

Uniper UK Limited

Environmental Permit Variation and Partial Low Risk Surrender Application - North Killingholme Power Project

Main Supporting Document

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Contents

List of Abbreviations	5
1. Non-Technical Summary	9
2. Introduction	12
2.1 Overview	12
2.2 Proposed Operations	12
2.3 Carbon Capture Readiness/ Decarbonisation Readiness	13
2.4 Environmental Setting	13
3. Site Condition Report	15
3.1 Installation Boundary	15
3.2 Partial Surrender	15
3.3 Site Condition	17
4. Operating Techniques	19
4.1 Technical Standards	19
4.2 Process Description	19
4.3 Ancillary Equipment and Structures	21
4.4 Utilities	22
4.5 Process Control	22
4.6 Management Systems	23
4.7 General Maintenance	25
4.8 Raw Materials	25
4.9 Waste	27
4.10 Energy Efficiency	29
4.11 Existing Pre-operational Measures	30
5. Emissions	32
5.1 Emissions to Air	32
5.2 Emissions to Water	35
5.3 Emissions to Sewer	38
5.4 Emissions to Land	38
5.5 Fugitive Emissions	38
5.6 Odour	38
5.7 Noise	38
6. Monitoring	41
6.1 Infrastructure	41
6.2 Emissions to Air	41
6.3 Emissions to Water	43
7. Environmental Risk Assessment (Impact Assessment)	46
7.1 Introduction	46
7.2 Installation Location and Sensitive Receptors	46
7.3 Pathways for Pollution	48
7.4 Impact Assessment	49

Tables

Table 2-1: Table S1.1 Schedule 1 Listed Activities	13
Table 4-1: Environmental Management System Summary	23
Table 4-2: Additional Raw Materials	26
Table 4-3: Anticipated Solid Waste Stream	27
Table 4-4: Anticipated liquid waste streams	28
Table 5-1: Emissions Inventory	34
Table 5-2: Noise Mitigation Measures	38
Table 6-1: Proposed Emissions and Monitoring for Emissions to Air	41
Table 6-2: Emission Limits and Monitoring Requirements for Emissions to Water	45
Table -: Human Receptors in the Vicinity of the Installation	46
Table -: Ecological Receptors in the Vicinity of the Installation	47

Figures

Figure 1: Installation Location and Existing Installation Boundary	A-56
Figure 2: Land to be Surrendered	A-57
Figure 3: Revised Installation Boundary	A-58
Figure 4: Indicative Installation Layout	A-59
Figure 5: Emission Point Locations	A-60
Figure 6: Indicative Drainage Plan	A-61

Appendices

Appendix A – Figures	A-55
Appendix B – Compliance Assessment Report	B-62
Appendix C – LCP BAT Assessment	C-64
Appendix D - Site Condition Report	D-83
Appendix E – Combined Heat and Power Readiness Assessment	E-84
Appendix F - Air Impact Assessment	F-85
Appendix G – Noise Impact Assessment	G-86
Appendix H - Qualitative Risk Assessment	H-87
Appendix I - Company Information and Directors	I-88
Appendix J – Environmental Management System Certificate	J-89

List of Abbreviations

Abbreviation	Description
ADMS	Atmospheric Dispersion Modelling System
AOC	Accidental Oil-Contaminated
APIS	Air Pollution Information Service
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQS	Air Quality Standard
BAT	Best Available Techniques
BAT-AEELs	Best Available Techniques-Associated Energy Efficiency Levels
BAT-AELs	Best Available Techniques-Achievable Emission Levels
BATc	Best Available Techniques Conclusions document
bgl	Below ground level
BGS	British Geological Survey
BRef	BAT Reference document
BTEX	Benzene, toluene, ethylbenzene, xylene
CAR	Compliance Assessment Report
CBA	Cost Benefit Analysis
CCR	Carbon Capture Readiness
CCGT	Combined Cycle Gas Turbine
CEMS	Continuous Emissions Monitoring Systems
CHP	Combined Heat and Power
CHP-R	Combined Heat and Power Ready
CL	Critical Level
CLd	Critical Load
CLRTAP	Convention on Long-range Transboundary Air Pollution
CO	Carbon Monoxide

Abbreviation	Description
CO ₂	Carbon Dioxide
CPT	Cone Penetration Test
DCO	Development Consent Order
DAA	Directly Associated Activities
DCS	Distributed Control System
DELCD	Dry Electrolytic Conductivity Detector
EA	Environment Agency
EAL	Environmental Assessment Level
EED	Energy Efficiency Directive
ELV	Emission Limit Values
EMS	Environmental Management System
ESD	Emergency Shutdown System
ESOS	Energy Savings Opportunity Scheme
EP	Environmental Permitting
ETP	Effluent Treatment Plant
EU	European Union
FID	Flame Ionisation Detector
GC	Gas Chromatography
GHG	Greenhouse Gas
GI	Ground Investigation
GIR	Ground Investigation Report
GT	Gas Turbine
HRSG	Heat Recovery Steam Generator
HVAC	Heating, Ventilation and Air Conditioning
IDB	Internal Drainage Board
IED	Industrial Emissions Directive
IP	Intermediate Pressure
JEP	Joint Environmental Programme

Abbreviation	Description
JT	Joules Thomson
LAT	Lowest Astronomical Tide
LCP	Large Combustion Plant
LP	Low Pressure
LWS	Local Wildlife Site
MCERTS	Monitoring Certification Scheme
MCPD	Medium Combustion Plant Directive
MIP	Membrane Interface Probe
MOSTAP	Monster Steek Apparat
MSDS	Material Safety Data Sheets
MWe	Megawatt Electrical
MWh	Megawatt Hours
MWth	Megawatt Thermal
NGT	National Gas Transmission
NIA	Noise Impact Assessment
NLC	North Lincolnshire Council
NNR	National Nature Reserve
NO	Nitric Oxide
NO ₂	Nitrogen Dioxide
NO _x	Oxides of Nitrogen
NPS EN-1	Overarching National Policy Statement for Energy
NSR	Noise Sensitive Receptor
NTS	National Transmission Service
PC	Process Contribution
PCC	Power Control Centre
PCM	Pollution Climate Mapping
PEC	Predicted Environmental Concentration
PID	Photo Ionisation Detector

Abbreviation	Description
PLC	Programmable Logic Controller
RHS	Relevant Hazardous Substances
RO	Reverse Osmosis
SAC	Special Area of Conservation
SCAIL	Simple Calculation of Atmospheric Impact Limits
SCR	Selective Catalytic Reduction
SLM	Sound Level Meter
SNCI	Site of Nature Conservation Importance
SO ₂	Sulphur Dioxide
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
ST	Steam Turbine
UNECE	United Nations Economic Commission for Europe

1. Non-Technical Summary

This Main Supporting Document presents the supporting information for an Environmental Permit variation application under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) ('the EP Regulations'), submitted on behalf of Uniper UK Limited ('Uniper') to vary the existing Environmental Permit for the North Killingholme Power Project (the 'Installation'), reference EPR/FP3838EB. The Installation's location and existing Installation Site Boundary is provided in Figure 1, Appendix A.

The existing Environmental Permit enables the operation of an 800 MWth Combined Cycle Gas Turbine (CCGT), with a net output of 470 MWe, fired on natural gas. The original assessments carried out for the original Permit application were based on the operation of a Mitsubishi Hitachi Power Systems M701F4, MHI F class model 800 MWth Combined Cycle Gas Turbine CCGT). The Environmental Permit was originally issued to C.Gen Killingholme Limited in 2017 and although issued in 2017, construction of the Installation was never started.

In 2024 the land and development rights for the CCGT power station was purchased from C.Gen Killingholme Limited by Uniper, and the Environmental Permit was transferred to Uniper in September 2025. Uniper now intend to commence construction of the CCGT in 2027, with commissioning planned for 2029.

There are a number of changes required to the existing Environmental Permit to ensure that it aligns with the Installation that Uniper propose to construct and operate. Namely, the capacity of the grid connection that is now available would enable operation of a CCGT with a net output of 540 MWe, which is greater than the output currently permitted (470 MWe). As such, Uniper are seeking to vary the Environmental Permit to enable them to maximise the net output of the CCGT to meet the available grid connection capacity (540 MWe). A substantial variation to the Environmental Permit for the Installation is therefore required to increase the thermal input capacity of the CCGT from 800 MWth to 900 MWth to allow for the increased net output capacity varying the permitted Section 1.1 Part A(1) (a) activity.

In addition to the new proposed CCGT, the Installation will also comprise a natural gas fired auxiliary boiler (approximately 8.5 MWth), two natural gas fired Joules Thomson (JT) heaters (approximately 3 MWth each) and also one emergency diesel generator (approximately 1.5 MWth).

The original Environmental Permit application included the operation of a gasification plant, however this was removed from the Installation during the determination phase. That said, the existing Environmental Permit still makes some reference to the Gasification Plant and therefore this needs removing. In addition, as the Installation no longer includes the gasification plant, the Installation therefore covers a much smaller area of land than that currently included within the existing Environmental Permit. As such there will be a reduction in the area included in the Installation Boundary. The application therefore includes a partial surrender of the northern section of the Installation as shown on Figure 2, Appendix A.

The revised Installation Boundary primarily comprises land within the existing Installation Boundary, although there are some minor changes to the abstraction water and wastewater pipeline routings, due to changes in land ownership since the original Environmental Permit application. The revised Installation Boundary is shown in Figure 3, Appendix A.

