

Compliance Assessment Report CAR_NRW0038548

Permit being assessed: LP3030XA.

For: Cardiff Energy Recovery Facility, held by Viridor Trident Park Limited

At: Trident Park, Glass Avenue, Cardiff, CF24 5EN.

Type of assessment carried out: Report/Data Review, Reason: Routine.

On 30/07/2021.

Parts of permit assessed: Emissions control, monitoring, reporting and emissions

NRW Lead Officer: Antony Leakey.

Report sent to: Gwyn Jones, Environment, Health and Safety Manager on 30/07/2021.

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

Part of permitted activity assessed (criteria)	Assessment result	Permit condition
C2 - General Management - Management system and operating procedures	C3 Minor	1.1.1
B1 - Infrastructure - Engineering for prevention and control of emissions	C3 Minor	2.3.7
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	C3 Minor	4.3.1
E1 - Emissions - Air	C3 Minor	3.1.2
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	C3 Minor	4.2.3
E5 - Emissions - Waste	Assessed (A)	
G1 - Monitoring and Records, Maintenance and Reporting - Monitoring of emissions and environment	Assessed (A)	

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

Total number of non-compliances recorded	Total non-compliance score
5	20

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
C2	Viridor to review, and update if necessary, procedures and processes for implementing risk controls identified by hazard studies in operational systems.	31/10/2021
B1	Viridor to review, and update if necessary, procedures and	31/10/2021

Criteria	Action needed	Complete by
	processes for implementing risk controls identified by hazard studies in operational systems.	
G4	Viridor to review, and update if necessary, NRW notification procedures and their implementation.	31/10/2021
E1	Viridor to investigate where possible the cause of the combustion instability indicated by the data and provide an update on any further actions to prevent a recurrence.	31/10/2021
G4	Viridor to review emissions reporting and data quality assurance processes and provide an update on progress.	31/10/2021

Action 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.

At this time, we are issuing you with a warning for the non-compliance recorded above. Warnings may influence future enforcement response for continued or further non-compliance.

This statement does not stop us from taking additional enforcement action if further relevant information comes to light or offences continue.

4. Details of our assessment

Trident Park Reporting Review and Compliance Assessment - 30 July 2021

Sulphur dioxide and NOx abatement operation

Abatement performance will now be assessed during the Waste Incineration Bref implementation permit review. See below for more details.

Power loss incident

The site suffered a total power loss at 0136h on 4/1/21 resulting from an internal loss of supply to the HV and LV distribution boards. Power supplies were restored at 0346h and plant recovery plans were initiated.

The HV and LV circuit breakers are controlled and operated by 110V battery supplies. Battery Charger No.1 provides 110V supplies to the HV circuit breaker control coils. Battery Charger No.2 provides 110V supplies to the LV circuit breaker control coils. 'Normal operation' is via site mains power providing a supply to the battery chargers. If there is a loss of mains supply to the battery chargers, they automatically revert to 'Battery Mode' in order to maintain the 110V coil supplies to the HV & LV circuit breakers. Once the battery chargers' mains supply is restored the battery chargers automatically switch back to 'Normal Operation' mode. In the event of a 110V coil power loss, any associated HV and LV circuit breakers will 'fail safe' to the OPEN position.

The Distributed Control System (DCS) received an ambiguous indication of the failure to restore “Normal Operation” mode as the DCS Battery Charger indication changed from ‘Normal Operation’ to ‘Operation’. As this event had not happened before the site team was unaware that the 110V supplies to both the HV and LV circuit breakers were being supplied in ‘Battery Mode’ resulting in the battery power slowly depleting over time until both breakers failed open.

The power loss was technically avoidable if the DCS alarm had been understood and acted upon. Viridor has a responsibility to ensure that all fault conditions that may cause environmental impacts are appropriately managed by providing operators with the necessary instructions and training.

A HazOp study or similar will have identified the need for the battery depletion DCS alarm, but the alarm priority, training need and requirement for operator instructions on how to respond to this alarm was not captured by the Viridor management system.

The operators disregarded the alarm because it did not convey clearly what the issue was, and the alarm did not have a high prioritisation setting configured.

