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TOYOTA

Julia Frost
Regulatory Officer
Natural Resources Wales
Chester Road
Buckley
Flintshire, CH7 3AJ

Ref: PPC Permit BK6483IU

Date: 14/01/2016

Dear Julia,

Please find enclosed the returns for emissions monitoring and performance during 2015.

Please note:

1. All particulates results are reported as an average of 3x 1 hour samples.
2. Phenol on ST1 is reported as a 4 hour average (as permit variation).
3. CO and NOx on ST2 is reported as a full shift average (as permit variation).
4. The Bag filter dust weight is high in 2015, due to carry over of a waste shipment from 2014.

If you have any queries, please do not hesitate to contact me.

Yours sincerely,

Keith Martin
Senior Engineer
Facilities and Environment

Enc: Reporting forms Air1a – f, Water1, Sewer1, Waterusage1, Energyusage1, Performance1

Permit Number: EPR/BK6483IU/V003 Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting Form Number: Air1a / 280709

**Reporting of emissions to air for the year …2015**

| Emission Point | Substance / Parameter | Emission Limit Value | Reference Period | Result [1] | Test Method [2] | Sample Date and Times | Uncertainty [3] |
|---|---|---|---|---|---|---|---|
| ST1 | Particulate | 5 mg/m$^3$ | 1 hour (avg 3x 1hr) | 0.18 mg/m3 | BS EN13284-1 | 07/09/2015, 1108 - 1446 hrs | 0.36 mg/m3 |
| ST1 | VOCs (expressed as Total Organic Carbon) | 50 mg/m$^3$ | 1 hour | 0.77 mg/m3 | BS EN 13526 | 07/09/2015, 1200 – 1300 hrs | 1.8 mg/m3 |
| ST1 | Formaldehyde | 1 mg/m$^3$ | 1 hour | 0.04 mg/m3 | BS EN 13649 | 07/09/2015, 1320 – 1420 hrs | 0.02 mg/m3 |
| ST1 | Phenol | 0.25 mg/m$^3$ | 4 hour (required for low limit of detection) | <0.21 mg/m3 (< limit of detection) | BS EN 13649 | 07/09/2015, 1040 – 1440 hrs | 0.49 mg/m3 |
| ST1 | Ammonia | N/A | 1 hour | 0.24 mg/m3 | BS EN 14791 | 08/09/2015, 0746 – 0846 hrs | 0.05 mg/m3 |

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.
[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed ..... Date 14/01/16

(Authorised to sign as representative of Operator)

Permit Number: EPR/BK6483IU/V003 Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting Form Number: Air1b / 280709

**Reporting of emissions to air for the year ...2015**

| Emission Point | Substance / Parameter | Emission Limit Value | Reference Period | Result [1] | Test Method [2] | Sample Date and Times | Uncertainty [3] |
|---|---|---|---|---|---|---|---|
| ST2 | Particulate | 5 mg/m$^3$ | 1 hour (avg 3x 1 hr) | 0.48 mg/m3 | BS EN 13284-1 | 08/09/2015, 0815 – 1158 hrs | 0.33 mg/m3 |
| ST2 | Oxides of Nitrogen (as $NO_2$) | 100 mg/m$^3$ | Average over production shift | 19 mg/m3 | BS EN 14792 | 08/09/2015, 0730 – 1630 hrs | 4.3 mg/m3 |
| ST2 | CO | 150 mg/m$^3$ | Average over production shift | 21 mg/m3 | BS EN 15058 | 08/09/2015, 0730 – 1630 hrs | 3.5 mg/m3 |
| ST2 | HCl | 10 mg/m$^3$ | 1 hour | 0.11 mg/m3 | BS EN 1911 | 08/09/2015, 1235 – 1335 hrs | 0.01 mg/m3 |
| ST2 | Fluorides | 1 mg/m$^3$ | 1 hour | 0.2 mg/m3 | BS ISO 15713 | 10/09/2015, 1237 – 1337 hrs | 0.02mg/m3 |

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed/ as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.
[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

(Authorised to sign as representative of Operator)

Date..14/01/16.....

