Department
for Environment
Food & Rural Affairs

Report on measures for 2018 exceedance of the Target Value for Benzo[a]pyrene in Swansea Urban Area agglomeration zone (UK0027)

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Contents

1. Introduction

1.1 Context

Under the EU Directive 2004/107/EC[1], the target value (TV) for Benzo[a]pyrene (B[a]P) is an annual mean concentration of 1 nanogram (one billionth of a gram (10^{-9})) per cubic metre (m^{-3}) of ambient air or lower. The Directive requires Member States report on measures in place to address the exceedance of the TV and that all reasonable measures that do not entail disproportionate cost should be taken to ensure this target is not exceeded.

The United Kingdom exited the European Union on 31 January 2020. Upon exit, the UK entered a Transition Period which will end on 31 December 2020. The UK was a Member State during the period this report covers, and the Directive requirements apply to the UK as part of its obligations during the Transition Period.

Once the Transition Period ends on 31 December 2020, the UK will continue to meet its reporting obligations through making this data available to the public to the same timescales.

Exceedance of the TV was reported in 2013, 2014, 2015, 2016 and 2017 in the Swansea Urban Area. A report on measures was published detailing the exceedance and the measures in place[2].

This document reports the exceedance situation for 2018 reflecting the more recent assessment and updating the 2013, 2014, 2015, 2016 and 2017 report on measures.

1.2 Status of zone

This is the report on measures required for exceedances of the TV for B[a]P within the Swansea Urban Area zone identified within the 2018 UK air quality assessment. Exceedances within this zone were identified on the basis of model results providing supplementary information for the assessment in addition to the results from fixed monitoring stations. This exceedance was reported via e-Reporting dataflow G[3] on attainment and Air Pollution in the UK[4].

[1] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:023:0003:0016:EN:PDF
[2] https://uk-air.defra.gov.uk/library/bap-nickel-measures
[3] http://cdr.eionet.europa.eu/gb/eu/aqd
[4] http://uk-air.defra.gov.uk/library/annualreport/index

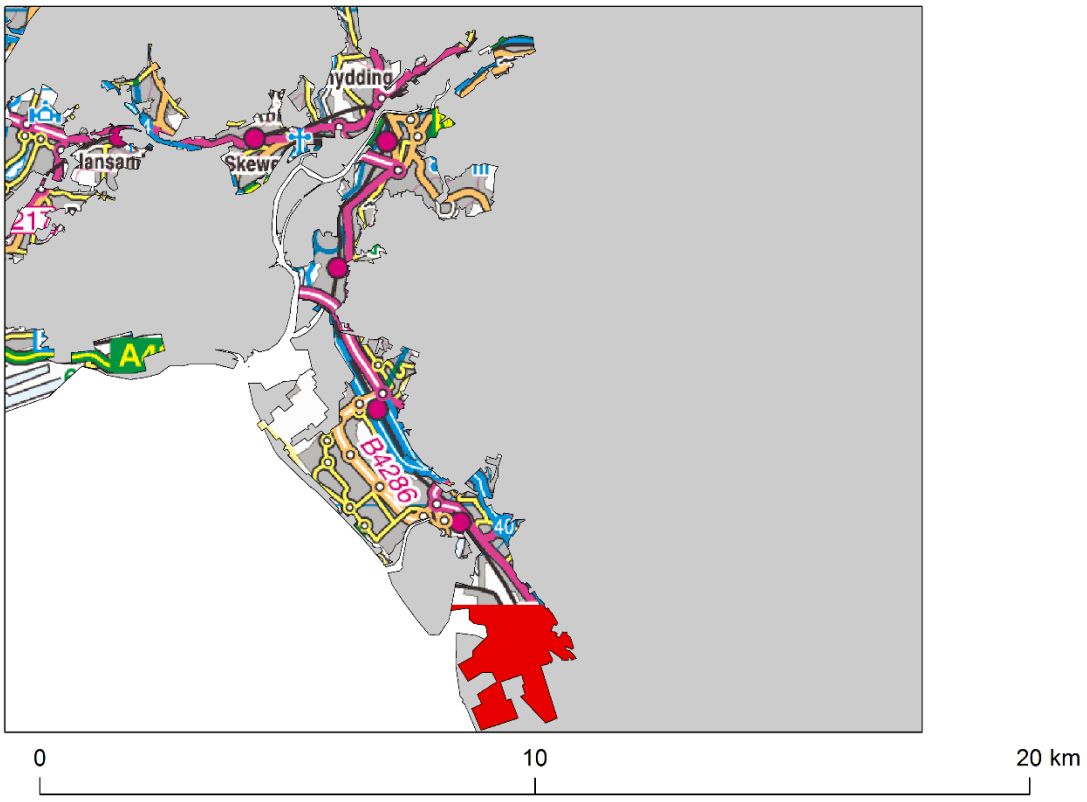
Table 1 summarises the spatial extent and associated resident population for the exceedances identified in this zone, as reported via e-Reporting.

