
ODOUR MANAGEMENT PLAN (OMP)

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Company Proprietary Information

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1. Introduction & Purpose

This OMP is intended to reflect the Environment Agency's Technical Guidance Note H4 'Odour Management' and describes:

- monitoring and contingencies to control and minimise odour pollution during normal and abnormal operation;
- preventing unacceptable off-site odour pollution as described by the Environmental Permit.

Extensive assessment of odour emissions at the WPF was conducted in 2017 to define and quantify an inventory of the main sources of odour. This was further updated by assessments carried out in 2020, 2021 and 2022.

The outcome of the 2022 assessment, which entailed odour sampling and olfactometry is summarised below as relative magnitudes of odourous emissions (odour units per second, OU_E/s) from various sources of the WPF. Some without abatement and the BT1 and Divert tanks with the Odour Control Units.

Stage of treatment	Odour source	2022	
		Odour emission rate (ou _E /s)	Percentage of total emissions
Preliminary treatment	Inlet well	83	0.6%
	DAF building 1	1,860	13.6%
	DAF building 2	280	2.0%
	DAF tank 3	52	0.4%
	Balance tank 2	4,309	31.5%
Primary treatment	Anoxic tank 1	177	1.3%
	Anoxic tank 2	978	7.1%
	Anoxic tank 3	22	0.2%
	Aeration tank 1a	197	1.4%
	Aeration tank 1b	197	1.4%
	Aeration tank 2	284	2.1%
	Aeration tank 3	817	6.0%
Sludge handling and processing	RAS / WAS chambers	74	0.5%
	Bottom sludge pit	807	5.9%
	Top sludge pit	2,489	18.2%
	Sludge cake dropping from conveyor	46	0.3%
	Sludge trailer	301	2.2%
Odour control unit	OCU (BT1 & Divert tanks)	729	5.3%
Total		13,701	100.0%

The 2022 assessment demonstrates that overall odour emissions have reduced by around 80-90% compared to the first assessment undertaken in 2017.

In particular the assessment illustrates that the OCUs have reduced the contribution of the overall total emissions. Of the remaining locations, odours originating from Balance Tank 2 (BT2), the Top sludge pit and the DAF 1 building contribute approximately 63% of the total emissions.

Emissions from other sources such as Anoxic Tanks 2 and 3 are either of much lower magnitude and/ or originate at close to ground level hence have a lower potential to cause adverse effects offsite.

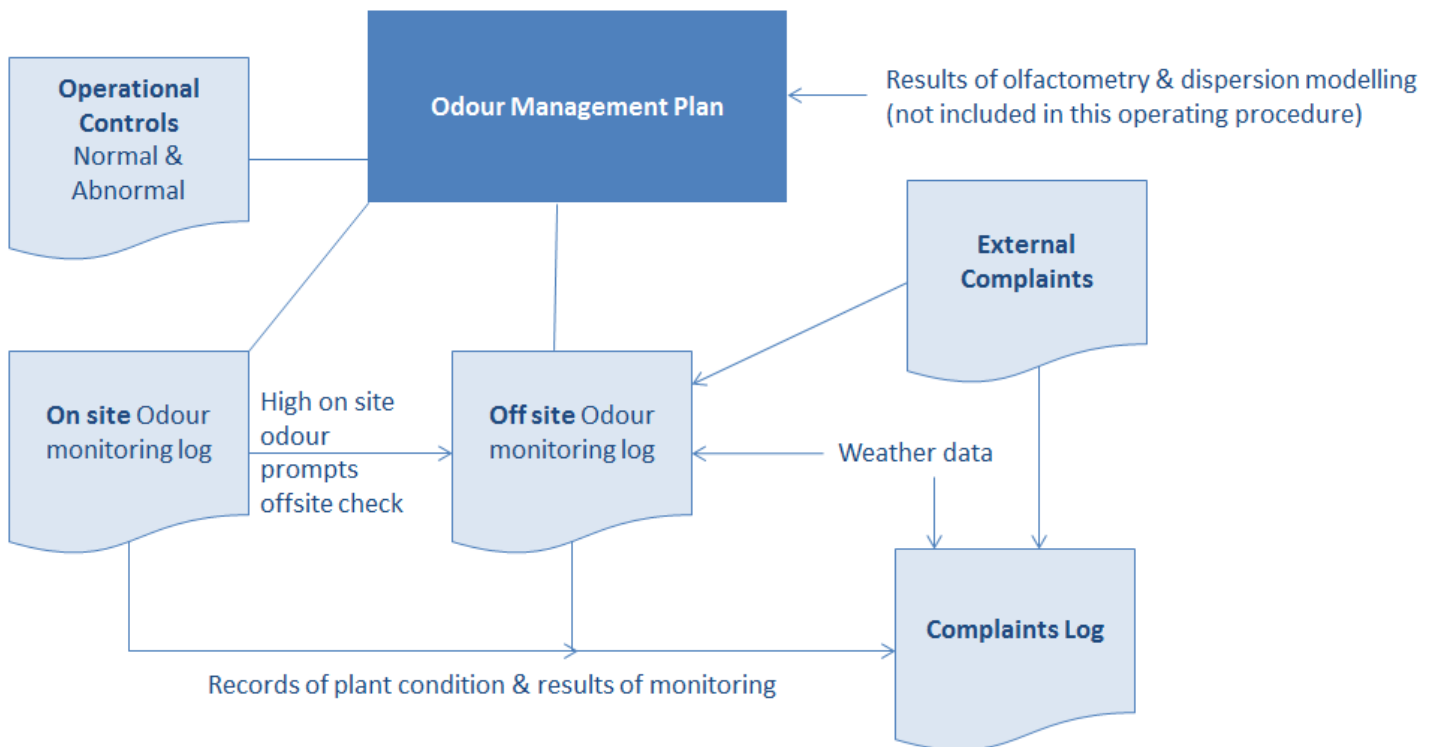
This assessment will also be used to review options for the design of improvements across the site as either infrastructure modifications/additions and/or additional OCUs to further reduce odour emissions from the WPF.

