Determination of a Variation Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2016

Consultation on our decision document recording our decision-making process

The Permit Number is:	EPR/RP3206BE
The Application number is:	EPR/RP3206BE/V004
The Applicant / Operator* is:	British Steel Limited
The Installation is located at:	Scunthorpe Integrated Iron & Steelworks

* Note: We have referred to the applicant as the operator throughout this document

Consultation commences on: 04/08/2022

Consultation ends on: 02/09/2022

Note: We are only consulting on our decisions regarding the derogations from the Best Available Techniques Conclusions (BAT C) for the Iron and Steel sector which are set out in section 5 of this document.

What this document is about

We have received an application to vary the conditions of the permit. The operator is proposing a large number of changes to the permit, including requests for derogations from the requirements of the BAT Conclusions for the Iron and Steel sector published in March 2012. The proposed changes are summarised below:

Sinter Plant Derogation

Derogation against BAT 20 - BAT- associated emission limit (BAT AEL) for dust 40 mg/Nm^3 for the advanced electrostatic precipitator as a daily mean value:

- An interim position (until 30/09/2024) emission limit for dust of 100 mg/m^3 (with advanced electrostatic precipitator) as a daily mean value.

Coke Plant Derogation

BAT 48 - to reduce the sulphur content of the coke oven gas (COG) by using one of the identified techniques (BAT AEL 1000mg/Nm^3):

- Derogation until 1st January 2027 ELV of 5000 mg/m^3 for hydrogen sulphide (H_2S)

BAT 49 IV - reduce the emissions from coke oven under-firing only for oxides of sulphur (BAT AEL 500 mg/Nm^3) and particulate matter (dust) (BAT AEL < 1 – 20 mg/Nm^3):

- Derogation until 1st January 2027 ELV of 5000 mg/m^3 for sulphur oxides (SO_x) expressed as sulphur dioxide (SO_2)
- Derogation until 1st January 2027 ELV of 200 mg/m^3 for dust emissions arising from underfiring

BAT 50 - reduce dust emissions from coke pushing by using one of the identified techniques (BAT AEL <10 mg/Nm^3):

- Derogation until 1st January 2027. No ELV set, controlled via pushing factor dust from coke pushing

BAT 51 - to reduce dust emissions in coke quenching by using one of the identified techniques (BAT AEL < 25g/t):

- Derogation until 1st January 2027. No ELV set for coke emissions, controlled by wet quenching

Permit amendments as a result of the operator's application

- Amended 2.1.2 – to reference only waste activities
- Amended 2.2.1 – to reference revised site boundary
- Amended 3.1.1 – to reference new emission table S3.9 due to consolidation
- Amended 3.1.3 and 3.1.4 – to remove reference to Schedules 3(a), 3(b) and 3(c) and amend table references
- Amended 3.5.1 – to remove reference to Schedules 3(a), 3(b) and 3(c) and add table S3.9

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- Amended 3.5.4 – to reference table S3.9 due to consolidation
- Amended 3.6.7 – to remove reference to Schedules 3(a), 3(b) and 3(c)
- Amended 3.7.1 – to add date for annual submission of report
- Amended 4.2.5 – to reference only waste activities
- Amended Table S1.1 as follows:
    - AR1 – amend reference to fuels used
    - AR2 – add tunnel furnace
    - AR3 – include a date for closure of the coke ovens
    - AR4 – reference waste tables
    - AR5 – update the limits to reference steel scrap and reference waste tables
    - AR8 – reference waste tables
    - AR9 – reference waste tables
    - AR10 – delete AR10 as DLCO is demolished and renumber subsequent activities
    - AR11 – add description, allow leachate treatment and reference wastes tables
    - AR12 – add description, allow leachate treatment and reference wastes tables
    - AR13 – reference waste tables
    - AR15 – add activity for the storage of hazardous waste under section 5.6 A(1)(a)
    - AR16 – consolidate S5.4 A(1) (a) (ii) into the permit
    - AR17 – consolidate S5.4 A(1) b) (iii) into permit
    - AR18 – consolidate S3.5 B (a) into the permit
    - AR24 – add new directly associated activities (DAA) for cutting and surface rectification
    - AR28 – add new DAA for the reception of non-hazardous waste
    - AR29 – add new DAA for the storage of street sweeping waste.
- Amended Table S1.2 to:
    - Reference the most up to date operating techniques documents, application documents, requests for information and remove out of date aspects
    - Reference documents for completed Improvement conditions IC4, IC5, IC6, IC7 and IC9
    - Reference the revised data handling procedure
    - Reference the operating techniques for the new saturator
    - Reference stack height change for emissions point A58 from 45.7m to 36m
    - Reference addition of a 50m tall new stack for new emission point A307
    - Reference the scrap acceptance procedures
    - Reference raw materials and wastes spreadsheet

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- Amended Table S1.3 to:
    - Mark IC2 and IC3 as withdrawn due to derogation
    - Mark reference IC4, IC6 and IC7 as completed
    - Add IC10a, IC10b, IC11a, IC11b, IC12a, IC12b, IC12c, IC13, IC14, , IC16, IC17
- Amended Raw materials Table S2.1 to include only restrictions which affect environmental impact and performance
- Amended waste tables to:
    - Add and split up waste tables to clearly specify the waste types under each activity
    - Update Hazard codes and site tonnages
    - Remove EWC codes 10 03 27*, 10 03 28 and 19 12 07
    - Add EWC waste codes 19 07 03, 19 08 12 to allow landfill leachate to be treated via Activity AR11 and AR12 (biological effluent treatment plant)
- Amended Table S3.0 to:
    - Remove emission points A129, A130, A131 – Heavy Plate Mill
    - Add emission points A139 - consolidation Yarborough permit
    - Remove A301, A304, A306, A308, A309, A310, A311, A312, A313, A315 and A316 as
    - Dawes Lane coke ovens not operational
    - Add 307A for Appleby Coke Oven Gas Flare new stack
- Removed Schedule 3(a) and Schedule 3(b) from the permit as the condition dates have expired
- Amended Table S3.1 to:
    - Amend emission limit value for A1 to apply daily mean limit of 100 mg/Nm3 for particulates in line with Sinter plant derogation
    - Add note for A1 shutdown periods
- Amended Table S3.2 to:
    - Amend ACO coke oven battery 1-4 DLCF, TLCF, PEF and MEF limits, monitoring frequency and monitoring standards based on IC4 completion
    - Amend ACO coke oven battery 1-4 to change ‘Mass Emission Factors’ (MEFs) to ‘Visible Emissions from Charging’ as referred to in BAT 44
    - Add limit for Door Leakage Control Factors (All batteries)
    - Add Top Leakage Control Factors (All batteries)
    - Amend the limit for coke pushing in line with the coke oven derogation (all batteries)
    - Amend A302 and A303:
        - Obscuration monitoring wording
        - Add emission limit for particulate emissions from under firing in line with derogation

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        - Amend emission limit for sulphur oxides in line with derogation
        - Amend NO_x monitoring and reference period due to IC6 completion
    - Remove reference to Dawes Lane coke ovens DLCO 1-3
    - Remove A301, A304, A305, A306, 307, A308, A315 and A316
    - Amend particulate matter limit for A324 and A325 in line with derogation
    - Revise table notes
    - Add point A307A flare stack to replace A307 once constructed
- Amended Table S3.4 to:
    - Amend air emission points A54, A55, A56 to remove emission limit values
    - Amend monitoring frequency and methodology for air emission point A78
- Added new Table S3.7 and emission point reference A139 due to permit consolidation
- Amended existing Table S3.7 reference to Table S3.8
- Amended existing Table S3.8 reference to Table S3.9
- Amended Table S3.9 to:
    - Remove Total organic carbon (TOC) limits and monitoring and amend monitoring frequency for biological oxygen demand for 5 days (BOD5) at water discharge points W1, W2, W3, W4, W6, W7 and W9
    - Amend pH reference period to daily mean for W1, W3, W4, W6, W7, W9 and W10
    - Amend Chlorine reference period and monitoring frequency for W3, W4, W6
    - Remove emission limits from W5, W8
    - Amend heavy metal monitoring frequency at W7
    - Remove phenol monitoring at W9
- Amended Reporting Table S4.1 to:
    - Amend particulates A3 and A9 reporting to annual
    - Separate reporting of dioxins and PAHs into separate rows for A1, A302 and A303 as have different monitoring frequencies
    - Remove reference to DLCO 1-3
    - Remove reference to A301, A308, A315 and A316
    - Remove reference to A201/3
    - Remove W5 and W8
    - Add A139
- Amended Table S4.2 to add scrap metal melted, dewatered sludge and filter cake tonnages

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- Amended Table S4.3 to:
    - Add energy usage and process down time for Activity AR16 due to consolidation
    - Amend A302 and A303 parameters
- Amended Table S4.4 to update, add and remove forms:
    - Replace air emissions reporting form air 1 to 30 with Emissions to Air form
    - Replace forms water 1-6 with Emissions to water form
    - Remove TNP form as obsolete
    - Remove form IED CON2 as no gas turbines
    - Added form IED CON1 for LCP boilers
    - Amend waste return form to E-waste returns
    - Replace performance reporting forms due to consolidation
    - Replace energy form due to consolidation
- Updated site plan at Schedule 7 showing biological effluent treatment plant boundary and revised permit boundary plan due to consolidation.
- Amended Annex to conditions – Derogation under Industrial Emissions Directive to reference latest derogations.

Permit consolidation

This variation also consolidates the changes to this permit, EPR/RP3206BE, and consolidates the following into one permit:

- EPR/VP3103MJ (waste oxide briquetting, slab yard operations, slag de-metalling/screening and oversized ferrous scrap processing)
- Permit EPR/VP3007SH (Blast Furnace Dewatering Facility)

All conditions and tables have been amended as required to consolidate the requirements of the above permits.

Environment Agency initiated variations

- Amended 2.3.6 to reference revised schedule 2 waste tables
- Amended 4.2.2 (c) to reference table S4.4 reporting forms
- Deleted 4.2.2 (d) due to change in referencing process monitoring
- Amended 4.2.3 (b) to reference table S4.4 reporting forms
- Amended 4.2.7 to reference table S4.4 reporting forms
- Amended 4.3.2 to latest notification requirement
- Amended Table S1.1 to:
    - Amend AR19 - AR22, AR25 - A27 to clarify wording
    - Add AR23 DAA for treatment of abstracted water
- Amended Table S1.3 to:
    - Amend IC8 completion date to reference variation number
    - Add improvement conditions 15a, 15b, 15c,15d

- Amended Waste tables in schedule 2 to remove EWC codes as they are onsite wastes
    - 05 01 05*
    - 05 01 06*
    - 10 02 07*
    - 10 02 08
    - 10 02 13*
    - 10 02 14
    - 10 02 15
    - 10 02 99
    - 13 05 01
    - 13 05 03
    - 13 05 07*
    - 13 05 01*
    - 13 05 03*
    - 19 02 03
    - 19 02 05*
- Amended Tables S1.4, S3.0, S3.6, S3.8 and S4.1 to remove CPS boiler 3 as it is decommissioned
- Amended Table S3.0 to:
    - Add A24 - Gas Holders (Blast Furnace)
    - Add A62 - Gas Holder (BOS)
- Amended Table S3.1 to:
    - Amend A1 Dioxins limit and increase monitoring frequency to quarterly due to derogation and add reference to improvement condition IC13
- Amended Table S3.2 to:
    - Split ACO coke ovens into single batteries
    - Amend monitoring method and include reference to IC19 in table S3.2 (coke ovens) for all batteries
    - Amend monitoring requirements and limit for obscuration for A302 and A303 so current limit applies until IC12a, IC12b and IC12c are completed
    - Amend A302 and A303 to Add monitoring for PAH and Dioxins due to derogations
- Amended Table S3.3 to:
    - Add reference to IC1 for monitoring frequency for A18, A19
- Amended Table 3.9 to:
    - Add reference to IC15c for Ammoniacal Nitrogen limit at W1
    - Amend monitoring frequency for cyanide limit subject to IC16 for W9

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- Added Table S3.10 process monitoring to include obscuration monitoring once IC12a, 12b and 12c have been completed and add process monitoring which was incorrectly included in table S4.4
- Amended Table S4.1 to:
    - Amend dioxin reporting to include coke ovens
    - Include different rows for reporting of dioxins and PAH monitoring as they have different monitoring frequencies.
    - Reference the requirements for reporting process monitoring
- Merged Table S4.4 with Table S4.3 to correct performance monitoring and re-named as Table S4.3 and:
    - Remove hydrogen sulphide process monitoring as obsolete
    - Remove process monitoring
    - Removed process monitoring and included it in Table S3.10
    - Add separate rows for flare and pressure relief mass emissions from A305
- Amend Table S4.5 to table S4.4 due to reporting table renumbering
    - Reference new air, water, process monitoring, water usage. Energy usage and performance indicator forms
    - Add Form IED AR1 for reporting mass emisisons and energy for LCPs

Proposed variations not accepted

The operator proposed the following changes to the permit, but these have not been accepted. Further information is provided in section 4 of this document.

- Insert condition 3.5.5 regarding continuous emission monitors installation and calibration
- Amend condition 4.2.2 (Annual Performance Review)
- Reduction in dioxin monitoring at emission point A1 (Sinter Plant) from quarterly to six-monthly
- Amend W1 ammoniacal nitrogen compliance limit from a limit of 3.5 mg/l to a limit based on the 95th percentile over a 6 month assessment period
- Remove requirement to monitor cyanide from emission point W9
- Change monitoring of chlorine from continuous to monthly random sample at emission points W3, W4 and W6.

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Proposed variations now withdrawn

The operator also proposed the following changes to the permit, but these were withdrawn on 01/12/2021:

- New activity under Section 2.1 A(2)(c) – zinc coating process
- Derogation from the BAT AELs for liquid effluent from the biological treatment plant.

This is a draft decision document, which accompanies a draft variation.

It explains how we have considered the operator's application, and why we have included the specific conditions in the draft varied permit we are proposing to issue to the operator. It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position. Unless the document explains otherwise, we have accepted the operator's proposals.

The document is in draft at this stage, because we have yet to make a final decision. Because the operator has requested a relaxation of certain otherwise mandatory standards, before we make this decision the IED requires us to explain our thinking to the public and other interested parties, to give them a chance to understand that thinking and, if they wish, to make relevant representations to us. We have provided our explanation in section 5 of this document and **only this section is subject to consultation** with the public.

We will make our final decision only after carefully taking into account any relevant matters raised in the responses we receive. Our mind remains open at this stage: although we believe we have covered all the relevant issues and reached a reasonable conclusion, our ultimate decision could yet be affected by any information that is relevant to the issues we have to consider. However, unless we receive information that leads us to alter the conditions in the draft consolidated variation notice, or to reject the requested derogations altogether, we will issue the notice in its current form with an explanation of how we have addressed consultation responses.

In this document we frequently say "we have decided". That gives the impression that our mind is already made up; but as we have explained above, we have not yet done so. The language we use enables this document to become the final decision document in due course with no more re-drafting than is absolutely necessary.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future.

How this document is structured

Glossary of terms

1. Our proposed decision
2. How we reached our draft decision
3. The legal framework
4. Decision considerations
5. Assessment of Derogation Requests
6. Consultation responses

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Glossary of terms

ACO	Appleby Coke Ovens
ADMS	Air Dispersion Modelling Software
AQMA	Air Quality Management Area
AQMP	Air Quality Management Plan
AQS	Air Quality Strategy
AURN	Automatic Urban and Rural Network
BAT	Best Available Technique(s)
BAT AEL	BAT Associated Emission Level
BAT C	BAT Conclusions for Iron and Steel Industry
B[a]P	Benzo alpha pyrene
BAU	Business as Usual
BCRA	British Carbonisation Research Association
BREF	Best Available Techniques (BAT) Reference Documents for Iron and Steel Industry
BOS	Basic Oxygen Steelmaking
CBA	Cost Benefit Analysis
CEM	Continuous Emissions Monitor
CIRIA	Construction Industry Research and Information Association
CM	Coke Making
COG	Coke Oven Gas
CoMAH	Control of Major Accident Hazards
CPS	Central Power Station
DAA	Directly Associated Activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DD	Decision Document

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Defra	Department for the Environment, Food and Rural Affairs
DLCF	Door Leakage Control Factor
DLCO	Dawes Lane Coke Ovens
EA	Environment Agency
EAL	Environmental Assessment Level
ELV	Emission Limit Value
EPR	Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No. 1154) as amended
ES	Environmental Standard
ESP	Electrostatic Precipitator
EWC	European Waste Catalogue
FEED	Front-end Engineering and Design
GHG	Greenhouse Gas(es)
H_2S	Hydrogen Sulphide
HW	Hazardous Waste
IC	Improvement Condition
IED	Industrial Emissions Directive (2010/75/EU)
LCP	Large Combustion Plant
LNR	Local Nature Reserve
LoD	Limit of Detection
MCERTS	Monitoring Certification Scheme
MEF	Mass Emission Factor
MEG	Mixed Enhanced Gas
NO_2	Nitrogen Dioxide
NO	Nitrogen Monoxide
NOx	Oxides of Nitrogen (NO plus NO_2 expressed as NO_2)

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NPV	Net Present Value
PAH	Polycyclic Aromatic Hydrocarbons
PC	Process Contribution
PCB	Polychlorinated Biphenyls
PCDD/F	Polychlorinated Dibenzodioxins/Furans
PEC	Predicted Environmental Concentration
PEF	Pushing Emissions Factor
PHE	Public Health England, now UK Health Security Agency
PM	Particulate Matter
PR	Public Register
RFI	Request for information
RGN	Regulatory Guidance Note
SAC	Special Area of Conservation
SO_2	Sulphur Dioxide
SOx	Sulphur Oxides
SP	Sinter Plant
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TCM	Technically Competent Manager/Management
TLCF	Top Leakage Control Factor
TOC	Total Organic Carbon
UKHSA	United Kingdom Health Security Agency
WACC	Weighted Average Cost of Capital
WAMITAB	Waste Management Industry Training Advisory Board

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1. Our proposed decision

We are minded to issue the variation notice to the operator. This will allow them to continue to operate the installation, subject to the conditions in the consolidated variation notice that updates the whole permit.

