Department
for Environment
Food & Rural Affairs

Report on measures for 2016 exceedance of the Target Value for Benzo[a]pyrene in Yorkshire and Humberside non-agglomeration zone (UK0034)

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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 that 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.

Exceedance of the TV were reported in 2013, 2014 and 2015 in the Yorkshire and Humberside non-agglomeration zone and a report on measures was published detailing the exceedance and the measures in place[2].

This document reports the exceedance situation for 2016 reflecting the more recent assessment and updating the 2013, 2014 and 2015 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 Yorkshire & Humberside zone identified within the 2016 UK air quality assessment. Exceedances within this zone were identified on the basis of measurement data with model results providing supplementary information. This exceedance was reported via e-Reporting dataflow G[3] on attainment and Air Pollution in the UK[4].

Table 1 summarises the spatial extent and associated resident population for the exceedances 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/library/bap-nickel-measures
[3] http://cdr.eionet.europa.eu/gb/eu/aqd
[4] http://uk-air.defra.gov.uk/library/annualreport/index

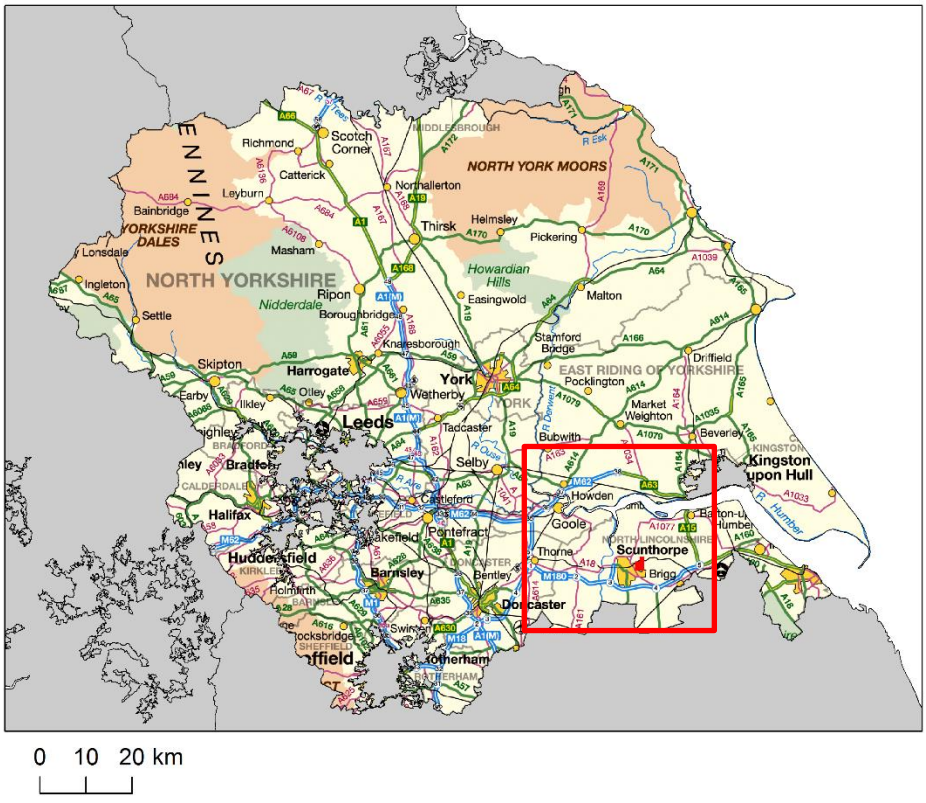
Table 1. Area exceeding B[a]P target value in 2016 and associated population for zone UK0034

Zone code	Zone Name	Area exceeding TV (km^2)	Population exceeding TV
UK0034	Yorkshire & Humberside	5	7

Figure 1a shows the locations of the exceedances in the context of the zone as a whole. Figure 1b shows the part of the zone including the exceedances in more detail.

