Compliance Assessment Report CAR_NRW0052273

Permit being assessed: BU2349IL.

For: Alyn Works, **held by:** Synthite Limited

At: Denbigh Road, Mold, Flintshire, CH7 1BT.

Type of assessment: Audit,

Reason: Routine.

On: 17/06/2026 between 10:00 and 12:30.

Parts of permit assessed: See below.

NRW Lead Officer: Philip Harper, accompanied by Ricky Hartleb.

Report sent to: Site Manager, Site Manager, on 17/07/2026.

1. Summary of our findings (full details in section 4)

Part of permitted activity assessed (compliance criteria)	Assessment result	Permit condition
IR1A - Installations - Management - General Management	C2 Significant	1.1.1
IR2C - Installations - Operations - Operating techniques	C3 Minor	2.3.1(a)
IR1A - Installations - Management - General Management	C3 Minor	1.1.2

Result types are explained in more detail in the 'Important Information' section below.

Total non-compliances recorded	Total non-compliance score
3	39

How we use the non-compliance score to calculate your annual fee is explained in the 'Important Information' section below.

2. What action is required?

Criteria	Action needed	Complete by
IR1A	See action 1 in main text.	31/08/2026
IR2C	See action 2 in main text	31/08/2026
IR1A	See action 1 in main text.	31/08/2026

Compliance criteria codes are listed in the 'Important information' section below.

3. What will happen next?

Any non-compliance we have identified and recorded on this form is an offence. It can result in criminal prosecution and/or suspension or revocation of your permit.

You are non-compliant with your permit.

We are currently considering taking enforcement action against you for the non-compliance recorded above. We will contact you in due course.

4. Details of our assessment

This compliance assessment report follows an audit for Synthite's Silver Formaldyhyde plant and its associated abatement. The audit follows an investigation into emissions limit breaches at the A16 emission point which is and exit gas boiler that was originally designed to abate emissions from the silver plant process.

At 10:00 am on the 17th June 2026, a site inspection was undertaken by NRW officers Phil Harper, Lead Specialist Industry & Waste Regulation, and Ricky Hartleb. This was an announced audit with Synthite operatives providing some supporting information prior to the audit on the 5th June 2026.

This audit has been arranged following concerns as to how the silver plant at Synthite is operated following investigations into emissions at A16.

On the 17th March 2026, compliance assessment report CAR_NRW0050962 was sent to the operator requiring the operator take actions regarding the emission breaches at emission point A16. These were reinforced via the service of a EPR regulation 36 and 61 notices on the 19th March 2026.

One action was for Synthite to "*conduct an investigation to identify the root cause(s) of the A16 boiler emission limit value (ELV) exceedances for formaldehyde & TVOC for samples since January 2023 and determine corrective and preventive actions to ensure compliance with the permitted emission limit value. Submit a report of the investigation findings, corrective and preventative actions proposed, with associated timescales for completion by the 31st May 2026.*"

The action was satisfied on the 7th April 2026 with the submission of a report into the boiler at A16 by DYNEA. The report highlighted several areas for consideration. That the burner configuration at the exit gas boiler or boiler 4 is constrained by inadequate mixture, insufficient residence time and combustion temperatures that are too low under high-excess-air operation.

In addition, a comparison between the composition of siler plant tail gas and foul air VOCs from a number of sources reaching boiler 4 for combustion at Synthite compared to DYNEAs database has shown that the formaldehyde concentrations at Synthite are 1017 mg/Nm3 (wet) and 1030 mg/Nm3 (dry) compared to the typical range of 100 – 200 mg/Nm3. This raises questions as to whether there is potential for reducing formaldehyde and VOC levels at the boiler inlet by revamping absorption sections and or including new scrubber facilities prior to the streams entering the boiler.

Page 7 of Synthite's own IPPC application from 2005 discusses in process controls for the absorbers at Synthite's silver plant, stating that "*in normal operation the exit gas from the final scrubber is drawn* *into the exhauster system. In normal operation the final composition of the exhaust gas is 25 % Hydrogen, 5 % Carbon Dioxide and 70 % Nitrogen. This is blown to the gas Boiler where it is burnt to provide steam for the process."* It is evident that other inputs of formaldehyde and methanol are present, either not being included in the permit application documents or added later such as in the addition of emissions from the A15 tanker loading scrubber.

The document then goes on to state that the control of the absorption system is manual. "*The operators monitor the levels and product quality in accordance with the Plant Operating Procedures and then adjusting the inlet and outlet flows to each of the columns.*

The levels are monitored via PLC and there are high and Low level alarms for the system. In the event of an alarm the operator adjusts the plant in accordance with the Plant Operating Procedures."