As part of our draft decision we have decided to grant the operator's requests for the following derogations from the requirements of the BAT Conclusions for the Iron and Steel sector:

Sinter Plant Derogation

BAT 20 - BAT-associated emission level value (AEL) for dust 40 mg/Nm^3 for the advanced electrostatic precipitator as a daily mean value: Derogated emission limit for dust of 100 mg/Nm^3 at emission point A1 (with advanced electrostatic precipitator) as a daily mean value until 30/09/2024.

Appleby Coke Oven Derogations

Emission points A302 ACO 1&2 Battery Stack and A303 ACO 3&4 Battery stack

BAT 48 - to reduce the sulphur content of the coke oven gas (COG) by using one of the identified techniques (BAT AEL 1000mg/Nm^3): Derogated emission limit of 5000 mg/Nm^3 for hydrogen sulphide (H_2S) until 31/12/2026

BAT 49 IV - reduce the emissions from coke oven under-firing only for:

- oxides of sulphur (BAT AEL 500 mg/Nm^3): Derogated emission limit of 5000 mg/Nm^3 for sulphur oxides (SO_x) expressed as sulphur dioxide (SO_2) until 31/12/2026.

- particulate matter (dust) (BAT AEL < 1 – 20 mg/Nm^3): Derogated emission limit of 200 mg/Nm^3 for particulate matter (dust) until 31/12/2026.

Coke Oven Battery ACO 1-2 and Coke Oven Battery ACO 3-4

BAT 50 - reduce particulate matter (dust) emissions from coke pushing by using one of the identified techniques (BAT AEL <10 mg/Nm^3): Derogation until 31/1/2026 and no limit set, as controlled via pushing factor dust from coke pushing.

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Emission point A325 - Appleby Coke Quenching Towers for Battery 3-4

BAT 51 - to reduce dust emissions in coke quenching by using one of the identified techniques (BAT AEL < 25g/t): Derogation until 31/12/2026 and no limit set for particulate matter (dust) coke emissions as controlled by wet quenching.

The way we assessed the operator's requests for derogations and how we subsequently arrived at our conclusion is recorded in section 5 of this document.

In addition to the requests for derogations, the operator applied to make a number of changes to the permit. The way we have assessed the proposed changes and how or whether we have decided to agree to the proposed changes is recorded in section 4 of this document. As well as the changes proposed by the operator, we have also made changes to the permit and the explanation for these changes is also recorded in section 4 of this document. We are not seeking comments on these changes to the permit.

We consider that, in reaching our draft decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The draft consolidated variation notice contains many conditions taken from our standard environmental permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the notice, we have considered the techniques identified by the operator for the operation of their installation and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of "tailor-made" or installation-specific conditions, or where our permit template provides two or more options.

2. How we reached our draft decision

2.1 Receipt of application

The application was duly made on 28/05/2021. This means we considered it was in the correct form and contained sufficient information for us to begin our determination, but not that it necessarily contained all the information we would need to complete that determination.

We carried out consultation on the application in accordance with the EPR and our statutory Public Participation Statement. We consider that this process satisfies, and frequently goes beyond the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in

Environmental Matters, which are directly incorporated into the IED, which applies to the installation and the application. We have also taken into account our obligations under the Local Democracy, Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements.

We advertised the application by a notice placed on our website, which contained all the information required by the IED, including telling people where and when they could see a copy of the application. We advertised the amendment to the timescale for the Sinter Plant derogation in the same way.

We also consulted with a number of external bodies including those with whom we have "Working Together Agreements". These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly. Note under our Working Together Agreement with Natural England, we only inform Natural England of the results of our assessment of the impact of the installation on designated Habitats sites.

Details of the bodies consulted are shown in section 4.3 below and their responses to the consultation on the application are shown in section 6.1 of this document.

2.2 Requests for Further Information

Although we were able to consider the application duly made, we did in fact need more information in order to determine it and issued information notices and requests for information (RFI) as shown in table 1 below. A copy of each information notice and request was placed on our public register together with the responses on receipt.

Table 1 Request and response dates for information notices and requests

Request date	Response date	Summary of information
05/11/2021 24/11/2021	18/10/2021 05/11/2021 25/11/2021 16/12/2021 14/04/2022	Additional information to support the Sinter Plant derogation request
30/11/2021 02/12/2021	25/11/2021 30/11/2021 02/12/2021	Additional information to support the Appleby coke ovens derogations requests

Table 1 Request and response dates for information notices and requests		
Request date	**Response date**	**Summary of information**
	15/12/2021 06/01/2022	
Schedule 5 Notice No 1 01/09/2021	12/11/2021 19/11/2021 01/12/2021 03/12/2021	• Further information regarding the hazardous waste storage activity • Further details of the cutting DAA • Information regarding specific waste types • Confirmation of stack height for A61 and details of the capacity to divert emissions from A58 to this stack • Justification for the proposed derogated ELV for coke oven under-firing • Grid references for emission points to water • Monitoring data for emission points to water and confirmation of spot sampling • Withdrawal of the derogation for the Biological Effluent Treatment plant • Withdrawal of the proposed new coating activity (Zinoco)
Schedule 5 Notice No 2 09/12/2021	15/12/2021 14/01/2022	• Further details of scrap metal processing • Revised list of raw materials • Separate waste tables for each activity and details of wastes accepted from off-site and those generated on-site and used • Risk assessment for hazardous waste storage activity • Updated operating techniques table for consolidated permits. • Confirmation of no solvents. • Thermal input of reheat furnace • Confirmation of which boilers are operational • Details of leachate to be accepted and procedures • Amended site plan • Details of treatment of abstracted water

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Table 1 Request and response dates for information notices and requests		
Request date	**Response date**	**Summary of information**
		• Justification for a modelling of different stack heights for A58 • Modelling impacts of emissions to air from the Sinter Plant and Appleby coke ovens at the Humber Estuary SAC/Ramsar • Details of drainage of oily mill scale storage area • Monitoring data for discharge point W5
Request for information 06/01/2022	24/01/2022	Modelling acid deposition impacts on Risby Warren SSSI from emissions from the Appleby coke ovens
Request for information 27/01/2022	11/02/2022	• Updated description of No4 saturator • Information relating to wastes and hazard codes • Revised site plan also showing T1 emission point • Scrap yard area surfacing • Further justification for removal of phenol and cyanide monitoring from emission point W9
Request for information 23/02/2022	24/02/2022 11/03/2022	• Withdrawal of plastic wastes for use in the blast furnace • Confirmation of off-loading of street sweeping wastes • Methodology for scrap separation • Details of bunding for No4 saturator

Having carefully considered the application and all other relevant information, we are now putting our draft decision regarding the derogations before the public and other interested parties in the form of a draft variation, together with this explanatory document. As a result of this stage in the process, the public has been provided with all the information that is relevant to our determination, including the original application and additional information obtained subsequently, and we have given the public two separate opportunities (including this one) to comment on the application and its determination and three opportunities in relation to the Sinter Plant derogation. Once again, we will consider all relevant representations we

receive in response to this final consultation on the derogations and will amend this explanatory document as appropriate to explain how we have done this, when we publish our final decision.

A summary of the consultation responses and how we have taken into account all relevant representations are shown in section 6 of this document.

3. The legal framework

The consolidated variation notice will be issued, if appropriate, under Regulations 18 and 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, if we issue the consolidated variation notice, it will ensure that the operation of the installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

4. Decision considerations

4.1 Confidential information

A claim for commercial or industrial confidentiality has been made.

We have accepted the claim for confidentiality.

We have excluded from the Public Register (PR) a section of the “Supporting Document RP3206BE_3 Sinter Plant Derogation” together with the spreadsheet “BETA_Scunthorpe Sinter Plant”, a section and table from document “Justification of derogation from achieving the BAT-AELs for emissions to air from sintering at British Steel, Scunthorpe”, dated 13 April 2022 and “Sinter Plant CBA– April 2022” as these contain details of costs and materials that could be used to calculate operating costs.

We consider that the inclusion of the relevant information on the PR would prejudice the operator’s interests to an unreasonable degree.

The decision was taken in accordance with our guidance on confidentiality.

4.2 Identifying confidential information

We have not identified any other information provided as part of the application that we consider to be confidential.

The decision was taken in accordance with our guidance on confidentiality.

4.3 Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- Food Standards Agency
- North Lincolnshire Council – Planning
- North Lincolnshire Council – Environmental Health
- North Lincolnshire Council – Director of Public Health
- Fisheries and Aquaculture Sciences
- Inshore Fisheries and Conservation
- National Grid
- Health and Safety Executive
- Marine Management Organisation
- Severn Trent Water
- Anglian Water
- UK Health Security Agency (formerly Public Health England)
- Harbour and Port Authorities

The comments on the application and our responses are summarised in section 6.1 of this document.

The operator submitted a revised assessment in relation to the derogation for particulate emissions from the Sinter Plant on 14/04/2022 which required re-consultation. As the amendment to the application related to emissions to air, we consulted only those organisations for which impact of emissions to air were relevant. Therefore, we consulted the following organisations:

- Food Standards Agency
- North Lincolnshire Council – Environmental Health
- North Lincolnshire Council – Director of Public Health
- Health and Safety Executive
- UK Health Security Agency (formerly Public Health England)

The comments on the application and our responses are summarised in section 6.2 of this document.

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4.4 The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 ‘Understanding the meaning of regulated facility’, Appendix 1 of RGN 2 ‘Interpretation of Schedule 1’ and Appendix 2 of RGN2 ‘Defining the scope of the installation’.

The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.

The operator proposed the following new activities and changes to existing activities in the permit:

- Hazardous waste storage S5.6 A(1)(a)
- DAA for cutting and rectification of scrap metal
- DAA for the acceptance of non-hazardous waste
- Addition of landfill leachate for treatment in the effluent treatment plant for both biological and physico-chemical treatment and amendment to the activity reference for physico-chemical treatment activity
- Addition of steel scrap to the iron and steel making activity
- Addition of the thermal input and details of the reheat furnaces
- DAA (AR30) for the receipt and temporary storage of street sweeping residues collected both within the permit boundary and in the local area prior to removal

We have assessed the supporting information provided with the application and the responses to our requests for information and are satisfied that these activities can be carried out without risk to the environment and human health. We have amended table S1.1 to include these new activities and the changes to existing activities.

We have included the permitted activities from permits EPR/VP3103MJ and EPR/VP3007SH, which are being consolidated with permit EPR/RP3206BE, in table S1.1.

The amended table S1.1 in the varied and consolidated permit specifies the activities that can be carried out under this permit. These activities together with the activities specified in the permits held by the operator for Yarborough Quarry landfill, Crosby North landfill, and the permits held by Liberty Merchant Bar plc and East Coast Slag Products Limited relating to this site, comprise the installation.

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4.5 The site

The operator has provided plans which we consider to be satisfactory.

These show the extent of the site of the facility.

The plan is included in the permit.

This permit applies to part of the installation and the activities are specified in table S1.1 of the permit and include the activities in permits EPR/VP3103MJ and EPR/VP3007SH which have been consolidated into this permit. The names and permit numbers of the operators of other parts of the installation are detailed in the permit's introductory note.

4.6 Site condition report

We reviewed the site reports for this permit and the reports for the two permits being consolidated. We consider that the existing site report for permit EPR/RP3206BE includes the areas of the two permits being consolidated with it.

Therefore, we have not required any further information in respect of the condition of the land in relation to this variation.

4.7 Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have consulted Natural England on our Habitats Regulation and SSSI assessments and taken their comments into account in the permitting decision.

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4.8 Environmental risk

We have reviewed the operator's assessment of the environmental risk from the facility, as follows:

Sinter plant derogation

The operator provided an air emissions risk assessment to support their request for derogation from the BAT AEL for particulate matter. This is discussed in section 5.3 below.

Coke oven derogation

The operator provided an air emissions risk assessment to support their request for derogations from the BAT AELs for particulate matter and sulphur dioxide. This is discussed in section 5.4 below.

BOS Plant Stack A58 – Assessment of stack height reduction.

The operator applied to amend the height of the West Vent stack for the BOS plant from 45.7m to 36m. For safety reasons the stack was reduced in height to 27m as the base could not safely support the original stack height. The operator provided an air emissions risk assessment that compared the impact of emissions of particulate matter at the original height (45.7m), the reduced height (27m) and the proposed height (36m).

We reviewed the modelling in this risk assessment and carried out our own sensitivity check modelling including the use of a different meteorological dataset and additional sensitive receptors in Scunthorpe town. We are satisfied that the model inputs represent a worst case as the operator modelled continuous operation of the stack when it is only expected to operate for up to 30 days per year.

Although we agreed with the operator's conclusion that the increase in emissions of particulate matter at a stack height of 36m compared with the original height of 45.7m would not be significant, we considered that the operator had not justified why the height of 36m was chosen. Therefore, we asked the operator in our schedule 5 notice dated 09/12/2021 to provide a revised risk assessment showing the emissions of particulate matter at different heights up to the original height of the stack together with the estimated costs of re-building the stack to its original height and for replacing the stack.

The operator submitted a revised risk assessment on 14/01/2022 that included the predicted process contributions of emissions of particulate matter for each 1m increase in height between the proposed 36m stack height and the original height of 45.7m. In addition, the operator provided estimated costs for the replacement of the stack and for increasing the height of the stack back to 45.7m.

The results of the modelling at the most impacted relevant receptor are shown in the table below:

Modelling results for Scunthorpe 6 (most impacted sensitive receptor)											
Height (m)	36	37	38	39	40	41	42	43	44	45	45.7
PC µg/m^3	0.301	0.296	0.290	0.285	0.281	0.276	0.271	0.261	0.256	0.252	0.251
PC/ES %	0.602	0.592	0.58	0.57	0.562	0.552	0.542	0.522	0.512	0.504	0.502
ES = 50 µg/m^3 annual average for PM10.											

The results show that the PCs are insignificant at all heights as they are all less than 1% of the environmental standard. The difference in the impact between the proposed height of 36m and the original height of 45.7m is also extremely small and, based on the costs provided by the operator as part of their response, the cost of extending the height of the stack or replacing it completely would be significant compared with the reduction in impact that the increase in height would achieve. In addition, the actual PCs would be much lower than those modelled and presented above as emissions are not continuous and will not always be at the emission limit. The PCs modelled are based on continuous emissions of particulate matter from the stack at the emission limit.

Therefore, we are satisfied that the proposed reduction in stack height to 36m, the maximum proposed by the operator on safety grounds, will not result in an increase in pollution from this stack.

<u>New activity – storage of hazardous waste under S5.6 A(1)</u>

We did not consider that the operator had adequately assessed the risks from the proposed new activity of storage of hazardous waste comprising heavy iron rich sludge. Therefore, we asked for more information in our notice dated 09/12/2021 which the operator provided in their response dated 14/01/2022.

We are satisfied that due to the nature of the waste to be accepted and the measures the operator has in place such as the characterisation of the waste, that the overall risk of emissions to air will be low. Although we have accepted the operator's arrangements for containment and drainage arrangements, we are not completely satisfied that these measure for the storage of these hazardous materials will prevent pollution – see Hazardous waste containment section below.

<u>New activity – storage and treatment of metal scrap</u>

We did not consider that the operator had adequately explained the measures in place to ensure the storage of scrap metal would not result in pollution of the environment due to contaminated run-off as the whole storage area does not

benefit from an impermeable pavement with sealed drainage system. Therefore, we asked the operator to demonstrate that the measures in place were compliant with the requirements of BAT 7 of the BAT C.

The operator confirmed that they provide suppliers with a specification for the scrap they will accept, which includes that the metal should be free from dirt and oils, and that there are appropriate waste acceptance procedures in place to assess the scrap when it is received at the site. Therefore, as the scrap metal is not contaminated with oils, it meets the requirements of BAT 7 in that where an impermeable surface with sealed drainage is not provided appropriate waste acceptance measures are in place to ensure only clean uncontaminated scrap metal is stored on these areas.

Hazardous waste containment

Although we consider the operator's risk assessments are satisfactory as stated above, we are not completely satisfied that the operator has demonstrated that containment and drainage arrangements for areas where hazardous wastes are stored are in accordance with BAT and the CIRIA guidance. Therefore, we have included IC15 in the permit requiring the operator to review all containment and drainage in areas where hazardous wastes are stored against the requirements of BAT and the CIRIA guidance. IC15 also proposes measures, with timescales for implementation, where improvements are required to meet the standards.

4.9 Operating techniques

4.9.1 General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.

We have updated table S1.2 in the varied and consolidated permit which specifies the operating techniques as follows:

- We have included an operating technique reference for the new saturator.
- We have removed reference to the requirement for a WAMITAB certified technically competent manager in relation to the millscale handling and treatment activity.
- We have added references to the documents submitted in response to the requirements of improvement conditions IC4, IC5, IC6, IC7 and IC9.
- We have added reference to the new data handling methodology.
- We have added the operating techniques for the new activities proposed under this variation and in response to our requests for information.
- We have added the operating techniques from the two permits that are being consolidated with this permit.

- We have added the documents referencing the stack height change at point A58 and the replacement stack (A307A) for flare A307.
- We have added reference for the raw materials and wastes spreadsheet.

4.9.2 Air Quality Management Plan

The current permit includes a condition that requires the operator to submit an Air Quality Management Plan (AQMP) for approval and specifies that it should include measures to address both point source and diffuse emissions of particulates and PAHs including proposals for reducing emissions. In addition, the condition requires an updated report to be submitted annually. The operator has proposed amended wording to the first part of the condition to specify the annual date by which the report shall be submitted to reflect the ongoing submissions. We have agreed to this change and the operator must submit an AQMP in accordance with the requirements of the condition by 30th June each year.

