MERSEYSIDE WASTE DISPOSAL AUTHORITY

Environmental Management System 5

Roughdales Closed Landfill Site: Maintenance Manual

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Document Revision History

Issue: 04

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Issue	Author	Date	Amendments
04	ASB	03/10/2014	Document redrafted

Contents

1.0 Site Location and Access

1.1 Site location

1.1.1 The landfill site is located off Sutton Heath Road leading from Sherdley Road, St Helens. See Appendix I.

1.2 Access routes

To the landfill site

1.2.1 The site has been restored to a 'Public Open Space' and as such is fully accessible to the public. Vehicular access points can be found on either Sutton Heath Road or Heathfield Avenue.

1.2.2 The site is unmanned.

To Gas Flare Compound

1.3.1 Access to the Gas Flare Compound is made through the kissing gate leading from the Sutton Heath Road entrance

1.3.2 The Gas Flare Compound is covered by a manned CCTV system. Before entering into the compound, personnel shall inform the monitoring station of their presence and their intention to enter the compound.

Authorised access is password protected, the details of which are not included in this EMS. See member of the Waste Facilities Dept for access arrangements

1.3.3 Keys to the Gas Flare Compound are kept in the offices of the Facilities Section on the 7th floor of 1 No Mann Island, Liverpool L3 1BP.

2.0 Purpose of Gas Extraction and Drainage Systems

2.1 Background

Historical

2.1.1 Roughdales Quarry was a former brick making quarry prior to becoming a landfill site. It operated as a landfill site between 1978 and 1990. It is approximately:-

- 7.75 hectares in area and,
- 15 metres average depth.

2.1.2 The site was installed as a 'Dilute and Disperse', whereby any leachate arisings are allowed to disperse to groundwater.

2.1.3 A gas extraction system has been put in place to prevent the migration of gas off site

2.1.4 In the mid 1990's St Helen's Council took possession of the site. It is responsible for all infrastucture management of the site excluding environmental responsibility with respect to to matters originating from the former landfilling operations. This responsibility is retained by MWDA.

2.1.5 MWDA is therefore responsible for :-

- implementing any environmental remedial measures required on the site.
- operating and maintaining the gas extraction system on the site.

Gas Extraction System

2.1.6 An extraction infrastructure is in place to contain and prevent the off site migration of landfill gases.

2.1.7 Gas is actively drawn from the site through a number of gas wells and gas lines to the gas flare where the gas is burnt off.

2.1.8 The gas flareand ancillary equipment is located in a secure compound close to the Sutton Heath Road entrance.

Site Drainage

2.1.9 A french drainage system exists on the site to collect surface water run off only.

2.1.10 St Helen's Council is responsible for ensuring that the stone fill to the french drain is kept free of soil, debris and vegetation build up. Failure to keep the french drain clear could result in flooding on the surface of the site, which could influence the movement of gas within the site and therefore the efficiency of the gas extraction system.

2.1.11 A trammel drain was originally installed on the eastern boundary to prevent the horizontal migration of leachate off site. This in turn connects into the public surface water sewer in Sutton Heath Road

2.1.12 The fabric in the trammel drain became blocked over a period of time and is now considered substantially ineffective. The pipework of the trammel however was not affected. As a consequence when the french drain was constructed, it was connected to the pipework of the trammel. Therefore, site surface water which drains into the french drain, ultimately discharges into the public surface water drain in the private road.

2.1.13 It is understood that the installation of a water main in Sutton Heath (Circa 1999) resulted in the severing of outfall connection from the trammel drain into public sewer. As a consequence, the trammel drain acts as a large soakaway for the dispersal of surface water run off from the french drain as described in 2.1.9 above, without any detrimental effect to the function of the french drain.

2.2 Environment Agency

The site is not subject to either an Environmental Permit or Waste Management Licence. Consequently there are no EA compliance limits/targets to attain.

2.3 United Utilities

As there is no outfall to public sewer, there is no Trade Effluent Discharge Consent.

