



# **Hanson Cement, Padeswood Works**

**Annual Report as required by**

**Condition 4.2.2**

**Permit EA/EPR/BL1096IB/V012**

**For Calendar year 2015**

## 1 Introduction

Condition 4.2.2 of PPC Permit BL1096 requires an annual performance report. This condition is specified in Variation V012:

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Natural Resources Wales by 31 January (or other date agreed in writing by the Natural Resources Wales) each year.

The report(s) shall include as a minimum:

- (a) A review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
- (b) The functioning and monitoring of the plant involved with the burning of waste derived fuels, in a format agreed with the Natural Resources Wales. The report shall, as a minimum requirement (as required by Article 12(2) of the Waste Incineration Directive) give an account of the running of the process and the emissions into air and water compared with the emission standards in the WID.

Note this replaces the requirements of the previous permit variations up to V050. An application to surrender the landfill section of the Permit was made on 18th December 2009 and the condition reported above replaces Condition 4.2.1 of previous permits and therefore no reporting will be made here on the landfill.

## 2 Condition 4.2.2 (a)

### 2.1 Emissions to Air

The main emissions to air from the installation are from the kiln via the main stack (emission point A8). There were two limit breaches in 2015 and these with the emission values are covered in some detail in the response to condition 4.2.1 (b).

The cement mills and associated equipment (emission points A3 to A7) and the kiln cooler (emission point A9) are the remaining major sources of emissions to air. The permit also includes emission limits and specific monitoring standards for these emission points.

Table 2.1 provides a summary of performance of these emission points based on the monitoring data collected during 2015.

Permit Reference	Description	Daily Average Limit (mg/m <sup>3</sup> )	Annual Mean (mg/m <sup>3</sup> )	Standard deviation	Predicted 99.7% compliance
A3	Cement Mill 1	30	Not used in 2015		
A4	Cement Mill 2	30	Not used in 2015		
A5	Cement Mill 3	30	8.73	8.64	34.5
A6	Cement Mill 4	30	1.48	3.56	12.2
A7	Cement Mill 4 classifier	30	11.79	6.17	30.3
A9	Clinker Cooler	50	19.4	8.86	46.0

Table 2.1 Summary of emissions for air monitoring points other than A8 for 2015.

The "Predicted 99.7% compliance" value is a statistical estimate of a limit value that 99.7% (or 997 out of every 1000) monitored results would be compliant.

There was one breach from Mill 3 filter and two from Mill 4 DCE filter in 2015. Additionally there were 4 notifications of unauthorised releases or breaches to air from the site in 2015 which are summarised in table 2.2 below. This brings the total to nine notifications in 2015. These are discussed again in the response to condition 4.2.2 (b) where appropriate but a similar summary follows:

Type	Short Description	Date of Notification
Limit Breach	NOx Breach of 543 mg/Nm <sup>3</sup> against limit of 500 mg/Nm <sup>3</sup>	5/2/2015
Limit Breach	NOx Breach of 668 mg/Nm <sup>3</sup> against limit of 500 mg/Nm <sup>3</sup>	4/4/2015
Limit Breach	Mill 3 Particulates, 35.6 mg/Nm <sup>3</sup> against limit of 30 mg/Nm <sup>3</sup>	6/7/2015
Fugitive	Kiln Inlet, emission following a shutdown and positive pressure	15/7/2015
Limit Breach	Mill 4 DCE Particulates, 30.9 mg/Nm <sup>3</sup> against limit of 30 mg/Nm <sup>3</sup>	17/7/2015
Fugitive	Rawmeal/dust emission from a damper due to a short term build-up of positive pressure in PHT/Filter system	23/8/2015
Fugitive	Cooler Dust: Filter dust return system overwhelmed tower feed during start up.	10/9/2015
Limit Breach	Mill 4 DCE Particulates, 34 mg/Nm <sup>3</sup> against limit of 30 mg/Nm <sup>3</sup>	15/10/2015
Fugitive	Level 6 Kiln feed: Worn refractory on inlet to cyclone 5 allowed fumes to pass when positive pressure occurred through the PHT following a planned kiln stop.	7/12/2015

Table 2.2 Summary Part A notifications for 2015 for releases to air.

Both the NOx breaches were linked to the SNCR system, the first due to sticking valve that limited ammonia flow and the second due to the system not restarting after a kiln trip.

Mill 3 particulate breach occurred as the mill was being run ahead of a planned stop for filter maintenance. Trends and mill stops had increased for the previous 24hrs but not above limit. The mill was then taken off by the 45minute internal high level system after midnight and left off for the works to be carried out. The breach pertains to only 45mins of operation and equates to an additional 0.15kg/24hrs of release over limit

The DCE filter emissions for the first breach were showing a normal slow upward trend when they increased significantly over a short duration. Changes were made to the mill operation to bring this down and were initially successful however running the next day the same increase was seen and the mill temporarily stopped, some part of the filter system were changed and this showed an improvement but was not sufficient to mitigate the earlier high results and equates to an additional 1.1kg/24hrs of release over limit.