4.10 National Air Pollution Control Programme

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting emission limit values in line with technical guidance we are minimising emissions to air, except where we have allowed derogations (see section 5). This will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

4.11 Updating permit conditions during consolidation

We have updated permit conditions to those in the current generic permit template as part of permit consolidation for permit EPR/RP3206BE being varied and for the two other permits being consolidated. The conditions will provide the same level of protection as those in the previous permits.

4.12 Changes to the permit conditions due to an Environment Agency initiated variation

We have varied the permit as stated in the variation notice and as follows:

Notifications

We have amended condition 4.3.2 to the most up to date template condition which requires the operator to notify us in the event of a breach of a permit condition using the form in schedule 5 of the permit in addition to when there is a breach of an emission limit.

Permitted wastes

We have amended the waste tables in schedule 2 by splitting the existing waste tables into new tables so that each activity listed in table S1.1 that accepts wastes from off-site has a related waste table. We have added the reference to the applicable waste table for each activity in table S1.1. We have included reference to all the waste tables in condition 2.3.6 which relates to the wastes that can be accepted at the site.

As these tables now only specify wastes accepted from off-site sources, we have removed the waste codes that are generated by the on-site activities. Therefore, the following wastes have been removed from the tables in schedule 2:

- 05 01 05*, 05 01 06*, 10 02 07*, 10 02 08, 10 02 13*, 10 02 14, 10 02 15, 10 02 99, 13 05 01, 13 05 01*, 13 05 03, 13 05 03*, 13 05 07*, 19 02 03, 19 02 05*

Wastes generated from the on-site activities which are recycled or treated through the on-site activities are now included as raw materials and referenced through the operating techniques table or, if they have a specification, through table S2.1 of the permit.

Addition of DAAs to Table S1.1

We have amended activity references AR19 to AR22 and AR25 to AR27 to clarify the wording of the description of each activity.

We have added a DAA (AR23) for the treatment of water abstracted from the river which is then used within the site. This activity had not previously been included as a DAA.

Improvement conditions

We have added the appropriate variation reference to IC8 in order that the timescale for compliance with the requirements of the condition is linked to the date of issue of the variation under which the condition was set. Currently the deadline is set as “within 1 year of permit variation”. By adding the variation reference, it clarifies which permit variation this refers to, making it clearer for compliance purposes.

Removal of CPS boiler 3

We have removed reference to CPS boiler 3 associated with the CPS LCP as it has been decommissioned. Reference has been removed from Tables S1.4, S3.0, S3.6, S3.8 and S4.1.

Gas Holders

We have amended table S3.0 relating to emission points to include points A24 and A62 for the gas holders for the blast furnace and BOS activities respectively.

During the determination of the variation, we were made aware of these emission points so have included them for completeness.

Dioxins monitoring at emission point A1

We have increased the monitoring frequency of dioxins at point A1 at the Sinter Plant to quarterly. As we have agreed that emissions of particulates from the Sinter Plant at point A1 can be higher than the relevant BAT AEL as part of the derogation (see section 5.3), we consider that emissions of dioxins could also increase. We have, therefore, included a requirement for quarterly monitoring of dioxins in table S3.1.

We have also included IC13 in table S1.3 which requires the operator to provide a report justifying any proposed reduction in monitoring frequency one month before the end of the derogation period. This will allow the operator to demonstrate whether elevated levels of dioxins have been emitted during the derogation and to justify a reduction in frequency when the derogation period ends and the lower BAT AEL for particulates applies.

Amendments to coke oven monitoring

We have re-formatted table S3.2 with the limits and monitoring requirements relating to the coke ovens, added references to ICs and amended monitoring requirements, as follows:

- We have listed the limits and monitoring requirements for each coke oven battery separately to make it clearer what monitoring applies.
- For all batteries we have amended the monitoring method as a result of completion of IC4. We have also included reference to IC17 in the monitoring methodology which requires the operator to review the management procedures to determine if the methodology meets BAT C 46 and that it allows compliance with the permit requirements. We have included IC17 as a result of completion of IC4 as we require further evidence that the methodology is appropriate.
- Although there was a previous derogation to the emission limit for particulate matter from under-firing at emission points A302 and A303 at the coke ovens, no limit was set in the monitoring table and emissions of PM were monitored using obscuration. We have agreed an emission limit for PM as a result of the derogation (see section 5.4) and this is now specified in table S3.2 of the varied and consolidated permit. As monitoring of PM concentrations as a daily mean from under-firing has not been required it is uncertain whether monitoring can be carried out and the agreed derogated limit of 200 mg/Nm^3 met. Therefore, we have specified IC12a, IC12b and IC12c requiring the operator to submit a report detailing the proposals for monitoring particulate concentrations, carry out the monitoring, demonstrate that the method is appropriate and determine based on monitoring results whether the derogated PM limit is appropriate.

Until these ICs are complete, the operator is required to continue to monitor obscuration in accordance with the requirements specified in table S3.2, after which obscuration will be carried out as part of process monitoring as specified in new table S3.10. As obscuration does not monitor an emission concentration but rather the density of the emission by reference to the Ringelmann shade chart, we consider that obscuration is a measure of performance rather than a method to demonstrate compliance with an emission limit.

- By allowing increased emissions of particulates over the derogation period (see section 5.4) increased emissions of dioxins and PAHs could also arise. Therefore, we have required monitoring of these pollutants at emission points A302 and A303, initially every 6 months and then as agreed following completion of IC10a.

Monitoring frequency at Points A18 and A19

Following the BAT review, the monitoring frequency at emission points A18 and A19 (blast furnaces) was changed to continuous. We have amended the monitoring frequency to "continuous, or as agreed under IC1" as continuous monitoring is not feasible for all pollutants and the operator needs to complete IC1 to show that their periodic monitoring is sufficient to show compliance and that continuous is not required in line with BAT 65.

Ammonia monitoring and limit at emission point W1

We have included several ICs in relation to ammonia emissions at emission point W1. The operator requested that the ELV be replaced with a 95th percentile limit to take account of exceedances of the limit and thus reduce the number of non-compliances at this discharge. As discussed in section 4.16 below, we did not agree with the operator's proposal as ammonia is an acute pollutant and river quality is good upstream of the discharge and poor downstream. In addition, modelling of emissions at this point demonstrated that the current limit would contribute to ongoing poor river quality. A lower ELV would be required to ensure the river quality does not deteriorate further.

Therefore, we have set IC15a for the operator to submit a sampling plan detailing the locations of sampling points upstream and downstream of the discharge and the methodology to be used to monitor ammonia at these points. Once the plan is agreed, the operator must carry out the sampling.

We have set IC15b that requires the operator to use the data collected under IC16a to carry out a river needs assessment which is to be submitted to us for an audit.

We have set IC15c in the event that our audit identifies that there is an impact on the Brumby Beck in which case the operator will have to provide an Action Plan detailing the proposed improvements including measures to reduce the ammonia

at source. The operator is also required to determine a revised ELV from the sampling, assessment and audit carried out under the previous IC requirement.

We have set IC15d requiring the operator to carry out the improvements identified.

We have also added a reference to IC15c in table S3.9 so that the emission limit specified for ammoniacal nitrogen applies until a different limit is agreed in accordance with this IC.

Process monitoring

We have added table S3.10 to the varied and consolidated permit that specifies process monitoring. We have added this table as previously process monitoring was incorrectly specified in schedule 4 of the permit in table S4.4.

Table S3.10 specifies the process monitoring removed from schedule 4 of the permit and obscuration in relation to the coke ovens, as described in the above section “Amendments to coke oven monitoring”.

Amendments to schedule 4

We have amended table S4.1 to include monitoring of dioxins at the coke ovens, include separate rows for reporting monitoring of dioxins and PAHs as they have different monitoring frequencies and to include reporting of the process monitoring that is now specified in table S3.10.

We have merged tables S4.3 and S4.4 as one table, S4.3. This now specifies the performance parameters that need to be reported. The process monitoring that was previously specified in these tables has been removed and included in new table S3.10. These changes mean that the requirements for process and performance monitoring are set out in the varied and consolidated permit in accordance with our template and the permit is consistent with other IED permits.

We have also amended some performance monitoring requirements in new table S4.3 as follows:

- Added separate rows for flare and pressure relief mass emissions reporting from A305.
- Updated the units to separate rows for each parameter to clarify what reporting is required for a number of activities.
- Removed parameters relating to the LCP as these are now reported through Form IED AR1.

We have amended and added a number of reporting forms in table S4.4 (previously S4.5), as follows:

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- We have not amended the air emissions reporting tables as requested by the operator as we have replaced all the forms, air 1 to 30, with our most recent reporting template, Emissions to Air Reporting Form.
- We have replaced Form IED CON2 with Form IED CON1 as this is the appropriate form for reporting continuous monitoring at LCP boilers rather than from engines/turbines which Form IED CON2 is for. The only LCPs at the site are boilers.
- We have added Form IED AR1 requiring reporting of mass emissions and energy from the LCPs. This is a standard reporting requirement for all LCPs.
- We have clarified that Form IED CEM1 is only for reporting CEMs from the LCPs.
- We have replaced Forms water 1-6 with our most recent reporting template, Emissions to Water Reporting Form.
- We have replaced the process monitoring, water usage, waste return, energy usage and other performance indicators reporting forms with the most recent reporting templates.

4.13 Raw materials

We have specified limits and controls on the use of raw materials and fuels.

The operator applied to remove the raw materials specified in table S2.1 of the permit which do not have a specification so as to be in line with other permits in the sector.

In our schedule 5 notice dated 09/12/2021 we asked the operator to provide a list of all raw materials used at the site, any specifications for them, whether they are included in their EMS and the process in which the raw material is used. The operator provided this information on 17/12/2021. Following the operator review of the draft permit, a revised version of the raw materials and wastes spreadsheet was submitted on 05/07/2022. A further version referenced LADK-CGVE5C was submitted on 02/08/2022. This version is referenced as a document in the operator's EMS.

We have amended table S2.1 to include only those fuels and raw materials for which a specification is required. The list of raw materials is included as an operating technique in table S1.2 which has been updated to include reference to the revised spreadsheet.

4.14 Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.

We are satisfied that the operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities
- the proposed infrastructure is appropriate; and
- the environmental risk assessment is acceptable.

We have excluded the following wastes for the following reasons:

- All wastes listed in the application and in the current permit which are produced on site.

  The waste tables in a permit list those wastes which are brought onto site. Therefore, in the varied and consolidated permit we have amended the waste tables to list only those wastes which are imported from off-site. Wastes which are generated on site and which are used in the processes are listed in the raw materials table (Table S2.1) where there is a specification or in the operating techniques table (Table S1.2).

- Plastic waste for the blast furnace.

  The operator withdrew these wastes as we were not satisfied that the process and emissions had not been fully assessed.

We have amended the waste tables included in Schedule 2 of the permit so that there is a table of wastes applicable to each activity listed in Table S1.1 which imports waste for treatment, storage or use.

We made these changes to clarify which wastes are imported to the site and which are produced by the activities at the site and subsequently re-used or removed from the site. These changes are in line with how waste activities are regulated in other sectors.

4.15 Improvement programme

Based on the information in the application, we consider that we need to include an improvement programme.

We have updated table S1.3 to show the improvement programme requirements that have been completed.

We have added the following improvement conditions:

- IC10a, IC10b, IC12a and IC12b - related to the coke oven derogations – see section 5.4.

- IC11a, IC11b and IC13 – related to the sinter plant derogation – see section 5.3.

- IC14 – We have included this IC in relation to the storage of hazardous wastes - See section 4.8.

- IC15a, IC15b, IC15c, IC15d – We have included these ICs requiring the operator to assess the impact of ammonia on the receiving water at point W1 - See section 4.12.

- IC16 – The operator requested that the ELVs and requirement for monitoring of cyanide and phenol be removed at emission point W9. As discussed in section 4.16 below, we did not agree that the monitoring results demonstrated that emissions of cyanide at this point were below background levels. Therefore, we have set this IC requiring the operator to provide a report with the results of a further 12 months of monitoring to determine if the concentrations of cyanide measured in the discharge are consistently below the LoD. If we agree that the results demonstrate that emissions of cyanide are not significant, monitoring can cease.

- IC17 - The operator provided monitoring proposals for Appleby coke ovens under IC4, however we were not entirely satisfied that the monitoring standard proposals were sufficient. We therefore require the operator to review their monitoring methodology for visual assessment of leakage from the coke ovens, demonstrate that the proposed methods are based on the British Carbonisation Research Association (BCRA) methods, that they meet the requirements of BAT C 46 and that the methods will allow them to effectively demonstrate compliance.

4.16 Emission limits

Emission Limit Values (ELVs) have been added, amended and deleted as follows:

- We have amended schedule 3, table S3.0 in the varied and consolidated permit by adding new emission points and marking redundant emission points as decommissioned as described below.

<u>Emissions to air</u>

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- Increased the ELV for particulate matter at the Sinter Plant, A1, to 100 mg/m^3 in accordance with the derogation request – see section 5.3 below.

- Added an ELV for particulate matter for the Appleby Coke Ovens battery stacks, A302 and A303 in accordance with the derogation request – see section 5.4 below.

- Added A307A for the replacement Appleby Coke Oven flare – A307 for the existing Appleby Coke Oven Flare has not been deleted as it is not clear when the flare will be replaced. We have added a note to specify that A307A applies when A307 has been removed. We have not set an ELV as there is none specified for A307 and A307A is a direct replacement.

- Amended the Door Leakage Control Factors, the Top Leakage Control Factors at the Appleby Coke Ovens. The operator had submitted proposals in response to improvement condition IC4 which were not agreed or incorporated into the permit, although the operator carried out monitoring in accordance with these proposals. These proposals have been submitted again as part of this variation in order that they can be incorporated into the permit. We have reviewed these proposals and have amended the emission factors in table S3.2.

- Amended the Mass Emissions Factor (coal charging visible emission) at the coke oven batteries 1–4 to 'Visible Emissions from Charging' as referred to in BAT 44. This had previously been agreed on completion of IC4 but had not been incorporated into the permit. As the proposals were submitted again as part of the variation, we have reviewed the proposals and made the appropriate change to table S3.2.

- The particulate ELVs have been removed from the BOS primary gas cleaning emission points (A54, A55 and A56). The operator considered the setting of the ELV at these points following the permit review to be inappropriate and not required by the BREF. In addition, the operator considers that it is not safe to monitor these emission points. We have reviewed the information provided by the operator and agree that the ELVs for PM are not required.

- Removed emission points relating to the Dawes Lane Coke Ovens, A301, A304, A306, A308, A310, A311, A312, A313, A315 as this plant is decommissioned.

- Removed emission point A316 relating to the Appleby Coke Oven Dryer as ammonium sulphate drying is no longer taking place and the stack has been demolished.

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- We have added emission point A139 and associated particulate ELVs and monitoring requirements to table S3.7 as a result of the consolidation of the Yarborough scrap metal processing activity permit into this permit. We have not added point A140 from the Yarborough scrap metal processing permit, as this point is obsolete as the cutting activity that produced particulates from the fume booth extraction unit no longer takes place.

We have removed emission points A129, A130 and A313 as these relate to the Heavy Plate Mill which is no longer in operation.

Emissions to water

- We have not amended the ELV for ammonia at emission point W1 to one based on the 95th percentile. We consider that this is not an appropriate method of setting limits for emissions to water. In addition, ammonia is an acute pollutant and any exceedance of the ELV could have an immediate impact on the river.

  We have used data provided by the operator to carry out modelling of ammonia emissions from the discharge point into the Brumby Beck and our results show that the current ELV could lead to a deterioration of river quality downstream of the discharge. Data suggests that the river quality upstream of the discharge is classified as good whereas downstream of the discharge it is classified as poor. In order to prevent further impact on the river quality, our modelling suggests that an ELV in the order of 1.1 mg/l would be required, which is lower than the current limit of 3.5 mg/l. As the majority of the operator's monitoring results show concentrations of ammonia to be above this limit, we are not able to set this revised limit in the varied and consolidated permit. However, we have instead included a number of ICs that require the operator to carry out sampling both upstream and downstream of the discharge as well as from the discharge itself in order to carry out a detailed assessment of the impact. Where a lower limit is required, the operator will also have to provide an Action Plan setting out measures to take to reduce the concentration of ammonia in the discharge, including looking at the potential to reduce ammonia at source.

- We have removed the ELVs from emission point W5. The operator provided data to show the number and duration of the emergency discharges and monitoring data to demonstrate that the discharges were below the ELVs. We agree that it is not appropriate to set ELVs on an emergency discharge.

- We have removed the ELV and the requirement to monitor phenol at emission point W9 as we agree with the operator's assessment that monitoring results show that the concentration of this substance in the discharge is not above background and are insignificant.

- We have not removed the ELV or requirement to monitor for cyanide from emission point W9 as the data provided does not show that emissions of this substance is insignificant as they have been above the limit of detection (LoD). More recently the LoD used is above the environmental standard for cyanide in water so results recorded at or below this LoD cannot be considered as insignificant. We have included an IC for the operator to review a further 12 months of data to determine if all the results are below the LoD.

- We have amended the description of the catchment for emission point W9 by removing the reference to the plate mill as it is no longer there. We have removed the ELV in respect of Phenol as requested by the operator as monitoring data shows that the concentrations in the emission are at or below the LoD.

  However, we have not removed the ELV for Cyanide as the monitoring data does not support that the concentrations are below background levels. Due to the change in the laboratory used to analyse water samples, the LoD for Cyanide is now above the relevant environmental quality standard (EQS) for the watercourse. Some, but not all, results are at the LoD and, therefore, do not show that the concentrations are below background. We have, however, set an IC (IC16) that requires the operator to review a further 12 months of monitoring data and use this data plus the data submitted with the application to justify the removal of the emission limit.

- We have removed the requirement to monitor TOC at points W1, W2, W3, W4, W6, W7 and W9 and their associated ELV. We agree that the ELV for BOD is sufficient and that requiring TOC to be monitored as well is onerous and does not provide useful data (see section 4.17 below).

