
# ODOUR MANAGEMENT PLAN

# FOR

# Ardersier WWTW

| Version | Date | Description |
|---|---|---|
| 3 | 14/03/07 | Phase 3 OMP |
| 3.1 | 04/02/08 | Annual review by Asset Planner |
| 3.2 | 12/01/09 | Annual review by Asset Planner |
| 3.3 | 08/02/10 | Annual review by Asset Planner |
| 3.4 | 04/02/11 | Annual review by Asset Planner |
| 3.6 | 24/01/13 | Annual review by Team Leader |
| 3.9 | 29/12/15 | Annual review by Operations Manager |
| | | |

# Contents

# 1 Introduction

The Sewerage Nuisance (Code of Practice) (Scotland) Order 2006, Scottish Statutory Instrument 2006 No. 155 came into force on 22 April 2006, together with a supporting Guidance Document entitled Assessment and Control of Odours from Waste Water Treatment Works.

The Code of Practice Requirement Paragraphs 6 (1) to (3) states:

*(1) An OMP shall be prepared for each WWTW and this shall detail operational and control measures appropriate to management and control of odour at the WWTW and shall: -*

*a) include the documented complaints administration procedure prepared in accordance with paragraph 7;*

*b) describe the best practicable means relevant to the particular WWTW for the implementation of the measures listed in paragraph 8; and*

*c) outline procedures for training staff and documenting training records in accordance with paragraph 9.*

*(2) The procedures and practices included in the OMP shall be adopted and implemented at the WWTW at all times and the format of the OMP should provide sufficient detail to allow operators and staff to clearly understand the operational procedures for both normal and abnormal conditions.*

*(3) The OMP shall be regularly reviewed and updated as new equipment or plant is installed, existing plant is substantially upgraded and when new policies, practices or procedures are adopted and shall, in any event, be reviewed at least once in any 12-month period.*

Other requirements for the OMP are detailed in Paragraph 6 and 8 and in the accompanying Guidelines sections 6 and Annex 4. Some relevant sections are given in Appendix 1 of this OMP.

# 2 Site Specific Information

## 2.1 Name of Works

Ardersier WWTW

## 2.2 Scottish Water Reference

STW001241

## 2.3 Local Authority

Highland

## 2.4 Co-ordinates

| Easting | Northing |
|---|---|
| 277649 | 856160 |

## 2.5 Total Population Equivalent

1,400 (Design p.e. 2,500)

## 2.6 Site Location

Ardersier WWTW is located to the north west of Ardersier between the B9006 and the coast, approximately 100m to the west. There is a football pitch adjacent to the site and an access road to the northwest. Fort George army base is approximately 500m north. There is farmland to the east on the opposite side of the B9006.

There are plans to build new housing within the catchment to the south east.

A location map is included in Appendix 2.

## 2.7 Process Overview

Ardersier WWTW treats domestic sewage from Ardersier, Fort George, Tornagrain, Inverness Airport and an industrial estate in the vicinity of the airport. All flows are pumped to the works. Fort George has a separate rising main. Flows from the Inverness Airport area are pumped to Ardersier where it combines with flow from Ardersier and is pumped to the works. There is some seasonal variation in load from Fort George and due to tourism but the works does not become overloaded.

The pumped flow is discharged into the inlet chamber via two bellmouths and is screened by two 6mm mesh spiral screens. Grit is removed in a Pista-type grit trap. Downstream of the grit trap, flow in excess of 3DWF is separated and passes to one of 2No. rectangular storm tanks. The storm tanks are underground and the contents are automatically returned to the inlet channel upstream of the storm overflow by 2No. pumps. Overflow from the storm tanks gravitates to the final effluent pumping station.

The main flow gravitates to the circular oxidation ditch with an inner final settlement tank (FST). The ditch is aerated by 2No. rotors and the DO is automatically controlled by means of an actuated effluent weir. The velocity within the ditch is maintained by the rotors and an additional pump. The pumping stations at Fort George and Ardersier are inhibited if the oxidation ditch high level is reached.

Mixed liquor from the oxidation ditch passes to the circular FST. The FST has a half-bridge scraper which operates continuously. Sludge from the FST is pumped back to the inlet channel upstream of the ditch by one RAS pump. Sludge is wasted from the system by the SAS pump which pumps sludge to the sludge holding tank periodically on an automatic timer.