On the second occasion the emission trends were stable until a unexpected increase that impacted on mill operations, investigations showed 2 bags in the filter in poor condition. These were replaced but the delay meant that there was not enough time to reduce the daily average. The excess emission equates to 4.8kg/24hrs.

The first of the fugitive emissions was the result of slight positive pressure in the kiln hood and seal and resulted in an estimated emission of 10kg. Second was from a holed damper casing and produced less than 50kg of dust to atmosphere.

Third occasion was caused by over return of filter dust at a kiln start-up and resulted in less than 50kg being released. The final instance was the result of failed repair in the PHT and again resulted in approx 50kg of dust release. There were no complaints directly linked to any of these events.

## 2.2 Emissions to Water

The discharges to water from the installation are via emission point W1. There were no limit breaches in 2015.

## 2.3 Noise

There was a permit variation in September 2014 that has removed the boundary noise limits and monitoring requirements.

## 2.4 Compliance

In 2015 there were 9 notifications of non-compliance via Schedule 6 Notifications. Table 2.3 shows this in context with previous year's levels. Brief details of the 2015 notifications are provided in 4.2.2 (b)

Year	Notifications
2006	134
2007	89
2008	40
2009	22
2010	11
2011	23
2012	17
2013	9
2014	3
2015	9

Table 2.3 Summary of total notifications since 2006.

## 3 **Condition 4.2.2 (b)**

This report is produced using the standard EA Annual WID Report template and is included in the following pages.

**Annual Performance Report for Hanson Cement Padeswood Works: 2015**

This report is required under the Waste Incineration Directive (WID) Article 12(2): - requirements on access to information and public participation. This requires the operator of an incineration or co-incineration plant to produce an annual report to the Regulator on the functioning and monitoring of the plant and to make this available to the public. To satisfy the requirements of the Directive the following information is provided:

**1 Introduction**

Name of company	Castle Cement Limited (currently trading as Hanson Cement)
Name of plant	Padeswood Works
Permit number	EA/EPR/BL1096IB/V012
Address	Padeswood, Mold, Flintshire, CH7 4HB.
Telephone	01244 550330
Contact name	Miss Victoria Smith
Position	Quality and Environment Manager
Further information	<p>There was one operational kiln at the Padeswood Works in 2015. This kiln is authorised to burn Cemfuel<sup>®</sup>, Profuel<sup>®</sup>, SRF, MBM and chipped tyres as kiln fuels in addition to more traditional fossil fuels such as coal, petcoke and kerosene. Coal and petcoke may originate anywhere in the world.</p> <p>Cemfuel<sup>®</sup> is manufactured from a range of waste streams including spent solvents, paint and ink residues, spent carbon absorbers and waste oils. The individual waste producers are located around the UK. Cemfuel<sup>®</sup> is produced specialist waste management companies via a number of processes including distillation, fractionation, grinding, melting, dissolving, filtering and blending.</p> <p>Profuel<sup>®</sup> and SRF are solid fuels produced to a tight specification. Non-hazardous, they are produced from wastes such as paper, board, offcuts and scrap supplied by Manufacturers. Also includes mixed fibres/plastic from Waste Processors.</p> <p>MBM (Meat and bone Meal) is supplied from several sources in mainland Britain and Ireland.</p> <p>Chipped tyres are derived from scrap tyres and supplied by a processing facility in Manchester. None were used in 2015.</p>

Copies of this report can be obtained via the Public Register.

## **2 Plant description**

The principal purpose of the activities at the installation is to manufacture cement.

Limestone, the main raw material, is extracted from a local quarry. This material is then crushed at the quarry in a dedicated crushing plant to a size of 95% no larger than 75 mm. The crushed stone is transported by road to the cement works where it is dried and crushed in a vertical roller mill with other minor components such as sand and pulverised fuel ash (PFA) to produce raw meal, a fine powder that is the feedstock for the cement kiln.

The raw meal is conveyed to the top of the pre heater tower. The meal is heated by the exhaust gases from the kiln as it passes down the tower until it reaches the calciner. This is a combustion chamber located between the kiln inlet and the bottom stage cyclone in which approximately 60% of the thermal energy required for the kiln is input. In the calciner the material temperature reaches ca. 900°C which results in most of the carbon dioxide in the limestone being driven off, a process called calcination. Fuels permitted to be burned in the calciner are coal, petcoke, chipped tyres, SRF, MBM and Profuel®.

