Natural Resources Wales Site Audit (LERP)

Site name	Hafod Landfill Site
Site address	Bangor Road, Johnstown, Wrexham, LL14 6ET
Permit number	EPR-PP3139GB
Operator	Enovert North Limited

Review of Landfill Gas Management Systems

Summary of Objectives

The objective of this site audit is to determine whether the landfill gas collection system installed at the site is :

- Capable of collecting and treating gas generated at the site.
- Being operated and maintained to maximise gas collection efficiency and minimise fugitive gas emissions.
- Being balanced correctly so the gas collected for treatment is equal to gas produced, to ensure an effectively balanced gas field, which will:
    - minimise fugitive emissions and lateral migration
    - maximise the gas available for the utilisation system
    - minimise air ingress into the gas field.

Summary of main findings / recommendations

Findings

- At the time of the audit 35% of the site does not have temporary or permanent geosynthetic capping. The uncapped area includes the cell where active tipping of waste occurs and a further 12% of the site is covered by a 0.5m layer of clay. The uncapped areas allow fugitive emissions of landfill gas. Following the audit Enovert have provided NRW with plans to extend temporary capping to cover an

additional 8% of the landfill. (Appendix B) This is a significant improvement to reduce uncapped areas of the landfill outside the active tipping cell.

- Several defects were detected in the temporary capping and gas infrastructure.
- Leachate wells in the active cells are point source emission hot spots for landfill gas. Following the audit Enovert are trialling a new method to tying in the temporary cap to the leachate towers in an effort to reduce emissions.
- Cell 5a/b has high levels of hydrogen sulphide.
- Leachate breakouts can be observed in parts of the landfill where capping is absent.
- Leachate is potentially blinding the wells and reducing the amount of gas being collected.
- Perimeter gas monitoring wells recorded high levels of methane during our audit. No landfill gas odour was detected at the perimeter gas monitoring wells. The observation is consistent with the sites monitoring of the perimeter gas monitoring wells. No corresponding gas flow was observed from the perimeter wells.
- There is currently sufficient capacity at the gas compound to treat the gas collected at the site.
- Pressure sensor at the flare flame arrestor was not working. The faulty valve was removed and a Tefen valve was fitted either side of the flame trap by the site on the 19.11.2024.

Recommendations

- Install temporary capping on areas of the landfill that will not return disposal operations to that part of the site for more than 6 months.
- Repair damaged capping and infrastructure as soon as possible
- More gas wells are required in cells 4 and 5 A/B to get sufficient gas well coverage of the landfill and to ensure odorous gas from cells 5a and 5b are captured. Following the audit the Enovert has provided a landfill gas infrastructure plan (appendix A) that details further wells to be installed in Cell 4. This includes 7 additional vertical gas extraction wells along with 3 horizontal extraction lines within cells 5a and 5b.
- Ensure bentonite seals are routinely checked during site walkovers. Carry out any necessary repairs.
- Improve condensate control within the gas wells – carry out a dipping exercise to establish perched levels in all gas and leachate wells.
- Continue to monitor and report leachate levels in accordance with the site permit.

- Provide proposals to reduce leachate and perched condensate levels in gas wells, including the use of temporary pumps on a rotational basis. Enovert have informed NRW that they are commissioning a new eductor system to remove condensate and leachate.

- Review the suction pressure at the compound following the well dipping/leachate review.

- Propose measures to reduce fugitive emissions of landfill gas from leachate wells and towers. Following the audit Enovert have provided NRW with further measures to reduce emissions.

- Check all gas wells in the southern area of the landfill that they are working effectively and that gas is being extracted within Cell 1 of the landfill.

- Replace the pressor sensor on the flare flame arrestor. Replaced by the site on the 19.11.2024

- On a quarterly basis, carry out an inspection of the gas infrastructure.

- Update gas infrastructure drawing once new infrastructure is in place.

- Provide to NRW recently updated surface water management plan.

INDEX

Introduction 2

1 Landfill Gas production 5
1.1 Review of GasSim models 5
1.2 Predicted gas production 6
2 Gas System overview 7
3 Gas treatment system 8
3.1 Gas engines 8
3.2 Gas Flares 8
3.3 Emissions 9
4 Gas collection – Pipework 10
5 Gas Collection – Extraction pipes 10
5.1 Permanent extraction wells 10
5.2 Temporary systems 10
5.3 Well coverage 10
5.4 Operation and performance 10
6 Fugitive emissions 13
6.1 Sub surface migration 13
6.2 Emissions to atmosphere 13
7 Other matters 15
APPENDIX A - Gas Engines 17
APPENDIX B – Landfill 19
APPENDIX C – Audit summary 21
APPENDIX D - Methane Emission Surveys 37
APPENDIX E – Gas field balancing data 43

Introduction

This Review has been carried out as part of Natural Resources Wales's on-going work to reduce landfill gas emissions from landfill sites in Wales. The audit is part of the Landfill Emission Reduction Project (LERP) that aims to audit all major landfill gas sites in Wales. The reduction of landfill gas emissions is considered a key objective in the overall government target of cutting total greenhouse gas emissions from the United Kingdom by 80% (of 1990 levels) by 2050.

The aim of the audit was to assess if the site operator can collect and treat landfill gas generated at the site. Assess if the site is being operated and maintained to maximise gas collection efficiency and minimise fugitive landfill gas emissions.

The Site Audit, undertaken on the 12th and 13th of November 2024, included a walkover of the whole landfill including the recently capped areas in Cells 5a and 5b on the North Eastern area of the site. The older capped parts of the landfill to the south were also included in the audit.

1 Landfill Gas production

Prior to undertaking and assessment of a landfill gas management system it is necessary to determine how much gas the site is producing so that the effectiveness of the system ie the proportion of generated gas that it captures, can be determined.

Landfill gas, comprising mainly methane and carbon dioxide, is produced during the bacteriological breakdown of waste in a landfill under anaerobic conditions. The volume of landfill gas that is produced at the site is dependent on the quantity of waste deposited and the degradable organic carbon content of that waste.

Provided that both the quantity and types of waste deposited at the site are known, the volume of gas that is likely to be produced by a site can be estimated using computer models such as GasSim.

GasSim, developed by Golder Associates on behalf of the Environment Agency, is a probabilistic (Monte Carlo) model that runs multiple simulations to determine the probability of a particular quantity of gas being produced.

A GasSim 2 model for Landfill Site was produced in 2019 in support of the permit requirement. Waste disposal commenced in 1999 and the site remains open.

1.1 Review of GasSim models

The critical input data in relation to modelled gas production are:

- Waste input (tonnage per year)
- Waste composition (determines the biodegradable carbon content)
- Moisture content (determined the degradation rate)

1.2 Predicted gas production

The current landfill gas generation curve for is reproduced as Figure 1

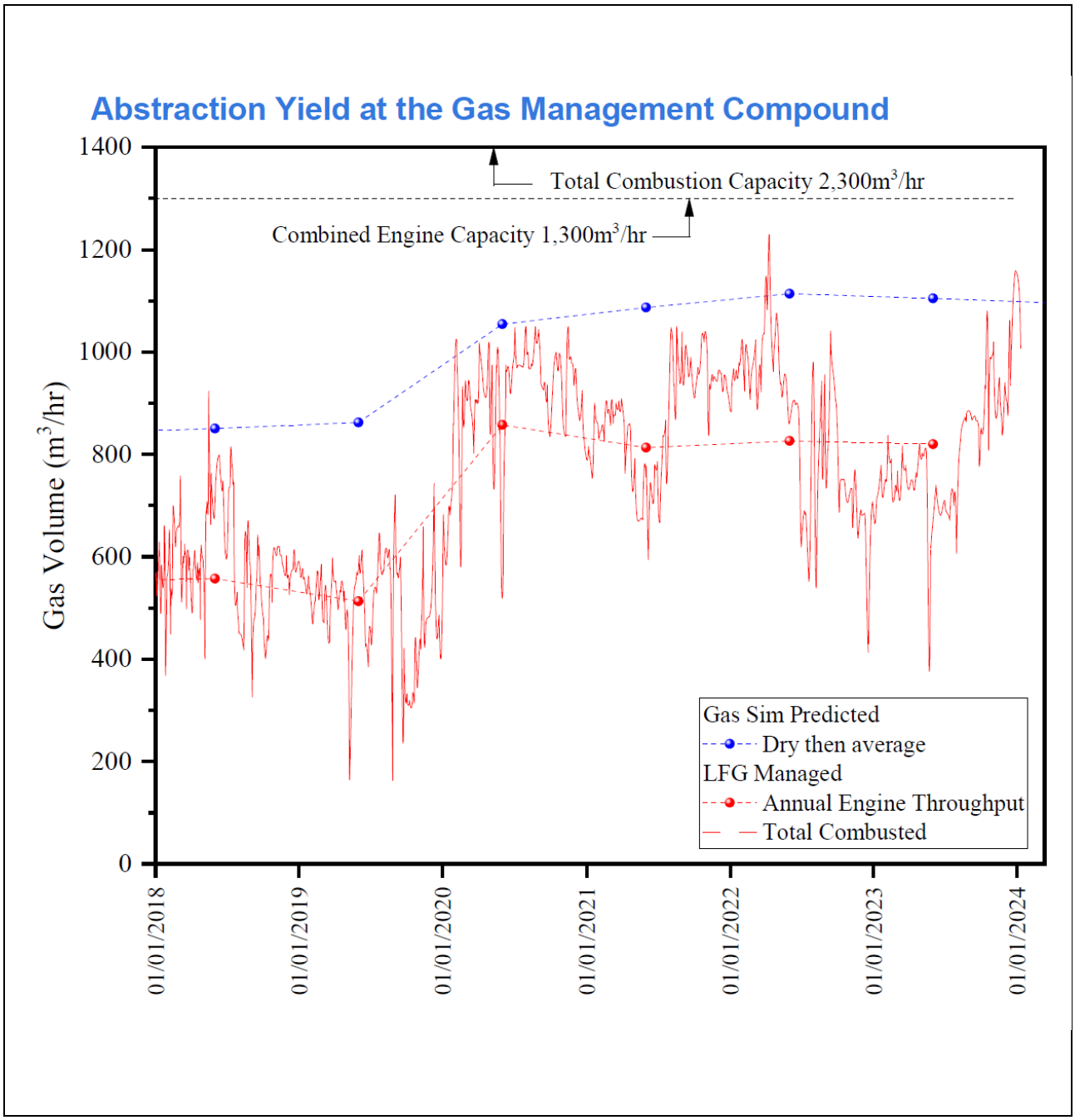


Figure 1 – Predicted gas generation Hafod Landfill Site. Source of the figure is from the 2023 annual monitoring review.

The GasSim 2 model predicts that in year (2024) landfill gas will be produced at a rate of 1100 m^3/hr. This amount of landfill gas volume measured at the compound has varied over the last few years. The average has stayed consistent but the gas combusted curve shows large variations above and below the average figure. Combusted gas has shown to be 200-300m3/hr above and below the average GasSim prediction. The combusted volume at the compound shows a fall from 2022 and then a rise up to 1000 m3 in 2024.

Landfill Gas Technical Guidance Note 03 (LFTGN03) – Guidance on the Management of Landfill Gas, recommends that a benchmark collection efficiency of **85%** should be used to assess the performance of a gas collection system.

Consequently, the benchmark collection figure that will be used to assess the current effectiveness of the gas collection system is X*0.85 = X **m3/hr.**

1100 X *0.85 = 935m3/hr

Gas flow was measured at 950m3 at the compound during the audit shows that the site is above the collection efficiency benchmark at 86%.