Final effluent from the FST gravitates to the final effluent pumping station from which it is pumped to the Moray Firth approximately 2 miles from the site by 2No. duty/standby submersible pumps. There are 2No. impeller blowers in the final effluent pumping station to aerate the final effluent.

The sludge holding tank is not decanted and will automatically inhibit the SAS pump if a high level is reached. Sludge is tankered off-site to Allanfearn approximately once per week.

A process flow diagram is shown in Appendix 3.

## 2.8 Import and Export of Sludges

There are no sludge imports to Ardersier WWTW and sludge is tankered off-site to Allanfearn for further treatment approximately once per week.

## 2.9 Odours and Mitigation

### 2.9.1 Odour Complaints Record

Recent complaints data can be obtained from the Scottish Water “Promise” complaints handling database on request to the team leader.

### 2.9.2 Location of Sensitive Receptors

Approximate distances to potential receptors are:

- Football pitch to the north west — approximately 100m.
- Farm to the east — approximately 300m.
- Fort George army base to the north — approximately 500m.

### 2.9.3 Sources of Odours

There is not an odour problem at Ardersier WWTW and there are no major sources of odour.

Minor sources of odour at the site are produced from the screen and grit skip, inlet works and oxidation ditch.

An indication of odour risk from each stage is given below.

| | Odour risk to receptor (with no mitigation) | Odour risk with mitigation |
|---|---|---|
| **Sewage treatment** | | |
| Inlet channels, screens and degritting. | Low | |
| Oxidation ditch. | Low | |
| Final settlement tank. | Low | |
| Storm tank. | Low / medium | Low |
| Final effluent pumping station. | Low | Low |
| **Sludge treatment** | | |
| Covered sludge holding tank. | Low / medium | Low |

### 2.9.4 Impact of Adverse Weather Conditions on Odours

Weather conditions that might have an adverse impact on the dispersion of odours would be those of low wind speeds and high temperature. High temperatures would be expected to significantly increase the risk of odours from the incoming sewage and all treatment processes.

### 2.9.5 Odour Mitigation Measures

Covers are provided at the following locations:

- Final effluent pumping station
- Sludge holding tank
- RAS / SAS pumping station.

# 3 Site Management Responsibilities

## 3.1 Management Structure

| | |
|---|---|
| Operational Area | North |
| Wastewater Operations Manager | Ewen Skinner |
| Team Leader | Roddy McDonald |

The Wastewater Operations Manager has overall responsibility for all wastewater operational activities within an operational region. He/she does not have day-to-day responsibility for operations related to odour control, but will be advised and will monitor progress should an incident occur.

The Team Leader's responsibilities will generally include 15-20 wastewater treatment works with Odour Management Plans. He/she has responsibility for agreeing work schedules and health and safety matters, and has a supervisory role for maintenance and inspection work.

The senior operator has responsibility for assigning tasks in accordance with the work schedule, to ensure that the necessary maintenance and inspection work is carried out.

## 3.2 Identification of Maintenance Needs

Operational and maintenance tasks are managed under the Works Asset Management System (WAMS).

Operation and Maintenance tasks for the WWTW to be carried out by site operators are identified by the team leader and the Operations Task Schedule team against the site assets identified in WAMS. These identified tasks are issued as Maintenance Scheduled Tasks (MSTs) relating to a works task schedule identifying daily, weekly, monthly and annual requirements. This schedule of planned tasks will in due course be printed on site specific sheets which will also allow recording of their completion.

Longer term M & E maintenance needs are identified with the Maintenance Planner and the Operations Team Leader using a Risk-Based Methodology and the resulting MSTs are incorporated in WAMS. Identified maintenance work is carried out by means of Work Orders (WO) which are generated automatically by WAMS and issued directly to the appropriate Electrical and Mechanical staff who also electronically record completion of the task and assign their time spent on the task. Any equipment, spares, materials, etc needed to complete the task are also assigned directly to these proactive Work Orders.

## 3.3 Inspection and Maintenance of Plant and Equipment

General maintenance and inspection tasks are carried out by the local operator in accordance with the works task schedule.

## 3.4 Fault Reporting

Where a fault is identified that cannot be rectified immediately, this is identified to the team leader who is responsible for determining the appropriate resolution. This is implemented by means of a Work Request detailing requirement and degree of urgency and results in a Work Order being assigned to the appropriate staff.