The calcined material enters the kiln, which is a slightly inclined tube rotating at approximately three revolutions per minute. As the kiln rotates the material moves down to the discharge end undergoing a series of complex reactions to produce cement clinker. To complete the required chemical reactions the material must reach a temperature in the region of 1450°C. The thermal energy required at this point is supplied via the kiln burner, a co-axial pipe that is permitted to use coal, petcoke, Cemfuel®, SRF, MBM and Profuel®. The heated material leaves the kiln and is cooled to control the chemical reactions; the heat recovered is used as combustion air in the kiln and calciner. The cooled clinker is then directed to a purpose built store for later grinding in the cement mills.

The clinker is transported from the storage facility by a series of conveyor belts and transferred to the cement mill feed hoppers. The clinker is dosed, along with gypsum, limestone and other minor additives which control the properties of the finished cement to the cement mills. There are four cement mills although only two were in operation in 2015, each ball mill is equipped with fabric filters to minimise releases of dust to air. The cement is transported pneumatically to storage silos before being despatched in bulk road tankers.

The packing facility was bought back into operation in 2015 with the addition of a new packer for plastic 25kg bags, the older paper packer was refurbished and restarted to run alongside the plastic line.

### 3 Summary of plant operation

#### 3.1 Plant details.

One cement kiln with the capacity to burn waste materials operates on site: for historic reasons this is known as kiln 4. The kiln is rated to produce ca. 1,000,000 tonnes per annum of cement clinker, although the actual production would be closer to 900,000 tonnes per annum inclusive of plant shutdowns.

The tonnage of cement produced is dependent on the clinker incorporation in the final product but approximates to 10% greater than the clinker production.

#### 3.2 Annual waste throughputs.

The amount of waste burned in 2014 is summarised in the table below.

Waste type	EWC code	Tonnes used
Cemfuel®	19 02 08	13,422
MBM	02 02 03	7,284
SRF	19 12 10	19,007

Table 3: Amount of waste burned in 2015

#### 3.3 Operational hours

The total hours of operation of the kiln and the total tonnage of cement clinker produced in 2014 is summarised in the table below.

Equipment	Annual production 2015	Operational hours 2015
Kiln 4	Confidential	Confidential

The annual shutdown of the kiln took place from the beginning of 1<sup>st</sup> January to 3<sup>rd</sup> February during which time the major maintenance to the plant took place. Clinker production took place as detailed in the table below:

Start	Stop	Comments
4 <sup>th</sup> February	17 <sup>th</sup> March	One 1 day stop
23 <sup>th</sup> March	4 <sup>th</sup> April	
23 <sup>rd</sup> April	15 <sup>th</sup> May	
One day production on 18 <sup>th</sup> May		
25 <sup>th</sup> May	11 <sup>th</sup> July	Two 1 day stops and two 2 day stops
27 <sup>th</sup> July	27 <sup>th</sup> September	one 1 day, one 2 day stop
11 <sup>th</sup> October	24 <sup>th</sup> November	Three one day pauses.
There was one day production 1 <sup>st</sup> December.		
5 <sup>th</sup> December	31 <sup>st</sup> December	One 1 day pause.

Table 3.3, Clinker Production

### 3.4 Residues

The only residue which is produced by the kiln is bypass dust. Commissioning of the bypass system commenced during 2008 and was completed in 2009. 2396 tonnes of bypass dust was sent off-site in 2015 for use as either as a land conditioning product or for further treatment.

## 4 Summary of plant monitoring.

### 4.1 Pollutants measured.

Emissions from kiln 4 main stack (point A8) are monitored continuously for particulate matter, carbon monoxide, sulphur dioxide, hydrogen chloride, oxides of nitrogen, and total organic carbon. In addition to the continuous monitoring, periodic monitoring is carried out for hydrogen fluoride, a range of metals, persistent organic pollutants, and other more volatile organic species. The following summarises the emissions measured and the frequency.

Pollutants Measured	Continuously	Periodically
Particulate matter	✓	
VOC's as total organic carbon	✓	
Hydrogen chloride	✓	
Carbon monoxide	✓	
Sulphur dioxide	✓	
Oxides of nitrogen	✓	
Hydrogen fluoride		✓
Cadmium & thallium and their compounds (total)		✓
Mercury and its compounds		✓
Zinc and its compounds		✓
Group III metals* & their compounds		✓
Dioxins and furans		✓
Dioxin-like polychlorinated biphenyls (PCB's)		✓
Polycyclic aromatic hydrocarbons (PAH's)		✓
Benzene		✓
1,3-butadiene		✓

Table 4.1, Emissions measured from A8 and the frequency

\* Group III metals as defined in the most recent variations of PPC Permit BL1096 are antimony, arsenic, chromium, cobalt, copper, lead, manganese, nickel and vanadium.