The current Environmental Permit allows for discharge to the Humber Estuary via Emission Point W1. Uniper are proposing a potential alternative location for W1, approximately 0.9km to the south of the current W1 location, as shown in Figure 3, Appendix A. The alternative location would enable them to reuse an existing underground pipe previously used to transport cooling water from the Humber Estuary to and from the former Killingholme A Power Station site. Killingholme A Power Station is no longer in operation and the Environmental Permit was successfully surrendered in September 2017 as the Environment Agency (EA) were satisfied that the necessary measures were taken to avoid any pollution risk and that the site had been returned to a satisfactory state.

Physical inspections of the pipeline and supporting infrastructure are currently underway. Onshore elements of the pipeline are being inspected using a combination of camera and other non-destructive techniques. Parts of the offshore elements of the pipeline will also be inspected. Inspection techniques of the offshore cooling water pipelines could include sonar scans.

For the current W1 location the pipeline route will need to be slightly amended to incorporate a small area of land located between Haven Road and Loverose Way as shown on Figure 3 in Appendix A.

As part of this variation application the Installation Boundary will incorporate both potential locations for W1. The decision over which location will be selected will be made following completion of detailed design. The Site Condition Report (see Appendix D) has been updated to incorporate the changes in the Installation boundary.

The raw materials to be used in the operation of the CCGT will remain unchanged. However, Application Form Part C2 Section 5b requires the completion of a Baseline Report for Stages 1 – 3 for hazardous substances. This has been completed and is presented in the Site Condition Report in Appendix D. The Stage 1 – 3 Assessment outlines the hazardous materials in use at the Installation and assesses their risk to soil and groundwater receptors. The results indicate that the proposed handling, containment features and management procedures will minimise the risk of impact occurring for the use or storage of the raw materials.

Process wastes from the Installation will remain unchanged. The key process waste is anticipated to be waste lubricating oil, which will be collected and transported offsite to be disposed of via licensed 3rd party waste contractors, in line with regulatory requirements and Installation procedures. There may be small quantities of waste generated from maintenance and welfare activities, which will be stored, managed and disposed of appropriately.

Due to the changes associated with the increase in output from the CCGT, the stack flow rates (Emission Point A1) have increased since the original Environmental Permit application. The CCGT will also be required to meet the Best Available Techniques - Achievable Emission Levels (BAT-AELs), which are lower than the emission limits from the Industrial Emissions Directive (IED), which were used in the original Environmental Permit application assessment. Due to the changes in the emission parameters, an air quality impact assessment has been undertaken to support this variation, which includes an assessment of background air quality conditions, identification of human and ecological receptors. The assessment used the latest ADMS atmospheric dispersion model (version 6) and the assessment is provided in Appendix F.

The results of the air quality assessment indicated that there is unlikely to be any exceedances of Air Quality Standard (AQS) or Environmental Assessment Level (EAL) at identified human health receptors.

The impacts at ecological receptors have also been assessed at both European designated sites and Sites of Scientific Interest (SSSI) within 15 km of the Installation and for local sites within 2 km. Again, the impacts are shown to be unlikely to lead to significant impacts at these sites.

At present the existing Environmental Permit allows for the following combined effluents to be discharged via emission point W1:

- Effluents from the HRSG;
- Effluents from the demineralisation plant; and
- Effluents from the cooling tower purge (containing concentrated solution of the dissolved solids already present in the raw river water and small amounts of chemicals added for the conditioning of the cooling water).

Under the existing permit the effluents from the HRSG and the demineralisation plant are mixed with the cooling tower purge prior to discharge to the River Humber. Under this variation application, the types of process effluent will remain unchanged however, Uniper also intend to treat the small quantities of sewage generated from welfare facilities at an onsite water treatment plant. The discharges from W1 will comply with the emission limits set out in Table S3.2 of EPR/FP3838EB.

There will be no point source emissions to land from the Installation.

A Noise Impact Assessment (NIA) has been undertaken to determine the impact on the nearest residential and ecological receptors. The design of the proposed changes to the Installation activities includes embedded mitigation to reduce the impact of noise generated on the receptors. The NIA concluded that with the implementation of the embedded mitigation, noise is predicted to have a low impact on human and ecological receptors. This is due to the combination of the embedded mitigation and the relatively high background noise from existing surrounding industrial activities.

Due to the nature of the Installation and the use of natural gas as a fuel, it is expected that odour from the proposed CCGT operations will not be a significant issue.

The Operator has an existing Environmental Management System (EMS) accreditation to ISO14001:2015. A site-specific EMS will be developed and will be in place prior to operation of the Installation. The EMS will include but not be limited to emissions monitoring, accident management, waste minimisation and management, and infrastructure maintenance.

2. Introduction

2.1 Overview

In 2017 an Environmental Permit (reference EPR/FP3838EB) was issued to C.Gen Killingholme Limited (C.Gen) for the operation of the C.Gen Killingholme Power Plant in Killingholme, North Lincolnshire. The Environmental Permit enables the operation of a Mitsubishi Hitachi Power Systems M701F4, MHI F class model 800 MWth Combined Cycle Gas Turbine (CCGT), fired on natural gas.

Despite the issuing of the Environmental Permit in 2017, construction never commenced. The site has been subsequently sold to Uniper UK Limited ('Uniper') in 2024 and the existing Environmental Permit was transferred from C.Gen to Uniper in September 2025. As part of this transfer the site has since been renamed to the 'North Killingholme Power Project' (hereby referred to as the 'Installation').

Uniper are now progressing plans to develop and commission the Installation. This forms part of our proposals for the Killingholme Low Carbon Power (KLCP) project which is exploring the potential development of carbon capture technology alongside the CCGT power station, to reduce CO₂ emissions produced during the electricity generation process. It is anticipated that a further variation to include carbon capture plant will be submitted to the Environment Agency (EA) following the determination of this Environmental Permit variation.

The original Environmental Permit application was for a CCGT with a net output of 470 MWe (800MWth input capacity), however, the capacity of the grid connection available would enable a net output of 540 MWe. As such, a substantial variation to the Environmental Permit for the Installation is required to increase the thermal input capacity of the CCGT from 800 MWth to 900 MWth to allow for the increased net output capacity, varying the permitted Section 1.1 Part A(1) (a) activity.

This Environmental Permit variation application outlines the changes required to the listed activity under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) ('the EP Regulations') as a Section 1.1 Part A(1)(a): Burning of any fuel in an appliance with a rated thermal input of 50MW or more.

In addition to the Environmental Permit variation application, a Partial Surrender of an area of the existing Installation Boundary is also required, in order to align the Installation Boundary with the now proposed Installation. For further details on the changes to the Installation Boundary Section 3 and the Site Condition Report in Appendix D.

2.2 Proposed Operations

2.2.1 Listed Activities under Schedule 1 of the EP Regulations

There is only one listed activity under Schedule 1 of the EP Regulations detailed in Table S1.1 of the Installation's Environmental Permit. This variation application will vary the existing the Section 1.1 Part A(1) (a) combustion activity as detailed in Table 2-1.

Table 2-1: Table S1.1 Schedule 1 Listed Activities

Activity listed in Schedule 1 of the EP Regulations	Description of Specified Activity	Limits of Specified Activity	Changes Detailed in this Variation
Section 1.1 Part A(1) (a) Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more.	LCP470 (CCGT mode): Operation of a 800MWth input combined cycle gas turbine power plant (CCGT) burning gas to produce electricity. 30MWth auxiliary boiler for production of steam for start-up of the plant. Two emergency diesel generator units, with a combined total electrical output of the order of up to 1.5 MWe (consisting of two units that will share a common stack (windshield).	From receipt of natural gas to discharge of exhaust gases and the generation of electricity.	A substantial variation to the main activity carried out on Installation. The specified activity should be updated with the following: <ul style="list-style-type: none"> • Increasing the thermal input capacity of the CCGT to 900 MWth • Reducing the thermal input capacity of the auxiliary boiler to 8.5 MWth • Addition of two 3 MWth Joules Thomson heaters • Removal of one emergency diesel generator 1.5M Wth emergency diesel generator

In addition, to the listed activity there are a number of Directly Associated Activities (DAA) including:

- Drainage systems;
- Raw and process water treatment (cooling water treatment, demineralisation water treatment plant); and
- Oil storage tanks

There are no changes to the DAAs listed on the existing permit with the exception of the removal of the waste water treatment plant (activity reference A3 in Table S1.1 of EPR/FP3838EB).

2.3 Carbon Capture Readiness/ Decarbonisation Readiness

Under the original Development Consent Order (DCO) completed in 2013, a Carbon Capture Readiness (CCR) Feasibility Study was carried out, with extra land being set aside for CCR as explained within Carbon Capture Storage Design Concept Report, 22 March 2013 (DCO Document Reference: 8.4).

In October 2024, the UK Government published a response to a consultation on the Decarbonisation Readiness proposals to expand the CCR requirements. The proposals aim to maximise the decarbonisation potential of new build and substantially refurbishing combustion power plants, and ensure the requirements keep pace with the emergence of new decarbonisation technologies.

The Decarbonisation Readiness requirements will be implemented through the EP Regulations however it will not come into effect for Environmental Permit applications until after 28th February 2026.

As previously stated, the intention for the North Killingholme Power Project is that it will be built to be carbon capture ready, so that as soon as a pipeline becomes available to the Site, this can be implemented. Uniper have already completed a Preliminary Front End Engineering Design (Pre-FEED) for a Carbon Capture Plant at the Installation and it is anticipated that a further variation to include the planned Carbon Capture Plant will be submitted to the EA following the determination of this Environmental Permit variation.