3.0 Gas Extraction System

3.1 Equipment inventory

3.1.1 Emergency electrical override

An emergency electrical override switch is located in a secure cabinet inside a small fenced compound at the Heathfield Avenue entrance. In the event of an emergency, the power supply to the flare can be terminated safely at this location.

3.1.2 A full inventory of the system apparatus can be found on MWDA's Asset Register for the closed landfill sites. This is a live document that details the individual components and their locations, along with a source for their replacement.

3.1.3 A Store of standby components is kept at the Authority's storage unit at its South Sefton facility. An individual member of the Waste Facilities department is tasked with maintaining the stock in Stores as part of general duties. A list of Stores can be found in Asset Register.

3.1.4 Apparatus in the Gas Extraction compound :-

- 1 No Flare stack (Hofsetter stack_Type – EHG02/03M_Serial No – 148)
- 1 No Suction pump (Hofsetter suction Pump_Type – EH02G500_Serial No 155)
- 5 No 3" Extraction pipelines
- 5 No 3" Butterfly (Isolation) valves
- 1 No Condensate tank
- 1 No Electrical control panel

3.2 Description of equipment installation

Flarestack

3.2.1 The flare stack, nominally 10m high, sits in the centre of the compound.

3.2.2 Beside the flarestack and piped to it is the suction pump and its drive motor

3.2.3 Connected to the suction side of the pump is the condensate tank and 5 No extraction pipelines.

Control Panel

3.2.4 The control panel is fixed to the flarestack at the far side from the gate.

3.3 Mode of operation

3.3.1 The system is designed to extract landfill gases via a number of gas wells located across the site, and will either vent the gases to atmosphere or ignite them when present in a combustable state.

3.3.2 Due to the age of the landfill site, the levels of gas on the site are much reduced, and the gas extraction system is set to operate on a timer for two hours only each day. By trial and error this has proven to be adequate enough to control gas levels, while minimising the electrical consumption of the system as a whole.

3.3.3 For the system to operate automatically the flare shall be switched to 'ON' on the control panel

3.3.4 During the operational period the vaccum pump draws the landfill gases through the extraction pipework, and vents it through the flare stack chimney.

3.3.5 As it passes through the stack the gas will be ingited by the unit if they are in a combustible state.

3.3.6 If the gas ingnites, the flare stack will run until the composition of the gas can no longer sustain a flame.

3.4 Emergency Isolation Switch

3.4.1 Otherwise known as a Kill Switch, and emergency isolation switch has been installed in the electrical supply meter, and enables the electrical supply to the Gas Flare Compound to be terminated in the event of an emergency.

3.4.2 In throwing the Kill Switch, all electrical power to the Gas Flare Compound will be isolated, shutting down all operational systems.

3.4.3 Access to the Kill Switch, located in the electrical meter housing within a small fenced compound at the Heathfield Avenue entrance, is made as detailed in 1.2 above.

4.0 Checking, Monitoring and Maintenance

4.1 Meter Readings

4.1.1 Readings are taken of all the electrical and operational meters in order to monitor the performance and efficiency of the plant and apparatus; along with the electrical consumption of the facility.

4.1.2 The readings are generally undertaken by the Waste Facilities' Environmental Officers during the course of the Environmental Monitoring activities. When necessary, this shall be undertaken by other members of the Waste Facilities Department with a sufficient familiarity of the extraction system.

4.1.3 Details, and the locations, of the meters to be read can be found in Meter Details and Locations – EMS 5. This is a pictorial guide to each meter and its location.

4.1.4 The meter readings are recorded by hand on the 'crib sheet' Meter Record Sheet – EMS 5. A store of blank hard copies are kept on site.

4.1.5 The readings are then archived on the spreadsheet Meter Reading – EMS 5. This automatically analyses successive readings for anomalies.

4.1.6 Anomalies could reflect faults in the system, and are investigated accordingly

4.2 Maintenance Inspections and Servicing

General inspection

4.2.1 The installation is visited by Waste Facilities' Environmental Officers during the course of the environmental monitoring activities, and by Waste Facilities' Mechanical Engineer as part of general duties.