Figure 1. Location of exceedance of the B[a]P target value during 2016 in zone UK0034 Yorkshire & Humberside. Areas of the zone in exceeding grid squares are marked red.

a) The whole zone



b) The exceedance locations at higher spatial resolution

An initial source apportionment was carried out and this analysis identified one exceedance situation within this zone

- Yorkshire and Humberside [B[a]P_UK0034_2016_1] related to industrial emissions (area of exceedance 5 km^2)

This 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 is reported within e-Reporting dataflow K[5].

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

2 Exceedance situation Yorkshire and Humberside [B[a]P_UK0034_2016_1] related to industrial emissions

2.1 Description of exceedance

This exceedance situation is an area of exceedance 5 km^2 to the north east of Scunthorpe in Lincolnshire. 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. The resident population associated with this exceedance situation is 7. Most of the grid squares have no resident population and are largely or wholly within the steelworks industrial complex area. During early 2016, the operator was Longs Steel UK Ltd, however in August 2016, the name changed to British Steel UK Ltd following purchase from Tata Steel UK Ltd.

Table 2 lists the measured concentrations of B[a]P in this zone since 2008. The TV was exceeded at two monitoring stations associated with this exceedance situation in 2016.

Table 2. Measured annual mean B[a]P concentrations in Yorkshire and Humberside zone UK0034 from 2008 to 2017 (ngm^{-3}). (Percentage data capture is shown in brackets).

Station (EoI code)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
High Muffles (GB0014R)	0.14 (95)	0.09 (62)	0.07 (94)	0.06 (87)	0.07 (91)	0.07 (87)	0.07 (98)	0.07 (98)	0.05 (100)	0.04 (100)
Royston (GB0940A)	2.6 (95)	1.0 (95)	1.1 (84)	0.84 (96)	0.89 (99)	0.85 (100)	0.92 (100)	0.41 (100)	0.52 (100)	0.34 (99)
Scunthorpe Low Santon (GB1004A)	6.0 (95)	2.4 (99)	1.8 (94)	3.0 (91)	2.9 (100)	3.4 (100)	3.6 (92)	3.5 (99)	1.1 (99)	0.83 (100)
Scunthorpe Town (GB0841A)	3.2 (99)	1.8 (99)	1.3 (80)	1.3 (86)	1.4 (98)	3.9 (98)	3.5 (90)	1.3 (92)	1.1 (100)	0.80 (99)
South Hiendley (GB0942A)	1.3 (97)	0.89 (94)	0.63 (91)	0.68 (83)	0.54 (100)	0.35 (91)	0.44 (99)	0.26 (95)	0.31 (100)	0.19 (100)

Figure 2 also shows the locations of the monitoring sites associated with the exceedance situation and the locations of the key industrial sources. Dispersion modelling up to and including 2016 has applied site level coordinates derived from the National Atmospheric Emissions Inventory (NAEI) for the sinter plant stack, which is about 850 m distant from the stack. The specific location of the sinter plant stack has been used for the 2017 assessment. The contribution from the sinter plant to ambient concentrations is much smaller than from the coke ovens and thus the uncertainty introduced will have been small. The specific location of the sinter plant is shown in the figure.

Dawes Lane coke ovens closed in March 2016. The exceeding grid squares within this exceedance situation are numbered and the numbers correspond to those in subsequent tables. Table 3 lists the exceeding grid squares and the resident population.

Figure 2. Exceedance situation Yorkshire and Humberside [B[a]P_UK0034_2016_1]. Exceeding grid squares are marked red. Locations of coke works at Appleby and Dawes Lane and sinter plant at Scunthorpe are also shown as well as the two monitoring sites at Scunthorpe Town and Scunthorpe Low Santon.

