



Department
for Environment
Food & Rural Affairs

Report on measures for 2014 exceedance of the Target Value for Benzo[a]pyrene in Teesside Urban Area agglomeration zone (UK0013)

November 2016



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1. Introduction

1.1 Context

Under the EU Directive 2004/107/EC¹, 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 target value and that all reasonable measures that do not entail disproportionate cost should be taken to ensure this target is not exceeded.

Exceedance of the TV was reported in 2013 in the Teesside Urban Area and a report on measures was published detailing the exceedance and the measures in place².

This document reports the exceedance situation for 2014 reflecting the more recent assessment and updating the 2013 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 Teesside Urban Area zone identified within the 2014 UK air quality assessment. Exceedances within this zone were identified on the basis of model results on a 1 km x 1 km grid resolution providing supplementary information for the assessment in addition to the results from fixed monitoring stations. This exceedance was reported via e-Reporting dataflow G³ on attainment and Air Pollution in the UK⁴.

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

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/assets/documents/reports/bap-nickel-measures/bap_teesside_UK0013_reportonmeasures_2013.pdf

³ <http://cdr.eionet.europa.eu/gb/eu/aqd>

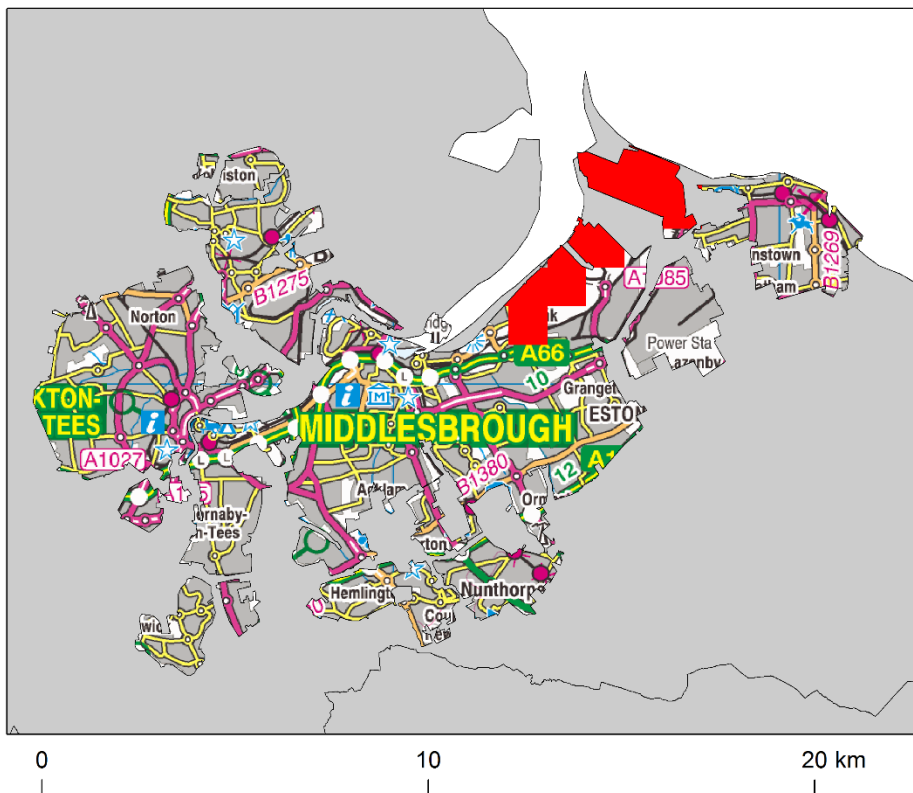
⁴ <http://uk-air.defra.gov.uk/library/annualreport/index>

Table 1. Area exceeding B[a]P target value in 2014 and associated population for Teesside urban Area zone UK0013

Zone code	Zone Name	Area exceeding TV (km ²)	Population exceeding TV
UK0013	Teesside Urban Area	8	2

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 in 2014 in Teesside Urban Area zone UK0013. 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 related to two industrial locations (see section 2 below):

- Teesside Urban Area [B[a]P_UK0013_2014_1] related to industrial emissions (area of exceedance 8 km²)

This report includes a description of the exceedance situation, including maps, information on source apportionment and a list of measures already taken or to be taken. Information on measures is reported within e-Reporting dataflow K⁵.

2 Exceedance situation Teesside Urban Area [B[a]P_UK0013_2014_1] related to industrial emissions

2.1 Description of exceedance

This exceedance situation has an area of exceedance of 8 km². Figure 2 shows the location of the exceedance situation in detail. The exceeding grid squares are numbered in Figure 2 and in subsequent tables for easy reference. Four of the grid squares are close to Redcar, three are close to South Bank and one is roughly half way between these two locations in Redcar and Cleveland. Most of the grid squares in exceedance are largely or wholly within the “SSI Redcar” steelworks industrial complex area. There is a railway station in the grid square labelled exceeding grid square 4 at British Steel Redcar. There is a resident population of 2, a port area and other industry at Tees Dock Grangetown in exceeding grid square 5. Shops, other businesses and a railway station are present in exceeding grid square 8 at South Bank. This exceedance situation is adjacent to and shares common sources with the exceedance situation North East [B[a]P_UK0036_2014_1].