4.2.2 The visit shall consist of checking the general condition of the compound itself and the fence and gates, along with all aparatus, for any evidence of vandalism or mechanical failure etc.

Testing the operational condition of the flare stack and control gear

4.2.3 During the course of the inspection, the operation of the flare can be checked with the following procedure:-

1) Press the reset button on the front of the control panel

2) Wait for a few seconds and check to see that the vacuum pump starts up (can be clearly heard).

3) After 30 seconds the system will atempt to ignite the gas and the roar of this from the stack top will be heard.

4) If the gas ingites on any of the three attempts then the system will continue to run and can be left.

5) If after three attempts the gas does not sustain combustion the the pump will stop running and shut down this to is ok.

6) Ensure that the control panel is left switched on.

7) Record any irregularities or malfunctions that may affect the normal operation of the system and arrange for appropriate remedial work to be carried out if necessary

4.2.4 Note: This is not a sheduled inspection, and is udnertaken on an ad hoc basis.

4.2.5 Any negative observations or concerns are reported to the Facilities dept. for further investigation.

Servicing

4.2.6 The Gas Extraction system is an automatic system, requiring no manual operation.

4.2.7 The flare stack and all of its ancilliary equipment should be fully serviced and tested by competent personel in order to function effectively, reliably, and in accordance with all appliciable legalisation. This is undertaken on the Authority's behalf by a specialst contractor.

4.2.8 Contractors are selected from the Authority's list of authorised Contractors and Suppliers EMS 4

4.2.9 The frequency of the maintenance and servicing shall be in accordance with the Monitoring and Maintenance Schedule – EMS 5.

In the event of elevated gas levels

4.2.10 Check to see if there is power to the flare stack by checking the power available lamp is lit on the flare stack control panel. See section 4.3 below of the is a power supply failure.

4.2.11 Provided that there is a power supply, the flare shall be manually engaged as detailed in 4.2.3 above.

4.2.12 If the flare does not respond, check the control panel lamp display to see if any of the warning lights are lit. If so contact Facilities dept. who will arrange for the maintenance contractor to attend site.

4.2.13 Extraction from specific areas of the site can be prioritized by adjusting the 5No isolation valves corresponding to the relevant gas wells.

4.3 Procedures in event of System Failure

4.3.1 Typical events which have caused a system failure:-

- Power failure from electricity supplier.
- Power failure from control panels to the apparatus
- Acts of extreme vandalism.
- Severe weather events.

4.3.2 In the event of a system breakdown, carry out a visual inspection for evidence of the above. In the event of:

1 Power failure from electricity supplier

Inform the electricity supply company and request an immediate presence on site to investigate/re-establish the supply. Contact details can be found in the site portfolio held in the Waste Facilities dept.

If a long delay is expected before power supply is re-established, arrangements shall be made for a maintenance service contractor to attend site with a portable generator. This can be coupled straight into the commando switch.

2 Power failure from control panel to apparatus.

Commission an electrical contractor to investigate/rectify problem.

If a long delay is expected before power supply is re-established, arrangements shall be made for a maintenance service contractor to attend site with a portable generator. This can be coupled straight into the commando switch.

3 Acts of extreme vandalism

Acts of extreme vandalism are varied in their nature and the damage to the treatment system is unpredictable. In such instances remediation works will need to be relevant to the nature of the damage.

When the vandalism entails a loss of power, it shall be rectified in accordance with the procedures set out above for loss of power.

4 Severe weather events *(Freezing temperatures)*

Severe weather events in the form of very low temperatures have in the past resulted in the failure of some systems. In such circumstances it is unlikely that any remediation works would be practicable due to the physical difficulties

presented by freezing weather conditions in getting plant and equipment to site. Any remediation will need to be judged on its own merit at the time.

Section 6.

