SEDALCOL UK Ltd
DENISON ROAD, SELBY,
NORTH YORKSHIRE

BEST AVAILABLE TECHNIQUE
COMPLIANCE STATEMENT

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1.0 Introduction

1.1 Scope

This document has been written to demonstrate that following a recent review of the processing at the Selby Wheat Processing Facility, Denison Road, North Yorkshire YO8 8AN, operated by Sedalcol UK Limited, under Environment Agency Permit reference EPR/KP3030TZ is currently being operated in compliance with the following Best Available Techniques (BAT) reference documents (BRef) in accordance with the Industrial Emissions directive European directives:

- Primary BRef: The Best Available Technique conclusions for the production of Large Volume Organic Chemicals (published 07/12/2017).
- Horizontal BRef: The Best Available Techniques conclusion for Common Waste Water and Waste Gas Treatment / management systems in the Chemical Sector (published 09/06/2016).

  Currently the operating plant is exempt from the BAT for Large Combustion Plant, due to the total rated thermal input being <50MW however in the near future the plant is going to be upgraded with a second power generation plant and may be required to be operated in compliance: for this reason the following BAT has been reviewed and is documented within in relation to compliance with the BRef.

- Combustion plant: The Best Available Techniques conclusion for Large Combustion Plants (published 17/08/2017).

2.0 Production of Large Volume Organic Chemicals

2.1 General BAT Conclusions

2.1.1 Monitoring of Emissions to Air

BAT1

BAT is to monitor channelled emissions to air from process furnaces/heaters in accordance with EN standards and with at least the minimum frequency given in the table below. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

NOT APPLICABLE because no process furnaces/heaters are installed on site.

BAT2

BAT is to monitor channelled emissions to air other than from process furnaces/heaters in accordance with EN standards and with at least the minimum frequency given in the table below. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

APPLICABLE. Sedalcol UK carries out periodical air emission control surveys within the frequency requested by its Environmental Permit according to the BS EN 14792 for Oxides of Nitrogen, BS EN 13284-1 for particulate, BS EN 12619 for VOC for all the stacks listed.

2.2 Emissions to Air

2.2.1 Emissions to air from process furnaces/heaters

BAT3

In order to reduce emissions to air of CO and unburnt substances from process furnaces/heaters, BAT is to ensure an optimised combustion. Optimised combustion is achieved by good design and operation of the equipment which includes optimisation of the temperature and residence time in the combustion zone, efficient mixing of the fuel and combustion air, and combustion control. Combustion control is based on the continuous monitoring and automated control of appropriate combustion parameters (e.g. O2, CO, fuel to air ratio, and unburnt substances).

NOT APPLICABLE because no process furnaces/heaters are installed on site.

BAT4

In order to reduce NO_X emissions to air from process furnaces/heaters, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because no process furnaces/heaters are installed on site.

BAT5

In order to prevent or reduce dust emissions to air from process furnaces/heaters, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because no process furnaces/heaters are installed on site.

BAT6

In order to prevent or reduce SO^2 emissions to air from process furnaces/heaters, BAT is to use one or both of the techniques given below.

NOT APPLICABLE because no process furnaces/heaters are installed on site.

2.2.2 Emissions to air from the use of SCR or SNCR

BAT7

In order to reduce emissions to air of ammonia which is used in selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) for the abatement of NOX emissions, BAT is to optimise the design and/or operation of SCR or SNCR (e.g. optimised reagent to NOX ratio, homogeneous reagent distribution and optimum size of the reagent drops). BAT-associated emission levels (BAT-AELs) for emissions from a lower olefins cracker furnace when SCR or SNCR is used: Table 2.1.

NOT APPLICABLE because no selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) for the abatement of NOX emissions are performed on site.

2.2.3 Emissions to air from other processes/sources

Techniques to reduce emissions from other processes/sources

BAT8

In order to reduce the load of pollutants sent to the final waste gas treatment, and to increase resource efficiency, BAT is to use an appropriate combination of the techniques given below for process off-gas streams.

APPLICABLE. The waste gases from fermentation tanks are processed by a wet scrubber (A21). The current set up of the scrubber is not representing BAT as the concentration of the flue gas is high compared to the 75 mg/m3 benchmark. Sedalcol Uk commits to improve the performances of the 2 column scrubbers to achieve the benchmark value within compliance date.

The action plan foresees various possible steps:

- fine tuning of the existent system and research of a new process balance to optimize efficiency and sustainability of the system itself, in regards of the water used and recovered into the process.

-If the previous step doesn't bring enough results, evaluation of a chiller system to cool down the temperature of the water used for the abatement.

-if previous steps don't bring enough results, evaluation of other VOC abatement techniques (biofilter, RTO).

BAT9

In order to reduce the load of pollutants sent to the final waste gas treatment, and to increase energy efficiency, BAT is to send process off-gas streams with a sufficient calorific value to a combustion unit. BAT 8a and 8b have priority over sending process off-gas streams to a combustion unit.

Applicability: Sending process off-gas streams to a combustion unit may be restricted due to the presence of contaminants or due to safety considerations.

NOT APPLICABLE. Off biogas from waste water treatment plant has insufficient calorific value and is too low in quantity to sustain a combustion unit (1000 Smc/day). If production of biogas from waste water treatment plant will increase the evaluation of a small combustion unit will be undertaken.

BAT10

In order to reduce channelled emissions of organic compounds to air, BAT is to use one or a combination of the techniques given below.

APPLICABLE. COMPLIANT.

Technique	Applied?
Condensation	NO
Adsorption	NO
Wet scrubbing	YES – Abated on Main VOC Outlet, (see BAT8)
Catalytic oxidiser	NO
Thermal oxidiser	NO

BAT11

In order to reduce channelled dust emissions to air, BAT is to use one or a combination of the techniques given below.

APPLICABLE. COMPLIANT.

Technique	Applied?

Cyclone	NO
Electrostatic precipitator	NO
Fabric filter	On all outlets on all powders
Two-stage dust filter	NO
Ceramic/metal filter	NO
Wet dust scrubbing	NO

BAT12

In order to reduce emissions to air of sulphur dioxide and other acid gases (e.g. HCl), BAT is to use wet scrubbing.

NOT APPLICABLE: Negligible concentrations of acid compounds present in emission in the small Biogas stream.

Techniques to reduce emissions from a thermal oxidiser

BAT13

In order to reduce emissions to air of NO_X, CO, and SO2 from a thermal oxidiser, BAT is to use an appropriate combination of the techniques given below.

NOT APPLICABLE because no thermal oxidisers are installed on site.

2.3 Emissions to water

BAT14

In order to reduce the waste water volume, the pollutant loads discharged to a suitable final treatment (typically biological treatment), and emissions to water, BAT is to use an integrated waste water management and treatment strategy that includes an appropriate combination of process-integrated techniques, techniques to recover pollutants at source, and pretreatment techniques, based on the information provided by the inventory of waste water streams specified in the CWW BAT conclusions.

APPLICABLE. COMPLIANT. Limiting product losses from cleaning, spillages etc. As these losses are treated within the waste water treatment plant (WWTP), the losses are benchmarked and targeted for action as kg COD/tonne wheat;

Optimising the amount of water used and recycled throughout the process, water usage and water recycled are benchmarked against industry standards and within the group. Dry cleaning procedures are used wherever possible with the wet and dry processes separated as part of the design. CIP activities and wet washing are limited to the wet mill and the distillery area with all waste liquid streams physically collected, equalised and fed to the WWTP. It is considered that the segregated design of the installation minimises the amount of water required for cleaning purposes.

2.4 Resource Efficiency

BAT15

In order to increase resource efficiency when using catalysts, BAT is to use a combination of the techniques given below.

NOT APPLICABLE because no catalysts are used on site.

BAT16

In order to increase resource efficiency, BAT is to recover and reuse organic solvents.

NOT APPLICABLE because no organic solvents are used on site.

2.5 Residues

BAT17

In order to prevent or, where that is not practicable, to reduce the amount of waste being sent for disposal, BAT is to use an appropriate combination of the techniques given below.

APPLICABLE

Technique	Applied?
Techniques to prevent or reduce the generation of waste	
Addition of inhibitors to distillation systems	N/A
Minimisation of high- boiling residue formation in distillation systems	N/A
Techniques to recover materials for reuse or recycling	
Material recovery (e.g. by distillation, cracking)	Yes, By-products are recovered from distillation.
Catalyst and adsorbent regeneration	N/A
Techniques to recover energy	
Use of residues as a fuel	N/A

2.6 Other than normal operating conditions

BAT18

In order to prevent or reduce emissions from equipment malfunctions, BAT is to use all of the techniques given below.

Technique	Applied?
Identification of critical equipment	Yes, plant has Critical Env. Devices, based on Environment management system ISO 14001 (2015) outputs.
Asset reliability programme for critical equipment	Yes, calibration and periodical maintenance.
Back-up systems for critical equipment	N/A because covered by Technique b, (asset reliability programme for critical equipment).