Whilst the absorbers are part of the formaldehyde production process, NRW views them as environmentally critical components of the plant, as they have impact on how much formaldehyde and methanol is allowed to proceed to the exit gas boiler 4 and associated emissions at A16. The plant manager described how results from sampling and analysis were input into a spreadsheet that was conditioned to show whether formaldehyde and methanol levels in various stages of the process were too high or too low. Plant operatives then make manual adjustments to the plant to bring into optimal operating conditions.

NRW officers requested sight of the procedures that instruct plant operatives to use the information to assess whether the plant is operating as it should be, otherwise to make adjustments to the process in line with the plant manual. The operator was unable to furnish Silver Plant operating procedures, the Chemicals Plant Manager stated that control of the plant relies on operator training and experience.

NRW officers proceeded to request the planned maintenance programme for the silver plant including absorption and abatement phases. The operator was unable to produce this information at the time of the audit due to the maintenance manager being on holiday.

It was also notable during the audit that various flow meters around the methanol vaporiser were broken. The flow meter and temperature probe at the A16 boiler (boiler 4) also appeared to be non-functional raising questions about the combustion control.

Due to the information which was missing at the time of the audit, the following information was requested form the operator once officers had left site.

- Monitoring data for absorbers for the last 12 months (since 1st May 2025)
- Planned maintenance and schedules for the absorber system including pumps.
- Any evidence demonstrating that the planned maintenance has taken place
- Dates of silver plant downtime/ operational time.

Partial submission of the information occurred on the 23rd June 2026. Each piece of information submitted will be discussed in turn.

<u>Silver Plant Monitoring Data.</u>

Monitoring data for samples which are taken regularly at the silver plant were submitted as requested. The data in the spreadsheet appeared to lack any value conditioning. It was not clear what values prompted action without an accompanying operating procedure. However, an average control could be inferred from the data and produced graphics.

Dates of silver plant downtime were submitted to NRW this data shows regular periods when the silver plant has not been operational due to catalyst changes. Synthite's own standard operating procedure for the exit gas boiler state that hydrogen rich tail gas is required to achieve the combustion temperature required to achieve the destruction of formaldehyde and VOCs such as methanol. It is not clear to NRW how the operator planned for hydrogen rich tail gas to be available to allow for combustion of foul air from the A15 tanker loading scrubber which is generally operable at all times during silver plant catalyst changes.

Silver Plant maintenance.

Within the submitting email the operator stated that "*The Reliability Engineer has advised that we don't currently have any records showing that maintenance has been carried out on these assets. He's planning to gather the asset numbers today and check whether he can match them to anything in our new system. There are also several boxes of paperwork in the Pilot Plant from when his predecessor issued work instructions under the old system, and he may be able to review these to see whether any historical maintenance information relates to the assets.*" As a result, the operator was unable to provide evidence demonstrating that the silver plant and associated environmentally critical equipment are being maintained in accordance with BAT and environmental permitting regulations.

It should be noted that within the submitting email the operator also stated that "*The concentration of formaldehyde and methanol in the foul gas stream is not influenced by the absorber column stages of the silver plant. The systems are independent.*" This is contrary to other documents which have been provided as part of this audit, including the silver formaldehyde plant functional description and the plant schematic drawings which were submitted ahead of the audit. These documents clearly show how exit gas from the absorbers and the concentrating column are vented to the vent column. Exit gas from the vent column is shown to be transferred to the exit gas boiler.

This clearly shows that the absorber process is intrinsically linked to the exit gas boiler. Therefore, ineffective absorption of formaldehyde and methanol within the gas stream can have a direct impact on the amount of formaldehyde and methanol which reaches the exit gas boiler at A16 for destruction. This raises questions regarding the level of understanding of the process and its environmental implications amongst plant personnel.

Following the audit a further EPR regulation 61 notice for information was served on the operator, providing a final opportunity to submit the information prior to further action being taken.

On the 3rd of July 2026, additional documentation relating to operational controls, maintenance arrangements and management systems has been submitted to NRW

NRW has reviewed the existence of this documentation when determining the final compliance scores applied within this report. However, the effectiveness, implementation and application of these systems have not yet been fully assessed.

NRW will undertake a detailed review of the submitted information and conduct a follow-up audit to verify that the documented systems are implemented, understood by personnel and operating effectively.

Summary of Audit Findings

Despite forewarning of the audit and the subjects that were planned to be covered. Plant management were unable to produce records which demonstrate that the silver plant and associated abatement at the silver plant are being managed and maintained in accordance with a robust management system and a defined maintenance schedule.