The nearest monitoring station to this exceedance situation is at Middlesbrough. Table 2 lists the measured concentrations of B[a]P at the Middlesbrough monitoring station, which is approximately 3 km south west of the nearest part of the exceedance situation. The measured concentration at this station was below the TV. The modelled concentration at this location is also below the TV, which is consistent with the measured value.

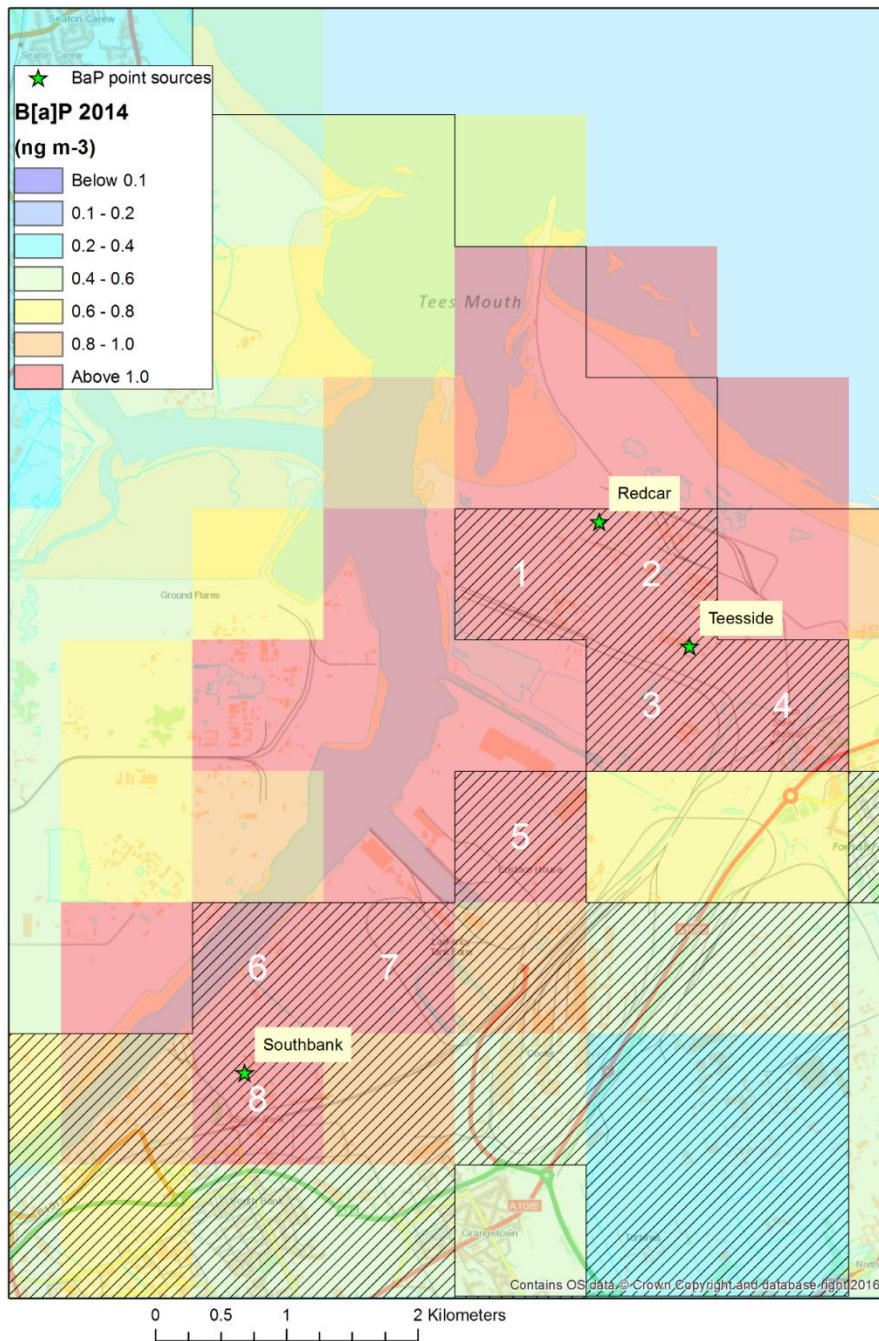
⁵ <http://cdr.eionet.europa.eu/gb/eu/aqd>

Table 2.2. Measured annual mean B[a]P concentration in Teesside Urban Area zone UK0013

Station (Eol code)	Annual mean concentration (ngm ⁻³) in 2014	Data capture (%)
Middlesbrough (GB0583A)	0.5	100

Figure 2 also shows the locations of the key industrial sources. The area shown on this map includes grid squares assigned to both the Teesside Urban Area (UK0013) and North East (UK0036) zones. The grid squares assigned to the Teesside Urban Area zone are shown as hatched. Thus the hatched red grid squares correspond to exceedance situation Teesside Urban Area [B[a]P_UK0013_2014_1] (this report) and the non-hatched red grid squares correspond to exceedance situation North East_[B[a]P UK0036_2014_1]. (see North East zone [UK0036 Report on Measures](#)). The exceeding grid squares within this exceedance situation are numbered and the numbers correspond to those in subsequent tables.