Table 1. Area exceeding B[a]P target value in 2018 and associated population for Swansea Urban Area zone UK0027

Zone code	Zone Name	Area exceeding TV (km^2)	Population exceeding TV
UK0027	Swansea Urban Area	4	2737

Figure 1 shows the locations of the exceedances in the context of the zone as a whole.

Figure 1. Location of exceedance of the B[a]P target value during 2018 in Swansea Urban Area zone UK0027. Areas of the zone in exceeding grid squares are marked red.



An initial source apportionment was carried out and this analysis has identified a single exceedance situation in this zone:

- Swansea Urban Area [B[a]P_UK0027_2018_1] related to industrial emissions (area of exceedance 4 km^2)

Following the approach developed for the previous report on measures for 2014, a subsequent more detailed modelling assessment was carried out for 2015, 2016, 2017 and 2018 using additional local data. Whereas the 2014 assessment concluded that there was unlikely to be exceedance of the TV outside the boundary of the industrial site in 2014, the more recent assessments indicate that it was likely that there was an exceedance of the TV at locations close to the industrial site in 2015, 2016, 2017 and again in 2018. This change has been linked to the adoption of an improved assessment method for fugitive emissions, which has led to a significant increase in reported coke ovens emission in recent years and is discussed later in this report. The following section details the exceedance situation in the zone including a description of the exceedance situation, maps, information on source apportionment and a list of measures already taken or to be taken. Information on measures are reported within e-Reporting dataflow K[5].

[5] http://cdr.eionet.europa.eu/gb/eu/aqd

2 Exceedance situation Swansea Urban Area [B[a]P_UK0027_2018_1] related to industrial emissions

2.1 Description of exceedance

This exceedance situation has an area of exceedance of 4 km^2 in Margam in Neath Port Talbot. Figure 2 shows the location of the exceedance situation, as predicted by the national model. Figure 3 shows the location of the exceedance situation in finer detail based on a more detailed, local modelling assessment. The exceeding grid squares are numbered in Figure 2 and in subsequent tables for easy reference. The resident population associated with this exceedance situation is 2,737, the majority being in the exceeding grid square numbered 2. This exceedance situation is adjacent to and shares common sources with the exceedance situation South Wales [B[a]P_UK0041_2018_1].

The fixed monitoring station at Port Talbot Margam is within the exceedance situation. Table 2 lists the measured concentrations of B[a]P in this zone since 2008. The measured and modelled concentrations at this station were below the TV in 2018.

Table 2. Measured annual mean B[a]P concentrations in Swansea Urban Area agglomeration zone UK0027 from 2008 to 2019 (ngm^{-3}). (Percentage data capture is shown in brackets).

Station (EoI code)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Port Talbot Margam (GB0906A)	0.53 (99)	0.39 (95)	0.38 (88)	0.40 (95)	0.40 (95)	0.44 (93)	0.60 (100)	0.79 (100)	0.93 (95)	0.64 (93)	0.70 (98)	0.32 (99)
Swansea Cwm Level Park (GB0943A)	0.32 (90)	0.24 (89)	0.29 (84)	0.27 (93)	0.28 (96)	0.27 (92)	0.33 (100)	0.35 (100)	0.39 (100)	0.33 (97)	0.28 (99)	0.23 (96)

Table 3 lists the exceeding grid squares and the resident population. The local modelling identified all four of the grid squares as exceeding.

The measurements at Port Talbot Margam were less than the TV. In modelling the spatial coverage of B[a]P concentrations, the national scale model predictions were calibrated to match the measurements. The calibrated predictions exceeded the target in the vicinity of the steelworks industrial complex in Port Talbot due to industrial emissions. 1 km grid squares have been classified as exceeding the TV if at least nine 100 m grid squares exceed the TV or at least one 100 m grid square exceeds and there is residential population in the exceeding 100 m grid squares. A concentration value was defined for each 1 km grid square from the fine scale modelling as the mean of the 100 m grid squares exceeding the TV within that 1 km grid square. Subsequent finer scale modelling that included a more detailed assessment also predicted exceedances of the TV at locations close to the industrial site in 2015, 2016, 2017 and 2018. However, a slightly smaller area of exceedance was predicted, as shown in Figure 3. The assessment is discussed in more detail in section 2.3.

Figure 2 also shows the locations of the key industrial sources. The area shown on this map includes grid squares assigned to both the Swansea Urban Area (UK0027) and South Wales (UK0041) zones. The grid squares assigned to the Swansea Urban Area zone and this exceedance situation - Swansea Urban Area [B[a]P_UK0027_2018_1] are shown as hatched (in this report) and the non-hatched red grid squares correspond to exceedance situation South Wales [B[a]P_UK0041_2018_1] (discussed in the South Wales zone UK0041 report).

Figure 2. Exceedance situation Swansea Urban Area [B[a]P_UK0027_2018_1]. Exceeding grid squares are marked red. Locations of coke works at Morfa and sinter plant at Port Talbot are also shown. Hatched grid squares are those assigned to Swansea Urban Area zone UK0027 (this report). Non-hatched grid squares are assigned to South Wales zone UK0041 and do not form part of this exceedance situation (see UK0041 report).

