HyNet North West

~~OUTLINE CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN (OCEMP)~~

OUTLINE OPERATIONAL AND MAINTENANCE ENVIRONMENTAL MANAGEMENT PLAN (OMEMP)

Appendix ~~5~~1 – Outline Odour Management Plan (Tracked)

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010 – Rule 8(1)(c)

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1. INTRODUCTION

1.1. PURPOSE OF THIS DOCUMENT

1.1.1. This document has been prepared on behalf of Liverpool Bay CCS Limited ('the Applicant') and relates to an application ('the Application') for a Development Consent Order (DCO) that has been submitted to the Secretary of State (SoS) for Energy Security and Net Zero under Section 37 of the Planning Act 2008 ('the PA 2008'). The Application relates to the Carbon Dioxide (CO_2) pipeline which constitutes the DCO Proposed Development.

1.1.2. The DCO Proposed Development will form part of HyNet North West ('the Project'), which is a hydrogen supply and Carbon Capture and Storage ('CCS') Project. The goal of the Project is to reduce carbon dioxide (CO_2) emissions from industry, homes and transport and support economic growth in the North West of England and North Wales. The wider Project is based on the production of low carbon hydrogen from natural gas. It includes the development of a new hydrogen production plant, pipelines, and the creation of CCS infrastructure. CCS prevents CO_2 entering the atmosphere by capturing it, compressing it and transporting it for safe, permanent storage.

1.1.3. The DCO Proposed Development is a critical component of the Project which, by facilitating the transportation of carbon dioxide, enables the rest of the Project to be low carbon. The hydrogen production and CO_2 capture and storage elements of the Project do not form part of the DCO Proposed Development and will be delivered under separate consenting processes.

1.1.4. Further details of each element of the DCO Proposed Development are set out in **Chapter 3 – Description of the DCO Proposed Development** of the Environmental Statement (ES) **[APP-055]**.

1.1.5. This document sets out the results of the odour modelling undertaken with respect to the venting procedures to be undertaken during routine maintenance of the pipeline as described in the Environmental Statement (Volume III) Appendix 6.2 Impurities Venting **[APP-082]**. An odour management plan as secured by Requirement 5 of the draft DCO **[REP1-004]** describes suggested mitigation measures for minimising the effects of odour on the local community and provides suggestions for monitoring and community engagement.

1.1.6. This document has been produced following the Environment Agency's additional guidance for odour management (**Ref 1.1**).

2. ODOUR MANAGEMENT AND MITIGATION

2.1. ODOUR MODELLING ASSESSMENT

2.1.1. The DCO Proposed Development proposes planned venting of equipment under the following circumstances at the Ince, Stanlow and Flint Above Ground Installations (AGI):

- Planned maintenance inspections of the pipeline using Pipeline Inspection Gauges (PIGs), hereafter referred to as 'pigging campaigns'. These are expected to occur no more than once a year, and would typically involve four PIG runs over a two-week period; and
- Manifold venting during planned maintenance, which involves the venting of the CO_2 inlet and outlet manifolds at the AGIs. These are expected to occur once every five years.

2.1.2. Both of these processes are highly infrequent; therefore any potential for nuisance will be rare. The frequency of these events is controlled by maintenance requirements for the operation of the pipeline.

2.1.3. A known volume of pipeline gas will be released during these processes. For pigging campaigns this is dictated by the size of the pig launching and receiving equipment. For manifold venting this is dictated by the size of the pipework in the AGI to be vented.

2.1.4. The CO_2 within the system may contain impurities such as hydrogen sulphide (H_2S) which has potential health effects and is also odorous. The concentration of H_2S within the pipeline will be limited to a maximum allowable concentration of 5ppm such that the long- and short-term Workplace Exposure Limits of 10ppm and 5ppm respectively will not be exceeded. See Section 2.2 for further details.

2.1.5. As reported in the Environmental Statement (Volume III) Appendix 6.2 Impurities Venting **[APP-082]** assessment thresholds were determined as shown in **Table 2.1**.