## 3.5 Routine and Non-Routine Operator Tasks

Operational tasks for the WWTW to be carried out by site operators are identified by the team leader and the Operations Task Schedule team against the site assets identified in WAMS. These identified tasks are issued as a works task schedule, identifying daily, weekly, monthly and annual requirements. This schedule of planned tasks is printed and the Operator is required to record which activities have been completed. The completed sheets are available from the Team Leader on request.

The site is visited by operation staff three times during the working week for approximately 1 hour per visit.

## 3.6 Spillages

Spillages of sewage, sludge or reagents are to be cleaned-up immediately. The affected area should be washed down with water. If there is a residual odour after washing, the affected area should be disinfected.

The site Operator is responsible for actioning the clean-up of the spillage.

The cause of a major spillage should be identified and recorded in the site diary. Causes of frequent spillages should be investigated and appropriate remedial measures initiated.

## 3.7 Operator Training

In general, operational staff are trained to SVQ level 2 in wastewater treatment. Where this is not the case, appropriate equivalent training is provided. All staff are to attend a standard odour awareness course. The record of attendance at this course, together with other operator training records, will be kept in the Scottish Water training data base, Quest. If necessary, access to records can be requested through the team leader.

## 3.8 Record Keeping

Records of M&E maintenance and repair activities are kept in the WAMS database. General maintenance records are held locally. If necessary, access to records can be requested through the team leader.

Daily operations are manually recorded by the site operator in the pre-printed site log held on site.

Tanker movements are recorded under the Gemini sludge management system. If necessary, access to records can be requested through the team leader.

## 3.9 Emergency Response Procedures

In an emergency situation, the team leader has responsibility for co-ordinating the appropriate resolution, and for keeping the local Environmental Health Officer informed of progress as required.

## 3.10 Customer Complaints Reporting Procedure

When a complaint has been received by the Customer Service Centre, it is handled in accordance with the Scottish Water customer complaints procedure. If it is received directly by the site, the complainant will be directed to the Customer Service Centre (24-hour telephone number 0845 601 8855) to ensure that the customer complaints procedure is followed and that calls are logged and tracked.

In the event that the complaint is not resolved to the complainants satisfaction, Scottish Water can also be contacted through one of the following routes:

- e-mail the Customer Relations team on customer.concerns@scottishwater.co.uk
- write to Customer Relations Manager, Scottish Water, PO Box 8855, Edinburgh, EH10 6YQ or
- telephone the Helpline on 0845 601 8855, asking for the Customer Relations Team.

The team leader has responsibility for ensuring that the complaint is investigated, and for liaison with the local community and Environmental Health Officer. This is included in Scottish Water's PROMISE system.

For continuing problems, and in cases where a community group has been formed, the Business and Community Relations Department will take responsibility for liaison with the community.

Appendix 4 describes the Complaint Logging Procedure.

# 4 Operational Procedures

## 4.1 Normal Operation

Normal operational procedures are recorded in the pre-printed site log diary.

Best Practice operational procedures relating to odour control are shown in Table 4.1 below.

## 4.2 Replenishment of Reagents and Consumables

There are no odour control reagents or consumables at Ardersier WWTW.

## 4.3 Monitoring Plant Performance and Emission Control Equipment

The site has a telemetry system for critical items of equipment. All alarms generated go to the Operation Management Centre flight desk for passing to the relevant staff, including call out of staff at times when the site is not manned.

## 4.4 Maintenance Activities, Emergencies and Breakdowns

### 4.4.1 Impact on Odours and Mitigation

The impact of possible maintenance activities, emergencies and breakdowns on odours, and mitigation measures, are outlined in Table 4.2 below. Planned activities that are likely to cause a significant increase in odour release should be subject of a separate risk assessment to derive likely impact and appropriate mitigation measures.