### 4.2 Availability of continuous emissions monitors.

The percentage of time during the year when the kiln was in operation that the continuous emission monitors were operating normally is summarised in the table below.

Continuous emission monitor	% Time operating normally
Particulates	99.8
Carbon monoxide	99.5
Sulphur dioxide	99.5
Oxides of nitrogen	99.5
Hydrogen chloride	99.5
Total organic carbon	99.5

Table 4.2, Emission monitors operating percentage



There were no substantial issues with the CEMs monitors during 2015.

#### 4.3 Summary of Continuous Emissions Monitor data.

Continuous emission data is submitted monthly to the Natural Resources Wales. This information is required by permit EA/EPR/BL1096/V012 and provides the daily average emission concentration for the month, the maximum daily mean concentration, the number of days in the month the relevant limit was exceeded for each pollutant and the number of invalid hours.

A summary of emission data is shown graphically and in tabulated form in Appendix 1

#### 4.4 Results of periodic monitoring.

Results of periodic monitoring of emissions are shown in the table below (routine biannual monitoring only – additional fuel trial data was accumulated and reported separately).

Pollutants Measured	Unit	1 <sup>st</sup> half 2014	2 <sup>nd</sup> half 2014
Hydrogen fluoride	mg/Nm <sup>3</sup>	0.027	<0.020
Cadmium & thallium & their compounds (total)	mg/Nm <sup>3</sup>	0.0012	0.00080
Mercury and its compounds	mg/Nm <sup>3</sup>	0.011	0.011
Zinc and its compounds	mg/Nm <sup>3</sup>	0.0031	0.0028
Group III metals* & their compounds	mg/Nm <sup>3</sup>	0.0051	0.0067
Dioxins / Furans (I-TEQ)	ng/Nm <sup>3</sup> (Min/Max)	0.011 / 0.011	0.022 / 0.022
Dioxins / Furans (WHO – TEQ Mammals)	ng/Nm <sup>3</sup> (Min/Max)	0.0096 / 0.0098	0.020 / 0.020
Dioxins / Furans (WHO – TEQ Fish )	ng/Nm <sup>3</sup> (Min/Max)	0.011 / 0.011	0.023 / 0.023
Dioxins / Furans (WHO – TEQ Birds )	ng/Nm <sup>3</sup> (Min/Max)	0.027 / 0.027	0.057 / 0.057
Dioxin – like PCBs (WHO – TEQ Humans/ Mammals)	ng/Nm <sup>3</sup> (Min/Max)	0.011 / 0.011	0.0015 / 0.0015
Dioxin – like PCBs (WHO – TEQ Fish )	ng/Nm <sup>3</sup> (Min/Max)	0.000061 / 0.000061	0.000091 / 0.000091
Dioxin – like PCBs (WHO – TEQ Birds )	ng/Nm <sup>3</sup> (Min/Max)	0.0038 / 0.0038	0.0076 / 0.0076
Polycyclic aromatic hydrocarbons (PAH's)	mg/Nm <sup>3</sup>	0.043	0.084
Benzene	mg/Nm <sup>3</sup>	1.8 / 2.3	1.0 / 1.8
1,3-butadiene	mg/Nm <sup>3</sup>	0.50	<0.19 / 0.39

Table 4.4, Results of periodic monitoring of emissions

\* Group III metals as defined in the most recent variations of PPC Permit BL 1096 are antimony, arsenic, chromium, cobalt, copper, lead, manganese, nickel and vanadium.

## **5 Summary of plant compliance.**

For continuously monitored emissions from the kiln 4 stack (Point A8) the plant met its particulate matter, sulphur dioxide, HCl, VOC and carbon monoxide emission limit values (ELV's) 100% of the time.

There were two exceedences of the daily ELV for oxides of Nitrogen, which equates to the plant meeting the daily ELV 99.2% of the time.

Both NO<sub>x</sub> breaches were linked to the SNCR system. The first occurred as the kiln came back into production following its winter shut down. NO<sub>x</sub> values were holding steady with the SNCR operating to control levels. The level then rose but the SNCR failed to control to set point for around 3hrs until the system came back into control. Investigations showed the main shut off valve to not be operating fully limiting flow in the system.

The second breach occurred when Kiln 4 was struggling to run consistently due to blockages in the tower. At the third kiln feed start of the day the SNCR failed to auto run due to an unacknowledged return fault. This was only confirmed later in the evening when the controller noticed the high running NO<sub>x</sub> on the control screen. The SNCR was then started with a low NO<sub>x</sub> set point to drive down the emissions by using a more aggressive ammonia addition rate, and lowered again later to attempt to mitigate the results. However there was insufficient running time to midnight to fully reduce the output. A software modification was added to the control system to automatically restart the SNCR when appropriate kiln limits are reached.