- We have removed the ELVs from emission point W8 as this discharge is of surface water from the stores area and not from any operational areas so in unlikely to be contaminated. We do not routinely set ELVs on discharges of clean surface water which are rainfall dependent.

- We have added emission point T1 to table S3.9 relating to the discharge of supernatant water from the dewatering plant as a result of the consolidation of the permit for the dewatering plant into this permit. No changes to the requirements have been made and no ELVs are set.

We have removed Schedule 3(a) from the varied and consolidated permit as it related to the emission limits and monitoring requirements that applied until 08/03/2016, as this date has now passed. We have also removed Schedule 3(b) from the permit relating to the emission limits and monitoring requirements

applicable from 08/03/2016 as this date has now passed. We have included the relevant tables in Schedule 3.

4.17 Monitoring

We have decided that monitoring should be added, amended and deleted as follows:

- All associated monitoring requirements relating to the emission points that have been removed from the permit have also been removed.

Emissions to air

- We have amended the monitoring methodology applicable to the Door Leakage Control Factors, the Top Leakage Control Factors and the Mass Emissions Factor (coal charging visible emission) at the Appleby Coke Ovens in line with the details submitted with the variation application.

- We have removed emission points A305 and A307 from table S3.2 as there are no monitoring requirements set for these points. They are listed as emission points in table S3.0.

- We have amended the monitoring methodology and reference period at A78 (steel/slag decant) in accordance with the operator's application.

Emissions to water

- We have amended the monitoring frequency of heavy metals at emission point W7 to quarterly as we are satisfied that the operator has justified this reduction in monitoring frequency.

- We have removed the monitoring requirements in respect of phenol from emission point W9.

- We have not removed the requirement to monitor cyanide at emission point W9 as we are not satisfied that the monitoring data demonstrates that concentrations of cyanide in the discharge are below background levels. We have set an IC, IC16, in the permit that requires the operator to review existing data and a further 12 months of monitoring data in order to justify the cessation of the monitoring of cyanide.

- We have not amended the monitoring of chlorine to a monthly random sample as requested by the operator for points W3, W4 and W6. As there are significant fluctuations in chlorine as a result of the use of hypochlorite

to prevent legionella contamination, we consider that continuous monitoring is required in order to check this variation in concentration. Random sampling for chlorine would not demonstrate the overall situation with regard to the emissions of chlorine and could miss peaks in concentration that could cause pollution. Therefore, we have retained the requirement for continuous monitoring with a monthly random sample to check the calibration of the CEM as there is no MCERTS certification for this sampler.

We have not added the proposed condition 3.5.5 into the monitoring section relating to uncertainties associated with monitoring of emissions from non-LCP plant which are monitored in accordance with BS14181 as requested by the operator. Previously the requirement to monitor non-LCP emissions in accordance with BS14181 was uniquely applied to this site but that is no longer the case as the BAT C across other sectors refers to BS14181 as the generic calibration standards. Reporting of emissions with IED uncertainty adjustments only applies to LCPs and to waste incineration plants and it is understood that it is not proposed that this is expanded to other sectors. The process of removing uncertainty from measurements under IED is being reviewed and an alternative methodology for reporting uncertainties may be applied in the future.

4.18 Reporting

We have amended reporting in the permit as follows:

- We have amended condition 4.2.5 of the varied and consolidated permit by adding prefix text that specifies the waste activities to which the condition applies. This means that the operator is required to report the quantity of waste accepted from off-site and removed from the site each quarter in relation to only the waste activities specified. We have not amended the frequency of reporting to annually as this is a standard condition for all activities that involve the storage and treatment of imported wastes under activities listed in section 5 of schedule 1 to the EPR. The frequency of reporting remains as quarterly.

We have not amended the following reporting requirements as requested by the operator:

- We have not amended condition 4.2.2 relating to the submission of an annual report of the performance of the installation to us by 31st January each year. The condition allows the operator to agree a different date for submission of the annual report and this has been done by the operator. Therefore, there is no need to amend the condition as the agreement is already in place. In addition, this is a standard condition in all permits.

- We have not amended the frequency of reporting of waste accepted and removed from quarterly to annually as requested by the operator as this is

a standard condition and applies for all sites accepting waste for treatment and storage.

We made these decisions in accordance with our determination of changes to the permit applied for, the requirements of the sector and relevant sector and monitoring guidance.

4.19 Management system

We are not aware of any reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

4.20 Technical competence

The operator requested that the requirement to have a technically competent manager (TCM) qualified to the appropriate WAMITAB level for the waste activities at the site should not apply. The operator stated that the waste activities (existing oily mill scale handling and proposed hazardous waste storage) take place at the same site as the iron and steel activity and the iron and steel activity is the primary purpose of the operation of the installation and, therefore, in accordance with the EPR these waste activities would not constitute a specified waste management activity and the requirement for a TCM is not required.

We agree with the operator's view and have excluded the requirement for a TCM from the operating techniques for the oily mill scale pad in table S1.2 and have not required a TCM for the proposed new activity of hazardous waste storage.

4.21 Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

4.22 Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit variation.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

Only this following section is subject to consultation

5. Assessment of derogation requests

5.1 Article 15(4) of IED

The IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

> ‘By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques (BAT) as described in BAT Conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:
>
> (a) the geographical location or the local environmental conditions of the installation concerned; or
>
> (b) the technical characteristics of the installation concerned.

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5.2 Cost Benefit Analysis

If a derogation is applicable under Article 15(4) of the IED, then Cost Benefit Analysis (CBA) is undertaken. The CBA allows calculation to indicate whether the costs of compliance are greater or less than the environmental benefits.

It essentially groups all the costs on one side, with all the benefits, as far as possible, on the other side. It then includes the effect of time on the value of those costs and benefits in order to produce a Net Present Value (NPV).

This gives an indication of whether those costs are disproportionate or not, but there are many sensitivities in the analysis and many aspects of the environment that cannot yet be monetised.

Where the NPV is positive, this indicates that the cost of compliance with the BAT AEL(s) does not outweigh the environmental benefits.

Where the NPV is negative, this indicates that the costs of compliance with the BAT AEL(s) outweigh the environmental benefits.

The operator has provided a CBA for different scenarios for each of the derogation requests.

5.3 Sinter Plant

The operator requested a derogation from the following BAT C in respect of the operations at the sinter plant:

> *20. BAT for primary emissions from sinter plants is to reduce dust emissions from the sinter strand waste gas by means of a bag filter.*
>
> *BAT for primary emissions for existing plants is to reduce dust emissions from the sinter strand waste gas by using advanced electrostatic precipitators when bag filters are not applicable.*
>
> *The BAT-associated emission level for dust is < 1 – 15 mg/Nm^3 for the bag filter and < 20 – 40 mg/Nm^3 for the advanced electrostatic precipitator (which should be designed and operated to achieve these values), both determined as a daily mean value.*

The derogation first requested was for an interim ELV for dust of 115 mg/Nm^3 until 30/09/2023, after which the BAT AEL of 15 mg/m^3 applicable to bag filters would apply as bag filters would have been installed to replace or assist the existing electrostatic precipitators (ESP). The current BAT AEL for dust is 40 mg/m^3 applicable to ESPs.

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After discussions between British Steel and the Environment Agency the interim derogated ELV was reduced to 100 mg/m³.

Subsequently the operator submitted an amendment to the application to change the time period for the Sinter Plant derogation from the initial proposed date of 30/09/2023 to 30/09/2024. The proposed derogated ELV remained as 115 mg/m^3 in the amended justification despite the previous agreement with the operator that the interim derogated ELV would be 100 mg/m^3. The assessment of the validity of the derogation request and the assessments of the costs/benefits and risks of allowing the derogation are based on the amended timescale and an interim derogated ELV of 100 mg/m^3 for emissions of dust.

5.3.1 Request criterion

The operator provided evidence to support the request for a derogation in the supporting document "Justification of derogation from achieving the BAT AELs for emissions to air from sintering at British Steel, Scunthorpe", dated 13 April 2022.

The report outlined what is technically feasible to install within the time constraints considering the scale of the plant. This would therefore meet the requirements for a derogation under Article 15(4)(b) of the Industrial Emissions Directive (IED) on the technical characteristics of the installation.

5.3.2 Validity of the derogation request

Sinter is produced at the site by blending raw materials including iron ore and reverts (recyclable materials arising from the site) and laying them down in beds to allow good mixing of material. Sinter feed is recovered from the beds by barrel reclaimers and a blend of sinter bed material, fluxes, coke breeze and limestone is fed onto a travelling grate where it is heated to a temperature in the region of 1300°C. Air is drawn through the bed of heated material and the flame front fuses the fine material into sinter. The sinter is cooled and screened prior to being transferred to the blast furnaces. Waste gases produced during sintering currently pass through an electrostatic precipitator and are discharged through the 107m high stack to atmosphere. Several emission improvements are in progress to meet IED BAT conclusion requirements such as Enhanced ESPs (particulates) and Lignite injection (Dioxins and Furans).

The operator has committed to replacing the ESP, or adding to the ESP, with bag filters with a deadline for completion of the work of 30/09/2024. This is the earliest date by which the design, construction and commissioning of the bag filter can be completed due to the availability of the technology supplier and engineers.

The operator is investigating two solutions through Front-end Engineering and Design (FEED) studies: 1. Replace the ESP with a bag filter; 2. Install a bag filter in addition to the ESP. A proposed timetable for the design, installation and commissioning of a bag filter has been provided which demonstrates that for either

solution it would not be possible to complete the installation of the bag filter before 30/09/2024 due to the scale, layout, ducting requirement, specific design requirements, tendering, construction and commissioning of this new plant. The timetable is shown in the table below.

Proposed timetable for installation of a bag filter*

Date	Key milestone	Comments
May 2022 - August 2022	Basic and detailed engineering	
August 2022 – July 2023	Procurement and Expediting	Manufacture of component parts (off-site), quality control and shipping
April 2023 – September 2023	Construction at site	Groundworks and infrastructure preparation including, but not limited to, electrical supply, concreting and diversion of waste gas pipework
August 2023 – August 2024	Construction at site	On site build of component parts, off-line testing and cold commissioning
September 2024	Construction at site	Final connection and hot commissioning before 30th September 2024

* Table is adapted from the operator's high level FEED study timetable, submitted on 16/12/2021

In order to prevent further breaches of the BAT AEL for particulates from the sinter plant main stack until the bag filter has been commissioned, the only alternative option considered feasible would be to temporarily cease production at the sinter plant and purchase iron ore pellets to maintain the operation of the blast furnaces. Use of our CBA tool confirms that the benefits (reduced pollution) of achieving the BAT AELs in this way would be significantly outweighed by the additional operating costs incurred.

We consider that the installation of the abatement proposals is not technically feasible within the time constraints considering the scale of the plant. This situation therefore meets the criteria for a derogation. Temporarily increasing the ELV for particulates until the commissioning of a new bag filter by 30/09/2024 (the earliest feasible date due to design, build and commissioning constraints), would be justified under Article 15(4) of the IED.

Therefore, we consider that the operator has made a valid request for a derogation under Article 15(4)(b) of the IED due to the technical characteristics of the installation.

5.3.3 ELVs

The derogation request is for an interim ELV for particulates until 30/09/2024 when a bag filter will have been installed and the BAT AEL applicable for bag filters will apply.

The ELVs proposed by the operator are set out in the table below.

ELV comparison table for particulates					
Averaging period	**Current ELV in permit (mg/Nm^3) For which the operator has installed electrostatic precipitators but still cannot comply**	**BAT AEL (mg/Nm^3) with electrostatic precipitators (current set up)**	**Operator Proposed (mg/Nm^3) Up to 30/09/2024**	**EA proposed (mg/Nm^3) Up to 30/09/2024**	**BAT AEL (mg/Nm^3) with fabric filter (proposed set up post 30/09/2024)**
Daily average	40	40	115	100	15
Monitoring frequency	Continuous measurement	Continuous measurement	Continuous measurement	Continuous measurement	Continuous measurement

Current ELV/BAT AEL
This is the BAT AEL for ESPs and has been applicable since 08/03/2016. Although schemes to improve the performance of the ESPs have been undertaken, it has not been possible to consistently achieve the limit.

Operator proposed ELV
The operator proposed this ELV based on the emission limit applicable prior to 08/03/2016, after which the BAT AEL of 40 mg/m^3 applied.

EA proposed ELV
We have reviewed the site's monitoring data and consider that the lower ELV of 100 mg/m^3 is achievable and will, therefore, result in lower emissions of particulates than that proposed by the operator.

BAT AEL
This ELV is the upper end of the range of BAT AELs applicable to emissions from bag filters. This will apply after 30/09/2024, which is the date the operator has committed to for the installation of a bag filter.

5.3.4 Demonstrating disproportionality of costs and benefits

Costs

The operator has satisfactorily demonstrated that the stated criterion would result in increased costs of achieving the BAT AEL (as compared to the typical cost of installing the appropriate technique) and as compared with environmental benefits. The CBA only covers the period January 2021 to 30th September 2024, as the fabric (bag) filter will be operational from 1st October 2024 and the relevant BAT AEL will be achieved.

CBA

Three options were proposed which were all taken forward for consideration under CBA. The options considered are:

1. Business as usual (BAU) - This is the base case, which assumes ongoing operation of the sinter plant whilst undertaking the project to install a bag filter. This means that the current BAT AEL specified in the permit will not be complied with and will result in continued non-compliances being recorded.

2. BAT option - Given that the existing abatement plant, even after implementation of a number of schemes to improve the performance, cannot consistently achieve the BAT AEL, the only way to prevent further breaches of the limit until the bag filter has been commissioned would be to cease production at the sinter plant until that time. In order to maintain iron and steel production at the site without the sinter plant it would be necessary to import all the materials to feed into the blast furnaces. Although the current blast furnace burden is principally sinter, this material is prone to degradation during handling and it is not possible to transport it over significant distances; the sinter in the current burden would therefore be replaced with iron ore pellets, which are more robust. The cost of purchasing pellets exceeds the cost of making sinter on site.

   A significant disadvantage of the BAT option is that the sinter plant at an integrated steelworks is used to agglomerate a number of different high-iron or high-carbon fine materials (reverts) arising from elsewhere on the site to return them to the ironmaking process. The amount of reverts generated may fall somewhat if sinter production were to be replaced by the importation of pellets, as some of the revert materials arise from degradation of sinter, whilst pellet feed would generate less fine material. However, many of the reverts arise from other processes (for instance blast furnace flue dust, BOS filter cake and hot mill sludge) and so would continue to be generated during the shutdown of the sinter plant.

   While the sinter plant is not in operation, an alternative treatment of these materials would be required and this could involve finding another outlet for the material outside the steelworks. Opportunities for

alternative routes for reuse of these materials are already well known and exploited, so it is unlikely that a new outlet to take the mass of materials generated could be found, particularly as the material would be available for only a relatively short time period, making investment in additional processing plant uneconomic; this option is therefore unfeasible.

It may be possible to store the materials on the site so that when the sinter plant operations resume in October 2024, they can be gradually added to the sinter mix and eventually used. Many of these materials are fine, so some dust mitigation measures (such as water sprays) would be required for any storage area. Storage might be required for 5 years or more from May 2022 until all the accumulated materials could be processed through the sinter plant as there are limits on the quantities of reverts in the blend to ensure an acceptable product quality. There is no suitable space on site for the storage of a significant tonnage of fine materials with suitable dust control in place.

If the arising revert materials were disposed of as waste, valuable resources with high iron and carbon content would be lost, reducing the material efficiency of steelmaking by British Steel and contravening the concepts of the Circular Economy. Many of the reverts contain levels of zinc that would cause them to be classed as hazardous waste and there is insufficient capacity at the on-site landfill to handle all this material. It would, therefore, have to be disposed of to external landfill sites at considerable cost, running into the hundreds of millions of pounds.

A further disadvantage of this scenario would be the security of supply of the raw materials for blast furnace production, as there is less availability of pellets rather than the iron ore currently imported for sintering. Any prolonged disruption to supply could have severe consequences for the continuation of blast furnace operations.

3. Preferred option - The preferred option is to continue to operate the sinter plant at Scunthorpe but with a temporary increase in the ELV for particulate matter under a derogation until the commissioning of a bag filter is complete. This is equivalent to the BAU scenario, but without continued non-compliances being recorded.

The options in the CBA tool are minimal on costs. There is no capital investment given in the tool. This is because the proposal states that a bag filter will be fitted in all options (either additional to existing ESPs or stand-alone) and that there is no difference in capital expenditure between the BAU option, the preferred option and the BAT option. The implications of this in terms of the CBA are:

1. the preferred option (derogation) is operationally and environmentally the same as BAU;
2. sensitivity analysis is limited to operational costs;
3. the risk associated with the sensitivity of the assumptions is difficult to determine; and
4. it is not possible to assess whether capital costs are consistent with third party sources.

Despite these limitations, the BAT AEL option demonstrates that costs would be disproportionate to benefits due to the cost of importing pellets in place of sinter and the cost of waste removal.

The operator has assumed that all the emissions from the bag filter are $PM_{2.5}$ rather than a split of $PM_{2.5}$ and PM_{10}. As $PM_{2.5}$ has a higher damage cost than PM_{10}, this represents a worst case with respect to emissions. The operator has also included emissions of SO_2, lead, $PM_{2.5}$, NOx, dioxins and PAHs in the CBA.

The operator has not included weighted average cost of capital in the CBA as there is no difference in the capital expenditure profiles between the preferred option and the BAT option, so this is not relevant in this case.

In addition, in order to carry out sensitivity analysis, the CBA tool requires an estimate of the uncertainty around the additional operating costs (the differential between producing sinter on-site and importing pellets), and this has been assumed to be $\pm$ 25%.