## Table 4.1: Normal Operation

| BEST OPERATIONAL PROCEDURES | REASON |
|---|---|
| **MONITORING AND SITE INSPECTION** | |
| ▪ All plant and equipment shall be subject to regular visual inspection and the performance of plant and equipment shall be monitored regularly. | ▪ *To ensure efficient and effective operation and management of odour emissions. As required by COP Paragraph 8(5).* |
| ▪ Regular inspection and review of the works is carried out to identify possible septicity (for example in the incoming sewage) and, where this is identified, treatment of the conditions leading to the septicity. | ▪ *To minimise odour release, and as required by COP Paragraph 8(3).* |
| **SCREENING AND GRIT REMOVAL (LOW RISK)** | |
| ▪ Screens and the screening area should be kept tidy and clean. | ▪ *To avoid unsightly and odorous areas. Washing and dewatering screenings removes faecal matter and reduces odour potential.* |
| ▪ Screenings should not be allowed to drop onto the ground where they could blow away. | |
| ▪ Liquors from the skip or dewatering equipment should be hosed regularly to the works drainage system. | |
| ▪ Screenings and grit skips should not be allowed to fill with rainwater or liquors. Care is needed to ensure that drainage liquor does not leave the skip during transport from the site. | ▪ *Skips full of liquors or rainwater will become anaerobic and odorous. Drainage liquor can be very odorous and visible during transport of skips.* |
| ▪ Screenings and grit skips should be removed from site as soon as they are filled. | ▪ *Skips may become very odorous during warm weather.* |
| ▪ Skips should be covered before removal. | ▪ *To prevent the loss of screenings and odour release.* |
| ▪ The Pista grit trap should be regularly cleared of grit. | ▪ *Aeration will strip odours, and the odours released will increase if grit is allowed to accumulate and become odorous.* |
| ▪ The grit washing equipment should be regularly inspected & maintained to ensure correct operation | ▪ *To reduce the organic content in the grit which could lead to the development of odours during storage.* |
| **ACTIVATED SLUDGE (LOW RISK)** | |
| ▪ Dissolved oxygen concentration in the mixed liquor must be maintained at more than 0.5 mg/l. | ▪ *To avoid development of septic conditions in the oxidation ditch.* |
| ▪ Faulty aerators must be repaired or replaced as soon as possible. | ▪ *To avoid development of septic conditions in the oxidation ditch. Temporary aeration equipment should be installed within 24 hours of the aerator failing.* |
| ▪ Dissolved oxygen probes should be checked and calibrated weekly. | ▪ *To ensure dissolved oxygen is maintained at the correct level.* |
| ▪ Recycle of activated sludge should be continuous. | ▪ *To avoid accumulation of mixed liquor in the settlement tanks and loss from the oxidation ditch.* |
| ▪ The impact of short term increases in organic and solids loading on aeration lanes may need to be assessed and measures taken to avoid overloading, such as additional aeration equipment. | ▪ *To avoid overloading with consequent development of anaerobic conditions and odours. Particular risk during the summer.* |
| **STORM TANKS (LOW RISK)** | |
| ▪ The storm overflow screens and weirs should be checked and cleared as soon as possible after each storm event. | ▪ *To prevent accumulation of floating debris in the storm tanks* |

| | |
|---|---|
| ▪ Emptying of the storm tanks should be as soon as possible after a storm using automatic control of return.<br>▪ Storm tanks should be desludged and cleaned as soon as possible after use. | ▪ *To avoid stored sewage becoming septic*<br>▪ *To avoid the development and release of strong odours from sludge and debris* |
| **SLUDGE STORAGE TANKS (LOW RISK)** | |
| ▪ Sludges should be processed as soon as possible after generation.<br>▪ Covers and inspection hatches must be kept closed and any holes sealed to prevent emission of odorous air. Damaged covers and seals and holes in the wall must be repaired.<br>▪ Overflow and outlet discharge pipes of covered tanks should be kept sealed, where possible, to avoid displacement of odorous air by this route. | ▪ *Retention leads to anaerobic conditions in sludges and liquors.*<br>▪ *To avoid release of odours into the atmosphere and help effectiveness of the passive dry-scrubbing filters.* |
| **TANKERING** | |
| • The close coupled (Bauer-type) connections should be used. Tanker drivers need to be made aware of the system and to use it effectively. | • *To reduce the emission of odours that will occur if wastes are allowed to cascade or free fall into tanks or sumps* |
| **COVERS AND BUILDINGS** | |
| ▪ All covers, whether ventilated or not, are confined spaces and all health and safety procedures relating to confined spaces will apply to covered processes. All covers should be included in a confined spaces register for the site. Safety considerations will at all times take precedence over other requirements outlined in this document.<br>▪ Covers should not be used to support other plant and equipment unless specifically designed to do so. No equipment requiring maintenance or inspection should be positioned on covers if the design of the covers does not permit subsequent access for maintenance.<br>▪ Access hatches should be opened only when required, and should be closed immediately after use. After closing, hatches should be secured by means of the clips, buckles or other closures provided, and locked if required.<br>▪ Any damage to access doors, equipment hatches etc. should be reported immediately and repaired as a matter of priority.<br>▪ Covers should be inspected at least annually by a competent person to ensure that they will continue to perform as designed. GRP, PVC and other plastics should be assessed for embrittlement, steel and other metals for corrosion, and wood for rot. | ▪ *Safety is at all times paramount.*<br>▪ *To protect the integrity of covers and to ensure proper maintenance.*<br>▪ *To prevent fugitive emissions of odour and to protect hatches from damage by wind.*<br>▪ *To prevent outward leakage of odour.*<br>▪ *For safety and to prolong the life of the asset.* |