There were no further breaches to emission limits for A8: extractive monitoring and therefore 100% compliance.

Also there were no limit breaches for discharge point (W1) again equating to a compliance of 100%.

In addition to the non-compliances resulting from exceedences of the ELV's discussed above and those for mill limit breached discussed earlier four further Schedule 6 Notifications (Part A's) were submitted to NRW.

- 17/06/15: Kiln hood suction set point was altered allowing slight positive pressure at the kiln seal while the kiln was not in operation. This occurred soon after the kiln had been stopped in order that a flame could be quickly re-established and resulted in a decrease in the negative pressure in the kiln system, allowing gasses to escape.

The standing instruction to kiln controllers has been altered to include a more negative set point. Review of the possibility to introduce a timed interlock to prevent manual override. Review of the position of the live feed screen in kiln control room

- 23/08/15: The area of from which the emission was found is a slide damper (SD01) in ducting that carries hot gasses (circa 300-400°C) from the kiln through to the raw mill, where it is used to dry the raw materials in the mill, rather than a dedicated material transfer line.

The Kiln Operator was trying to balance the negative pressures through the kiln system but the position of this hole is not obvious from the trends available in the control room. Whilst going through the process of stabilising the system there was a short period of positive pressure which forced the gas stream to exit through the damaged damper.

- Further investigations were undertaken as to how the gas stream had been able to exit the ducting and damper system which revealed that the damper casing had been holed. As this is not directly in the gas flow it isn't considered a high risk maintenance area and therefore is only inspected in shut downs when access to this area can be carried out when the system is cool.

Hole in the damper was patched we have not experienced issues with its operation since, however additional work is scheduled for the full January 2016 shutdown as a preventative measure.

- 10/09/15: The kiln was off for most of the previous day, and kiln feed re-introduced at just after midnight, feed to the preheater tower was then run for around 40 minutes at 140t/h when the kiln became very unstable.

Investigations traced the route cause to filter dust entering the top of the top of the tower, increasing the feed rate and overwhelming the PHT. After 30mins the Kiln Burner reduced the raw meal feed to 120t/h to the tower to reduce the total material flow and the risk of further overwhelming the system.

This situation occurred because under normal operation we empty the bag filter to the tower, through a screw to the raw meal elevator. This is the only outlet from the filter for the collected dust and can only be used whilst the kiln is in operation. If the kiln trips this system continues to operate collecting dust but with no outlet. This can lead to a significant backlog of material being introduced from the bag filter hopper at restart of kiln operation. This return feed is in equilibrium when kiln is in stable operation, hence we don't see this as an ongoing issue.

As part of the continuous improvement program we are investigating amending the material flows by installing a blowing line to a silo, this system will be able to run when the kiln is off emptying the filter system of collected dust before feed re-starts. The transfer on material from the silo can then be managed along with the normal return from the filter system.

- 07/12/15: The inlet to Cyclone 5, part of the system within the preheater tower, on level 6, had earlier in the year been found worn and an external plate repair was applied to this area to prevent the chance of future emissions and to control process issues.

However despite checks in this area the repair failed unexpectedly creating a small void through which mostly fumes were emitted. These were very visible on the day due to cooler outside temperature.

A review of the original repair was carried out, and the area had additional supports and welding carried out. Checks were then undertaken in this area to monitor the repair. This area is undergoing corrective works during the January shutdown.

Padeswood received one warning letter and no enforcement notices in 2015. The warning letter was issued for breaches against condition 1.1.1 "that the operator shall manage and operate the activities in accordance with a written management system that identifies and minimises the risks of pollution" and 3.2.1 "Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution." The site is working the NRW to complete an action plan to address the concerns raised.

## **6 Summary of plant improvements.**

Plant improvements carried out in 2015 to reduce dust and noise impacts included bag changes in cement mill 3, cement mill 4 DCE, cooler and main bag filters. Repairs and modifications to the heat exchanger and installation of a stone reject system to raw mill circuit. Additionally new roller shutter doors on the Stone store were installed.

The site also installed and commissioned a new SRF handling unit to increase feed rate up to 10t/h feed from two additional offloading stations. This is designed to run alongside the existing system.

The existing paper packer was re-commissioned and a new plastic bag packer installed.

The site also recruited additional 20 plus personnel to ensure that there was adequate cover for the new and existing plant operations.