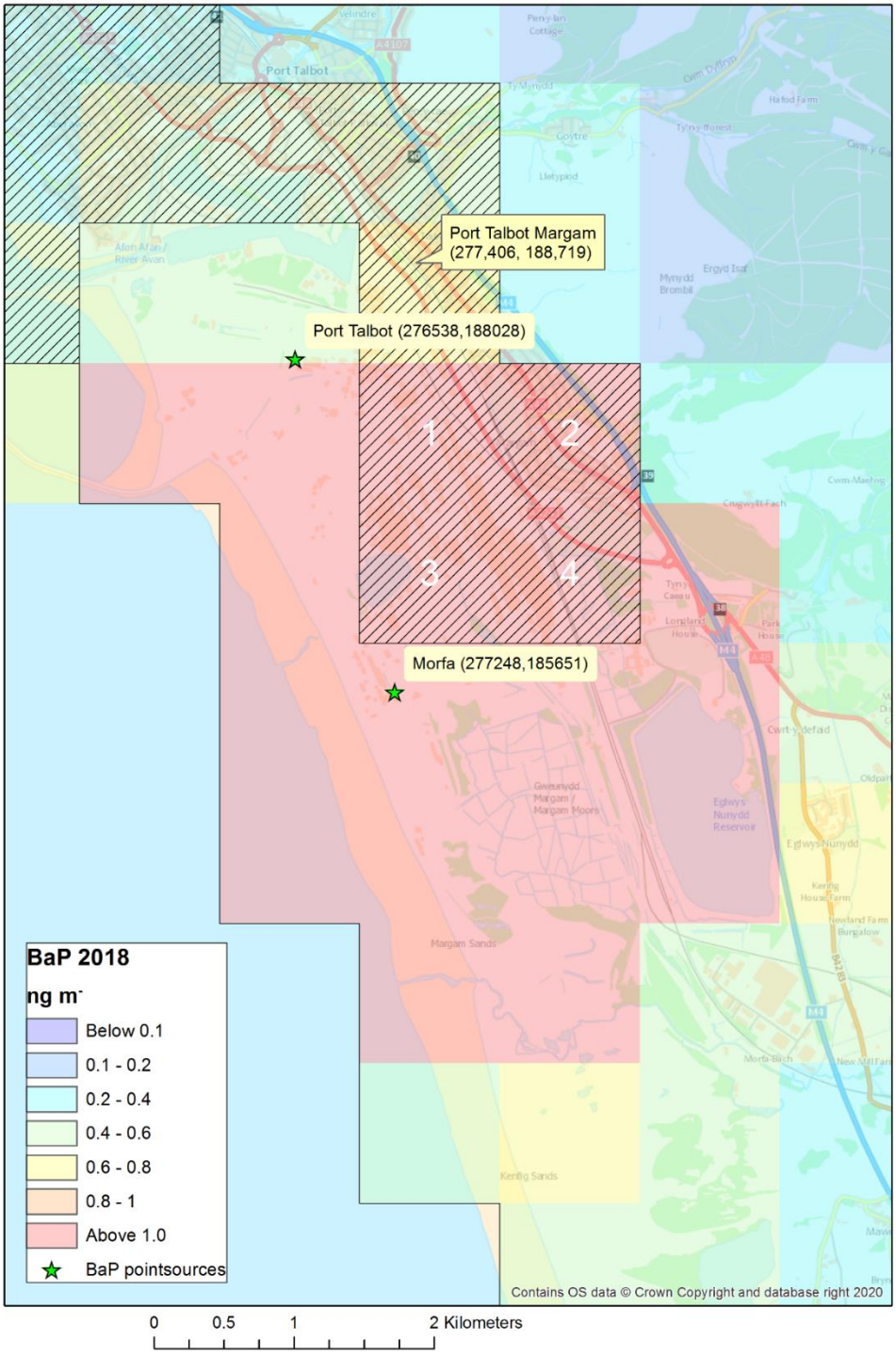


Table 3. Exceeding grid squares for exceedance situation BaP_UK0027_2018_1. * denotes grid squares also identified as exceeding in the detailed local modelling

Grid square number	Resident population	Notes
1*	137	Mostly steelworks industrial complex, Margam
2*	2503	Small part of steelworks industrial complex, playing fields, school, Margam
3*	0	Steelworks industrial complex
4*	97	Partly steelworks industrial complex, Margam

2.2 Source apportionment

Table 4 provides a breakdown of the main emission sources (source apportionment) that have contributed to the grid squares in this exceedance situation, highlighting the significant contribution from industrial sources. The penultimate column is the total from all emission sources. The values in this column have been rounded to 1 decimal place for consistency with the values used in the compliance assessment. The values in the other columns have not been rounded. The other shaded columns are the subtotals for the regional, urban background and local contributions. Table 5 gives a more detailed source apportionment indicating how the separate industrial processes contribute to the total industrial figure. This shows that the coke ovens at Morfa are the main sources associated with this exceedance situation.