BAT19

In order to prevent or reduce emissions to air and water occurring during other than normal operating conditions, BAT is to implement measures commensurate with the relevance of potential pollutant releases for: (i) start-up and shutdown operations; (ii) other circumstances (e.g. regular and extraordinary maintenance work and cleaning operations of the units and/or of the waste gas treatment system) including those that could affect the proper functioning of the installation.

APPLICABLE. COMPLIANT. The system is covered by regular maintenance schedule, readiness of spare parts for emergency situations and repair, ability for temporary storage of emissions.

2.7 BAT conclusions for lower olefins production

2.7.1 Emissions to air

2.7.1.1 BAT-AELs for emissions to air from a lower olefins cracker furnace

The associated monitoring is in BAT1

2.7.1.2 Techniques to reduce emissions from decoking

BAT20

In order to reduce emissions to air of dust and CO from the decoking of the cracker tubes, BAT is to use an appropriate combination of the techniques to reduce the frequency of decoking given below and one or a combination of the abatement techniques given below.

NOT APPLICABLE because no lower olefins cracker furnaces are installed on site.

2.7.1.3 Emissions to water

BAT21

In order to prevent or reduce the amount of organic compounds and waste water discharged to waste water treatment, BAT is to maximise the recovery of hydrocarbons from the quench water of the primary fractionation stage and reuse the quench water in the dilution steam generation system.

NOT APPLICABLE because no lower olefins cracker furnaces are installed on site.

BAT22

In order to reduce the organic load discharged to waste water treatment from the spent caustic scrubber liquor originating from the removal of H2S from the cracked gases, BAT is to use stripping.

NOT APPLICABLE because no lower olefins cracker furnaces are installed on site.

BAT23

In order to prevent or reduce the amount of sulphides discharged to waste water treatment from the spent caustic scrubber liquor originating from the removal of acid gases from the cracked gases, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because no lower olefins cracker furnaces are installed on site.

2.8 BAT conclusions for aromatics production

2.8.1 Emissions to air

BAT24

In order to reduce the organic load from process off-gases sent to the final waste gas treatment and to increase resource efficiency, BAT is to recover organic materials by using BAT 8b. or, where that is not practicable, to recover energy from these process off-gases (see also BAT 9).

NOT APPLICABLE because aromatics are not produced on site.

BAT25

In order to reduce emissions to air of dust and organic compounds from the regeneration of hydrogenation catalyst, BAT is to send the process off-gas from catalyst regeneration to a suitable treatment system.

NOT APPLICABLE because aromatics are not produced on site.

2.8.2 Emissions to water

BAT26

In order to reduce the amount of organic compounds and waste water discharged from aromatic extraction units to waste water treatment, BAT is either to use dry solvents or to use a closed system for the recovery and reuse of water when wet solvents are used.

NOT APPLICABLE because aromatics are not produced on site.

BAT27

In order to reduce the waste water volume and the organic load discharged to waste water treatment, BAT is to use an appropriate combination of the techniques given below.

NOT APPLICABLE because aromatics are not produced on site.

2.8.3 Resource efficiency

BAT28

In order to use resources efficiently, BAT is to maximise the use of co-produced hydrogen, e.g. from dealkylation reactions, as a chemical reagent or fuel by using BAT 8a. or, where that is not practicable, to recover energy from these process vents (see BAT 9).

NOT APPLICABLE because aromatics are not produced on site.

2.8.4 Energy efficiency

BAT29

In order to use energy efficiently when using distillation, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because aromatics are not produced on site.

2.8.5 Residues

BAT30

In order to prevent or reduce the amount of spent clay being sent for disposal, BAT is to use one or both of the techniques given below.

NOT APPLICABLE because aromatics are not produced on site.

2.9 BAT conclusions for ethylbenzene and styrene monomer production

2.9.1 Process selection

BAT31

In order to prevent or reduce emissions to air of organic compounds and acid gases, the generation of waste water and the amount of waste being sent for disposal from the alkylation of benzene with ethylene, BAT for new plants and major plant upgrades is to use the zeolite catalyst process.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

2.9.2 Emissions to air

BAT32

In order to reduce the load of HCl sent to the final waste gas treatment from the alkylation unit in the AlCl3-catalysed ethylbenzene production process, BAT is to use caustic scrubbing. Only applicable to existing plants using the AlCl3 catalysed ethylbenzene production process.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT33

In order to reduce the load of dust and HCl sent to the final waste gas treatment from catalyst replacement operations in the AlCl3-catalysed ethylbenzene production process, BAT is to use wet scrubbing and then use the spent scrubbing liquor as wash water in the post-alkylation reactor wash section.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT34

In order to reduce the organic load sent to the final waste gas treatment from the oxidation unit in the SMPO production process, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT35

In order to reduce emissions of organic compounds to air from the acetophenone hydrogenation unit in the SMPO production process, during other than normal operating conditions (such as start-up events), BAT is to send the process off-gas to a suitable treatment system.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

2.9.3 *Emissions to water*

BAT36

In order to reduce waste water generation from ethylbenzene dehydrogenation and to maximise the recovery of organic compounds, BAT is to use an appropriate combination of the techniques given below.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT37

In order to reduce emissions to water of organic peroxides from the oxidation unit in the SMPO production process and to protect the downstream biological waste water treatment plant, BAT is to pretreat waste water containing organic peroxides using hydrolysis before it is combined with other waste water streams and discharged to the final biological treatment.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

2.9.4 *Resource efficiency*

BAT38

In order to recover organic compounds from ethylbenzene dehydrogenation prior to the recovery of hydrogen (see BAT 39), BAT is to use one or both of the techniques given below.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT39

In order to increase resource efficiency, BAT is to recover the co-produced hydrogen from ethylbenzene dehydrogenation, and to use it either as a chemical reagent or to combust the dehydrogenation off-gas as a fuel (e.g. in the steam superheater).

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT40

In order to increase the resource efficiency of the acetophenone hydrogenation unit in the SMPO production process, BAT is to minimise excess hydrogen or to recycle hydrogen by using BAT 8a. If BAT 8a is not applicable, BAT is to recover energy (see BAT 9).

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

2.9.5 *Residues*

BAT41

In order to reduce the amount of waste being sent for disposal from spent catalyst neutralisation in the AlCl3-catalysed ethylbenzene production process, BAT is to recover residual organic compounds by stripping and then concentrate the aqueous phase to give a usable AlCl3 by-product.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT42

In order to prevent or reduce the amount of waste tar being sent for disposal from the distillation unit of ethylbenzene production, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT43

In order to reduce the generation of coke (which is both a catalyst poison and a waste) from units producing styrene by ethylbenzene dehydrogenation, BAT is to operate at the lowest possible pressure that is safe and practicable.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

BAT44

In order to reduce the amount of organic residues being sent for disposal from styrene monomer production including its co-production with propylene oxide, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because ethylbenzene and styrene monomer are not produced on site.

2.10 BAT conclusions for formaldehyde production

2.10.1 Emissions to air

BAT45

In order to reduce emissions of organic compounds to air from formaldehyde production and to use energy efficiently, BAT is to use one of the techniques given below.

NOT APPLICABLE because formaldehyde is not produced on site.

2.10.2 Emissions to water

BAT46

In order to prevent or reduce waste water generation (e.g. from cleaning, spills and condensates) and the organic load discharged to further waste water treatment, BAT is to use one or both of the techniques given below.

NOT APPLICABLE because formaldehyde is not produced on site.

2.10.3 Residues

BAT47

In order to reduce the amount of paraformaldehyde-containing waste being sent for disposal, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because formaldehyde is not produced on site.

2.11 BAT conclusions for ethylene oxide and ethylene glycols production

2.11.1 Process selection

BAT48

In order to reduce the consumption of ethylene and emissions to air of organic compounds and CO2, BAT for new plants and major plant upgrades is to use oxygen instead of air for the direct oxidation of ethylene to ethylene oxide.

NOT APPLICABLE because ethylene oxide and ethylene glycols are not produced on site.

2.11.2 Emissions to air

BAT49

In order to recover ethylene and energy and to reduce emissions of organic compounds to air from the EO plant, BAT is to use both of the techniques given below.

NOT APPLICABLE because ethylene oxide and ethylene glycols are not produced on site.

BAT50

In order to reduce the consumption of ethylene and oxygen and to reduce CO2 emissions to air from the EO unit, BAT is to use a combination of the techniques in BAT 15 and to use inhibitors.

NOT APPLICABLE because ethylene oxide and ethylene glycols are not produced on site.

BAT51

In order to reduce emissions of organic compounds to air from the desorption of CO2 from the scrubbing medium used in the EO plant, BAT is to use a combination of the techniques given below.