2.4 Environmental Setting

The Installation is located approximately 5 km northwest of Immingham Docks, on land adjacent to C.RO Ports Killingholme Ltd (CPK). The nearest residential settlements to the Installation, are:

- East Halton (approximately 1.2 km to the west);
- North Killingholme (approximately 2 km to the southwest); and
- South Killingholme (approximately 3 km to the southwest).

The Installation is located wholly within the administrative boundary of North Lincolnshire Council (NLC) and the parishes of North Killingholme and East Halton. The site is centred at Ordnance Survey National Grid Reference TA 1578 1963.

The Humber Estuary is located approximately 0.5 km northeast of the Installation (at its nearest point) and is the only European Site located within 15 km of the Site. The Humber Estuary is designated as a Special Area of Conservation (SAC), RAMSAR and a Special Protection Area (SPA) under the Habitats Regulations.

The closest Site of Special Scientific Interest (SSSI) to the site is the North Killingholme Haven Pits SSSI located approximately 0.3 km east of the Installation (at its nearest point). The Humber Estuary SAC/ SPA, as described above, is also a SSSI. Locally designated sites within 2 km include Chase Hill Wood Local Wildlife Site (LWS), Halton Marsh Clay Pits LWS, and Burkinshaw's Covert LWS.

The Installation's location is not within an Air Quality Management Area (AQMA), and there are no AQMAs within 2 km. The only AQMA in the administrative boundary of NLC is situated approximately 22 km southwest of the Installation in Scunthorpe, which was declared in 2005 for exceedances of the daily mean PM₁₀ Air Quality Standard (AQS). The closest AQMA to the Installation is situated within the neighbouring Kingston-Upon-Hull City Council authority area approximately 10 km northwest of the Installation, which was declared in 2005 for exceedances of the annual mean NO₂ AQS.

Further detail on the environmental setting and local receptors is presented in Section 7.

3. Site Condition Report

3.1 Installation Boundary

3.1.1 Overview

The original Environmental Permit application was for a Power Island and a Gasification Plant and therefore covered a much larger site area than is required for the Installation. The existing Installation Boundary is shown in Figure 1, Appendix A.

The Installation will now occupy the land that was previously earmarked for the gasification plant. As the Installation will only comprise a CCGT generating station, the Installation Site Boundary can be reduced in size from the current permitted Installation Boundary. The land to be surrendered from the Installation Boundary is shown in Figure 2 and the revised Installation Boundary is shown in Figure 3, Appendix A.

In addition, the current permit allows for discharge to the Humber Estuary via Emission Point W1. Uniper are proposing a potential alternative location for W1, approximately 0.9km to the south of the current W1 location, as shown in Figure 5, Appendix A. The alternative location would enable them to reuse an existing underground pipe previously used to transport cooling water from the Humber Estuary to and from the former Killingholme A Power Station site.

The route to the existing W1 point will predominantly be within the existing Installation Boundary with the exception of a small area of land located between Haven Road and Loverose Way now being required for the pipeline if that route is chosen. The amendment to the Installation Boundary has been addressed in the updated Site Condition Report which is presented in Appendix D.

3.2 Partial Surrender

Pre-Application advice was issued by the EA on 23/07/2025 (pre-application reference EPR/FP3838EB/P002) which included the following advice in relation to the amendments to the Site Condition Report as part of this variation.

“The Site Condition Report (SCR) will need to be updated to reflect the correct installation boundary. The application should include a part-surrender as well to highlight the land that will be removed from the installation boundary. A justification to show the current state of the land will be required for the surrendered land. Regarding the alternative water emission point, if this will require setting a new pipeline, we would need to know the state of the land along the proposed route in the SCR. We would not require any investigations if it were an existing pipeline but please mention this in the application.”

Under the existing Environmental Permit, the Local Area Officer for the EA completed a Compliance Assessment Report (CAR) on 05/12/2024 following a site inspection. During the assessment, the EA confirmed that the Site remains in a pre-construction phase, with no evidence suggesting the initiation of any construction activities. Consequently, the report indicated that no non-compliances with the existing Environmental Permit conditions had been identified and the EA Officer confirmed that the Site was in a clean and tidy state.

The EA Officer confirmed that a large portion of the Site had been tarmacked while the remainder consisted of unmade land. The tarmacked areas of land were being used to for the storage of pre-registered cars. This CAR can be found in Appendix B.

The land to be surrendered covers an area of approximately 19.5 hectares and is shown in Figure 2, Appendix A. The majority of the land included in the partial surrender is the land to the north of the site and the area occupied by the existing pond which has been reflected in the Site Condition Report which can be found in Appendix D.

To surrender the land, the Applicant is submitting a partial low risk surrender as part of this Environmental Permit variation application. A ‘low risk’ surrender application is defined in the Part E2 application form Guidance document¹ as:

“applying to surrender a permit for an activity where the evidence burden to demonstrate that the site is in a satisfactory condition is small or non-existent. This will include permits where the operation never started. If we have confirmed that the facility you wish to surrender is low risk and we do not have to carry out an intrusive investigation (except in the case of a landfill surrender; see below), tick this box and you pay a reduced fee. You must also send a copy of the evidence with the application”.

As the Installation was never developed and no listed activities have been carried out under the existing Environmental Permit, no pollution by the permitted activity can have occurred, therefore we consider this to be sufficient information to demonstrate a low risk partial surrender.

3.2.1 Existing W1 and Pipeline Route

Due to changes in land use since the original Environmental Permit application, the route to the existing W1 Emission Point has been amended to create a connection between Haven Road and Loverose Way through to W1, as shown in Figure 3 in Appendix A.

3.2.2 Alternative W1 and Pipeline Route

The alternative W1 Emission Point, located 0.9km to the south of the current W1 location, would utilise an existing underground pipe. This pipeline was previously used to transport cooling water from the Humber Estuary to and from the former Killingholme A Power Station. This power station is no longer in operation and the permit was successfully surrendered in September 2017 as the EA were satisfied that the necessary measures were taken to avoid any pollution risk and that the site had been returned to a satisfactory state.

Physical inspections on the pipeline and supporting infrastructure are currently underway. Onshore elements of the pipeline are being inspected using cameras and other non-destructive investigative methods. The onshore pumphouse and associated structures (including suction dock and the dry well) will be inspected using a combination of camera inspections and concrete testing. The pipeline between the pumphouse and the proposed alternative W1 Emission Point will be inspected using cameras. The outfall itself will be inspected potentially using sonar scans.

The offshore pipeline is constructed of polyethylene, and it is anticipated that only minor refurbishments would be required as there is limited degradation potential due to the lack of oxygen. The onshore part of the pipeline is constructed of glass reinforced plastic.

Once the pipeline is refurbished it will comply with BS EN 14161 or ASME31.1. The refurbishment will be supplied and installed in compliance with the Pressure Equipment Directive (2014/68/EU) in accordance with ASME B31.1. Only methods and materials that are qualified for use in accordance with the Pressure Equipment Directive (2014/68/EU) will be used.

Once in use the performance and condition of the pipeline will be monitored via pressure indicators both in the pumphouse and at the cooling water recirculation pumps. The pipeline will also be periodically flushed to ensure there is no build-up of silt within the pipeline.

Based on the above if the alternative pipeline route was to be used it is unlikely that pollution would result from the operation of the pipeline.

This Environmental Permit variation application incorporates both W1 potential locations and it is intended that the decision over which location will be selected following detailed design.

¹ Environment Agency, 2020, ‘Guidance notes on part E2’. Available at: <https://assets.publishing.service.gov.uk/media/5ea01716e90e0704955ec597/Form-guidance-EPC-Part-E2-surrender-application.pdf>

3.3 Site Condition

3.3.1 Land Within the Revised Installation Boundary

A brief summary of the sensitivity of the revised Installation area (excluding the parcel of land that is being surrendered as outlined in 3.2 and shown on Figure 2 in Appendix A) is provided here:

- **Geology:** Areas of Made Ground, with depths of 0.3m to 4.5m and recycled aggregate stockpiles are also present across the site. Alluvium was found to be between 0.2m and 2.3m thick below the Made Ground, comprises slightly sandy, slightly gravelly clay over Glacial Till which contains occasional lenses of gravel and sand. This is underlain by Burnham Chalk Formation which is a sedimentary bedrock.
- **Hydrogeology:** The Burnham Chalk formation underlying the drift geology has been classified as a Principal Aquifer. Principal aquifers are layers of rock that have high inter-granular and/ or fracture permeability meaning they usually provide high levels of water storage. In addition, they may support water supplies and or river base flow on a strategic scale. The drift geology (glacial till) is classified by the EA as a non-aquifer of negligible permeability. As such, these formations are generally regarded as containing insignificant quantities of groundwater.
- **Hydrology:** The existing surface water drainage network in the vicinity of the Installation takes the form of natural channels, culverts, and open linear drainage channels around the site boundary. Located beyond the southeast of the Installation Boundary is an existing pond (as shown on Figure 1 in Appendix A), where it is thought that this network of drains ultimately discharges. The Site is approximately 0.7km from the Humber Estuary at the closest point.
- **Land use:** Currently the site remains in a pre-construction phase with some earthwork activities taking place.