2 Overview of current landfill gas management system

Landfill gas is delivered to the gas control compound, situated at the NE corner of the site, via a permanent ring main. The majority of the gas and leachate wells are connected via manifolds in the older southern area of the site.

Permanent extraction wells have been installed in operational, permanently and temporary capped areas on the site.

Gas utilisation takes place in the gas control compound. On the date of the review inspection the recorded flow was 950 m3/hr.

Yearly reporting on the average flow (m3/hr) indicates a slight upward trend and plateau in average gas volumes captured at the site. However the volume at the compound fluctuates 200-300 m3/hr above and below the average figure (Figure 1).

In 2021 an average flow of 893 m3/hr was calculated from the yearly reported figures provided by the Operator, rising to the most recent calculated value of 933 m3/hr in 2023. The values are approximately the benchmark collection figure volumes calculated in GasSIM.

Annual monitoring (year)	Average flow (m3/hr)	GasSIM	Benchmark collection figure (GasSIM * 0.85)
2021	893	1090	926.5
2022	947	1110	943.5
2023	933	1100	935

3 Gas treatment system

Scope of review

Element	Issue	Main matters to be considered
Gas Treatment	Capacity	Does the installed plant have sufficient capacity to deal with the volume of gas predicted to be generated at the current time. Does the installed plant have sufficient capacity to deal with the volume of gas predicted to be generated in the peak year?
	Operation	How is the collected gas partitioned between the engines and the flares? Does the partitioning of gas effect environmental control? Does the volume of gas currently being treated correspond with the expected gas yield from the site?
	Emissions	Are emissions from the plant within acceptable limits?

3.1 Gas engines

The landfill gas engines at the site are a CAT 3516 1140 kw/hr with a capacity of 300-800 m3/hr and a CAT 3512 750 kw/hr with a capacity of 100-500 m3/hr. The flare was operational during the audit and the CAT 3512. The CAT 3516 was undergoing maintenance. The engines have sufficient capacity to combust the gas produced by the landfill.

3.2 Gas Flares

The gas compound contains a high temperature flare with a capacity of 150-1500 m3/hr (turndown ration of 10:1). The flare was newly installed in 2022. The flare has sufficient capacity to combust the gas produced by the landfill.

The flares flame arrestor had a faulty pressure sensor on the flare side of the flame arrestor. The pressure dial was on zero. The sensor was replaced on the 19.11.2024 with a tefen valve so that pressure across the flame arrestor can be monitored.

The engine and flares were housed in a secure compound;

3.3 Emissions

Emissions of the engines and flare did not form part of the scope of the audit.

4 Gas collection

The Site Audit, undertaken on the 12th and 13th November 2024, included a review of the gas collection system in the active landfilling in Phase 5 in the Northern area of the site. The older capped parts of the landfill to the South were also included in the audit.

5 Gas Collection – Extraction pipes

Overview

The site audit undertaken on the 12/13.11.24, looked at the gas installed infrastructure. **Appendix A & C**, Audit Summary, details the wells that were investigated.

5.1 Permanent extraction wells

In total there are approximately 100 permanently installed extraction points at the site, 48 gas wells and 10 leachate wells were visited during the audit.

5.2 Temporary systems

5.2.1 Pin Wells

Pin wells have been used within the active tipping face to capture landfill gas in the areas adjacent and beneath the tipping face. Pin wells in the current active tipping face are in the process of being buried by waste or are already buried by waste. The site has proposed further pin wells to be installed as the cell is infilled. Pin wells are an effective way to capture the landfill gas with high levels of H2S in the active cells. However close control and monitoring of the pins wells is required to ensure that oxygen is not drawn into the waste mass. Balance data from the site shows that the pin wells have indications of air being drawn into the waste mass but are kept open to capture odorous gas.

5.3 Well coverage

LFTGN03 recommends a maximum extraction well spacing of 40m to ensure adequate coverage. Therefore, for the purpose of this review a well spacing of 40 metres is used as a benchmark for assessing the coverage of the installed gas system.

The site has good well coverage, with the majority of the wells being within a 20m radius. However the northern part of Cell 4, where the north facing slope meets Cell 5b, has poor well coverage. Future well plans (Appendix A) provided by the operator shows additional pin well coverage in Cell 5b and the new tipping areas of the site and in the temporary 0.5m clay soil capped slope of cell 4. The plans are good but further wells and deeper wells that cover the entire waste mass is required in cell 4 and cell 5 (a/b).

5.4 Operation and performance

The status of gas collection field has been based on site observations and field balancing data.

Photographs are included in **Appendix C**, Audit Summary**.** A copy of the field balancing data and associated analysis is also presented in **Appendix E,** Gas Field Balancing.

The visible elements of the extraction system were inspected during the audit and at several locations some notable defects were recorded.

- Low angle wells beneath the temporary capping on cell 5a (SCAV or scavenger wells) have poor electro-fused joins onto the temporary capping. High methane gas readings at these joins were recorded. The joins on these wells need to be repaired.
- Concrete leachate towers were found to be areas of point source emissions of landfill gas.
- High suction pressures are found across the landfill on the majority of the wells. Suction up to -100+mbar based on the October balancing data. From discussion with the site operator the site uses methane percentage of the gas to keep track on gas production and extraction. If gas extraction exceeded production then the methane percentage would decrease. The site controls methane percentage and balance of the gas field by controlling the suction at which gas is extracted.. Suction pressure has increased in the gas field from August to late October. High suction pressures increase the risk of drawing air into the waste and creating aerobic conditions. High suction can also lead to rapid blinding of the well. Suction at the compound on the 13.11.24 during the audit was -84mbar.

Much of the pipework across the site is of a surface laid nature. No issues were found in the pipework across the site.

Gas monitoring results for the latest balance data show high hydrogen sulphide levels in cell 5A and 5B and in the recently installed pin wells in cell 5A. The balance data has a maximum H2S reading of 1000 ppm however the 2023 annual monitoring review shows very high H2S gas in wells HF00LC04 (2,760 ppm), HF00W131 (1,714 ppm), HF00W132 (1,896 ppm), HF00W133 (2,392 ppm), HF00W134 (1,821 ppm), HF00W135 (1,857 ppm), HF00W136 (1,273 ppm) and HFLMP05B (1,124 ppm). A copy of the readings are presented in **Appendix E,** Gas Field Balancing.

Leachate pumps have been installed in selected gas wells, in order to reduce the locally perched leachate levels. Elevated leachate levels will reduce performance of gas extraction wells, as the slotted section of available pipework is within the liquid. The high suction pressures on the wells may result in water drawn up into the well and worsen the problem. Condensate blockages also become more likely.

It is essential that a well de-watering Plan is implemented ASAP in order to increase the performance (and maintain life) of gas extraction wells.

A summary of the audit finding are attached in **Appendix C**, Audit Summary.

Findings

- Fugitive emissions from :-
    - around the base of gas wells
    - damaged temporary lining system
    - Leachate towers boot seals onto the temporary capping

- Air leaks
- Uncontrolled leachate breakouts in the northern uncapped area of the landfill.
- Holes in the LLDPE may serve as both a route for methane emissions and also a potential source of oxygen ingress into the landfill influenced by both barometric pressure and very variable suction pressures.
- High hydrogen sulphide levels found in, Cell 5Aand 5B with levels over 1000ppm.

Recommendations

- Operator to investigate and repair well defects, including bentonite seals, seals on well boots and leachate towers and holes in the liner.

- Operator to ensure that the well infrastructure is inspected every year.

- Install gas wells or pin wells on the northern slope of cell 4 to improve gas well coverage of the site.

- Monitor H2S levels in high H2S wells to see the trends of H2S generation.

- Update the site’s gas infrastructure drawing once new infrastructure is in place.

6 Fugitive emissions

Landfill gas that is not captured by the gas collection system is likely to escape from the site, either from the site surface or from point source emissions

6.1 Surface migration

A summary of the audit findings are presented in **Appendix C**, Audit Summary.

Findings

- 35% (38,060 m2) of the landfill is currently not capped with a geosynthetic liner. A further 12% (13,329 m2) of the landfill is covered by a 0.5m clay soil layer. The site has proposed temporary capping to cover an additional 8% (8,860 m2) of the landfill. (Appendix B)
- Fugitive methane was recorded in the uncapped areas.
- Methane was recorded in areas outside the waste mass. This is an indication of migration of gas from outside the temporary capped area or migration along installation infrastructure.
- Gas extraction in the uncapped area could be drawing in oxygen into the landfill.
- Gas balancing data shows numerous wells with evidence for air ingress (high nitrogen and oxygen). The site does allow for high air ingress in some wells within Cell 1, the older part of the site, where the site is permanently capped to maintain gas extraction of landfill gas and to mitigate odour. Gas balance data shows that wells with high oxygen are identified by the operator and turned off/isolated to stop air ingress into the landfill.

Recommendations

- Install temporary capping on areas of the landfill that will not return disposal operations to that part of the site for more than 6 months.
- Following the audit Enovert have provided NRW with a capping plan (Appendix B).

6.2 Emissions to atmosphere

6.2.1 Point source emissions

Unsealed leachate wells and monitoring points may act as significant point source emissions.

During the review the following was identified: -

- Leachate wells –
    - Leachate concreate towers have high readings of methane around the base of the concreate rings.
    - Poor sealing of leachate wells to the temporary capping. Gaps between the temporary capping and the concreate allow fugitive emissions of landfill gas.
- Gas wells -
    - Fugitive methane emissions at the base of wells where the bentonite seal is dried and cracked.

  A summary of both the gas wells and leachate wells are summarised in **Appendix C,** Audit Summary.

6.2.2 Surface emissions

The review of the capping plan of the site identified areas of the site that do not have adequate capping. The Landfill Status Plan in Appendix B show the areas of the landfill capped.

[Note: Typically landfill gas production commences within a few weeks of waste deposition and methanogenesis may be well established after 6 months and reached steady state after 12 months [ref. Barry D.L., Smith. R., & Harries C (2004) Onset of Methanogenesis in Landfilled MSW. Proc. Waste 2004 Conf. Integrated Waste Management and Pollution Control, 28-30 September 2004]. Consequently it is considered likely that surface emissions may be significant in any phase of the site where waste deposits ceased more than 12* months ago and gas extraction is not in place].[*this figure is dependent on site conditions.]

The main source of methane detected at the site from the gazomat survey was measured from the leachate wells and the uncapped areas. Odour was detected on the working face and methane readings taken at shoulder height downwind of the tipping face were 150ppm. No odour and methane emissions was detected from the surface of the non-operational areas where permanent capping is in place.

Recent areas of temporary capping have been installed in the NE corner of the site (Appendix B). At the northern toe of cell 5A methane gas was recorded 1-2m away from the edge of the capping. Bubbling puddles with methane escaping was also observed. This is an indication that landfill gas is travelling out of the cell. From discussions with the site, a likely cause of the gas present 1-2m from the toe of the temporary capping is the use of un-engineered clay to aid sealing of the intercell bund onto the waste. The un-engineered clay has likely created a preferential pathway for gas to escape. Large amounts of leachate was also observed beneath the temporary capping at the toe of Cell 5A slope. The leachate has caused the temporary capping to move and be under strain as leachate collects at the bottom of the slope. The strain of the capping has formed a tear at the SCAV 2 well where fugitive methane was recorded.

At the southern edge of the recently installed capping in cell 5A there is a 5m wide gap to the area of permanent capping. The uncapped strip is an area where fugitive surface emissions were recorded up to 0.8% methane gas. This strip of uncapped landfill allows landfill gas to escape and for oxygen to ingress into the landfill.