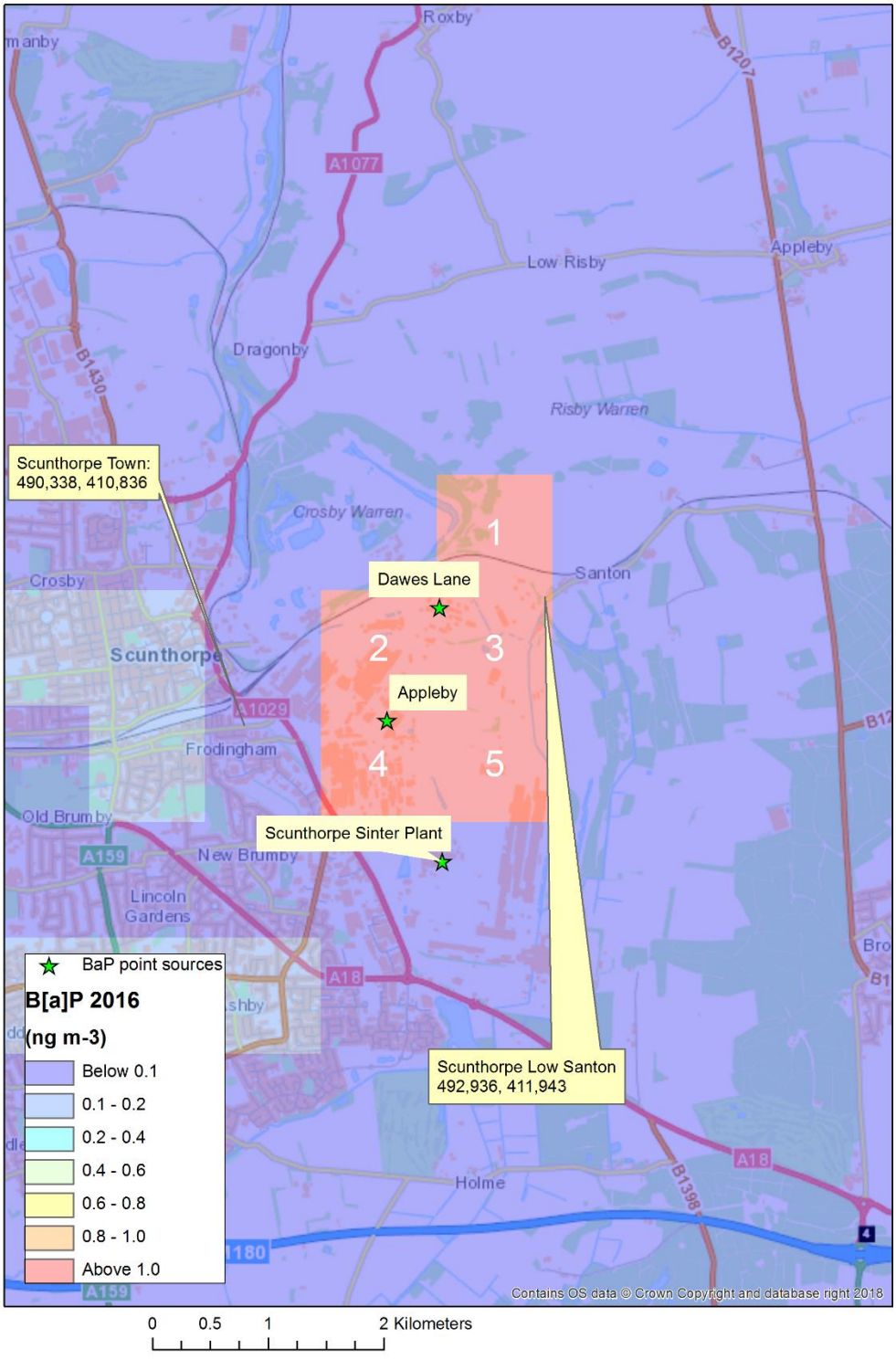


Table 3. Exceeding grid squares for exceedance situation BaP_UK0034_2016_1.

Grid square number	Resident population	Notes
1	0	Partly steelworks industrial complex
2	0	Steelworks industrial complex
3	7	Mostly steelworks industrial complex, houses in High Santon
4	0	Mostly steelworks industrial complex
5	0	Steelworks industrial complex

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 Appleby is the main source associated with this exceedance situation (note Dawes Lane coke ovens closed in March 2016).