The uncontrolled shut down resulted in a period of hours when waste was burning out on the grate without full combustion air or support burner operation. This was particularly the case for line 1 which suffered a grate failure following the shutdown. As might be expected CO and VOC emissions were elevated for some of the period, but stack flows were low reducing the pollutant load. Flue gas temperatures indicate that there was still some thermal buoyancy, but plume momentum was reduced due to the low flow rate. A reasonable level of dispersion is expected to have been maintained due to the tall 90 metre stack.

Operation with waste on the grate without auxiliary burners in operation and with flue gas combustion chamber temperatures below 850°C for a period of up to 24 hours on line 1 is a category 3 non-compliance with permit condition 2.3.7.

Assessment of air quality impacts associated with elevated VOC emissions suggests that effects would be minor based on a pessimistic approach using worst-case assumptions about VOC species released. The reportable VOC emissions were caused by open limit switches as the feed chutes were cleared during the recovery phase although technically the plant was in operation. Similarly, the elevated emissions during this period are a category 3 non-compliance with permit condition 3.1.2. This has been consolidated with the separate non-compliance with the VOC ELV on 23 January (see commentary below).

The failure to translate the HazOp power failure requirements into an appropriately prioritised alarm, provide operators with the necessary instructions and training in relation to the DCS charging failure alarm is a category 3 non-compliance with permit condition 1.1.1.

The event was not notified to NRW for some time and then the nature of the event was not made clear. The failure to notify is a category 3 non-compliance with permit condition 4.3.1. There is an outstanding action for Viridor to update and submit the notification procedures.

The Trident Park electrical team and the operations team are carrying out daily checks on the battery charger units to ensure they are operating in ‘Normal Operation’ mode.

The battery charger manufacturer attended site in order to carry out battery charger inspections. No known faults or issues were noticed during the engineer's inspection and the battery chargers were in good working order.

The battery charger control cards and have been replaced as a precaution.

The DCS indication has been changed to improve the clarity of the message displayed: 'Batteries in Operation' displays when the Battery chargers are in 'Battery Mode' as well as a flashing 'Batteries Discharging' warning message.

The battery charger associated DCS alarms are now configured as high priority alarms due to their potential detrimental effects. A review of the battery charger alarms, and their associated priority levels has been undertaken and now complies with industry standard alarm protocols.

A review of the site Blackout procedure has been undertaken, and an associated Unit Emergency Plan has been produced. Operations team retraining was completed during Quarter 1 2021.

The remaining outstanding actions relating to this event are associated with Viridor procedures for translating HAZOp/risk assessment study recommendations into operational controls and NRW notification criteria for events and permit non-compliance.

ACTION: Viridor to review, and update if necessary, procedures and processes for implementing risk controls identified by hazard studies in operational systems and NRW notification procedures and their implementation by 31 October 2021.

IBA assessment

The log of sampling dates for 2020 that should be maintained as evidence of the randomised sampling approach was inspected. It is not clear that the sampling dates are randomised and there may be bias towards sampling at the early/late and middle dates in the month, although days of week appear to be reasonably randomised.

The Sampling Record for the July 2020 sample was examined. Details of the sampling approach are limited and refer to the IBA SOP. There is also a suggestion that front of stockpile increments only are collected due to access limitations. The overall primary sample mass does not appear to follow the general approach set out in the ESA IBA Protocol, which suggests that 200 kg composite primary sample should be obtained while loading a vehicle is taking place. It is unclear if the site-specific protocol follows a different approach based upon considerations based in CEN Technical Report 15310-2. PD CEN/TR 15310-2:2006 – Guidance on Sampling Techniques.

Compliance with the sampling requirements of the ESA IBA Protocol will be examined further during the next site inspection.

ACTION: Viridor to submit a copy of the Trident Park IBA SOP to NRW for assessment.

Combustion and efficiency control

The Martin Combustion System inspection reports for 2017, 2018 and 2019 were examined for supporting evidence of air flows used in the R1 calculations. It was apparent from these reports that some aspects of plant maintenance have been neglected with potential impacts on emissions minimisation and efficiency. In particular, failure to control tramp air ingress, oxygen analyser calibration and grate coverage with implications for combustion control efficiency and fugitive ash emissions into the boiler house. Evidence of fires in feed chutes was also identified.