Uncapped areas in the northern part of the landfill had leachate breakouts and high methane readings across this section of the landfill. These areas of uncapped landfill is the main cause of surface emissions. The uncapped area is most likely the cause behind the high nitrogen readings in the sites gas balance data as the uncapped area can draw in air from the atmosphere. Rainwater entering the landfill in the uncapped areas would also contribute to the large amount of leachate generated in the landfill.

Finding

Greenhouse gas emissions are likely to be significant from:-

- Areas where there is no temporary or permanent geosynthetic capping
- Damaged temporary capping
- Poorly sealed gas wells and leachate towers

Recommendations

- Install temporary capping on areas of the landfill that will not return disposal operations to that part of the site for more than 6 months.
- Repair all damaged areas of temporary capping.
- Ensure bentonite seals are routinely checked during site walkovers.
- Carry out necessary repairs to the damaged bentonite seals.

7 Other matters

Landfill leachate is collected and transported offsite for treatment. Leachate is pumped from chambers/monitoring points and from a number of gas wells at the site.

- Extraction sump / well –

Cell 1 – no sumps

Cell 2 – no sumps

Cell 3 – LC3

Cell 4 – LC4

Cell 5 – LC(P)5 and LC5B

- Monitoring point –

Cell 1 – MP1b (LMP1r)

Cell 2 – LMP2r

Cell 3 – LMP3

Cell 4 – LMP4A and LMP4B

Cell 5 – LMP5A, LMP5B and LMP5C

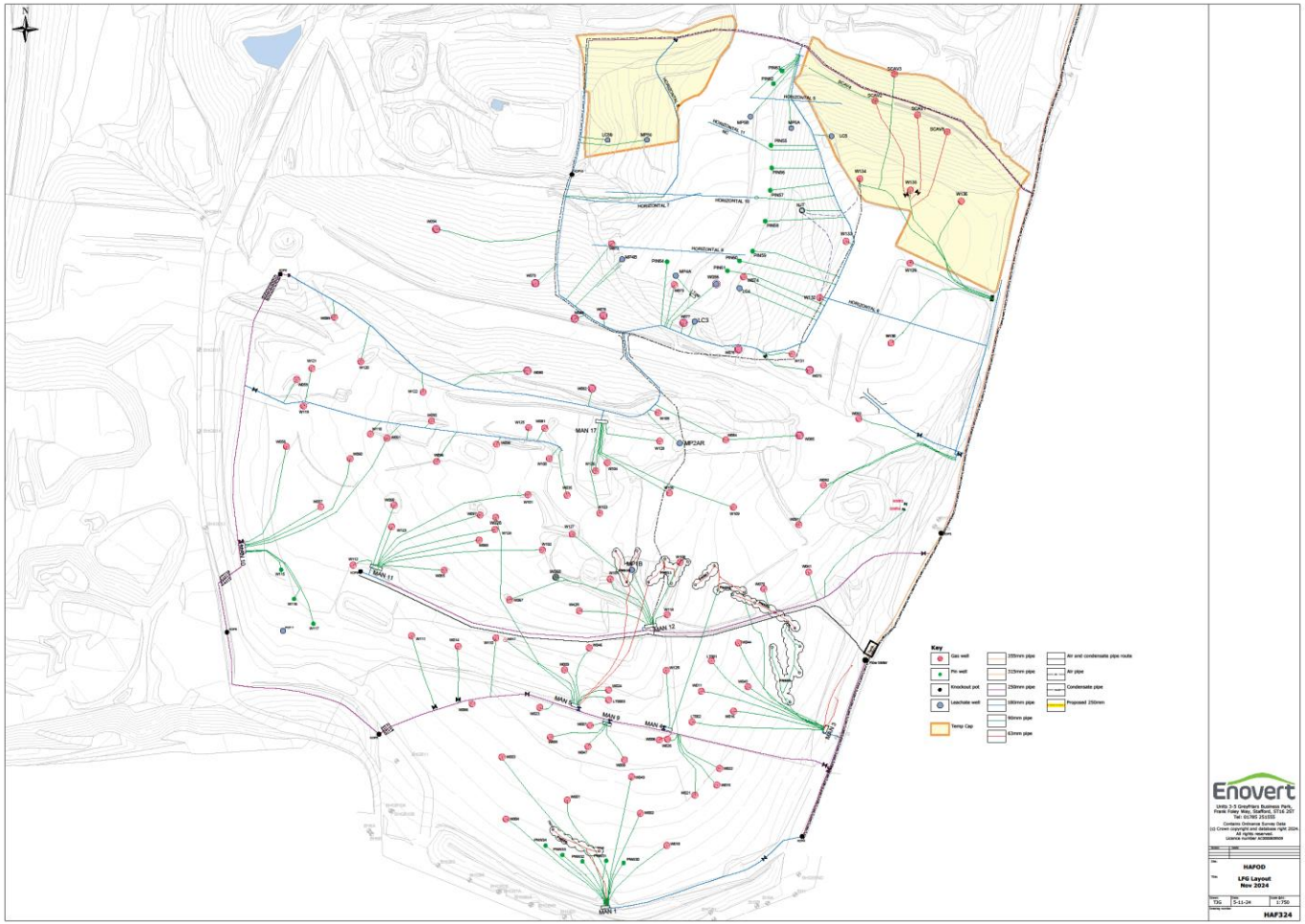
Findings

- Leachate breakouts were observed in the uncapped areas of the landfill. Leachate was collecting at the base of the landfill to the west of cell 5B.
- Basal and perched leachate could potentially block the wells and reducing the amount of gas being collected.

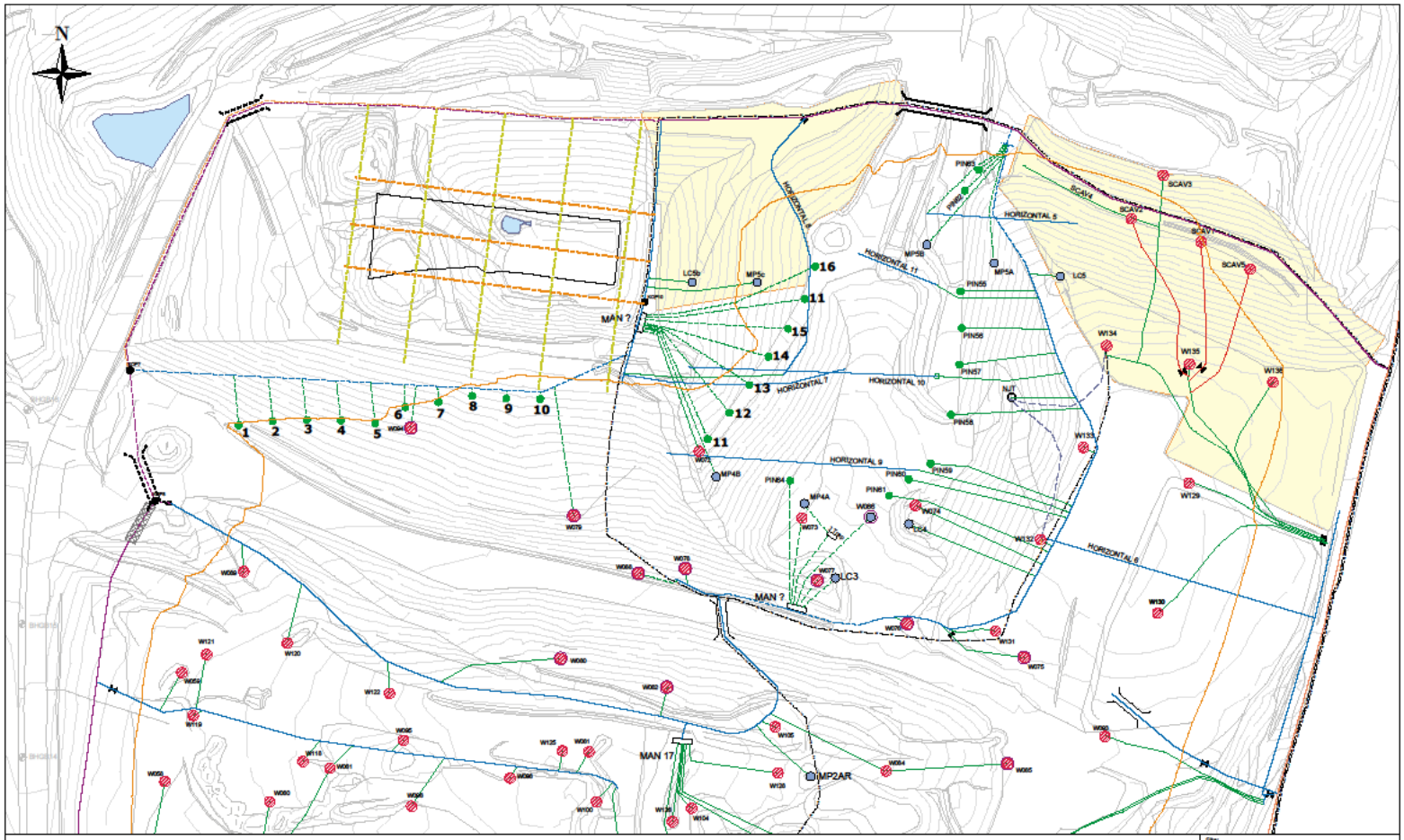
Recommendations

- The operator must continue to monitor and report leachate levels in accordance with their permit.
- Use temporary or permanent impermeable geosynthetic capping to reduce rainwater ingress into the waste.
- Improve leachate control within the gas wells – carry out a dipping exercise to establish leachate levels in wells.
- Ensure that there is sufficient provisions for leachate containment on site as well as adequate transportation and disposal to offsite facilities.
- The operator to produce an updated surface water management plan.

APPENDIX A – Gas Infrastructure Map



Proposed Landfill Works -new gas wells



Key

- 250mm pipe
- 180mm pipe
- 90mm pipe
- Proposed 250mm pipe
- Proposed 180mm pipe
- Proposed 90mm pipe
- air line
- Proposed air line
- 10m waste depth at 12-9-24
- Proposed horizontal Phase 1 (approx 86mAOD)
- Proposed horizontal Phase 2 (approx 92mAOD)
- Temp Cap

Units 3-5 Greyfriars Business Park,
Frank Foley Way, Stafford, ST16 2ST
Tel: 01785 251555