The detailed assessment is not included in this procedure in the interests of simplicity but is available via the Environmental Management System as indicated below:

Merlin (\\vgbnunefp01\general\$) (M:) > DENVER > Environmental Management System > (D) Sites > Davidstow > 8.1 Operational Control > 3. Odour > Odour Impact Assessment

2. Overview

The component parts of the OMP are summarised by the diagram below:



3. Operational Controls

The following operational controls contribute to minimisation of odour emissions from the Waste Water Treatment Plant (WPF) which has the greatest potential to adversely affect local residents:

3.1 Creamery Controls

Maintaining a consistent flow and load of untreated effluent to the WPF are the main considerations for control of Creamery operations with regard to odour management. The principal controls entail:

- Short Interval Control (SIC) for Cheese and Whey departments to provide routine assurance that process control parameters remain within normal specification and/ or identify necessary actions to restore control
- Communication with the WPF in the event that process effluents deviate outside of normal ranges – typically as a result of the need to discharge greater amounts of ingredients/ intermediates or ancillary chemicals to drain. The Creamery operations team(s) seek prior approval from the WPF operations team that the WPF is able to accept any abnormal flows before they are discharged
- Discharges of significant flows/ loads of high strength effluent are not routed to the WPF and are instead routed to contingency storage (lagoon) to enable subsequent discharge to the WPF and/or phosphate removal plant and/ or removal from site via road tanker.
- Discharge of significant flows/ loads of high strength effluent are subject to prior approval by the Creamery management team. The respective Operations team seeks prior approval from the Team Shift Leader (who may typically consult with the Duty Manager/ Site Director).

Procedure	Title	Description
WSEP-23	Diverting Waste to the Lagoon	Diverting abnormal flows to the Lagoon

3.2 WPF Proactive Controls – Normal Operation

The principal day to day controls for the WPF which contribute to minimisation of odour emissions include:

- Routine monitoring of influent conditions (flow, COD etc)
- Ensuring adequate levels of mixing and aeration of Balance Tank 1 and the Divert tanks to prevent formation of static zones
- Periodic removal of sludge accumulations from BT1 and/ or Divert to prevent creation of static zones
- Ensuring continuous operation of the odour abatement scrubber ('Peacemaker') by ensuring (i) the extraction fan is running and tank covers and extraction ductwork are intact and (ii) continued dosing of odour suppressing chemical(s) in to the circulating liquor of the first wet stage of the OCU
- Routine inspection and maintenance of the scrubber and monitoring of odour levels in the treated air from the scrubber carried out by the equipment supplier (AWT) every 3 months to validate effective operation of the scrubber
- Periodic (typically annual) olfactometric assessment of emissions from principal sources at the WPF

3.3 WPF Reactive Controls – Abnormal Operation

Abnormal flows/ loads to the WPF are evident from:

- By prior notification and agreement with the Cheese/ Whey operations team
- From routine monitoring of influent composition
- On activation of the automated 'divert' function based on continuous monitoring of influent turbidity.

When abnormal flows to the WPF are evident, operating procedure DC-EMS-DAV-EMS-13 describes actions to be taken to manage flows and loads.

Procedure	Title	Description
EMS-13	Production Environmental Controls	Control of abnormal flows to WPF

In the event of higher levels of odour originating from BT1 or Divert tank which have the potential to exceed design conditions of the scrubber:

- A proprietary odour suppressant (typically 'Diox Max' an aqueous solution of stabilised chlorine dioxide) is added to the tank in controlled doses of typically 1,000 litres over a 12 hour shift – depending on plant conditions
or
- In the event of detection of increased levels of H₂S in the headspace of BT1 or Divert tanks, the alkalinity is increased (typically pH between 8 and 8.5) through the dosing of caustic which is currently performed manually and planned to be dosed automatically as part of the 'Auto Divert' project planned for late 2023

In this event refer to sections (4) and (5) below regarding on-site and off-site monitoring.