Permit Number: EPR/BK6483IU/V003 Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting Form Number: Air1c / 280709

**Reporting of emissions to air for the year ...2015**

| Emission Point | Substance / Parameter | Emission Limit Value | Reference Period | Result [1] | Test Method [2] | Sample Date and Times | Uncertainty [3] |
|---|---|---|---|---|---|---|---|
| ST4 | Particulate | 5 mg/m$^3$ | 1 hour (avg 3x 1 hr) | 0.18 mg/m3 | BS EN 13284-1 | 11/09/2015, 0850 – 1219 hrs | 0.36 mg/m3 |
| ST4 | Oxides of Nitrogen (as $NO_2$) | 100 mg/m$^3$ | 1 hour | 5.4 mg/m3 | BS EN 14792 | 10/09/2015, 1230 – 1330 hrs | 4.2 mg/m3 |
| ST4 | CO | 150 mg/m$^3$ | 1 hour | 24 mg/m3 | BS EN 15058 | 10/09/2015, 1230 – 1330 hrs | 2.1 mg/m3 |

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.
[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

(Authorised to sign as representative of Operator)

Date..14/01/16.....

Permit Number: EPR/BK6483IU/V003

Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting

Form Number: Air1d / 280709

**Reporting of emissions to air for the year ...2015**

| Emission Point | Substance / Parameter | Emission Limit Value | Reference Period | Result [1] | Test Method [2] | Sample Date and Times | Uncertainty [3] |
|---|---|---|---|---|---|---|---|
| ST9 | Particulate | 5 mg/m$^3$ | 1 hour (avg 3x 1 hr) | 4.1 mg/m3 | BS EN 13284-1 | 20/10/2015, 1049 – 1444 hrs | 0.45 mg/m3 |
| ST9 | Formaldehyde | 7 mg/m$^3$ | 1 hour | 0.18mg/m3 | BS EN 13649 | 20/10/2015, 0817 – 0917 hrs | 0.03 mg/m3 |
| ST9 | Ammonia | 10 mg/m$^3$ | 1 hour | 2.0 mg/m3 | BS EN 14791 | 20/10/2015, 0817 – 0917 hrs | 0.18 mg/m3 |
| ST9 | CO | 150 mg/ m$^3$ | 1 hour | 15 mg/m3 | BS EN 15058 | 20/10/2015, 1047 – 1147 hrs | 2.1 mg/m3 |
| ST9 | Oxides of Nitrogen (as $NO_2$) | 150 mg/m$^3$ | 1 hour | 7.6 mg/m3 | BS EN 14792 | 20/10/2015, 1047 – 1147 hrs | 4.1 mg/m3 |

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.

[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

(Authorised to sign as representative of Operator)

Date 14/01/16

Permit Number: EPR/BK6483IU/V003 Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting Form Number: Air1e / 280709

**Reporting of emissions to air for the year ...2015**

| Emission Point | Substance / Parameter | Emission Limit Value | Reference Period | Result [1] | Test Method [2] | Sample Date and Times | Uncertainty [3] |
|---|---|---|---|---|---|---|---|
| ST11 | Particulate | 5 mg/m$^3$ | 1 hour (avg 3x 1 hr) | 0.26 mg/m3 | BS EN 13284-1 | 10/09/2015, 0750 - 1132 hrs | 0.43 mg/m3 |
| ST11 | Formaldehyde | 7 mg/m$^3$ | 1 hour | 0.27 mg/m3 | BS EN 13649 | 09/09/2015, 0805 – 0905 hrs | 0.03 mg/m3 |
| ST11 | Ammonia | 10 mg/m$^3$ | 1 hour | 0.58 mg/m3 | BS EN 14791 | 09/09/2015, 0805 – 0905 hrs | 0.12 mg/m3 |
| ST11 | CO | 150 mg/ m$^3$ | 1 hour | 2.3 mg/m3 | BS EN 15058 | 10/09/2015, 0920 – 1020 hrs | 1.9 mg/m3 |
| ST11 | Oxides of Nitrogen (as $NO_2$) | 150 mg/m$^3$ | 1 hour | 75 mg/m3 | BS EN 14792 | 10/09/2015, 0920 – 1020 hrs | 4.2 mg/m3 |

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.
[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

(Authorised to sign as representative of Operator)

Date....14/01/16.....