NOT APPLICABLE because ethylene oxide and ethylene glycols are not produced on site.

BAT52

In order to reduce EO emissions to air, BAT is to use wet scrubbing for waste gas streams containing EO.

NOT APPLICABLE because ethylene oxide and ethylene glycols are not produced on site.

BAT53

In order to prevent or reduce emissions of organic compounds to air from cooling of the EO absorbent in the EO recovery unit, BAT is to use one of the techniques given below.

NOT APPLICABLE because ethylene oxide and ethylene glycols are not produced on site.

2.11.3 Emissions to water

BAT54

In order to reduce the waste water volume and to reduce the organic load discharged from the product purification to final waste water treatment, BAT is to use one or both of the techniques given below.

NOT APPLICABLE because ethylene oxide and ethylene glycols are not produced on site.

2.11.4 Residues

BAT55

In order to reduce the amount of organic waste being sent for disposal from the EO and EG plant, BAT is to use a combination of the techniques given below.

NOT APPLICABLE because ethylene oxide and ethylene glycols are not produced on site.

2.12 BAT conclusions for phenol production

2.12.1 Emissions to air

BAT56

In order to recover raw materials and to reduce the organic load sent from the cumene oxidation unit to the final waste gas treatment, BAT is to use a combination of the techniques given below.

NOT APPLICABLE because phenol is not produced on site.

BAT57

In order to reduce emissions of organic compounds to air, BAT is to use technique d given below for waste gas from the cumene oxidation unit. For any other individual or combined waste gas streams, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because phenol is not produced on site.

2.12.2 Emissions to water

BAT58

In order to reduce emissions to water of organic peroxides from the oxidation unit and, if necessary, to protect the downstream biological waste water treatment plant, BAT is to pretreat waste water containing organic peroxides using hydrolysis before it is combined with other waste water streams and discharged to the final biological treatment.

NOT APPLICABLE because phenol is not produced on site.

BAT59

In order to reduce the organic load discharged from the cleavage unit and the distillation unit to further waste water treatment, BAT is to recover phenol and other organic compounds (e.g. acetone) using extraction followed by stripping.

NOT APPLICABLE because phenol is not produced on site.

2.12.3 Residues

BAT60

In order to prevent or reduce the amount of tar being sent for disposal from phenol purification, BAT is to use one or both of the techniques given below.

NOT APPLICABLE because phenol is not produced on site.

2.13 BAT conclusions for ethanolamines production

2.13.1 Emissions to air

BAT61

In order to reduce ammonia emissions to air and to reduce the consumption of ammonia from the aqueous ethanolamines production process, BAT is to use a multistage wet scrubbing system.

NOT APPLICABLE because ethanolamines are not produced on site.

2.13.2 Emissions to water

BAT62

In order to prevent or reduce emissions of organic compounds to air and emissions to water of organic substances from the vacuum systems, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE because ethanolamines are not produced on site.

2.13.3 Raw material consumption

BAT63

In order to use ethylene oxide efficiently, BAT is to use a combination of the techniques given below.

NOT APPLICABLE because ethanolamines are not produced on site.

2.14 BAT conclusions for toluene diisocyanite (TDI) and methylene diphenyl diisocyanate (MDI) production

2.14.1 Emissions to air

BAT64

In order to reduce the load of organic compounds, NOX, NOX precursors and SOX sent to the final waste gas treatment (see BAT 66) from DNT, TDA and MDA plants, BAT is to use a combination of the techniques given below.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

BAT65

In order to reduce the load of HCl and phosgene sent to the final waste gas treatment and to increase resource efficiency, BAT is to recover HCl and phosgene from the process off-gas streams of TDI and/or MDI plants by using an appropriate combination of the techniques given below.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

BAT66

In order to reduce emissions to air of organic compounds (including chlorinated hydrocarbons), HCl and chlorine, BAT is to treat combined waste gas streams using a thermal oxidiser followed by caustic scrubbing.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

BAT67

In order to reduce emissions to air of PCDD/F from a thermal oxidiser (see Section 12.1) treating process off-gas streams containing chlorine and/or chlorinated compounds, BAT is to use technique a, if necessary followed by technique b, given below.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

2.14.2 Emissions to water

BAT68

BAT is to monitor emissions to water with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

BAT69

In order to reduce the load of nitrite, nitrate and organic compounds discharged from the DNT plant to waste water treatment, BAT is to recover raw materials, to reduce the waste water volume and to reuse water by using an appropriate combination of the techniques given below.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

BAT70

In order to reduce the load of poorly biodegradable organic compounds discharged from the DNT plant to further waste water treatment, BAT is to pretreat the waste water using one or both of the techniques given below.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

BAT71

In order to reduce waste water generation and the organic load discharged from the TDA plant to waste water treatment, BAT is to use a combination of techniques a., b. and c. and then to use technique d. as given below.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

BAT72

In order to prevent or reduce the organic load discharged from MDI and/or TDI plants to final waste water treatment, BAT is to recover solvents and reuse water by optimising the design and operation of the plant.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

BAT73

In order to reduce the organic load discharged from a MDA plant to further waste water treatment, BAT is to recover organic material using one or a combination of the techniques given below.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

2.14.3 Residues

BAT74

In order to reduce the amount of organic residues being sent for disposal from the TDI plant, BAT is to use a combination of the techniques given below.

NOT APPLICABLE because toluene diisocyanate (TDI) and methylene diphenyl diisocyanate (MDI) are not produced on site.

2.15 BAT conclusions for ethylene dichloride and vinyl chloride monomer production

2.15.1 Emissions to air

2.15.1.1 BAT-AEL for emissions to air from an EDC cracker furnace

The associated monitoring is in BAT1

2.15.2 Techniques and BAT-AEL for emissions to air from other sources

BAT75

In order to reduce the organic load sent to the final waste gas treatment and to reduce raw material consumption, BAT is to use all of the techniques given below.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

BAT76

In order to reduce emissions to air of organic compounds (including halogenated compounds), HCl and Cl2, BAT is to treat the combined waste gas streams from EDC and/or VCM production by using a thermal oxidiser followed by two-stage wet scrubbing.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

BAT77

In order to reduce emissions to air of PCDD/F from a thermal oxidiser (see Section 12.1) treating process off-gas streams containing chlorine and/or chlorinated compounds, BAT is to use technique a, if necessary followed by technique b, given below.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

BAT78

In order to reduce emissions to air of dust and CO from the decoking of the cracker tubes, BAT is to use one of the techniques to reduce the frequency of decoking given below and one or a combination of the abatement techniques given below.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

2.15.3 Emissions to water

BAT79

BAT is to monitor emissions to water with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

BAT80

In order to reduce the load of chlorinated compounds discharged to further waste water treatment and to reduce emissions to air from the waste water collection and treatment system, BAT is to use hydrolysis and stripping as close as possible to the source.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

BAT81

In order to reduce emissions to water of PCDD/F and copper from the oxychlorination process, BAT is to use technique a. or, alternatively, technique b together with an appropriate combination of techniques c., d. and e. given below.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

2.15.4 Energy efficiency

BAT82

In order to use energy efficiently, BAT is to use a boiling reactor for the direct chlorination of ethylene. Only applicable to new direct chlorination plants.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

BAT83

In order to reduce the energy consumption of EDC cracker furnaces, BAT is to use promoters for the chemical conversion.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

BAT84

In order to reduce the amount of coke being sent for disposal from VCM plants, BAT is to use a combination of the techniques given below.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

BAT85

In order to reduce the amount of hazardous waste being sent for disposal and to increase resource efficiency, BAT is to use all of the techniques given below.

NOT APPLICABLE because ethylene dichloride and vinyl chloride monomer are not produced on site.

2.16 BAT conclusions for hydrogen peroxide production

2.16.1 Emissions to air

BAT86

In order to recover solvents and to reduce emissions of organic compounds to air from all units other than the hydrogenation unit, BAT is to use an appropriate combination of the techniques given below. In the

case of using air in the oxidation unit, this includes at least technique d. In the case of using pure oxygen in the oxidation unit, this includes at least technique b. using chilled water.

NOT APPLICABLE because hydrogen peroxide is not produced on site.

BAT87

In order to reduce emissions of organic compounds to air from the hydrogenation unit during start- up operations, BAT is to use condensation and/or adsorption.

NOT APPLICABLE because hydrogen peroxide is not produced on site.

BAT88

In order to prevent benzene emissions to air and water, BAT is not to use benzene in the working solution.

NOT APPLICABLE because hydrogen peroxide is not produced on site.

2.16.2 Emissions to water

BAT89

In order to reduce the waste water volume and the organic load discharged to waste water treatment, BAT is to use both of the techniques given below.

NOT APPLICABLE because hydrogen peroxide is not produced on site.

BAT90

In order to prevent or reduce emissions to water of poorly bioeliminable organic compounds, BAT is to use one of the techniques given below.

