Tilbury Water Recycling Plant
Odour Management Plan

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The contents of this document will be reviewed every 1 years

Revision	Authors	Date of Issue	Comments
001	Paul Kitchen	July 2011	
002	Paul Kitchen	May 2012	
003	Paul Kitchen	July 2012	Review with Sarah Legg
004	Paul Kitchen	July 2012	Review with Sarah Legg, Katherine Northall (EA) Colin Pomphrett (EHO)
005	Paul Kitchen	May 2013	Update to reflect Drier Closure
007	Paul Kitchen	July 2013	Update to reflect temporary lime plant
008	Paul Kitchen	September 2013	Update to reflect site changes
009	Paul Kitchen	Feb 2014	Updated with more information
010	Paul Kitchen	Nov 2017	Updated following EA

			inspection
011	Paul Kitchen	April 2022	Updated for changes to permit
012	Oliver Harriman	September 2023	Review

Contents

Operation of Permitted Site

Overview

Tilbury Water Recycling Centre serves a population equivalent of approx 250,000. It serves the domestic catchments of West Thurrock, Grays, Chafford Hundred, Tilbury, Chadwell-St-Mary and Stanford-Le-Hope as well as the industrial customers along the Thames Corridor including Tilbury Docks. Sewage is pumped via various routes to the inlet works on site.

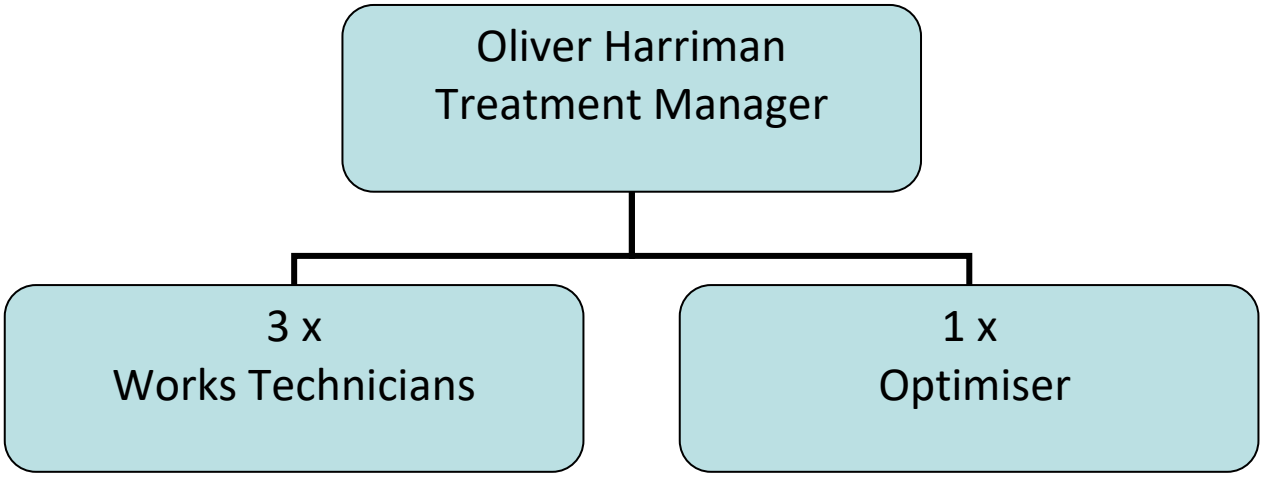
Within the boundary of the Water Recycling Centre a Sludge Dewatering Hub exists. It is for this area that the EA permit refers and also the OMP is specifically targeted.

Sludge Treatment & de-watering Processes

The Biosolids plant includes imported sludge facilities for both liquid and cake, sludge blending, screening and batching prior to dewatering in order to feed a storage silo. This silo discharges into arctic bulkers for onward transportation to other treatment sites.

All the sludge tanks, sump, cake import, dewatering centrifuges and silo are treated in a chemical and biofilter odour plant

STW Management Structure



Procedures for Reporting Faults

The site SCADA system that will automatically generate alarms for investigation and action as necessary continuously monitors both Plants. Visual Inspections will also form part of the normal routine activity of site personnel and will be subject to weekly visits

Identifying Maintenance and Inspection Needs

The complete site will be controlled using the Anglian Water system known as SAP ALM which identifies the need to undertake maintenance on each item of plant to the maintenance team in a timely manner and records the outcome of the maintenance.