## Table 4.2: Maintenance Activities, Emergencies and Breakdowns

| Item | Possible failures or abnormal situations.<br>Nature/cause of failure | Potential outcome if failure occurs | Measures to prevent or reduce the risk and impact | Actions, responsibility, timescale |
|---|---|---|---|---|
| **Maintenance** | | | | |
| | Start up and shut down of key plant and equipment. | ▪ Odour release. | ▪ Separate risk assessment may be required. | Team leader to co-ordinate response.<br>Risk assessment to be carried out. |
| | Operations which require drain down of a tank may need to be scheduled to minimise odour impact. | ▪ Very strong odours may be released during emptying and cleaning of tanks. | ▪ Separate risk assessment may be required.<br>▪ Where odour problems are possible, liaison with the local authority and community to forewarn of the activity may be necessary. | Team leader to assess whether assessment needed. |
| **Breakdown** | | | | |
| | Power failure. | ▪ Loss of processes, flooding. | ▪ Standby generation brought on site. | Team leader to co-ordinate response. |
| | Failure of aeration equipment/pumps. | ▪ Anaerobic conditions leading to odour release from the oxidation ditch. | ▪ PPM/Additional aeration equipment brought onto site/telemetry. | Team leader/Operator. |
| **Emergency** | | | | |
| | Unforeseen events leading to release of odours. | | ▪ Liaison with the local authority and community. | Team leader. |

## Appendix 1: Relevant Sections of the Code of Practice

COP Requirement- Para 8(2): All plant and equipment and odour control measures shall be operated effectively and efficiently.

COP Requirement- Paragraph 8 (3): Operating conditions shall be managed to minimise effluent septicity at the WWTW (other than for plant and equipment that is designed to operate under anaerobic conditions) and shall include regular inspection and review of the process to identify possible septicity and, where this occurs, treatment of the conditions leading to the septicity to minimise odour release

COP Requirement- Paragraph 8 (4): Efficient and effective housekeeping shall be adopted at all times which shall include avoiding spillage as far as practicable and, where spillage does occur, cleaning as soon as possible after identification of the spillage

Scottish Executive: Guidance on Statutory Code of Practice, Section 6.6: Screenings should preferably be washed and 'bagged' and grit should be washed to reduce odour potential. Skips containing screenings and grit should be covered, and removed from site as soon as is practicable

Paragraph 8 (5): All plant and equipment shall be subject to regular visual inspection and the performance of plant and equipment shall be monitored to ensure efficient and effective operation and management of odour emissions.

Paragraph 8 (6): Adequate supplies of reagents and consumables used for process optimisation or as part of the odour control measures shall be readily available

Paragraph 8 (7): An effective planned inspection and preventative maintenance regime shall be employed in respect of all plant and equipment the failure or malfunction of which may lead to odour nuisance.

COP Requirement- Paragraph 8 (8): "Where maintenance or cleaning operations are likely to lead to the release of nuisance odours, these operations shall be scheduled to minimise impact and odour minimisation measures shall be incorporated."