3.3.2 Existing W1 and Revised Pipeline Located Outside the Existing Installation Boundary

The underlying land for the amended pipeline route to the existing W1 location (which is currently outside of the Installation Boundary) has the following underlying geology:

- **Geology:** Superficial geology is classified on the BGS Onshore GeoIndex² beach tidal flat deposits comprising predominantly clay, silt and sand. For bedrock geology the site overlies the Burnham Chalk Formation.
- **Hydrogeology:** The Burnham Chalk formation underlying the drift geology has been classified as a Principal Aquifer. Principal aquifers are layers of rock that have high inter-granular and/ or fracture permeability meaning they usually provide high levels of water storage. In addition, they may support water supplies and or river base flow on a strategic scale. The drift geology (glacial till) is classified by the EA as a non-aquifer of negligible permeability. As such, these formations are generally regarded as containing insignificant quantities of groundwater.
- **Hydrology:** The parcel of land is located on the banks of the Humber Estuary. An existing pond is located beyond the southeast of the Installation Boundary.
- **Land use:** The area of land overlying the pipeline route has been tarmacked and is currently used as a container storage area.

3.3.3 Alternative W1 and Pipeline Route

As outlined in Section 3.2.2 the alternative W1 Emission Point would utilise an existing pipeline. The underlying geology of this pipeline is outlined below:

- **Geology:** Superficial geology is classified on the BGS Onshore GeoIndex² as beach tidal flat deposits comprising predominantly clay, silt and sand overlaying glacial till. For bedrock geology the site overlies

² British Geological Survey, (n.d.) GeoIndex (Onshore). Available at: <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>

the Burnham Chalk Formation. The pipeline also passes through some deposits of Made Ground underneath the Humber Sea Terminal land.

- **Hydrogeology:** The Burnham Chalk formation underlying the drift geology has been classified as a Principal Aquifer. Principal aquifers are layers of rock that have high inter-granular and/ or fracture permeability meaning they usually provide high levels of water storage. In addition, they may support water supplies and or river base flow on a strategic scale. The drift geology (glacial till) is classified by the EA as a non-aquifer of negligible permeability. As such, these formations are generally regarded as containing insignificant quantities of groundwater.
- **Hydrology:** The parcel of land is located on the banks of the Humber Estuary.
- **Land use:** The area of land immediately south of the Installation is currently open fields. The remaining land is occupied by the Humber Sea Terminal and has been tarmacked and used for car parking.

4. Operating Techniques

4.1 Technical Standards

The technical standards that are considered to be applicable to this Environmental Permit variation application are:

- Best Available Techniques (BAT) Reference (BRef) Document for Large Combustion Plant (LCP BRef)³;
- BAT Conclusions for Large Combustion Plant (LCP BATc)⁴;
- Develop a management system: environmental permits⁵; and
- Emergency backup diesel engines on installations: best available techniques⁶.

A review of the Installation against the LCP BAT conclusions has been provided in Appendix C.

Proposed CCGT for the combustion for fuel to generate power falls under Section 1.1 Part A(1)(a): Burning of any fuel in an appliance with a rated thermal input of 50 MW or more. The Installation will be compliant with the Industrial Emissions Directive (IED), LCP BRef and the associated LCP BATc; and a summary of compliance against the current BATc is provided in Appendix C with more detailed discussion presented in the following sections.

4.2 Process Description

4.2.1 Overview

Uniper are seeking to install a CCGT power station comprising the following elements:

- CCGT (including Gas Turbine (GT), Steam Turbine (ST), electricity generator (and associated transformers) and a Heat Recovery Steam Generator (HRSG));
- Gas reception area;
- Auxiliary boiler;
- Emergency diesel generator;
- Raw water treatment plant;
- Demineralised water treatment plant;
- Hybrid cooling towers with condenser and auxiliary cooling equipment;
- Wastewater treatment plant;
- Raw and fire water storage tank; and
- Materials Storage Facility.

³ Best Available Techniques (BAT) Reference Document for Large Combustion Plants, under Directive 2010/75/EU of the European Parliament and of the Council, European IPPC Bureau, December 2017. Available at: [Best Available Techniques \(BAT\) Reference Document for Large Combustion Plants - Industrial Emissions Directive 2010/75/EU \(Integrated Pollution Prevention and Control\)](#)

⁴ Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 Establishing Best Available Techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for Large Combustion Plants, European IPPC Bureau, July 2017. Available at: [Publications Office](#)

⁵ <https://www.gov.uk/guidance/develop-a-management-system-environmental-permits>

⁶ [Emergency backup diesel engines on installations: best available techniques \(BAT\) - GOV.UK](#)

4.2.2 CCGT Power Generation Plant

The selected CCGT to be installed will have a thermal input capacity of 900 MWth and will comprise a GT, a ST, a HRSG and auxiliary plant.

The GT will comprise an inlet air filter, an air compressor, combustion chambers, power turbine and exhaust silencer. Within the GT, natural gas will be mixed and combusted with air from the compressor outlet. The hot combustion gases will expand across the blades of the turbine producing mechanical energy used to drive the generator to produce electricity.

The exhaust gas from the GT will still contain recoverable heat energy. To utilise this energy the hot exhaust gases from the GT will then be passed through a HRSG to produce high-pressure, medium-pressure and low-pressure steam, which is used to drive a ST, also connected to the generator; thereby maximising electricity generation from the fuel being combusted.

The steam exhausting from the ST will be condensed, with the condensate returned to the steam-water cycle of the HRSG for continued reuse. Water used within this steam/ water cycle will need to be treated to be of extremely high purity to regulate the build-up of residual dissolved solids in pipework arising from the continuous evaporation and condensing of water within the cycle. To further manage this, it will be necessary to purge a small amount of the recirculating water ('boiler blow-down') intermittently. Any blow-down removed from the cycle will need to be made up with fresh demineralised water.

The condensation of steam exiting the ST will be achieved using a separate circuit of cooling water that will be recirculated through hybrid cooling towers.

In Table 2 of the LCP BATc, it outlines the energy efficiency requirements for new CCGTs. CCGTs with a thermal input capacity equal to or greater than 600 MWth are required to have a net electrical efficiency of between 57 - 60.5%. The combination of the high-efficiency GT and the HRSG/ ST, is anticipated to be capable of achieving electrical efficiency levels of 59%, thereby achieving the efficiency range presented in the LCP BATc.

The Installation will be able to achieve the upper end of the LCP BATc BAT-Achievable Emission Levels (AEL) for oxides of nitrogen (NO_x) through the use of primary combustion controls, and no secondary emissions abatement systems are required. As such, the Installation will not include Selective Catalytic Reduction to reduce NO_x emissions.

Whilst it is recognised that SCR could be applied to reduce NO_x emissions towards the lower end of the BAT-AEL range, this would result in an emission of ammonia, due to the potential for ammonia slip to occur. Ammonia contributes to nitrogen deposition on habitat receptors, with a deposition rate that is significantly greater than that of NO₂, and therefore it is considered that any emission of ammonia (even at the lower end of the BAT-AEL range of 3 – 10mg/Nm³) would increase the nitrogen deposition impacts more than any reduction in the NO_x impacts would achieve. It is therefore considered that if SCR were applied, nitrogen deposition impacts at the closest habitat receptors would increase above the 1% threshold for determining insignificance on these receptors.

As the predicted impacts of NO₂ at human health receptors and NO_x at habitat receptors are considered to be either insignificant or not significant, it is not considered that there is any driver to reduce the NO_x emissions below the upper end of the associated BAT-AEL range.

A contractual agreement to receive natural gas from the National Transmission System (NTS) will be in place, which will include the requirement for the gas to comply with specified quality criteria. Equipment such as a gas chromatograph (GC) will be put in place to test the quality of the fuel (GCs usually take measurements every 5 – 10 minutes). The Joint Environmental Programme (JEP) Report Characterisation of Power Plant Fuels for Compliance with LCP BATc BAT 9 was produced to assist operators of LCP comply with BAT. The Installation will implement the requirements through the site's Environmental Management System (EMS).

The electricity generated by the CCGT will be exported to the Killingholme 400kV substation. There is existing agreement for a net electrical power export of 540 MWe from the Uniper Killingholme Power Project.

4.3 Ancillary Equipment and Structures

4.3.1 Auxiliary Boiler

The Installation will require the use of an auxiliary boiler to provide steam during start-up. The thermal input capacity of the boiler is 8.5 MWth. The boiler will be designed to temporarily provide steam during these events which would otherwise normally be provided by the HRSG for deaeration of the feedwater/ condensate before its introduction into the main boiler, to warm the steam piping and ST gland system.

The auxiliary boiler system will be gas-fired and incorporate a small stack of the order of 15m high (Emission Point A2). The proposed operating regime will include multiple start-ups and shutdowns per annum which will require the operation of the auxiliary boiler. This is anticipated to be less than 500 hours per annum.

Due to the thermal input capacity, this plant falls under the requirements of the Medium Combustion Plant Directive (MCPD), although as it will be operational for less than 500 hours per annum, it will be exempt from meeting the MCPD Emission Limit Values (ELVs). That said, it is anticipated that the boiler would be compliant with the limits.

The existing Environmental Permit includes the operation of an auxiliary boiler with a thermal input capacity of 30 MWth. The proposed 8.5 MWth auxiliary boiler will therefore replace the 30 MWth boiler.

4.3.2 Gas Reception Area

The CCGT will be fired using natural gas from the NTS via a gas reception area owned and operated by Uniper. There will be no storage of natural gas on-site.

Joules Thomson (JT) heaters are required where the temperature of the gas downstream of the gas pressuring reducing station falls below a set point (which is anticipated to be approximately 15°C). There will be two natural gas fired JT heaters present, each with a thermal input capacity of 3 MWth (Emission Points A3 and A4). The number of hours of operation will be dependent on the pressure and temperature of the incoming natural gas stream but is anticipated to be approximately 500 hours per year. Although not anticipated to be operational for more than 500 hours a year, the JT heaters will comply with the emission limits set out for such plant under the MCPD requirements.