**Summary of information made available.**

Monthly emission data reported to the Natural Resources Wales is published in the public register. The register is held at the following address:

Natural Resources Wales  
Chester Road  
Buckley  
Mold  
CH7 3AJ

Hanson Cement Liaison Committee meetings are held quarterly on the second Monday of the month. This meeting provides a forum for local residents, local groups and elected representatives of local parish and District councils to discuss matters of concern with the company. Representatives of Natural Resources Wales and Public Health Wales also attend this meeting.

The 2015 Hanson UK Sustainability report can be downloaded via the website at [www.heidelbergcement.com/uk/en/hanson/home.htm](http://www.heidelbergcement.com/uk/en/hanson/home.htm)

Hanson Cement operates an 'open door' policy enabling members of the public to contact the company to arrange a visit to the site or obtain information. The company can be contacted by the following methods:

By post: Hanson Cement, Padeswood Works, Padeswood, Mold, Flintshire, CH7 4HB.

By e-mail: [enquiries@hanson.com](mailto:enquiries@hanson.com)

By telephone: 01244 550330

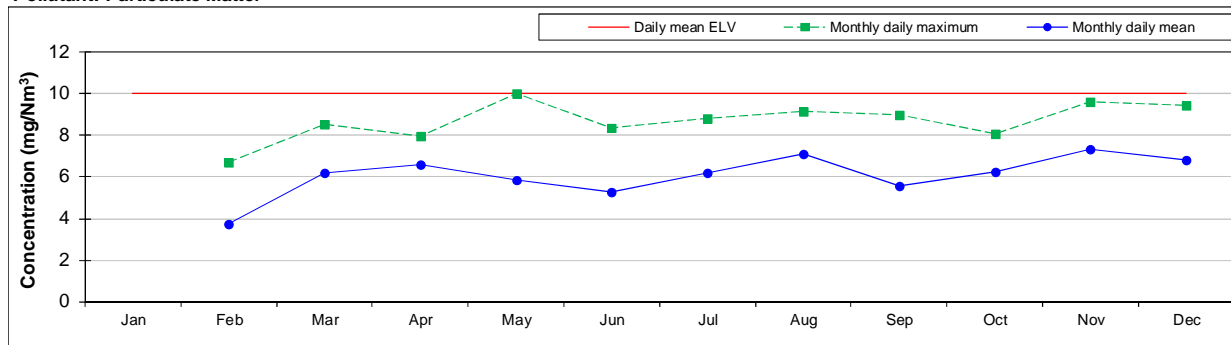
Annual Report as per Condition 4.2.2 Permit EA/EPR/BL1096IB/V012  
EA Template Annual WID Report

## Appendix 1

The graphs show the annual emission to air of the continuously monitored pollutants:

### A1 Particulate matter.

Pollutant: Particulate Matter



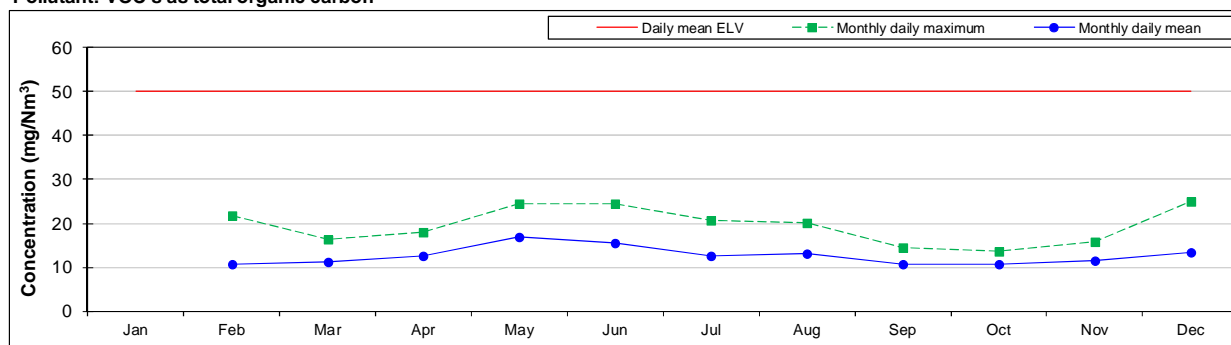
Annual Summary			Month											
Daily mean			Daily mean ELV	10	10	10	10	10	10	10	10	10	10	10
	Annual daily maximum	10.00	Monthly daily maximum		6.7	8.6	8.0	10.0	8.4	8.8	9.2	9.0	8.1	9.6
	Annual daily mean	6.09	Monthly daily mean		3.7	6.2	6.6	5.9	5.3	6.2	7.1	5.6	6.2	7.4

**Exceedences**

Daily Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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### A2 VOC's as total organic carbon.

