	--------------------------------	-----------	--------------------------	--------------	--	---

<p>Primary Raw Desludge Pumping chamber</p>	<p>Sludge (Low)</p>	<p>Covered and OCU</p>	<p>PM</p>	<p>Visual Inspection</p>	<p>Daily</p>	<p>OCU Failure and increased odour</p>	<p>Repair OCU as soon as possible.</p> <p>Carryout regular inspections of OCU and carry out remedial works.</p> <p>Check auto drains on ducts leading to OCU and drain and excess water.</p>
---	---------------------	------------------------	-----------	------------------------------	--------------	--	--

<p>Storm Tanks and Channels</p> <p>Linked tasks in appendix 5 section 2.6</p>	<p>Sewage/septic (Low)</p>	<p>The tanks and channels shall be kept empty and clean. Operations staff to regularly monitor incoming flow so that the storm tank contents can be returned to the works as soon as possible after the high flows have abated. Any residues left in the tanks will be assessed by site management for odour emission potential, considering the season and the number of tanks affected, and resources utilised as required to manually clear them.</p>	<p>Tech1 / Team Manager</p>	<p>Visual Inspection</p>	<p>At least daily following a storm event until all tanks are clear.</p>	<p>Elevated odour</p>	<p>Ensure scraper bridge is operational and scrapers have good contact with the base of the storm tank to ensure debris is cleared.</p> <p>Increase scaper times in the summer months to ensure tank is kept clean.</p>
<p>Storm Tank Inlet Channel</p> <p>Linked tasks in appendix 5 section 2.6</p>	<p>Sewage/septic (Low)</p>	<p>It is anticipated that with the arrangement whereby the tanks fill sequentially but the entire inlet channel is used throughout the storm event, sludge will build up in the storm tank inlet channel. Any residues left in the channels will be assessed by site management for odour emission potential, considering the season, and resources utilised as required to clear them. The channel should be inspected after it has been used and, in any case, cleared of any sludge within 1 week.</p>	<p>Process Controller / Team Manager / Tech 1</p>	<p>Visual Inspection</p>	<p>As required</p>	<p>Elevated odour</p>	<p>Inspect channel for debris and arrange contractor to periodically remove any grit or debris from the channels.</p>

<p>Grit Removal Equipment, Drainage &amp; Grit Skip Management Linked tasks in appendix 5 section 2.5</p>	<p>Septic (L)</p>	<p>General housekeeping and site rounds.</p>	<p>Site Tech 1</p>	<p>Visual inspection</p>	<p>Daily</p>	<p>Skips over two thirds full are always prioritised for emptying given potential for odour.</p>	<p>Removal of grit removal skips follows approach for screenings (although odour potential can be proportionally less). Proactive interventions are also made earlier in the process, such as removal of grit build up in the inlet channels; attention to blockages in the wash water system; rag removal from baffles/mechanical equipment are regular tasks completed weekly.</p>
<p>Fats, Oils and Grease Scum removal system</p>	<p>Fat (L)</p>	<p>Scum traps work adequately</p>	<p>Site Tech 1</p>	<p>Visual inspection</p>	<p>Daily</p>	<p>Spillage identified</p>	<p>Clean up as soon as possible and no later than the end of the day</p>



<p>Primary Settlement Tanks Linked tasks in appendix 5 section 3</p>	<p>Sewage (Low)</p>	<p>The PST distribution chamber is a raised unit with considerable turbulence. It is covered but there are inspection hatches in the cover. This can be a source of odour and it is important that these hatches are closed. Ideally the PSTs would be run with very low sludge blankets in the tanks. This is not always possible due to breakdowns in the sludge thickening and dewatering equipment further downstream. The primary sludge drum thickeners have been particularly unreliable. New drum thickeners have been installed. Blanket dips carried out, desludge to stop going septic. Ferric dosing on the front for p removal gives small odour benefit.</p>	<p>Tech 1</p>	<p>Visual</p>	<p>Daily</p>	<p>Elevated odour  Gas bubbles and scum on the surface of the PST's</p>	<p>Ensure all covers are closed on the distribution Chamber.  Carryout regular blanket dips and adjust desludging to reduce blanket levels  If scraper operation impaired remedial action is manually desludge the tank by the Tech 1 within 2 working days. Attention to scraper fail alarm will be addressed within 1 working day and if cannot be resolved a job raised on SAP for M/E to resolve in 1 working day. Tanks may require cleaning or emptying which may take up to 3 months to complete. Funding</p>
--	---------------------	--	---------------	---------------	--------------	---	--

							to support scaffolding and cleaning may be required.
Cess reception area Linked tasks in appendix 5 section 2.1	Septic sewage, sulphide (medium)	Discharged to inlet works through close coupled connector. Any spills cleaned at time. Delivery is via sealed tankers. Unusual odour levels noted on site log for action.  Discharge logged by tanker driver using swipe card. Records and accounts are managed by TW Commercial and checked by CoTC holder for the site. Quantity managed by TW Biorecycling to be within permit limits. 300-700m <sup>3</sup> /week normally Monday to Friday deliveries	TW Biorecycling team Tech 1 & Drivers	Visual inspection for spills by driver	Daily / Weekly	Spillages identified; tanker seen discharging in an inappropriate manner.	Stop operation and contact the responsible company. Clean up as soon as possible
Activated Sludge Plant lanes Linked tasks in appendix 5 section 4.1	Earthy (Low)	Checked for failure of mixers & scum build-up in the anoxic zone	Tech 1	Visual Inspection	Daily	Elevated odour and build up on solids on aerations anoxic zones	Check mixers are operational and lift any failed assets to check for blockages

Final settlement tanks Linked tasks in appendix 5 section 5	Low	Scrapers should be regularly checked and maintained to ensure they are working effectively, and any blockages cleared.	Tech 1	Visual Inspection	Daily	Elevated odour  Gas bubbles and scum on the surface of the FST's  Scraper not working properly	Check blanket dips on regular basis.  Repair failed scraper  Ensure scum traps are kept clean and clear  Drain and inspect scraper blades for wear and damage
RAS and SAS chambers and pumping Linked tasks in appendix 5 section 10	Low	Check condition of pumps	Tech 1	Visual Inspection	Daily	Asset failure or build-up of debris on the surface of the wet wells	Repair failed assets and undertake regular cleaning of wet wells
Tertiary treatment – disc filters followed by GAC Linked tasks in appendix 5 section 7.2	Low	Check condition of disc filters and complete quarterly cleaning on filter disc panels.  Check wash water pressure is adequate for cleaning panels.  Check backwash pumps are fully operational.  Check automatic feed valve operates on high level to prevent flooding the disc filter assets				Asset failure or build-up of debris on the surface of the wet wells  Cleaning of disc filter panels	Repair failed assets and undertake regular cleaning of wet wells  Complete quarterly cleaning with OEM

Odour control package (inlet) Linked tasks in appendix 5 section 9	Sewage (Low)	Monthly health checks carried out by specialist contractors. Daily site rounds carried out by ops.	Technical specialist Tech 1s	Monthly Daily	Inspection Visual inspection	Odour release from the OCU	Control OCU performance, identify reasons for odour release.  Check with waste pumping team to ensure chemical dosing is active at Nine Elms and Haydon End SPS.
---	--------------	---	---------------------------------	------------------	---------------------------------	----------------------------	--

**Table 4.4: Summary of routine odour mitigation tasks for assets under Sludge Treatment Centre Permit**

Odour source	Odour and offensiveness Low/Medium/High	Specific odour management tasks	Responsibility	Monitoring	Monitoring Frequency	Trigger for action	Remedial action and timescales
Primary Raw Sludge and SAS Thickening and pumping Linked tasks in appendix 5 section 8.4	Raw sludge (medium)	Drum thickeners in odour controlled building	Tech 1	Visual inspection	Daily	Elevated odour	Check odour control unit  Check sludge blankets on PST's, potential septic sludge

Sludge Blending & Mixing Linked tasks in appendix 6 section 3	Sludge (Low)	Kept covered	PM	Visual Inspection	Daily	Elevated odour	Check odour control unit and carryout any remedial works  Ensure paddle mixer is working
Cake Pad & Drainage Linked tasks in appendix 6 section 16 and 17 (including cake imports)	Digested Sludge (Medium)	Regular collection of cake for removal from site  Digested sludge cake removals are kept as frequent as possible to avoid sludge ageing on site.  Cake in storage forms a crust after a day or two reducing risk of odour. No additional turning or handling during cake storage. Subject to pre acceptance checks.	Tech 1	Visual Inspection	Daily	Elevated odour	Increase sludge collections through the summer months to reduce odours
Vehicle Movements & Wash Down Linked tasks in appendix 6 section 16 and 17	Digested sludge (Medium)	Keep movements to a minimum and cover wagons	Biorecycling Team	Visual Inspection	As required	Sludge debris on site roads	Monitor condition of vehicles as they exit site.  Carryout regular road sweeping activities

Raw Sludge Well	Sludge (Low)	Raw sludge well is connected to the OCU system on the Klampress building	Tech 1	Visual	Daily	<p>Spillages from raw sludge well, will run down site access road to SAS Building</p> <p>Increased odour</p>	<p>Wash Down as soon as possible</p> <p>Check OCU and ensure water traps are functioning correctly</p>
-----------------	--------------	--	--------	--------	-------	--	--

<p>Sludge import Linked tasks in appendix 6 section 1</p>	<p>Septic sludge, sulphides (Medium)</p>	<p>Discharged to the relevant covered holding tank through close coupled connector. Tank connected to Odour Scrubber. Discharge logged by tanker driver using swipe card. 250-1650m3 / week</p> <p>Imported sludge discharged to a covered sludge holding tank through close coupled connector.</p> <p>Delivery is via sealed tankers and on an impermeable hard standing with sealed joints and kerbs. Any leakages and spillages are washed into the site drainage</p>		<p>Visual</p>	<p>Weekly</p> <p>Daily</p>	<p>Odour release from the OCU</p> <p>Spillages from delivery vehicles</p>	<p>Check OCU performance, identify reasons for odour release and carryout remedial works.</p> <p>Monthly inspections completed by ERG</p> <p>Ensure all covers and ducts are intact and asset connections are secure.</p> <p>All spillages are down as soon as possible.</p>
---	--	--	--	---------------	----------------------------	---	--