4.3.3 Emergency Diesel Generator

In the event of a loss of electrical power to the Site, the Installation will include an emergency diesel generator (Emission Point A5) to provide backup electrical power to enable the plant to be shut down safely. The approximate thermal input capacity will be 1.5 MWth. The likelihood of operating the plant as a result of a significant loss of power is low, however, to ensure that the plant is ready for operation in the event of an emergency the emergency diesel generator will be required to undergo routine testing which will be up to 50 hours per annum.

As the emergency back-up generator would only be used to provide power at the site during an emergency, it is excluded from the Specified Generator requirements of the EP Regulations and as it would operate for less than 500 hours per year it would also be exempt from the MCPD ELVs.

4.3.4 Cooling System

The operation of the CCGT will require continuous cooling during operation. Cooling water will be sourced from an abstraction point from the Humber Estuary. The abstraction licence (reference 4/29/09/*T/0132) has an abstraction limit of 1,650 m³/h for cooling water. Following abstraction, the cooling water will be transferred to a settling pond to remove suspended solids (labelled as Make-up Water Pond for CCGT on Figure 4, Appendix A). Once the water has settled it will be subject to water treatment within a cooling water conditioning plant which will include acid dosing, hardness stabiliser dosing and biocide dosing. Once treated the cooling water will be sent to the cooling towers for use.

The water will be used within hybrid cooling towers which operate by utilising the high latent heat of evaporation for water to dissipate the heat load.

Where practical, efforts will be made to recover wastewater streams to serve as cooling water make-up or as feed for the demineralisation water treatment plant in order to reduce emissions to water. This will include

HRSB blowdown, Reverse Osmosis (RO) rejects (from demineralisation treatment plant), effluent from the condenser and treated water from the oil/ water separator.

Once the cooling water has been utilised the removed suspended solids will be reintroduced to the cooling water and discharged via Emission Point W1.

4.3.5 Demineralisation Water Treatment Plant

Non-potable water will be sourced from Anglian Water primarily for use within the steam system and for condensate polishing. Prior to use within these systems the non-potable water will be subject to treatment within a demineralisation water treatment plant. The demineralisation plant will operate using a RO system. The RO system operates by pumping feed water through a semi-permeable membrane which allows water particles to pass through but will retain any other substances present. Substances other than the water molecules will collect on the surface of the membrane and the treated water will continue along the process.

The demineralisation plant effluent reject water will contain elevated concentrations of substances found in the non-potable feed water. This water will be sent to the cooling water conditioning plant and then be used within the cooling towers.

4.3.6 Sanitary Water Treatment Plant

The management of wastewater generated by the welfare facilities is yet to be confirmed. The two potential options are for the wastewater to go to a local sewer if a connection is available, alternatively it will be managed and treated within the Installation via a package sanitary treatment plant, with the resulting waters being discharged via Emission Point W1.

For the purpose of this application the sanitary wastewater has been included as part of the emission to water.

4.4 Utilities

4.4.1 Natural Gas

The CCGT will be fired on natural gas which will be sourced from the NTS. The CCGT will consume approximately 372,000 tonnes per annum of natural gas based on the proposed operating regime. The natural gas will enter the Site via a tie-in to an existing natural gas pipeline into the gas reception area.

4.4.2 Cooling Water

The cooling water source for the Installation will be obtained from the Humber Estuary, via the abstraction point licenced under 4/29/09/*T/0132. The abstraction licence was issued to Uniper on 30 April 2025 and allows for the abstraction of 14,493,600 m³ of raw water per annum for cooling.

4.4.3 Instrument Air and Nitrogen

Instrument air and nitrogen are required to support the operation of the plant under normal operating conditions as well as start-up and shut-down. Nitrogen will be stored within stainless steel bottles.

4.4.4 Water

A new potable water connection by Anglian Water will be installed to provide potable water to the Installation. The potable supply will be used to supply welfare facilities and the annual consumption is expected to be 1,095m³ per annum.

Non-potable water will be sourced from Anglian Water primarily for use within the steam system and for condensate polishing. The annual consumption is expected to be 96,871 m³ per annum.

4.5 Process Control

The CCGT will be operated using a Distributed Control System (DCS). The plant will be controlled from a central control room in addition to local control panels for plant. The DCS will be highly automated and allowing for continuous process control during start-up, normal operations and shut-down operations.

The DCS system will be designed as a plant wide control and operation system that will directly interface with the following subsystems:

- Condition monitoring system;
- Continuous emissions monitoring system (CEMS);
- Various vendor packages including emergency diesel generators; and
- Fire and gas safety system.

The control system will continuously undertake automatic checks to ensure the Installation’s safety protection system is operating efficiently. The system will react immediately if a system fault is recognised by the automatic fault detection system. Programmed failsafe responses will be triggered to react to the identified fault.

4.6 Management Systems

Uniper has a long-established EMS which is accredited to ISO 14001:2015 and the certificate is provided in Appendix J. Uniper’s operational sites within the UK have a shared certificate and meet the requirements of the standard by working to central system procedures as well as site specific/ local procedures. The central procedures include the core management system requirements to ensure that there is consistency in the implementation of the EMS across all Uniper’s UK sites. The shared system requires sites to follow the high-level management instructions but also to have in place local management instructions that are specific to their plant and operations. This ensures that the right actions are taken at the right time by the right people.

The Installation will be included within the company’s current ISO 14001 EMS. The Installation will be designed with compliance with the EMS in mind, and a fully integrated EMS will be implemented into all aspects of plant operation. A summary of the EMS is presented in Table 4-1.

Table 4-1: Environmental Management System Summary

Section	Detail
Scope of EMS	The scope includes all aspects of the site operations including the generation and supply of electricity to the grid and the maintenance of associated equipment.
Uniper Health, Safety, Security, Environment & Sustainability (HSSE&S) Policy	<p>Uniper hold an Environmental Policy that is consistent with the requirements of the LCP BRefc BAT 1. The Operators Environmental Policy commits to the following:</p> <ul style="list-style-type: none"> • Compliance with legal and other obligations; • Provide a safe and secure workplace; • Identify and manage social and environmental aspects; • Promote carbon neutrality; • Develop and implement sustainable resource use and energy efficiency measures; • Engagement and consultation with stakeholders; • Work with partners to develop solutions that can contribute to a low carbon economy; • Protect our business from the risk of disruption; and • Continual improvement of our HSSE & Sustainability performance and management system by setting objectives and targets providing resources and information necessary to achieve them. <p>A copy of the current policy can be provided.</p>
Roles, Resources and Responsibilities	This sets out who is responsible for what activity and is linked to detailed procedures under operational control.
Planning: Environmental Aspects and Impacts/ Risk Assessments	Uniper will identify the environmental aspects and impacts relevant to the Installation. These will be risk assessed, and mitigation and control measures will be identified and implemented to reduce the impact of the Installation on the environment. Risks will be assessed under normal, abnormal and emergency conditions. They will include location of the Installation and any impacts on nearby sensitive receptors.

Section	Detail
Risk and opportunities	Internal and external risks and opportunities will be identified in a register. This will highlight any risks to the Installation as well as opportunities e.g. climate adaptation and resilience or decarbonisation opportunities. If the risks and opportunities are of high enough significance, plans will be put in place to mitigate or implement them.
Compliance Obligations	A register will be maintained including all applicable Environmental Legislation. Evaluation of compliance will be carried out at a site level. The legal register will be subject to regular review and updated with new or amended legislation relevant to the operations.
Objectives and Targets / Improvement Programmes	Objectives and targets are laid out within the improvement programme. They will be based on significant aspects, risks or opportunities, the outcome of audits and incident trends. Individuals will be given responsibility to achieve them.
Competence, Awareness and Training	Using Uniper's established competency and training systems, the key competency requirements will be set out for the operation of the Installation and the training individuals require. This will be subject to annual review or as operations change. Training will include environmental training in relation to operation of the plant, emissions monitoring and emergency response. The potential environmental risks posed by the work of contractors is to be assessed within the work control management systems at the Installation, and instructions will be provided to contractors about protecting the environment whilst working on site as part of a specific site induction process which will be compulsory to all on site contractors.
Communication, Complaints and Requests for Information	The process for receiving and responding to complaints and communicating with Regulators and other interested parties will be implemented as part of the EMS. The procedure details who does what and when.
Operational Control	This is the part of the EMS that sets out the key operational controls for day-to-day operation of the Installation and will include: <ul style="list-style-type: none"> • Site infrastructure plan (see below); • Operational procedures covering start up, shut down and normal and abnormal operations; • Emissions monitoring and associated procedures (e.g. MCERTS, EN14181); • Site equipment and maintenance plans/ systems; • List of wastes produced and waste management procedures at the Installation; and • Reporting and recording environmental incidents
Site Infrastructure plan	A site infrastructure plan will form part of the EMS, including the following: site details and locations of buildings, services (mains water, gas, electricity), site access points, roads, water management systems (effluent, surface water, sewage), drainage plans, oil and chemical storage facilities, emission points (to air and water), monitoring locations, spill / clean up kits, vulnerable receptors (e.g. estuary, groundwater, wildlife locations etc).
Document Information and Control	This covers key documents needed for permit compliance and other key documents relevant to the operation of the Installation. The procedure will include the process for keeping documents, including period of retention, document issue to ensure only the most up-to-date procedures are used and location of the documents. Uniper has an electronic system that is available to all relevant employees and contractors.
Emergency Preparedness and Response	An Emergency and Business Continuity Plan will be put in place for the Installation. This will include dealing with environmental incidents and cover site plans and information for emergency services.
Monitoring, Measurement, Analysis and Evaluation	This will include establishing key performance indicators to measure environmental performance and the effectiveness of the EMS. All actions arising from incidents, accidents and audits will be recorded. The corrective/preventative action that needs to be implemented to stop reoccurrence will also be recorded. Tracking the implementation of these actions will be through Management Review (see below), and monitoring audit actions as part of the key performance indicators for the EMS.