Table 4. Source apportionment for exceedance situation Yorkshire and Humberside [B[a]P_UK0034_2016_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	492500	412500	34	n/a	0.035	0.000	0.001	0.020	0.000	0.001	0.012	1.205	1.205	1.2	0
2	491500	411500	34	n/a	0.039	0.000	0.003	0.025	0.000	0.001	0.009	4.805	4.805	4.8	0
3	492500	411500	34	n/a	0.031	0.000	0.001	0.019	0.000	0.001	0.009	2.163	2.163	2.2	7
4	491500	410500	34	n/a	0.044	0.001	0.001	0.031	0.000	0.001	0.009	3.960	3.960	4.0	0
5	492500	410500	34	n/a	0.032	0.000	0.001	0.021	0.000	0.001	0.009	1.631	1.631	1.7	0

Table 5. Detailed source apportionment for industrial sources only, for exceedance situation Yorkshire and Humberside [B[a]P_UK0034_2016_1]. Annual mean B[a]P concentration (ngm^{-3})

Grid square number	OS easting (m)	OS Northing (m)	Zone	Appleby coke ovens	Dawes Lane coke ovens	Scunthorpe, other plant	Local increment: Industry including heat and power production
1	492500	412500	34	1.159	0.038	0.008	1.205
2	491500	411500	34	4.795	0.006	0.004	4.805
3	492500	411500	34	2.121	0.032	0.010	2.163
4	491500	410500	34	3.956	0.002	0.001	3.960
5	492500	410500	34	1.623	0.002	0.007	1.631

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 2016 compliance assessment for B[a]P.

2.3 Measures

The main overview report contains more information on how industrial sites are regulated. There are no specific Best Available Techniques (BAT) conclusions designed to reduce B[a]P under the Industrial Emissions Directive (EU Directive 2010/75/EU). However, there are some narrative and specific BAT Conclusions to minimise particulate emissions, indirectly reducing B[a]P emissions. Permit conditions transposed these into the EPR permit in February 2016 and focused on the Coke Ovens and Sinter plant which are the main sources of this pollutant. BAT Reference Document (BREF)[6] contains stringent requirements for iron and steel

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

works to significantly reduce their fugitive emissions, including Polycyclic Aromatic Hydrocarbons (PAH) (B[a]P is a pollutant from this chemical group).

During 2015, diffuse emissions at the coke ovens at Appleby and Dawes Lane continued to be the main sources associated with the exceedance in this zone, whereas whilst the Sinter Plant has a significant mass emission, it is a point emission from a 107m high stack and highly dispersed. For March 2016, the Environment Agency completed a review of the IPPC permit HP3736AW, the Operator is currently British Steel Ltd (formerly Longs Steel UK Ltd). The EPR permit review considered the Operator's proposed techniques and comparison against other relevant techniques by the European Commission establishing Best Available Techniques (BAT) conclusions for Iron and Steel Production as detailed in the document reference 2012/135/EU (BRef) published on 8 March 2012. To note following an operational strategic review, the owners of the steelworks announced in October 2015 their intention to close down Dawes Lane Coke Oven (DLCO). DLCO subsequently closed on the first compliance day for IED (8th of March 2016).

During 2015, the performance of both coke oven plants were poor at the then Longs Steel UK Ltd installation. Following regulatory pressure to improve, the operational strategic review concluded that alongside the closure of DLCO Plant there would be a focused investment in the Appleby Coke Ovens (ACO). Since 2016, the steelworks has continued working through a significant capital and revenue project. The Recovery project of ACO to improve operational performance on both the CO Batteries and by-products plant with improved infrastructure was to prevent and minimise emissions, specifically PAH and B[a]P emissions reductions associated with particulate emissions. A rebuild of Battery 3 was completed, operated on hot idle (no coke making) from December 2015 to August 2016. Further works have been on the refurbishment of Batteries 1, 2 and 3 and the associated By-products plant. As such, the reported measures in previous reports on "Measures for Dawes Lane Coke Ovens" can now be discounted.

The Sinter plant stack is the other significant PAH and B[a]P emissions source. It is a point source release and emissions are highly dispersed via its 107m high stack. This plant is subject to other specific Best Available Techniques (BAT) conclusions from the BRef under the Industrial Emissions Directive (EU Directive 2010/75/EU). Improved abatement projects being implemented to reduce particulate and dioxin/furan emissions have potential to minimise B[a]P emissions. The revised permit has 6 monthly PAH monitoring expressed as B[a]P emissions to assess potential improvements.