Enovert

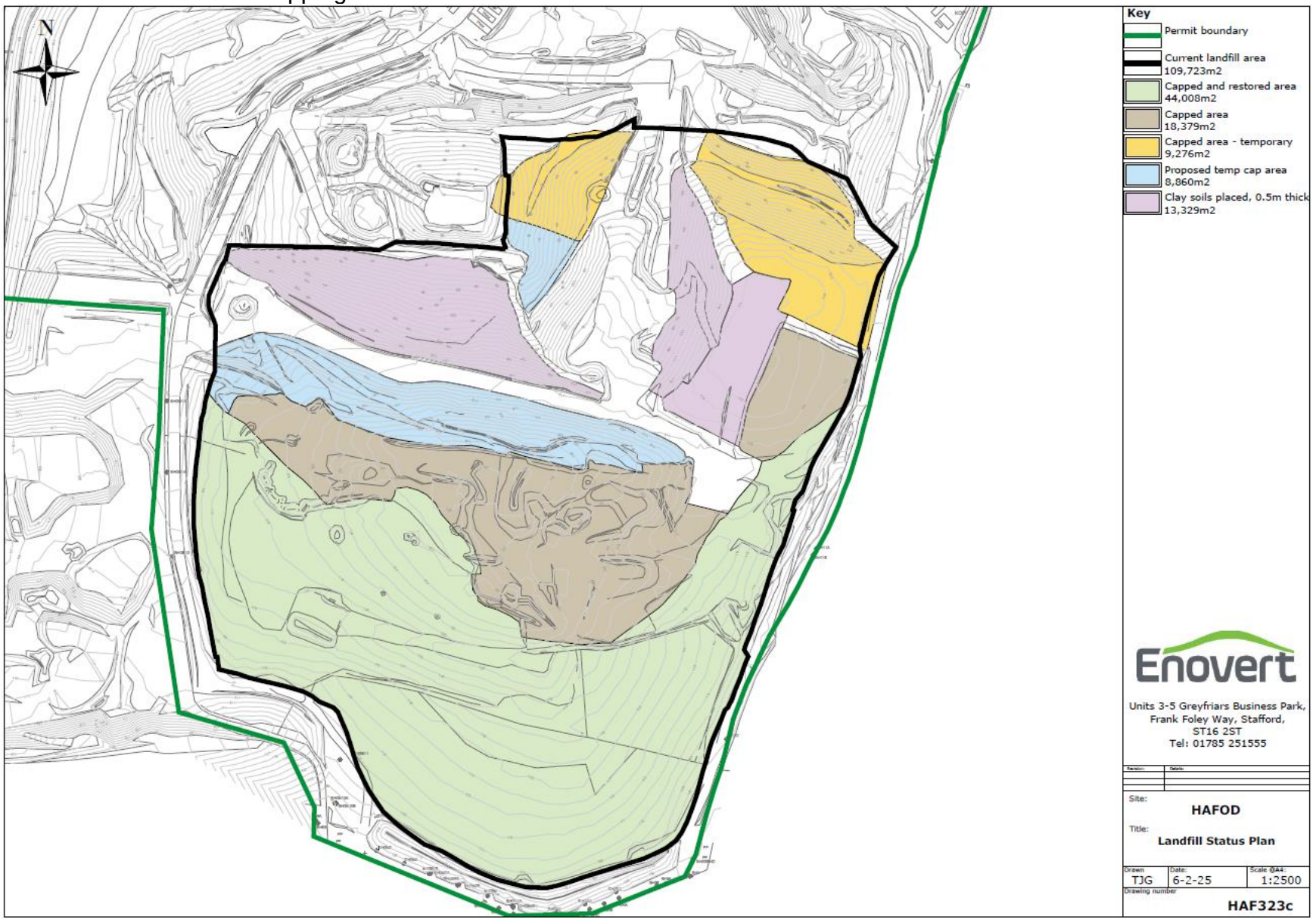
Site: **HAFOD**

Title: **LFG Works Nov 2024**

Drawn:	Date:	Scale @A3:
TJG	4-11-24	1:1000

Drawing number: **FIGURE x**

APPENDIX B – Landfill Capping Overview



APPENDIX C – Audit Summary

Hafod

Methane Emissions Survey Sheet –
Photograph index

GAS WELLS AND MANIFOLDS

GW132	Kink in kanaflex
GW122	Deteriorating kanaflex
GW91 & GW92	Kanaflex below ground
GW115 / 116 / 46 / 7 & 70	Dense vegetation obstructing access
GW129 & 130	Fugitive emissions. Repair / rehydrate bentonite seal
GW166 / 117 / 13 /133 / 67 & 42R	Modify end cap
GW76	Fugitive emissions. Disconnected well on working face
GW135	Fugitive emissions
GW136	Fugitive emissions
Scavenger wells	Fugitive emissions

LEACHATE WELLS, RISERS, BREAKOUTS and CONDENSATE MANAGEMENT

LCP3	Fugitive emissions
LC4	Fugitive emissions
LCP5	Fugitive emissions
MP5A	Fugitive emissions
MP5B	Fugitive emissions
GW1 / 2 & 3	Ground water risers – fugitive emissions
North facing slope of Cell 4	Leachate breakout / vegetation dieback – fugitive emissions
Cell 5B	Leachate breakout
Cell 5B toe	Leachate breakout at the toe of the temporary capped area
KOP 7	Fugitive emissions
Toe of Cell 5A & Scavenger 2	Leachate collecting causing bulging and tension in the temporary capping Rip at base of well in temporary capping. Secure top of well
Toe of Cell 5A	Leachate removal coupling

GENERAL SITE

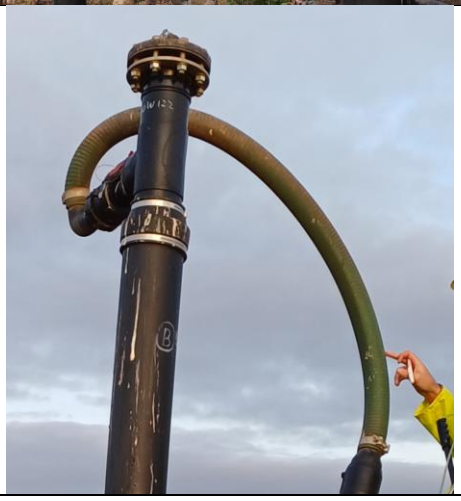
Uncapped area – 4m east of GW129	Fugitive emissions
Working face	Wells LCP3 and GW77 in foreground
Working face	Working face and temporary capping on cell 5A and 5B

Gas compound	General view of compound and surface water lagoon

PERIMETER MONITORING BOREHOLES

Southern perimeter near GB5	Algal bloom / orange coloured staining / traces of sheen on water surface
AGB4A / 4B / 5 / 7B / 8 / 9 / I / J	Methane detected above open valves. No odour detected. Rate of gas was not recorded.

GAS WELLS AND MANIFOLDS

Well number	Comments	Photograph
GW132	Kink in kanaflex	
GW122	Deteriorating kanaflex	

GW91 & GW92	Kanaflex below ground	 

GW115 / 116 / 46 / 7 & 70	Dense vegetation obstructing access			
GW129 & 130	Fugitive emissions GW129 up to 8.50% CH4 Repair / Rehydrate bentonite seal on GW129 & 130			

GW116 / 117 / 13 / 133 / 67 & 42R	Modify end cap	
GW76	Fugitive emissions 0.25% CH4 Disconnected well on working face	

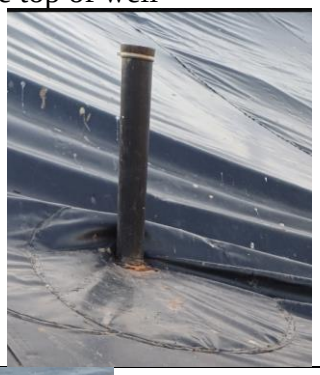
GW135	Fugitive emissions Base 8% CH4 Joint 3% CH4	
GW136	Fugitive emissions Hole at base in the weld 8.50% CH4	
Scavenger wells (Photo of scavenger 7)	Fugitive emissions from Scavengers 1 -1.80% CH4 2 -2.60% CH4 3 -0.60% CH4 7 -4.20% CH4	

LEACHATE WELLS, RISERS, BREAKOUTS and CONDENSATE MANAGEMENT		
Location / well number	Comments	Photograph
LCP3 (RHS) and GW77 (LHS)	Fugitive emissions LCP3 – 30% CH4 at base of well. High H2S, alarm activated	
LCP3	View of LCP3 and tipping face. Personal H2S gas alarm warning close to LC3. Indication of high H2S and landfill gas (30% methane)	
LC4	Fugitive emissions 1% CH4 side of chamber Disconnected well	

LCP5	Fugitive emissions from edge of boot seal. Up to 7.7% CH4 Concrete has visible porosity and holes allowing gas to escape from behind the boot seal.		 
MP5A	Fugitive emissions 1.60% CH4 at the edge of the concrete chamber		

MP5B	Fugitive emissions 13.5% CH4 at base of well	
GW1 / 2 & 3	Ground water risers Max level of 1000ppm CH4 detected near the risers	
North facing slope of Cell 4	Leachate breakout / Vegetation dieback. Uncapped slope 0.6% CH4 recorded at leachate breakout location	 

North facing slope and the active tipping face	Large uncapped area of cell 4 and western slope of cell 5a and 5b.	
Cell 5B	Leachate breakout Leachate towers LC5B and MP5C in background	
Cell 5B toe	Leachate breakout at the toe of the temporary capped area	

KOP 7	47ppm CH4 Base of well 40ppm CH4 at temporary gaffer tape repair 14% CH4 from hole in the top of the KOP wrapped in yellow tape		
Toe of Cell 5A Scavenger 2	Leachate collecting causing bulging and tension in the temporary capping. 2.60% CH4 near toe		Rip at base of well in temporary capping Secure top of well 
Toe of Cell 5A	Leachate removal coupling		

Toe of 5A	Bubbling gas at the toe.		

GENERAL SITE		
Well number	Comments	Photograph
Uncapped area - 4m east of GW129 (GW129 shown in background near litter fence) Thin 5m strip between permanent and temporary cap	Fugitive emissions 0.80% CH4 (blue flag marker – operator survey recorded 1900ppm CH4)	
Working face Wells LCP3 GW77 in foreground		

Working face and temporary capping on cell 5A and 5B	
Gas compound	

PERIMETER MONITORING BOREHOLES		
Well number	Comments	Photograph
Southern perimeter near GB5	Algal bloom Orange coloured staining Traces of sheen on water surface	
GB4A / 4B / 5 / 7B / 8 / 9 / I / J	Methane detected above open valves GB4A– 700ppm GB4B– 32ppm GB5 – 0.80% GB7B– 110ppm dropped to 14ppm GB8 – 2.4ppm GB9 – 34ppm I – 7ppm J – 28%	

APPENDIX D - Methane Emission Survey.

Methane Emissions Survey Sheet –

Site	**Hafod. Day 1**	**Date**	12/11/24	**Time**	in:	9:30
					out:	4:30
Instrument	Gazomat Inspectra TDL	**Test gas reading**	-	**Time**		-
Next Calibration due		**Background reading**	1.8 ppm	**Time**		
Weather conditions:	Sunny, Cold, still			**Atm. Press.**		1037
Survey Undertaken by:	Mostyn Wall.					

General comments / observations

Survey Results				
Point ref.	**Time**	**Methane Reading**	**Feature and / or Grid Reference**	**Description / Comment**
SCAV3	10:53	0.6% Gas	SCAV3 well at toe of temporary capping	Approx 30 cm Tear on the temporary cap at the weld join to the well.
	10:58	1.5% Gas	Edge of the temporary cap	Bubbling gas observed in puddle.
	11:05	2.5ppm		Corner of temporary cap.
Pin 62	11:08	36ppm & 46ppm		Edge of well
Pot 1 (SCAV 7)	11:11	3 % gas		Pot 1 next to MP5A – measured at the base of the well.
Pot1 (SVAC 7)		4.2%		Edge of chamber
MP5B	11:17	13.5% gas		Edge of concreate chamber
MP5A	11:21	138ppm & 1.6% gas		Edge of concreate chamber
LC5	11:28	142ppm & 7.7% gas		Edge of boot seal onto concreate. Concreate had visible porosity and holes that allowed gas to escape behind boot seal.
134	11:41	139ppm		At well connection
SCAV 1	11:47	1.8% Gas		Hole in temp cap. Acute low angle weld join where SCAV 1 is attached to the temp cap.
SCAV 2	11:48	2.6 % Gas		Hole in Temp cap. Acute low angle weld join where SCAV 2 is attached to the temp cap.
135	11:50	8% Gas		Hole in temp cap at the weld to well 135
136	11:56	8.5% Gas		Hole in temp cap at the well join
	11:59	30ppm	NE Corner of the temporary cap at the top of the slope	Airbourne reading downwind of active tipping.
	12:02	705ppm	Above ring main on the eastern boundary	

GW2	12:07	120ppm	GW riser on slope opposite temporary cap.	GW riser that goes beneath engineered landfill.