Pollutant: VOC's as total organic carbon



Annual Summary			Month											
Daily mean			Daily mean ELV	50	50	50	50	50	50	50	50	50	50	50
	Annual daily maximum	25.1	Monthly daily maximum		22	16	18	24	21	20	15	14	16	25
	Annual daily mean	12.6	Monthly daily mean		11	11	13	17	15	13	13	11	11	13

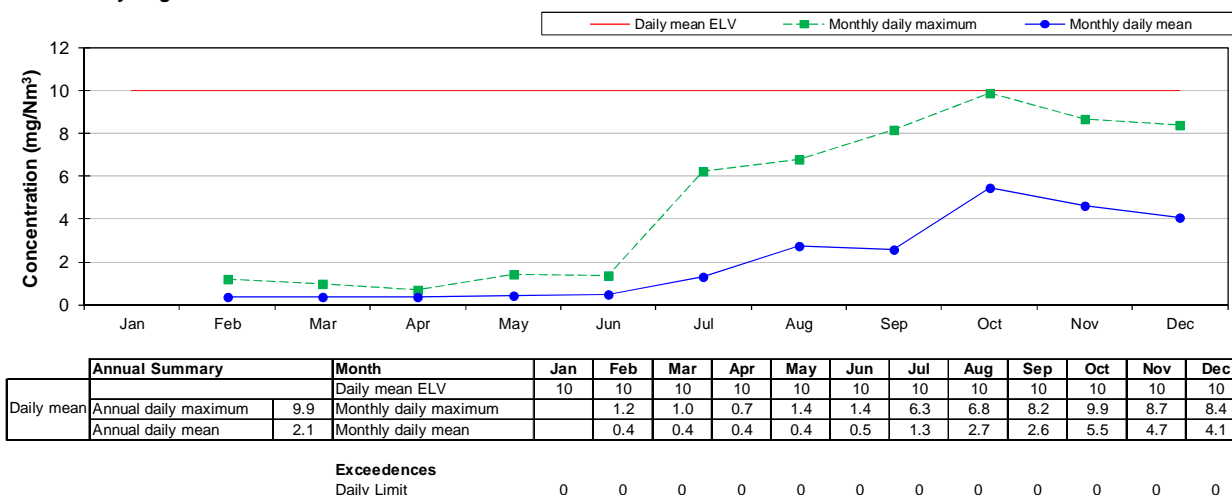
**Exceedences**

Daily Limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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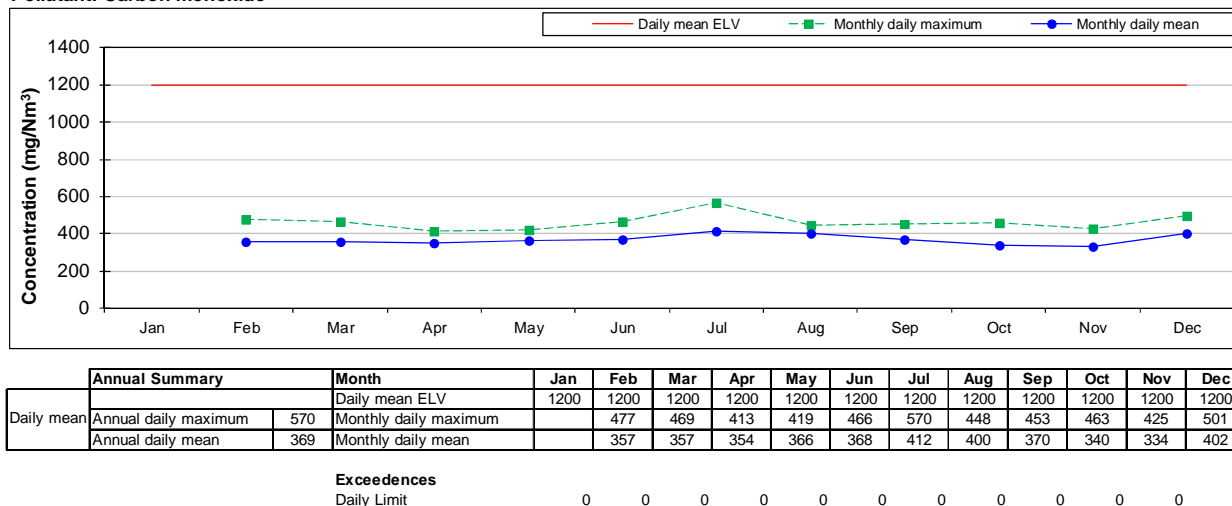
A3 Hydrogen chloride.

