

This form will report compliance with your permit as determined by an NRW officer

Site	Bryn Posteg Landfill	Permit Ref	BU77661C		
Operator/Permit holder	Sundorne Products (Ilanidloes) Ltd				
Regime	Installations				
Date of assessment	02/08/2016 - 03/08/2016	Time in	09:30	Out	15:00
Assessment type	Audit				
Parts of the permit assessed	Gas, leachate and monitoring infrastructure				
Lead officer's name	Zachary, Aled				
Accompanied by	Roberts, Anthony, Ross, Stuart				
Recipient's name/position	David Williams/ Technical Manager	Date issued	24/10/2016		

Section 1 – Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations or the licence under the Water Resources Act 1991 as amended by the Water Act 2003. A detailed explanation is captured in "Compliance Assessment Report Detail" (Section 2) and any actions you may need to take are given in the "Action(s)" (section 4). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our Compliance Classification Scheme (CCS). CCS Scores can be consolidated or suspended where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your local office.

Permit conditions and compliance summary	CCS Category	Condition(s) breached
B1 - Infrastructure - Engineering for prevention and control of emissions	C2	2.9.1; 1.1.1
B5 - Infrastructure - Plant and equipment	C2	1.1.1
C1 - General Management - Staff competency/training	C3	1.1.1
E1 - Emissions - Air	C2	3.3.1
E2 - Emissions - Land and groundwater	C3	3.6.1
F1 - Amenity - Odour	C2	3.4.1

KEY: See Section 5 for breach categories, suspended scores will be indicated as such.

A = Assessed or assessed in part (no evidence of non-compliance), **X** = Action only,

O = Ongoing non-compliance, not scored.

Number of breaches recorded	6	Total compliance score (see section 5 for scoring scheme)	132
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If the Number of breaches recorded is greater than zero, please see Section 3 for our proposed enforcement response

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- The part(s) of the permit that were assessed (eg. Maintenance, training, combustion plant, etc)
- Where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- Any non-compliances identified
- Any non-compliances with directly applicable legislation
- Details of any multiple non-compliances
- Information on the compliance score accrued inc.
- Details of advice given
- Any other areas of concern
- Any actions requested
- Any examples of good practice
- A reference to photos taken

02 & 03 August 2016.

Audit of Landfill gas control, extraction, utilisation and monitoring infrastructure, including a review of leachate control and monitoring.

NRW Staff present:

Aled Zachary, Tony Roberts & Stuart Ross (Day 1)

Gas Engines & Gas Utilisation Plant (GUP).

Permit Condition 1.1.1 - activities shall be managed and operated: (a) in accordance with a management system, which identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents incidents and non-conformances and those drawn to the attention of the operator as a result of complaints.

Findings -

1. At the time of inspection both gas engines were non-operational. The newer engine was undergoing its 40,000 hour service, whilst the second engine was also down for unplanned maintenance work. The Landfill Directive requires utilisation before flaring in the hierarchy, which should mean that when one engine is down, for whatever reason, the other engine should be running wherever possible.
2. If there is a power outage the gas extraction system will not operate and must wait for service personnel to attend site for up to 24 hrs.
3. Upon approaching the landfill gas compound it was noted that the blue regulation valve before the flare manifold was cycling from fully closed to fully open. This was causing repeated pressurising of the pipe-work on the positive pressure side of the booster and then a de-pressuring and valve closing cycle to occur with accompanying surging/roaring noise as the gas cyclically discharged into the flare.
4. During the valve gas cycling process described above the burners on the flare were shutting down and then re-igniting from the auto pilot light. The louvres were not responding and the gas flow was reading up to 1800m³/hr at its maximum point. The negative pressure on the field side of the compound was also affected and this will have produced changing pressures on the field affecting field balance across the wells. This was witnessed out on the gas field by officers AZ and SR.
5. The bulk gas flow measurement at the compound was not steady and a reliable reading was not available.

The above demonstrates that the procedures and implementation of those procedures for minimising the risk of pollution from operation and maintenance of the GUP are currently ineffective and require review

Summary -

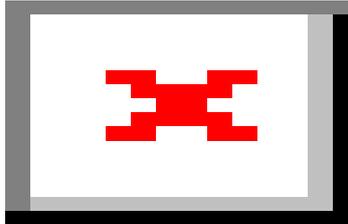
These issues are considered a breach of Condition 1.1.1 with the potential for significant environmental effect; taken as an aggregated score with the other breaches of this condition listed below has been scored a **Category 2 breach of the permit requirements.**

Gas Extraction Infrastructure & Emissions.