Table 4. Source apportionment for exceedance situation Swansea Urban Area [B[a]P_UK0027_2018_1]. Annual mean B[a]P concentration (ngm^{-3}).

Grid square number	OS easting (m)	OS Northing (m)	Zone	**a) Regional background: Total**	**b) Urban background increment: Total**	Urban background increment: Traffic	Urban background increment: Industry including heat and power production	Urban background increment: commercial and residential	Urban background increment: Shipping	Urban background increment: Off road mobile machinery	Urban background increment: Other	**c) Local increment: Total**	Local increment: Industry including heat and power production	**Total for all emission sources (a+b+c)**	Resident population
1	277500	187500	27	n/a	0.082	0.001	0.041	0.036	0.000	0.001	0.003	1.279	1.279	1.4	137
2	278500	187500	27	n/a	0.171	0.002	0.087	0.075	0.000	0.001	0.005	1.012	1.012	1.2	2503
3	277500	186500	27	n/a	0.067	0.000	0.036	0.027	0.000	0.001	0.004	4.833	4.833	4.9	0
4	278500	186500	27	n/a	0.145	0.001	0.104	0.029	0.000	0.006	0.005	1.610	1.610	1.8	97

Table 5. Detailed source apportionment for industrial sources only for exceedance situation Swansea Urban Area [B[a]P_UK0027_2018_1]. Annual mean B[a]P concentration (ngm^{-3})

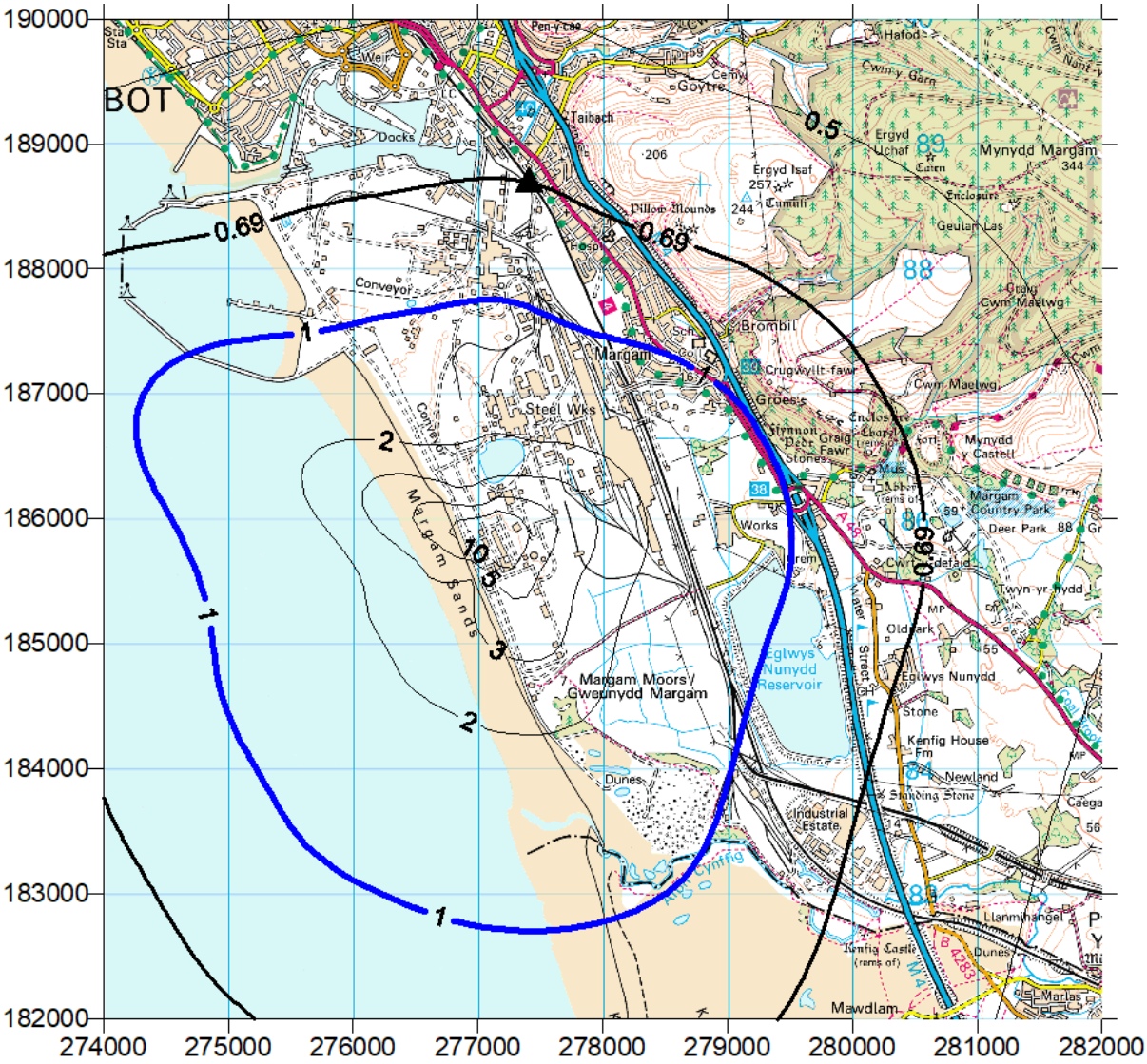
Grid square number	OS easting (m)	OS Northing (m)	Zone	Morfa coke ovens	Port Talbot sinter plant	Local increment: Industry including heat and power production
1	277500	187500	27	1.279	0.000	1.279
2	278500	187500	27	1.012	0.001	1.012
3	277500	186500	27	4.833	0.000	4.833
4	278500	186500	27	1.609	0.001	1.610