The Environment Agency set out a permit condition in the 8 Feb 2016 issued EPR IED permit HP3736AW to review and report on measures to prevent and minimise PAH emissions and the PAH AQ Management plan, due annually for this report and related considerations. This is annually reviewed.

Table 6 sets out the measures that are being taken or are to be taken (planned) primarily during the ACO Battery Recovery project with the closure of the DLCO plant.

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

Measure code	Description	Classification	Implementation dates	Other information		Comment
1	Polycyclic Aromatic Hydrocarbon (PAH) Improvement Plan; The operator shall submit a written plan, to the Environment Agency (the regulator) for approval, of the measures to be taken to minimise PAH emissions (IARC Group 1, 2a & 2b), particularly the marker PAH; Benzo [a] Pyrene (B[a]P) and Volatile Organic Compounds as fugitive releases from existing Appleby and Dawes Lane coke oven battery plants	Permit systems and economic instruments: EPR permits	Start: 2012 Expected end: 2024 Status: Implementation	Source affected:	Industry including heat and power production	**COMPLETED 2012 improvement condition.** An improvement condition on the Scunthorpe site permit BL3838IW V007 9 May 2012. The measures described in column 1 of this table (Measure codes); Appleby Coke Ovens 1 -20 and Dawes Lane 1 are from the PAH improvement Plan. This PAH Improvement Plan forms part of a wider
				Spatial scale:	Local	
				Cost:	Unknown, Operator information	
				Indicator:	Reduction in ambient B[a]P concentration	
				Target emissions reduction:	Not available	

						Coke Oven Battery Recovery Project.
2	PAH measurement and analysis; The operator undertakes B[a]P monitoring to AURN monitoring location standards with time resolution as low as 1 day. PAH measurements at two locations, using pollution rose analysis to identify key sources. Emission factors to be calculated.	Permit systems and economic instruments: EPR permits	Start: 2012 Expected end: None Status: Implementation	Source affected:	Industry including heat and power production	**COMPLETED 2012 improvement. 2017 Update - Moved to measuring ambient PAH as B[a]P at one location, with time resolution now at 3 days (averaging period).** Measurements and analysis indicate that the coke ovens at Appleby (and previously Dawes Lane) are the key sources for this exceedance situation. Emission factors calculated for each plant by reverse
				Spatial scale:	Local	
				Cost:	Unknown, Operator information	
				Indicator:	Not available	
				Target emissions reduction:	Not available	

							modelling methodology (Measure No. 4). **2016 Update** – DLCO closed in March 16. Coke production has reduced which will also affect emission levels.
3	Emission measurements; Direct emissions measurements using flameproof blanket fixed over oven doors to create a chimney. Bespoke monitoring to establish improved emission factors.	Permit systems and economic instruments: EPR permits	Start: Expected end: Status:	2007 2008 Complete	Source affected: Spatial scale: Cost: Indicator:	Industry including heat and power production Local Unknown, Operator information Not available	**COMPLETED:** Analysis indicates that B[a]P emission dominated by door leakage (>98% of total). Emission rates consistent with estimates at other similar plants across Europe

				Target emissions reduction:	Not available	
4	Reverse Dispersion Modelling; To provide an independent estimate of emission rates, based on ambient measurements	Permit systems and economic instruments: EPR permits	Start: 2014 Expected end: 2015 Status: Complete	Source affected:	Industry including heat and power production	**COMPLETED:** Results reasonably consistent with emissions estimates from direct measurements. Indicates that coke ovens are the main source.
				Spatial scale:	Local	
				Cost:	Unknown, Operator information	
				Indicator:	Not available	
				Target emissions reduction:	Not available	

Appleby Coke Ovens 01	Replacement of Door seals; Regular door maintenance is necessary to ensure the maintenance of good seals and a programme to overhaul doors on a daily basis is ongoing.	Permit systems and economic instruments: IED permits	Start: 2012 Expected end: Ongoing Status: Implementation	Source affected:	Industry including heat and power production	**ON-GOING:** In 2017 doors were repaired and frame changes done on 33 ovens. In total, 57 frames were changed; 26 pusher side and 31 on the coke side. Ascension pipes between the ovens and collecting main were replaced on 24 ovens. Door jetters are being repaired continuously on an ongoing basis. **2018** plan – Planned to change a full jetting unit during late 2018/early 2019 on either battery 1 or 2.
				Spatial scale:	Local	
				Cost:	Operator information	
				Indicator:	Not available	
				Target emissions reduction:	Not available	