ACTION: Viridor to review these issues and provide an update on progress at next review meeting.

CEMs QAL2 reset

The reset of the ERF CEM calibration functions has been completed and photographic evidence provided of implementation of the new functions in the DAHS software. A review of the QAL2 reports has identified the following aspects for further discussion:

- Documentation of QAL3 failures, deviations for stabilisation approach and linearity tests
- QAL2 function gradients <0.9 for some pollutants (e.g. HCl, SO₂)
- Low valid calibration ranges
- Low level cluster failure for dust

ACTION: Viridor to review these issues and provide an update on progress at next review meeting.

Steam venting noise

Process operators have been briefed on the need to minimise steam venting during night-time.

A review and update of notification procedures and associated operator training will be undertaken as part of the follow up action to the power failure event discussed above.

Wind speed and direction monitoring requirement

The permit requires (Table S3.4) continuous monitoring of wind conditions at the site but NRW understands that this has not been implemented. Provision of such data is likely to be useful due to the nature of the complaints received regarding the ERF and its operation.

ACTION: Viridor to review provision of an onsite weather station and update at next review meeting.

Nitrous oxide, carbon dioxide and flue gas flow rate monitoring

NRW has adopted the Environment Agency requirement for voluntary monitoring of these parameters to EN14181/16911 standard by 2022.

ACTION: Viridor to review voluntary implementation of additional monitoring to the relevant standards and update at next review meeting.

Waste Incineration Bref Review

The permit review process has started and NRW served a Regulation 61 information notice to start the Trident Park ERF permit review on 15 June 2021. A response time of 6 months is required with the aim to have granted reviewed permits by November 2022. An assessment of abatement system performance will now be undertaken as part of the permit review.

Deemed Permit Condition

As a result of [The Waste \(Circular Economy\) \(Amendment\) Regulations 2020](#), which came into force on the 1st October, the Environmental Permitting (England and Wales) Regulations 2016 have been amended to introduce a statutory permit condition for:

- landfill
- waste incineration plant
- small waste incineration plant
- waste co-incineration plant operators

This is to prevent waste that was separately collected for re-use or recycling from being accepted for landfill or incineration.

Where separately collected waste is treated (for example by sorting in a material recycling facility), you may landfill or incinerate waste from that treatment which is unsuitable for recycling if it gives the best environmental outcome in line with the waste hierarchy.

The following has been inserted in Schedule 9 of the Environmental Permitting (England and Wales) Regulations 2016:

“Waste separately collected for preparing for re-use and recycling not to be incinerated

1.—(1) Every environmental permit which authorises a small waste incineration plant, a waste co-incineration plant, or a waste incineration plant is deemed to contain the following condition, unless such a condition to the same effect is included in the permit.

(2) The condition is that the operator must not accept—

(a) any waste paper, metal, plastic or glass for incineration if that waste has been separately collected for the purpose of preparing for re-use or recycling; or

(b) any waste for incineration that results from the treatment of waste referred to in paragraph (a), unless—

(i) the relevant permit authorises the operator to accept that type of waste for incineration; and

(ii) incineration of that waste delivers the best environmental outcome in accordance with regulation 12 of the Waste (England and Wales) Regulations 2011.”

Emissions review

The plant has been mostly operational during the Q4 2020, Q1 and Q2 2021 emissions and 2020 annual reporting review period. The main outage occurred during June and July 2021.

The Line 1 30-minute average VOC ELV was exceeded on 23 January 2021 shortly after start up and as the burners were not firing at the time of the elevated TVOC data and all

steam and oxygen parameters indicate that if all feeders, dampers and grate were providing “ON” signals, then the plant was “operating” and the CEM data was reportable.

The plant control logic allows for the burners to “assist” maintenance of T2S while the plant is operational and there is no evidence in the data that the plant dipped back into shut down.

Close examination of the times and data suggest that there was a transient combustion issue shortly after the plant switched from start up to operational mode when the waste feed came on presumably at 07:20h.

The burners kicking in briefly at 07:27h are presumably in response to the dropping furnace temperature after the waste feed was established 7 minutes earlier and may be an indication of low CV/wet waste.