Drawings and Photographs

Sub Section	Description
6.1	Drawings
6.2	Photographs

6.1 Drawings

6.1.1 The following drawings are included in this section:-

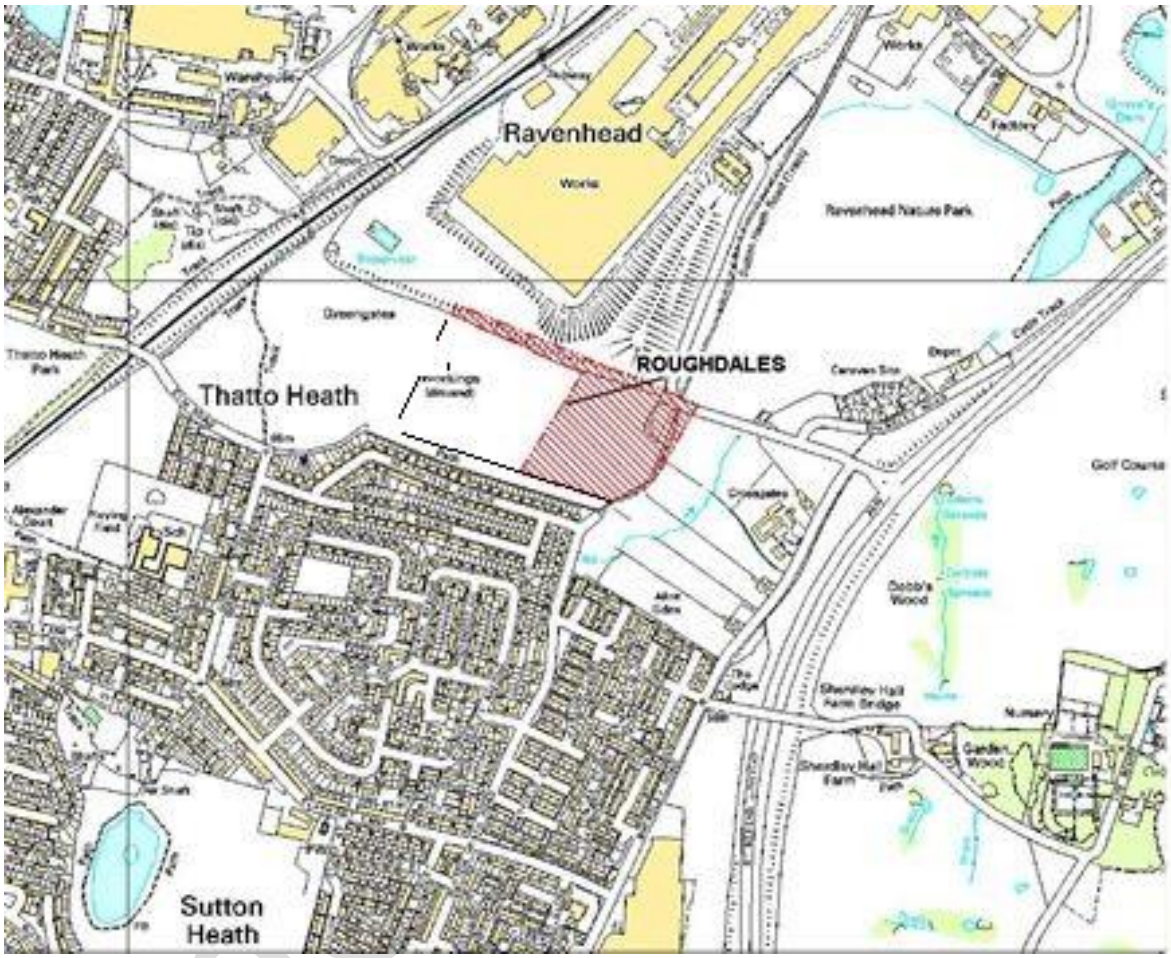
Drawing no.	Description
• **Drawing no.1**	Location Plan
• **Drawing no.2**	Site Infrastructure