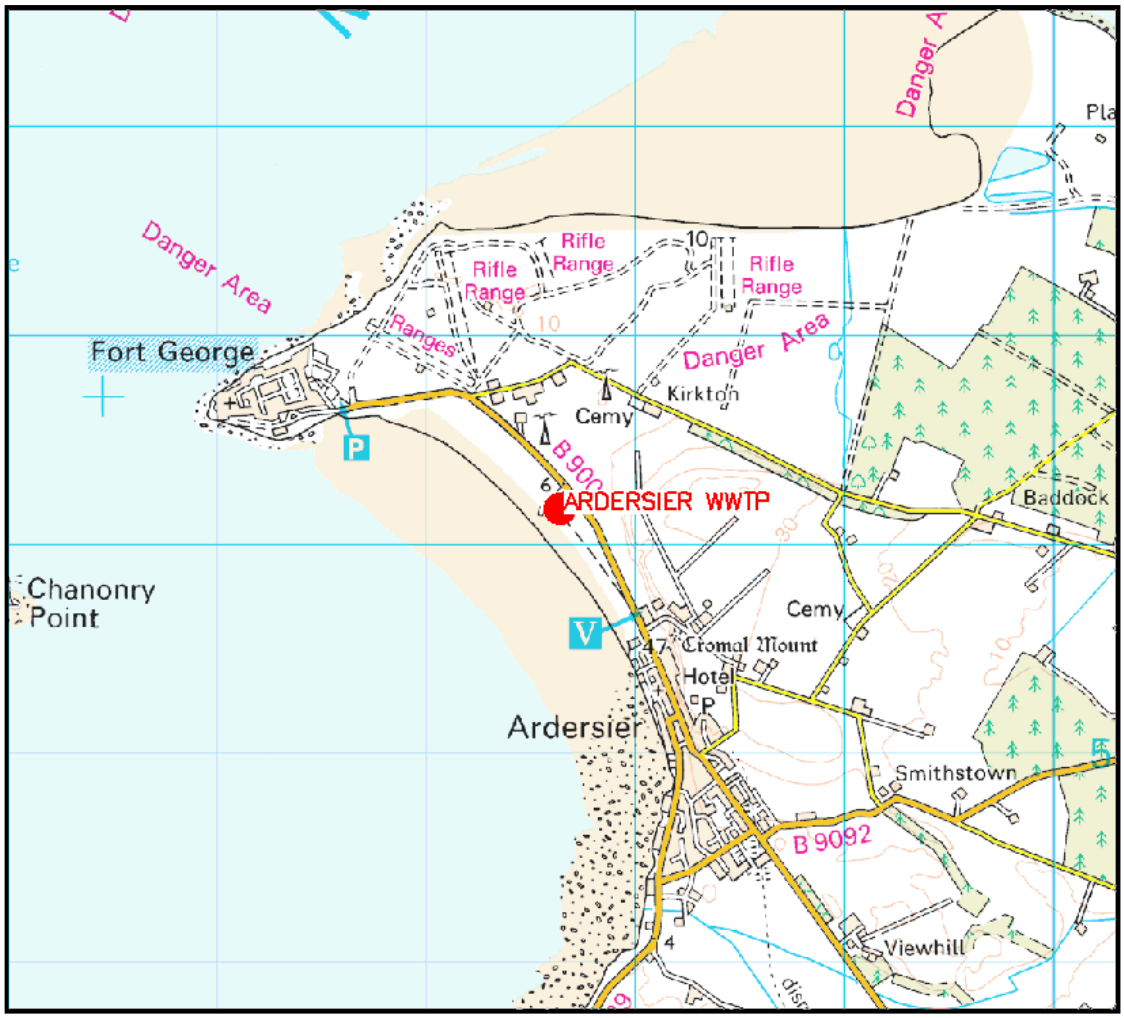
Scottish Executive: Guidance on Statutory Code of Practice, Section 6.7.4: "Draining tanks for cleaning has been implicated as a source of odour complaints. This should be scheduled to minimise impact and Scottish Water should consider liaison with the local authority and community to forewarn of such activities"

COP Requirement Paragraph 8 (9) Adequate supplies of essential spares for odour critical equipment shall be readily available.

COP Requirement- Paragraph 8 (10): Storage of sludge at the WWTW shall be minimised as far as efficient operation permits and the loading and offloading procedures shall minimise odour release.

Scottish Executive: Guidance on Statutory Code of Practice, Section 6.9.1: Storage of sludge product on site should be minimised as far as efficient operation permits. Where storage cannot be avoided, the design of storage tanks and the offloading frequency and procedures should minimise odour release. In addition excessive handling of odorous wastes such as sludges should be avoided

## Appendix 2: Location of Ardesier WWTW



**Appendix 3: Process Flow diagram**

| | |
|---|---|
| **Site Name:** | Ardersier WWTP |
| **Site ID:** | STW001241 |