NOT APPLICABLE because hydrogen peroxide is not produced on site.

3.0 Large Combustion Plants

3.1 General BAT conclusions

3.1.1 Environmental management systems

BAT1

In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features:

(i) commitment of the management, including senior management;

(ii) definition, by the management, of an environmental policy that includes the continuous improvement of the environmental performance of the installation;

(iii) planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;

(iv) implementation of procedures paying particular attention to:

(a) structure and responsibility

(b) recruitment, training, awareness and competence

(c) communication

(d) employee involvement

(e) documentation

(f) effective process control

(g) planned regular maintenance programmes

(h) emergency preparedness and response

(i) safeguarding compliance with environmental legislation;

(v) checking performance and taking corrective action, paying particular attention to;

(a) monitoring and measurement (see also the JRC Reference Report on Monitoring of emissions to air and water from IED-installations — ROM)

(b) corrective and preventive action

(c) maintenance of records

(d) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained;

(vi) review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness;

(vii) following the development of cleaner technologies;

(viii) consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life including;

(a) avoiding underground structures

(b) incorporating features that facilitate dismantling

(c) choosing surface finishes that are easily decontaminated

(d) using an equipment configuration that minimises trapped chemicals and facilitates drainage or cleaning
(e) designing flexible, self-contained equipment that enables phased closure

(f) using biodegradable and recyclable materials where possible;

(ix) application of sectoral benchmarking on a regular basis. Specifically for this sector, it is also important to consider the following features of the EMS, described where appropriate in the relevant BAT:

(x) quality assurance/quality control programmes to ensure that the characteristics of all fuels are fully determined and controlled (see BAT 9);

(xi) a management plan in order to reduce emissions to air and/or to water during other than normal operating conditions, including start-up and shutdown periods (see BAT 10 and BAT 11);

(xii) a waste management plan to ensure that waste is avoided, prepared for reuse, recycled or otherwise recovered, including the use of techniques given in BAT 16

(xiii) a systematic method to identify and deal with potential uncontrolled and/or unplanned emissions to the environment, in particular:

(a) emissions to soil and groundwater from the handling and storage of fuels, additives, by-products and wastes

(b) emissions associated with self-heating and/or self-ignition of fuel in the storage and handling activities;

(xiv) a dust management plan to prevent or, where that is not practicable, to reduce diffuse emissions from loading, unloading, storage and/or handling of fuels, residues and additives;

(xv) a noise management plan where a noise nuisance at sensitive receptors is expected or sustained, including;

(a) a protocol for conducting noise monitoring at the plant boundary

(b) a noise reduction programme

(c) a protocol for response to noise incidents containing appropriate actions and timelines

(d) a review of historic noise incidents, corrective actions and dissemination of noise incident knowledge to the affected parties;

(xvi) for the combustion, gasification or co-incineration of malodourous substances, an odour management plan including:

(a) a protocol for conducting odour monitoring

(b) where necessary, an odour elimination programme to identify and eliminate or reduce the odour emissions

(c) a protocol to record odour incidents and the appropriate actions and timelines

(d) a review of historic odour incidents, corrective actions and the dissemination of odour incident knowledge to the affected parties.

Where an assessment shows that any of the elements listed under items x to xvi are not necessary, a record is made of the decision, including the reasons.

APPLICABLE. COMPLIANT.

SEDALCOL UK Ltd. operates an environmental management system (EMS) certified to ISO 14001:2015 which covers all these points. See attached the ISO 140001 certificate in appendix (A).

3.2 Monitoring

BAT 2

BAT is to determine the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the gasification, IGCC and/or combustion units by carrying out a performance test at full load (1), according to EN standards, after the commissioning of the unit and after each modification that could significantly affect the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the unit. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

APPLICABLE. COMPLIANT.

Sedalcol operates fully automated high performance combustion units with related data measures, logs and compares combustion performance against benchmark data.

BAT3

BAT is to monitor key process parameters relevant for emissions to air and water including those given below:

Stream	Parameters	Monitoring	Monitored?
Flue-gas	Flow	Periodic or continuous determination	**Undertaken periodically by 3rd party accredited monitoring company.**
	Oxygen content, temperature, and pressure	Periodic or continuous measurement	**Undertaken periodically by 3rd party accredited monitoring company.**
	Water vapour content		
Waste water from flue-gas treatment	Flow, pH, and temperature	Continuous measurement	**N/A because flue gas treatment is not required**

BAT4

BAT is to monitor emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

APPLICABLE. COMPLIANT

At the incoming stage of development of the site the total thermal input, given by the sum of the single combustion units thermal input, will be >50MWth. The installation is provided of separate stacks for each combustion unit, bringing the Thermal Power installed linked to each stack below the 50 MWth. The reason because separate stacks have been built is purely addressed by the layout of the combustion units and by the need to raise up the efficiency of the single units with the installation of a new heat recovery heat exchanger.

Following a discussion with the local Environment Agency Inspector Sedalcol, would be allowed to proceed with periodical emission surveys instead of continuous emission monitoring.

BAT5

BAT is to monitor emissions to water from flue-gas treatment with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

NOT APPLICABLE because no flue-gas treatment systems are required at the installation being Dry Low emission technology design with built in NOX abetment systems installed.

3.3 General environmental and combustion performance

BAT6

In order to improve the general environmental performance of combustion plants and to reduce emissions to air of CO and unburnt substances, BAT is to ensure optimised combustion and to use an appropriate combination of the techniques given below.

Technique	Description	Applicability	Applied?
Fuel blending and mixing	Ensure stable combustion conditions and/or reduce the emission of pollutants by mixing different qualities of the same fuel type	Generally applicable	**N/A SINGLE FUEL, natural gas from the external network.**
Maintenance of the combustion system	Regular planned maintenance according to suppliers' recommendations		**YES: Maintenance contracts in place**

Advanced control system	See description in Section 8.1	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system	**YES: Fully automated and advanced controlled plant <2 years old.**
Good design of the combustion equipment	Good design of furnace, combustion chambers, burners and associated devices	Generally applicable to new combustion plants	**YES: recently engineered plant <2 years old.**
Fuel choice	Select or switch totally or partially to another fuel(s) with a better environmental profile (e.g. with low sulphur and/or mercury content) amongst the available fuels, including in start-up situations or when back-up fuels are used	Applicable within the constraints associated with the availability of suitable types of fuel with a better environmental profile as a whole, which may be impacted by the energy policy of the Member State, or by the integrated site's fuel balance in the case of combustion of industrial process fuels. For existing combustion plants, the type of fuel chosen may be limited by the configuration and the design of the plant	**N/A SINGLE FUEL natural gas from the external network.**

BAT7

In order to reduce emissions of ammonia to air from the use of selective catalytic reduction (SCR) and/or selective non-catalytic reduction (SNCR) for the abatement of NOX emissions, BAT is to optimise the design and/or operation of SCR and/or SNCR (e.g. optimised reagent to NOX ratio, homogeneous reagent distribution and optimum size of the reagent drops).

NOT APPLICABLE because no selective catalytic reduction (SCR) and/or selective non-catalytic reduction (SNCR) systems are installed.

BAT8

In order to prevent or reduce emissions to air during normal operating conditions,

BAT is to ensure, by appropriate design, operation and maintenance, that the emission abatement systems are used at optimal capacity and availability.

APPLICABLE. COMPLIANT. The modern combustion plant is a Dry Low emission technology design with built in NOX abetment systems.

BAT9

In order to improve the general environmental performance of combustion and/or gasification plants and to reduce emissions to air, BAT is to include the following elements in the quality assurance/quality control programmes for all the fuels used, as part of the environmental management system (see BAT 1):

APPLICABLE. COMPLIANT. The fuel used is natural gas provided by the National Grid. Technical and Quality details are provided by the fuel supplier.

(i) Initial full characterisation of the fuel used including at least the parameters listed below and in accordance with EN standards. ISO, national or other international standards may be used provided they ensure the provision of data of an equivalent scientific quality;

(ii) Regular testing of the fuel quality to check that it is consistent with the initial characterisation and according to the plant design specifications. The frequency of testing and the parameters chosen from the table below are based on the variability of the fuel and an assessment of the relevance of pollutant releases (e.g. concentration in fuel, flue-gas treatment employed);

(iii) Subsequent adjustment of the plant settings as and when needed and practicable (e.g. integration of the fuel characterisation and control in the advanced control system (see description in Section 8.1)).

Initial characterisation and regular testing of the fuel can be performed by the operator and/or the fuel supplier. If performed by the supplier, the full results are provided to the operator in the form of a product (fuel) supplier specification and/or guarantee.