Figure 2. Exceedance situation Teesside Urban Area [B[a]P_UK0013_2014_1]. Exceeding grid squares are marked red. Locations of coke works at Redcar and South Bank and sinter plant at Teesside are also shown. Hatched grid squares are those assigned to Teesside Urban Area zone UK0013 (this report). Non-hatched grid squares are assigned to North East zone UK0036 and do not form part of this exceedance situation (see North East zone [UK0036 Report on Measures](#)).



2.2 Source apportionment

Table 3 provides a breakdown of the main emission sources (source apportionment) that have contributed to the grid squares in this exceedance situation. 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. It is clear that industrial sources are the main source associated with this exceedance situation. Table 4 gives a more detailed source apportionment indicating how the separate industrial processes contribute to the total industrial figure and show that the coke ovens at South Bank are the main source associated with the exceedance at the two grid squares at South Bank (7 and 8) and the Redcar coke ovens are the main source associated with the exceedance at the two grid squares at Redcar (1 and 2). These sources are regulated by the Environment Agency.

Table 3. Source apportionment for exceedance situation Teesside Urban Area [B[a]P_UK0014_2014_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	Urban background increment: commercial and	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	Total for all emission sources (a+b+c)	Resident population
1	455500	525500	13	n/a	0.144	0.003	0.096	0.011	0.008	0.002	0.024	3.265	3.265	3.4	0	
2	456500	525500	13	n/a	0.161	0.003	0.118	0.011	0.003	0.002	0.024	4.155	4.155	4.3	0	
3	456500	524500	13	n/a	0.446	0.003	0.397	0.012	0.002	0.003	0.030	0.780	0.780	1.2	0	
4	457500	524500	13	n/a	0.461	0.004	0.401	0.012	0.002	0.012	0.030	0.868	0.868	1.3	0	
5	455500	523500	13	n/a	0.205	0.003	0.155	0.013	0.002	0.003	0.028	0.908	0.908	1.1	2	
6	453500	522500	13	n/a	0.201	0.004	0.148	0.013	0.002	0.002	0.032	1.169	1.169	1.4	0	
7	454500	522500	13	n/a	0.129	0.004	0.078	0.013	0.001	0.002	0.031	1.495	1.495	1.6	0	
8	453500	521500	13	n/a	0.135	0.006	0.076	0.013	0.001	0.003	0.036	5.995	5.995	6.1	0	

Table 4. Detailed source apportionment for industrial sources only for exceedance situation Teesside Urban Area [B[a]P_UK0013_2014_1]. Annual mean B[a]P concentration (ngm⁻³)

Grid square number	OS easting (m)	OS Northing (m)	Zone	Redcar coke ovens	South Bank coke ovens	Teesside sinter plant	Local increment: Industry including heat and power production
1	455500	525500	13	3.140	0.122	0.003	3.265
2	456500	525500	13	4.016	0.138	0.001	4.155
3	456500	524500	13	0.576	0.203	0.001	0.780
4	457500	524500	13	0.708	0.158	0.002	0.868
5	455500	523500	13	0.516	0.385	0.007	0.908
6	453500	522500	13	0.301	0.862	0.006	1.169
7	454500	522500	13	0.334	1.155	0.006	1.495
8	453500	521500	13	0.233	5.756	0.005	5.995

Footnote to Table 4: South Bank Coke Ovens stopped production during September 2015. Redcar Coke Ovens and Teesside sinter plant stopped production during October 2015 and changes will impact 2015 compliance reporting rather than 2014 as discussed in this report.

A revised modelling methodology incorporating a finer spatial scale for dispersion modelling of all coke ovens in the UK and revision to the emissions rate for the coke ovens at Scunthorpe have been adopted for the 2015 compliance assessment for B[a]P that were not incorporated into 2014 reporting.

2.3 Measures

The installation relating to the identified exceedance was the Sahaviriya Steel Industries (SSI UK) owned steelworks near Redcar and its associated coke ovens.

SSI UK placed the steelworks into liquidation in early October 2015 and the Official Receiver announced on 12th October⁶ that the steelworks and its coke ovens would be closed down. Future modelled assessments of this zone will reflect the closure of the plant and the zone will be expected to show compliance with the TV.

The measures set out in Table 5 reflect the changes at the Teesside industrial site.

⁶ <https://www.gov.uk/government/news/redcar-coke-ovens-to-be-closed>

Table 5. Table of measures taken at Teesside industrial site

Measure code	Description	Classification	Implementation dates	Other information		Comment
SSI1	Closure of Teesside Integrated Steel Works	Permit systems and economic instruments: other measure	Start: 2015 Expected end: 2015 Status: Implementation	Source affected:	Industry including heat and power production	South Bank Coke Ovens stopped production during September 2015. Sahaviriya Steel Industry (SSI UK) near Redcar and its associated Coke Ovens and Teesside sinter plant stopped production during October 2015.
				Spatial scale:	Local	
				Cost:		
				Indicator:		
				Target emissions reduction:		