The CBA using central assumptions shows a negative net present value (NPV) for the BAT AEL option compared with the preferred derogation option. This means that the operating costs of achieving BAT by importing pellets rather than making sinter are greater than the monetised value of the pollutant emissions that would be prevented before the fabric filter is commissioned. Therefore, despite the limitations of the CBA, the cost of compliance for the BAT option is clearly disproportionate when compared to the environmental benefit achieved.

The operator carried out sensitivity analysis using the damage cost ranges and operational cost uncertainties. The sensitivity analysis included in the CBA tool shows that there are only two cases where the overall NPV of the BAT option is positive. These are when the highest damage costs are used (which has the effect of increasing the benefits greatly leading to a positive NPV) or when a 25% reduction in operating costs is assumed.

We have reviewed the CBA and, even though the operator decided not to include capital costs as these were the same as the BAU, we consider that the operator has provided a credible argument that the increased operational costs linked to the technical characteristics are disproportionate for achieving the BAT AEL.

5.3.5 Risks of allowing the derogation

There are no identified significant negative environmental impacts of allowing the derogation compared with the impacts of achieving the BAT AEL. The impact from particulates that has been recorded from the installation is primarily driven by fugitive emissions not dust emitted from this controlled point.

We have based our assessment on the emissions of particulates at the ELV, since an increase in the ELV is requested, rather than on actual emissions. As discussed in section 5.3.3 above, three different emission levels were originally considered, which are the current ELV of 40 mg/m³, the requested interim ELV of 115 mg/m³ that would apply up to and including 30/09/2024 and a future ELV of 15 mg/m³ that would apply after that date. Subsequently an alternative interim emission level of 100 mg/m³ was considered which will apply until 30/09/2024 with the future ELV of 15 mg/m³ applying after that date.

In all cases the ELVs are expressed as a daily average at reference conditions of dry gas at 0°C and 1 atmosphere pressure. Particle size measurements have shown that currently 84% of the total particulate matter emitted from the sinter plant ESPs is PM_{10} (this fraction would include $PM_{2.5}$) and 56% of the total particulate matter is $PM_{2.5}$. It would be expected that after the installation of a bag filter, all the residual particulate matter would be $PM_{2.5}$ or less.

The average waste gas flow from the main stack is 333 m³/s at reference conditions.

Annual emissions

The table below shows the mass emission rates for the different cases and the estimated annual emissions, based on continuous operation at the respective ELVs for the whole year, which represents the worst case.

Pollutant	**Unit**	**Current/BAT AEL**	**Operator proposed until 30/09/2024**	**EA proposed until 30/09/2024**	**BAT AEL from 01/10/2024 (bag filter)**
Total particulate matter	ELV (mg/m³ at ref. conditions)	40	115	100	15
Total Particulate Matter	Mass emission rate (g/s)	13.3	38.3	33.3	5
	Annual emission (tonnes)	420	1208	1050	158

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Pollutant	Unit	Current/BAT AEL	Operator proposed until 30/09/2024	EA proposed until 30/09/2024	BAT AEL from 01/10/2024 (bag filter)
PM10	Mass emission rate (g/s)	11.2	32.2	28	0
	Annual emission (tonnes)	353	1014	882.5	0
PM2.5	Mass emission rate (g/s)	7.5	21.4	18.75	5
	Annual emission (tonnes)	235	676	587.5	158

The annual emissions of total particulate matter following the installation of the bag filter by 30/09/2024 will fall to 158 tonnes compared with the operator's preferred option (now slightly reduced as agreed with us) of 1050 tonnes. This is a significant reduction so for the proposed period of the derogation, higher discharges of particulate matter will be permitted. However, these emissions are only a small part of the total emissions of particulate matter from the installation as a whole.

Predicted impacts

The impact of dust emissions from the sinter plant main stack on local air quality has been assessed through dispersion modelling using ADMS dispersion model (version 5.2.1.0). The model was used for a previous sinter plant modelling exercise in 2018 and for the original derogation justification in 2021.

Ground level PM_{10} and $PM_{2.5}$ concentrations were calculated across a 12 x 13 km area with grid spacing of 100 metres to capture the peak ground-level concentrations attributable to emissions from the sinter plant main stack. This grid covers the 19 sensitive receptors included in the modelling and also part of the wider Air Quality Management Area (AQMA). The receptors included in the modelling also include habitat sites. The only impact of particulate emissions on these sites would be smothering due to significant quantities of particulates being deposited on the habitat.

The modelled process concentrations are less than 2% of the relevant environmental standards at all the sensitive receptors and at the Rowland Road AURN site the emissions from the sinter plant main stack would contribute no more than 0.15% of the measured PM_{10} levels even if emissions were continuously at the proposed interim ELV of 115 mg/m³. The predicted environmental concentrations are less than 100% of the environmental standards

at all the sensitive receptors. It is considered that there will not be significant deposit of particulates at the habitat sites which would cause smothering.

The modelling has been carried out based on the operator's proposed ELV of 115 mg/m^3 for PM. We have set an interim ELV of 100 mg/m^3 which is slightly lower than that used in the modelling. Therefore, the modelling represents a worst case.

The operator also included assessment of the impact of dioxins/furans and PAHs, as benzo[a]pyrene (B[a]P), in the modelling. These pollutants are associated with emissions of PM and, therefore, an increase in the ELV for PM could also mean an increase in emissions of these pollutants. The process contributions of B[a]P are less than 2% of the relevant environmental standard. Although the measured B[a]P concentrations at the AURN site exceed the target value, the sinter plant emissions contribute only a small fraction of the overall levels.

In order to determine the impact of dioxins/furans a human health risk assessment would be required. As the derogation is for an increase in PM we have not required the operator to provide this assessment as it is not relevant to our assessment. As an increase in the ELV for PM could result in increased emissions of dioxins/furans we have not agreed the reduction in the monitoring of dioxins/furans proposed by the operator in the variation application but have included an IC in the varied and consolidated permit requiring the operator to continue monitoring of these pollutants and to provide a report to justify a reduction in monitoring frequency before the end of the derogation period.

Summary of the risks of allowing the derogation

The operator has demonstrated that the costs of achieving the BAT AEL are disproportionate to the environmental benefits. Dispersion modelling has demonstrated that the impact of dust emissions at the proposed interim ELV of 115 mg/m^3 is not significant and measured levels are already well below the relevant air quality standards. Therefore, there is no overriding air quality issue that has prevented the derogation being granted.

Final considerations

We have included the derogated ELV of 100 mg/m^3 for PM in table S3.1 of the varied and consolidated permit which is time limited until 30/09/2024 after which the BAT AEL will apply. We have also included two improvement conditions relating to the installation of the proposed abatement plant (bag filter).

We have set IC11a that requires the operator to submit a report before the expiry of the derogation in respect of PM from the Sinter Plant that details the abatement plant to be installed. We have set IC11b that requires the operator to demonstrate that they have installed the abatement plant by the date of cessation

of the derogation. In addition, they will need to confirm the BAT AEL that will apply based on the type of abatement plant that is fitted.

The operator had applied to reduce the monitoring frequency of Dioxins as polychlorinated dibenzodioxins/furans (PCDD/F) Dioxins I – TEQ (dioxins) from quarterly to six monthly. As we have agreed that emissions of particulates above the BAT AEL apply until 30/09/2024 in accordance with this derogation, it is likely that higher emissions of dioxins will also occur as they are linked to particulate releases. Therefore, we have not agreed to the reduction in monitoring frequency which remains at quarterly, and we have included IC13 that requires the operator to provide evidence to justify the reduction in monitoring frequency before the end of the derogation period.

5.4 Coke Ovens

The operator requested five derogations against the following BAT C in respect of operations at the Appleby coke ovens:

48. BAT is to reduce the sulphur content of the coke oven gas (COG) by using one of the following techniques:

I. desulphurisation by absorption systems

II. wet oxidative desulphurisation.

The residual hydrogen sulphide (H_2S) concentrations associated with BAT, determined as daily mean averages, are < 300 – 1 000 mg/Nm^3 in the case of using BAT I (the higher values being associated with higher ambient temperature and the lower values being associated with lower ambient temperature) and < 10 mg/Nm^3 in the case of using BAT II.

49. BAT for the coke oven under firing is to reduce the emissions by using the following techniques:

I. preventing leakage between the oven chamber and the heating chamber by means of regular coke oven operation

II. repairing leakage between the oven chamber and the heating chamber (only applicable to existing plants)

III. incorporating low-nitrogen oxides (NOx) techniques in the construction of new batteries, such as staged combustion and the use of thinner bricks and refractory with a better thermal conductivity (only applicable to new plants)

IV. using de-sulphurised coke oven gas (COG) process gases.

The BAT-associated emission levels, determined as daily mean values and relating to an oxygen content of 5 % are:

- *sulphur oxides (SOx), expressed as sulphur dioxide (SO_2) < 200 – 500 mg/Nm^3*
- *dust < 1 – 20 mg/Nm^3*
- *nitrogen oxides (NOx), expressed as nitrogen dioxide (NO_2) < 350 – 500 mg/Nm^3 for new or substantially revamped plants (less than 10 years old) and 500 – 650 mg/Nm^3 for older plants with well- maintained batteries and incorporated low- nitrogen oxides (NOx) techniques.*

50. *BAT for coke pushing is to reduce dust emissions by using the following techniques:*

I. *extraction by means of an integrated coke transfer machine equipped with a hood*

II. *using land-based extraction gas treatment with a bag filter or other abatement systems*

III. *using a one point or a mobile quenching car.*

The BAT-associated emission level for dust from coke pushing is < 10 mg/Nm^3 in the case of bag filters and of < 20 mg/Nm^3 in other cases, determined as the average over the sampling period (discontinuous measurement, spot samples for at least half an hour).

Applicability

At existing plants, lack of space may constrain the applicability.

51. *BAT for coke quenching is to reduce dust emissions by using one of the following techniques:*

I. *using coke dry quenching (CDQ) with the recovery of sensible heat and the removal of dust from charging, handling and screening operations by means of a bag filter*

II. *using emission-minimised conventional wet quenching*

III. *using coke stabilisation quenching (CSQ).*

The BAT-associated emission levels for dust, determined as the average over the sampling period, are:

- *< 20 mg/Nm3 in case of coke dry quenching*

- *< 25 g/t coke in case of emission minimised conventional wet quenching*

- *< 10 g/t coke in case of coke stabilisation quenching.*

Description of BAT I

For the continuous operation of coke dry quenching plants, there are two options. In one case, the coke dry quenching unit comprises two to up to four chambers. One unit is always on stand-by. Hence no wet quenching is necessary but the coke dry quenching unit needs an excess capacity against the coke oven plant with high costs. In the other case, an additional wet quenching system is necessary.

In case of modifying a wet quenching plant to a dry quenching plant, the existing wet quenching system can be retained for this purpose. Such a coke dry quenching unit has no excess processing capacity against the coke oven plant.

Applicability of BAT II

Existing quenching towers can be equipped with emissions reduction baffles. A minimum tower height of at least 30m is necessary to ensure sufficient draught conditions.

Applicability of BAT III

As the system is larger than that necessary for conventional quenching, lack of space at the plant may be a constraint.

The permit includes a number of derogations from the above BAT C which were agreed during the review of the permit following publication of the relevant BAT C for the iron and steel sector. These are:

- BAT 48 - De-sulphurisation of COG – the requirement for the H_2S content of COG to be reduced to below 1,000 mg/m³ was delayed to 31st January 2022 for Appleby (a limit of 5,000 mg/m³ is applied in the interim)

- BAT 49 - SO_2 from coke oven under firing – compliance with the BAT AEL of 500 mg/m³ was delayed to 31st January 2022 (in the interim there is no specific limit as SO_2 emissions, controlled by the sulphur content of the COG and sulphur limit in coking coals, this limit will be met after installation of COG de-sulphurisation)

- BAT 49 - Particulate matter from coke oven under firing – compliance with the BAT AEL of 20 mg/m³ was delayed to 31st March 2024 (a limit on obscuration is applied instead indirectly controlling particulate matter (PM), combustion, organic compounds and oven wall leakage). In the interim there is no specific PM limit, only annual monitoring

- BAT 50 - Particulate matter from coke oven pushing – compliance with the BAT AEL of 10 mg/m³ after abatement was delayed to 31st March 2024 (in the interim there is no abatement plant and a Pushing Emissions Factor limit applied)

- BAT 51- Particulate matter from coke quenching – compliance with the BAT AEL of 25 g/t was delayed to 31st March 2024 (in the interim there is no specific limit)

The operator has committed to closure of the Appleby coke ovens by 31/12/2026 and has applied to extend the current derogation timescales until that date. In addition, an ELV of 100 mg/m^3 for dust emissions from under-firing during the derogation period was proposed, although modelling was based on an ELV of 50 mg/m^3. During the determination of the derogation request for the dust emission ELV from under-firing, it was agreed that the proposed ELV of 100 mg/m^3 was not achievable. We asked the operator to assess the impact of dust emissions based on an ELV of 300 mg/m^3 as limited monitoring data showed that emissions were below this limit. The operator amended the derogation request to an ELV of 200 mg/m^3 for dust emissions from under-firing as they considered that this limit was achievable and would result in less impact on
the environment as a result of reduced emissions compared with a limit of 300 mg/m^3. We agreed with this amendment.

Although the operator has applied for the derogations as an extension to the time period for the current derogations, we have assessed the derogation requests as if they are new requests.

The derogations requested by the operator are for the continued operation of the Appleby coke ovens without any additional abatement until they are closed by 31/12/2026. The specific derogations relate to the following BAT C:

- BAT 48 I. Desulphurisation by absorption systems: ELV for H_2S 5000 mg/m^3

- BAT 49 Coke under-firing: No ELV for SOx, controlled by the sulphur content of the COG and sulphur limit in coking coals

- BAT 49 Coke under-firing: ELV for dust 200 mg/m^3

- BAT 50 Coke-pushing: No ELV set for dust, controlled by pushing factor

- BAT 51 Coke-quenching: No ELV set

5.4.1 Request criterion

The operator provided evidence to support the request for the derogations in the document “Justification of derogation from achieving the BAT AELs for emissions to air from the coke making at British Steel, Scunthorpe”, dated 15 December 2020. Further evidence was provided in response to requests for information sent on 01/09/2021, 09/12/2021 and 06/01/2022.

The report included an analysis to demonstrate that the costs of installing the abatement necessary to meet the BAT AELs that would apply at the end of the current derogation periods would be disproportionally high compared to the environmental benefits. Also, due to technical considerations, the timescales for equipment installation and commissioning and the intended limited lifetime of the coke ovens, any abatement equipment would operate for only a short period of time. This would, therefore, meet the requirements for a derogation under Article 15(4)(b) of the IED on the technical characteristics of the installation which would be that the intended remaining operational lifetime of the plant is such that any additional abatement equipment would operate for only a short period of time.

5.4.2 Validity of the derogation request

There were originally two coke oven plants at Scunthorpe; Appleby and Dawes Lane. Dawes Lane was closed on the 08/03/2016 and is currently under demolition. Coal is predominantly delivered by train for the Coal Handling Plant area to form a coking coal blend from graded coal beds prior to being recovered by a stacker-reclaimer, stored in silos and taken by conveyors to Appleby coke oven plant’s central battery silo. Appleby coke oven has 4 Batteries, operating as two units. Each Battery is designed with 33 oven chambers, each unit has dedicated coal charging cars, coal levelling and coke pushing cars, then coke side guide cars for coke quenching with dedicated unit Quenching Towers. The coal via charging cars is charged to Battery ovens where it is heated at a temperature of between 1200-1300°C for a period of approximately 18-24 hours to produce coke. Battery over-pressurisation system (CoMAH) has pressure relief venting and then flaring of raw COG. Coke is pushed from the side of each oven and quenched with recycled water before being transferred by conveyor to the blast furnaces. After quenching, the coke is graded by size and transferred to the blast furnace silos. COG pulled off in the ovens by exhauster fans is initially cooled, processed through gas cleaning scrubbers and by-products are removed prior to gas-holder storage or direct reuse. Clean gas is recycled within the site as a high calorific value fuel and exported as a constituent of mixed enhanced gas (MEG) used to fuel boilers and reheat furnaces on the site. Excess gas may be flared via a dedicated flare stack. Cooling and process waters transferred from the by-products plant are treated in an off-site biological effluent treatment plant prior to discharge into the River Trent.

The Appleby coke ovens are reaching the end of their operational life. Significant time, resource and capital expenditure has allowed repair and maintenance of both the Batteries and By-Products Plant since implementing the IED provisions by permit review since 2016. The objective was to allow operation to 2024 when several BAT C derogations would be implemented to feasibly continue operations that would meet BAT. However, due to a change in operator the investment plans have changed and the current operator is proposing to close the Appleby coke ovens by 31/12/2026. The closure is part of a significant capital expenditure plan provided from now into the late 2020s to de-carbonise steel making at Scunthorpe to meet the UK Climate Change strategy and modernisation.