During the lifetime of the plant the SAP ALM system and on site visual monitoring will be used determine further maintenance needs. Details of Design of the various odour plants are included in Appendix 2.
The CHP discharge emissions will be sampled as part of the commissioning period.

Replenishing Consumables

Chemicals are in use across Tilbury WRC. Responsibility for replenishing supplies sits with Operational Administrator and Treatment Manager.

Receipt of Complaint

A separate procedure BUS-PRO-013 exists for written complaints however:

Customers can contact Anglian Water in a number of ways

- By telephoning 08457 145145
  By writing to:-

  Anglian Water
  Customer Services
  PO Box 770
  Lincoln
  LN5 7WX

- By E Mail www.anglianwater.co.uk

Customers may also contact Thurrock Council or the Environment Agency to report odour complaints. Should Thurrock Council or the EA wish to contact Anglian Water about any complaints they receive, they should use one of the above contact methods.

Action taken to resolve complaint

All complaints received are logged in to the AWS SAP database; this system holds records of all customer jobs/complaints received by the company. Customer complaints are passed out to the Customer Response Manager who will investigate in conjunction with staff from Treatment Managers team.

The treatment manager or a designated representative will walk around the site and carry out some 'sniff' tests at the following locations, entrance gate, LSR and cake unloading, cake storage area, approach roads and upwind and downwind of the biofilter. The odour Monitoring log (Appendix 3) will be completed.

AWS will respond to the complaint in writing within 10 working days as defined in the levels of service set by OFWAT.

Complaints are regularly monitored by the Treatment Manager and compared to actions being undertaken on the site or in the local sewerage network.

Odour Critical Plant Operation and Management

Operation and maintenance of odour control units

In developing a new Biosolids treatment process at Tilbury WwTW, it was necessary to consider the potential odour impact that the plant could cause. As part of the design process odour modelling was carried out and areas where such risk could occur were identified. This led to the installation of two independent odour control plants. After the dryer was de-commissioned the RTO was closed down however the biofilter continues.

Odour Abatement Equipment

Biofilter

This is a two-stage system; 1st stage utilising chemical scrubbing followed by a second stage of treatment by polishing via a natural medium. It is designed to de-odorise aspiration air from the silos and the raw sludge process. The discharge bed itself is an area of 15m by 15m at a 2m height.

Basic Design Parameters

Estimated Data for incoming offgas
Composition: approx. 50ppm H_2S, approx. 50 ppm NH_3,
Volume flow: 18000 m^3/h wet
Temperature: 25-40 degrees C

Estimated Data for outgoing offgas
Composition: approx. 0.5ppm H_2S, approx. 0.5ppm NH_3
Odour load: 500 OU_e/Nm3
Discharge Velocity: approx. 0.025m/s
Temperature: ambient (max 35 degrees C)

The plant treats odorous air from the following areas
Sludge Holding Receptacles:
2 no. Import tanks; 2. no SAS tanks,2 no. Blend tanks, 2 no. Batch tanks; 1 no. Cake storage Silo, 1 no. cake import Hopper; 1 no. screen sludge sump; 2 no, Final product Storage silos

Plant:
6 no. Sludge Screens; 4 no. dewatering centrifuges; 2 no. Sludge Feed Hoppers; cake conveyors

The Bio-Filter draws flows from all of the Covered Sludge Tanks, Sludge sumps, Cake Hoppers, Centrifuges and Cake Silos.

The Contaminated Air entering the Bio-Filter is Alkali scrubbed.

Note: The bulk storage chemical (Alkali) is concentrated at 25% and although dosed in small quantities extreme care is required around the storage areas. Care is also required in the scrubbing units and although less concentrated still present a risk. Trace Gases may be found in the discharge from the Biofilter

Odour Monitoring

The Odour plant has a number of operational parameters that are constantly monitored by the site SCADA system to ensure correct operation. Alarms are generated if parameters move away from set points and site staff would then take appropriate action. See Odour Response Procedure.