<p>Primary digestion Linked tasks in appendix 6 section 6</p>	<p>Digested sludge (low)</p>	<p>Tanks covered</p>				<p>Elevated odour potential gas release  Foaming incident</p>	<p>Check primary digester gas pressures, temperatures, flows and heat exchanger system. Also check gas mixing system  Check sludge samples and send to laboratory for testing.  Check antifoam system is working with adequate stock of chemical.  Check batch feed volumes to each digester.</p>
---	------------------------------	----------------------	--	--	--	---	---



							<p>Check HACCP Compliance</p> <p>Clean up any spillages as soon as possible.</p>
<p>Secondary digestion Linked tasks in appendix 6 section 7</p>	<p>Digested sludge (low)</p>	<p>Open Tanks</p> <p>Supernatant returned to Return Liquor Pump Station</p> <p>High volumes on grit prevent the tanks from being emptied, third of the volume has been lost to grit</p>				<p>Increased odour</p>	<p>Check retentions times and ensure primary digesters are operating correctly with the correct retention time.</p> <p>Control supernatant returns to reduce load and odour</p>

<p>Klampress Linked tasks in appendix 6 section 12</p>	<p>Sludge (Low)</p>	<p>Sludge contained within the unit and connecting pipework Centrate is discharged to a liquor sump which is under extraction to odour scrubber. Spillages are washed to site drainage which returns to the head of the works. Liquids contained in centrifuge and pipework. OCU maintained.</p>	<p>Tech 1</p>	<p>Visual SCADA</p>	<p>Daily Continuous</p>	<p>Elevated odour</p>	<p>Check retention times on Primary and Secondary Digesters  Ensure sludge spills are cleared as soon as possible</p>
<p>Temporary centrifuge Linked tasks in appendix 6 section 13</p>	<p>Sludge (Low)</p>	<p>If the site suffers a failure of the Klampress or existing centrifuge then a hire unit may be installed on site but it would only process indigenous sludge since we are not allowed to process raw sludge.</p>				<p>Elevated odour</p>	<p>Check retention times on Primary and Secondary Digesters  Ensure sludge spills are cleared as soon as possible</p>

Biogas storage Linked tasks in appendix 6 section 8	Gas (low)	Check for leaks Service PRVs	Tech 1	Visual	Daily	Elevated odour  PRV's audibly venting to atmosphere	Check Gas Bag Volume  Check CHP and Waste Gas Burner are functioning correctly  Check GAS Slam Shut Valve on Gas Bag
CHP Linked tasks in appendix 6 section 9	Gas (low)	Maintenance by CHP team	CHP Team			CHP Failure  Poor Combustion and poor emissions	Repair CHP Engine and check emissions
Boiler	Gas (low)	Service as required	Tech 1	Visual	Daily	Process Boiler Failure  Poor Combustion and poor emissions	Repair Process Boilers and check emissions

Waste Gas Burner	Gas (low)	Check for leaks	Tech 1	Visual	Daily	Waste gas burner failed	Repair waste gas boiler
Odour control packages (OCU 6 and OCU 3) Linked tasks in appendix 5 section 9	H2S (low)	Monthly performance checks by specialist Framework agreed contractors. Daily site rounds	Contractors Tech 1	Inspection Visual inspection	Monthly Daily	Elevated odour	Confirm correct operation of OCU's and carry out any remedial works

**Table 4.5: Intermittent, abnormal, and emergency events for assets under UWWTD**

Process stage	Event	Status	Ops mitigation	Expansion of TWUL operational response	Odour risk after mitigation
Site Drainage	temporary drum thickener liquors	Constant	Visual inspection on rounds, keep clear. Containment by covers.	Ensure drainage is free flowing and carry out camera surveys as required	M
OCU1 (inlet channel to screens)	OCU failure	Ab	Odour sprays	Service OCU's on a regular basis and hire temporary odours sparys from LMC in th event of failure	H
Incoming Sewers & Reception Wet Well	discharge of sludge liquors	Int	inlet covered, 2 odour control units (1 routine odours & 1 peak loading)	Ensure all access hatches are secure but	M

Version 7.3

				return liquor pumping stations could be dosed with Ferric Sulphate to control H2S Levels	
Haydon End SPS	Dosing issues at SPS	Ab	dosing nutriox at SPS.	Gain data from YARA from H2S sensor in the main inlet channel.  Liaise with Network Pumping Team to ensure dosing is operational and at the correct level	H
Nine Elms SPS	Dosing issues at SPS	Ab	dosing nutriox at SPS.	Gain data from YARA from H2S sensor in the main inlet channel.  Liaise with Network Pumping Team to ensure dosing is operational	H

				and at the correct level	
Inlet Pumping Station	Clearing out fat build-ups	Int	Carry out clean, every two months	Book tankers via LMC to clean wet wells monthly	L
Cess Reception, Discharge, Wash down & Drainage	Spillages	Ab	Clean up any spills as soon as possible	Monitor cess reception area and ensure tankers report failures and spillages immediately and clear any spillages as soon as possible	H
Storm Tanks	Unable to clean tank thoroughly, scraper not working	Ab	Recirculate during draining to flush solids away	Check storm tank after each operation and ensure it is clean and clear.  Tank can be washed down by Tech1's if the bridge or scrapers fail to reduce build of sludge.	M
Storm Tanks	Prolonged weather holding storm flows in storm tanks	Int	continue to treat FFT	Monitor flow to treatment	M

				constantly and enable storm return pumps to operate to prevent return settled sludge.	
Grit Removal Equipment, Drainage & Grit Skip Management	Clean out of detritor	Int	Return to service ASAP	Monitor performance of grit removal system and carryout remedial works as required utilising the bypass channel until repairs can be completed	M
Primary Settlement Tanks	Sludge builds up within tanks	Ab	Keep drum thickeners and klampresses running to maintain sludge throughput	Monitor blanket levels 3 x per week and check the surface of the tanks for gas bubbles and ensure scum traps are working correctly	H
Activated sludge lanes	Mixers out for refurb	Planned	Check mixers and aeration patterns across all aeration lanes and listen for any air leaks and carryout any remedial works.  Check calibration of all DO Probes	Listen for any audible air leaks.  Check mixers and lift any	L

				failed assets and check for blockages	
Final Settlement Tanks	Wash down tank prior to maintenance, return to service ASAP to reduce load on other units	Int	Wash down tank prior to maintenance, return to service ASAP to reduce load on other units	Inspect scum traps  Check blanket levels 3 x per week	M
SAS chambers and pumping	SAS storage tank gone septic	Ab	Process sludge and replace with fresh sludge to remove odour	Ensure one SAS belt remains in service and this will prevent any septicity within the SAS Tank.	L

**Table 4.6: Intermittent, abnormal, and emergency events for assets under Sludge Treatment Centre Permit**

Process stage	Event	Status	Ops mitigation	Expansion of TWUL operational response	Odour risk after mitigation
OCU3 (klampress building)	OCU failure	Ab	Odour sprays	Hire odour sprays from LMC and set up 2 x units around the general area.	H
OCU 6 (drum thickeners, sludge storage tanks)	OCU failure	Ab	Repair unit asap	Hire odour sprays from LMC and set up 2 x units	H



				around the general area.	
Cess Reception, Discharge, Wash down & Drainage	Spillages	Ab	Clean up any spills as soon as possible	Monitor cess reception and ensure drainage is operational. Also check condition of impermeable surfaces and kerbing.  Complete audit checklist	H
Sludge import	Spillages	Ab	Clean up any spills as soon as possible	Monitor condition of import area and ensure spillages are washed down as soon as possible.  Also check condition of impermeable surfaces and kerbing.  Complete audit checklist	M/H
Digestion and feeding	Failure of tanks/process	Ab	Ensure tanks are inspected on 10 yearly basis and carry out remedial works following inspections	Follow 10 yearly inspection program and	L

				<p>deliver remedial works following inspections.</p> <p>Ensure gas and sludge valves are all tested on a regular basis</p>	
Secondary digestion	Failure of tanks/process	Ab	<p>Ensure tanks are inspected on 10 yearly basis and carry out remedial works following inspections</p>	<p>Carry out works to regularly clean and empty secondary digesters</p> <p>Undertake routine inspections of the exterior of the tank</p>	M
Beltpresses	Breakdown of plant/out for service	Ab	<p>Carry out daily inspections as per Ops round for sludge stream and defect Klampress faults to Brettex and carry out routine maintenance under Ops round and PPM Tasks</p> <p>Maintenance contract is in place with Brettex</p>	<p>Defect faults to Brettex to carry out planned and reactive works.</p> <p>Site has a temporary Centrifuge until Klampresses get replaced</p>	M
Sludge dewatering	Use of temporary centrifuge.	Int	<p>Planned replacement Klampress. If required odour spray</p>	<p>GEA centrifuge is not under any service contract,</p>	M

				so all failures need to be investigated by Ops and M&E Teams before we engage GEA.	
Cake Pad and drainage (including imports)	Unable to move cake	Ab	Inspect cake pads on a regular basis and ensure emergency storage pads are available to stockpile sludge cake	Monitor condition of emergency storage pads and ensure they are available for use. Check drainage is functioning correctly.	M
Biogas storage	Biogas released from PRV	Ab	Carry out daily inspections as per Ops round for sludge stream.  Undertake PRV Servicing on an annual basis	Check primary digester gas pressures, temperatures, flows and heat exchanger system. Also check gas mixing system  Check sludge samples and send to laboratory for testing.  Check antifoam system is working with adequate stock of chemical.	M

			<p>Check batch feed volumes to each digester.</p> <p>Check HACCP Compliance</p> <p>Clean up any spillages as soon as possible.</p>
--	--	--	--

**Table 4.7: General Intermittent, abnormal, and emergency events**

Incidents and emergencies	Event,	Status	Ops mitigation	Odour risk after mitigation
Fire	Failure of fans or sludge building	E	Use of SHTs for storage of sludge. Tanker from site Bypass inlet works using storm tank to interstage pump station – No Odour Control  Divert un-thickened sludge to blending tank – PST Blanket levels rise adding to odour release, additional tankering may be required from RAW Sludge Tank.  GBT Failure – Hire temporary assets – Potential for additional loading on existing odour control unit from septic sludge in the SAS Tank – Tanker if required	Low/Medium
	Inlet Works – Screen and Odour Control			Low/Medium
	Raw Sludge – Drum Thickener Building			Low/Medium
	SAS Building – Gravity Belt Thickeners			Low/Medium
	Klampress Building			Low/Medium

Incidents and emergencies	Event,	Status	Ops mitigation	Odour risk after mitigation
	<p>CHP Building</p> <p>Control panel failures on odour control assets</p>		<p>Klampsess / centrifuge failure – Hire temporary assets – No additional odour</p> <p>Use of SHTs for storage of sludge. Tanker from site</p> <p>Unable to process sludge through the whole site, so additional odours throughout the process. Hire temporary pumping and generation assets to support installed equipment.</p> <p>Hire temporary starters until panels can be replaced</p>	<p>Low/Medium</p> <p>Low/Medium</p>
Severe weather	Transport of sludge from site inhibited resulting in back up of sludge in site resulting in additional odour release from tanks and PSTs	E	Event unlikely plus additional storage in the existing sludge holding tanks	Low
Flooding	Flooding causing process or equipment problems	E	Not an identified problem at Swindon. 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.	Low
Other incidents	Transport of sludge to land inhibited for other reasons leading to back up of sludge in site resulting in additional odour release from tanks and PSTs	E	Transport to other STWs if necessary	Low

### 4.3.2 Odour Control Units

There are three odour control units:

#### UWWTD

- OCU1 (New 2015) - A calcified seaweed biofilter which serves the inlet channel to the screens. 3 activated carbon filters for peak loading.