Table 2.1 – H_2S Assessment Levels

Threshold	H_2S µg/m^3 (ppm)	Origin
Odour Detection Threshold	7µg/m^3 (0.0047ppm)	HSE – odour detection threshold WHO – odour nuisance threshold, 30 mins average

Threshold	H_2S µg/m^3 (ppm)	Origin
Environmental Assessment Level (Protection of health and ecosystems)	150µg/m^3 (0.1ppm)	Environment Agency, hourly mean

2.1.6. The results of the modelling (assuming a 10m temporary stack) from the Environmental Statement (Volume III) Appendix 6.2 Impurities Venting **[APP-082]** are summarised in **Table 2.2**.

Table 2.2 – Pigging and Manifold Venting Results Summary

Above Ground Installation Site	Process Description	Maximum Hourly H_2S Concentration (µg/m^3)[a]	Meteorological Condition[b]	Flow Condition[c]	Worst-case Odour Zone (m)[d]
Ince	Manifold	**20.4**	G	Average, Cold	100 – 160*
	Pig Launcher	4.3	G	Average, Cold	-
Stanlow	Manifold	**21.1**	G	Average, Cold	100 – 140*
	Pig Receiver	4.7	G	Average, Cold	-
	Pig Launcher	**10.8**	G	Average, Cold	30 – 80
Flint	Manifold	**24.0**	G	Average, Cold	120 – 150*
	Pig Receiver	4.9	G	Average, Cold	-
	Pig Launcher	3.8	G	Average, Cold	-

a. Concentrations emboldened represent an exceedance of the odour threshold of 7µg/m^3.

b. Indicative meteorological conditions are modelled that represent the possible states of the atmosphere, termed A to G. These conditions range from unstable conditions (typical of sunny days with light winds, A to C) through neutral conditions (cloudy/windy periods, C to E) to stable conditions (clear nights with light winds, F to G).

c. Flow conditions refer to state of the vented gas giving rise to maximum ground level concentrations, defined as:

- Peak = Maximum flow sustained for the hour (usually occurring directly after opening the valve)
- Average = Average flow sustained for the hour
- Ambient = Temperature of the release is the same as the ambient air
- Cold = Temperature of the release is set to -60°C

d. Range given as maximum over all flow and meteorological conditions. Zones marked with a '*' occur during peak flow conditions.

The results in **Table 2.2** show that the risk of odours covers distances of between 30 m and 160 m from operations and these are also shown in the figures below. All risks of odour occur in meteorological stability class G, representative of clear nights with light winds. For all other meteorological conditions, the risk of odours is removed. To reiterate, these venting procedures will be highly infrequent.