Point ref.	Time	Methane Reading	Feature and / or Grid Reference	Description / Comment
GW2	12:09	1000ppm	GW riser on slope opposite temporary cap.	
	12:13	188ppm	53.002523 , -3.027942	On soil cover on edge of the landfill.
	12:16	30ppm	53.002523 , -3.027942	On soil cover on edge of the landfill.
129	12:20	625ppm		Base of well, bentonite seal dry and cracked.
129	12:20	8.5%		Base of well, bentonite seal dry and cracked.
130	12:24	24ppm		Base of well
132	12:32	25ppm		Base of well
133	12:35	64ppm		Base of well
131	12:41	7.3ppm		
W76	12:43	0.25% Gas		Edge of metal casing – disconnected due to road crossing /tipping face
LC3	12:49	30% Gas		Base of leachate well. H2S alarm went off.
W77	12:52	0.1% gas		Base of well
W73	12:54	1% Gas		Base of well – Gurgling well, sound of leachate being drawn up.
MP4A	12:59	48ppm		Base of well.
LC4	13:04	1% Gas		Side of well chamber
88	14:35	26pm		
78	14:35	150ppm		Airbourne reading (emission from tipping and uncapped areas.)
72	14:42	105ppm		Base of well
	14:43	427ppm	Slope of face next to well 72	Emission from uncapped area / slope
MP4B	14:45	0.6% Gas		Side of well. Air leak coming from electrical pump – drawing in air.
	14:58	185ppm		Leachate pipe next to well 79
W72	15:00	0.4% Gas		Leachate bubbling gas below well 72
MP5C	15:11	125ppm		Base of well
MP5C	15:11	0.1 % Gas		Inside concreate casing – whistling sound of leak.
	15:20	30ppm	Leachate breakout on slope	
	15:20	0.1 Gas	Leachate breakout on slope	Large patch of non-vegetation halfway up slope – leachate spring

		6% Gas	Leachate breakout on slope	
	15:30	280ppm	53000989, -3.032015	Uncapped slope
W94	15:35	12.8ppm		
KOP8	15:44	5.7ppm		Top seal of KOP
W89	15:48	2.5ppm		
W120	15:50			Lots of leachate in well
W122	15:54	2.5ppm		Next to uncapped flank – could be drawing in O2?

Findings/Recommendations

Hafod

Surface Emissions Survey 12/11/24

Key

- 0 - 50ppm
- 50 - 100ppm
- 101 - 500ppm
- 501 - 1000ppm
- 1001 - 5000ppm
- 5001 - 10000ppm
- >1% v/v

Methane Emissions Survey Sheet –

Site	**Hafod. Day 2**	**Date**	13/11/24	**Time**	in:	9:30
					out:	4:30
Instrument	Gazomat Inspectra TDL	**Test gas reading**	-	**Time**		-
Next Calibration due		**Background reading**	1.8 ppm	**Time**		
Weather conditions:	Sunny, Cold, still			**Atm. Press.**		1036
Survey Undertaken by:	Mostyn Wall.					

General comments / observations

Survey Results				
Point ref.	**Time**	**Methane Reading**	**Feature and / or Grid Reference**	**Description / Comment**
	10:46	25ppm		Exhaust from the smaller engine at the gas compound
	11:08	635ppm	53.003281, -3.028372	Toe of slope of temp cap. 2m away from the edge.
	11:12	9.1ppm		Toe of slope of temp cap. 2m away from the edge.
	11:14	640ppm		Bubbling gas 1m away from the edge of the temporary cap.
GW2	11:19	114ppm		GW2 riser
		81ppm		Riser to the left of GW2
GW1		160ppm		GW1
		70ppm		GW1 – front hole in lid
GW2		246ppm		Underneath well casing
	11:28	317ppm	Above ring main adjacent to the temporary cap (NE) outside waste mass	
		9.6ppm	53.002776, -3.027971	3m away from the edge of the cap.
	11:31	60ppm	53.002590, -3.027971	Edge of fence outside waste next to North Hall road.
	11:36	1.9ppm		Area of no cap between temporary cap and permanent cap on Eastern edge of landfill
		35ppm		Area of no cap between temporary cap and permanent cap on Eastern edge of landfill
		163ppm	53.002495, -3.028387	Area of no cap between temporary cap and permanent cap on Eastern edge of landfill
		0.4% gas	53.002573, -3.028643	Area of no cap between temporary cap and permanent cap on Eastern edge of landfill – 6m east of W129
	11:43	0.8% gas		Area of no cap between temporary cap and permanent cap on Eastern edge of landfill – 4m east of W129. Blue flag from operator survey recorded 1900ppm.

Point ref.	Time	Methane Reading	Feature and / or Grid Reference	Description / Comment
W93	12:00	15ppm		Ambient air reading next to W93 – shoulder height measurement.
W92	12:03	10ppm		Buried flexihose at base of well. Flexihose needs to be above the surface.
W85	12:06	54ppm		1.5m away from well
W85		6.6ppm		At base of well
W91	12:11	3.3ppm		At base of well
W70	12:12	3.0ppm		At base of well
W114	12:17	3.0ppm		At base of well
LMP4A	12:21	3.0ppm		At base of well
W42R	12:26	128ppm		` At base of well
W42R		550ppm		At base of well
W67	12:31	3ppm		At base of well
W102	12:36	1.8ppm		At base of well
W124	12:41			Ok
W97	12:42			Ok
W101	12:44	1.8ppm		Ok
	12:50	98ppm		Surface of uncapped flank, area of poor vegetation cover
		150ppm		Surface of uncapped flank, area of poor vegetation cover
		503ppm	53.002176, -3.032420	Surface of uncapped flank, area of poor vegetation cover
POT 7	14:03	40ppm		Duct tape on boot seal
		47ppm		Base of well
		14% Gas		Hole in the top of POT7
W114	14:14	1.8ppm		Base of well
W46	14:20	1.8ppm		Base of well
W23	14:24	2.3ppm		Base of well
W47	14:29	1.8ppm		Base of well
GB9	14:40	34ppm		Recording from open valve
GB8	14:42	2.4ppm		Recording from open valve
GB7B	14:44	110ppm to 14ppm		Value open, high reading from 110 then dropped to 14 ppm in a few seconds. Most likely gas in the top of the well.

GB5	14:50	1400pm		In well bore casing next to closed well value
		1.7% Gas		In well bore casing next to closed well value
		0.8% Gas		Above open valve.
Well J	14:53	4ppm		Above open valve.
		18% Gas		Above open valve.
		28% Gas		Above open valve. Increased from 4ppm to 28% gas
Well I	14:58	7ppm		Above open valve.
GB4A	15:02	0.6ppm		Within bore casing – closed valve
		700ppm		Above open valve.
GB4B	15:06	32ppm		Above open valve.

Findings/Recommendations

Hafod

Surface Emissions Survey 12/11/24

Key

- 0 - 50ppm
- 50 - 100ppm
- 101 - 500ppm
- 501 - 1000ppm
- 1001 - 5000ppm
- 5001 - 10000ppm
- >1% v/v