#### STC Permit

- OCU3 (A13) - A lava rock biofilter serving the digested sludge Klampress building and raw sludge sump (UWWTD), this unit has been refurbished under Eight20 growth project AMP6.
- OCU6 (A12) Under eight20 Swindon growth project new OCU, has been delivered to cover primary drum thickener building, imported sludge tank, primary sludge buffer tank, drum thickener waste chamber, import sludge screens, existing sludge blending tank, provision for new blending tank connection and import sludge pumping station. This consists of a biofilter and 2 No duty carbon filters.

There are also three OCUs which are decommissioned:

- OCU2 removed end of AMP6, Drum thickeners.
- OCU4 removed end of AMP6, SAS thickening building.
- OCU5 removed, end of AMP6, SAS holding tank, sludge blending tank and import screens.

### 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.

Spill response guidance is also available in the Pollution Prevention Essential Standard at [Environmental Management System - Pollution Prevention \(sharepoint.com\)](#).

## 4.4 Routine Monitoring

### 4.4.1 Performance Checks and Testing

Overall plant performance is assessed daily as part of the generic Site and Sludge Rounds, which apply to Thames Water large STW sites, and have been included in appendices 5 and 6, respectively. The objective of these is 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 Swindon 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 for THP AD.
- 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. Swindon fits into the third row of the table.
- Dry solids feed: see table above, Swindon 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.

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

### **Sniff Testing**

Sniff testing has been incorporated into our Odour Improvement Plan (Appendix 2). This is to allow time to ensure that the most effective sniff testing can be carried out using personnel not sensitised to smells on site.

The procedure will be undertaken in response to complaints or if a risk of odour nuisance at sensitive receptors is expected and/or has been substantiated.

- Sniff testing will normally be carried out at by someone not routinely based at site, who are less sensitised to odour produced on site.
- Assessing potential odour sources within the Urban Waste Water Treatment (UWWT) and Sludge Treatment Centre (STC) processes and attempt to trace the odour to its source.
- The procedure and recording form which will be used can be found in appendix 7 of the OMP.

Site operatives' complete daily walkovers of site which includes assessing 'If site odour level is acceptable'. This is captured and recorded in the e-log book to ensure steady state monitoring.

## **4.5 Record Keeping**

Records of routine monitoring, inspections and sludge blanket checks are kept in the E-logbook. Records of skip management, which collect wastes generated from UWWTD activities, and any spillages and remedial actions are held in the site diary. Sludge blanket levels are recorded on run charts 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.

The SOM states that skip management records are kept in the site E-logbook, as are records of any exceptions with screenings and grit removal plant. Primary Settlement Tanks sludge blanket levels are recorded electronically on the Cockpit and on Run Charts.

Operation and maintenance manuals together with records of maintenance reports for the odour control assets are kept within the Swindon STW E-logbook.

Odour control units are part of the Operations maintenance plans with pH results being tested. An annual review of the Ops & Maintenance plans will take place with the review of the Odour Management Plan.

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

Emergencies such as fire, flood, and severe weather are managed by Thames Water's Business Resilience and Security Team. The processes employed can be found on Thames Water's EMS SharePoint and are entitled: 'Security and Emergency Risk Management Process' and 'Event Management Procedure'. These are company confidential documents and therefore, are 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, the site will run on island mode for critical plant. However, as this doesn't include the odour control units there is a potential temporary risk of odour until power is restored.

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

Odour mitigation for emergency events have been detailed in Tables 4.5 - 4.7. The purpose of Tables 4.3 - 4.7 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.

Our Operations Team and odour contractor have recommended consideration of the following techniques either proactively (so accompanying planned or reactive works with known odour risk) and in an investigative capacity attached to an incident:

- (a) Targeted use of 'Jerome' hydrogen sulphide analysers
- (b) Targeted use of sniff tests ('calibrated nose')
- (c) H<sub>2</sub>S measurements of stored materials where septicity is either present, or the material is at risk of septicity from continued storage especially in the open air, for example, prior to de-watering where measurements of sulphide & dissolved O<sub>2</sub> would inform a condition assessment. Quantities and storage times precipitating a need for such assessments. This recommendation is being raised with the Area Process Scientist.
- (d) Inclusion of temporary odour suppressants/misting agents and continued access to process critical spares (odour minimisation by early intervention).
- (e) Further expansion of odour risk within site incident planning
- (f) Temperature assessment in secondary digester tanks on the basis that increased temperatures give greater potential for volatilisation of odours
- (g) For PSTs, asset condition (wear/damage) would consider odour risks where assets are taken offline
- (h) Telemetry/alarming of whessoe valve releases – there is an existing phased project within TWUL to enhance this at our sludge locations.

## 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 Odour Critical Plant 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 OCU Selection and performance validation

#### OCU 1 (UWWTD)

Serves the inlet works

For periodic monitoring:

- Inlet and outlet Hydrogen Sulphide concentrations recorded and assessed for removal efficiency and below maximum designed inlet loading during monthly inspections. Following the monthly inspections, hydrogen sulphide concentrations are trended by ERG which would enable identification of a decrease in H<sub>2</sub>S removal. Should this occur, ERG would include this in the recommendation section of their inspection report, for example media replacement.
- System integrity checked during daily site rounds and monthly inspections to confirm extraction points and routes undamaged.

#### OCU 3 (A13)

Serves the digested sludge Klampress building and raw sludge sump (UWWTD)

Single stage biofilter

Design airflow rate	1650 Am <sup>3</sup> /hr
Design irrigation rate	4.4 m <sup>3</sup> /hr
Design H <sub>2</sub> S inlet load	5 ppm (average) 20 ppm (Max)
Design inlet temperature	20C
Design removal efficiency	99%
Duty/standby fan	Present
Media type	LavaRok

*Nominal design criteria back calculated by ERG*

For periodic monitoring:

- Inlet and outlet Hydrogen Sulphide concentrations recorded and assessed for removal efficiency and below maximum designed inlet loading during monthly inspections. Following the monthly inspections, hydrogen sulphide concentrations are trended by ERG which would enable identification of a decrease in H<sub>2</sub>S removal. Should this occur, ERG would include this in the recommendation section of their inspection report, for example media replacement.
- System integrity checked during daily site rounds and monthly inspections to confirm extraction points and routes undamaged.

#### OCU 6 (A12)

Installed in 2019 serves the primary drum thickener building, imported sludge tank, primary sludge buffer tank, drum thickener waste chamber, import sludge screens, existing sludge blending tank.

Biofilter

Design airflow rate	3088 Am <sup>3</sup> /hr
---------------------	--------------------------

Design irrigation rate	1.79 m3/hr
Design H2S inlet load	105 ppm (average)
Design inlet temperature	Up to 40C
Design removal efficiency	98%
Duty/standby fan	Present
Media type	LavaRok

#### Carbon Filter

Design airflow rate	3088 Am3/hr
Design H2S inlet load	3 ppm (average) 10 ppm (Max)
Design inlet temperature	Up to 40C
Design removal efficiency	99%
Duty/standby fan	Present

*Nominal design criteria back calculated by ERG*

For continuous operational monitoring, system incorporates:

- Visibility of fans on SCADA, with alarms, for loss of extraction from odorous sources
- Continuous discharge H2S monitoring capability and alarms
- Mains power alarm
- Final effluent flow alarm for status of irrigation

For periodic monitoring:

- Inlet and outlet Hydrogen Sulphide concentrations recorded and assessed for removal efficiency and below maximum designed inlet loading during monthly inspections. Following the monthly inspections, hydrogen sulphide concentrations are trended by ERG which would enable identification of a decrease in H2S removal. Should this occur, ERG would include this in the recommendation section of their inspection report, for example media replacement.
- System integrity checked during daily site rounds and monthly inspections to confirm extraction points and routes undamaged.

Evidence of the systems continuing ability to treat the input flow are confirmed by monthly inlet and outlet odorous gas (hydrogen sulphide) concentrations. Examples of such reductions are given in 5.1.3 iii) of the OMP

#### **5.1.3 Maintenance 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 a contractor. Refer to the Odour Control Unit Asset Standard and Site Operating Manual for more information.