Section	Detail
Audit	The EMS will be subject to an external ISO 14001 audit from an independent certified auditing company alongside Uniper's other accredited sites. The Installation will also be subject to internal audits in accordance with risk and the Company Internal Audit Plan.
Management Review	The EMS will be subject to review to assess if it is performing effectively and if additional resources need to be provided or further actions taken. This management review process will be in several parts; the first review takes place at a site level with all Senior key personnel that have control over operations. There would be a further fleet Management Review that would include Directors from across the business.
Climate Change Adaptation Risk Assessment	Climate change adaptation and mitigation will be considered in the proposed plant design. Climate change adaptation risk assessments are carried out at an operational site level. Uniper will consider how a changing climate might affect future operations and ability to comply with permit conditions. The risk assessment considers climate change projections to support risk identification. Climate related risks and any associated mitigation plans are managed within the Company's system

The key environmental management responsibilities will be allocated as described below.

- The Plant Manager will have overall responsibility for management of the Installation and compliance with the Environmental Permit. The Plant manager will have extensive experience relevant to his responsibilities and will be responsible for ensuring adequate resources are available to manage the environmental requirements.
- The Production Manager will have day-to-day responsibility for the operation of the plant, to ensure that the plant is operated in accordance with the permit and that the environmental impact of the plant's operations is minimised. In this context, he or she will be responsible for designing and implementing operating procedures which incorporate environmental aspects.
- The Engineering Manager will be responsible for the management of maintenance activities, for maintenance planning and for ensuring that the plant continues to operate in accordance with its design and environmental requirements.
- The SHE/Environment Team leader will be responsible for producing reports that need to be submitted to the EA, liaising with the Uniper central environment team and the site management, to ensure the requirements of the Environmental Permit and the EMS are met.

4.7 General Maintenance

The objective of plant maintenance is to ensure that the Installation operates safely and efficiently. General ongoing maintenance, occurring during normal operation, will also be required via the Installation's EMS.

Major plant maintenance shutdowns will be planned on a long-term basis with such outages likely to be infrequent (of the order of every four/ five years) and will vary in duration (7 – 45 days depending on the maintenance required). Maintenance programmes will be developed to be in accordance with the recommendations of the equipment manufacturers' recommendations and operating instructions.

4.8 Raw Materials

The use of hazardous materials within the Installation will be eliminated by design where possible, and minimised where it is not practical to eliminate them. A Stage 1 – 3 Assessment for the storage of hazardous materials has been undertaken and is included in Annex 3 of Appendix D.

In areas where chemicals are being handled, the flooring will be paved and kerbed/ bunded to ensure that spillages and/ or leaks in those areas are contained, manually cleaned up and disposed of appropriately, in line with the existing Installation's spillage management procedures. Any liquid chemicals stored will be kept in appropriately bunded and segregated areas.

Raw materials will be stored in appropriate containers, within suitable spill protection including; double skinned tanks with leak detection, on bunded pallets, on drip trays, in specifically designed cabinets and cupboards or other appropriate storage units and areas.

The EMS will comprise procedures for controlling raw material delivery including for oil transfer operations, and spill response procedures. Spill kits will be available at appropriate locations at the Installation.

The main raw material used will be natural gas which will be combusted within the CCGT to produce electricity. The natural gas will be transported to the site via an underground pipeline with no on-site storage or treatment facilities beyond adjustment of temperature, pressure and filtration and knockout pots to remove any condensed liquids. The CCGT is expected to consume 372,000 tonnes of natural gas per annum based on the expected operating regime.

Other raw materials and their predicted storage volumes are detailed in Table 4-2.

Table 4-2: Additional Raw Materials

Material	Purpose	Estimated Maximum Storage Quantity	Estimated Annual Consumption
Natural gas	Fuel gas	No on-site storage	372,000 tonnes
Nitrogen	Blanketing of HRSG	532 Nm ³ (stainless steel bottle containers)	540 Nm ³
Cooling water	Cooling towers	4,400 m ³ (lined pond)	5,880,600 m ³
Raw water	Process water and firefighting water	1,000 m ³ (stainless or coated steel container)	97,000 m ³
Demineralisation water treatment plant chemicals (i.e. caustic soda, sodium bisulphite, anti-scalant)	Demineralisation water treatment plant chemicals	4 m ³ (IBC)	30 m ³
Demineralisation water treatment plant cleaning chemicals (i.e. caustic cleaner, acid cleaner)	Cleaning of the demineralisation plant (anticipated cleaning frequency 3 – 4 times per year)	2 m ³	Unknown at this stage.
Cooling water treatment chemicals (biocide, coagulant, flocculant aid)	Cooling water treatment chemical	36 m ³ (combination of HDPE/FRP tank, or IBC)	820 m ³
Condensate polishing chemicals (i.e. sulphuric acid, caustic soda)	Condensate polishing	20 m ³ (steel tank or HPDE/FRP coated steel)	40 m ³
Closed water cooling cycle for auxiliary boiler (carbonhydrazide, glycol)	Closed cooling water system	50 l (contained within cooling system)	N/A – closed loop system
Aqueous ammonia	Dosing to steam/ condensate system	1m ³ (bunded IBC container)	25 m ³
Oxygen	Dosing into main condensate system	2 x 50 l container	Unknown at this stage
Hydrogen	Generator filling	To be confirmed	800 m ³ per filling (number of fillings currently unknown)
Lubrication oil	Used for lubrication of mechanical equipment	300 l	6,600 l

Material	Purpose	Estimated Maximum Storage Quantity	Estimated Annual Consumption
Transformer oil	Use within transformers	4,000 l	To be confirmed.
Diesel	Emergency standby diesel generator fuel	To be confirmed	25 m ³
Carbon Dioxide	Fire extinguishing	To be confirmed	Only required in emergency scenarios
Argon	Generator purge	To be confirmed	400 m ³

4.9 Waste

The waste information presented in this section has been estimated based on typical types and volumes of waste generated by CCGTs of comparable capacity.

The volume and types of waste that will be generated as a result of the operation of the Installation will be minimal. General wastes from the Installation are expected to be minimal and will be appropriately disposed of via licensed 3rd party waste contractors, in line with regulatory requirements. In addition, there will be:

- Used GT air intake filters;
- Used RO membranes (typically replaced every 5 to 10 years);
- Separated oil/ sludge from oil/ water separators;
- Used oil, chemicals or chemical containers; and
- Waste lubricating oil.

All wastes will be stored in appropriate, labelled containers and stored in designated bunded waste storage areas. All bulk liquid waste storage tanks will be within bunds with 110% capacity of the primary container.

All other wastes generated such as packaging and general wastes will be managed through waste management practices at the Installation, implemented through the Installation's EMS and in accordance with BAT.

The main solid wastes that are anticipated to be generated by the operation of the Installation, including estimated quantities and generation frequency i.e. continuous/ intermittent/ occasional, are shown in Table 4-3. The anticipated main liquid wastes are shown in Table 4-4.

Table 4-3: Anticipated Solid Waste Stream

Waste Stream	Anticipated European Waste Code	Estimated Annual Quantity (tpa)	Disposal Route
General waste (including mixed municipal, dry mixed recycling, non-hazardous wood waste, other packaging, biodegradable waste)	15 01 01	100	Collected for off-site recycling, treatment or disposal by licenced 3 rd party waste contractor.
	15 01 02		
	15 01 03		
	15 01 06		
	15 01 10*		
	17 02 01		
	20 01 38		
	20 02 01		
	20 03 01		

Waste Stream	Anticipated European Waste Code	Estimated Annual Quantity (tpa)	Disposal Route
Solid oily separator waste, absorbents, filter materials, wiping cloths, protective clothing contaminated by dangerous substances	15 02 02* 15 02 03	25	Collected for off-site treatment by licenced 3 rd party waste contractor.
Used electronics (e.g. Fluorescent Tubes & Sodium Lamps, discarded equipment, discarded electrical and electronic equipment, used batteries)	20 01 21* 16 02 13* 16 06 04 16 06 01*	20 (generated during maintenance periods)	Collected for off-site treatment by licenced 3 rd party waste contractor.
Waste lubrication oil	13 02 05 13 02 08 13 03 07 13 07 01	35	Collected for off-site treatment by licenced 3 rd party waste contractor.
Used filters	15 02 03 16 01 07 19 09 05 19 05 06 20 03 01	25	Collected for off-site treatment by licenced 3 rd party waste contractor.
Waste metals from maintenance	16 01 17 20 01 40 17 04 01	40 (generated during maintenance periods)	Collected for off-site recycling by licenced 3 rd party waste contractor.

Table 4-4: Anticipated liquid waste streams

Waste Stream	Anticipated European Waste Code	Estimated Annual Quantity	Disposal Route
Process wastewater not suitable for on-site treatment (chemically contaminated water, gas turbine wash water, process closed drains)	16 10 04	~ 35m ³ / 28 days	Collected for off-site treatment by licenced 3 rd party waste contractor.
Oil disposal from oil separators	13 02 05* 13 01 13*	9000 l/yr	Collected for off-site treatment by licenced 3 rd party waste contractor.
Condensate polishing effluent	10 10 01 16 10 02	1,350	Collected for off-site treatment by licenced 3 rd party waste contractor.