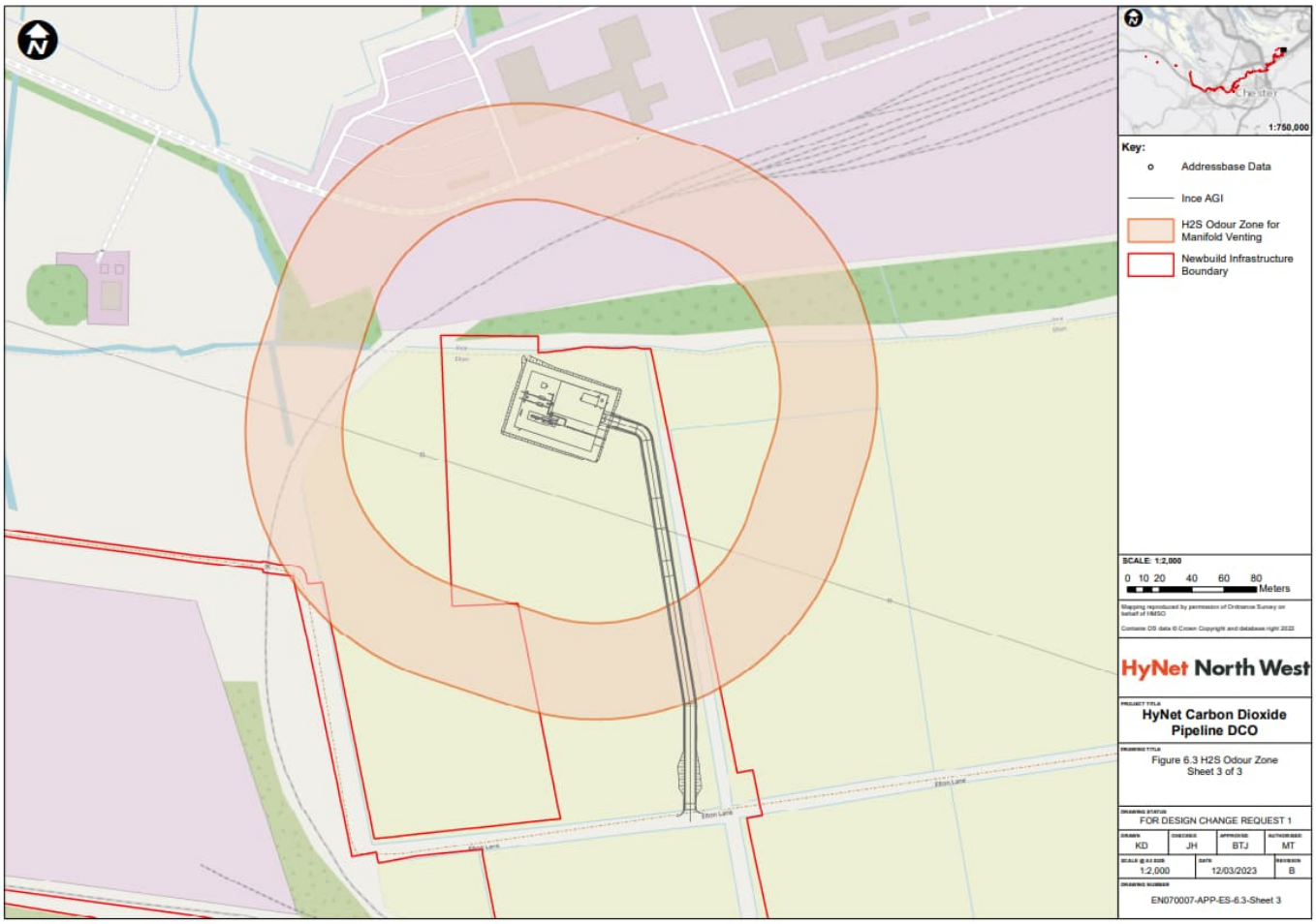


Figure 2-1 – H_2S Odour Risk Zone for Ince AGI During Manifold Venting

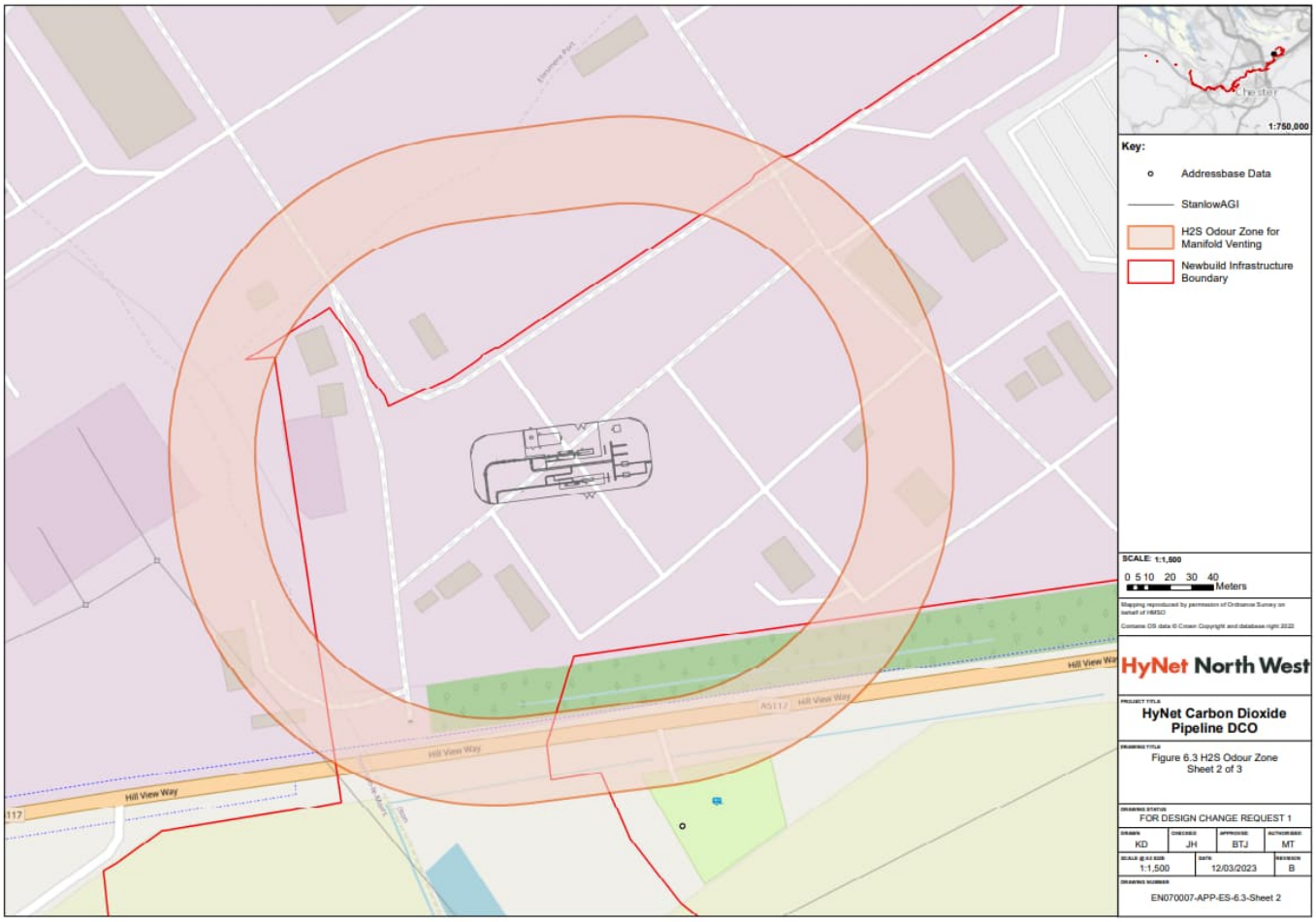


Figure 2-2 – H_2S Odour Risk Zone for Stanlow AGI During Manifold Venting

Figure 2-3 – H_2S Odour Risk Zone for Flint AGI During Manifold Venting

2.2. PROCESS MANAGEMENT

2.2.1. The CO_2 within the manifolds and PIG launchers/receivers will be at high pressure before venting. The CO_2 will expand and initially cool before equilibrating with ambient conditions within the vent stack and release to open atmosphere. The rate of venting of the CO_2 will be controlled by a vent valve to limit the amount of released gas that sinks and stays close to the ground, which would increase its potential for impact on humans and the environment.

2.2.2. By design specification at the CO_2 emitter sources associated with the Project (which are not part of the DCO Proposed Development), the H_2S content of the pipeline gas will be limited to 5ppm. That is not to say that the H_2S content will be at 5ppm at all times, rather this is a maximum allowable concentration from the emitter. As a result, the H_2S concentration is likely to be much lower during venting operations, and is therefore expected to generate less odour risk than predicted in the worst-case assessment described above.

2.3. MITIGATION

ENGAGING WITH THE LOCAL COMMUNITY

2.3.1. Due to the infrequent nature of the releases and the subsequent potential for dispersion the proposed mitigation measures involve effective communication with the local communities within the worst-case odour zones outlined in **Table 2.2** and illustrated in **Figure 2-3, Figure 2-2** and **Figure 2-1** of this document. As long as reasonably practicable, communication will be undertaken with local residents and places of work at least a week before any venting operations commence at the Ince, Stanlow and Flint AGIs. The communication should involve:

- Expected start time of venting;
- Expected duration of venting; and
- Expected prevailing wind direction and speed during the scheduled time of operations.