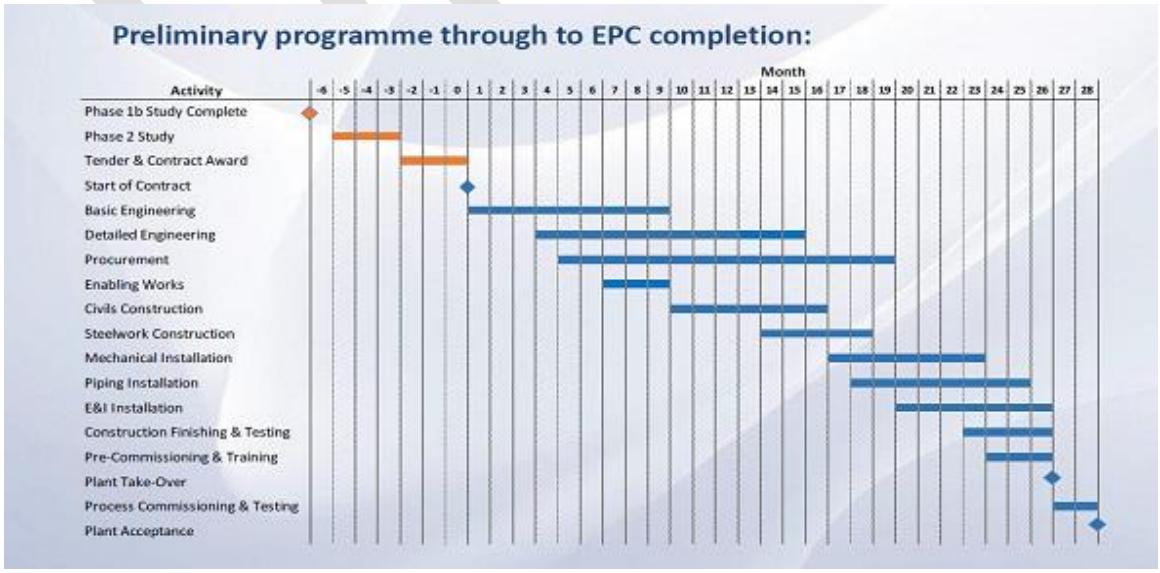
The operator has considered the options for meeting the BAT AELs when the current derogation deadlines end, as follows:

BAT 48 – De-sulphurisation of COG

The capital cost of installing a COG de-sulphurisation plant and other necessary enablers, such as improved de-tarring, at Appleby coke ovens is approximately £49 million. The time taken to construct and commission the new plant would be about 3 years. This would be an independent stand-alone process operation unit within the integrated process and could be adapted if built at oversized capacity. However, other operational constraints such as the proposed locations of future coke ovens, the plant remaining 'on-line' and live working means that it would only be used for 2 years before closure.

The operator provided information and a timeline for a preliminary programme for the design, construction and commissioning of a new de-sulphurisation plant.

Timeline for fitting a new de-sulphurisation plant*



* Table reproduced from information provided by the operator

BAT 49 Particulate matter from coke oven under-firing; BAT 50 Particulate matter from coke pushing; and BAT 51 Particulate matter from coke quenching

Based on the latest information from the sinter plant bag filter project for particulate arrestment (see section 5.3.2 above), we would anticipate that improvements at the coke ovens would involve a 3-year programme for each of these particulate abatement projects which comprise a 1-year engineering design phase and a 2-year build phase, including rebuild of the quench towers. This means that any abatement plant would not be commissioned before the current derogations time periods end.

Summary

We have reviewed other practicalities and other potential scenarios around the installation of new plant and abatement equipment and are of the view that this equipment has no realistic prospect of being designed, installed and commissioned for the remaining life of the coke ovens with limited operational time to the closure timetable.

None of these abatement projects could be easily adapted to serve any new ovens that may be built to meet the post December 2026 scenarios because each BAT conclusion technique would have to be designed to fit Appleby coke ovens and sized accordingly, not for a new coke oven. Any construction of new coke ovens would have to be carried out at a different location to the Appleby coke ovens. A tentative location for a new coke oven would be at least 0.5 km from Appleby. New COG pipelines would have to be built to transfer gas from Appleby to the new COG de-sulphurisation plant and to transfer the cleaned gas required for under firing back to Appleby.

Although the operator has outlined reasons for non-compliance with the relevant BAT Cs/previous derogation timescales, we believe that this was mainly due to Tata Steel (the operator at the time of the agreement of the current derogations) selling the steelworks to a venture capital company in 2016. This company then failed to implement the necessary plans or investments before liquidation in 2019, especially in relation to the de-sulphurisation of COG. The Dawes Lane coke ovens were also decommissioned. In February 2020, the new owners, Jingye, proposed a different operational strategy and new modernisation plans for de-carbonisation.

However, if Tata had initially applied for derogations to 31/12/2026 for these BAT Cs, they are likely to have been granted. The original CBA, (using PM_{10} harm costs lower than current costs) and using a figure of 20% of PM being $PM_{2.5}$, would have still suggested that the emissions would not have resulted in breaches of the environmental standards without bringing in new criteria as per the new application. There may also have been a request for extension to the derogations post-2024 because of the lack of contractors that could build and install the plant in the agreed timeline. The company had (and still has) the Port Talbot steelworks which was first in line for similar upgrades and improvements.

We have taken an integrated approach to these derogation requests rather than requiring five separate derogation requests. These proposals under the BAT measures all link to each other as they surround and inter-connect with the same piece of plant and they are therefore all impacted by the same issues such as plant shut down, decarbonisation programmes and engineering restrictions, and hence are all impacted by the commissioning timescales and limited life of the plant.

Therefore, we consider that the operator has made a valid request for a derogation under Article 15(4)(b) of the IED due to the technical characteristics of the installation and the short operational lifetime of any abatement plant.

5.4.3 ELVs

The derogation requests were for the extension of the periods for the current derogations until 31/12/2026 when the Appleby coke ovens will close. The derogation request was also for an ELV for dust from under-firing of 100 mg/m^3, although the modelling was based on an ELV of 50 mg/m^3. Following discussion with the operator and based on limited monitoring data, the proposed ELV for dust from under-firing was amended to 200 mg/m^3 as it was considered that there was no evidence that an ELV of 50 mg/m^3 or 100 mg/m^3 would be achievable.

The current ELVs, the BAT AELs and the operator's proposed derogated ELVs are shown in the tables below.

Current ELVs					
BAT	**48** **H_2S**	**49** **SO_2**	**49** **PM**	**50** **PM**	**51** **PM**
ELV mg/Nm^3 where applicable	5000 Daily average	No limit	Obscuration 50% Daily average	Pushing emission factor 0.2 (max) – Quarterly (13 week) reporting period mean 0.6 (max) – Weekly Mean	No limit
Correction factors e.g., O_2 ref conditions	Unknown	-	Unknown – see Schedule 6 Interpretation	None	-
Monitoring frequency	CEM	-	CEM	Weekly	-
Condition	2.3.5 Table S2.1	3.1.2 Sch. 3(c) Table S3.2	3.1.2 Sch. 3(c) Table S3.2	3.1.2 Sch. 3(c) Table S3.2	3.1.2 Sch.3(c) Table S3.2

BAT AELs					
BAT	**48** **H_2S**	**49** **SO_2**	**49** **PM**	**50** **PM**	**51** **PM**
BAT AELs **mg/Nm^3 where applicable**	300-1000 or <10 Daily average	200-500 Daily average	1-20 Daily average	<10 or <20 Daily average	25g/t Daily average
Correction factors e.g., O_2 ref conditions	Unknown	In relation to emissions from combustion sources subject to BAT-AELs for air emissions, the concentration at a temperature of 273.15K and at a pressure of 101.3 kPa, with correction for water vapour content and correction for an oxygen content of 3% for blast furnace hot blast stoves and 5% for coke oven underfiring	In relation to emissions from combustion sources subject to BAT-AELs for air emissions, the concentration at a temperature of 273.15K and at a pressure of 101.3 kPa, with correction for water vapour content and correction for an oxygen content of 3% for blast furnace hot blast stoves and 5% for coke oven underfiring	In relation to emissions from non-combustion sources subject to BAT-AELs for air emissions, the concentration at a temperature of 273.15K and at a pressure of 101.3 kPa, with correction for water vapour content	In relation to emissions from non-combustion sources subject to BAT-AELs for air emissions, the concentration at a temperature of 273.15K and at a pressure of 101.3 kPa, with correction for water vapour content
Monitoring frequency	CEM	CEM			

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Operator proposed ELVs until 31/12/2026					
BAT	**48** **H_2S**	**49** **SO_2**	**49** **PM**	**50** **PM**	**51** **PM**
Operator Proposed (mg/Nm^3) where applicable	No limit Controlled by sulphur content of the blended coking coal	5000 Daily average	200 Daily average	No limit	No limit
Correction factors e.g., O_2 ref conditions	None	In relation to emissions from combustion sources subject to BAT-AELs for air emissions, the concentration at a temperature of 273.15K and at a pressure of 101.3 kPa, with correction for water vapour content and correction for an oxygen content of 3% for blast furnace hot blast stoves and 5% for coke oven underfiring	In relation to emissions from combustion sources subject to BAT-AELs for air emissions, the concentration at a temperature of 273.15K and at a pressure of 101.3 kPa, with correction for water vapour content and correction for an oxygen content of 3% for blast furnace hot blast stoves and 5% for coke oven underfiring	None	None
Monitoring frequency	-	CEM	CEM	Six monthly (minimum of 2 months between monitoring)	Monitoring as agreed in writing with the Environment Agency.
Condition	Sch 3, table S3.2	Sch 3, table S3.2	Sch 3, table S3.2	Sch 3, table S3.2	Sch 3, table S3.2

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5.4.4 Demonstrating disproportionality of costs and benefits

Costs

The operator has satisfactorily demonstrated that the stated criterion would result in disproportionate costs for achieving the BAT AELs compared to the environmental impacts.

CBA

Five options were considered with four going forward to a CBA. In each case, an estimate of capital costs was also included. Operating costs were also considered.

1. Business as usual - The base case assumes ongoing operation of Appleby coke ovens until closure by 31/12/2026. This means that the current ELVs specified in the permit will be complied with until the current derogations end in 2022 and 2024 and the relevant BAT AELs will apply after this. The operator will not be able to comply with these BAT AELs.

   Capital expenditure would be at the minimum level to maintain operations until this date. Operating costs for other scenarios are defined relative to the operating costs of BAU.

2. BAT option - It was assumed that a COG de-sulphurisation unit would have been commissioned by 31/01/2022, through-wall leakage would be reduced, a pushing emissions abatement system would be commissioned and both quench towers rebuilt by 31/03/2024. In this case, there would be no breaches of the relevant BAT AELs after the current derogations have expired.

   The capital cost of installing a COG desulphurisation plant and other necessary enablers, such as improved de-tarring, at Appleby coke ovens is approximately £49M. The BREF quotes net operating costs of €9.2 per 1,000 Nm^3 COG treated with an absorptive process after offsetting the sale of elemental sulphur produced by the desulphurisation plant. The costs in the BREF refer to 2010 and inflation has increased these by approximately 20% since then based on UK deflators. Using an exchange rate of €1.12 to £1, this is equivalent to an operating cost of £9.83 per 1,000 Nm^3 COG at current prices. The total gas production at Appleby coke ovens in 2019 was 162M Nm^3, so the annual operating costs for this scenario would be £1.6M greater than for the BAU case. The cost of repairs to oven walls to reduce through-wall leakage is £50M, a pushing emissions abatement system is £18M and new quench towers are £8M each. Although the pushing emissions abatement system would require additional electricity for the extraction fans and possibly some replacement bags in the filter, a conservative assumption has been made that none of

these schemes would significantly increase operating costs above the BAU case.

3. Early build of COG de-sulphurisation plant - It may be possible to build the COG desulphurisation unit before the rest of a new coke plant so that gas from Appleby coke ovens could be treated in the new desulphurisation plant. This would avoid the need to build a plant that would operate for only five years at Appleby but there would be significant difficulties. Notwithstanding, it would take a minimum of 3 years to build this plant.

   The tentative location for a new coke plant would be at least 0.5 km from Appleby. New COG pipelines would have to be built to transfer gas from Appleby to the new COG desulphurisation plant and to transfer the cleaned gas required for under firing back to Appleby. These pipelines would be in use for no more than five years. A new coke plant would have a greater capacity than current operations at Appleby and therefore the new COG desulphurisation unit would be oversized to treat the gas arising from Appleby at present. The by-products plant at Appleby was not designed to clean the gas to the level required to feed into a COG desulphurisation unit and the residual levels of, particularly, tar in the current gas would damage the new plant. As a result, a proportion of the £49M spend at Appleby would still be required to improve the cleanliness of the COG, and any additional cleaning processes would be in use for no more than five years. No decision has yet been made whether to build a new coke plant, so if the new coke plant is not built, then the overall cost of building an oversized COG desulphurisation unit at least 0.5 km from Appleby would exceed the £49M above and would still only be used until closure by the end of 2026.

4. Preferred option - The decision to close Appleby coke ovens means that it is uneconomic to install the abatement equipment described above as it would operate for such a short period of time. The operator's preferred option is to **extend the existing derogations** to allow continued operation of Appleby coke ovens without additional abatement until it closes by 31/12/2026.

5. Move to electric arc furnace steel making - If the proposed derogations are accepted, then the mass of emissions released compared to the mass released if compliant with the BAT AELs would be higher. De-sulphurising the COG would potentially affect the SO_2 emissions from the whole site. The annual mass emission of SO_2 would fall from the current 5,312t to 4,010t, a reduction of 25%. The principal sulphur source, solid fuel in the sinter blend, would not be affected by COG desulphurisation.

   If BAT was fully implemented for under firing, pushing and quenching at Appleby coke ovens, the annual PM_{10} emission from those three sources might be expected to fall from around 209t (out of 605t total PM) per

annum to 10t per annum. In the context of the whole British Steel site, this represents a reduction of 11% in the overall PM_{10} emissions.

The CBA submitted by the operator has been reviewed and considered to support the derogation requests. The basis of some cost assumptions has been challenged and considered reasonable.

The costs have been compared using the Environment Agency's CBA tool V 6.21 which is based on HM Treasury's Green Book guidance. The results are summarised in terms of NPV. The costs of meeting the BAT AELs outweigh the monetised benefits in comparison to the proposed derogation (i.e., NPV < 0).

The estimate of the NPV of the BAT scenario is – £61.6M compared to that of the preferred option. This means that the costs of implementing BAT (both capital and operating costs) are greater than the monetised value of the pollutant emissions that would be prevented by £61.6M across the remaining lifetime of the coke plant. On this basis, the achievement of the BAT AELs as described in the BAT conclusions would lead to disproportionately high costs compared to the environmental benefits, which would meet the requirements for a derogation under Article 15(4) of the Industrial Emissions Directive.

The breakdown of the calculations is as follows:

- The NPV of the capital expenditure required to achieve all the BAT AELs would be £153.3M, considering the cost of capital and the discount factor applicable to future costs.
- The additional operating costs for the COG desulphurisation plant would have an NPV of £7.0M.
- The emissions of SO_2 and $PM_{2.5}$ that would be prevented by the application of BAT would have an NPV of £98.7M, considering the 2% annual uplift in damage costs above inflation.
- The overall NPV of installing the abatement necessary to meet the emission limits that would apply at the end of the current derogation periods is therefore £61.6M less than for the preferred option of extending the derogations to the end of 2026 (or the net cost at present values is £61.6M greater for the BAT option than for the preferred option).

The weighted average cost of capital (WACC) is consistent with what we would expect for the sector. WACC of 8% is a typical value for a steel company in Western Europe. This has been derived from the most recent annual accounts of Thyssen Krupp (8.5% WACC used for the Steel Europe division), Voestalpine (7.8% for the steel division) and Outokumpu (7.6% for European operations). The lifetime of the technology and the appraisal period are based on closure of the Appleby coke ovens by 31/12/2026.

The operator has provided a credible argument that the increased costs linked to the technical characteristics are disproportionate for achieving the BAT AELs. An

appropriate range of options were reviewed and those identified as technically viable were considered further. Viable options were taken forward for CBA, were adequately described in the CBA and the cost of the BAT AELs options were confirmed as disproportionate compared to the environmental benefits. The CBA using central assumptions shows negative NPVs for the BAT AELs of -£61.6 million and therefore the cost of compliance is disproportionate compared to the environmental benefit achieved.

The operator originally modelled for PM at an emission limit of 50mg/m^3 but has subsequently provided revised modelling at 300mg/m^3 (stated as an emission rate of 2.64 g/s in the revised modelling compared to that in the original modelling of 0.44 g/s), which is 6 times higher. All other inputs are as before as included in the text of the report plus an addition of an extra receptor as identified by the EA (Humber Estuary SPA/SAC/Ramsar).

5.4.5 Risks of allowing the derogation

There are no identified significant negative environmental impacts of allowing the derogations compared with the impacts of achieving the BAT AEL. However, increased emission limits potentially increase the level of emissions which in turn increases the impact of these emissions on the environment and contribute to a deterioration in air quality.

Annual emissions

The mass of emissions released compared to the mass released if compliant with the BAT AELs would be higher. De-sulphurising the COG would potentially affect the SO_2 emissions from the whole site. The annual mass emission of SO_2 would fall, but as the principal sulphur source is solid fuel in the sinter blend, the overall reduction would be limited as this source would not be affected by COG desulphurisation.

If BAT was fully implemented for Battery under-firing, coke pushing and quenching at Appleby coke ovens, the annual PM_{10} emission from those three sources might be expected to fall. However, in the context of the whole British Steel site, this would only be a limited reduction in the overall PM_{10} emissions.

Therefore, as the increased annual mass emissions of SO_2 and PM_{10} arising as a result of the derogations is limited in comparison to emissions for the site as a whole, we do not consider that this increase will have a significant impact.

Predicted impacts

The operator carried out air dispersion modelling using the ADMS (version 5.2) modelling software. The operator modelled emissions at the proposed derogated limits and at the BAT AELs for SO_2 and PM.

Modelling of emissions showed that the assumed current and BAT SO_2 emissions scenarios predictions are unlikely to exceed the short-term or long-term environmental standards.

Short-term SO_2 concentrations could reduce by more than 50% at some sensitive receptor locations, or as little as 0% at other locations with COG de-sulphurisation. The level of reduction is highly dependent on which SO_2 sources dominate the short-term impact at that location.
Annual mean SO_2 concentrations are predicted to be reduced by up to 55% at nearby protected conservation areas under COG de-sulphurisation.

Predictions under the current SO_2 emissions scenario compare favourably with the measured concentrations at Rowland Road AURN in 2019 indicating the model is likely to be a reasonable representation of the 2019 SO_2 emissions.