Permit Number: EPR/BK6483IU/V003 Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting Form Number: Air1f / 280709

**Reporting of emissions to air for the year ...2015**

| Emission Point | Substance / Parameter | Emission Limit Value | Reference Period | Result [1] | Test Method [2] | Sample Date and Times | Uncertainty [3] |
|---|---|---|---|---|---|---|---|
| ST10 | Particulate | 5 mg/m$^3$ | 1 hour (avg 3x 1 hr) | 0.2 mg/m3 | BS EN 13284-1 | 09/09/2015,0720 - 1120 hrs | 0.39 mg/m3 |
| ST10 | Oxides of Nitrogen (as $NO_2$) | 150 mg/m$^3$ | 1 hour | 3.2 mg/m3 | BS EN 14792 | 10/09/2015, 1030 – 1130 hrs | 4.2 mg/m3 |
| ST10 | CO | 150 mg/m$^3$ | 1 hour | 16 mg/m3 | BS EN 15058 | 10/09/2015, 1030 – 1130 hrs | 2.1 mg/m3 |
| ST12 | Particulate | 5 mg/m$^3$ | 1 hour | 1.8 mg/m3 | BS EN 13284-1 | 19/10/2015, 1131 - 1454 hrs | 0.45 mg/m3 |

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.
[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

Date 14/01/'16

Permit Number: EPR/BK6483IU/V003 Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting Form Number: Water1 / 280709

**Reporting of emissions to water (other than to sewer) and land for the year…2015**

| Emission Point | Substance / Parameter | Emission Limit Value | Reference Period | Result [1] | Test Method [2] | Sample Date and Times | Uncertainty [3] |
|---|---|---|---|---|---|---|---|
| W1 | Total Hydrocarbon Oil | N/A | 1 Week Average as permit requirement | 0.19 mg/l | Solvent extract of the sample / GCFID | 22 – 27/09/2015 | 0.03 mg/l |
| W1 | pH | N/A | | 7.0 | Based "The Measurement of Electrical Conductivity and Laboratory Determination of the pH Value of Natural, Treated and Wastewaters 1978". | 22 – 27/09/2015 | 0.07 |
| W1 | COD | N/A | | 16 mg/l | Dichromate oxidation / digestion. | 22 – 27/09/2015 | 1.42 mg/l |
| W2 | Total Hydrocarbon Oil | N/A | 1 Week Average as permit requirement | 0.07 mg/l | Solvent extract of the sample / GCFID | 22 – 27/09/2015 | 0.02mg/l |
| W2 | pH | N/A | | 7.4 | Based "The Measurement of Electrical Conductivity and Laboratory Determination of the pH Value of Natural, Treated and Wastewaters 1978". | 22 – 27/09/2015 | 0.074 |
| W2 | COD | N/A | | 34 mg/l | Dichromate oxidation / digestion. | 22 – 27/09/2015 | 3.03 mg/l |

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.
[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.
[3] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed ..... Date 14/01/16

(Authorised to sign as representative of Operator)

Permit Number: EPR/BK6483IU/V003 Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting Form Number: Sewer1 / 280709

**Reporting of emissions to sewer for the year ...2015**

| Emission Point | Substance / Parameter | Emission Limit Value | Reference Period | Result [1] | Test Method [2] | Sample Date and Times [3] | Uncertainty [4] |
|---|---|---|---|---|---|---|---|
| S1 | Instantaneous flow | 20 $m^3$ per hour | Per annum | 16.20 m3 per hour | Flow meter | 23/01/2015 | Uncertainty is reported for accredited analysis, conducted quarterly. |
| S1 | Daily Flow | 400 $m^3$ per day | Per annum | 111.01 m3 per day | Flow Meter | 07/10/2015 | |
| S1 | Minimum pH | 5 | Per annum | 7.03 | pH meter | 23/10/2015 | |
| S1 | Maximum pH | 10 | Per annum | 8.18 | pH meter | 20/03/2015 | |
| S1 | Total suspended solids | 200 mg/l | Per annum | 57.0 mg/l | Filter paper/balance | 16/10/2015 | |
| S1 | COD | 1500 mg/l | Per annum | 982.0 mg/l | Titration | 14/08/2015 | |
| S1 | Total hydrocarbon oil | 150 mg/l | Per annum | 31.0 mg/l | Gravimetric | 23/10/2015 | |
| S1 | Sulphate | 1000 mg/l | Per annum | 424.0 mg/l | AA spectrophotometer | 30/01/201 | |
| S1 | Copper | 1 mg/l | Per annum | 0.17 mg/l | AA spectrophotometer | 30/10/2015 | |
| S1 | Zinc | 2 mg/l | Per annum | 1.1 mg/l | AA spectrophotometer | 14/08/2015 | |
| S1 | Lead | 1 mg/l | Per annum | 0.17 mg/l | AA spectrophotometer | 22/05/2015 | |
| S1 | Nickel | 1 mg/l | Per annum | 0.2 mg/l | AA spectrophotometer | 24/04/2015 | |

