



Wrexham Clinical Waste Incinerator

Review of QAL2 and AST Reports

24 April 2014

Wrexham Clinical Waste Incinerator, Marlborough Road

Permit Number EPR/WP3836ZF

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Summary

The last QAL2 (Quality assurance level) exercise, QAL2 2012, was conducted in November 2012 and reported February 2013.

The last AST (Annual Surveillance Test) exercise, AST 2013, was conducted in November 2013 and reported February 2014.

There are no records available to confirm if actions were completed at the time of the issue of the reports. Since the issue of the reports the following maintenance procedures have been carried out:

- 1) CEMS (Continuous Emission Monitoring Systems) has been maintained by the Service Provider as per recommended maintenance schedule defined in the maintenance agreement. Service records are kept on site.
- 2) QAL3's have been completed on a weekly basis by the site maintenance supervisor. The Assistant Site Manager will be trained to complete QAL3's in his absence.
- 3) An AST, AST 2013, has been completed and the recommended QAL2 2014 has been carried out 8, 9 & 10 April 2014 but awaiting the report. QAL2 2014 was carried in accordance with Standard BS EN 14181, Stationary source emissions. Quality assurance of automated measuring systems, and the Wrexham permit and covered the following parameters:
 - a) NO_x
 - b) CO
 - c) SO₂
 - d) Water Vapour
 - e) Particulate matter
 - f) O₂
 - g) HCl
 - h) VOC
 - i) CO₂

The conclusions and recommendations (in italics) of the QAL2 2012 and AST 2013 reports are summarised below and accompanied by a review of the current situation:-

QAL2 2012

Particulate Matter

A calibration function has been derived however it does not pass the variability test, which indicates that there could be a problem with the CEMS system. Further investigations are required to ascertain why a valid calibration function could not be derived and a repeat of the QAL2 exercise may be required once the CEMS has been checked and / or fixed.

QAL2 2014 was carried out 8, 9 & 10 April 2014.

Also, an investigation into particulate matter results was conducted as a result of breach of a biannual test LEV. The conclusions were submitted to EA as per Part B notification. The following actions were identified as a result of the investigation:

Immediate Actions

- 1) All filter bags have been replaced.
- 2) The particulate matter instrument was inspected by the Service Provider
- 3) Biannual particulate matter test was repeated 23 January 2014- The result of which was 1.44 mg/m³ and therefore well within the permitted limit of 20 mg/m³
- 4) Three monthly Inspections and cleaning of the particulate matter CEMS probe carried out by the CEMS Service Provider.

Actions to prevent reoccurrence of damage to filter bags

- 1) Bag house trace heating and heater to be returned to service. Completed 1 April 2014
- 2) Post Combustion stages to be inspected for evidence of fires and to ensure all clear of foreign material pre-bag house before start up. Ensure a record is maintained. On going
- 3) A sample of used filter bags from known high wear areas to be exchanged at shutdowns for return to the supplier to identify excessive bag wear. On going

Actions to identify damage to filter bags

- 1) Contact CEMS Service Provider about Site Maintenance staff carrying out higher frequency particulate matter probe cleaning and feasibility of using a "maintenance setting" to take the probe off line whilst cleaned. Awaiting response from Service Provider.
- 2) Investigate feasibility of reinstating filter bag house pressure differential indication to help identify passing filter bags (reduction in pressure differential) or blinding of filter bags (increase in pressure differential). Contractor booked for May 2014 shutdown.
- 3) Review purchasing equipment to allow "Black light test" of filter bag condition using UV visible powder and UV light. Schedule and record test and results appropriately. Ordered, awaiting delivery.

Hydrogen Chloride and Oxygen

A valid calibration function has been derived which passes the variability test. This calibration function should be used and entered into the Data Collection Software (DCS). It should however be noted that the calibration function derived for Oxygen is quite a bit higher than would be expected. The functional tests performed by Service Provider did not include a check of the Oxygen cell on the analyser and therefore the CEMS results for Oxygen could be construed as being "questionable".

The CEMS Service Provider tests the functionality of the Oxygen cell during the routine service. The functionality of the oxygen cell is being tested during the current QAL2 2014 exercise.

There is nothing in subsequent Service Providers routine service records after the QAL2 2012 to suggest that the Oxygen analyser has not been functioning correctly. A meeting with the Service Provider during QAL2 2014 exercise reaffirmed the fact that there is no reason to believe the oxygen cell hasn't been functioning normally

Service Provider's service engineer carried out linearity checks before Easter. All tests were correct.