6.2 Photographs

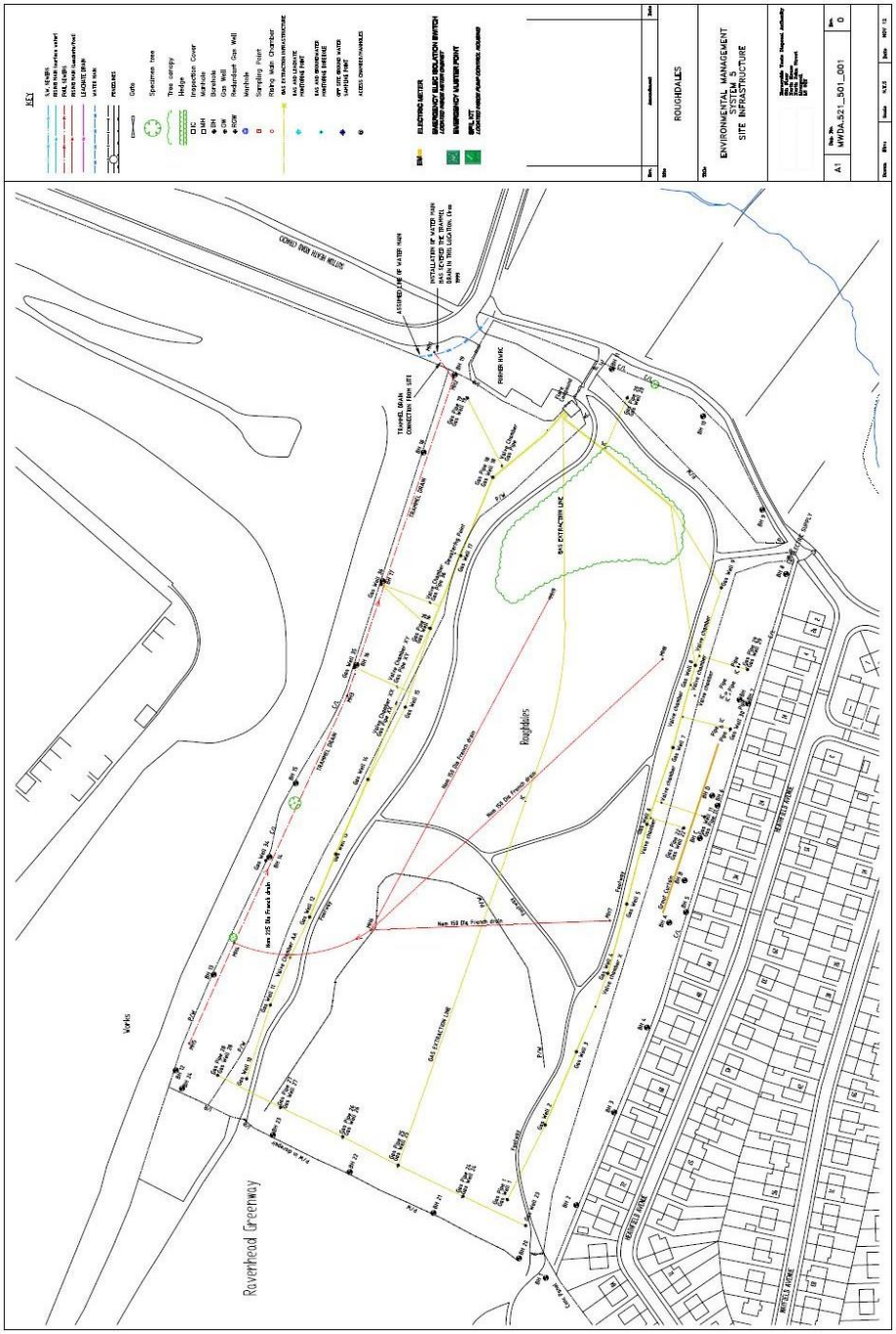
6.2.1 The following photographs are included in this section:-

Photograph no.	Description
• **Photograph no.1**	Control panel
• **Photograph no.2**	Flare stack and compound

APPENDIX I
Location Plan



APPENDIX II
Site Infrastructure



APPENDIX III
Photographs

1 Flare control panel
2 Flare compound
3 Emergency isolation

Flare Control Panel

Flare Compound

Kill switch