In addition to this routine manual checks are carried out by the site Technician or Treatment Manager. This is logged by the site Technician and includes general observations regarding odours both on and off site and correct operation of plant.

Odour Adaptation can be overcome by inviting third parties to site for an assessment of odour. This is usually the local EHO or officer from the EA but could also include members of the public.

Site Operative Training

All site staff has been trained in the operation and maintenance of odour plant and the importance of their operation to the local community.

Spillage Management Procedure

All spillages will be dealt with by suitable means (hoses, tankers etc) All Technicians at the site have a responsibility to maintain good housekeeping and to clear up spillages at the earliest opportunity to prevent unnecessary odour. Anglian Water use several jetting and tankering contractors who can provide additional equipment to clean up spillages. Tanker drivers are to clean up any spillages at the sludge reception tanks as they occur.

Dispersion

A wind sock on site gives a visual indication of wind direction and can assist in the location of suspected odours. The prevailing wind of Westerly blows away from the local housing and can be used as part of the overall odour strategy.

Weather data can be provided by the Met Office

Record Keeping

Records of training, maintenance, monitoring and complaints will be kept.

Emergency Breakdown and Incident Response Planning

Odour Response Procedure

Odour Critical Plant	Response to breakdown and Timescales	Foreseeable consequences on odour if plant breaks down	Actions to reduce impact and remedial measures	Standby Plant/ Spares	Person Responsible
Bio Filter	Job raised to site staff. An initial assessment will be made within 3 hours of the likely duration of any problem. Anything that is likely to cause a problem for greater than 12 hours will be reported to the EA	Increase in odour levels or plant failure that can not be overcome quickly would activate the remedial measures	Hire in Odour Masking Unit from supplier.	Standby pumps. Spare Pump Controller Spare PH probes	Treatment Manager
Odour Masking Unit	Job raised to site staff. An initial assessment will be made within 3 hours of the likely duration of any problem. Anything that is likely to cause a problem for greater than 12 hours will be reported to the EA	Masking unit is a fairly simple unit and parts can be sourced quickly.	Hire in additional Odour Masking Unit from supplier.	Various spare parts available on Site.	Treatment Manager