Pollutant: Hydrogen chloride



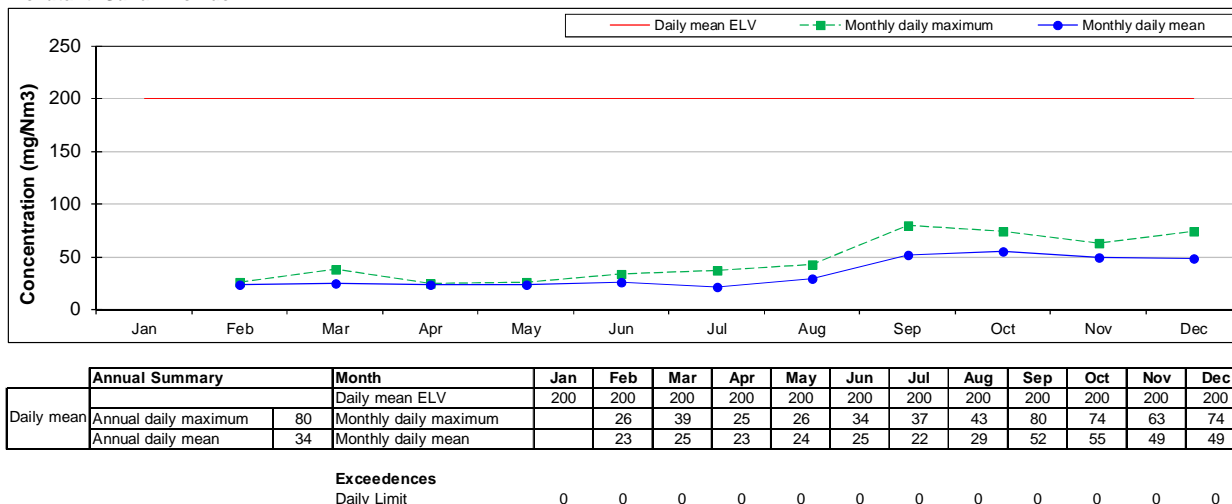
A4 Carbon monoxide.

Pollutant: Carbon monoxide



A5 Sulphur dioxide.

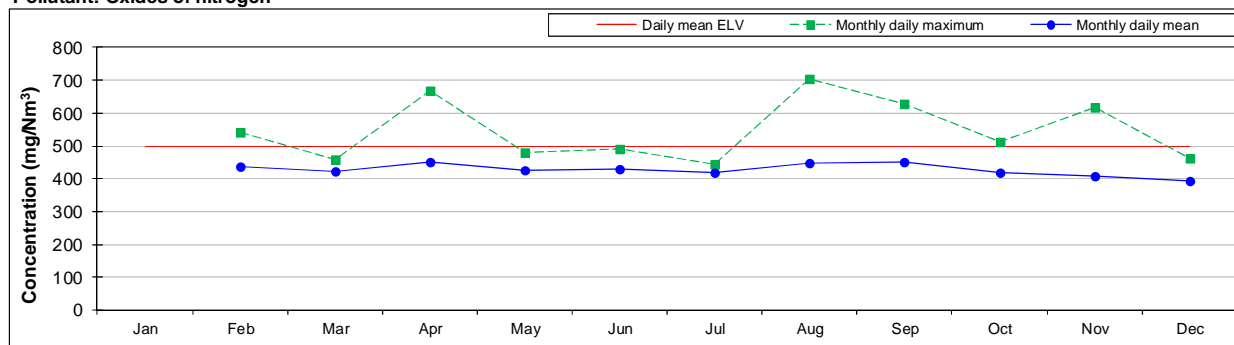
Pollutant: Sulfur Dioxide



Annual Report as per Condition 4.2.2 Permit EA/EPR/BL1096IB/V012  
EA Template Annual WID Report

A6 Oxides of nitrogen.

Pollutant: Oxides of nitrogen



Annual Summary			Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Daily mean	Daily mean ELV			500	500	500	500	500	500	500	500	500	500	500	500
	Annual daily maximum	704	Monthly daily maximum		543	460	668	480	491	443	704	630	511	616	463
	Annual daily mean	428	Monthly daily mean		436	424	450	426	430	419	447	451	419	407	395

Exceedences

Daily Limit	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
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Note: during 2015 a trial was run with increased NO<sub>x</sub> limit (1500 mg/Nm<sup>3</sup>) to allow ammonia background to be obtained. Dates the increased NO<sub>x</sub> limit was in place are as follows:

Start Date	Stop Date	Number of Weeks
24 <sup>th</sup> August	6 <sup>th</sup> September	2
21 <sup>st</sup> September	27 <sup>th</sup> September	1
12 <sup>th</sup> October	18 <sup>th</sup> October	1
2 <sup>nd</sup> November	15 <sup>th</sup> November	2

Hence the daily means in August, September, October and November to not count as permit breaches and these all occurred during the trail periods.