APPENDIX E – Gas Field Balancing Data

Monitor ID	Date Taken	Initial Assessment	Heating Status	Valve after	CH4 %	CO2 %	O2 %	Balance Gas %	CH4:CO2	N2%	FN2%	FN2%N2	N2:02	Diff mBar	Atm mbar	CO ppm	H2S ppm	Comments
HF000NJT	22/10/2024 13:45	OK		10	49.0	26.7	2.6	16.7	1.8	21.7	11.9	55%	8	-24.82	1012	13	0	11
HF00HZ05	22/10/2024 13:26	OK		100	58.2	40.6	0.9	0.3	1.4	0.3	-3.1	-1044%	0	-88.17	1013	33	0	1
HF00HZ06	22/10/2024 08:54	OK		90	61.4	43.3	0.2	0	1.4	-4.9	-5.7	116%	- 24	-112.50	1010	18	0	1
HF00HZ07	22/10/2024 13:01	OK		100	60.3	39.7	0.6	0	1.5	-0.6	-2.9	483%	- 1	-93.06	1013	15	0	1
HF00HZ09	22/10/2024 13:50	OK		100	52.8	37.0	1.4	8.8	1.4	8.8	3.5	40%	6	-77.16	1012	30	0	2
HF00HZ10	22/10/2024 13:40	OK		30	59.8	39.1	0.3	0.3	1.5	0.8	-0.4	-46%	3	-85.16	1011	13	0	1
HF00HZ11	22/10/2024 13:31	OK		10	59.8	41.8	0.1	0	1.4	-1.7	-2.1	124%	- 17	0.12	1012	43	0	1
HF00HZ11	22/10/2024 13:32	OK		30	59.7	41.9	0.1	0	1.4	-1.7	-2.1	124%	- 17	-19.43	1012	38	0	1
HF00LC04	22/10/2024 13:57	Aerobic	Caution	0	0.4	6.8	2.0	74.2	0.1	90.8	83.2	92%	45	1.14	1012	17	0	12
HF00LC05	22/10/2024 13:27	OK		40	45.7	33.4	1.8	17.4	1.4	19.1	12.3	64%	11	-3.49	1013	22	0	2
HF00LC5B	22/10/2024 13:10	OK		20	52.8	39.5	1.0	6.3	1.3	6.7	2.9	43%	7	-6.52	1015	26	1	2
HF00LC5B	22/10/2024 13:11	OK		30	52.9	39.2	1.4	6.5	1.3	6.5	1.2	18%	5	-10.98	1015	25	1	2
HF00M1MA	22/10/2024 11:01	OK		100	51.5	35.9	1.3	11.3	1.4	11.3	6.4	56%	9	-109.91	1012	7	0	2
HF00M1MB	22/10/2024 10:45	OK		100	52.1	35.8	1.3	10.8	1.5	10.8	5.9	54%	8	-109.16	1011	6	0	2
HF00M3MA	22/10/2024 09:46	OK		100	58.5	39.9	0.7	0.9	1.5	0.9	-1.8	-197%	1	-109.67	1011	5	0	1
HF00M3MB	22/10/2024 09:25	OK		100	59.1	41.0	0.4	0	1.4	-0.5	-2.0	409%	- 1	-110.58	1010	5	0	1
HF00M4MA	22/10/2024 10:06			100	25.3	24.9	2.9	44.4	1.0	46.9	35.9	77%	16	-108.41	1010	10	0	4
HF00M4MB	22/10/2024 10:01			100	28.6	28.4	3.0	39.2	1.0	40.0	28.7	72%	13	-109.05	1010	10	0	4
HF00M5MA	22/10/2024 10:29	OK		100	51.1	41.1	1.0	6.8	1.2	6.8	3.0	44%	7	-108.84	1010	12	0	1
HF00M5MB	22/10/2024 10:17	OK		100	52.1	39.8	1.2	6.9	1.3	6.9	2.3	34%	6	-108.41	1010	12	0	2
HF00M9MA	22/10/2024 10:14	OK		100	58.6	39.0	0.8	1.6	1.5	1.6	-1.5	-91%	2	-107.58	1010	7	0	1
HF00M9MB	22/10/2024 10:08			100	43.0	36.1	1.3	19.6	1.2	19.6	14.7	75%	15	-108.60	1010	14	0	2
HF00W001	22/10/2024 10:49			20	30.0	21.4	2.7	41.2	1.4	45.9	35.7	78%	17	-111.12	1012	4	0	5
HF00W002	22/10/2024 10:48	OK		100	57.2	32.2	1.3	9.3	1.8	9.3	4.4	47%	7	-110.45	1012	6	0	2
HF00W003	22/10/2024 10:50			40	36.8	26.2	5.4	31.6	1.4	31.6	11.2	35%	6	-112.26	1012	5	0	5
HF00W004	22/10/2024 10:58	OK		70	53.2	35.8	1.8	9.2	1.5	9.2	2.4	26%	5	-110.52	1012	7	0	2
HF00W005	22/10/2024 10:12	OK		5	60.9	41.0	0.2	0	1.5	-2.1	-2.9	138%	- 10	-106.53	1011	5	0	1
HF00W006	22/10/2024 09:59	OK		100	57.1	43.7	0.4	0	1.3	-1.2	-2.7	229%	- 3	-108.93	1010	9	0	1
HF00W007	22/10/2024 10:16	Air Leak		0	14.6	10.6	16.0	58.8	1.4	58.8	-1.6	-3%	4	-95.72	1010	3	0	2
HF00W008	22/10/2024 10:09	Aerobic	Caution	0	0.5	8.3	3.6	74.7	0.1	87.6	74.0	84%	24	-63.42	1010	6	0	6
HF00W009	22/10/2024 10:18	OK		100	52.0	39.8	1.9	6.3	1.3	6.3	-0.9	-14%	3	-108.02	1011	12	0	2
HF00W010	22/10/2024 10:46			25	35.2	24.3	4.8	34.3	1.4	35.7	17.6	49%	7	-109.67	1012	4	0	5
HF00W011	22/10/2024 09:31	OK		30	57.8	40.8	0.7	0	1.4	0.7	-2.0	-282%	1	-111.26	1011	9	0	1
HF00W014	22/10/2024 10:36	OK		10	49.2	33.9	2.9	14	1.5	14.0	3.0	22%	5	-108.51	1011	4	0	2
HF00W015	22/10/2024 09:54	OK		100	45.1	36.6	0.9	17.4	1.2	17.4	14.0	80%	19	-108.46	1010	13	0	1
HF00W016	22/10/2024 09:29	Air Leak		0	0.5	1.5	21.8	76.2	0.3	76.2	-6.0	-8%	3	-89.59	1011	1	0	2
HF00W021	22/10/2024 09:56	OK		100	63.3	36.8	0.7	0	1.7	-0.8	-3.5	435%	- 1	-108.56	1010	6	0	1
HF00W022	22/10/2024 09:51	Air Leak		100	0.3	2.0	20.3	76.2	0.2	77.4	0.8	1%	4	-107.72	1010	2	0	2
HF00W022	22/10/2024 09:52	OK		100	55.5	40.7	0.3	3.5	1.4	3.5	2.3	67%	12	-97.81	1010	6	0	1
HF00W023	22/10/2024 10:31	OK		100	60.1	41.3	0.7	0	1.5	-2.1	-4.8	227%	- 3	-108.70	1011	5	0	1
HF00W024	22/10/2024 10:22	OK		100	56.4	40.8	0.8	2	1.4	2.0	-1.1	-53%	2	-108.88	1010	13	0	1
HF00W026	22/10/2024 09:57			90	36.4	32.6	1.2	29.8	1.1	29.8	25.2	85%	25	-108.97	1010	14	0	2
HF00W028	22/10/2024 10:25	OK		100	49.5	39.4	1.7	9.4	1.3	9.4	3.0	31%	6	-109.02	1011	12	0	2
HF00W041	22/10/2024 09:19	OK		10	65.1	18.6	2.8	13.5	3.5	13.5	2.9	22%	5	-39.27	1010	4	0	2
HF00W044	22/10/2024 09:38	OK		100	56.1	40.8	0.7	2.4	1.4	2.4	-0.3	-12%	3	-110.51	1011	5	0	1
HF00W045	22/10/2024 09:36	OK		20	51.0	36.4	2.2	10.4	1.4	10.4	2.1	20%	5	-110.70	1011	5	0	2
HF00W045	22/10/2024 09:37	OK		30	50.0	36.0	2.5	11.5	1.4	11.5	2.0	18%	5	-111.24	1011	3	0	2
HF00W046	22/10/2024 10:20			90	15.0	11.2	3.7	57.9	1.3	70.1	56.1	80%	19	-108.55	1011	1	0	2
HF00W046	22/10/2024 10:21	Air Leak		10	15.2	11.2	15.9	57.7	1.4	57.7	-2.3	-4%	4	-108.93	1011	2	0	2
HF00W047	22/10/2024 10:11	Aerobic	Caution	0	7.3	38.3	2.0	52.4	0.2	52.4	44.8	86%	26	-16.11	1011	67	1	4
HF00W049	22/10/2024 10:55	OK		100	50.4	36.7	0.4	11.7	1.4	12.5	11.0	88%	31	-110.77	1012	8	0	2
HF00W055	22/10/2024 12:24	OK		100	58.8	39.7	0.9	0.6	1.5	0.6	-2.8	-472%	1	-111.58	1011	6	0	1
HF00W056	22/10/2024 12:16			40	25.1	20.7	1.0	53.2	1.2	53.2	49.4	93%	53	-108.60	1011	4	0	1
HF00W057	22/10/2024 11:17			0	12.9	4.9	5.3	64.8	2.6	76.9	56.9	74%	15	-38.69	1007	3	0	6
HF00W058	22/10/2024 11:20	Air Leak		0	1.8	3.5	20.5	74	0.5	74.2	-3.1	-4%	4	-100.93	1012	2	0	2
HF00W059	22/10/2024 11:25	OK		10	74.6	16.6	1.1	7.3	4.5	7.7	3.5	46%	7	-90.99	1011	2	0	2
HF00W060	22/10/2024 11:19	Aerobic		50	25.0	25.0	0.6	49.4	1.0	49.4	47.1	95%	82	-50.48	1012	3	0	5
HF00W061	22/10/2024 11:18			70	40.0	33.8	1.3	24.9	1.2	24.9	20.0	80%	19	-90.36	1012	3	0	2
HF00W065	22/10/2024 12:23			0	19.8	14.9	0.4	50.4	1.3	64.9	63.4	98%	162	-20.49	1011	6	0	6
HF00W066	22/10/2024 10:35			0	8.8	4.9	3.3	78.9	1.8	83.0	70.5	85%	25	-3.85	1010	3	0	6
HF00W067	22/10/2024 12:35	Aerobic	Caution	0	2.0	8.3	3.2	74	0.2	86.5	74.4	86%	27	-16.99	1011	9	0	6
HF00W070	22/10/2024 09:21	OK		100	62.1	40.7	0.9	0	1.5	-3.7	-7.1	193%	- 4	-110.93	1010	6	0	1
HF00W072	22/10/2024 12:59	OK		5	45.1	31.7	1.2	19.8	1.4	22.0	17.4	79%	18	1.91	1013	13	0	5
HF00W073	22/10/2024 12:48	Air Leak		0	0.2	3.3	20.9	75.6	0.1	75.6	-3.2	-4%	4	0.26	1013	5	0	12
HF00W074	22/10/2024 13:54	OK		30	52.0	38.6	1.2	7.9	1.3	8.2	3.6	44%	7	-78.09	1012	31	1	2
HF00W075	22/10/2024 13:59	Aerobic	Caution	25	26.2	28.4	0.9	44.5	0.9	44.5	41.1	92%	49	-4.94	1012	24	1	5
HF00W076	22/10/2024 12:43	Aerobic	Caution	0	0.2	3.2	4.4	75.8	0.1	92.2	75.6	82%	21	0.61	1012	2	0	12
HF00W077	22/10/2024 12:46			20	43.5	38.9	0.4	17.2	1.1	17.2	15.7	91%	43	-8.34	1010	21	0	1
HF00W078	22/10/2024 12:52			10	46.3	40.4	0.3	12.6	1.1	13.0	11.8	91%	43	-1.02	1013	7	0	1
HF00W079	22/10/2024 13:03			10	54.4	46.1	0.2	0	1.2	-0.7	-1.5	213%	- 3	-8.72	1014	14	0	1
HF00W080	22/10/2024 11:39			20	53.2	46.7	0.8	0	1.1	-0.7	-3.8	536%	- 1	-97.25	1011	23	0	1
HF00W080	22/10/2024 11:40			30	50.5	50.0	0.3	0	1.0	-0.8	-2.0	246%	- 3	-93.76	1011	21	0	1
HF00W081	22/10/2024 12:06	Aerobic	Caution	0	13.5	16.9	0.3	60.7	0.8	69.3	68.1	98%	231	-13.24	1010	12	0	2
HF00W082	22/10/2024 11:42	Air Leak		0	19.1	11.0	15.1	54.3	1.7	54.8	-2.2	-4%	4	-96.41	1011	4	0	2
HF00W084	22/10/2024 11:48			100	49.4	41.7	0.8	8.1	1.2	8.1	5.0	62%	10	-96.65	1011	22	0	1