Initially the operator modelled PM emissions at a limit of 50 mg/m^3 and at the BAT AEL. However, we considered the proposed limit of 50 mg/m^3 to be unachievable. We asked the operator to re-model at 300 mg/m^3 which represented the worst-case concentration of total particulates from the limited annual periodic monitoring provided (no daily mean monitoring has ever been done). Modelling was carried out on the basis that all the emission was PM_{10} and that all the emission was $PM_{2.5}$ in order to represent the worst-case scenario. We reviewed their modelling and agreed that this represented the worst-case. The increase in the PCs at receptors, because of the increase in the modelled PM concentration of 300 mg/m^3 compared with the modelling based on a limit of 50 mg/m^3, is not significant and does not change the conclusions of the initial modelling. In discussion with the operator an ELV of 200 mg/m^3 has been set as the operator considered that emissions of particulates will be below this limit.

The PM_{10} PCs are all <10% of the daily mean standard. The maximum PM_{10} and $PM_{2.5}$ PCs are 0.62 µg/m^3 at Low Stanton which are 1.55% and 3.1% of the relevant annual mean standards respectively (using the limit for $PM_{2.5}$ of 20 µg/m^3 rather than the 25 µg/m^3 that is referenced in the operator's modelling reports). In the original modelling based on 50 mg/m^3 the PCs were 1.17% and 2.35% of the standards at this same location.

Although specific background concentrations are not provided in either report, monitoring at the Rowland Rd AURN gives a concentration of 20 µg/m^3 for PM_{10}. The operator concludes in their report that this suggests that emissions of particulates from the coke ovens are not likely to exceed the environmental standards and that these emissions do not contribute significantly to the local level of these pollutants. The increase in the PCs at receptors because of the increase in the modelled PM concentration of 300 mg/m^3 is not significant and does not change the conclusions of the previous modelling.

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We find that comparing predictions to measured PM_{10} concentrations at Rowland Road AURN coke making processes are only likely to be a small contributor. Our worst-case prediction is around 1 µg/m^3.

The 90.41st percentile daily mean PM_{10} PCs from coke making processes are insignificant (less than 10% of the daily mean standard) under current emissions scenarios.

Annual mean PM_{10} PCs from coke making processes could be just over the long-term insignificance criteria (1% of the ES) under the current emissions scenario and with our higher coke oven under firing emissions. Annual mean $PM_{2.5}$ PCs could be over 2% of the ES at some assessed receptor locations under the current emissions scenario and with higher coke oven under firing emissions.

The PCs are likely to be well below the insignificance criteria compared to the long-term and short-term PM_{10} and long-term $PM_{2.5}$ environmental standards with BAT implementation. The level of reduction from BAT implementation on PM_{10} and $PM_{2.5}$ concentrations could be over 90%.

On review, we consider that allowing the proposed derogations would not cause any further significant pollution or prevent a high level of protection of the environment as a whole to be achieved. Although dispersion modelling has demonstrated that application of BAT would significantly reduce ambient SO_2 concentrations in the vicinity of the steelworks, measured levels are already well below the relevant air quality standards. In the case of PM_{10}, application of the relevant BATs would have much less effect on local air quality because the derogated sources at the coke ovens contribute only a small proportion of the overall measured levels. There is therefore no significant risk of impact from emissions and no overriding air quality issue that might prevent the existing derogations being extended.

Summary of the risks of allowing the derogation

The operator has demonstrated that the costs of achieving the BAT AELs are disproportionate to the environmental benefits and that any abatement equipment required to be fitted to meet the BAT AELs would only operator for a short period of time, if at all, before closure of the Appleby coke ovens by 31/12/2026.

Although continuation of emissions at the current derogated limits until closure of the Appleby coke ovens by 31/12/2026 will result in higher emissions of SO_2 and PM than if emissions were at the BAT AELs, modelling has demonstrated that the impact of emissions at the proposed derogated limits are unlikely to result in breaches of the relevant environmental standards.

The operator has demonstrated that the assessment of derogation impacts, considering model uncertainties and the accuracy and precision of the monitoring

equipment versus discerning improvements in local air quality due to the implementation of BAT is likely to be difficult to measure on the ground.

On this basis, we agree with the operator's conclusion that there is no overriding air quality issue that has prevented the derogations being granted.

Final considerations

We have set the derogated ELVs, where applicable, in table S3.2 of the permit and these will apply until the plant closes by 31/12/2026.

Based on the information in the application, our assessment of the derogation proposals and responses received during consultation, we consider that we need to include improvement conditions and other changes to monitoring requirements, as follows:

IC10a and IC10b.

Allowing the current derogated emissions of SO_2 and PM from the coke ovens above the BAT AELs to continue until closure by 31/12/2026 means that emissions of other pollutants for which there are no BAT AELs will also be higher than if appropriate abatement was in place to meet the BAT AELs. We have set IC10a in table S1.3 of the varied and consolidated permit that requires the operator to submit proposals for monitoring of pollutants emitted from the Coke Ovens for which no BAT AEL is set and to carry out the agreed monitoring. We have required this as all pollutants from the operation of the Coke Ovens have not been characterised. We have set IC10b to require the operator to submit a report of the monitoring agreed under IC10a that specifies any emission limits and justifies any additional control measures. We have required this in order to minimise the pollution from this activity.

IC12a and IC12b.

The current derogation for PM emissions from coke oven under-firing does not include a daily average ELV. To date compliance assessments have been based on percentage obscuration. During the determination of the proposed derogated ELV for PM from coke oven under-firing we asked the operator to provide information regarding the emissions of PM and whether there was any correlation between the PM emissions as a numerical figure and those for percentage obscuration. The operator does not monitor PM emissions from coke oven under-firing as a daily average, but rather carries out annual periodic monitoring and, therefore, there was only a limited data set available. This limited data was not considered to be sufficiently reliable to define a specific correlation between the percentage obscuration and PM concentration in the emission, although it did provide a trend. As a result, we have included IC12a and IC12b in table S1.3 of the varied and consolidated permit that requires the operator to submit proposals for the monitoring of PM emissions from the Appleby coke ovens. This is to determine whether it is possible to monitor PM emissions continuously as a

concentration and to determine if the proposed derogated limit for PM of 200 mg/m^3 as a daily average for coke oven under-firing is achievable.

Once the proposals for monitoring have been agreed and carried out in accordance with IC12a, the operator is required to either justify the current derogated ELV or propose a lower ELV.

Changes to monitoring at the Coke Ovens

We have added PAH monitoring and made changes to obscuration as a result of the derogations.

- PAH monitoring - We consider that allowing the increased emissions of PM as a result of the coke oven derogations could also increase the emissions of other pollutants, including PAH for which no BAT AELs apply. Currently other emissions from coke oven under-firing are not monitored other than those for which there is a BAT AEL. We have included a requirement to monitor PAH initially every 6 months in table S3.2 and then in accordance with the frequency agreed under IC10a.
- Changes to Obscuration monitoring - Currently there is no ELV set for PM for coke oven under-firing except that the BAT AEL will apply when the current derogation period expires. However, a limit for obscuration is applicable for PM. As a result of the derogation applied for under this variation, we have set an ELV for PM which applies until the plant closes by 31/12/2026. The operator has not been able to demonstrate a strong correlation between obscuration and PM concentrations mainly due to the absence of monitoring data in respect of PM emissions.

  Once IC12a, IC12b and IC12c have been complied with, obscuration will be carried out as a process monitoring requirement as specified in the new table S3.10 we have included in the varied and consolidated permit. We consider that as obscuration relates to the darkness of the emission from the plant it is a useful way of determining how effective the operation of the plant is. It is also an indicator of amenity impact as significant dark smoke can result in complaints.

5.5 Annex to the variation notice/permit

The applicability of Article 15(4), results of our assessment and justification for permit conditions imposed are documented in an annex to the variation notice/permit in accordance with the requirement of IED Article 15(4) as described above.

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6. Consultation Responses

6.1 Consultation on the application

The following summarises the responses to consultation with other organisations as listed in section 4.3 above, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

We have not received any comments from members of the public or any other interested party or organisations.

Response received from: Severn Trent Water.

Brief summary of issues raised: No comments to make.

Summary of actions taken: None required.

Response received from: North Lincolnshire Council Planning/Environmental Health.

Brief summary of issues raised:

Coke making derogation

CM1. No justification for why 2019 was chosen as the year on which emissions were based, no indication that this is representative or explanation whether emissions will vary for the period when the derogation applies.

CM2. Unclear what parameters and assumptions were considered for the 2015 modelling so unclear whether these are still valid.

CM3. Unclear why data from the years 2012 to 2014 were considered in the modelling and not more recent data and why several years of data has been used to assess inter-year variations.

CM4. It is unclear why only 3 of the 5 Local Authority monitoring stations were used in the modelling.

CM5. Concentrations of PAH are high in the area and the Appleby Coke Ovens are a significant contributor, so it is unclear why PAH emissions have not been considered in the assessment.

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Sinter Plant derogation

SP1. The operator states the modelling has been based on a previous modelling exercise from 2018 and it isn't clear what parameters from 2018 have been used and whether these assumptions are still accurate.

SP2. Unclear why data from the years 2012 to 2014 were considered in the modelling and not more recent data and why several years of data has been used to assess inter-year variations.

SP3. It is unclear why only 3 of the 5 Local Authority monitoring stations were used in the modelling.

SP4. No justification for the ELV of 115 mg/m^3 has been provided which is three times higher than the current limit. It isn't clear what the existing emissions from the plant are and it would not be justified to set a limit higher than actual emissions.

BOS Plant Stack A58

BOS1. It is unclear why 2019 has been selected as a representative year. Several years of data should be considered for a robust assessment and it is not possible to comment on the conclusions in the absence of this.

BOS2. It is not clear how the annual averages for the original, current and proposed stack height have been calculated.

BOS3. No justification for why a stack height of 36m has been chosen.

BOS4. The model outputs have not been included in the report.

Summary of actions taken:

Coke making derogation

See section 5.4 above.

CM1. The SO_2 emissions have been based on 2019 distribution of gaseous fuels to processes around the site and the sulphur content of the fuels. This may not represent worst-case short-term SO_2 emissions as the fuel distribution is based on annual consumption rates. However, this approach is valid for the purpose of comparing current and BAT emission scenarios.

The emission rates included in the air dispersion modelling report are based on the proposed derogations emission limit values or the BAT AELs. Therefore, as the typical emissions rate will be below this, we consider it represents a worst case scenario.

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For particulates we considered that the proposed emission concentration of 50mg/m^3 is unlikely to be representative of emissions. Therefore, we asked the applicant to remodel using an emission concentration of 300mg/m^3 as this would be more representative of a worst case for particulate emissions from the coke ovens.

CM2. We have undertaken an audit of the air dispersion modelling results and checked the sensitivity of the results using our own parameters for this location. While we may not agree with all the model input parameters used and our numerical values are not consistent with those predicted by the operator's modelling, we are satisfied that the conclusions reached are appropriate as the sensitivity modelling does not change the conclusions made by the operator in their modelling.

CM3. We require a minimum of three years of modelling and recommend that 5 years is used. As part of our audit we have undertaken sensitivity analysis using different meteorological data for different years. This did not significantly change the conclusions reached in the operator's modelling.

CM4. The operator originally assessed impacts at discrete receptors representing air quality monitoring sites Rowland Road, Low Santon and East Common Lane. They also made predictions at Risby Warren SSSI, Broughton Far Woods SSSI and local nature site Ashby Ville LNR, Sawcliffe LNR and Spring Wood Ancient Woodland. The operator later provided further predictions at six receptors in Scunthorpe town (Scunthorpe 1 to 6) which were used in a previous modelling study following a request for further information by a schedule 5 notice in March 2021. We have included Scunthorpe 1 to 6 receptors in our check modelling and carried out sensitivity analysis using our own background data and though we may not agree with all the operator's input parameters we agree with conclusions of their report.

CM5. As there is no BAT AEL for PAH there is no BAT AEL to derogate from so we have not required any assessment of pollutants other than those for which a derogation from the BAT AELs has been applied.

However, we recognise that more work is required to assess the impact of other pollutants. Therefore, we have set improvement conditions IC10 a and IC10b in table S1.3 of the permit requiring the operator to monitor, asses and report emissions of other pollutants, which will also include PAH. In addition, we have included a requirement to monitor PAH and dioxins from the coke ovens in table S3.2 of the varied and consolidated permit.

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Sinter Plant derogation

See section 5.3 above.

SP1. See CM2 response above.

SP2. See CM3 response above.

SP3. See CM4 response above.

SP4. We asked the operator to justify the proposed derogated emission limit in our schedule 5 notice. The proposed limit of 115 mg/m^3 is the limit set in the permit prior to the review of the permit against the BAT C. Although an acceptable justification was not provided, subsequent review of the operation of the plant, its inputs and the optimisation of the plant suggested that a lower limit of 100 mg/m^3 was more appropriate. Therefore, we have agreed the derogated limit from the BAT AEL as 100 mg/m^3.

BOS Plant Stack A58

See section 4.8 above.

BOS1. We have undertaken an audit of the air dispersion modelling results and checked the sensitivity of the results using our own parameters for this location. While we may not agree with all the model input parameters used and our numerical values are not consistent with those predicted by the operator's modelling, we are satisfied that the conclusions reached are appropriate as the sensitivity modelling does not change the conclusions made by the operator in their modelling.

BOS2. The annual average PCs at receptors have been modelled based on the continuous emissions of particulates from the stack at a concentration of 50 mg/m^3, which is the limit set in the permit for emission of particulates from this stack. This represents a worst case as the back-up system that vents through this stack is not expected to operate for more than 30 days in a year. The same input parameters have been used for each assessment with the exception of the change in stack height.

BOS3. We asked the operator to provide justification for the stack height chosen of 36m via a schedule 5 notice dated 09/12/2021. The operator provided further modelling at stack heights at 1m intervals between 36m and 45.7m, with 45.7m and costs for different options. We have assessed the modelling and justification for the stack height chosen and agree with the conclusions. See section 4.8 above.

BOS4. The modelling has provided the results of the worst case impacts. We have carried out an audit of the modelling including sensitivity checks and

did not require any further information from the operator as we are satisfied that the results in the report represent the worst case.

Response received from: UK Health Security Agency (formerly Public Health England - PHE).

Brief summary of issues raised:

Site Air Quality Management Plan

PHE expects regulation to aim to ensure concentrations of emissions do not exceed health based standards. PHE recommended further action to reduce exposure from PAHs and particulate matter, both PM10 and $PM_{2.5}$.

The Plan should include quantitative information on the source apportionment of pollutants and should include the mechanisms for planned actions and outcomes so the link between improvements and air quality is stated for each action.

The proposed amendment would potentially restrict reductions from a large number of sources as the operator states that it would be unacceptable to require them to achieve emissions below the BAT AELs.

Appleby Coke Ovens derogation (ACO)

ACO1. It is unclear whether the commitment to close the ACO in 2026 is binding or whether there could be further derogations requests.

ACO2. The cost benefit assessment should include sensitivity analysis to reflect continued operation after 2026 if this is possible.

ACO3. There is no evaluation of the contribution of the coke ovens to PAH concentrations which consistently exceed National Air Quality Objectives.

ACO4. There is no reflection of the Air Quality Management Area.

ACO5. Confirmation that the meteorological data for the years 2012-2014 used in the modelling reflect a reasonable worst case.

ACO6. The modelling only shows impacts at a limited number of receptors and it would be helpful if the report could highlight the most affected receptor as a new row.

ACO7. PHE trusts that the assumptions used will be validated, such as the proportions of PM_{10} to $PM_{2.5}$ used, efficiency and costs of abatement and conclusions of the cost-benefit analysis, and note:

- The high damage cost sensitivity reported a positive net present value.
- Total health benefits from reduced emissions relate to all emissions of emitted substances. The benefits of reducing emissions of other pollutants are absent from the analysis and discussion.
- Derogation timelines were not discussed or subject to sensitivity analysis and alternative options (early commissioning of coke oven gas desulphurisation for a future replacement plant or move to electric arc furnace) are ruled out and not assessed, but the derogation conclusion may have a bearing in their inclusion.
- Defra guidance recommends the use of a more detailed impact pathway approach.

Sinter Plant Derogation

SP1. Unclear whether the commitment to install a bag filter in 2023 is binding or whether there would be further derogation requests.

SP2. The assertion that there is “no over-riding air quality issue that might prevent the existing derogation being extended, is made without discussion of the local context – elevated PAHs, the AQMA.

SP3. The inputs to the modelling and cost-benefit analysis should be validated.

SP4. A limited number of receptors have been used.

SP5. The high damage cost sensitivity reported a positive net present value.

SP6. Derogation timelines were not included.

SP7. Defra recommends the use of a more detailed impact pathway approach.

Oily Millscale Pad – general assurances are provided regarding waste storage and specific requirements have not been addressed.

Raw materials – need to consider the potential implications of changes in material use for emissions.

Zinc coating – Further details of the H1 assessment showing that emissions are screened as insignificant are not provided. It is not clear if there are one or two new emission points.

Replacement flare stack A307A – There is no accompanying assessment of impact of emissions and need to confirm these are lower than existing flare.

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Removal of emission limits from BOS flare – There is no information on the significance of emissions and need confirmation that there are no implications for previous assessments.

Updated stack height for BOS back up ventilation A58 – This will result in increased ground level concentrations. Only limited number of receptors included and need short and long term concentrations at most impacted receptors, confirmation of 2019 as representative of emissions. Support exploration of diversion to A61 if it would reduce emissions.

Biological effluent treatment plant derogation – The request does not evaluate potential impacts on human receptors. It implies that compliance with BAT AELs will be solved by closure of the Appleby coke ovens.

Summary of actions taken:

Site Air Quality Management Plan (AQMP)

We have changed the wording of the condition as requested by the operator, and an AQMP is required to be submitted by 30th June each year.

The condition requires the operator to include appropriate measures aimed at addressing both diffuse and point source emissions of PM and PAHs targeted to address the most polluting sources with individual measures to prevent or minimise those emissions with a significant contribution to exceedance of any air quality standards. In addition, the operator is required to provide written descriptions of the improvements made each year and include action plans and planned improvements for the coming year. Performance and success of previous years measures is required to be supported by data.