[1] The result given is the maximum value (or the minimum value in the case of a limit that is expressed as a minimum) obtained during the reporting period, expressed in the same terms as the emission limit value. Where the emission limit value is expressed as a range, the result is given as the 'minimum – maximum' measured values.

[2] Where an internationally recognised standard test method is used the reference number is given. Where another method that has been formally agreed with the Agency is used, then the appropriate identifier is given. In other cases the principal technique is stated, e.g. gas chromatography.
[3] For non-continuous measurements the date and time of the sample that produced the result is given. For continuous measurements the percentage of the process operating time covered by the result is given.
[4] The uncertainty associated with the quoted result at the 95% confidence interval, unless otherwise stated.

Signed .....

(Authorised to sign as representative of Operator)

Date...14/01/'16.....

Permit Number: EPR/BK6483IU/V003

Operator: Toyota Manufacturing UK Ltd

Facility: Deeside Engine Casting

Form Number: Waterusage1 / 280709

**Reporting of Water Usage for the year ...2015**

| Water Source | Usage ($m^3$/year) | Specific Usage ($m^3$/unit output) |
|---|---|---|
| | | |
| Mains water | 7628 m3/annum | 0.92 m3/tonne of cast aluminium |
| Site borehole | N/A | |
| River abstraction | N/A | |
| | | |
| | | |
| TOTAL WATER USAGE | 7628 m3/annum | 0.92 m3/tonne of cast aluminium |

Operator's comments :
To standardise consumption, the specific usage units are measured in m3/metric tonne of cast aluminium. This makes consumption units independent of engine production mix.

Site collected rain water for use on site is not counted.

Signed .....

(authorised to sign as representative of Operator)

Date... 14/01/16.....

| | | | |
|---|---|---|---|
| Permit Number: | EPR/BK6483IU/V003 | Operator: | Toyota Manufacturing UK Ltd |
| Facility: | Deeside Engine Casting | Form Number: | energyusage1 / 280709 |

**Reporting of Energy Usage for the year ...2015**

| Energy Source | Energy Usage<br>Quantity | Primary Energy (MWh) | Specific Usage (MWh/unit output) |
|---|---|---|---|
| | | | |
| Electricity * | 6,471 MWh | 16,825 MWh | 2.0343 MWh/tonne of cast aluminium |
| Natural Gas | 13,877 MWh | 13,877 MWh | 1.678 MWh/tonne of cast aluminium |
| | | | |
| TOTAL | 20,348 MWh | 20,348 MWh | 3.712 MWh/tonne of cast aluminium |
| | | | |

* Conversion factor for delivered electricity to primary energy = 2.6

Operator's comments :
To standardise consumption, the specific usage units are measured per metric tonne of cast aluminium. This makes consumption units independent of engine production mix.
Electricity is reported as Grid, on-site generated electricity from the new solar PV installation is counted and treated as grid.

Signed .....

(Authorised to sign as representative of Operator)

Date 14/01/16

| | | | |
|---|---|---|---|
| Permit Number: | EPR/BK6483IU/V003 | Operator: | Toyota Manufacturing UK Ltd |
| Facility: | Deeside Engine Casting | Form Number: | performance1 / 280709 |

**Reporting of other performance indicators for the year…2015**

| Parameter | Units | Result |
|---|---|---|
| Total raw material used | Tonnes | 6234.7 Tonnes |
| Dross removed from site | Tonnes | 230.17 Tonnes |
| Bag filter dust | Tonnes | 20.96 Tonnes |
| Furnace linings | Tonnes | 11.79 Tonnes |
| Total swarf recycled | Tonnes | 489 Tonnes |
| Total 3rd party scrap recycled | Tonnes | 0.0 Tonnes |

Operator's comments : Bag filter dust figure is high for 2015. This is due to carry over from a delayed transfer in Dec 2014 (and as such 2014 figure was low).

Signed .....

(Authorised to sign as representative of Operator)

Date..14/01/16.....