1	Monitor ID	Date Taken	Initial Assessment	Heating Status	Valve after	CH4 %	CO2 %	O2 %	Balance Gas %	CH4:CO2	N2%	FN2%	FN2%N2	N2:02	Diff mBar	Atm mbar	CO ppm	H2S ppm	Comments
240	HF00W084	22/10/2024 11:48			100	49.4	41.7	0.8	8.1	1.2	8.1	5.0	62%	10	-96.65	1011	22	0	1
243	HF00W085	22/10/2024 11:49	Aerobic	Caution	0	0.4	8.9	1.9	73.6	0.0	88.8	81.6	92%	47	1.09	1011	5	0	2
246	HF00W086	22/10/2024 13:55	OK		20	52.8	37.8	1.3	8.1	1.4	8.1	3.2	39%	6	-77.24	1012	32	2	1
247	HF00W086	22/10/2024 13:56	OK		35	52.6	38.7	1.2	7.5	1.4	7.5	2.9	39%	6	-78.07	1012	29	1	2
251	HF00W088	22/10/2024 12:54	OK		10	55.4	45.2	0.1	0	1.2	-0.7	-1.1	159%	- 7	-1.38	1013	14	0	1
254	HF00W089	22/10/2024 11:35	OK		100	64.8	34.0	0.9	0.3	1.9	0.3	-3.1	-1044%	0	-102.31	1012	5	0	1
257	HF00W091	22/10/2024 09:13			80	44.3	40.6	0.2	14.9	1.1	14.9	14.1	95%	74	-108.02	1007	12	0	1
260	HF00W092	22/10/2024 09:12	OK		100	52.2	40.7	0.8	6.3	1.3	6.3	3.2	52%	8	-111.12	1011	11	0	1
263	HF00W093	22/10/2024 09:10	OK		80	52.4	41.6	0.2	5.8	1.3	5.8	5.0	86%	29	-101.64	1009	13	0	1
264	HF00W093	22/10/2024 09:11	OK		90	52.2	41.9	0.2	5.7	1.2	5.7	4.9	86%	28	-107.02	1009	11	0	1
267	HF00W094	22/10/2024 13:04			5	20.8	19.7	0.7	53.4	1.1	58.8	56.1	95%	84	-7.78	1014	10	0	5
270	HF00W095	22/10/2024 11:32			10	31.2	26.6	0.9	41.3	1.2	41.3	37.9	92%	46	-9.32	1011	18	0	1
273	HF00W096	22/10/2024 11:31	Air Leak		0	0.2	1.3	21.5	77	0.2	77.0	-4.1	-5%	4	0.04	1011	2	0	12
276	HF00W097	22/10/2024 12:21			100	37.0	31.3	0.9	30.8	1.2	30.8	27.4	89%	34	-110.24	1011	8	0	1
279	HF00W098	22/10/2024 12:08			10	39.0	36.3	0.6	24.1	1.1	24.1	21.8	90%	40	-26.52	1011	7	0	1
284	HF00W100	22/10/2024 12:03			0	52.3	49.0	0.2	0	1.1	-1.5	-2.3	153%	- 7	-4.10	1010	23	0	1
285	HF00W100	22/10/2024 12:04			10	51.1	50.4	0.1	0	1.0	-1.6	-2.0	126%	- 16	-6.55	1010	21	0	1
288	HF00W101	22/10/2024 12:17	Aerobic		5	24.1	25.0	5.2	45.7	1.0	45.7	26.1	57%	9	-73.69	1011	6	0	4
291	HF00W102	22/10/2024 12:22	Aerobic	Caution	20	27.9	30.7	0.8	40.6	0.9	40.6	37.5	92%	51	-48.31	1011	8	0	4
294	HF00W103	22/10/2024 11:58	Aerobic	Caution	30	23.5	29.4	0.2	46.9	0.8	46.9	46.1	98%	234	-62.48	1010	9	0	4
295	HF00W103	22/10/2024 11:59	Aerobic	Caution	10	23.2	29.7	0.2	46.9	0.8	46.9	46.1	98%	234	-52.67	1010	8	0	4
298	HF00W104	22/10/2024 11:57	Aerobic	Caution	0	21.6	25.4	1.4	51	0.9	51.6	46.3	90%	37	23.59	1010	10	0	4
301	HF00W105	22/10/2024 11:47	OK		100	53.5	40.4	1.2	4.9	1.3	4.9	0.3	7%	4	-96.70	1011	10	0	2
304	HF00W106	22/10/2024 11:55	OK		80	55.4	42.1	0.1	2.4	1.3	2.4	2.0	83%	24	-98.19	1010	11	0	1
307	HF00W107	22/10/2024 12:34	Aerobic		10	29.9	31.4	3.0	35.7	1.0	35.7	24.4	68%	12	-36.52	1011	8	0	4
310	HF00W108	22/10/2024 12:30			0	36.3	24.6	5.8	33.3	1.5	33.3	11.4	34%	6	-30.74	1011	11	0	6
314	HF00W109	22/10/2024 11:53	OK		20	51.5	39.3	0.7	8.5	1.3	8.5	5.8	69%	12	-59.15	1010	10	0	1
315	HF00W109	22/10/2024 11:54	OK		30	50.0	41.5	0.2	8.3	1.2	8.3	7.5	90%	41	-63.14	1010	9	0	1
318	HF00W110	22/10/2024 10:33			20	35.1	31.7	0.4	32.8	1.1	32.8	31.3	95%	82	-75.91	1011	5	0	1
321	HF00W111	22/10/2024 10:38	OK		0	58.9	29.2	1.9	10	2.0	10.0	2.8	28%	5	-0.07	1011	5	0	2
322	HF00W111	22/10/2024 10:39	OK		10	62.7	31.5	1.2	4.6	2.0	4.6	0.0	1%	4	-95.55	1011	5	0	2
325	HF00W112	22/10/2024 12:13			100	42.3	18.6	0.7	38.4	2.3	38.4	35.7	93%	55	-109.91	1011	4	0	1
329	HF00W114	22/10/2024 12:30	Aerobic	Caution	0	1.2	7.3	4.0	73.8	0.2	87.5	72.4	83%	22	-3.00	1011	5	0	6
332	HF00W115	22/10/2024 11:15	Aerobic	Caution	5	1.3	9.2	3.7	85.8	0.1	85.8	71.8	84%	23	-104.71	1011	3	0	5
336	HF00W116	22/10/2024 11:12	Air Leak		5	0.5	3.5	20.6	75.4	0.1	75.4	-2.3	-3%	4	-81.06	1011	3	0	5
339	HF00W117	22/10/2024 11:13	OK		100	56.3	24.8	0.9	18	2.3	18.0	14.6	81%	20	-104.81	1011	3	0	1
341	HF00W118	22/10/2024 11:29			0	0.5	3.1	18.0	76	0.2	78.4	10.5	13%	4	-12.16	1011	2	0	6
345	HF00W119	22/10/2024 11:26	Aerobic	Caution	0	0.9	4.6	2.8	75.1	0.2	91.7	81.1	88%	33	-11.44	1011	2	0	6

	A	B	D	E	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	AB
1	Monitor ID	Date Taken	Initial Assessment	Heating Status	Valve after	CH4 %	CO2 %	O2 %	Balance Gas %	CH4:CO2	N2%	FN2%	FN2%N2	N2:02	Diff mBar	Atm mbar	CO ppm	H2S ppm	Comments
345	HF00W119	22/10/2024 11:26	Aerobic	Caution	0	0.9	4.6	2.8	75.1	0.2	91.7	81.1	88%	33	-11.44	1011	2	0	6
348	HF00W120	22/10/2024 11:37	Aerobic	Caution	20	25.6	26.8	1.0	46.6	1.0	46.6	42.8	92%	47	-13.38	1012	7	0	5
351	HF00W121	22/10/2024 11:27			0	0.9	3.8	18.2	77.1	0.2	77.1	8.4	11%	4	-2.91	1011	2	0	6
354	HF00W122	22/10/2024 11:38	Aerobic	Caution	0	1.4	7.8	1.6	73.8	0.2	89.2	83.1	93%	56	-2.24	1012	4	0	6
357	HF00W123	22/10/2024 12:14	OK		40	50.4	29.3	0.1	20.2	1.7	20.2	19.8	98%	202	-108.48	1011	4	0	1
358	HF00W123	22/10/2024 12:15	OK		50	50.3	30.0	0.1	19.6	1.7	19.6	19.2	98%	196	-110.42	1011	4	0	1
361	HF00W124	22/10/2024 12:18			10	35.5	29.9	0.8	33.8	1.2	33.8	30.7	91%	42	-44.88	1011	6	0	1
365	HF00W125	22/10/2024 12:07			40	42.1	36.2	0.8	20.9	1.2	20.9	17.8	85%	26	-14.17	1010	30	1	1
369	HF00W126	22/10/2024 11:59	Aerobic	Caution	0	20.2	21.0	0.6	50	1.0	58.2	55.9	96%	97	-1.02	1010	8	0	4
372	HF00W127	22/10/2024 12:20	Aerobic	Caution	5	18.6	21.6	0.4	53.3	0.9	59.4	57.9	97%	148	-40.39	1011	8	0	4
375	HF00W128	22/10/2024 11:52	OK		100	50.4	36.2	0.7	12.7	1.4	12.7	10.0	79%	18	-96.99	1010	13	0	1
378	HF00W129	22/10/2024 08:52			100	55.7	48.5	0.5	0	1.1	-4.7	-6.6	141%	- 9	-112.73	1010	30	1	1
381	HF00W12R	22/10/2024 10:03	Aerobic	Caution	0	0.4	4.6	1.8	74.7	0.1	93.2	86.4	93%	52	-26.13	1010	5	0	6
384	HF00W130	22/10/2024 08:53	OK		100	59.9	42.0	0.8	0	1.4	-2.7	-5.8	213%	- 3	-110.63	1010	24	1	1
387	HF00W131	22/10/2024 14:00	Aerobic		15	33.3	33.3	0.4	32.1	1.0	33.0	31.5	95%	82	-6.50	1012	34	1	5
393	HF00W132	22/10/2024 13:58			25	45.9	38.8	1.6	13.7	1.2	13.7	7.6	56%	9	-20.62	1012	34	4	2
398	HF00W133	22/10/2024 13:48	OK		10	45.2	36.8	1.3	16.7	1.2	16.7	11.8	70%	13	-13.28	1012	23	0	1
401	HF00W134	22/10/2024 09:05			10	56.5	48.5	0.2	0	1.2	-5.2	-6.0	115%	- 26	0.47	1009	37	0	1
402	HF00W134	22/10/2024 09:06			20	56.1	48.7	0.2	0	1.2	-5.0	-5.8	116%	- 25	-4.26	1009	30	0	1
406	HF00W135	22/10/2024 08:50			30	43.8	34.2	1.6	19.5	1.3	20.4	14.3	70%	13	-16.59	1009	13	0	2
409	HF00W136	22/10/2024 08:49			100	40.1	28.9	0.9	30.1	1.4	30.1	26.7	89%	33	-112.80	1011	8	0	1
412	HF00W42R	22/10/2024 12:36			0	39.2	24.3	5.1	31.4	1.6	31.4	12.1	39%	6	-5.55	1011	10	0	6
415	HF0KOP01	22/10/2024 08:30	Aerobic	Caution		0.5	4.4	3.3	76.3	0.1	91.8	79.3	86%	28	0.63	1011	4	0	
418	HF0KOP02	22/10/2024 08:46				0.5	0.1		77.9	5.0	99.4	99.4	100%	9,940,001	0.09	1011	1	0	
421	HF0KOP03	22/10/2024 09:15	Aerobic			0.5	6.6	4.9	75	0.1	88.0	69.5	79%	18	0.35	1011	4	0	
424	HF0KOP04	22/10/2024 09:48	Aerobic	Caution		0.5	6.2	4.3	74.5	0.1	89.0	72.8	82%	21	0.18	1011	2	0	
427	HF0KOP05	22/10/2024 10:40	Aerobic	Caution		0.4	6.1	3.4	75	0.1	90.1	77.2	86%	26	0.42	1011	2	0	
430	HF0KOP06	22/10/2024 11:07	Aerobic	Caution		0.3	5.5	4.1	74.5	0.1	90.1	74.6	83%	22	0.05	1012	3	0	
433	HF0KOP08	22/10/2024 11:34	Aerobic	Caution		0.2	3.0	1.6	75.8	0.1	95.2	89.1	94%	59	0.26	1011	1	0	
436	HF0KOP09	22/10/2024 12:11	Aerobic	Caution		0.4	7.9	1.9	73.7	0.1	89.8	82.6	92%	47	0.11	1010	3	0	
439	HF0KOP10	22/10/2024 13:07	Aerobic			0.2	4.8	6.7	75	0.0	88.3	63.0	71%	13	0.09	1014	5	0	
442	HF0KOP11	22/10/2024 13:21	Aerobic	Caution		0.6	8.2	1.7	72.9	0.1	89.5	83.1	93%	53	0.11	1015	13	0	
447	HF0LMP1B	22/10/2024 12:32			10	51.7	47.6	0.1	0.6	1.1	0.6	0.2	31%	6	-9.69	1011	14	0	1
450	HF0LMP2AR	22/10/2024 11:44	OK		100	56.8	39.9	0.9	2.4	1.4	2.4	-1.0	-43%	3	-97.42	1011	11	0	1
453	HF0M10MA	22/10/2024 11:21			100	32.4	27.9	0.9	38.8	1.2	38.8	35.4	91%	43	-104.27	1012	4	0	1
456	HF0M10MB	22/10/2024 11:09			100	32.1	29.0	0.9	38	1.1	38.0	34.6	91%	42	-104.85	1011	4	0	1
459	HF0M11MA	22/10/2024 12:25			100	33.8	31.4	1.0	33.8	1.1	33.8	30.0	89%	34	-110.86	1011	7	0	1
462	HF0M11MB	22/10/2024 12:12			100	35.0	30.2	0.9	33.9	1.2	33.9	30.5	90%	38	-109.44	1011	6	0	1