Parameter	Monitoring Method	Action if red flag identified and Expected timescales	Frequency	Biofilter	Carbon	Chemical scrubber
<b>Performance monitoring</b>						
Gas inlet temperature (5-40C)	Temperature probe	Investigate any anomalies relating to temperature, such as individual process checks	Monthly	X	X	X
Gas outlet temperature (5-40C)	Temperature probe	Investigate any anomalies relating to temperature, such as individual process checks				
Gas inlet flow rate or velocity (6m/sec)	Calibrated velocity meter	Investigate any anomalies relating to flow rates; velocities and pressure drop across the system by measuring the inlet and outlet pressure.  Check fan functionality; presence of obstructions; bring forward contractor service. If fan replacement needed c. 2* months minimum typical duration depending on severity of issue/condition of back up fan (*time of order to mobilisation; assumes second duty fan runs; timescale includes time to install replacement and fabrication).  If solely an electrical issue, recourse to TWUL ICA Technician mostly likely within a week. Other root causes are usually blocked media; duct and failure of non-return dampers around fan sets.	Monthly	X	X	X
Gas outlet flow rate or velocity (6m/sec)	Calibrated velocity meter					
Gas inlet humidity (Post biofilter humidification > 90% Carbon units <70%)	Hygrometer	Check any preheaters fitted to system before carbon, or check irrigation is working on biofilter.	Monthly	X	X	-
Back pressure (to assess media thatching or media compaction) Typically systems work around 0.5 kPA	Calibrated digital pressure meters	Values above threshold would be 'RAG' banded in the OCU contractor inspection reports. If pressure gauges are over-pressurised to the extent fouling is or has occurred to be treated as high priority. Check for blockages, poor FFE quality/check if media is of a type susceptible to biodegradation.	Monthly	X	X	X
pH of discharge irrigation water (2-3pH)	pH paper	Less than 2 increase irrigation.	Monthly	X	-	-

pH of scrubber liquor (9.2 pH)	Calibrated pH probe (calibrated with standard solutions)	Recalibrate pH probe and check dosing and chemical availability	Continuous	-	-	X
Redox potential of scrubber liquor (700-730 mV)	Calibrated redox probe (calibrated with standard solutions)	Recalibrate redox probe and check dosing and chemical availability	Continuous	-	-	X
Gas inlet/outlet concentrations for hydrogen sulphide (50ppb used for media change out)	Drager Tubes/CEN TS 13649 for sampling NIOSH 6013 for analysis OR US EPA M11*	Check functionality of odour control unit. If repair or replacement media required raise a job on SAP or APS risk and arrange for contractor repair. Timescale Bespoke to root cause/see later entries. Arrange re-test post remedial work. Major repairs up to 6 months depending on complexity	Monthly/ 6 monthly	X	X	X
Gas inlet/outlet concentrations for ammonia (20mg/m3)	EN ISO 21877 OR CEN TS 1369 for sampling NIOSH 6016 for analysis*	Check functionality of odour control unit. If repair or replacement media required raise a job on SAP or APS risk and arrange for contractor repair. Timescale Bespoke to root cause/see later entries. Arrange re-test post remedial work. Major repairs up to 6 months depending on complexity	6 monthly	X	X	X
Gas inlet/outlet concentrations VOCs and RSH	RSH – Drager tubes VOC – PID as isobutylene		Quarterly	x	x	x
<b>Maintenance checks and inspections</b>						
Check integrity of tank covers for damage and ensure access hatches are closed		Close hatches ASAP	Daily	X	X	X
Check building & door integrity for damage or leakage; doors closed (if required)		Closed doors ASAP	Daily	X	X	X
Check damper positions on ductwork are in the correct positions		Correct positioning	Daily	X	X	X
Check irrigation and humidification systems are functioning		Turn on systems or investigate malfunction.	Daily	X	-	-
Check for free discharge of effluent from drain		Investigate blockage	Daily	X	-	-

Check irrigation water supply is working at required rate
Check condensate removal points for free flow of liquid
Check OCU condition for signs of damage or leaks
Check general ductwork for signs of damage or leaks
Check spray pattern from irrigation nozzles and clean nozzles as required
Check flexi joints between fans and ductwork for leaks
Check fans for excessive vibration or noise, belt tension and bearing temperature
Check irrigation water pH
Check irrigation pumps condition and operation
Check chemical reagent levels and supply

Visual check on flow gauge, investigate if required.	Monthly <sup>1</sup>	X	-	-
Visual check	Daily/Monthly <sup>1</sup>	X	X	X
Call specialist contractor if identified	Daily / Monthly <sup>1</sup>	X	X	X
Condition of ductwork would be 'RAG' banded in the OCU contractor inspection reports. If broken, then odours not being conveyed to OCU and can be indicated by low inlet load. Worst case the ductwork is disconnected ('sucking air') such that odour removal is not taking place.	Daily / Monthly <sup>1</sup>	X	X	X
Adjust spray pattern, clean the strainer and unblock nozzles or replace as deemed necessary. Timescale durations of c. 2 weeks where just irrigation required.	Daily / Monthly <sup>1</sup>	X	-	X
Contractor inspection reports 'RAG' band these issues with a level of detail to then inform the maintenance response. Timescale durations of 1 to 2 months typical depending on complexity (time of order to mobilisation)	Monthly	X	X	X
Contractor inspection reports 'RAG' band these issues with a level of detail to then inform the maintenance response. Timescale durations of 1 to 2 months typical depending on complexity (time of order to mobilisation)	Monthly	X	X	X
Contractor inspection reports 'RAG' band these issues with a level of detail to then inform the maintenance response. Timescale durations of 1 to 2 months typical depending on complexity (time of order to mobilisation)	Monthly	X	-	-
Contractor inspection reports 'RAG' band these issues with a level of detail to then inform the maintenance response. Timescale durations of 1 to 2 months typical depending on complexity (time of order to mobilisation)	Monthly	X	-	
Order when required. Ensure no low-level alarms.	Weekly	-	-	X

Check chemical dosing and blow down pump condition and operation
Check blow down rate is within correct range
Check ph and Redox probes are working and in calibration
Check recirculating liquor strainer and replace if necessary
Check water softener is working correctly (if installed)
Check dampers are operational and in good condition
Inspect electrical control panel and check for faults and alarms
Simulate duty / standby fan and pump changeover
Check H <sub>2</sub> S meter is functioning and calibrated (if installed)

If outside pH levels, investigate. Initiates blow down to correct level.	Daily/Monthly	-	-	X
If outside pH levels, investigate. Initiates blow down to correct level.	Monthly	-	-	X
Contractor inspection reports 'RAG' band these issues with a level of detail to then inform the maintenance response. Timescale durations of 1 to 2 months typical depending on complexity (time of order to mobilisation)	Monthly	-	-	X
Flows recorded on SCADA	Monthly	-	-	X
Water hardener test papers used to check water quality.	Monthly	-	-	X
Swap over duty fan to stand by fan and record flow volumes to identify issue.	Monthly	X	X	X
Visual inspection by monthly contractor and investigation any alarm conditions.	Monthly	X	X	X
Contractor inspection reports 'RAG' band these issues with a level of detail to then inform the maintenance response. Timescale durations of 1 to 2 months typical depending on complexity (time of order to mobilisation)	Monthly	X	X	X
Check calibration is still in date during monthly contractor inspection.	Monthly	X	X	X

\*Only required on OCUs covered by STC permit

Condition of the media in the OCU is monitored by performance checks and by additional testing as required.

The OCUs at Swindon STW are covered by a service and maintenance contract with a specialist Contractor. They are inspected on a monthly basis and reports are sent to site management. 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.



The OCUs are specifically designed to minimise the release of odour, bioaerosols and microorganisms.

**Optimum flow rates; trigger levels; odorous components/concentrations in the gas stream and associated physical properties are all important to OCU function and are described below:**

**(i) Optimum flow rate through the system to allow for effective treatment.**

A '**Maximum velocity in duct work**'; rather than volume; is the key design aspect informing effective treatment for new/existing OCUs. Not exceeding 10m/second in a piece of ductwork will avoid noise break out; the industry benchmark for new plant being 8m/second. Given velocity is directly related to the volume; the specification is +/- 20% to reflect instrumentation variation; and therefore all OCUs are checked to see **if they can meet 6m/second** with escalation in monthly contractor inspection reports where this value is not reached. This is a good indicator of functionality, appropriate sizing, and system health.

**ii) The trigger levels/ranges for action if processes monitoring parameters are breached/ outside optimal parameters.**

All OCUs, irrespective of media type, *will stipulate a minimum of 30 seconds retention time*, for a biofilter to achieve a minimum of 95%, removal efficiency. A minimum of 2-3 seconds retention time for a carbon filter is stipulated.

H2S readings are reported in the monthly service reports which inform odour equivalents (OEs). The accepted OEs for H2S at 0.5 part per million is equivalent to 1,000 odour units. A "red action" would be raised for any value 3 parts per million or greater on the discharge from the biofilter (before the carbon filter) and 0.5 parts per million off the subsequent carbon filter. There is a relationship between increases in discharge efficiency from the biofilter since if this rises it will start to exhaust the carbon filter defining the red action. Contextual knowledge must inform any triggers for action; rather than focusing on a single value. Where there is a single stage biofilter a 'red action' would be raised at 0.5ppm regardless of removal efficiency.

Trigger levels are more difficult to identify for other parameters, such as mercaptans and ammonia since the design assumptions for OCUs are informed by H2S removal. Removal for these parameters is therefore limited. For Total VOCs, *in respect to methane rather than small chain VOCs*, there is no removal.

From a qualitative value, from visual inspections, 'red flags;' would include if irrigation pipework to the biofilter is broken (no water entry to media); neither extraction fan running; broken ductwork leading to the OCU sucking in atmospheric air.

On identification of such red flags, such that the effective function of the OCU is at risk of being compromised, the following actions would be taken:

- (i) For significant issues relating to any aspect of 'condition monitoring' - including effective function of the biofilters - impacting upon parameter reductions at the inlet/out; differential pressures or irrigation volumes – the Performance Manager would urgently contact Head of Maintenance at ERG to book in reactive maintenance attention. Timescales would be of highest priority but response times/duration dependent on the issue identified
- (ii) For issues relating to housekeeping (leaks) or issues relating to OCU power supply (electrics) – for example, impacting either fan operation - these would be referred to a TWUL Electrician for assessment and either rectified by the area operational team or escalated to an external contractor where repairs are more complex. Timescale for expectation of resolution would typically be within 24 hours.

For either (i) and (ii) if any significant pollution risk (odour) was identified the Performance Manager would contact TWUL's incident help desk. A supporting risk would be recorded in APS (risk assessment software) to support funding where a need for remedial works was identified.

### iii) Odorous components in the gas stream and concentrations of emissions

The monthly contractor inspections of each OCU provide data for H<sub>2</sub>S; VOC; Mercaptans (R<sub>SH</sub>). The sampling methodology being Drager (gas analysis) tube for c. 30 seconds to 2 minutes duration.

To achieve an appropriate level of surveillance on OCU performance, outside of the contractor monthly inspections, there is additional oversight from the Operations Management Team through:

- Visibility using local SCADA control panels for OCU 6, which records fan status
- Daily site rounds by Thames Water technicians. These are Psion based checks using SAP Plus for escalations including, for example, internal MANDAT tickets or identifying a need for contractor support. The tasks in the daily checks mirror the numbered tasks in the contractor 'Monthly Health Checks'. See Figure 5.1 and section 9 in Appendix 5 in the OMP. There is connectivity between the site rounds and SCADA, for example, if excessive noise is recorded this could relate to an operational fault in OCU, and in turn, is visualised on the local SCADA screens.