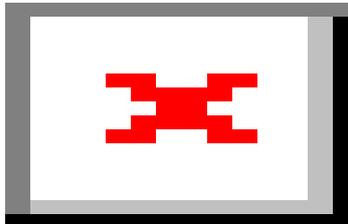
Permit Condition 3.3.1 - fugitive emissions of substances (excluding odour, noise and vibration) shall not cause pollution. The operator shall be taken to have breached this condition where appropriate measures have been taken to prevent, or where that is not practicable, minimise, those emissions

Findings -

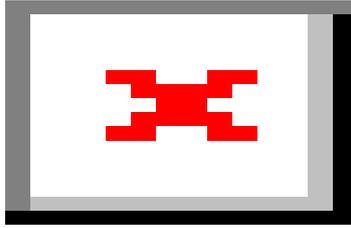
Landfill gas under pressure from the south west surface of Cell 9D(i) adjacent to the old cell entrance, with a peak CH₄ reading of 13.8% ambient including 1.143ppm (1143ppb) of H₂S. Significant emissions were also recorded from the southern flanks of cells 9D(i) and 9C:



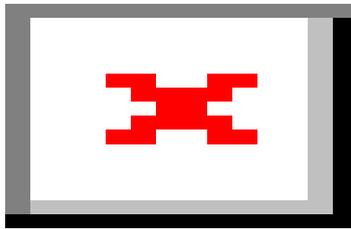
2.4% methane recorded from "Side Wall Riser" serving the under engineering drainage system of Cell 9D(i) (pictured above)



26% Methane recorded from an area of geotextile covering the basal liner on the Southern flank of Phase 9C. (pictured above)



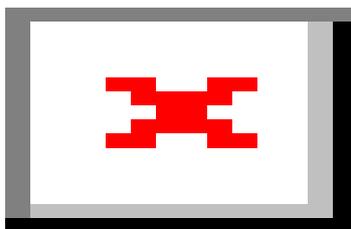
7.5% Methane recorded from pin well on the southern flank of Phase 9C. (pictured above)



22.4% Methane recorded from surface on the southern flank of Phase 8. (pictured above)

Significant levels of ambient landfill gas emissions were also recorded from the waste surface and other areas of the operational areas. Readings from the surface of Cell 9D(ii) were recorded at 70-90ppm with peak readings in excess of 1200ppm on the western edge of Cell 9D(ii) and 5000ppm on the edge of temporary capping. For context point source emissions above 1000ppm are considered to be "significant" and therefore ambient emissions in excess of this indicate very large amount of fugitive gas release to atmosphere.

One of the towers at the base of the western flank of Cell 9C was discharging landfill gas at a rate sufficient trigger the personal gas alarms of officers. This level of gas emissions and gas under pressure through leachate demonstrates a severe lack of landfill gas control over a large area of the operational area:



Emissions from the leachate tower above were sufficient to trigger officers personal gas alarms

Connection pipe-work across both cells 9D(i) and 9D(ii) was noted as consisting largely of 63mm diameter gas carrier pipe, which in many cases was undulating and contained significant levels of condensate. This is further compromising gas extraction efficiency in the operational areas.

Summary -

The issues outlined above are considered to have the potential for significant effect on the environment and have been scored a **Category 2 breach of the permit requirements.**

Odour Emissions.

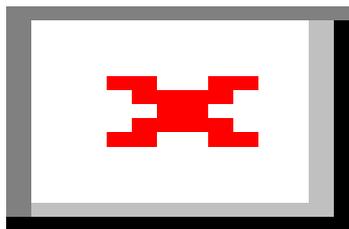
Permit Condition 3.4.1 states emissions from the activities shall be free from odour at levels likely to cause annoyance outside the site, as perceived by an authorised officer of the Agency, unless the operator has used appropriate measures to prevent or where that is not practicable to minimise those emissions.