Appleby Coke Ovens 02	Door extractor adjustments; New door extractor as a trial to increase flexibility in door adjustments. Once the optimum position for each door has been ascertained then sealing each individual door will become easier and more consistent	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2013 2018 Implementation	Source affected: Spatial scale: Cost: Indicator: Target emissions reduction:	Industry including heat and power production Local Operator information Not available Not available	**ON-GOING:** No 3 pusher overhauled and now working within required parameters. **2018 plan** New visual pressure gauge being installed on door extractors on all machines to allow operators to ensure doors extractors are sealing properly and at optimal pressure.
Appleby Coke Ovens 03	Machine alignments; The development of a cross-battery interlock system, using lasers to accurately line up pusher and coke machines, is under consideration.	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2015 2018 Implementation	Source affected: Spatial scale:	Industry including heat and power production Local	**ON-GOING:** The project to install cross-battery interlock system is ongoing. Technical difficulties due to movement of the batteries have

					Cost:	Operator information	resulted in the project being delayed. **Update** – Issues to due battery movement have prevented implementation to date, but it is anticipated that this can be fitted to each battery after each goes through a hot idle period.
					Indicator:	Not available	
					Target emissions reduction:	Not available	
Appleby Coke Ovens 04	Access to carry out door maintenance; There are issues with working at height on the battery bench level to manually plug leaks. Very constrained in meeting Health and Safety requirements as the design is a shallow	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2012 2018 Implementation	Source affected:	Industry including heat and power production	**COMPLETED** 4 new EZ bonding lines in place. These will allow for quicker access. An alternative option and design developed to implement on the Pusher side; a lanyard and running rail
					Spatial scale:	Local	
					Cost:	Not available	

	concrete foundation bench.				Indicator:	Not available	system. Trial successful full engineering design developed. **2017 Update** – EZ line installed of B4. New Heras fencing installed in floors on all batteries to enable safe access. This issue has now been resolved and will not be progressed further.
					Target emissions reduction:	Not available	
Appleby Coke Ovens 05	New Doors and Frames; Where damage to doors and frames is such that repairs cannot be effected in-situ then a programme of replacement is required. Develop a schedule for	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2015 Ongoing Implementation	Source affected:	Industry including heat and power production	**ON-GOING:** Included in the PAH / coke oven recovery capital expenditure plan. Subject to capital plan. **2017/2018**
					Spatial scale:	Local	

	door and frame replacement as required at Appleby, subject to the outcome of the capital expenditure plan.				Cost:	Unknown, Operator information	Recovery plan is ongoing and will continue through 2018.
					Indicator:	Not available	
					Target emissions reduction:	Not available	
Appleby Coke Ovens 06	New inspection hatch door seals; Inspection hatches are provided in the oven top to allow temperature and visual checks to be made. The hatch seals can become degraded owing to repeated movement and require replacement. A programme of replacements is ongoing,	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2013 2015 Complete	Source affected:	Industry including heat and power production	132 hatches fitted, all **COMPLETED**.
					Spatial scale:	Local	
					Cost:	Operator information	
					Indicator:	Not available	

	132 seals are to be replaced.			Target emissions reduction:	Not available	
Appleby Coke Ovens 07	Replacement spigot jointing compound; A seal is provided around the ascension pipe spigot to allow emission-free collection of coke oven gas from each oven.	Permit systems and economic instruments: IED permits	Start: 2013 Expected end: 2014 Status: Complete	Source affected:	Industry including heat and power production	**COMPLETED**: The replacement spigot compound is now being used. Although it is not as reliable as the previously used compound (in terms of deterioration), it is better quality and it is the best available on the market. No further options.
				Spatial scale:	Local	
				Cost:	Operator information	
				Indicator:	Not available	
				Target emissions reduction:	Not available	
Appleby Coke	Pullman valve replacements; A programme of valve replacements, to combat	Permit systems and economic	Start: 2009 Expected end: Ongoing	Source affected:	Industry including heat and	**ON-GOING:** **2017 Update:** Routine maintenance of the