### iv) Physical properties of the air stream at point of control i.e., humidity, optimum temp, pH for effective odour control

For **humidity**, *the gas is humidified before being received by the biofilter*, so this parameter has less relevance. Biofilter post humidification should achieve a level of >90%. Carbon units should be set at <70%.

For **temperature**, this is fairly constant throughout the year as this is informed by the need to achieve fairly constant temperatures in the digestion process. A range of 20 to 40°C being standard.

**pH** will be slightly variable depending on the H<sub>2</sub>S that is there from the condensing air stream contributing to SO<sub>2</sub> formation. This tends not to be an issue at the biofilter itself since the active component of the biofilter will in itself produce SO<sub>2</sub> as a waste product from converting the H<sub>2</sub>S.

**pH** off a bio-scrubber is checked on the quarterly inspections since it might suggest an issue with the active component of the biofilter being impacted by the accumulation of its waste product thereby making the lower part of the bed inactive. A pH of 2 to 3 would be expected as a theoretical upper limit to liquor discharged from the biofilter but recorded values are significantly less; pH 4 to 5 being typical (reflecting the logarithmic scale). Note if efficiency of the process is being impacted; pH would also be part of the investigative checks (i.e., more than quarterly).

### Table 5.1 Monthly 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.	

## 5.1.4 Records

Maintenance history records are kept in the company's asset register on SAP.

## 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.

### **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 Swindon STW will be made via the Customer Centre, logged, and passed (directly, or via the OMC) to local Operations (Performance Manager and Customer & Stakeholder Manager) via e-mail. Operations will investigate and take appropriate action.

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

Following investigations, the customer is updated accordingly.

Thames Water Website – [www.thameswater.co.uk](http://www.thameswater.co.uk). The form is called “Report A Problem”.

customer.feedback@thameswater.co.uk with the subject ‘Swindon Sewage Treatment Works’

Thames Water Customer Services  
Telephone: 0800 316 9800

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

Swindon Borough Council – Environmental Services (Direct Contact Centre)  
Telephone: 01793 445501

Environment Agency  
Incident hotline: 0800 80 70 60  
Email: incident\_communications\_service@environment-agency.gov.uk

Customer contacts regarding Swindon 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 by 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 Swindon 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 the Wastewater Control Centre have 24 working hours to respond to the customer with an update. Within these 24 hours, the Customer & Stakeholder Manager will contact to 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 as detailed in table 4.2 and 4.3 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 Customer Stakeholder Manager will be contacted directly if there are risks of odour generation (e.g. digester cleaning, tank cleaning or process issues). 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.

## 7 Appendices

### Appendix 1. Odour Risk Assessment



Swindon%20STW%20  
SERV%20Odour%20R



**Appendix 2. Odour Improvement Plan**

Odour Improvement Plan Swindon STW

Review Date - 2/11/23

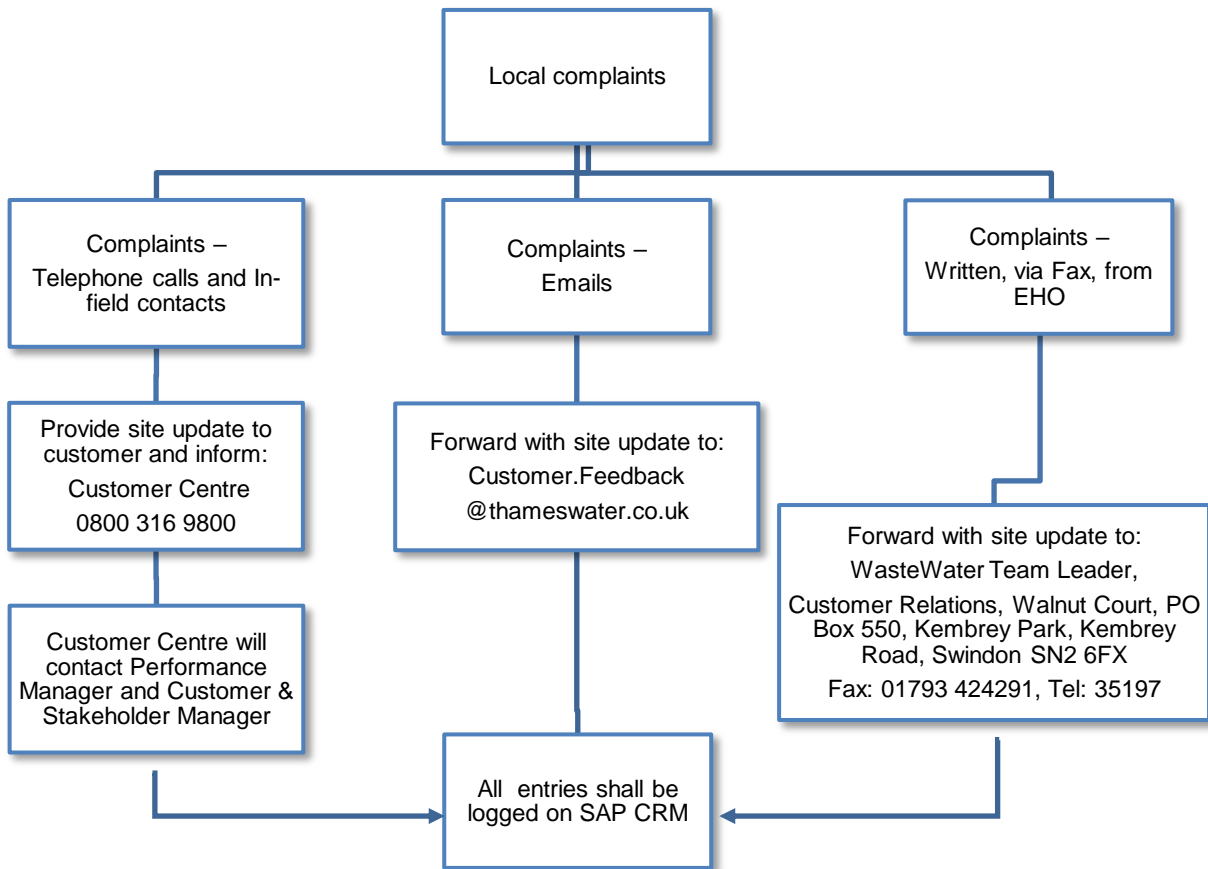
Process Stage	Owner	Issue	Plan	Action	Expected difficulties	Measures to mitigate	Timeframe
Inlet Skips	Mikhael Sheppard	Odours during summer months from raggy skips	To cover the skips or cover and treat	Risk on APS raised, 131269, quotes required for both option of either cover or cover and treat with OCU. Meeting Biffa to discuss collection options alongside potential to install a form of enclosed compaction skip. Intention to progress through the Spend to Save Initiative. Quote now received to improve quality of screenings.	Funding	Replace skips more frequently than actually required. Keep area clean	AMP8
Inlet area	Mikhael Sheppard	Pumped septic loads from catchment	For CFS to continue to treat odour at Nine Elms PSt (seasonal dosing) Haydon End PSt (permanent dosing)	Engagement with CFS and Yara for dosing. Inlet channel has a YARA H2S monitor installed so we can monitor levels and Yara can monitor performance of Nine Elms and Haydon End PS. New main at Haydon End PS being installed - septicity study to take place to see how dosing needs to be altered.	CFS funding for dosing.	None	Ongoing
Digested sludge	Mikhael Sheppard	Due to reliability of Klampresses, we have installed temp Centrifuge on Cake pad 3 for next 3 years. AMP7 project	New Klampress in AMP7 year 3 to be installed - deferred	Centrifuge will be relocated to Pad No 1 but it will only ever process digested sludge cake and will run as a duty asset 7 days a week, the site won't process any more sludge than it already does it just gives us improved reliability due to the issues with the current Klampresses.	Delivery alongside other AMP projects	Temporary centrifuge	AMP8/9
Raw Sludge Well	Mikhael Sheppard	Additional fat & sludge being released to the sludge well.	are looking to divert the scum system away from the raw sludge system to the raw liquor pumping station.	Risk raised	Funding	Monitoring sludge blankets levels in the PSTs	Ongoing
OCU	Mikhael Sheppard	Monthly health checks identify issues with OCUs	Action recommendations laid out by monthly health checks	Action recommendations laid out by monthly health checks	Funding		Ongoing
Sniff testing	Mikhael Sheppard	Implement sniff testing procedure	Implement sniff testing procedure	Procedure written for sniff testing, in order to achieve effective sniff testing personnel needs to be identified to carry out the procedure who are not acclimatised to smells on site.	Resource	Site Round, Monthly health checks	6 months from permit issues



### Appendix 3. Customer Communications Plan

#### Complaints Process

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



**IMPORTANT NOTE:**

Any communications received from the local Member of Parliament or senior council officers need to be forwarded to the Local/Regional Government Liaison person

## Communications

<b>Level 1</b>	Stable operations: Compliant with Operational Asset Standards.			
<b>Communications Approach</b>	Standard regular proactive 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>
Swindon Borough Council Environmental Health Department EH Officer	As required but at least quarterly	Telephone / email / meeting	Update on operational activity on site	Performance Manager and Customer & Stakeholder Manager
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
Environment Agency	As required	Telephone / email / meeting	Update on operational activity on site	Performance Manager or 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

<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 and Environment Agency.</li> <li>Commence proactive communications with other stakeholders.</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>
Swindon Borough Council Environmental Health Department EH Officer	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	Performance Manager and Customer & Stakeholder Manager, 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 weekly	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 then weekly	Telephone / email	To enable the Customer Centre to deal with queries from the press (reactive only).	Duty Manager
<b>Other areas/stakeholders outside Swindon 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 and Environment Agency.</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>
Swindon Borough Council Environmental Health Department EH Officer	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)
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 MP for Swindon North, and MP for Swindon South	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 Regional Government Liaison person
Environment Agency	As required as per notification procedure	As required as per notification procedure	As required as per notification procedure	Pollution desk or Level 5 Manager (Operations Manager) / Level 4 Manager (Regional Operations Manager)

<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 Centre to deal with queries from customers (reactive only)	Duty Manager
<b>Other areas/stakeholders outside Swindon 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	Performance Manager and Customer & Stakeholder Manager