2.3.2. The type of communication used (e.g. online, via post or local noticeboards) will be at the discretion of the site manager or operations manager.

TIME OF VENTING

2.3.3. As per **Table 2.2** the worst-case odour zones and concentrations are likely to occur during meteorological class G which represents conditions experienced during a very calm, clear night. For all other meteorological conditions the risk of odours is unlikely. Therefore, venting procedures should only occur during the working day (**D-AQ-039** of the **REAC [REP1-015** and **CR1-109]**).

2.4. METEOROLOGICAL DATA

2.4.1. A summary of meteorological data for Hawarden for 2021 is shown in **Figure 2-4**. The data is broken down seasonally due to changes in wind direction and intensity over the course of one year, however intra-day variations could result in conditions that differ from those summarised here.

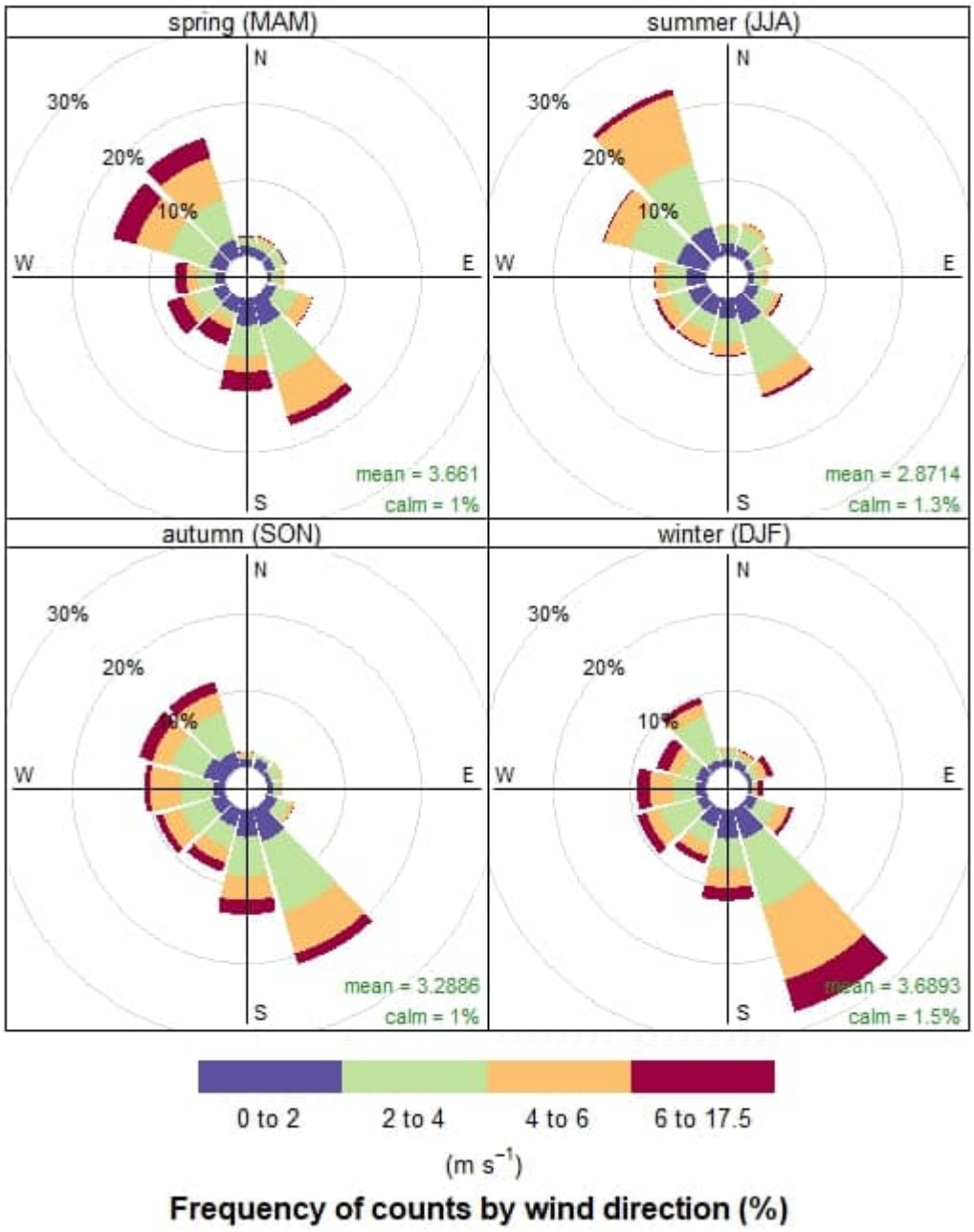


Figure 2-4 – Seasonal Meteorological Data for Hawarden for 2021

2.4.2. As well as informing the appropriate application of mitigation and/or monitoring strategy, meteorological data can be used to assist investigation of any complaints that arise as a result of venting operations.

2.5. COMPLAINTS PROCEDURE

2.5.1. All complaints should be investigated and evidence of the investigation recorded in the site log. Part of the communication procedure within any Community Engagement program should seek to inform that in order to effectively investigate complaints it is essential that the relevant site is informed immediately either by the complainant themselves or by the relevant regulating authority.

2.5.2. Site contact details should be clearly communicated to local residents who should be encouraged to immediately contact the site or the relevant regulating authority as part of good neighbourly practise. Contact details for the regulating authorities are:

- Environment Agency Incident (Hotline) 0800 80 70 60
- Cheshire West and Chester Borough Council 0300 123 8123
- Flintshire County Council 01352 703 440

2.5.3. All complaints should be recorded and the record kept with the site logs. The record of the complaint should include details of the complainant, site conditions, meteorological conditions at the time of the complaint and the action taken to investigate. Details of all complaints should be made available to the relevant authorities on request.

2.6. RESPONSIBILITIES

2.6.1. The overall responsibility for the Outline Odour Management Plan shall remain with the Site Manager. In the event of an odour complaint the Odour Complaint form (Annex A) will be used and if the complaint is validated the cause investigated and remedied.

3. SUMMARY

3.1.1. This Outline Odour Management Plan has been produced as part of the suite of measures designed to minimise the environmental impact of the operation of the DCO Proposed Development. It draws on the assessment of routine maintenance of the pipeline as described in the Environmental Statement (Volume III) Appendix 6.2 Impurities Venting **[APP-082]** and has been produced in line with Environment Agency guidance (**Ref 1.1**).

3.1.2. Mitigation measures in this document are to ensure effective communication and good relations with the surrounding residents in order that they are informed both about the nature and frequency of venting operations, and have appropriate contact details should they have any complaint about these operations. In addition, mitigation measures include the restriction of venting operations to only occur during the working day (**D-AQ-039** of the **REAC [REP1-015 and CR1-109]**).