Measuring cells are checked during service with calibration gas and by checking parameters. Both of them were correct.

Total VOCs, Oxides of Nitrogen (as NO₂), Water Vapour, Carbon Dioxide

A valid calibration function has been derived which passes the variability test. As the gradient of the calibration function is less than half of the 95% Confidence Interval [CI] and the SRM and CEMS data are therefore deemed to be extremely close in agreement with one another, MID 14181 Version 2.4 suggests that the calibration function derived may not be used and the calibration function in the Data Collection Software (DCS) could be left at 1.0000 (i.e. $y = x$). Agreement from the Environment Agency must be sought before applying this guidance.

No action required

Sulphur Dioxide & Carbon Monoxide

As the emissions are of an extremely low order (<10% of the Daily ELV) and the spread of data is poor, a valid calibration function has not been derived. The graphical representation of the data can be seen in Section 4A at the back of the test report. Environment Agency guidance for these situations suggests that where emissions are extremely low and a linearity test was not / or could not be performed, it is acceptable to leave the calibration function in the Data Collection Software (DCS) as 1.0000 (i.e. $y = x$), and take the CEMS readings as being indicative readings only.

No action required

Linearity Conclusion

The CEMs was found to give a linear response to all the tests gases supplied to the analyser, passing the BS EN 14181 test of residuals requirement.

AST 2013

The last AST exercise was conducted November 2013 and reported February 2014

Oxides of Nitrogen (as NO₂)

The CEMS data was corrected using the calibration function derived during the most recent QAL2 campaign. The corrected values passed both the variability and calibration tests as required by BSEN14181 and therefore the calibration function is deemed to be valid within the given tolerances. The calibration range derived in the previous QAL2 has been extended as a larger spread of data was collected during this AST exercise.

No action required

Total VOCs, Carbon Monoxide, Water Vapour, Oxygen (Dry), Carbon Dioxide

The CEMS data was corrected using the calibration function derived during the most recent QAL2 campaign. The corrected values passed both the variability and calibration tests as required by BSEN14181 and therefore the calibration function is deemed to be valid within the given tolerances. The calibration range derived in the previous QAL2 is still valid.

No action required

Hydrogen Chloride

The CEMS data was corrected using the calibration function derived during the most recent QAL2 campaign. The corrected values did not pass either of the variability or calibration tests as required by BS EN 14181 and therefore the calibration function is deemed to be invalid. The correct functionality of the CEMS system had been checked during the pre-AST functional checks, however, it may be worth re-checking. Following this, a new QAL2 will be required to derive a new calibration function. It is worth noting that applying a function of $y = x$ would have led to the CEMS passing both the variability and calibration checks, however it is not permissible to change the function from the QAL2 based on an AST exercise. A repeat QAL2 will still be necessary.

QAL2 2014 carried out 8, 9 & 10 April 2014 as per recommendation.

Total Particulate Matter

The CEMS data was corrected using the calibration function derived during the last QAL2 performed in 2012, although it should be noted that this function was deemed invalid due to it failing the test of variability, and a re-test was recommended. The corrected values failed both of the variability and calibration tests as required by BS EN 14181. The correct functionality of the CEMS system had been checked during the pre-AST functional checks, however, it may be worth re-checking. Following this, a new QAL2 will be required to derive a new calibration function.

CEMS has been checked by Service Provider as part of the investigation into elevated particulate readings. The Engineers report concludes that CEMS is operating correctly. Investigation findings were submitted to the EA and highlighted above.

QAL2 2014 has been carried out as per recommendation.

General comments:

Discussions have been held with Service Provider and Catalyst and Site Maintenance Manager.

Since the QAL2 2012, the CEMS has been regularly maintained by the Service Provider with no issues raised.

QAL3's have been completed on a weekly basis by in house staff and have all passed.

AST 2013 was completed in 2013 and where variability requires re-checking QAL2 2014 has been carried out as per the recommendations in the AST.

The oxygen cell has been checked by the Service Provider on a regular basis and there are no reported problems.

Actions

Carry out Q2 8, 9 & 10 April 2014 (completed, awaiting report)

Ensure all actions determined by Q2 2014 are completed

Train Assistant Site Manager to complete QAL3 test