	A	B	D	E	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	AB
1	Monitor ID	Date Taken	Initial Assessment	Heating Status	Valve after	CH4 %	CO2 %	O2 %	Balance Gas %	CH4:CO2	N2%	FN2%	FN2%N2	N2:02	Diff mBar	Atm mbar	CO ppm	H2S ppm	Comments
462	HF0M11MB	22/10/2024 12:12			100	35.0	30.2	0.9	33.9	1.2	33.9	30.5	90%	38	-109.44	1011	6	0	1
465	HF0M12MA	22/10/2024 12:37			100	39.0	36.8	2.2	22	1.1	22.0	13.7	62%	10	-110.86	1011	13	0	2
468	HF0M12MB	22/10/2024 12:29			100	30.4	28.7	3.4	37.5	1.1	37.5	24.6	66%	11	-111.61	1011	10	0	2
471	HF0M17MA	22/10/2024 12:00	OK		100	49.0	36.9	0.7	13.4	1.3	13.4	10.7	80%	19	-97.06	1011	12	0	1
474	HF0M17MB	22/10/2024 11:51	OK		100	45.1	33.7	0.7	20.5	1.3	20.5	17.8	87%	29	-97.42	1011	10	0	1
477	HF0PNS05	22/10/2024 09:39	OK		100	61.0	39.7	0.2	0	1.5	-0.9	-1.7	188%	-4	-111.10	1011	5	0	1
480	HF0PNS06	22/10/2024 09:40	OK		100	60.4	40.3	0.2	0	1.5	-0.9	-1.7	188%	-4	-110.81	1011	5	0	1
483	HF0PNS07	22/10/2024 10:04			90	33.8	32.7	0.6	32.9	1.0	32.9	30.6	93%	55	-110.52	1010	11	0	4
484	HF0PNS07	22/10/2024 10:05	Aerobic	Caution	10	33.5	33.8	0.5	32.2	1.0	32.2	30.3	94%	64	-108.74	1010	9	0	4
487	HF0PNS08	22/10/2024 10:02	OK		100	59.3	40.7	0.9	0	1.5	-0.9	-4.3	481%	-1	-108.62	1010	22	0	1
490	HF0PNS09	22/10/2024 10:51			15	39.3	28.6	4.6	27.5	1.4	27.5	10.1	37%	6	-111.03	1012	5	0	5
494	HF0PNS10	22/10/2024 10:24	OK		10	49.9	40.0	1.6	8.5	1.2	8.5	2.4	29%	5	-108.07	1011	13	0	2
497	HF0PNS11	22/10/2024 10:26	OK		100	57.7	43.5	0.8	0	1.3	-2.0	-5.1	253%	-2	-108.48	1011	7	0	1
500	HF0PNW17	22/10/2024 10:28	OK		100	60.0	41.5	0.8	0	1.4	-2.3	-5.4	233%	-3	-108.48	1010	8	0	1
503	HF0PNW30	22/10/2024 10:52	OK		100	61.4	35.2	0.4	3	1.7	3.0	1.5	48%	7	-111.52	1012	8	0	1
506	HF0PNW31	22/10/2024 10:53	OK		100	59.7	34.6	0.6	4.8	1.7	5.1	2.8	55%	8	-111.61	1012	8	0	1
509	HF0PNW32	22/10/2024 10:54	OK		100	59.3	36.5	0.7	3.5	1.6	3.5	0.8	24%	5	-111.07	1012	9	0	1
512	HF0PNW33	22/10/2024 10:56	OK		100	59.7	34.5	0.8	5	1.7	5.0	1.9	39%	6	-110.58	1012	9	0	1
515	HF0PNW34	22/10/2024 10:57	OK		100	50.1	31.3	0.6	15.8	1.6	18.0	15.7	87%	30	-110.70	1012	8	0	2
520	HF0PNW55	22/10/2024 13:34	Aerobic	Caution	0	0.2	1.9	0.4	76.7	0.1	97.5	96.0	98%	244	3.57	1012	9	0	2
525	HF0PNW56	22/10/2024 13:37	Air Leak		0	13.4	7.4	17.2	62	1.8	62.0	-2.9	-5%	4	-25.22	1012	8	0	2
529	HF0PNW57	22/10/2024 13:41	OK		20	62.0	38.0	0.6	0	1.6	-0.6	-2.9	483%	-1	3.80	1011	29	2	1
530	HF0PNW57	22/10/2024 13:42	OK		40	61.1	39.1	0.2	0	1.6	-0.4	-1.2	298%	-2	-16.34	1011	34	3	1
537	HF0PNW58	22/10/2024 13:43	OK		50	60.2	38.3	0.3	0.6	1.6	1.2	0.0	3%	4	-81.62	1012	28	1	1
540	HF0PNW59	22/10/2024 13:49			25	40.0	26.5	1.6	28	1.5	31.9	25.8	81%	20	-75.49	1012	25	1	5
547	HF0PNW60	22/10/2024 13:51	Aerobic	Caution	0	4.0	12.8	2.6	66.2	0.3	80.6	70.8	88%	31	-67.89	1012	26	0	6
553	HF0PNW61	22/10/2024 13:52	OK		20	61.6	38.4	0.7	0	1.6	-0.7	-3.4	482%	-1	-77.77	1012	30	2	1
554	HF0PNW61	22/10/2024 13:53	OK		40	59.5	40.1	0.3	0.1	1.5	0.1	-1.1	-1069%	0	-79.10	1012	36	1	1
557	HF0PNW62	22/10/2024 13:24	OK		40	57.3	41.6	0.1	1	1.4	1.0	0.6	59%	10	-86.93	1014	24	0	1
561	HF0PNW63	22/10/2024 13:23			20	40.5	34.2	1.1	24.2	1.2	24.2	20.0	83%	22	-81.05	1013	27	0	1
564	HF0PNW64	22/10/2024 12:49	OK		60	61.6	34.7	0.9	2.8	1.8	2.8	-0.6	-23%	3	-99.00	1012	12	0	1
565	HF0PNW64	22/10/2024 12:50	OK		70	60.2	37.0	0.5	2.3	1.6	2.3	0.4	16%	5	-99.24	1012	11	0	1
568	HFLMP003	22/10/2024 12:45	OK		100	60.6	39.3	0.2	0	1.5	-0.1	-0.9	892%	-0	-96.76	1012	8	0	1
571	HFLMP04A	22/10/2024 12:48	Aerobic	Caution	0	0.2	3.5	0.7	75.5	0.1	95.6	92.9	97%	137	1.07	1012	6	0	12
574	HFLMP04B	22/10/2024 12:56			0	24.3	14.5	1.8	44.5	1.7	59.4	52.6	89%	33	0.18	1013	6	0	2
577	HFLMP05A	22/10/2024 13:28	OK		60	59.3	40.8	0.5	0	1.5	-0.6	-2.5	420%	-1	-75.20	1014	24	0	1
578	HFLMP05A	22/10/2024 13:29	OK		80	58.1	42.3	0.1	0	1.4	-0.5	-0.9	183%	-5	-87.88	1014	22	0	1
581	HFLMP05B	22/10/2024 13:25	OK		100	58.3	40.6	0.6	0.5	1.4	0.5	-1.8	-360%	1	-86.55	1014	21	0	1

1	Monitor ID	Date Taken	Initial Assessment	Heating Status	Valve after	CH4 %	CO2 %	O2 %	Balance Gas %	CH4:CO2	N2%	FN2%	FN2%N2	N2:02	Diff mBar	Atm mbar	CO ppm	H2S ppm	Comments
578	HFLMP05A	22/10/2024 13:29	OK		80	58.1	42.3	0.1	0	1.4	-0.5	-0.9	183%	-5	-87.88	1014	22	0	1
581	HFLMP05B	22/10/2024 13:25	OK		100	58.3	40.6	0.6	0.5	1.4	0.5	-1.8	-360%	1	-86.55	1014	21	0	1
586	HFLMP05C	22/10/2024 13:13	OK		10	54.2	36.4	0.7	8.7	1.5	8.7	6.0	69%	12	0.07	1015	25	2	1
587	HFLMP05C	22/10/2024 13:14	OK		30	59.0	39.4	0.4	1.2	1.5	1.2	-0.3	-29%	3	-1.75	1015	16	1	1
590	HFLT0001	22/10/2024 09:32	Aerobic	Caution	0	0.7	7.6	1.8	74.1	0.1	89.9	83.1	92%	50	-82.43	1010	5	0	6
593	HFLT0002	22/10/2024 09:27	Aerobic		0	0.4	2.4	4.7	75.7	0.2	92.5	74.7	81%	20	-91.10	1011	2	0	6
596	HFLT0003	22/10/2024 10:23	OK		90	50.1	39.7	0.7	9.5	1.3	9.5	6.8	72%	14	-108.95	1011	11	0	1
599	HFSCAV01	22/10/2024 09:02	OK		100	61.5	41.9	0.7	0	1.5	-4.1	-6.8	165%	-6	-110.56	1010	16	0	1
602	HFSCAV02	22/10/2024 09:01	OK		100	62.1	41.1	0.8	0	1.5	-4.0	-7.1	176%	-5	-111.93	1009	17	0	1
606	HFSCAV03	22/10/2024 09:03	OK		30	56.6	46.8	0.8	0	1.2	-4.2	-7.3	173%	-5	-111.49	1009	30	0	1
607	HFSCAV03	22/10/2024 09:04			40	55.6	47.9	0.3	0	1.2	-3.8	-5.0	131%	-13	-112.03	1009	31	0	1
610	HFSCAV04	22/10/2024 08:59	OK		20	51.1	38.7	0.5	9.5	1.3	9.7	7.8	80%	19	-0.77	1010	10	0	1
613	HFSCAV05	22/10/2024 08:57			10	34.7	27.5	4.1	33.7	1.3	33.7	18.2	54%	8	-0.26	1009	7	0	5
618	HFSP01MA	22/10/2024 14:06	OK		100	45.3	36.8	1.1	16.8	1.2	16.8	12.6	75%	15	-100.24	1013	23	13	2
623	HFSP01MB	22/10/2024 08:28	OK		100	48.3	36.7	0.9	14.1	1.3	14.1	10.7	76%	16	-119.06	1011	13	1	1
627	HFSP02MA	22/10/2024 14:08			100	45.0	37.2	1.0	16.8	1.2	16.8	13.0	77%	17	192.76	1014	24	12	1
631	HFSP02MB	22/10/2024 08:29	OK		100	47.5	38.5	0.8	13.2	1.2	13.2	10.1	77%	16	170.18	1011	17	1	1
634	HFSWR001	22/10/2024 09:41	OK		100	60.5	38.9	0.2	0	1.6	0.4	-0.4	-98%	2	-110.33	1011	5	0	1
637	HFSWR002	22/10/2024 09:44	OK		100	62.9	40.0	0.2	0	1.6	-3.1	-3.9	126%	-15	-110.38	1011	5	0	1
641	HFSWR004	22/10/2024 09:17	OK		30	62.5	36.9	1.0	0	1.7	-0.4	-4.2	1052%	-0	-110.38	1011	6	0	1
642	HFSWR004	22/10/2024 09:18	OK		40	61.7	37.8	0.9	0	1.6	-0.4	-3.8	958%	-0	-111.49	1011	5	0	1