4. On-site Odour Monitoring

The On-Site odour monitoring log (Appendix 1) is used to record:

- Boundary odour intensity & character (offensiveness) - checked and recorded every 2 hours. The Environment Agency's (EA) standard scale of 1-6 is used for intensity (see Appendix 3)
- Concentration of substances known to contribute to off-site odours e.g. hydrogen sulphide (H₂S)
- Weather data, most notably wind direction and strength
- WPF plant conditions and any abnormal activity
- Actions taken in the event of detection of abnormal/ increased odour

Ref.	Title & Description
Appendix 1	WPF Short Interval Control Monitoring

The results on site monitoring are summarised in the complaint log sheet described in Section 6 below

5. Off-site Odour Monitoring

In addition to ad-hoc checks of the local area, an off-site odour assessment is carried out:

- On receipt of an external complaint

The off-site odour monitoring form (Appendix 2) is used to record to results of off-site assessments and includes:

- Odour intensity & character (offensiveness) down wind of the WPF. The EA's standard scale of 1-6 is used for intensity
- Any other activities in the local area that could give rise to increased background odour levels.

Off-site odour monitoring is typically carried out by WPF Manager, E&S Manager, Team Shift Leaders (TSLs) and members of the Site Leadership Team (SLT) including weekend duty managers.

Off-site odour monitoring should not be carried out solely by personnel who have worked at the WPF immediately prior to carrying out the survey as they may be de-sensitised to odours characteristic of the WPF.

The reporting table from the Offsite Odour-Noise Monitoring procedure is shown in Appendix 2 with the details and map provided in the full document.

Ref.	Title & Description
Appendix 2	F.ENV.05 Offsite Odour-Noise Monitoring -V3 – reporting table

The results off site monitoring are summarised in the complaint log sheet described in Section 6 below.

6. External Complaints

External complaints are received either directly from members of the public or via the EA's National Incident Recording System (NIRS).

The Odour Complaint log is used to record:

- Details of the external complaint (time/ date, location, level and character)
- Results of on-site odour monitoring
- Results of off-site odour monitoring
- Weather conditions including results of on-site wind monitoring station
- Any feedback provided to the EA and/ or complainant.

Ref.	Title & Description
EMS	EMS/ Sites/ Davidstow/ 9.1.1 Performance Evaluation/ 8. Complaints Log

Reports are collated in separate sheets per calendar year.

7. Responsibilities

Responsibility for ensuring the effectiveness of this OMP includes:

Action	Responsibility
Ensuring WPF operational controls to reduce odour during normal & abnormal operation	WPF Operations Team
Ensuring Creamery operational controls to reduce odour – including liaison with the WPF team in the event of abnormal process effluents	Cheese Operations Manager Whey Operations Manager Team Shift Leads
Completing On-site Odour Monitoring Log	WPF Operations Team
Completing Off-site Odour Monitoring Log	Site Leadership Team, Duty Manager, Team Shift Leads
Completing Odour Complaint Log	Environment & Sustainability Adviser
Providing feedback to EA and/ or complainant	Environment & Sustainability Manager

Appendix 1 – On Site Short Interval Control Monitoring

msa environmental													SAPUTO, DAVIDSTOW - WPF SHIFT LOG			SHEET 2 OF 4		Saputo Dairy UK	
DATE		Friday 04 Nov 22										Go To Date							
WPF SHORT INTERVAL CONTROL																			
Time	BT1 pH	BT1 DO mg/l	BT1 Headspace mg/l	Divert Headspace mg/l	Scrubber Stack H2S mg/l	W2 pH	W2 Temp Deg C	W2 TSS mg/l	W2 Phosphate mg/l	W2 Flow m3/hr	W2 Ammonia mg/l	W2 TOC mg/l							
08:00																			
10:00																			
12:00																			
14:00																			
16:00																			
18:00																			
20:00																			
22:00																			
00:00																			
02:00																			
04:00																			
06:00																			
Time	Recovered Water	Discharge to River																	
06:00 to 07:00	55																		
07:00 to 08:00	55																		
08:00 to 09:00	52																		
09:00 to 10:00	52																		
10:00 to 11:00																			
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02:00 to 03:00																			
03:00 to 04:00																			
04:00 to 05:00																			
05:00 to 06:00																			

BIOLOGICAL PLANT	Start 0-4 hrs	Mid 6-8 hrs	End 10-12 hrs	Start 0-4 hrs	Mid 6-8 hrs	End 10-12 hrs	Total
Recovered Water	214						214
Discharge To River							

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Appendix 2 – Off Site Odour Monitoring Record

Completed By				
Date:	Time➤	09:00	15:00	OTHER:
Wind direction		Weather/Other		
Location▼	Odour (any H ₂ S?)	Character of odour	Intensity level	Noise
1 Site				
2 Trewassa				
3 Treworra				
4 Tremain				
5 Airfield				
Other notes, people met, comments				
Observations at other locations on drive				