Potential Odour Sources

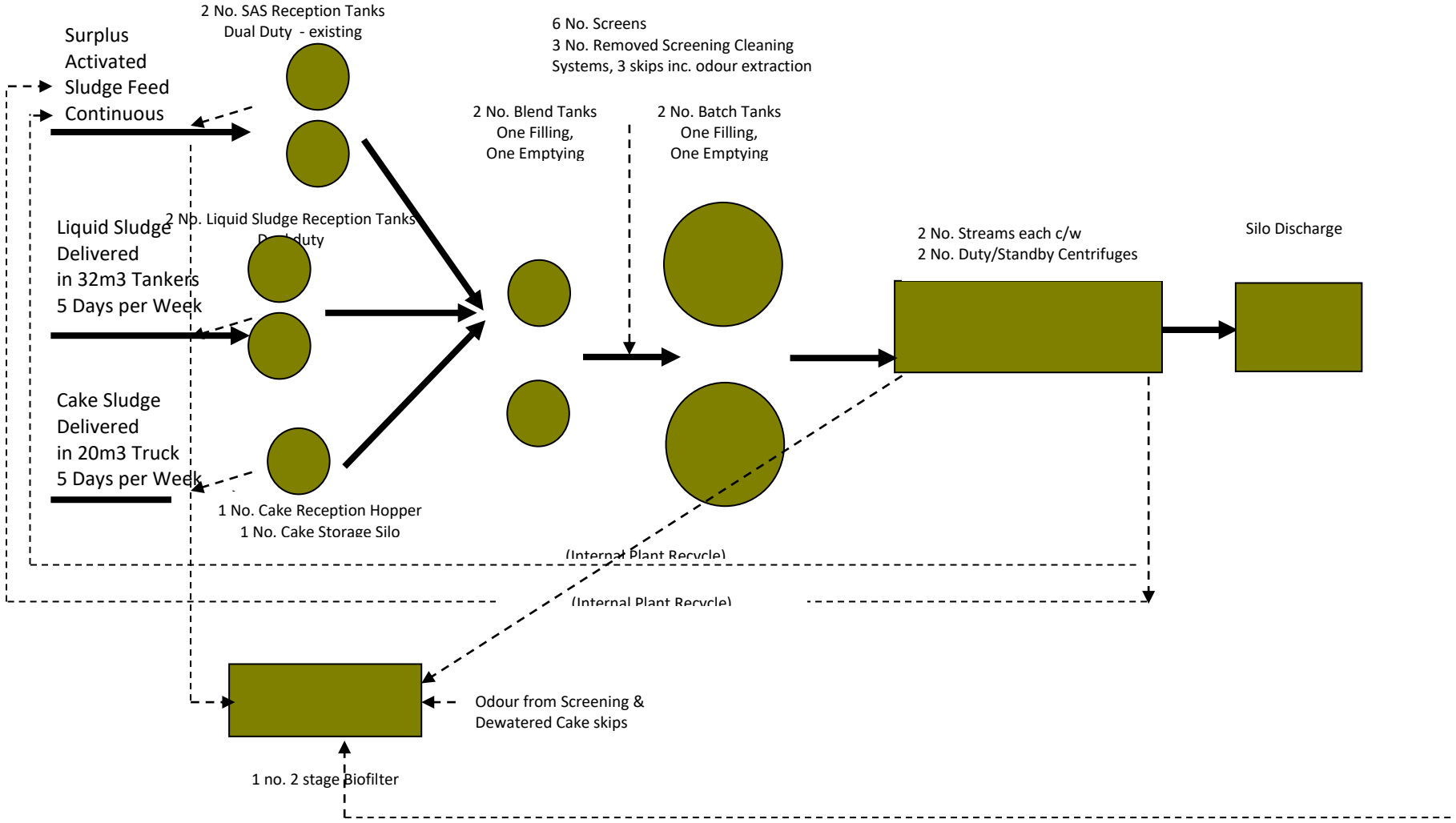
Potential Odour Source and likely Odour	Routine Actions Required	Monitoring Frequency	Attention Level	Action level	Preventative Action	Actions to take if odour confirmed
SAS Storage Tanks H2S	Check for strong and uncharacteristic odours and any damage to structure or ducting	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Tanks are positively odour controlled to Biofilter • Check to ensure Biofilter is operating within acceptable parameters including SCADA data	Repair any damage to structure and/or extraction ductwork
Liquid Import Tanks H2S	Check for strong and uncharacteristic odours and any damage to structure or ducting	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Tanks are positively odour controlled to Biofilter • Check to ensure Biofilter is operating within acceptable parameters including SCADA data	Repair any damage to structure and/or extraction ductwork
Cake import Facility H2S Methane	Check for strong and uncharacteristic odours and any damage to structure or ducting	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Positively odour control to Biofilter • Check to ensure Biofilter is operating within acceptable parameters including SCADA data	Repair any damage to structure and/or extraction ductwork

Potential Odour Source and likely Odour	Routine Actions Required	Monitoring Frequency	Attention Level	Action level	Preventative Action	Actions to take if odour confirmed
Cake Storage Silo's H2S Methane	Check for strong and uncharacteristic odours and any damage to structure or ducting	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Positively odour control to Biofilter • Check to ensure Biofilter is operating within acceptable parameters including SCADA data	Repair any damage to structure and/or extraction ductwork
Screening Skips H2S	Check for strong and uncharacteristic odours and any damage to structure or ducting	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Positively odour control to Biofilter • Check to ensure Biofilter is operating within acceptable parameters including SCADA data	Repair any damage to structure and/or extraction ductwork
Sludge Sump H2S	Check for strong and uncharacteristic odours and any damage to structure or ducting	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Positively odour control to Biofilter • Check to ensure Biofilter is operating within acceptable parameters including SCADA data	Repair any damage to structure and/or extraction ductwork

Potential Odour Source and likely Odour	Routine Actions Required	Monitoring Frequency	Attention Level	Action level	Preventative Action	Actions to take if odour confirmed
Dewatering Centrifuges H2S Methane	Check for strong and uncharacteristic odours and any damage to structure or ducting	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Positively odour control to Biofilter • Check to ensure Biofilter is operating within acceptable parameters including SCADA data	Repair any damage to structure and/or extraction ductwork
Dewatered Cake Skips H2S	Check for strong and uncharacteristic odours and any damage to structure or ducting	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Positively odour control to Biofilter • Check to ensure Biofilter is operating within acceptable parameters including SCADA data	Repair any damage to structure and/or extraction ductwork