Findings -

1. Landfill gas point sources, daily cover and use of temporary capping.

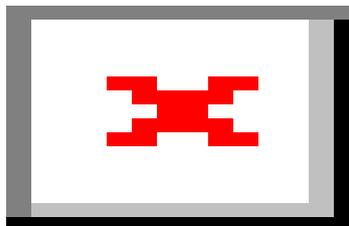
There were numerous point sources of landfill gas with strong odours detected including:

Five Leachate Towers on Phases 9C & 9D(ii) openly venting landfill gas to atmosphere resulting in strong and persistent odours around these features. Throughout the audit, strong odours were detected across the site, on at least one occasion causing nausea and resulting in inspecting officers to dynamically risk assess the area:

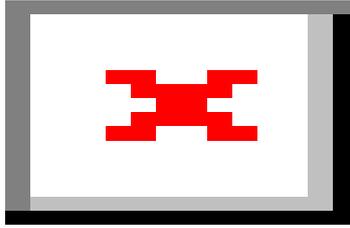


5 out of 6 leachate extraction points in Cells 9C/9D(ii) openly venting to atmosphere

The working area in cell 9D(ii) was also largely uncovered or partially covered with off spec compost over large areas of the cell - the use of materials as cover that could contribute further to odour emissions from the site is not considered best practice.



Off-spec compost material being used as daily cover in Cell 9D(ii)



Large operational tipping area and general lack of suitable cover material.

Further to the above the operational area(s) have large sections that do not benefit from the use of temporary capping and this is considered to be contributing to the levels of off site odour being detected. Landfill gas odours were recorded to the east of the site on the road leading to Llidiartywaun on both days prior to officers attending site.

2. Hydrogen Sulphide Emissions from Leachate Storage.

This is a new issue that has developed from the transfer of excess leachate from the operational area to the intermediate storage lagoon adjacent to the ETP. Due to the levels of dissolved hydrogen sulphide in the leachate, the lagoon and the movement of this material is now a point source for Sulphides / H₂S. This is contributing to some degree to the odour that was detected at the entrance to Cefn Gwilgy Bach, Pen-Bryn-Du and other residents to the North East of the site.

Summary -

These issues are considered to have the potential for significant effect on the receiving environment and off site odours were substantiated at the time of, prior to and following the audit. **As a result these issues aggregated together have been scored a Category 2 breach of the permit requirements.**

Leachate Management and Monitoring.

Permit Condition 2.9.1 states that the limits for leachate listed in Schedule 4 table S4.1 shall not be exceeded.

Permit Condition 1.1.1 - activities shall be managed and operated: (a) in accordance with a management system, which identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents incidents and non-conformances and those drawn to the attention of the operator as a result of complaints.

Findings -

Monitoring Data reviewed during the audit demonstrated that leachate heads on site are still not back within the 1m head as required by the permit. A notice requiring leachate heads to be reduced back to compliant limits was issued on 03 March 2016 with a deadline of 18 April 2016

A copy of the most up to date Leachate Management plan was not available for review during the audit. It was also confirmed that some of the leachate wells on site are not being monitored to the frequency required by the permit (monthly) owing to the fact that they are gas sealed. These wells are only dipped during pump maintenance, which was stated to around once every 6 months. We consider this to be an unacceptable monitoring frequency given the issues identified with leachate head compliance.

No formal method statement for the maintenance of leachate pumps and monitoring of leachate levels that SGG carry out appears to be in place. No procedures to ensure leachate heads on site remain compliant or procedures to manage the response to non-compliance or emergencies / abnormal operations was available.

Summary -

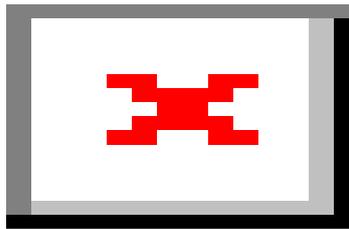
Given the pollution incident(s) in February and March 2016 involving the discharge of leachate to surface waters and the ongoing issue with leachate head compliance these issues are considered to have the potential for significant effect on the receiving environment. **As a result these issues aggregated together have been scored a Category 2 breach of the permit requirements.**

Perimeter Gas Borehole Monitoring and Infrastructure Review.

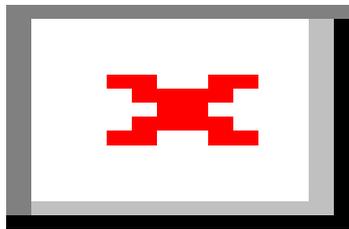
Permit Condition 3.6.1 requires the operator to undertake the monitoring specified in the following tables in schedule 4 to the permit: Landfill gas specified in tables S4.5, S4.7 & S4.8

Findings -

A review of the perimeter gas borehole monitoring infrastructure was carried out on Day 2 of the audit. Many of the boreholes were noted as being in a poor state of repair, with no headworks or exposed to the elements and did not appear to be regularly maintained. Some of the boreholes utilise bungs in the standpipe(s) that are not air tight and give no confidence that the results being obtained are representative of the gases being sampled from the boreholes themselves. We had difficulty locating some of the perimeter boreholes due to undergrowth / lack of clear identification:



Gas monitoring borehole unprotected and with ill-fitting sampling tap / bung



Gas and groundwater monitoring borehole with rope running through the borehole seal.