Fuel(s)	Substances/Parameters subject to characterisation	Tested?
Biomass/peat	LHV	N/A
	Moisture	N/A
	Ash	N/A
	C, Cl, F, N, S, K, Na	N/A
	Metals and metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn)	N/A
Coal/lignite	LHV	N/A
	Moisture	N/A
	Volatiles, ash, fixed carbon, C, H, N, O, S	N/A
	Br, Cl, F	N/A
	Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn)	N/A
HFO	Ash	N/A
	C, S, N, Ni, V	N/A
Gas oil	Ash	N/A
	N, C, S	N/A
Natural gas	LHV	YES

	CH4, C2H6, C3, C4+, CO2, N2, Wobbe index	**YES**
Process fuels from the chemical industry	Br, C, Cl, F, H, N, O, S	**N/A**
	Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn)	**N/A**
Iron and steel process gases	LHV, CH4 (for COG), CXHY (for COG), CO2, H2, N2, total sulphur, dust, Wobbe index	**N/A**
Waste	LHV	**N/A**
	Moisture	**N/A**
	Volatiles, ash, Br, C, Cl, F, H, N, O, S	**N/A**
	Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn)	**N/A**

BAT10

In order to reduce emissions to air and/or to water during other than normal operating conditions (OTNOC), BAT is to set up and implement a management plan as part of the environmental management system (see BAT 1), commensurate with the relevance of potential pollutant releases, that includes the following elements:

a) appropriate design of the systems considered relevant in causing OTNOC that may have an impact on emissions to air, water and/or soil (e.g. low-load design concepts for reducing the minimum start-up and shutdown loads for stable generation in gas turbines),

b) set-up and implementation of a specific preventive maintenance plan for these relevant systems,

c) review and recording of emissions caused by OTNOC and associated circumstances and implementation of corrective actions if necessary,

d) periodic assessment of the overall emissions during OTNOC (e.g. frequency of events, duration, emissions quantification/estimation) and implementation of corrective actions if necessary.

NOT APPLICABLE because OTNOC of the combustion units consists in the plant start up phase and shut down phase of the duration of max 600 sec. No emission to water. Emissions to air during the start up phase and shut down phase during the transitory phase.

BAT11

BAT is to appropriately monitor emissions to air and/or to water during OTNOC. The monitoring can be carried out by direct measurement of emissions or by monitoring of surrogate parameters if this proves to be of equal or better scientific quality than the direct measurement of emissions. Emissions during start-up and shutdown (SU/SD) may be assessed based on a detailed emission measurement carried out for a typical SU/SD procedure at least once every year, and using the results of this measurement to estimate the emissions for each and every SU/SD throughout the year.

NOT APPLICABLE because OTNOC of the combustion units consists in the plant start up phase and shut down phase of the duration of max 600 sec. No emission to water. Emissions to air during the start up phase and shut down phase during the transitory phase.

3.4 Energy efficiency

BAT12

In order to increase the energy efficiency of combustion, gasification and/or IGCC units operated ≥ 1 500 h/yr, BAT is to use an appropriate combination of the techniques given below.

Technique	Description	Applicability	Applied?
Combustion optimisation	Optimising the combustion minimises the content of unburnt substances in the flue-gases and in solid combustion residues	Generally applicable	**YES,** The current turbine and combined boiler are efficiently engineered and designed for combined heat and power applications (CHP), the unit has an overall efficiency of 90%.
Optimisation of the working medium conditions	Operate at the highest possible pressure and temperature of the working medium gas or steam, within the constraints associated with, for example, the control of NOX emissions or the characteristics of energy demanded		**NO**
Optimisation of the steam cycle	Operate with lower turbine exhaust pressure by utilisation of the lowest possible temperature of the condenser cooling water, within the design conditions		**NO**
Minimisation of energy consumption	Minimising the internal energy consumption (e.g. greater efficiency of the feed-water pump)		**YES**
Preheating of combustion air	Reuse of part of the heat recovered from the combustion flue-gas to preheat the air used in combustion	Generally applicable within the constraints related to the need to control NOX emissions	**NO**
Fuel preheating	Preheating of fuel using recovered heat	Generally applicable within the constraints associated with the boiler design	**NO**

		and the need to control NOX emissions	
Advanced control system	Computerised control of the main combustion parameters enables the combustion efficiency to be improved	Generally applicable to new units. The applicability to old units may be constrained by the need to retrofit the combustion system and/or control command system	**YES,** recent combustion unit design and control system.
Feed-water preheating using recovered heat	Preheat water coming out of the steam condenser with recovered heat, before reusing it in the boiler	Only applicable to steam circuits and not to hot boilers. Applicability to existing units may be limited due to constraints associated with the plant configuration and the amount of recoverable heat	**YES,** Preheating of water carried on through heat exchanger on waste flue gases.
Heat recovery by cogeneration (CHP)	Recovery of heat (mainly from the steam system) for producing hot water/steam to be used in industrial processes/activities or in a public network for district heating. Additional heat recovery is possible from: — flue-gas — grate cooling — circulating fluidised bed	Applicable within the constraints associated with the local heat and power demand. The applicability may be limited in the case of gas compressors with an unpredictable operational heat profile	**YES,** The Turbine provides waste heat to the attached boilers as part of the CHP: the steam is then used for process purposes.
CHP readiness	See description in Section 8.2.	Only applicable to new units where there is a realistic potential for the future use of heat in the vicinity of the unit	**YES,** possibility for expansion of the heat recovery loop in case of future other users.
Flue-gas condenser	See description in Section 8.2.	Generally applicable to CHP units provided there is enough demand for low-temperature heat	**N/A.** Heat from flue gases is recovered using a dedicated heat exchanger which brings the flue gases temperature to the minimum value to avoid acid condensation.

Heat accumulation	Heat accumulation storage in CHP mode	Only applicable to CHP plants. The applicability may be limited in the case of low heat load demand	**N/A**
Wet stack	See description in Section 8.2.	Generally applicable to new and existing units fitted with wet FGD	**N/A**
Cooling tower discharge	The release of emissions to air through a cooling tower and not via a dedicated stack	Only applicable to units fitted with wet FGD where reheating of the flue-gas is necessary before release, and where the unit cooling system is a cooling tower	**N/A**
Fuel pre-drying	The reduction of fuel moisture content before combustion to improve combustion conditions	Applicable to the combustion of biomass and/or peat within the constraints associated with spontaneous combustion risks (e.g. the moisture content of peat is kept above 40 % throughout the delivery chain). The retrofit of existing plants may be restricted by the extra calorific value that can be obtained from the drying operation and by the limited retrofit possibilities offered by some boiler designs or plant configurations	**N/A**
Minimisation of heat losses	Minimising residual heat losses, e.g. those that occur via the slag or those that can be reduced by insulating radiating sources	Only applicable to solid-fuel-fired combustion units and to gasification/IGCC units	**N/A**
Advanced materials	Use of advanced materials proven to be capable of	Only applicable to new plants	**YES,** recent combustion unit design and steam generators.

	withstanding high operating temperatures and pressures and thus to achieve increased steam/combustion process efficiencies		
Steam turbine upgrades	This includes techniques such as increasing the temperature and pressure of medium-pressure steam, addition of a low-pressure turbine, and modifications to the geometry of the turbine rotor blades	The applicability may be restricted by demand, steam conditions and/or limited plant lifetime	**YES,** Future improvement foreseen with increase of steam pressure and temperature 15→21 Bar
Supercritical and ultra-supercritical steam conditions	Use of a steam circuit, including steam reheating systems, in which steam can reach pressures above 220,6 bar and temperatures above 374 °C in the case of supercritical conditions, and above 250 – 300 bar and temperatures above 580 – 600 °C in the case of ultra-supercritical conditions	Only applicable to new units of ≥ 600 MWth operated > 4 000 h/yr. Not applicable when the purpose of the unit is to produce low steam temperatures and/or pressures in process industries. Not applicable to gas turbines and engines generating steam in CHP mode. For units combusting biomass, the applicability may be constrained by high- temperature corrosion in the case of certain biomasses	**N/A**

3.5 Water usage and emissions to water

BAT13

In order to reduce water usage and the volume of contaminated waste water discharged, BAT is to use one or both of the techniques given below.

Technique	Description	Applicability	Applied
Water recycling	Residual aqueous streams, including run-off water, from the plant are reused for other purposes. The degree of recycling is limited by the quality requirements of the recipient water stream and the water balance of the plant	Not applicable to waste water from cooling systems when water treatment chemicals and/or high concentrations of salts from seawater are present	**YES** Steam condensate is collected and reused in the boiler system.
Dry bottom ash handling	Dry, hot bottom ash falls from the furnace onto a mechanical conveyor system and is cooled down by ambient air. No water is used in the process.	Only applicable to plants combusting solid fuels. There may be technical restrictions that prevent retrofitting to existing combustion plants	**N/A**

BAT14

In order to prevent the contamination of uncontaminated waste water and to reduce emissions to water, BAT is to segregate waste water streams and to treat them separately, depending on the pollutant content.