Routine Actions Required	Monitoring Frequency	Attention Level	Action level	Preventative Action	Actions to take if odour confirmed
Check for strong and uncharacteristic odours and any damage to structure or ducting. Check operating parameters	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours , check operation of the Biofilter Odour Plant	• Check to ensure Biofilter is operating within acceptable parameters • Check to ensure that no uncharacteristic odours are being generated elsewhere on the site	Repair any damage to structure and/or extraction ductwork

Tilbury Biosolids Dryer Plant



Appendix 1

Odour on site is managed in accordance with Anglian Water policies and procedures available on Sharepoint.

Appendix 2

Sewage Treatment Works information

Overview

Preliminary Treatment

The inlet works comprises of 4 no.6mm screened which remove unwanted debris in the sewage. These screenings are washed and collected in skips.
Flow is split into 4 streams, each stream consists of the following process plant

Secondary Treatment

1 deep shaft where air is added to the process causing biological reaction, breaking the sewage into basic components.

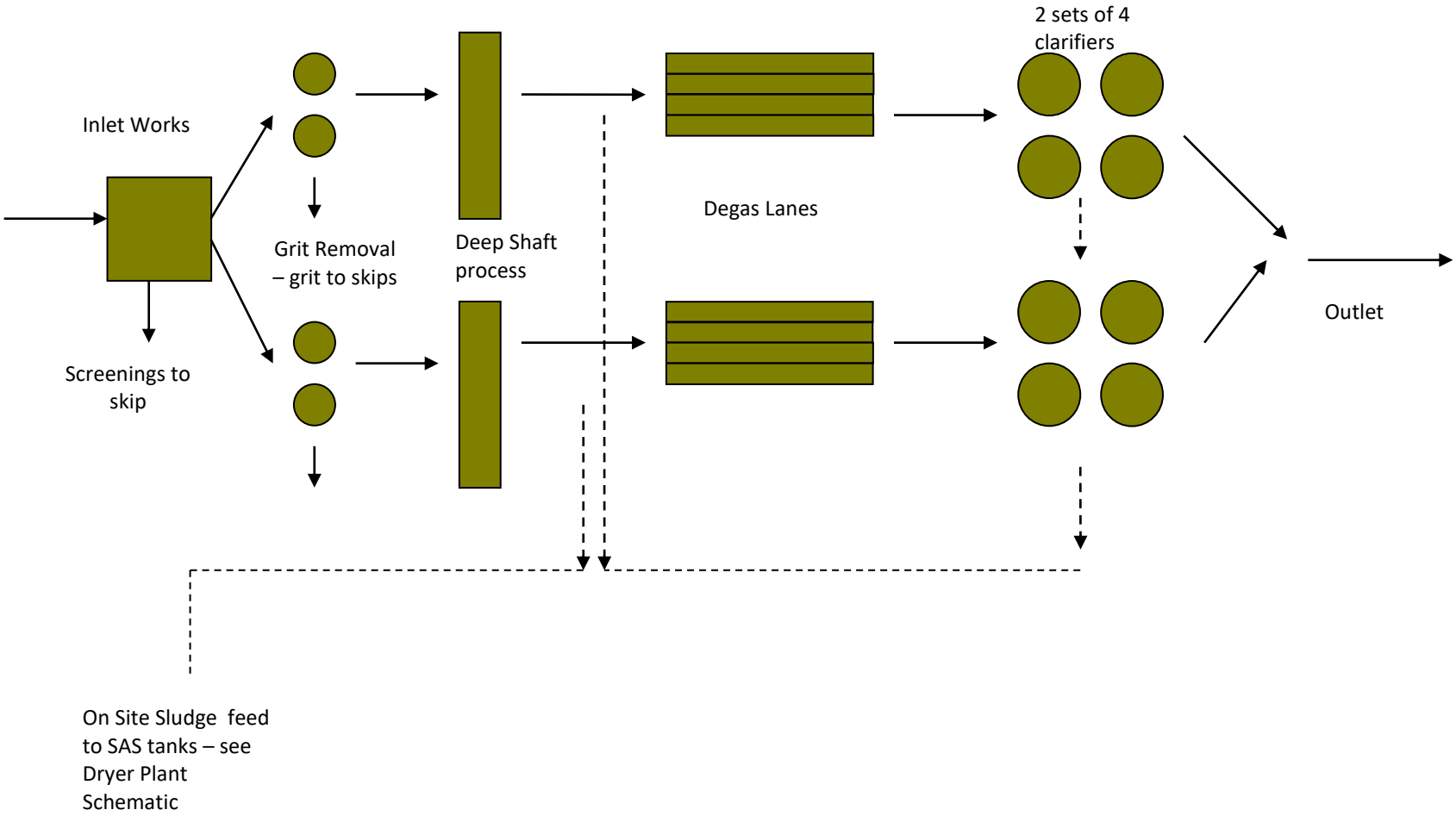
2 no. degas lanes - air is removed for a second biological treatment