### Appendix 4. Site Drawings

Figure A - Site Location Map with Receptors

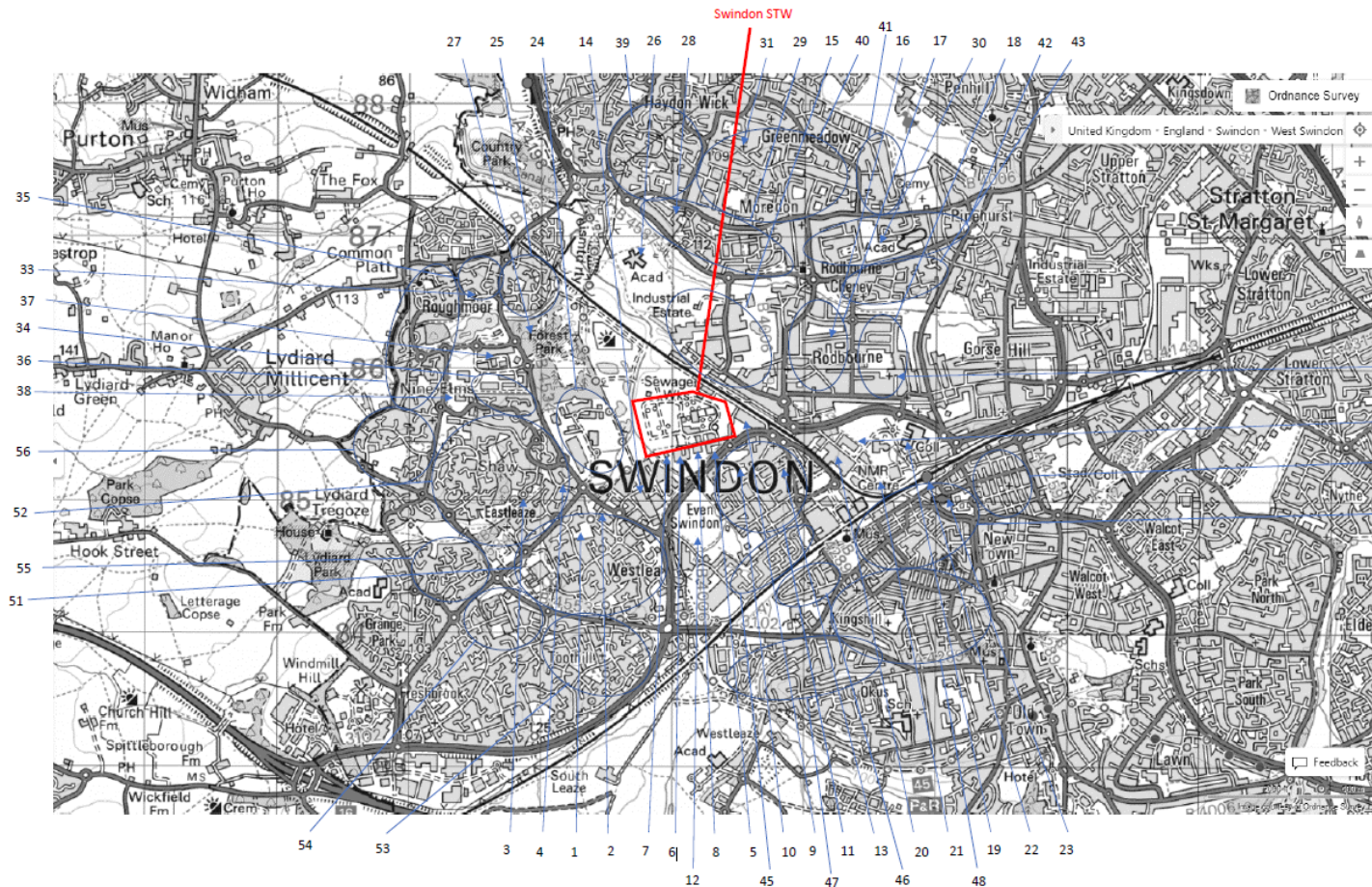
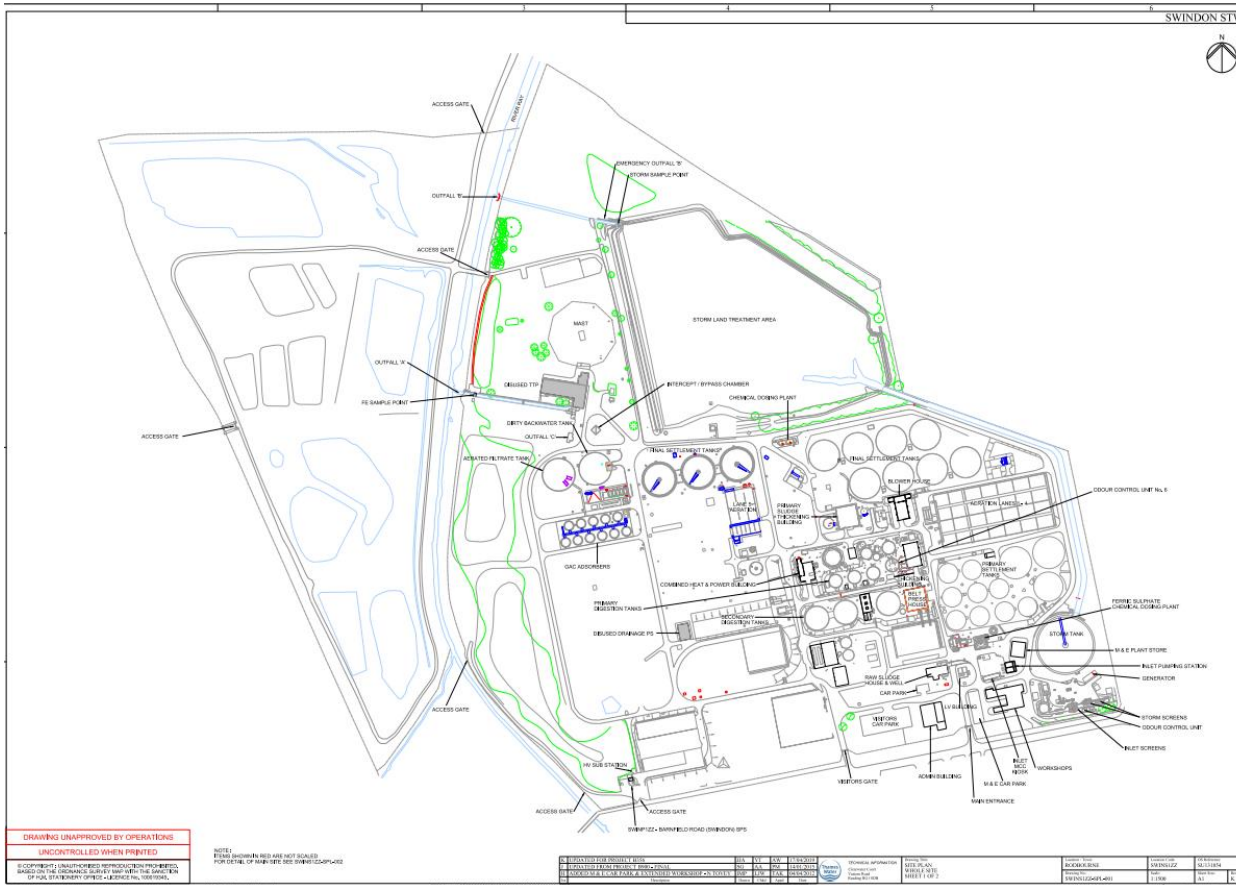
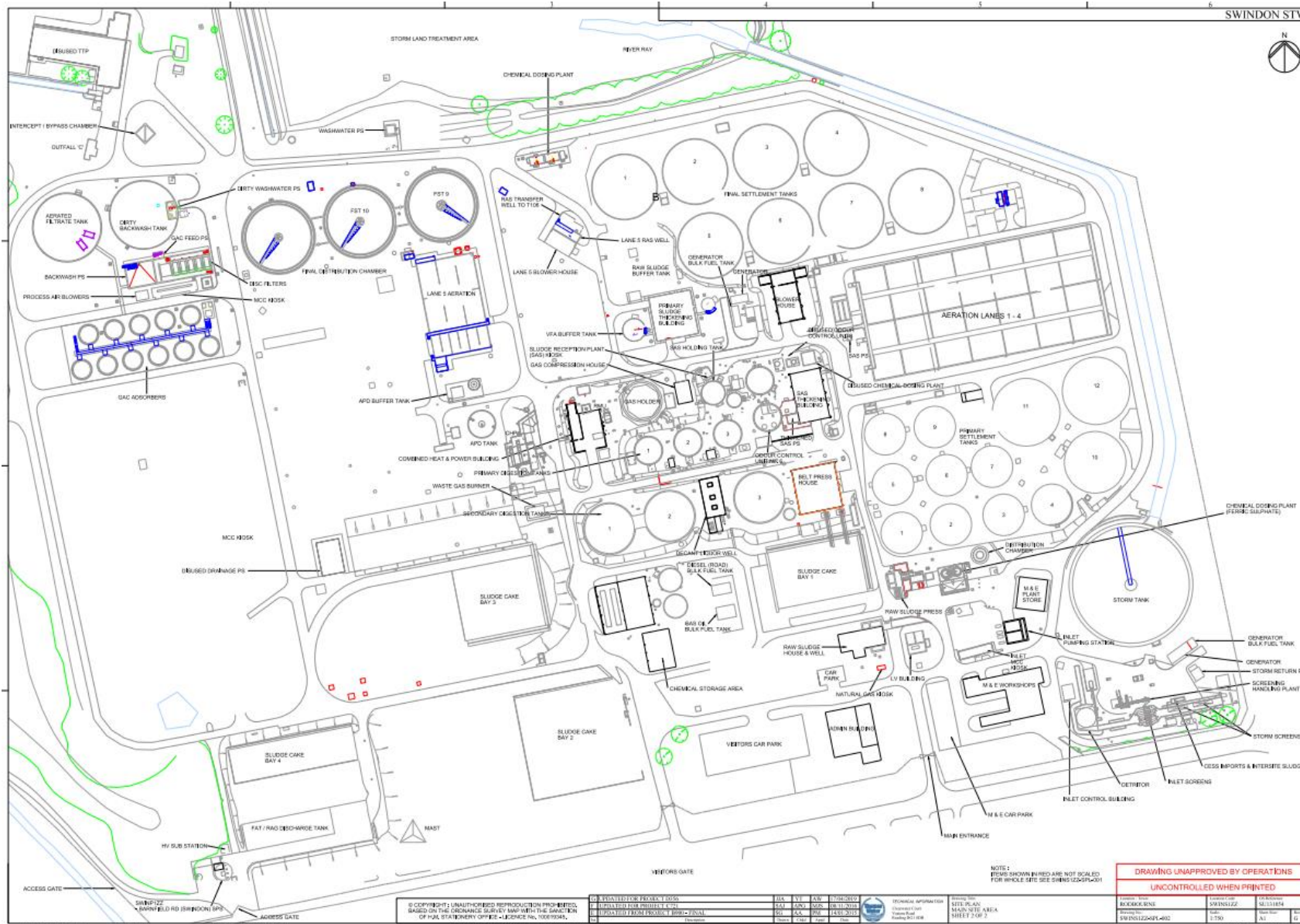