2.3 A detailed local assessment

In order to assess this exceedance in more detail, a dispersion modelling assessment was undertaken making use of additional local data. The background concentration for this assessment was derived from local measurements rather than from a model, as was the case for the national modelling assessment. The detailed assessment indicated that off-site concentrations of B[a]P exceeded the TV in 2018. B[a]P emission from the coke ovens in 2018 was estimated to be 76.2 kg using the new assessment method. Section 2.4 provides more detail on coke oven sources and measures that have been, or will be, implemented to tackle them.

Figure 3 plots the sum of the process contribution, due to emissions from the steelworks complex, and the ambient B[a]P background, derived from the measurement at the Port Talbot Margam monitoring site, which is indicated as a filled black triangle. The blue contour indicates the predicted environmental concentration of 1 ng/m^3 and shows that it is likely that the TV would have been exceeded beyond the industrial site boundary.

Figure 3. Predicted environmental concentration (PEC) of B[a]P (ng/m^3) for 2018.



2.4 Measures

The main overview report contains more information on how industrial sites are regulated. There are no specific BAT conclusions designed to reduce B[a]P under the Industrial Emissions Directive (EU Directive 2010/75/EU), in either the Coke Ovens or Sinter plant, which are the main sources of this pollutant. BAT looks to control emissions in general and the techniques required will also affect B[a]P concentrations. The iron and steel BAT Reference Document (BREF)[6] contains stringent requirements for iron and steel works to significantly reduce their fugitive emissions, including Polycyclic Aromatic Hydrocarbons (PAH) (B[a]P is a pollutant

[6] http://eippcb.jrc.ec.europa.eu/reference/BREF/IS_Adopted_03_2012.pdf

from this chemical group). The reduction of emissions of polychlorinated dibenzodioxins/furans (PCDD/F) and polychlorinated biphenyls (PCB) by utilising lignite injection at the sinter plant will also result in a reduction of B[a]P. Monitoring and further modelling as the techniques are employed will demonstrate the scale of the reduction. The regulator is of the view that Tata will be at BAT within the timescales required by the Industrial Emissions Directive or within the periods of any agreed derogations for the Sinter Plant and the Coke Ovens.

Reason for increases in reported coke oven emissions and next steps

In 2015 the implementation of the BREF for Iron and Steel production, resulted in the need to improve the monitoring of fugitive emissions from the coke ovens.

The method employed prior to 2015 (BCRA method) required an estimate to be carried out every three months that relied on a subjective assessment of leak severity. The industrial operator agreed a new method with the regulator (NRW) that was adapted from the US EPA methodology. This methodology requires the leaks be monitored and recorded daily and does not attribute a severity to the leaks, all leaks are treated as a priority. When both methods were assessed side by side it was clear that the BCRA method gave a favourable estimation of the fugitive emission resulting in a low estimation factor per tonne of coke. The new methodology has resulted in an increase in the estimation of B[a]P released from the coke ovens in 2015, however, the actual release is likely to have been similar to previous years.

The change in the methodology has meant that the operator has a better understanding of the precise sources of fugitive emissions and enabled a targeted improvement programme to be established. This improvement programme was expected to show a decrease in results in 2017 and 2018. Monitoring has shown a decrease in 2017 but a slight increase in 2018 caused by a high result in May, with subsequent months showing a return to a lowering trend that continues into 2019. The site regulator will continue to focus on better performance through regulatory work and will review the interventions following analysis of the 2018 and 2019 data.

Table 6 shows the measures taken or to be taken at Port Talbot industrial site.