We consider that this condition does require the operator to identify the most polluting sources of emissions, provide measures for reducing these and consider the success of the planned improvements using data. Therefore, the condition does require quantitative information to be used for demonstrating improvements and this will demonstrate where improvements to air quality have been made.

We have not made any changes with respect to the operator proposing that it is made clear that they are not required to achieve emissions below the BAT AELs. There are no BAT AELs for diffuse emissions and we have set BAT AELs for point source emissions, except for the derogated limits which are time limited. We do not consider that any changes are required.

Appleby Coke Ovens derogation

See section 5.4 above.

ACO1. There is a clear commitment from the operator to close the plant in 2026. There is no alternative proposal for making improvements to the plant so

that it can meet the BAT AELs. Failure to close the plant by the deadline will result in breaches of the permit. We would not consider an extension to the derogation on the basis of delays.

ACO2. The operator has committed to closure of the plant by 2026 and, although the operator could apply for a further derogation to extend the deadline, it is unlikely that we would consider it. Therefore, we do not consider it necessary for the operator to provide any further sensitivity analysis for different timescales.

ACO3. There is no BAT AEL for PAH and it does not form part of the derogation request. We have, however, inserted improvement conditions (IC10a and IC10b) into the permit requiring the operator to assess emissions of other pollutants, including PAHs. We have also included a requirement to monitor PAH and dioxins in Table S3.2 of the permit.

ACO4. A 12 x 13 km area with grid spacing of 100 metres was used in the modelling to capture the peak ground-level concentrations attributable to emissions from the coke ovens. This grid covers the eight main sensitive receptors but also includes the wider AQMA. This assessment is also based on a worst-case highly conservative scenario for emissions. The conclusions are that the plant will not contribute significantly to the AQMA, therefore the designation and evaluated concentrations in this area have been taken into account.

ACO5. The minimum number of years we require for inclusion in modelling is 3 years, but we recommend 5. We have undertaken a sensitivity analysis using different meteorological data and for a longer period. This did not significantly change the conclusions reached in the operator's dispersion modelling.

ACO6. The operator provided an addendum to their modelling dated March 2021 which included additional sensitive receptors. We have undertaken an audit of the modelling along with sensitivity analysis and are satisfied that the proposals will not result in a breach of the air quality standards at sensitive receptors.

ACO7. We have assessed the operator's cost-benefit analysis (CBA) including the proportions of particulate matter used and are satisfied that the CBA has considered the worst case. We have reviewed the CBA and:

- The operator has utilised the higher values for damage costs in their CBA sensitivity analysis, which has the effect of increasing the benefits greatly leading to a positive NPV. These higher damage cost values are however significantly higher than the central value and the costs are based on a worst-case scenario. As the central and the low damage costs are both negative, with the central being minus 61.6 NPV. Therefore, taking into

account the assessment of a worst-case scenario, we agree with the conclusions of the operator.

- The relevant BAT Conclusions and BAT AELs only affect SO_2 and PM emissions, so only those substances were assessed. NOx emissions and impacts will be the same whether the operator undertakes COG desulphurisation, reduces through-wall leakage and rebuilds the quench towers or not (same for most other species). The derogation methodology looks at the differences between BAT and the proposed option, and in the case of species other than SO_2 and PM, there will be no difference.
- Evidence supplied by the operator demonstrates that there are technical grounds for approving the derogations as the remaining operational lifetime is such that any additional abatement equipment would operate for only a short period of time or not at all. Limited space on the working plant (note that a coke oven plant has to remain in operation to maintain its physical integrity), makes it unrealistic to expect COG de-sulphurisation, coke pushing, quenching and under firing particulate matter arrestment build to occur simultaneously. A best-case scenario is an overlap in the design phase resulting in a continuous project timeline for complete retrofit to meet BAT of 5 years, 4 months, taking us beyond the closure date. Therefore, it was not considered relevant to require the operator to assess the sensitivity of different timelines and alternative options are not possible.
- The Defra tool cited is intended to be used to inform national policy development to compare costs of interventions with benefits and guide national policy. It is not used during permit determination to inform regulatory positions for specific installations.

<u>Sinter Plant Derogation</u>

See section 5.3 above.

SP1. The operator originally proposed a time limited derogation in respect of PM emissions from the Sinter Plant until 30/09/2023. However, the operator submitted a revised proposal on 14/04/2022 for a proposed derogation until 30/09/2024. The operator revised the timescale for installing a bag filter due to the availability of the technology supplier.

There is a clear commitment from the operator to fit the fabric (bag) filters and failure to install them could lead to enforcement proceedings as the varied permit includes an improvement condition requiring British Steel to install the fabric (bag) filter by 30/09/2024. The operator does have the right to submit further variation and derogation applications, and these would be assessed on their own merits.

SP2. No further assessment is required as a 12 x 13 km area with grid spacing of 100 metres was used in the modelling to capture the peak ground-level concentrations attributable to emissions from the sinter plant main stack. This grid covers the eight main sensitive receptors but also includes the wider AQMA.

Dispersion modelling has demonstrated that the impact of dust emissions at the proposed interim ELV is not significant and measured levels are already well below the relevant air quality standards. Therefore, there is no overriding air quality issue that might prevent the derogation being granted.

As the derogation request was in relation to particulate matter, there is no requirement to consider other pollutants as part of this assessment. However, in the revised derogation justification, the operator carried out an assessment of emissions of dioxins/furans and PAHs, in the form of benzo [alpha] pyrene, together with dust emissions on the basis that these pollutants are associated with dust.

SP3. We have carried out an audit of the air dispersion modelling and have assessed the CBA. We have carried out our own sensitivity analysis and have considered that the modelling and CBA represent the worst case and the conclusions can be used in our determination.

SP4. In our audit of the modelling submitted with the original derogation proposal we considered an additional six sensitive receptors around Scunthorpe town. The operator included these additional receptors in the modelling submitted with the revised derogation proposal. Modelling results indicated that emissions are not significant at all receptors.

SP5. The operator has utilised the higher values for damage costs in their CBA sensitivity analysis, which has the effect of increasing the benefits greatly leading to a positive NPV. These higher damage cost values are however significantly higher than the central value and the costs are based on a worst-case scenario. As the central and the low damage costs are both negative with the central NPV being minus tens of millions of pounds, considering the assessment of a worst-case scenario, we agree with the conclusions of the operator.

SP6. The improvements will be made by 30/09/2023 and we have included improvement conditions (IC11a and IC11b) in the varied permit requiring the operator to have installed the bag filter by this date. The operator did not consider shorter timelines because the date identified is the earliest date identified by the manufacturer and designers by which the new fabric (bag) filter can be designed, built and commissioned. The derogation will be time limited until the end of September 2024 as requested.

SP7. The Defra tool cited is intended to be used to inform national policy development to compare costs of interventions with benefits and guide national policy. It is not used during permit determination to inform regulatory positions for specific installations.

Oily Millscale Pad – We have asked the operator for more information regarding the operations carried out in this area and what measures are taken to prevent and minimise pollution. We are not completely satisfied that the operator will have appropriate measures in place to prevent pollution, so we have included an improvement condition (IC14) in Table S1.3 that requires the operator to review the surfacing for all areas where hazardous waste is stored against the requirements of BAT 7 – see section 4.8 above.

Raw materials – The operator is not proposing a change to the raw materials that can be used at the site but rather to the way in which the permit references them. Currently the permit includes a list of raw materials in table S2.1, some of which have specifications and some of which don't. Usually this table, as referenced by condition 2.3.5 of the permit, is used to specify limits on certain parameters on raw materials that can be used to ensure that the raw materials used do not impact on emissions. A list of all raw materials used by the operator is provided in the application and this list forms part of the operating techniques. Where new raw materials are proposed, the operator is required to notify us of the change in accordance with condition 4.3.5 and provide an assessment of the impact of that change on emissions. Where there is a significant impact the operator would be required to submit a variation application together with supporting information including a risk assessment.

In our request for information in the schedule 5 notice dated 09/12/2021 we asked the operator for a complete list of raw materials and any specifications that are required for that raw material. The operator provided a list which was subsequently re-submitted as a document in their EMS on 02/08/2022. This document is referenced in table S1.2 of the varied permit and forms part of the operating techniques. Where a specification for the raw material is needed, the raw material has been included in table S2.1 of the varied permit together with the required specification. In future if the operator wants to accept new, or change existing, raw materials, they will need to notify us in accordance with condition 4.3.5 and justify the change.

Zinc coating – The operator requested on 01/12/2021 that the new zinc coating process be withdrawn from the application. Therefore, we have not considered this activity further.

Replacement flare stack A307A – We are satisfied that the replacement flare stack is more efficient than the existing one and, therefore, emissions will be no worse, and are likely to be better than those from the current flare. Therefore, we have not required a detailed assessment of emissions. We have added information to table S3.0 to clarify that this is a replacement stack and therefore the two stacks cannot operate concurrently.

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Removal of emission limits from BOS flare - The particulate ELVs have been removed from the BOS primary gas cleaning emission points (A54, A55 and A56). There are no limits for this plant specified in the BAT C and therefore, we agree with the operator's view that it is not appropriate to set limits for these and that it is not safe to monitor these emission points.

Updated stack height for BOS back up ventilation A58 - The annual average PCs at receptors have been modelled based on the continuous emissions of particulates from the stack at a concentration of 50 mg/m^3, which is the limit set in the permit for emission of particulates from this stack. This represents a worst case as the back up system that vents through this stack is not expected to operate for more than 30 days in a year.

We have undertaken an audit of the air dispersion modelling results and checked the sensitivity of the results using our own parameters, including different meteorological data, for this location. While we may not agree with all the model input parameters used and our numerical values are not consistent with those predicted by the operator's modelling, we are satisfied that the conclusions reached are appropriate as the sensitivity modelling does not change the conclusions made by the operator in their modelling.

We asked the operator to confirm their intention to divert emissions to the alternative emission point A61 in our schedule 5 notice dated 09/12/2021. Although the operator did provide some information regarding this proposal there was no concrete commitment to pursuing this proposal. As a result, we asked the operator to justify the stack height chosen taking into account the costs of extending the stack to its original height and replacing the stack altogether and to assess the impact at receptors at different heights.

We have assessed this additional modelling and are satisfied that in addition to the safety considerations, it is not cost effective to extend the height of the stack back to the original 45.7m or to construct a new stack as the reduction in predicted process contributions at receptors as a result of the increased height is minimal. The PCs at receptors are insignificant at a stack height of 36m.

Biological effluent treatment plant derogation – The operator withdrew the application for a derogation in their letter dated 01/12/2021. Therefore, we have not considered this further.

Response received from: Anglian Water.

Brief summary of issues raised: Confirmed they are not the sewerage undertaker and that Severn Trent Water are. They had no concerns regarding discharge of trade effluent and that they are not aware of any designated sites which could be impacted in which they had an interest.

Summary of actions taken: None required.

6.2 Consultation on the amendment to the application

The operator submitted a revised assessment in relation to the derogation for particulate emissions from the Sinter Plant on 14/04/2022 which required re-consultation.

The following summarises the responses to this re-consultation with other organisations as listed in section 4.3 above, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

Response received from: UK Health Security Agency

Brief summary of issues raised:

1. The applicant proposes 115 mg/m^3 as an interim Emission Limit Value (ELV) for total PM, but the selection of that particular value (which is ~3 times higher than the reportedly unreachable current 40 mg/m^3 ELV and ~8 times higher than the 15 mg/m^3 ELV proposed from Oct 2024) is not further explained.

2. Meteorological data from 2012-2014 is used in the dispersion modelling assessment. The basis for selection of these years (and whether they are a representative worst-case) is not discussed.

3. The background concentrations used in the assessment are not restated, so predicted concentrations are assumed to be process contributions.

4. As there is no air quality standard for dioxin and furan concentrations, more detailed assessment of human uptake would be required to judge the significance of exposures by comparison to health criteria such as Tolerable Daily Intakes.

5. For PAHs, the applicant compares predicted environmental concentrations to the Fourth Air Quality Daughter Directive target value of 1 ng/m^3 for the annual mean concentration of benzo-a-pyrene (B[a]P), rather than the National Air Quality Objective for PAH (annual mean of 0.25 ng/m3 B[a]P in ambient air.

6. The site is associated with a longstanding Air Quality Management Area (AQMA) due to elevated local concentrations of PM.

7. There is no threshold for health effects associated with dust and NO_x and any increase in emissions is associated with a health burden. Ambient concentrations of PAHs exceed the objective values and there was a breach in the dioxin limit form the Sinter Plant stack.

8. Comments on CBA:

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a) Sensitivity analysis focussed on BAT AEL option and indicates in some scenarios – low operating costs, high damage cost – complying with BAT realises net benefits.

b) Timelines are not explored in the sensitivity analysis.

c) The BAT scenario considers local health benefits with reduced emissions; overall (global) health benefits would be reduced is transboundary impacts of iron pellets production abroad were included.

9. Recommendations:

a) Use of Defra's impact pathway approach to air quality appraisal.

b) Any derogation is time limited with interim limits that incentivise minimisation of emissions before abatement is upgraded.

c) Consider whether permit conditions can proportionally reduce emissions from other sources in order to address health damage costs associated with higher emissions.

d) Expect continued dialogue with EA on any dioxin breaches, mitigation and health impact assessment.

Summary of actions taken:

1. The proposed derogated ELV of 115 mg/m^3 is the limit set in the permit prior to the review of the permit against the BAT C. Based on technical considerations we have set the derogated ELV for PM as 100 mg/m^3 as we consider that this is achievable.

2. As part of our audit of the original Sinter Plant derogation, we have undertaken sensitivity analysis using different meteorological data for different years. This did not significantly change the conclusions reached in the operator's modelling. Therefore, we consider that the meteorological years chosen are acceptable.

3. The predicted concentrations stated in the report are process contributions.

4. As part of the revised impact assessment for the revised derogation the operator has carried out an assessment of the impact from emissions of other pollutants including dioxins and furans. In order to determine the impact on human health, a detailed human health risk assessment would be required, but we do not consider this to be necessary. The derogation is not proposing a higher emission limit for dust than that applicable prior

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to the setting of BAT AELs resulting from the implementation of the BAT C and, in fact, we are setting a lower derogated ELV. As emissions of dioxins and furans are linked to emissions of dust, this means that there is no increase in the emissions of dioxins and furans compared with the current levels.

We have not agreed to the operator's proposal to reduce the monitoring frequency for dioxins and furans and have included an IC in the varied and consolidated permit that requires the operator to provide a report justifying any reduction in the monitoring frequency for dioxins and furans.

5. The operator should have used the lower objective value in the assessment. However, we have not required the operator to revise their assessment as the derogation relates to emissions of dust and not to PAHs. The operator proposed that the derogated limit for dust was the limit that applied prior to the permit review that implemented the BAT C, so there is no increase in the emissions of dust as a result of the derogation hence no increase in PAH emissions. We have reduced the derogated ELV for dust from the operator's proposed limit of 115 mg/m^3 to 100 mg/m^3 as we consider that this emission limit is achievable. As discussed in section 5.3 above, we have agreed to the derogation in relation to dust emissions from the Sinter Plant as the derogation is for a specific period, the operator has proposed to install a bag filter which will meet the BAT AEL and the CBA demonstrates that the cost of closing the Sinter Plant, which is the only option to meet the BAT AELs prior to the installation of the abatement plant, is disproportionally high compared to the benefits.

6. The 12 x 13 km area with grid spacing of 100 metres was used in the modelling to capture the peak ground-level concentrations attributable to emissions from the sinter plant main stack and the AQMA is included in this grid. The modelled process concentrations across the grid and at the receptors were not significant.

7. The operator's proposed derogated ELV (which we have reduced) is the limit that applied prior to the permit review that implemented the BAT C so there is no increase in emissions as a result of this derogation. Emissions of PAHs and dioxins are associated with emissions of dust but as the limit for dust is not being increased there is no corresponding increase in the emissions of PAHs and dioxins. We have included IC13 in the varied and consolidated permit in order for the operator to continue to monitor dioxins and furans quarterly during the period of the derogation and to submit a report justifying any reduction in the monitoring frequency.

8. Points a) and b) are addressed in points SP5 and SP6 of our response to the first consultation (see section 6.1 above).

If the operator had to consider global impacts or benefits from the BAT option (temporarily closing the sinter plant) then this would also have to be done for each of the different options. Global impacts are taken account of through assessing global warming potential for the different options, although these are not directly related to health impacts.

The CBA tool applies damage costs to emissions to air and these could be applied in relation to the difference in emissions from the production of iron ore pellets and production of sinter at the Scunthorpe site. However, these damage costs would not take account of the impact of disposal of wastes from the site that are currently used in the sinter process in the BAT option and this would, therefore, not be a fair comparison.

The operator has provided some information regarding annual emissions from the production of sinter at their site as compared to emissions from the production of iron ore pellets. This shows that annual emissions of some pollutants from the production of iron pellets are less than those from the production of sinter at the steelworks, but this is not the case for all pollutants.

We are satisfied that the operator has considered the appropriate impacts and damage costs in relation to the CBA provided.

9. Point SP7 in our response to the comments from the first consultation addresses point a) (see section 6.1 above).

   The derogation is time limited until 30/09/2024 and we have included ICs in the varied and consolidated permit that require the operator to submit a report with the proposals for the bag filter, timescales for installation and commissioning of the plant and to confirm that the plant is installed and can meet the relevant BAT AELs. It is not possible to include interim limits to incentivise minimisation of limits before the emissions are abated as the BAT AEL can only be met with the installation of the bag filter.

   Action is already being carried out through existing conditions in the permit, such as the requirement for an AQMP, and by our audits of the performance of the site to reduce overall emissions from the site.

   Our Area compliance team will continue the existing dialogue with the UKHSA in relation to the past and any future dioxin breaches and welcome the UKHSA’s input.

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6.3 Consultation on the draft decision

To be completed after the consultation ends.

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