Figure B - Site Plans





UNCONTROLLED WHEN PRINTED

Figure C - Site Plan Showing Area of EPR Permitted Activities

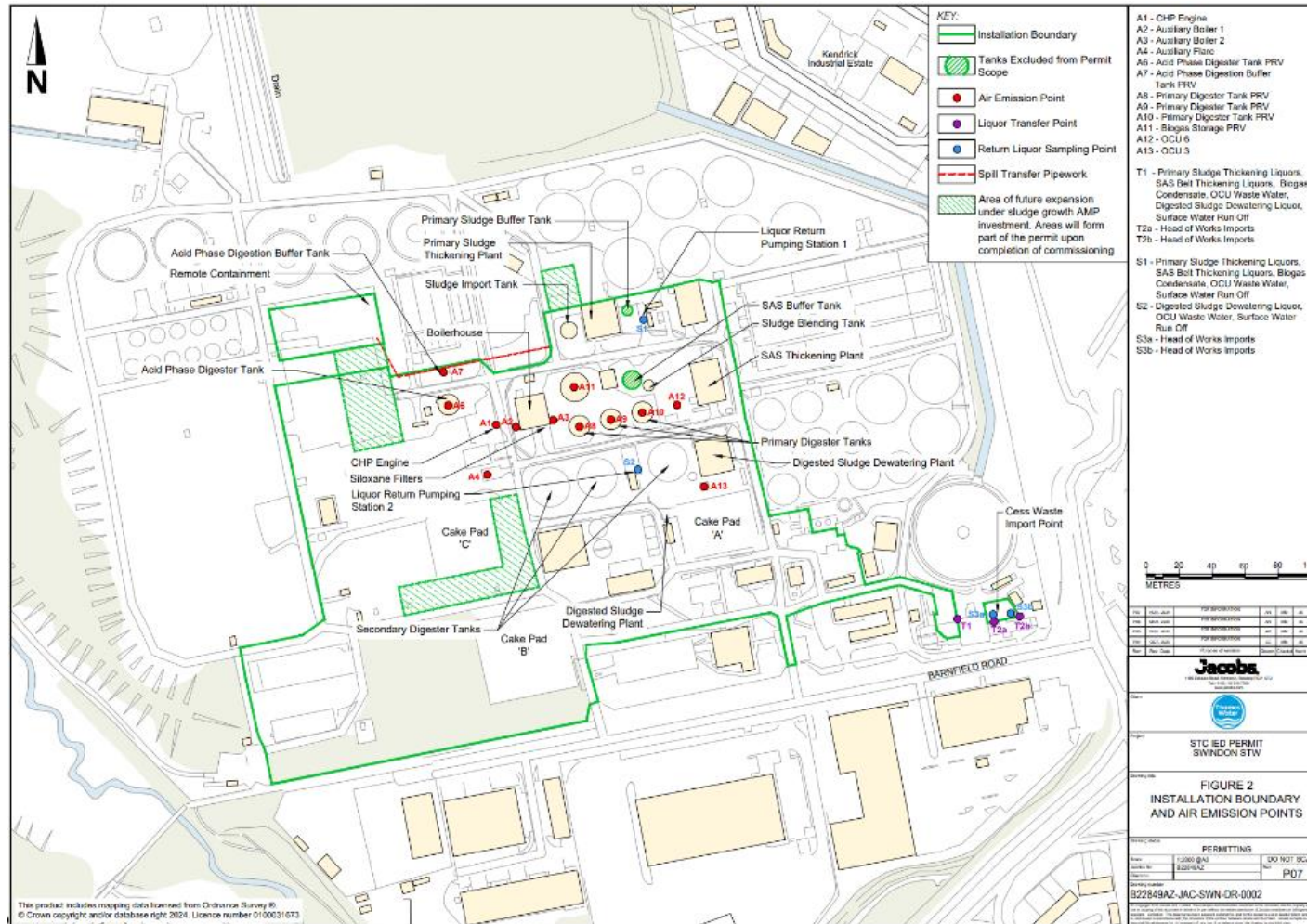
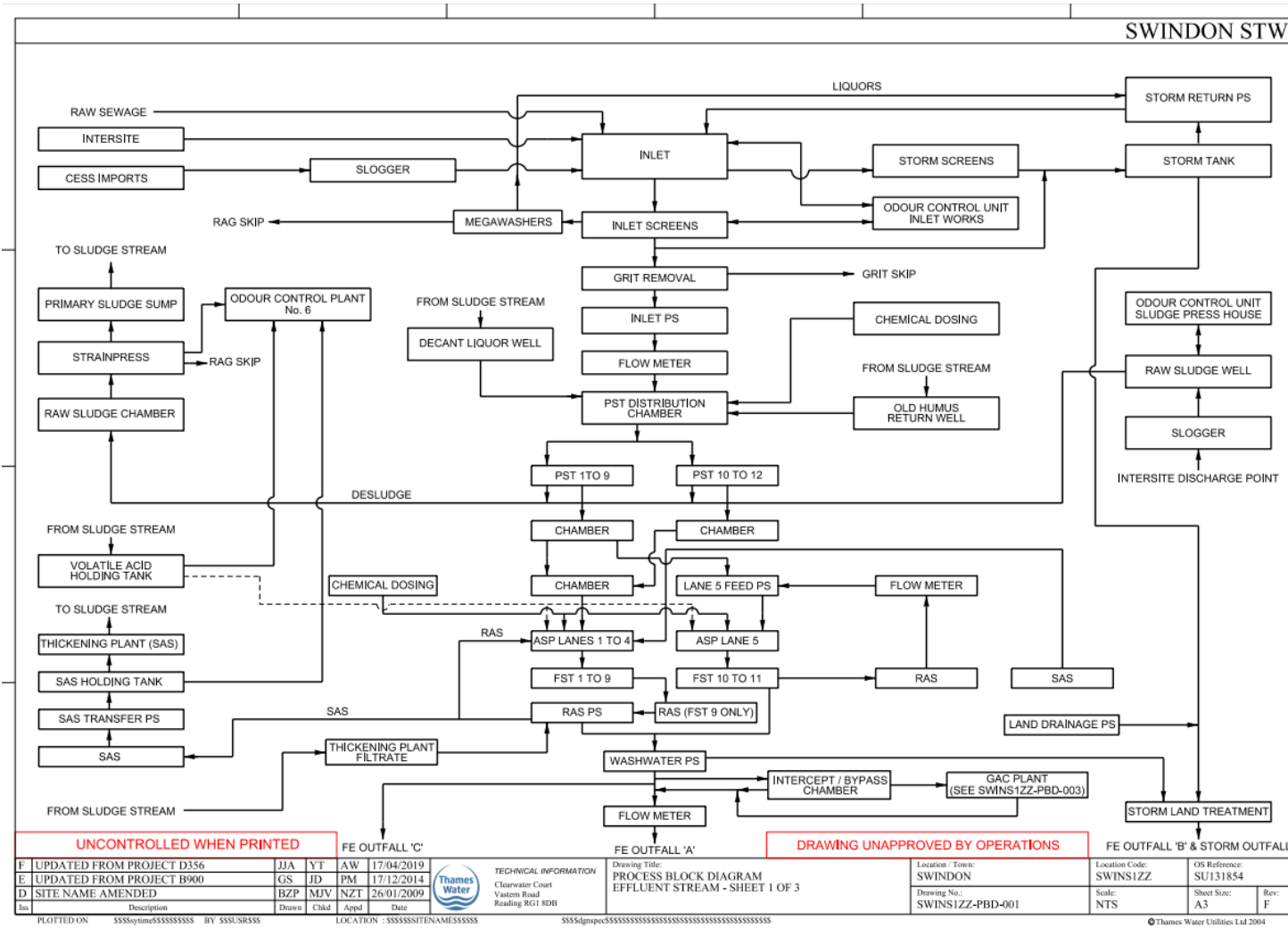
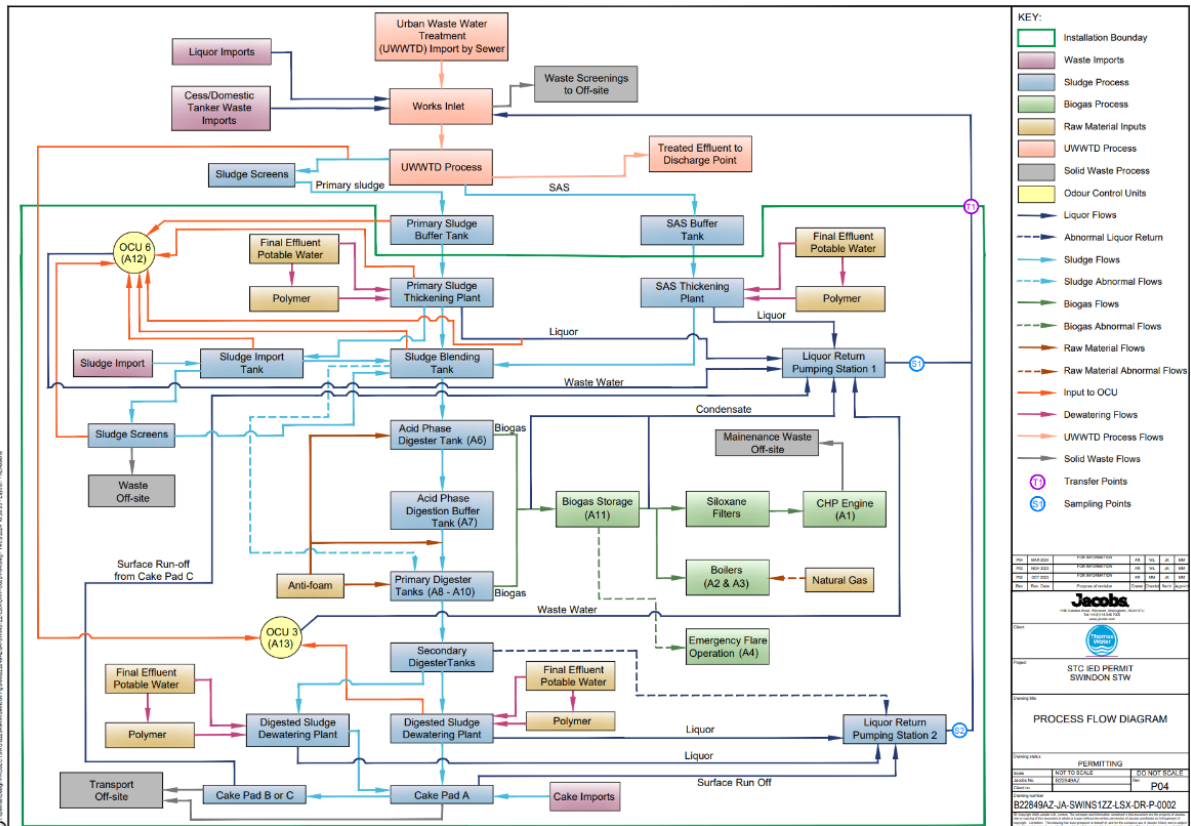