NOT APPLICABLE because no polluted water streams are discharged by the combustion activity.

BAT15

In order to reduce emissions to water from flue-gas treatment, BAT is to use an appropriate combination of the techniques given below, and to use secondary techniques as close as possible to the source in order to avoid dilution.

NOT APPLICABLE because no flue gas treatment with water is required for emission abatement in order to match the limits in NOx and CO.

3.6 Waste management

BAT16

In order to reduce the quantity of waste sent for disposal from the combustion and/or gasification process and abatement techniques, BAT is to organise operations so as to maximise, in order of priority and taking into account life-cycle thinking:

(a) waste prevention, e.g. maximise the proportion of residues which arise as by products;

(b) waste preparation for reuse, e.g. according to the specific requested quality criteria;

(c) waste recycling;

(d) other waste recovery (e.g. energy recovery), by implementing an appropriate combination of techniques.

NOT APPLICABLE because no waste are produced with the current combustion system.

3.7 Noise emissions

BAT17

In order to reduce noise emissions, BAT is to use one or a combination of the techniques given below.

Technique	Description	Applicability	Applied
Optional Measures	These include: —improved inspection and maintenance of equipment — closing of doors and windows of enclosed areas, if possible — equipment operated by experienced staff — avoidance of noisy activities at night, if possible — provisions for noise control during maintenance activities	Generally applicable	**YES, maintenance contract on going, enclosed areas, equipment doors kept closed.**
Low-noise equipment	This potentially includes compressors, pumps and disks	Generally applicable when the equipment is new or replaced	**YES**
Noise attenuation	Noise propagation can be reduced by inserting obstacles between the emitter and the receiver. Appropriate obstacles include protection walls, embankments and buildings	Generally applicable to new plants. In the case of existing plants, the insertion of obstacles may be restricted by lack of space	**N/A**
Noise-control equipment	This includes: — noise-reducers — equipment insulation — enclosure of noisy equipment — soundproofing of buildings	The applicability may be restricted by lack of space	**YES, main combustion unit fully enclosed in noise proof package.**
Appropriate location of equipment and buildings	Noise levels can be reduced by increasing the distance between the emitter and the receiver and by using buildings as noise screens	Generally applicable to new plants. In the case of existing plants, the relocation of equipment and production units may be restricted	**YES, safe distance kept from critical receptors.**

		by lack of space or by excessive costs	

3.8 BAT Conclusions for the combustion of solid fuels (BATc 18-27)

NOT APPLICABLE because no solid fuels are used at the installation.

3.9 BAT conclusions for the combustion of liquid fuels (BATc 28-39)

NOT APPLICABLE because no liquid fuels are used at the installation.

3.10 BAT conclusions for the combustion of gaseous fuels

3.10.1 BAT conclusions for the combustion of natural gas

3.10.1.1 Energy efficiency

BAT40

In order to increase the energy efficiency of natural gas combustion, BAT is to use an appropriate combination of the techniques given in BAT 12 and below.

APPLICABLE. COMPLIANT. The steam produced by cogeneration CHP is used into the process as thermal vector. The steam is also used to run a steam turbine which provides compressed air to the plant for process purposes.

Technique	Description	Applicability	Applied
Combined cycle	See description in Section 8.2	Generally applicable to new gas turbines and engines except when operated < 1 500 h/yr. Applicable to existing gas turbines and engines within the constraints associated with the steam cycle design and the space availability. Not applicable to existing gas turbines and engines operated < 1 500 h/yr. Not applicable to mechanical drive gas turbines operated in discontinuous mode with extended load variations and frequent start-ups and shutdowns. Not applicable to boilers	**N/A**

3.10.1.2 *NO_x, NMVOC and CH_4 emissions to air*

BAT41

In order to prevent or reduce NOX emissions to air from the combustion of natural gas in boilers, BAT is to use one or a combination of the techniques given below.

Technique	Description	Applicability	Applied
Air and/or fuel staging	See descriptions in Section 8.3. Air staging is often associated with low-NOX burners	Generally applicable	N/A
Flue-gas recirculation	See description in Section 8.3		N/A
Low-NOX burners (LNB)			YES
Advanced control system	See description in Section 8.3. This technique is often used in combination with other techniques or may be used alone for combustion plants operated < 500 h/yr	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system	YES
Reduction of the combustion air temperature	See description in Section 8.3	Generally applicable within the constraints associated with the process needs	N/A
Selective non– catalytic reduction (SNCR)		Not applicable to combustion plants operated < 500 h/yr with highly variable boiler loads. The applicability may be limited in the case of combustion plants operated between 500 h/yr and 1 500 h/yr with highly variable boiler loads	N/A
Selective catalytic reduction (SCR)		Not applicable to combustion plants operated < 500 h/yr. Not generally applicable to combustion plants of < 100 MWth. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr	N/A

BAT42

In order to prevent or reduce NOX emissions to air from the combustion of natural gas in gas turbines, BAT is to use one or a combination of the techniques given below.

Technique	Description	Applicability	Applied
Advanced control system	See description in Section 8.3. This technique is often used in combination with other techniques or may be used alone for combustion plants operated < 500 h/yr	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system	**YES, recent system design.**
Water/steam addition	See description in Section 8.3	The applicability may be limited due to water availability	**NO**
Dry low-NOX burners (DLN)		The applicability may be limited in the case of turbines where a retrofit package is not available or when water/steam addition systems are installed	**NO**
Low-load design concept	Adaptation of the process control and related equipment to maintain good combustion efficiency when the demand in energy varies, e.g. by improving the inlet airflow control capability or by splitting the combustion process into decoupled combustion stages	The applicability may be limited by the gas turbine design	**NO**
Low-NOX burners (LNB)	See description in Section 8.3	Generally applicable to supplementary firing for heat recovery steam generators (HRSGs) in the case of combined-cycle gas turbine (CCGT) combustion plants	**YES** Low NOx burners are installed
Selective catalytic reduction (SCR)		Not applicable in the case of combustion plants operated < 500 h/yr. Not generally applicable to existing combustion plants of <	**NO**

		100 MWth. Retrofitting existing combustion plants may be constrained by the availability of sufficient space. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr	

BAT43

In order to prevent or reduce NOX emissions to air from the combustion of natural gas in engines, BAT is to use one or a combination of the techniques given below.

NOT APPLICABLE, because no engines (without considering turbines) fed by natural gas are installed on site.

BAT44

In order to prevent or reduce CO emissions to air from the combustion of natural gas, BAT is to ensure optimised combustion and/or to use oxidation catalysts.

APPLICABLE. COMPLIANT: Optimised combustion values set by the supplier of the combustion unit considering the data provided on the fuel by the National Gas Network.

BAT45

In order to reduce non-methane volatile organic compounds (NMVOC) and methane (CH4) emissions to air from the combustion of natural gas in spark-ignited lean-burn gas engines, BAT is to ensure optimised combustion and/or to use oxidation catalysts.

NOT APPLICABLE because no spark-ignited lean-burn gas engines are installed on site.

3.11 BAT conclusions for the combustion of iron and steel process gases (BATc46-51)

NOT APPLICABLE because no combustion facilities for iron and steel process gases are installed on site.

3.12 BAT conclusions for the combustion of gaseous and/or liquid fuels on offshore platforms (BATc 52-54)

NOT APPLICABLE because no offshore platforms are present in the installation.

3.13 BAT conclusions for multi-fuel-fired plants (BATc 55-59)

NOT APPLICABLE because no multi fuel fired plants are present in the installation.

3.14 BAT conclusions for the co-incineration of waste (BATc 60-71)

NOT APPLICABLE because no co-incineration of waste is performed.

3.15 BAT conclusions for gasification (BATc 72-75)

NOT APPLICABLE because no gasification is performed.

4.0 Common Waste Water

4.1 Environmental Management Systems

BAT1

In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features:

(i) commitment of the management, including senior management;

(ii) an environmental policy that includes the continuous improvement of the installation by the management;

(iii) planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment;

(iv) implementation of procedures paying particular attention to:

(a) structure and responsibility;

(b) recruitment, training, awareness and competence;

(c) communication;

(d) employee involvement;

(e) documentation;

(f) effective process control;

(g) maintenance programmes;

(h) emergency preparedness and response;

(i) safeguarding compliance with environmental legislation;

(v) checking performance and taking corrective action, paying particular attention to:

(a) monitoring and measurement (see also the Reference Report on Monitoring of emissions to Air and Water from IED installations — ROM);

(b) corrective and preventive action;

(c) maintenance of records;

(d) independent (where practicable) internal or external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained;

(vi) review of the EMS and its continuing suitability, adequacy and effectiveness by senior management;

(vii) following the development of cleaner technologies;

(viii) consideration for the environmental impacts from the eventual decommissioning of the plant at the design stage of a new plant, and throughout its operating life;

(ix) application of sectoral benchmarking on a regular basis;

(x) waste management plan (see BAT 13).