A number of the perimeter boreholes were found to contain levels of methane and carbon dioxide consistent with significant potential offsite gas migration, the condition of many of the boreholes was also of concern:

G37 - Gas Sampling Tap and bung requires replacement

G36 - Was recorded at +0.17mb, 15% CH₄, 5.7% CO₂ and 10.7% O₂ suggesting potential landfill gas migration

G35 - 56% CH₄, 38.8% CO₂, 3.1% O₂ suggesting landfill gas migration

G41 - The bung in the standpipe was noted as being loose

G40 - Bung in standpipe loose, 17.8% CH₄, 19.4% CO₂, 1.1% O₂

G39 - No results were able to be obtained, headworks require replacement.

G31 - Loose sampling tap / bung, readings suggested air was being sampled

G30 - Rope protruding through borehole seal, loose headworks

G29 - No protective headworks on this borehole

G23 - A stick was present in the sampling valve, 9.8% CH₄, 7.2% CO₂, 13.2% O₂ suggesting migration

G22 - 74.2% CH₄, 20% CO₂, 0.1% O₂, 5ppm H₂S. Methane Enrichment suggesting clear evidence of landfill gas migration from Phase 1/2 of the landfill

G21 - 52.7% CH₄, 10.2% CO₂, 0.8% O₂, 2ppm H₂S. Ratio of gases present suggesting clear evidence of landfill gas migration from Phase 1/2 of the landfill

G37 - 51.9% CH₄, 33% CO₂, 0% O₂, 1ppm H₂S, +0.06mb. Ratio of gases present suggesting clear evidence of landfill gas migration from Phase 1/2 of the landfill. This reading was after removing the loose standpipe bung and replacing it, which also requires replacement.

G17 - G12 were unable to be located due to excessive vegetation growth and poor borehole marking

G10, G9 & G8 - showed no results of any significance, G8 had a loose bung in the borehole standpipe.

G3 - A stick in the sampling cap, no protective casing,

G2 - Sampling results suggested air ingress

G1 - 7.3% CH₄, 1.8% CO₂, 12.7% O₂, 78.2% Balance suggesting some degree of gas migration

Summary -

Presently the condition of the monitoring infrastructure and the presence of gas levels that suggest offsite landfill gas migration is of concern. As a result these issues aggregated together have been scored a **Category 3 breach of the permit requirements**, which could be escalated if not addressed.

Staff training and provision of sufficient staff and resources to manage the above issues.

Permit Condition 1.1.1 the activities shall be managed and operated: (b) by sufficient persons who are competent in respect of the responsibilities to be undertaken by them in connection with the operation of the activities

Findings -

The site technical manager is only directly on site three days per week. The Site manager does not appear to have any direct involvement with ensuring the site is compliant with its environmental permit. There is only one member of staff responsible for the operation and balancing of the gas field, with any issues related to the GUP undertaken by third party contractors or service agreements. Management of the leachate treatment plant, its operation and maintenance appears to be a shared responsibility. Exea Associated Ltd have recently been taken on board to provide to some extra assistance with many of the technical aspects of landfill operation, such as gas and leachate control.

Summary -

Presently the level of staff and resource available to the site to ensure compliance with the permit is deemed to be inadequate. This is reflected in the numerous, longstanding and significant breaches of the permit conditions identified. This has currently been scored a **Category 3 breach of the permit requirements**, subject to review in future if performance and levels of resource available is not improved.

This form will report compliance with your permit as determined by an NRW officer

Site	Bryn Posteg Landfill	Permit Ref	BU7766IC
Operator/Permit holder	Sundorne Products (Ilanidloes) Ltd	Date	02/08/2016

Section 3 – Enforcement Response

You must take immediate action to rectify any non-compliance and prevent repetition. Non-compliance with your permit conditions constitutes an offence and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.

We will now consider what enforcement action is appropriate and notify you, referencing this form.

Section 4 – Action(s)

This section summarises the actions identified during the assessment along with the timescales for when they will need to be completed.