It is of note that responses from site management following the audit indicate inconsistencies in the understanding of the relationship between certain plant processes and emissions management requirements, in particular regarding the relationship between the absorption system and emissions at A16. This has the potential to lead to the quantities of formaldehyde and methanol entering the abatement system.

Information provided by the operator during and immediately following the audit appeared inconsistent with established process documentation, indicating that further assurance is required regarding understanding of the environmental function of critical plant.

Furthermore, the operator has failed to demonstrate how emissions are effectively managed during periods of silver plant downtime, when hydrogen-rich gas required for effective combustion may not be available. This raises questions which require further review by NRW to determine whether emissions remain adequately controlled during these periods.

The points highlighted indicate weaknesses in the implementation and demonstration of the site's management systems that require further assessment.

Non-compliances with the Environmental Permit.

Permit condition 1.1.1a states the following "*The operator shall manage and operate the activities in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints;*"

Permit condition 1.1.1b states that "The operator shall manage and operate the activities using sufficient competent persons and resources."

Failure to furnish the requested information during the audit, together with inconsistencies in explanations provided regarding key process interactions, indicates that further assurance is required regarding competence and understanding of environmentally critical plant. A lack of competence significantly increases the risk that the process is not controlled in a manner which protects the environment.

The inability to produce key information during an audit investigating serious compliance issues, combined with internal management action and apparent governance failures, points toward weaknesses in the implementation and availability of management system controls, even with the documentation being furnished a later date as required by an enforcement notice.

The addition of foul gas from the A15 tanker loading scrubber to boiler 4 at A16 raises questions as to whether the implications of process constraints at the silver plant were fully considered.

These observations increase the risk that site activities may not be adequately controlled to minimise the potential for pollution.

A category 2 score has been applied against permit condition 1.1.1 under subheading IR1A Management.

The modification of the A15 emission point in this manner represents an unpermitted change in operating techniques. NRW considers this a breach of permit condition 2.3.1(a) "*The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by Natural Resources Wales.*"

A category 3 score has been applied against permit condition 2.3.1(a) under subheading IR2C Operating Techniques.

Permit condition 1.1.2 "*States that Records demonstrating compliance with condition 1.1.1 shall be maintained.*" Whilst documents demonstrating compliance with permit condition 1.1.1 have now been produced, these documents were not available for review during the audit despite indication that officers would be inspecting this information during the audit. The operator also failed to produce these documents when they were requested by email following the audit. This indicates poor availability and control of the management system. NRW views this a non-compliance against permit condition 1.1.2.

A category 3 score has been applied against permit condition 1.1.2 under subheading IR1A Management.

Action 1: The operator must ensure that the documentation provided in response to the Regulation 61(1)) notice is is fully embedded within site management system and operations by the 31st August 2026.

Action 2: Provide NRW with a plan as to how formaldehyde emissions from tanker loading will be abated during silver plant shut down periods. Please do so by the 31st August 2026.

NRW will contact site operatives in due course to arrange a follow up audit. The investigation into permitted emissions level breaches at permitted emission point A16 continues.

Kind Regards

Phil Harper

Lead Specialist Industry & Waste Regulation North Wales

03000 65 3717/ 07890025506

philip.harper@cyfoethnaturiolcymru.gov.uk

If you have any queries about this report, or to discuss completion of any actions, please contact the NRW Officer named above.

Important information

Legal status of this report
Your permit is issued to you under the Environmental Permitting Regulations. You have a responsibility to comply with the conditions of your permit and prevent pollution/harm of the environment. You must also ensure that you comply with any other relevant legislation that may apply to your site's operations.

This report explains the findings of our assessment and any action you are required to take. We categorise non-compliance using our guidance for assessing non-compliance at regulated sites.

When we find potential non-compliance/s we will normally give you advice on how to maintain compliance.

To correct non-compliance, we may:

- require you to take specific actions
- issue a notice
- review the conditions of your permit.

Any advice and guidance we give will be without prejudice to any other enforcement response that we consider may be required.