Specifically for chemical sector activities, BAT is to incorporate the following features in the EMS:

(xi) on multi-operator installations/sites, establishment of a convention that sets out the roles, responsibilities and coordination of operating procedures of each plant operator in order to enhance the cooperation between the various operators;

(xii) establishment of inventories of waste water and waste gas streams (see BAT 2).

In some cases, the following features are part of the EMS:

(xiii) odour management plan (see BAT 20)

(xiv) noise management plan (see BAT 22).

APPLICABLE COMPLIANT

SEDALCOL UK Ltd. operates an environmental management system (EMS) certified to ISO 14001:2015 which covers all these points. See attached the ISO 140001 certificate in appendix (A).

BAT2

In order to facilitate the reduction of emissions to water and air and the reduction of water usage, BAT is to establish and to maintain an inventory of waste water and waste gas streams, as part of the environmental management system (see BAT 1), that incorporates all of the following features:

(i) information about the chemical production processes, including:

(a) chemical reaction equations, also showing side product

(b) simplified process flow sheets that show the origin of the emissions;

(c) descriptions of process-integrated techniques and waste water/waste gas treatment at source including their performances;

(ii) information, as comprehensive as is reasonably possible, about the characteristics of the waste water streams, such as:

(a) average values and variability of flow, pH, temperature, and conductivity;

(b) average concentration and load values of relevant pollutants/parameters and their variability (e.g. COD/TOC, nitrogen species, phosphorus, metals, salts, specific organic compounds);

(c) data on bioeliminability (e.g. BOD, BOD/COD ratio, Zahn-Wellens test, biological inhibition potential (e.g. nitrification));

(iii) information, as comprehensive as is reasonably possible, about the characteristics of the waste gas streams, such as:

(a) average values and variability of flow and temperature;

(b) average concentration and load values of relevant pollutants/parameters and their variability (e.g. VOC, CO, NOX, SOX, chlorine, hydrogen chloride);

(c) flammability, lower and higher explosive limits, reactivity;

(d) presence of other substances that may affect the waste gas treatment system or plant safety (e.g. oxygen, nitrogen, water vapour, dust).

APPLICABLE.COMPLIANT. Complete data collection on production processes, waste water streams and waste biogas stream.

4.2 Monitoring

BAT3

For relevant emissions to water as identified by the inventory of waste water streams (see BAT 2), BAT is to monitor key process parameters (including continuous monitoring of waste water flow, pH and temperature) at key locations (e.g. influent to pretreatment and influent to final treatment).

APPLICABLE: COMPLIANT – Continuous Sampling and automated monitoring at outlet with daily laboratory samples collected and analysed.

BAT4

BAT is to monitor emissions to water in accordance with EN standards with at least the minimum frequency given below. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

APPLICABLE. COMPLIANT. It should be noted that Nitrogen, Phosphorous, Halogens, Metals or toxic bacteria are not added during the process, therefore the facility does not generate any additional emissions above the background within the water supply.

Substance/Parameter		Standard(s)	Min monitoring frequency	Monitored?
Total organic carbon (TOC)		EN 1484	Daily	YES
Chemical oxygen demand (COD)		No EN standard available		YES
Total suspended solids (TSS)		EN 872		YES
Total nitrogen (TN)		EN 12260		N/A
Total inorganic nitrogen (Ninorg)		Various EN standards available		N/A
Total phosphorus (TP)		Various EN standards available		N/A
Adsorbable organically bound halogens (AOX)		EN ISO 9562	Monthly	N/A
Metals	Cr	Various EN standards available	Monthly	N/A
	Cu			N/A
	Ni			N/A
	Pb			N/A
	Zn			N/A
	Other metals, if relevant			N/A
Toxicity	Fish eggs (Danio rerio)	EN ISO 15088	To be decided based on a risk assessment, after an intial character acterisation	N/A
	Daphnia (Daphnia magna Straus)	EN ISO 6341		N/A
	Luminescent bacteria (Vibrio fischeri)	EN ISO 11348-1, EN ISO 11348-2 or EN ISO 11348-3		N/A
	Duckweed (Lemna minor)	EN ISO 20079		N/A
	Algae	EN ISO 8692, EN ISO 10253 or EN ISO 10710		N/A

BAT5

BAT is to periodically monitor diffuse VOC emissions to air from relevant sources by using an appropriate combination of the techniques I-III or, where large amounts of VOC are handled, all of the techniques I-III.

I. sniffing methods (e.g. with portable instruments according to EN 15446) associated with correlation curves for key equipment;

II. optical gas imaging methods;

III. calculation of emissions based on emissions factors, periodically validated (e.g. once every two years) by measurements.

APPLICABLE. Sedalcol currently performs weekly boundary odour assessment which does not represent BAT for fugitive emissions control. Sedalcol commits to undertake periodical fugitive emission surveys to identified sources undertaking one of the techniques mentioned in the BAT5 and satisfy the requirement before or within the compliance date of 07/12/2021.

BAT6

BAT is to periodically monitor odour emissions from relevant sources in accordance with EN standards.

APPLICABLE. COMPLIANT. Sedalcol carries out periodical Sniff testing at the relevant receptors in order to monitor odour emissions. The monitoring plan is part of the EMS through its procedure "SED EWI-008 Internal odour and noise monitoring". Records are kept with the usage of forms suggested by the M4 Odour Management.

4.3 Emissions to Water

4.3.1 Water Usage and Waste Water Generation

BAT7

In order to reduce the usage of water and the generation of waste water, BAT is to reduce the volume and/or pollutant load of waste water streams, to enhance the reuse of waste water within the production process and to recover and reuse raw materials.

APPLICABLE. COMPLIANT. Process water is recovered from dedicated evaporator and recirculated to reduce waste water output.

4.3.2 Waste Water Collection and Segregation

BAT8

In order to prevent the contamination of uncontaminated water and to reduce emissions to water, BAT is to segregate uncontaminated waste water streams from waste water streams that require treatment.

APPLICABLE. COMPLIANT. Separate collection of foul, process and surface waters.

BAT9

In order to prevent uncontrolled emissions to water, BAT is to provide an appropriate buffer storage capacity for waste water incurred during other than normal operating conditions based on a risk assessment (taking into account e.g. the nature of the pollutant, the effects on further treatment, and the receiving environment), and to take appropriate further measures (e.g. control, treat, reuse).

APPLICABLE. COMPLIANT. Emergency collection buffer tank present on site.

4.3.3 *Waste Water Treatment*

BAT10

In order to reduce emissions to water, BAT is to use an integrated waste water management and treatment strategy that includes an appropriate combination of the techniques in the priority order given below.

Technique	Applied?
Process-integrated techniques	**YES,** Optimising the amount of water used and recycled throughout the process.
Recovery of pollutants at source	**YES,** CIP activities and wet washing will be limited to the wet mill and the distillery area.
Waste water pretreatment	**N/A**
Final waste water treatment	**YES,** with all waste liquid streams physically collected, equalised and fed to the WWTP.

BAT11

In order to reduce emissions to water, BAT is to pretreat waste water that contains pollutants that cannot be dealt with adequately during final waste water treatment by using appropriate techniques.

NOT APPLICABLE: Not Required as influent only requires very minor to low treatment prior to discharge.

BAT12

In order to reduce emissions to water, BAT is to use an appropriate combination of final waste water treatment techniques.

Technique	Typical Pollutants Abated	Applicability	Applied?
Preliminary and primary treatment			
Equalisation	All pollutants	Generally applicable.	**YES**
Neutralisation	Acids, alkalis		**YES**
Physical separation, e.g. screens, sieves, grit separators, grease separators or primary settlement tanks	Suspended solids, oil/grease		**YES**
Biological treatment (secondary treatment), e.g.			
Activated sludge process	Biodegradable organic compounds	Generally applicable.	**YES**
Membrane bioreactor			**NO**

Nitrogen removal			
Nitrification/denitrification	Total nitrogen, ammonia	Nitrification may not be applicable in case of high chloride concentrations (i.e. around 10 g/l) and provided that the reduction of the chloride concentration prior to nitrification would not be justified by the environmental benefits. Not applicable when the final treatment does not include a biological treatment.	**N/A**
Phosphorus removal			
Chemical precipitation	Phosphorus	Generally applicable.	**N/A**
Final solids removal			
Coagulation and flocculation	Suspended solids	Generally applicable.	**NO**
Sedimentation			**NO**
Filtration (e.g. sand filtration, microfiltration, ultrafiltration)			**YES**
Flotation			**NO**

APPLICABLE. COMPLIANT. Sedalcol monitors its emissions to water in regards of the substances released by its process. Matter of monitoring are TSS, COD, BOD, Hydrocarbon Oil Index.