Table 6. Table of measures taken or to be taken at Port Talbot industrial site

Measure code	Description	Classification	Implementation dates	Other information	Comment	Future work
Coke Ovens 1	Measures to meet new fugitive BAT emission limits (BATELs)	Permit systems and economic instruments: IED permits	Start: 2015 Expected end: 2027 (tied to life of asset) Status: Implementation	Source affected: Industry including heat and power production Spatial scale: Local Cost: Not available Indicator: Emissions estimate Target emissions reduction: Not available	Tata has adopted a modified US EPA method for fugitive release assessment. This uses a binary 'leak-no leak' assessment. This method directly compares to the BATc. Tata has committed to coke ovens life extension expenditure worth ~£3m/year over the next three years. Coke ovens life extension project is ongoing and there has been consistent investment in this area by Tata Steel to date. Compliance with the new limits has been summarised below for tops, doors and charging emissions. Where compliance has not been achieved, NRW will respond per its CCS compliance scheme and work with Tata to achieve the new limits. NRW continues to apply CCS scores in response to any emission limit breaches. An EPR Regulation 61 Notice was used in 2018; Tata Steel's	Fugitive releases from coke ovens are affected by the internal operating pressure of the ovens. This pressure is at its highest when ovens are initially charged with coal and there is the maximum production of coke oven gas (COG). The rate of COG production gradually decreases as the contents of the oven are carbonised. Tata are investigating the feasibility of installing gas pressure controls on individual ovens to improve the overall control system and therefore minimise fugitive releases of B[a]P from its coke oven batteries. Tata Steel will need to outline its future strategy for this asset as Morfa Coke Ovens moves towards the end of its extended campaign life. This is now projected to be the late-2020s thanks to the life extension project work. It should be noted that as the ovens age, the likelihood of permit non-compliances and elevated emissions may increase despite the life extension measures.

					response included a plan with timescales outlining a pathway towards compliance. Compliance for coke oven doors emissions achieved (and sustained) since August 2018. Good progress has been made towards compliance with the doors achieving full compliance in 2018. Compliance with all relevant emission limits (doors, tops and charging) achieved in February 2019.	Tata's strategy will need to address other critical steelworks assets approaching end of life e.g. sinter plant. A replacement coke ovens may require significant planning (~5yrs design & construction) and capital expenditure (>£500m). Further notices will be considered should performance deteriorate and repeated permit non-compliances occur.
Coke Ovens 2	Spigot improvements. The spigot is the joint between the oven and the gas main. Measures include fitting	Permit systems and economic instruments: IED permits	Start:2015 Expected end: 2019 Status: Under control	Source affected: Industry including heat and power production Spatial scale: Local	Control of fugitive emissions from coke ovens will result in lower B[a]P emissions. The 1% BAT-AEPL (Associated Emission Performance Level) for tops is very challenging. Current leakage rate is 8% (or 92% leak free). A programme of works is ongoing to reduce leakage, but the rate of spigot renewal is	It should be noted that as the ovens age, the likelihood of permit non-compliances and elevated emissions may increase despite the life extension measures. At Port Talbot there are two COG collection mains for each oven and four charge holes. Tata have assessed the feasibility of moving to a single COG collection main, which would significantly reduce the

	of new collars, 'repacking' existing spigot seals, fitting new seals and, shortening of ascension pipes.			Cost: Not available Indicator: Percentage leak rate reduced to target of 1% Target emissions reduction: Not available	difficult to change due to the complexities of working on a live coke oven. The work must be sequenced to avoid affecting oven integrity (ovens are usually in continuous operation). Significant effort has been applied by Tata Steel to reduce fugitive emissions from coke oven tops. Improved performance has coincided with secured capital expenditure (coke ovens life extension project) and refinement of maintenance plans and procedures. Tata continues to follow a rolling program of work to control leaks from coke oven tops. A full replacement 'cycle' has been completed for the spigots. Sustained compliance may become more challenging as the batteries approach the end of their campaign life. Significant progress is being made with 97.5 % leak free performance in August 2018. Further progress towards the BAT AEPL of 99% is expected. Compliance with the BAT-AEPL for tops was achieved in February 2019 and has been sustained.	number of emission points along the coke oven battery tops. The feasibility study has been completed and a number of third party technology suppliers have been contacted. Moving to a single COG main will incur significant cost and loss of production. A cost-benefit analysis will be necessary before any capital expenditure proposal can be considered by Tata Steel. Tata are trialling mechanical spigots on some ovens which may offer more robust performance compared to the current rolling programme of (manually) sealing and re-sealing spigot joints. The early trial conclusions are encouraging.

					Target achieved (<1% leakage) NRW is addressing non-compliance in accordance with its CCS scheme. We have also commenced monthly compliance reviews of coke ovens performance. BAT-AEPL has been met. Coke Ovens performance is discussed at least every quarter with Tata Steel.	
Coke Ovens 3	Coke Oven door improvements Each coke oven has two sets of doors at either end. Hot coke is pushed from the 'ram side' doors through the 'coke side' doors into waiting rail cars. Doors and door frames require regular	Permit systems and economic instruments: IED permits	Start: 2015 Expected end: 2019 Status: Under control	Source affected: Industry including heat and power production Spatial scale: Local Cost: Not available Indicator: Percentage leak rate reduced to target of 10%	Control of fugitive emissions from coke ovens will result in lower B[a]P emissions. BAT-AEL for doors is 10% leakage or 90% non-leaking doors. Battery 1 and 2 have now achieved compliance with the BAT AEPL achieving 91.5 % leak free in August 2018. Leakage rate from coke oven doors has declined to <10% (90% no leaks). Emissions have been compliant since August 2018. Because of changing shift practices, standardising door cleaning methods and an ongoing door/door frame replacement	It should be noted that as the ovens age, the likelihood of permit non-compliances and elevated emissions may increase despite the life extension measures. Leaks from coke oven doors occur when hot gases penetrate the seals between the door and its frame. Doors and frames are routinely cleaned to ensure a tight seal. Previously Tata considered a remotely controlled cleaning device for the smaller 'leveller' doors which are difficult to clean. This has been abandoned for technical reasons. Tata's door cleaning programme now includes a team which targets leveller doors and seals to provide an equivalent level of cleaning.