Waste Stream	Anticipated European Waste Code	Estimated Annual Quantity	Disposal Route
Raw Water Treatment Plant Waste (elevated concentrations of raw water)	10 01 26	350	Collected for off-site treatment by licenced 3 rd party waste contractor.
Waste lubrication oil	13 02 05 13 02 08 13 03 07 13 07 01	35	Collected for off-site treatment by licenced 3 rd party waste contractor.
Used chemicals or chemical containers	06 01 01 06 01 02	2	Collected for off-site treatment by licenced 3 rd party waste contractor.

4.10 Energy Efficiency

Energy efficiency has been integrated into the Installation's design to optimise performance and reduce energy consumption and waste, where possible. Uniper will comply with the Energy Savings Opportunity Scheme (ESOS). Under the ESOS the operator is required to undertake an energy assessment which involves an audit of their energy use every four years. The purpose of the energy audits is to identify specific, cost-effective energy-saving measures. This must include 95% of the Uniper's whole energy consumption, including industrial processes. Following the audit, there is a requirement to create and publicly report on an action plan, along with annual progress updates, ensuring accountability for implementing improvements.

In addition, Uniper will update their EMS to incorporate the operation of the Installation. As part of the requirements under the EMS, the energy efficiency will be monitored, reviewed and reported on. Uniper will employ performance engineers to audit energy performance on a daily, weekly and annual basis during which opportunities for improvement of energy efficiencies can be identified.

In Table 2 of the LCP BATc outlines the energy efficiency requirements for new CCGTs. CCGTs with a thermal input capacity equal to or greater than 600MWth are required to have a net electrical efficiency of between 57 - 60.5%. The combination of the high-efficiency GT and the HRSG/ ST is anticipated to be capable of achieving electrical efficiency levels of 59% thereby exceeding the lower range of the efficiency presented in the LCP BATc.

The efficiency of the CCGT and ancillary equipment will be monitored primarily through automated data collation and analysis software which gathers, archives, and processes operational data from the plants DCS in real time. Parameters that are monitored include items such as the individual fuel, plant power outputs, works power demand, ambient factors, and many other operational instruments that allow performance and efficiency factors to be assessed. The Installation will use thermal modelling to implement targets for performance. As part of the auditing process a variation report will be produced which will summarise the overall performance of the plant by measuring the actual performance against those targets set by the thermal model. The data produced will enable Uniper to make decisions on where it is possible to improve performance and increase energy efficiency.

4.10.1 Combined Heat and Power Readiness Assessment

Under Article 14 of the Energy Efficiency Directive (2012/27/EU) (EED), operators of certain types of combustion installations >20MWth are required to undertake an assessment of opportunities for cogeneration (also known as combined heat and power (CHP)) or supplying a district heating or cooling network. It requires that a cost-benefit analysis in accordance with Part 2 of Annex IX of the EED is carried out in order to assess the cost and benefits of providing for the operation of a new installation as a high-efficiency cogeneration installation.

In the pre-application advice issued on 23/04/2025 the EA stated the following:

“The third BAT test (CHP) states that the applicant/ operator should carry out periodic reviews of opportunities for the supply of heat to realise CHP. Considering the timeframe since the permit issue, the CHP readiness study should be updated. Regarding the application, a summary of the CHP readiness study would be appreciated.”

The CHP Readiness (CHP-R) Assessment has been updated as part of this permit variation and is presented in Appendix E.

The assessment concludes that, although a small number of theoretical heat off-taker opportunities were identified in the CHP search area, the consultation found no interest in a heat connection. Therefore, at this time, there are no identified feasible heat off-taker opportunities (considering both technical and economic feasibility).

District heating or process CHP is therefore not proposed to be installed from the outset of commercial operation of the Installation. However, the Installation will be designed to be CHP-Ready in accordance with the BAT Tests of the CHP-R Guidance.

4.11 Existing Pre-operational Measures

The existing Environmental Permit includes pre-operation condition PO2 which states the following:

“The Operator shall submit a written report to the Environment Agency providing full detailed design details for the site (including drainage).

The Operator shall undertake a review of the Environmental Permit application against the final plans for the installation, prior to construction, to:

- I. ensure that the final proposals will meet the requirements for BAT; and*
- II. the application still accurately reflects the final design and operating proposals*
- III. provide an updated site layout plan, detailing the precise and accurate location of plant and all emission points.*

The Operator shall submit the findings of this review within the written report to the Environment Agency for approval in writing by the Environment Agency.”

PO2 requires the submission of the final plans including the drainage plan and site layout along with a review comparing the final plans to the design submitted at the time of the application. At the time of this variation application the Installation is still being finalised. As such the submitted Drainage Plan (Figure 6, Appendix A) and the Installation Layout Plan (Figure 4, Appendix A) are indicative at this stage. Although the drainage plan is still under development, and therefore through detailed design will be subject to change, the general principles of having segregated drainage systems are likely to remain unchanged. Further details on the drainage philosophy are outlined in Section 5.2.

Following the completion of the final plans Uniper will undertake a review of the permit application against the final plans which will be submitted to the Environment Agency in accordance with PO2.

The existing Environmental Permit also includes a pre-operation condition (PO5) which requires the production of a site closure plan which will be submitted to the EA to outline proposals for the decommissioning of the Project and the reinstatement of the Operations Area. This requirement is no longer outlined in the relevant Permit application forms. As such this pre-operational condition will not be addressed through this permit variation however a Site Closure plan will be developed by the Operator at the end of the Installation’s operating life.

This Environmental Permit Variation application also addresses PO3 which states the following:

“Prior to undertaking commissioning of the plant the applicant will submit, to the environment agency, a reviewed and revised Combined Heat and Power Assessment in line with the Environment Agency’s latest Guidance (CHP Ready Guidance for Combustion and Energy from Waste Power Plants, V1.0 February 2013), for written acceptance and approval from the Environment Agency.”

PO3 which required the submission of a revised Combined Heat and Power Assessment in line with the EA’s Guidance has been addressed within this permit variation application. A CHP Assessment is presented in Appendix E. A summary of the findings can be found in Section 4.10.1

5. Emissions

5.1 Emissions to Air

In addition to the emission points detailed below, there will be a gas-fired building heater in the region of 1.5 MWth input, to provide building heating. This will not be required to operate during warmer months and therefore it is assumed that it will only be operational for 50% of the year. As this provides direct gas-fired heating, this is exempt from MCPD controls and therefore is not included within the Permit application.

The existing permit includes an emission point referenced as M1, which was an emission point associated with the “vent scrubber for an acid tank”. This is no longer included within the design of the Installation, and therefore this emission point should be removed from the Environmental Permit through this variation application.

An Air Quality Impact Assessment has been carried out for the emissions from the Installation and is detailed in Appendix F.

5.1.1 HRSG Stack – Emission Point A1

There will be one main Emission Point associated with the CCGT which is the HRSG stack (A1). The emissions from the stack will comprise oxides of nitrogen (NO_x) and carbon monoxide (CO). The use of natural gas means that emissions of sulphur dioxide (SO₂) and particulates (PM) from the CCGT plant will be negligible.

Emissions of NO_x from the CCGT plant will be controlled to meet the upper end of the BAT-AEL range of 10 – 30mg/Nm³ by primary means, such as the use of dry low NO_x burners and operation and control through an automated process control system in accordance with BAT. Combustion emissions will be released at the LCP BAT-AELs, which can have an uplift applied where the electrical efficiency (EE) of the CCGT is greater than 55%. The anticipated EE of the CCGT is 59% and therefore the NO_x BAT-AELs have been uplifted accordingly.

Emissions of carbon monoxide (CO) from the CCGT will also be controlled by primary means and will be balanced against the requirement to minimise NO_x, as this has a greater potential for air quality impacts. Whilst it is recognised that the BAT conclusions detail an indicative yearly average of 5 - 30 mg/Nm³ for new CCGT plant, emissions have been assessed at the higher IED limit of 100mg/Nm³, given that the AQS and EALs relevant to the assessment of CO are associated with short term averaging periods, rather than annual averaging periods.

5.1.2 Auxiliary Boiler – Emission Point A2

Emissions to air will also come from the natural gas fired 8.5 MWth auxiliary boiler which will be fired on natural gas and used primarily during start-up.

The operation of the auxiliary boiler would be limited to a few hours of operation at intermittent intervals and is therefore only likely to only operate for approximately 35 to 40 hours per annum. Due to the thermal input capacity, this plant falls under the requirements of the MCPD, however, as the operation of this new plant will be below 500 operating hours per annum, it will be exempt from meeting the MCPD ELVs. That said, it is considered that the relevant ELVs will be met by the installed plant.

The NO_x emissions from the boiler have been modelled assuming 500 hours operation per year at an ELV of 100 mg/Nm³ (which is compliant with the ELV set out in the MCPD) and CO emissions at 80 mg/Nm³.

5.1.3 Joules Thomson Heaters – Emission Points A3 and A4

Emissions will also be generated from the operation of the natural gas fired JT heaters. The heaters are required compensate the reduction in temperature due to the Joule-Thompson effect (see Section 4.3.1 for further details). Each heater will have a thermal input capacity of 3 MWth and therefore falls under the requirements of the MCPD. The operation of the plant is dependent on the pressure of the incoming natural gas from the NTS and will therefore be used intermittently. This use will not exceed 500 hours of operation per annum therefore it will be exempt from meeting the MCPD ELVs. That said, the plant will meet the MCPD ELVs

and therefore has been modelled at an hourly NO_x concentration of 100 mg/Nm³ and CO emissions at 80 mg/Nm³.