Ovens 08	a design issue, is ongoing.	instruments: IED permits	Status:	Implementation		power production	Pullman valves is ongoing. This will continue as “Business as Usual”. There is no longer a significant issue related to these valves.
					Spatial scale:	Local	
					Cost:	Operation information	
					Indicator:	Not available	
					Target emissions reduction:	Not available	
Appleby Coke Ovens 09	Tie rod replacements; Periodical surveys are carried out to inspect tie rod integrity and a programme of replacement has commenced and is expected to continue until 2015	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2013 Ongoing Implementation	Source affected:	Industry including heat and power production	**ON-GOING:** 2017 Update: 47 tie rods have been replaced throughout the year as required, during routine maintenance. **2018 Plan:** Battery 1 tie rods will be replaced as required
					Spatial scale:	Local	
					Cost:	Operator Information	

				Indicator:	Not available	during the programmed hot idle period in late 2018/early 2019.
				Target emissions reduction:	Not available	
Appleby Coke Ovens 10	Repairs to battery refractories; A programme of silica welding and end flue repairs to seal oven wall cracks has begun and is expected to continue throughout the remaining operational lifetime of the coke oven plant	Permit systems and economic instruments: IED permits	Start: 2013 Expected end: 2024 Status: Implementation	Source affected:	Industry including heat and power production	**ON-GOING:** 2017 Update: Refractory has been replaced throughout the year as required, during routine maintenance. 4 end flues have been replaced on the pusher side, and 17 on the coke side. **2018 Plan:** Battery 1 end flues and silica welds will be replaced during the programmed hot idle period in late 2018/early 2019.
				Spatial scale:	Local	
				Cost:	Operator information.	
				Indicator:	Not available	
				Target emissions reduction:	Not available	

						Other BaU maintenance ongoing on the other batteries.
Appleby Coke Ovens 11	Replacement of battery refractories; Where repairs to battery refractories are ineffectual or not practically possible, and where the continued operation of the oven will cause excessive emissions, the oven in question is taken out of operation minimising pollution.	Permit systems and economic instruments: IED permits	Start: 2013 Expected end: 2024 Status: Implementation	Source affected:	Industry including heat and power production	**ON-GOING:** A significant Battery Recovery Programme was initiated during 2014 and subject to a capital plan proposal put forward. Mainly end wall and flue repairs. This continued through 2017, including hot idling of battery 3, and will continue into 2018, when battery 1 will be hot idled.
				Spatial scale:	Local	
				Cost:	Subject to Capital plan proposal	
				Indicator:	Not available	
				Target emissions reduction:	Not available	

Appleby Coke Ovens 12	Pressure stabilisation system; A linkage pipe has been placed on either side of the gas booster station, providing a pressure feedback loop.	Permit systems and economic instruments: IED permits	Start: 2012 Expected end: 2013 Status: Complete	Source affected:	Industry including heat and power production	**COMPLETED.**
				Spatial scale:	Local	
				Cost:	Operator information	
				Indicator:	Not available	
				Target emissions reduction:	Not available	
Appleby Coke Ovens 13	New Gas Holder to improve pressure control. Beneficial effects in reducing pressure fluctuations and hence emissions from the	Permit systems and economic instruments: IED permits	Start: 2015 Expected end: 2017 Status: Planning	Source affected:	Industry including heat and power production	**ON-GOING:** The new gas holder construction has been continuing through 2017. It is planned to continue throughout
				Spatial scale:	Local	

	batteries caused by high positive pressure.				Cost:	Operator Information	2018 and commission by 2019.
					Indicator:	Not available	
					Target emissions reduction:	Not available	
Appleby Coke Ovens 14	Underfiring Changeover Timings; Reversal of the heating cycle in the coke ovens at Appleby and Dawes Lane now timed not to coincide	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2013 2013 Complete	Source affected:	Industry including heat and power production	**COMPLETED.**
					Spatial scale:	Local	
					Cost:	Not available	
					Indicator:	Not available	