Criteria Ref.	CCS Category	Action required/advised	Due Date
See Section 1 above			
B5	C2	<p>1. Investigate the cause of the issues with control valve cycling and submit a report to NRW within 14 days receipt of this report, including (but not limited to) action(s) you will take to ensure this issue does not arise in the future.</p> <p>2. Submit a timetable for the installation of a standby or “blackstart” generator for the landfill gas utilisation compound to ensure operation during electrical outages.</p> <p>3. Implement procedures to ensure that the gas engine maintenance is appropriately planned to minimise engine downtime where possible.</p>	01/11/2016
F1	C2	<p>1. A combination of additional gas well / leachate tower sealing works and temporary capping is urgently required to bring these odour emissions down to acceptable levels.</p> <p>2. Measures to reduce or remove H2S emissions from the lagoon and the transfer of leachate need to be investigated and put into place as soon as is possible. Any pipe work delivering leachate to the intermediate storage lagoon should be orientated to prevent degassing of the leachate where possible.</p> <p>Please submit a plan detailing how the above will be addressed including timescales.</p>	28/10/2016
B1	C2	<p>1. Leachate heads within operational cells need to be reduced as a matter of urgency. Submit a plan detailing how this will be achieved with timescales for completion.</p> <p>2. The leachate management plan should be updated and submitted for review. The plan should include a proposal for</p>	28/10/2016

		monitoring of all leachate wells to the frequency required by the permit and contingencies plans / actions in the event of: leachate head non-compliance, leachate treatment plant down time and leachate outbreak(s).	
C1	C3	<p>1. Review the current level of staff and resources available to site to comply with the requirements of the permit.</p> <p>2. Submit information outlining roles and responsibilities of all staff who manage or perform operations that impact on permit compliance, which should include (but not limited to) identification of any improvements that can be made in respect to levels of staff competency, training and resource levels.</p>	30/11/2016
E1	C2	<p>Submit an Action plan detailing how the following will be addressed:</p> <p>1. Pipe-work should be upgraded and the correct falls established as a matter of urgency. This work should be completed as a matter of urgency.</p> <p>2. Steps must be immediately taken to gain control of the landfill gas extraction in the operational areas. Submit plans to upgrade extraction gas extraction infrastructure.</p> <p>3. Landfill gas extraction efficiency must be improved across the whole site without delay, including (but not limited to):</p> <ul style="list-style-type: none"> • Improvement of the operation of the landfill gas combustion compound • Improvement of the gas field balancing regime • Ensuring consistent pressure is applied across the gas field • De-watering of any wells flooded by leachate in cells 9C and 9D(i) & 9D(ii) • Reduction in gas pressures at depth • Improved de-watering of connecting pipe-work including installation of knock out pots where appropriate • Dipping of all gas wells on a monthly basis and calculation of available slotting 	28/10/2016
E2	C3	<p>The current adequacy and condition of the monitoring infrastructure should be reviewed for suitability. Procedures to ensure boreholes are regularly maintained and protected from damage and the elements should also be put in place. Investigations into the source(s) of the potential gas migration and remedial measures are required to be submitted</p>	30/11/2016

Section 5 – Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- Advise on corrective actions verbally or in writing
- Require you to take specific actions verbally or in writing
- Issue a notice
- Require you to review your procedures or management system
- Change some of the conditions of your permit
- Decide to undertake a full review of your permit

Any breach of a permit condition is an offence and we may take legal action against you

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and/or suspension or revocation of the permit.

See our Enforcement and Civil Sanctions guidance for further information

This report does not relieve the site operator of the responsibility to

- Ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- Ensure you comply with other legislative provisions which may apply

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance that could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

Section 6 – General information

Data protection notice

The information on this form will be processed by the Natural Resources Wales (NRW) to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s). The NRW may also use and/or disclose it in connection with:

- Offering/providing you with its literature/services relating to environmental matters
- Consulting with the public, public bodies and other organisations (eg. Health and Safety Executive, local authorities) on environmental issues
- Carrying out statistical analysis, research and development on environmental issues
- Providing public register information to enquirers
- Investigating possible breaches of environmental law
- Assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Regulations request

The NRW may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The NRW will provide a copy of this report to the public register(s). However, if you consider that any information contained in this report should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within fifteen working days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with officer's line managers using the informal appeals procedure. If you wish to raise your dispute further through our official Complaints and Commendations procedure, phone our general enquiry number 0300 065 3000 (Mon to Fri 08.00 – 18.00) and ask for the Customer Contact team or send an email to enquiries@naturalresourceswales.gov.uk. If you are still dissatisfied you can make a complaint to the Public Services Ombudsman for Wales. For advice on how to complain to the Ombudsman phone their helpline on 0845 607 0987.

Welsh Language

If you would like this form in Welsh please contact your Regulatory Officer.