Assessment results and non-compliance categories (used in section 1):

Assessment result	Description
Assessed (A)	Assessed or assessed in part, no evidence of non-compliance found
Action only (X)	Action required for the permit condition assessed to avoid non-compliance. No non-compliance scored at this time
Ongoing (O)	Ongoing non-compliance, not scored

Non-compliance category	Description	Score
C1 Major	Potential to have a major, serious, persistent and/or extensive impact or effect on the environment, people and/or property	60
C2 Significant	Potential to have a significant impact or effect on the environment, people and/or property	31
C3 Minor	Potential to have a minor or minimal impact or effect on the environment, people and/or property	4
C4 No environmental impact	Non-compliance at a regulated site that cannot foreseeably have any impact on the environment, people and/or property	0.1

How we use assessment scores
The number and severity of non-compliances recorded in a year will affect your annual subsistence fee the following year. A non-compliance factor is added to your site's Operator Performance Risk Appraisal (OPRA) score when we calculate your fee to reflect the additional resource we use to assess permit compliance.

If your assessment result in Section 1 is suspended, what does this mean?
In line with our guidance, we may suspend scores for up to six months to allow time for remedial action to be taken. Suspended scores will be re-instated if the action is not completed.

Full list of Industry compliance criteria (used in section 1 and 2):

1. Management
- IR1A – General management
- IR1B – Finance (only applicable to Landfill)
- IR1C – Energy efficiency
- IR1D - Efficient use of raw materials
- IR1E - Avoidance, recovery and disposal of wastes produced by the activities
- IR1F - Multiple operator installations

2. Operations
- IR2A – Permitted activities
- IR2B – The site
- IR2C – Operating techniques
- IR2D – Technical requirements
- IR2E – Improvement programme
- IR2F – Pre-operational conditions
- IR2G – Landfill engineering (only applicable to Landfill)
- IR2H – Waste acceptance (only applicable to Landfill)
- IR2I – Leachate levels (only applicable to Landfill)
- IR2J – Closure and aftercare (only applicable to Landfill)
- IR2K – Landfill gas management (only applicable to Landfill)

3. Emission and Monitoring
- IR3A(1) – Emissions to water
- IR3A(2) – Emissions to air
- IR3A(3) – Emissions to land
- IR3B – Emissions of substances not controlled by emission limits
- IR3C – Odour
- IR3D – Noise and vibration
- IR3E – Monitoring
- IR3F – Pests
- IR3G – Air quality management plans
- IR3H – Monitoring for the purposes of the Industrial Emissions Directive (this heading includes Large Combustion Plants)
- IR3I – Fire

4. Information
- IR4A – Records
- IR4B – Reporting
- IR4C – Notification

Enforcement response
Any non-compliance with a permit condition is an offence and we may take legal action against you. Action we take can include prosecution, serving a notice on you and/or suspension or revocation of your permit. See our Enforcement and Sanctions Guidance for further information.

Data protection notice
You should make sure that anyone named in this report knows that the information it contains will be processed by Natural Resources Wales to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s).

We may also use and/or disclose the report in connection with:

- offering or providing you with our literature or services relating to environmental matters
- consulting with the public, public bodies and other organisations (e.g. 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 our service
- Freedom of Information Act or Environmental Information Regulations requests.

We may also pass it on to our agents or representatives to do these things on our behalf.

Disclosure of information – this report will be available to view on-line
If you think this report contains commercially confidential information that should not be placed on our public register, you must contact your local Natural Resources Wales office within **fifteen working days** of receiving this report, using the contact details in the accompanying email or letter. You must give a full explanation of why it should not be added to our public register, including specifying which information is commercially confidential. We will assess your request and respond to you within twenty working days to let you know if we agree to your request.

Disputing the Content of this Compliance Assessment Report Form
If you disagree with the content of this Compliance Assessment Report form, you should submit your concerns, in writing, to the regulating officer who issued it within **15 working days** of its issue. This will be treated as a **Stage 1 review**.

If you are not satisfied with the outcome of the stage 1 review, you may request a **Stage 2 appeal**. This request must be submitted **within 21 working days** of receiving the response from the stage 1 review.

Further details on our review and appeal process are available at: Natural Resources Wales / Appeal a regulatory decision from Natural Resources Wales

Concerns Not Related to the Content of this Compliance Assessment Report Form
If your concerns do not relate to the content of the Compliance Assessment Report form, you should first attempt to resolve the issue with the regulating officer or their line manager.

If the issue remains unresolved, please contact our **Customer Contact Team**:

- **Telephone**: 0300 065 3000 (Monday to Friday, 09:00–17:00)
- **Email**: enquiries@naturalresourceswales.gov.uk

They will provide details on how to escalate your concerns through our **Complaints and Commendations procedure**.

If you are dissatisfied with our response, you may contact the **Public Services Ombudsman for Wales**:

- **Telephone**: 0300 790 0203
- **Email**: ask@ombudsman.wales

Welsh Language Standards

We are committed to establishing Natural Resources Wales as a naturally bilingual organisation. We will provide compliance reports in your preferred language.