					Target emissions reduction:	Not available	
Appleby Coke Ovens 15	New benzole plant; The benzole plant will be replaced. This will minimise pressure increase at the batteries, and secondly, prevent naphthalene in burner flues and leading to cold spots on oven walls, and eventual refractory damage caused by inconsistent heating.	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2014 2017 Implementation	Source affected:	Industry including heat and power production	**ON-GOING:** **2017:** New benzole plant has been commissioned. **2018 plan:** Continue work to bring new benzole plant up to stable operation.
					Spatial scale:	Local	
					Cost:	Operator information	
					Indicator:	Not available	
					Target emissions reduction:	Not available	

Appleby Coke Ovens 16	Coke machine ‘inching’ facility; The facility to ‘inch’ the position of the machines will allow better alignment and less damage to the battery metalwork and fabric	Permit systems and economic instruments: IED permits	Start: 2015 Expected end: 2016 Status: Complete	Source affected:	Industry including heat and power production	**Update** – **Completed.** New operator panels fitted to all three pushing machines. Systems fitted to four of the six machines. Trial unsuccessful on pusher machines, implemented on all 3 guide machines in use.
				Spatial scale:	Local	
				Cost:	Operator information	
				Indicator:	Not available	
				Target emissions reduction:	Not available	
Appleby Coke Ovens 17	Automated leveller control; An automated leveller control system is currently being considered as part of a management of change exercise.	Permit systems and economic instruments: IED permits	Start: 2015 Expected end: 2018 Status: Planning	Source affected:	Industry including heat and power production	**2017 Plan** - See action Appleby Coke Ovens 03. This work will follow interlock system installation, which will be
				Spatial scale:	Local	

					Cost:	Not available	progressed over the coming years.
					Indicator:	Not available	
					Target emissions reduction:	Not available	
Appleby Coke Ovens 18	New venting lids; A new 'venting lid' has been developed to allow burn off of carbon deposits. The build-up of carbon deposits on the roof of the oven can also cause pressure issues within the oven by blocking the free passage of coke oven gas leading to door / tops leakage.	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2013 2013 Complete	Source affected:	Industry including heat and power production	**COMPLETED.**
					Spatial scale:	Local	
					Cost:	Operator information	
					Indicator:	Not available	

					Target emissions reduction:	Not available	
Appleby Coke Ovens 19	Primary cooler replacement; When primary coolers are not effective, the pressure of the by-products plant is increased and this is translated to the batteries and door / tops leakage.	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2013 2019 Implementation	Source affected:	Industry including heat and power production	**ON-GOING:** **2017 Update** – No 7 primary cooler replaced and commissioned. **2018 Plan**: It is planned to upgrade either No 2 or No 3 primary cooler during this period.
					Spatial scale:	Local	
					Cost:	Operator information	
					Indicator:	Not available	
					Target emissions reduction:	Not available	

Appleby Coke Ovens 20	Heating system checks; The original analysis of waste gas emissions from individual oven flues was completed. This was to provide information on the operation of each individual oven in terms of heating uniformity and emissions. No benefit from the trial and engaged an external company.	Permit systems and economic instruments: IED permits	Start: Expected end: Status:	2013 Ongoing Implementation	Source affected: Spatial scale: Cost: Indicator: Target emissions reduction:	Industry including heat and power production Local Not available Not available Not available	**COMPLETED**: External consultants have completed a heating survey since the initial trials. Additional resources put in place to carry out the recommendations of this survey. Reviewed 6 monthly. Extra resource allocated as part of new recovery plan. **2017 Update** – Extra resource within day team including engineering. Heating is part of daily management and meeting reviews held. This is now business as usual, rather than an improvement.

Dawes Lane Coke Ovens 01	Closure of Dawes Lane Coke Ovens	Permit systems and economic instruments: other	Start:	2016	Source affected:	Industry including heat and power production	**Dawes Lane Coke Ovens closed 8 March 2016**
			Expected end:	2016			
			Status:	Complete			
					Spatial scale:	Local	
					Cost:		
					Indicator:		
					Target emissions reduction:		