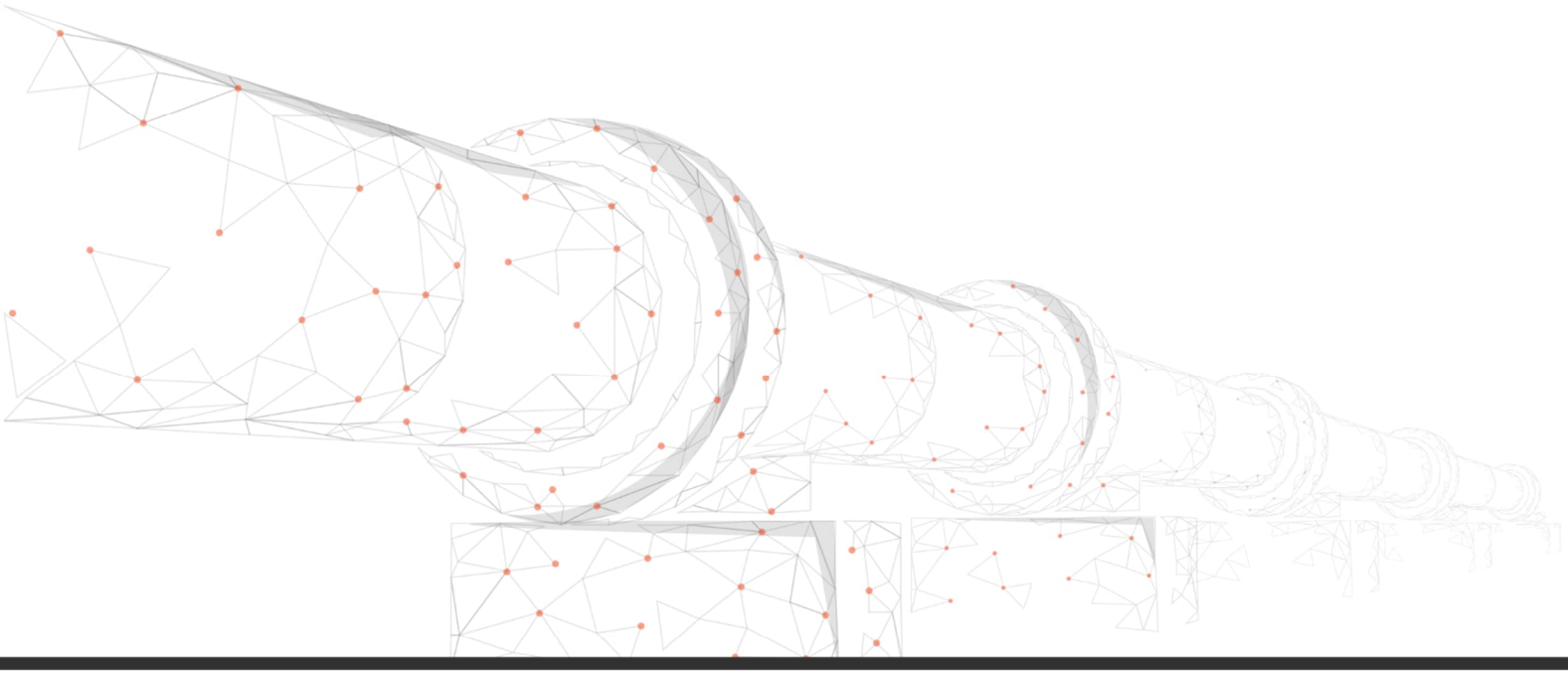
3.1.3. This document is intended to be a flexible document that is available to site management and operations personnel. The content of the document may be subject to review by a site or operations manager following the receipt of any complaint.

3.1.4. All updates are to be agreed with a site or operations manager, and environmental manager and the relevant regulating authority.

4. REFERENCES

Ref 1.1 – Environment Agency (2011). Additional guidance for Odour Management. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/296737/geho0411btqm-e-e.pdf

Annexures



Annex A

ODOUR ASSESSMENT REPORT

Location	Time Start/Finish	Odour				
		Y/N	Intensity	Extent	Description	Source

Annex B

ODOUR COMPLAINTS FORM

Incident Details	
Complainant Name	
Address Postcode	
Complainant Contact Details	
Tel	
Email	
Date	
Complaint Ref Number	
Complaint Details	
Investigation Details	
Investigation carried out by	
Cloud conditions (quarter, half etc)	
Wind strength and direction	
Complainant's description of odour	
Location of Odour Source	
Investigation findings	
Feedback given to Environment Agency and/or local authority	
Date feedback given	
Feedback given to public	
Date feedback given	
Review and Improve	
Improvements needed to prevent a reoccurrence	
Proposed date for completion of the improvements	
Actual date for completion	
If different insert reason for delay	
Does the odour management plan need to be updated	
Date that the odour management plan was updated	
Closure	
Site Manager review date	
Site Manager signature to confirm no further action required	