Final Settlement

2 no. clarifiers – solids are allowed to drop out for removal
2 no Return Activated sludge pumps (RAS)

Potential Odour Source and likely Odour	Routine Actions Required	Monitoring Frequency	Attention Level	Action level	Preventative Action	Actions to take if odour confirmed
STW Inlet & pumping station H2S Septic Sewage	• Check condition of sewage entering works for unusual odours	5/wk	• Increased Odour from sewage	• Noticeable odour from sewage	• Take sample and get analysed for BOD, COD etc. • Notify trade effluent to check consented discharge • Contact Collection to check any chemical dosing equipment	Check Pumping stations and any large traders
Inlet Screen H2S Septic Sewage	• Check screen for build up of rag & fat • Clean weekly • Check condition of screen	5/wk	• Increased odour from screen • Build up of rag & fat on/or around screen	• Noticeable odour from screen • Large build up of debris around screen	• Clean inlet screen and remove rag and fat from equipment • Return screen to Ops ASAP	Check Pumping stations and any large traders
Screening and Grit skip H2S Septic Sewage	• Empty regularly	Weekly	• Increased odour from skip	• Noticeable odour from skip	• Consider covering skips	Empty Skips

Potential Odour Source and likely Odour	Routine Actions Required	Monitoring Frequency	Attention Level	Action level	Preventative Action	Actions to take if odour confirmed
AST's/ Deep Shaft H2S	Check for strong and uncharacteristic odours	Daily	• Deviation of MLSS levels from norm	• Significant deviation of MLSS levels from norm	• Routine sampling and review of sample results against DO levels and influent strength	Take Samples if mixed liquor looks poor
RAS pumps H2S	Check for strong and uncharacteristic odours	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours to TM and area Scientist	• Regular checks and investigative action	Check for Blockages
FST's	Remove fat/scum	Weekly	• Rising sludge • Bubbling on surface	• Large amounts of rising sludge • Bubbling • Increased odour level	• Increase RAS ratio	Consider emptying individual tanks
Degas Tanks following Deep Shaft H2S	Check for strong and uncharacteristic odours & visual appearance	Daily	• Investigate unusual odours	• Investigate and report strong/unusual odours to TM and TEI	• Regular checks and investigative action	Consider emptying individual tanks


2 sets of 4
clarifiers
Inlet Works
Degas Lanes
Grit Removal
– grit to skips
Deep Shaft
process
Outlet
Screenings to
skip
On Site Sludge feed
to SAS tanks – see
Dryer Plant
Schematic

Appendix 3

Tilbury Waste Water Treatment Plant
ODOUR OBSERVATIONS

DATE	TIME	LOCATION	OBSERVATIONS AND DESCRIPTION OF ODOUR AND STRENGTH	WEATHER AND WIND DIRECTION	Observer

0 Faint intermittent
1 Faint continuous
2 Strong intermittent
3 Strong continuous
4 Very strong intermittent
5 Very strong continuous

DESCRIPTION CHARACTERISTICS

For example

Rotten egg/ sulphur Raw sewage/drains, Fishy, Excreta

Locations: entrance gate, upwind and downwind of the biofilter, LSR and cake unloading, dryer approach roads and upwind and downwind of Cake Pad