Boiler oxygen falls noticeably between 07:37h and 07:40h and this corresponds with a significant rise in 10-min average CO concentration, suggesting a combustion issue that presumably resulted in a longer term rise in TVOC or a spike large enough to affect both 30-min averages during this period.

This cannot be considered a period of abnormal operation either as the TVOC levels are higher than those allowed by the permit, which are the same as for “normal” operation. The elevated emissions during this period are a category 3 non-compliance with permit condition 3.1.2 due to the limited impact associated with a marginal rise in VOC emissions for a short duration.

ACTION: Viridor to investigate where possible the cause of the combustion instability indicated by the data and provide an update on any further actions to prevent a recurrence by 31 October 2021.

It is noted that the 95th percentile of 10-minute average CO concentrations in any 24-hour period is not reported quarterly as required by the permit.

Several discrepancies were also identified between quarterly CEMs emissions reports for 2020 and the annual report. These were transposition errors arising during the transfer of data from the DAHS-generated reporting format that retains data integrity to a bespoke quarterly and annual reporting format.

The monthly automatically generated CEMs data reports should now be used for quarterly reporting and an annual report with appropriate data QA processes produced using the standardised Environment Agency format.

Action to resolve all these issues is already in hand and will ensure future compliance with reporting requirements. The reporting failures could result in ELV exceedances being missed and action not being taken to investigate and make improvements to prevent recurrence. It is recognised that gross increases in emissions are likely to be spotted by the operating team and so this is considered a category 3 non-compliance with permit condition 4.2.3.

ACTION: Viridor to review emissions reporting and data quality assurance processes and provide an update on progress by 31 October 2021.

All emissions and reports other than the specific cases discussed in this report are compliant with the permit limits.

END

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 only relating to the activity assessment
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.

What are suspended scores?

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 and Waste action criteria (used in section 1 and 2):

A: Permitted activities

- A1 Specified by permit

B: Infrastructure

- B1 Infrastructure – Engineering for prevention and control of emissions
- B2 Infrastructure – Closure and decommissioning
- B3 Infrastructure – Site drainage engineering (clean and foul)
- B4 Infrastructure – Containment of stored materials
- B5 Infrastructure – Plant and equipment

C: General management

- C1 General management – Staff competency/training
- C2 General management – Management system and operating procedures
- C3 General management – Materials acceptance
- C4 General management – Storage, handling, labelling and segregation

D: Incident management

- D1 Incident management – Site security
- D2 Incident management – Accidents, emergency and incident planning

E: Emissions

- E1 Emissions – Air
- E2 Emissions – Land and groundwater
- E3 Emissions – Surface water
- E4 Emissions – Sewer
- E5 Emissions – Waste

F: Amenity

- F1 Amenity – Odour
- F2 Amenity – Noise
- F3 Amenity – Dust/fibres/particulates and litter
- F4 Amenity – Pests/birds and scavengers
- F5 Amenity – Deposits on road

G: Monitoring and records, maintenance and reporting

- G1 Monitoring and records, maintenance and reporting – Monitoring of emissions and environment
- G2 Monitoring and records, maintenance and reporting – Records of activity, site diary/journal/events
- G3 Monitoring and records, maintenance and reporting – Maintenance records
- G4 Monitoring and records, maintenance and reporting – Reporting and notification to Natural Resources Wales

H: Resources efficiency

- H1 Resource efficiency – Efficient use of raw materials
- H2 Resource efficiency – Energy efficiency

Enforcement response

Any permit condition non-compliance 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 20 working days to let you know if we agree to your request.

What do I do if I disagree with the report or have a complaint?

If you disagree with this compliance assessment report, you should contact the lead officer without delay to discuss your concerns.

If you are unable to resolve the issue with the lead officer or their line manager you should contact our Customer Contact team on 0300 065 3000 (Monday to Friday 08:00 – 18:00), or email enquiries@naturalresourceswales.gov.uk for details of how to raise your dispute further through our Complaints and Commendations procedure.

If you are dissatisfied with our response, you can contact the Public Services Ombudsman for Wales by phone on 0300 7900203 or by email at 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.