Here following a comparison against typical and worst case results in order to demonstrate compliance.

	Typical	Worst daily case result*
COD [mg/l]	33.73	66.77
BOD [mg/l]	5.87	16.70
TSS [mg/l]	11.80	36.37
Hydrocarbon Oil Index [mg/l]	0.20	0.20
**from 2016 to 2018 YTD*		

BAT13

In order to prevent or, where this is not practicable, to reduce the quantity of waste being sent for disposal, BAT is to set up and implement a waste management plan as part of the environmental management system (see BAT 1) that, in order of priority, ensures that waste is prevented, prepared for reuse, recycled or otherwise recovered.

APPLICABLE. COMPLIANT. Waste management system in place in accordance with EMS and ISO 14001:2015

BAT14

In order to reduce the volume of waste water sludge requiring further treatment or disposal, and to reduce its potential environmental impact, BAT is to use one or a combination of the techniques given below.

APPLICABLE. COMPLIANT. In order to minimise the volume of waste water sludge requiring further treatment or disposal one of the techniques used is to maximise the previous re-usage of process water and limiting product losses from cleaning, spillages etc. as these losses are treated within the waste water treatment plant; a key point is the optimisation of the amount of water used and recycled throughout the process. Dry cleaning procedures are used wherever possible with the wet and dry processes separated as part of the design. CIP activities and wet washing are limited to the wet mill and the distillery area with all waste liquid streams physically collected, equalised and fed to the WWTP. It is considered that the segregated design of the installation minimises the amount of water required for cleaning purposes.
Stabilisation techniques are used such as aerobic and anaerobic digestion.
Sedimentation is also used to reduce the volume of filter cake in the anaerobic digestion facility.

4.4 Emissions to Air

4.4.1 Waste Gas Collection

BAT15

In order to facilitate the recovery of compounds and the reduction of emissions to air, BAT is to enclose the emission sources and to treat the emissions, where possible.

APPLICABLE. COMPLIANT. The waste gas sources are fully enclosed. The Biogas of the Waste Water Treatment Plant is then flared. Fermentation waste gases are collected being an anaerobic reaction, so the system is fully enclosed and gases sent to treatment.

4.4.2 Waste Gas Treatment

BAT16

In order to reduce emissions to air, BAT is to use an integrated waste gas management and treatment strategy that includes process-integrated and waste gas treatment techniques.

APPLICABLE: COMPLIANT. Waste gas is burnt with a flare system, currently not efficient to feed back into combustion systems, due to the low volume of gas created, its location within the facility and the processing energy required to make it suitable for the turbines.

Waste gases from fermentation tanks processed by wet scrubbing and periodical monitoring of the emission source as set by Environmental Permit.

4.4.3 Flaring

BAT17

In order to prevent emissions to air from flares, BAT is to use flaring only for safety reasons or non-routine operational conditions (e.g. start-ups, shutdowns) by using one or both of the techniques given below.

NOT APPLICABLE: Following discussion with Local Environment Agency Compliance officers, it is currently not efficient to feed back into gas recovery system due to the low volume of gas created, its location within the facility and the processing energy required to make it suitable for the turbines.

BAT18

In order to reduce emissions to air from flares when flaring is unavoidable, BAT is to use one or both of the techniques given below.

Technique	Description	Applicability	Applied?
Correct design of flaring devices	Optimisation of height, pressure, assistance by steam,	Applicable to new flares. In existing	**N/A**

	air or gas, type of flare tips (either enclosed or shielded), etc., aimed to enable smokeless and reliable operation and to ensure the efficient combustion of excess gases.	plants, applicability may be restricted due to e.g. maintenance time availability during the turnaround of the plant.	
Monitoring and recording as part of flare management	Continuous monitoring of the gas sent to flaring, measurements of gas flow and estimations of other parameters (e.g. composition, heat content, ratio of assistance, velocity, purge gas flow rate, pollutant emissions (e.g. NOX, CO, hydrocarbons, noise)). The recording of flaring events usually includes the estimated/ measured flare gas composition, the estimated/measured flare gas quantity and the duration of operation. The recording allows for the quantification of emissions and the potential prevention of future flaring events.	Generally applicable.	**YES,** compliant; monitoring and recording of flows, quantities, flare events.

4.4.4 Diffuse VOC Emissions

BAT19

In order to prevent or, where that is not practicable, to reduce diffuse VOC emissions to air, BAT is to use a combination of the techniques given below.

APPLICABLE: COMPLIANT.

In order to prevent diffuse VOC emissions to air Sedalcol considers in the development of its projects to limit the number of potential emission sources. Maintenance schedules and enclosed systems designs are aimed to maximize the containment of potential diffuse VOC emissions. The waste gas streams are controlled and periodical monitored where requested by the Environment Agency. Wet scrubbing system in place for fermentation area, looking for development on its performances (see LVOC BAT review). The WWTP is a fully enclosed system.

4.4.5 Odour Emissions

BAT20

In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:

(i) a protocol containing appropriate actions and timelines;

(ii) a protocol for conducting odour monitoring;

(iii) a protocol for response to identified odour incidents;

(iv) an odour prevention and reduction programme designed to identify the source(s); to measure/estimate odour exposure; to characterise the contributions of the sources; and to implement prevention and/or reduction measures.

APPLICABLE: COMPLIANT. Sedalcol within its EMS certified ISO 14001 manages odour prevention, monitoring, response. A system is so implemented to follow up and keep track of action plans agreed.

BAT21

In order to prevent or, where that is not practicable, to reduce odour emissions from waste water collection and treatment and from sludge treatment, BAT is to use one or a combination of the techniques given below.

Technique	Description	Applicability	Applied?
Minimise residence times	Minimise the residence time of waste water and sludge in collection and storage systems, in particular under anaerobic conditions.	Applicability may be restricted in the case of existing collection and storage systems.	**YES,** residence time kept under control.
Chemical treatment	Use chemicals to destroy or to reduce the formation of odorous compounds (e.g. oxidation or precipitation of hydrogen sulphide).	Generally applicable.	**N/A**
Optimise aerobic treatment	This can include: (i) controlling the oxygen content; (ii) frequent maintenance of the aeration system; (iii) use of pure oxygen; (iv) removal of scum in tanks.	Generally applicable.	**N/A**
Enclosure	Cover or enclose facilities for collecting and treating waste water and sludge to collect the odorous waste gas for further treatment.	Generally applicable.	**YES,** the system is fully enclosed.
End-of-pipe treatment	This can include: (i) biological treatment; (ii) thermal oxidation.	Biological treatment is only applicable to compounds that are easily soluble in water and readily bio eliminable.	**N/A**

4.4.6 Noise Emissions

BAT22

In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to set up and implement a noise management plan, as part of the environmental management system (see BAT 1), that includes all of the following elements:

(i) a protocol containing appropriate actions and timelines;

(ii) a protocol for conducting noise monitoring;

(iii) a protocol for response to identified noise incidents;

(iv) a noise prevention and reduction programme designed to identify the source(s), to measure/estimate noise exposure, to characterise the contributions of the sources and to implement prevention and/or reduction measures.

APPLICABLE: COMPLIANT. Sedalcol within its EMS certified ISO 14001 manages noise prevention, monitoring, response. A system is so implemented to follow up and keep track of action plans agreed.

BAT23

In order to prevent or, where that is not practicable, to reduce noise emissions, BAT is to use one or a combination of the techniques given below.

Technique	Description	Applicability	Applied?
Appropriate location of equipment and buildings	Increasing the distance between the emitter and the receiver and using buildings as noise screens.	For existing plants, the relocation of equipment may be restricted by a lack of space or excessive costs.	**YES,** in the project phase the layout of a plant is set taking in consideration the noise issue as well.
Operational measures	This includes: (i)improved inspection and maintenance of equipment; (ii) closing of doors and windows of enclosed areas, if possible; (iii)equipment operation by experienced staff; (iv) avoidance of noisy activities at night, if possible; (v)provisions for noise control during maintenance activities.	Generally applicable.	**YES,** periodical maintenance in place.
Low-noise equipment	This includes low-noise compressors, pumps and flares.	Applicable only when the equipment is new or replaced.	**YES,** low noise motors are preferred.
Noise-control equipment	This includes: (i) noise-reducers; (ii) equipment insulation; (iii) enclosure of noisy equipment; (iv) soundproofing of buildings.	Applicability may be restricted due to space requirements (for existing plants), health, and safety issues.	**YES,** noise screens or noise attenuation enclosure are installed on site on critical equipment.
Noise abatement	Inserting obstacles between emitters and receivers (e.g. protection walls, embankments and buildings).	Applicable only to existing plants; since the design of new plants should make this technique unnecessary. For existing plants, the insertion of obstacles may be restricted by a lack of space.	**YES,** the location is surrounded with embankments on south east side.