	maintenance and periodic replacement to minimise fugitive emissions.			Target emissions reduction: Not available	programme, the door leakage rate has dropped noticeably across both batteries. Significant effort has been applied by Tata Steel to reduce fugitive emissions from coke oven doors. Improved performance has coincided with secured capital expenditure (coke ovens life extension project) and refinement of maintenance plans and procedures. Tata continues to follow a rolling program of work to control leaks from coke oven doors. Door cleaning techniques have been critical to achieving the improved performance against the BAT-AEPL. Sustained compliance may become more challenging as the batteries approach the end of their campaign life. Tata achieved full compliance with the BAT-AEL for doors in August 2018. Compliance with the BAT-AEPL for doors was achieved in August 2018 and has since been sustained. Target achieved (<10% leakage) NRW is addressing non-compliance in accordance with its CCS scheme. We have also commenced monthly compliance	Tata is retro-fitting a new type of coke oven door (with tighter 'z' seals) to its existing ovens. This will eventually result in the replacement of all door seals.

					reviews of coke ovens performance. BAT-AEPL has been met. Coke Ovens performance is discussed at least every quarter with Tata Steel.	
Coke Ovens 4	Reduction of emissions during charging Coke ovens are 'charged' with coal through charge holes in the top of each oven. The charging	Permit systems and economic instruments: IED permits	Start: 2015 Expected end: Status: Under control	Source affected: Industry including heat and power production Spatial Scale: Local Cost: Not available	Control of fugitive emissions from coke ovens will result in lower B[a]P emissions. BAT-AEL for charging emissions is 30 seconds as a monthly mean. During 2017 Tata have improved charging performance and are currently achieving close to 30 seconds. Charging performance has improved following a deterioration in performance in 2018. The key	It should be noted that as the ovens age, the likelihood of permit non-compliances and elevated emissions may increase despite the life extension measures. Automatic systems are being fitted which seal the charge hole lids and clean the carbon residues around the holes and lid seals.

	nozzles, holes and lids all require regular maintenance and periodic replacement to minimise fugitive emissions.			Indicator: Duration of release reduced to 30 seconds as a monthly mean. Target emissions: Not available	items of equipment (charge holes and the coal charging apparatus) have now all been refurbished and/or replaced. Emissions have been compliant (<30 seconds visible emissions per charge) since February 2019. Tata continues to follow a rolling program of work to maintain the equipment used for charging coal. Sustained compliance may become more challenging as the batteries approach the end of their campaign life. Tata complied with the BAT-AEL for charging emissions during July and August 2017. Since February 2019, compliance has improved further and has been moving towards 20 seconds visible emissions per charge as a monthly average figure. Further improvement may be possible. BAT-AEPL has been met. Coke Ovens performance is discussed at least every quarter with Tata Steel. Target achieved (<30 seconds visible emission per charge). NRW is addressing non-compliance in accordance with its CCS scheme. NRW continue to	

					review coke oven performance as part of its regulatory work." BAT-AEPL has been met. Coke Ovens performance is discussed at least every quarter with Tata Steel.	
Coke Ovens 5	Reduction of emissions during coke pushing Finished coke is pushed from each oven into specially designed rail cars. A mobile fume extraction system (also known as a coke-side arrestment system) is used at Port Talbot to capture fugitive emissions from coke pushing and	Permit systems and economic instruments: IED permits	Start: 2015 Expected end: 2020 Status: Implementation	Source affected: Industry including heat and power production Spatial Scale: Local Cost: Not available Indicator: Compliance with 20 mg/m^3 BAT-AEL. Reduced numbers of black pushes Target emissions: Not available	Control of fugitive emissions from coke ovens will result in lower B[a]P emissions. The BAT-AEL for coke pushing (dust) emissions is 10mg/m3 for bag filters and 20mg/m3 in all other cases. Measured using discontinuous monitoring (spot sampling) No bag filter at Port Talbot so the applicable limit is 20mg/m3. BAT-AEL has been reflected in Tata Steel's permit since 2015 (no change). No verified breaches of this emission limit (BAT-AEL) since it came into force. Oven heating issues can result in poorly carbonised batches of coke. When these are pushed, visible fugitive emissions increase ('black pushes') and can	Discussion with Tata Steel about monitoring this emission point continuously using a particulates CEM. Tata believes there is potential to repair/reinstate a higher number of damaged oven flues than was previously thought possible (~5% of the total number of flues). We await further confirmation once this project's scope and aims have been better defined. Black push data analysis allowing targeting of 'problem' ovens New fume extraction system has been delayed due to project overrun (bad weather delaying crane lifts, Covid-19 disruption). Upgraded hood and guide car now in place and final commissioning scheduled for November 2020. Black pushes should theoretically reduce once the new fume extraction (coke-side fume arrestment) system is brought online.