Figure D – Process Block Diagram of Effluent Stream



<b>UNCONTROLLED WHEN PRINTED</b>				FE OUTFALL 'C'	FE OUTFALL 'A'	<b>DRAWING UNAPPROVED BY OPERATIONS</b>	FE OUTFALL 'B' & STORM OUTFALL
E	UPDATED FROM PROJECT D356	JJA	YT	AW	17/04/2019	Location / Town:	SWINDON
E	UPDATED FROM PROJECT B900	GS	JD	PM	17/12/2014	Location Code:	SWINS1ZZ
D	SITE NAME AMENDED	BZP	MJV	NZT	26/01/2009	Drawing No.:	SWINS1ZZ-PBD-001
Rev	Description	Drawn	Chkd	Appd	Date	Scale:	NTS
PLOTTED ON: \$\$\$SYTIME\$\$\$\$\$ BY: \$\$\$SR\$\$\$				LOCATION: \$\$\$SITE\$\$\$\$\$		©Thames Water Utilities Ltd 2004	

Figure E - Process Block Diagram of EPR 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 logbook & 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
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	

ID	Instruction	Daily	Weekly
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	
l)	Check and clean instrumentation probes, floats and ultrasonic heads (where applicable).	X	
2.4	<b>Screenings handling</b>	Daily	Weekly



ID	Instruction	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	
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

ID	Instruction	Daily	Weekly
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
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	

ID	Instruction	Daily	Weekly
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	
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

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

ID	Instruction	Daily	Weekly
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	
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

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

ID	Instruction	Daily	Weekly
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	
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

ID	Instruction	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>	<b>Daily</b>	<b>Weekly</b>
	<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	
	<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	



ID	Instruction	Daily	Weekly
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?		
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	

ID	Instruction	Daily	Weekly
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**

	<b>Instruction</b>	<b>Daily</b>	<b>Weekly</b>
<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	
h)	Manually check gas isolation valve handle operation by closing & opening valve.		X

	Instruction	Daily	Weekly
<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	X	
<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	X	
<b>c)</b>	Check glycol pressure relief valve and ensure liquid level visible in sight glass	X	
<b>d)</b>	Check & log hours run	X	
<b>e)</b>	Check & log kwh exported (where relevant)	X	
<b>f)</b>	Check & log kwh generated	X	
<b>g)</b>	Check & log kwh used on site	X	
<b>h)</b>	Check & log use of secondary fuel	X	
<b>i)</b>	Check & log gas used	X	
<b>j)</b>	Check & log heat liberated from engine, heat dumped, heat liberated from boilers	X	
<b>k)</b>	Check & log engine temperatures and pressures, by exception	X	
<b>l)</b>	Check & log gas stream for methane composition		X
<b>m)</b>	Check automatic u-tubes to ensure that there are no gas leaks or freezing		X
<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.	X	
<b>10</b>	<b>Liquor Treatment</b>	Daily	Weekly
<b>a)</b>	Check return liquors and return rate	X	
<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?)	X	
<b>b)</b>	Check chemical storage tank level - reorder as required	X	
<b>c)</b>	Check for excessive vibration in the dosing pump	X	
<b>d)</b>	Check the level in the internal bund and empty as required	X	
<b>e)</b>	Check for leaks on visible chemical lines	X	
<b>f)</b>	Check the trace heating system	X	
<b>g)</b>	Check external storage tank bund for rainwater and/or chemical. Empty as appropriate.		X

	Instruction	Daily	Weekly
<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>
<b>q)</b>	High pressure steam clean complete machine, frame rollers and hoppers avoiding all electrical and instrumentation equipment		<b>X</b>
<b>r)</b>	Check condition of belt filter for wear i.e. Creasing / condition of seam to avoid failure / breakage and damage to other components		<b>X</b>



	Instruction	Daily	Weekly
<b>13</b>	<b>Sludge Dewatering – Centrifuge</b>	Daily	Weekly
<b>a)</b>	Check condition of stockpile, Check quality of product	X	
<b>b)</b>	Check kwh, amps and hours run	X	
<b>c)</b>	Check poly dosing system	X	
<b>d)</b>	Check quality of centrate	X	
<b>e)</b>	Check sludge feed rate, Check quality of product in feed	X	
<b>f)</b>	Visually check auto lubrication systems (grease pot) are functioning correctly, take appropriate action.	X	
<b>g)</b>	Log hours run	X	
<b>h)</b>	Log kwh hours run	X	
<b>i)</b>	Log polymer usage, note each bag change/delivery	X	
<b>j)</b>	Log sludge flow rate	X	
<b>k)</b>	Log volume of cake produced	X	
<b>l)</b>	Make adjustments to get optimum throughput, product quality and poly dosing	X	
<b>m)</b>	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
<b>a)</b>	Poly make up storage & dosing – liquid - check supply of polymer held in IBC; Top up, replace, order as appropriate	X	
<b>b)</b>	Liquid - check dosing pumps & settings	X	
<b>c)</b>	Liquid - check dilution water is available	X	
<b>d)</b>	Liquid - clean up any spillages of liquid	X	
<b>e)</b>	Liquid - log usage of polymer i.e. IBCs level	X	
<b>f)</b>	Liquid - log settings of dosing pumps	X	
<b>g)</b>	Liquid - log type of polymer	X	
<b>h)</b>	Liquid - check polymer flowmeter pressure – if above 3 bar clean filter and mixer		X
<b>i)</b>	Liquid - check made up solution appears ok	X	
<b>j)</b>	Liquid - check bunded area for spillages	X	
<b>15</b>	<b>Poly Make Up, Storage, &amp; Dosing – Powder</b>	Daily	Weekly
<b>a)</b>	Dry powder - check dosing pumps & settings	X	

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

## Appendix 7 Odour sniff testing protocol

### Purpose

Sniff testing is conducted to assist in managing odours to prevent or minimise the risk of adverse odour impact offsite.

### **Frequency**

The procedure is to be undertaken in response to complaints or if a risk of odour nuisance at sensitive receptors is expected and/or has been substantiated.

### **Pre-requisites for the assessor**

The assessment is undertaken by a member of staff trained in the procedure. The assessment in response to complaints will normally be carried out by someone not based on site. The member of staff will normally be office based rather than operations based. This means that their senses are less likely to become affected by any site odours.

Assessors must comply with the following:

- They should not consume strongly flavoured food or drink (this includes coffee) at least half an hour before conducting the assessment.
- They should not smoke at least half an hour before conducting the assessment.
- They should not consume confectionary or soft drinks must be avoided for the duration of the assessment.
- Scented toiletries including perfume, deodorant or aftershave should not be applied less than an hour before conducting the assessment.
- If the assessment requires travelling between locations in a vehicle, this vehicle must not contain deodorisers / air fresheners.
- If the assessor has a cold, sore throat, or sinus trouble they should not conduct the assessment.

Prior to the commencement of the inspection, the operator shall check the weather data including the wind direction, wind speed, temperature and rainfall.

### **Odour complaint investigation**

Where possible, odour complaints will be actively investigated by an assessor. Timely receipt of a complaint is essential if such investigations are to have any value.

At each location the following procedure is undertaken:

- a. The assessor will stand facing the wind and breathe deeply, for a period of 3-5 minutes.
- b. The following information is recorded using the odour monitoring form.
  - i. Time, wind speed and direction, temperature, precipitation.

- ii. The type of any odour(s) detected.
- iii. The intensity of any odours detected on a scale of 0 to 6.
- iv. The persistence of the any odours detected i.e. constant or intermittent.
- v. The likely source of any odours detected (e.g. a specified onsite IED source, a specified non IED sources, offsite odour source, etc).
- vi. Any abnormal conditions on site that may account for the odour e.g. broken duct, open door, unusual operation, spillage etc.

The pre-requisites for assessors and monitoring approach are as defined in the sniff testing procedure with the following exceptions:

- The first assessment should be conducted at the complainant's location.
- If site odours are detected, the assessor shall move back towards the site, assessing potential odour sources within the Urban Waste Water Treatment (UWWT) and Sludge Treatment Centre (STC) processes and attempt to trace the odour to its source.
- On site operations shall also be reviewed to identify any abnormal site operations or activities that could be responsible for elevated odour levels.
- The sensitivity of the offsite location to odours should be recorded as a comment.

The findings of the investigation should be reported back to the Thames Customer Services Centre so that feed-back can be provided to the complainant.

### Odour monitoring form

Date: \_\_\_\_\_ Assessor name: \_\_\_\_\_

Time	Location	Receptor sensitivity (off site locations only)	Wind speed & direction	Temperature (degrees)	Rainfall (y/n)	Odours detected (description)	Intensity (0 – 6)	Persistence (intermittent / constant)	Perceived source	Other comments

<b>Intensity</b>		<b>Receptor Sensitivity</b>	
1 Very faint odour	3 Distinct odour	5 Very strong odour	Low (e.g. footpath, road)
2 Faint odour	4 Strong odour	6 Extremely strong odour	Medium (e.g. industrial or commercial workplace)
			High (e.g. housing, pub/hotel etc.)

---- End of OMP ---