	channel the waste gases and particulates to a set of scrubbers.				temporarily overwhelm the fume extraction system. Availability of the fume extraction system can also influence fugitive emission levels. The system was originally installed in the 1980s and has become increasingly unreliable. There is a rolling programme of repair & refurbishment for the oven gas (heating) flues. Coke oven temperature profiles and coke yields are positively affected by keeping as many gas flues as possible in working order. The difficulty associated with this work increases as the battery ages. NRW has introduced a new reporting metric for the number of black pushes at the coke ovens. This data is reported monthly. The fume extraction (coke-side fume arrestment) system was brought offline in March 2019 to allow a replacement hood, rail carriage and new ducting to be fitted. The new system should offer greater reliability and fume capture capability. Water sprays have been used during this period of unavailability to 'knock down'	

					fugitive emissions from coke pushing. BAT-AEL achieved. Black pushes do not have an ELV but are now scrutinised using new performance metric (see above) NRW is addressing non-compliance in accordance with its CCS scheme. NRW continue to review coke oven performance as part of its regulatory work." BAT-AEL has been met. Coke Ovens performance is discussed at least every quarter with Tata Steel.	
Sinter Plant	Improvements to Lignite Injection Lignite is used in combination with lime to trap and neutralise certain pollutants present in hot flue gases. These additives are injected directly into	Permit systems and economic instruments: IED permits	Start: 2015 Expected end: 2025 Status: Implementation	Source affected: Industry including heat and power production	Lignite-lime injection forms part of several projects to ensure that the sinter plant complies with the new tighter EU (IED) standards. The lignite-lime injection system at Port Talbot has not yet been commissioned. There are no specific BATc or BAT-AELs designed to reduce B[a]P from sinter plant emissions. However, reducing overall emissions will result in lower B[a]P emissions. Associated work and regulatory interventions by NRW to address persistent particulate emission	Covid-19 impact and associated economic turmoil may prove a barrier to the implementation of this scheme. The interior of each ESP and the (waste gas) wind main system are subject to high temperatures and continual physical abrasion by entrained dust, which progressively wears away exposed surfaces and parts. Keeping pace with this degradation and maintaining an 'air-tight' system is critical to the safe commissioning of lignite-lime injection. Tata Steel has adjusted its maintenance strategy to allow

	the hot flue gases. The integrity of the flues and the emissions abatement systems must be sound for lignite-lime injection to be used safely.				limit (BAT-AEL) breaches from the sinter plant main stack should indirectly reduce B[a]P emissions from this source. Main stack particulate emissions: Tata Steel responded to an EPR Regulation 61 Information Notice in August 2018. The company's response included a plan with timescales outlining a pathway towards compliance. Lignite-lime injection has already been approved by Tata and is still progressing. Several preparatory works must be completed over planned sinter plant stops before the system can be brought online. The preparatory works remain incomplete but are still being pursued by Tata Steel. Air ingress issues must be resolved before lignite-lime can be brought online. A key performance indicator is 17% oxygen within the waste gas stream - sensors are now in place to monitor this. The valves at the base of each ESP (dust) collection hopper have also been upgraded and are subject to a rolling maintenance programme. Previously the valve seals were degrading too quickly and allowing air into the system. Bringing lignite-lime online prematurely can result in fires	shorter stops to be taken more frequently within a quarterly maintenance framework, enabling worn parts to be replaced before they degrade completely. The engineering challenges and associated unavailability of lignite-lime injection may increase as the sinter plant ages. Use of customised lime products as waste gas reagents is Tata's contingency plan should the air ingress issues prove insurmountable. Tata Steel will need to outline its future strategy for this asset as the Sinter Plant moves towards the end of its campaign life. Tata's strategy will need to address other critical steelworks assets approaching end of life e.g. coke ovens. A replacement sinter plant may require significant planning and capital expenditure.

					starting within the main stack Electrostatic Precipitators (ESPs) as a result of lignite (fuel) + heat + oxygen. The system is unlikely to be commissioned in 2020 because of the preparatory works described above, along with wider Covid-19 and economic disruption. Tata has been exploring a contingency solely involving the use of lime products i.e. no lignite. There are customised lime compounds available that may deliver similar levels of waste gas reagent performance and are also capable of removing micro-pollutants. These compounds present a much lower risk of combustion compared to lignite and the impact of air (O2) ingress becomes less pronounced. This project has been delayed due to problems with the performance of the electrostatic precipitators. NRW are currently working with Tata to agree new timescales for the implementation of lignite injection." Sinter Plant performance is discussed at least every quarter with Tata Steel. NRW continues to focus on persistent particulate	

					emission limit breaches from the main stack. Scrutinising the root cause(s) of these breaches maintains attention on the integrity of the main stack waste gas system.	