5.1.4 Emergency Diesel Generator – Emission Point A5

The Emergency Diesel Generator is for emergency purposes only, with annual operations of less than 50 hours per year. As such, it is exempt from ELVs imposed through the EP Regulations Specified Generator requirements. Additionally, as it will be operated for less than 500 hours per year it will be exempt from the MCP ELVs.

The Emergency Diesel Generator will be optimised to reduce emissions ('emissions optimised') with NO_x emissions meeting the 2g TA Luft and United States Environment Protection Agency (EPA) Tier 2 (or equivalent) standards.

In order to ensure that the Emergency Diesel Generator remains fit for purpose, it will be subject to routine testing, which will not exceed 50 hours per annum.

Table 5-1: Emissions Inventory

Emission Point	Stack height (m)	Stack Diameter (m)	Temp (°C)	Actual flow rate (Am ³ /s)	O ₂ Content (%)	H ₂ O Content (%)	Normalised flow (Nm ³ /s) ¹	Efflux velocity (m/s)	Pollutant	Emission conc ² (mg/Nm ³)	Release rate (g/s)
A1 (HRSG Stack)	80	8.3	73.8	856	13.0	8.5	775	15.8	NOx (annual)	32.2	24.9
									NOx (daily)	42.9	33.2
									Carbon monoxide	100	77.5
A2 (Auxiliary Boiler)	15	0.8	130	10.6	*	*	7.2	21.1	NOx	100	0.7
									Carbon monoxide	80	0.6
A3 and A4 (JT Heaters)	10	0.5	160	4.5	*	*	2.9	23.1	NOx	100	0.3
									Carbon monoxide	80	0.2
A5 (Emergency diesel Generator)	20	0.4	470	7.5	*	*	2.8	58.8	NOx	750	2.1

¹ Normalised to dry gas, 0°C, 101.3kPa, 15% oxygen

² As the net electrical efficiency (EE) of the CCGT is greater than 55%, the EE uplift has been applied to the higher end of the BAT-AEL range, e.g. for the annual average NO_x BAT-AEL = 30 mg/Nm³ x 59 / 55 and for the daily BAT-AEL = 40 mg/Nm³ x 59 / 55.

* No information available, however it considered that not correcting the normalised flow rate for these parameters lead to a conservative assessment.

5.2 Emissions to Water

There will be two emission points to water from the Installation via Emission Points W1 and W2. The emissions from W1 will comprise the following process wastewater streams:

- Cooling tower water blow down (containing small amounts of chemicals added for the conditioning of the cooling water);
- Cooling tower water sediment (comprising a concentrated solution of the solids already present in the raw river water);
- Combined effluents from onsite processes used for cooling tower water make-up (this will include HRSG blowdown, RO rejects (from demineralisation treatment plant), effluent from the condenser and treated water from the oil/ water separator);
- Treated surface water from oil separators; and
- Treated sanitary wastewater (if a connection to sewer is not available).

As outlined above, where practical, efforts will be made to recover wastewater streams to serve as cooling water make-up or as feed for the demineralisation water treatment plant in order to reduce water use and emissions to water. This will include HRSG blowdown, RO rejects (from demineralisation) and treated water from the oil/ water separator.

The anticipated discharge rate from W1 is expected to be approximately 0.25 m³/s under normal operating conditions (excluding rainfall and storm events) which equates to approximately 21,000 m³/day.

The existing Environmental Permit allows for the following combined effluents to be discharged via emission point W1:

- Effluents from the cooling tower blow down (containing concentrated solution of the dissolved solids already present in the raw river water and small amounts of chemicals added for the conditioning of the cooling water).
- Effluents from the HRSG; and
- Effluents from the demineralisation plant.

It is therefore considered that the proposed emission sources are the same as those listed on the current permit with the exception of the potential for treated sanitary wastewater to also be discharge, depending on whether a connection to sewer is available (as detailed in Section 4.3.6).

As part of the previous application an H1 assessment was completed for the discharge from W1. The initial H1 assessment concluded that all process contributions will be <4% of the relevant EQS and are therefore considered not to be significant based on the screening criteria from the above H1 Guidance Note. The EA reviewed the H1 assessment along with the Water Quality and Resources chapter of the Environmental Statement. The EA identified gaps in the assessment, specifically around dilution and specific pollutants and issued and requested further information via a Schedule 5 notice. Following the applicant's submission of updated assessments in February and April 2017, the EA concluded that the emission to water via emission point W1 were deemed acceptable.

As the emission sources of the W1 discharge are considered to be the same as those assessed for the original application, it is considered that the findings of the original H1 assessment are still applicable.

It should be noted that the actual discharge point for the existing W1 and the alternative W1 location will be offshore. The discharge point for the existing W1 is located off the jetty as shown on Figure 5, Appendix A at a depth of 2.1m below the Lowest Astronomical Tide (LAT). The discharge point for the alternative W1 is 250m from the shoreline at a depth of a minimum of 0.3m below the extreme low water level. The discharge for the alternative W1 is further offshore than the existing W1, which would afford better dilution than the existing W1. It is therefore it is considered that the original H1 assessment would provide a conservative assessment of the impacts from the alternative W1 Emission Point.

The locations of W1 and the alternative W1 (as shown on Figure 5 in Appendix A) represent the location that the discharge will be monitored.

It is yet to be confirmed if sanitary water will be treated onsite within a package sanitary treatment plant or sent to sewer, if a connection is possible. If the treated sanitary water is discharged via W1 it is expected that this will equate to $3\text{m}^3/\text{day}$. This is based on 30 permanent staff at the site generating 90l per day per person in line with the British Water Code of Practice ‘Flows and Loads – 4’⁷. This has been factored into the approximately $0.25\text{m}^3/\text{s}$ volume ($21,000\text{ m}^3/\text{day}$) detailed above. The addition of the treated sanitary water is unlikely to have a noticeable impact given the very small volume and that the water will be treated to a quality that will comply with the General Binding Rules for ‘Small Sewage Discharge to a Surface Water’⁸. These rules apply to sites which are generating less than 5m^3 of sewage per day.

The existing permit has a maximum daily flow limit from W1 of $423,360\text{m}^3$ per day. No changes to this limit are required under this variation application.

Though not explicitly listed in the existing Environmental Permit, site surface water was also included in the original permit application as part of the discharge via W1. Following discussions with the Environment Agency on surface water drainage from the Site, concerns have been raised over the existing pond that lies to the southeast of the Installation Boundary, as development of the Installation and discharge of all surface water via W1 would remove the natural flow of water into this pond. The pond supports Marsh Harrier and Water Vole, and therefore it is proposed that some uncontaminated surface water drainage from the Installation will be discharged from the surface water retention pond to the existing pond to maintain the water level in the pond. This will be via a new Emission Point W2 (as shown on Figure 5 in Appendix A). The pond flows to Internal Drainage Board (IDB) drains and flows to the Humber. Water that is not sent to the existing pond via W2 will be discharged via the W1 Emission Point.

5.2.1 Uncontaminated Surface Water Drainage

The uncontaminated surface water drainage system will collect rainwater from uncontaminated areas such as building roofs, paved process areas, and roads. Surface runoff from roofs may be collected into rainwater harvesting systems with minimal treatment for reuse and could be directed to the demineralisation plant.

Surface runoff which is not collected for reuse will flow towards the main storm water system via an oil interceptor. As part of the treatment process, larger debris will be removed using mechanical screens.

A retention pond will be incorporated into the drainage system, designed to accommodate the peak flow based on the mean annual flood of storm water and fire water runoff. The associated drainage pipes will intentionally be oversized to manage peak flow conditions and ensure system resilience.

As stated previously, there is a requirement to direct some uncontaminated surface water from the retention pond to the pond located southeast of the Installation Boundary, in order to maintain water levels within the pond.

An Indicative Drainage Plan is presented in Figure 6, Appendix A).

5.2.2 Potentially Contaminated Surface Water Drainage

Where there is a risk of contaminated surface water to be generated, the drainage system will be kerbed and/or bunded. The system will also include sumps to contain potentially contaminated surface water.

The discharge will include runoff from contaminated paved areas, water from vehicle maintenance facilities, workshops, and drainage from drip trays of safety showers and eyewashes. If the water is tested and demonstrated to be uncontaminated, it will be discharged to the retention pond for discharge to W1 or W2, if required.

⁷ British Water (2021), ‘Code of Practice - flows and loads – 4’. Available at: [flows_and_loads_bw_cop_18..pdf](#)

⁸ Environment Agency (2023), ‘General Binding Rules: small sewage discharge to a surface water’. Available at: <https://www.gov.uk/guidance/general-binding-rules-small-sewage-discharge-to-a-surface-water>

Any contaminated water will be collected and taken off-site for treatment via a licensed 3rd party waste contractor.

Surface water which is generated from areas of the Site where oil is used or stored will be managed via a dedicated drainage system designed to manage potentially contaminated effluent. Potentially oil-contaminated water or oil spillages from specific locations will be contained and managed using dedicated kerbs or bunds, wherever practicable, before entering the main oil-contaminated drainage network. To prevent further contamination, drainage from these areas will be directed to the Accidental Oil-Contaminated (AOC) sump, where residual oil will be removed prior to discharge. The sump will be designed to capture effluent that is potentially contaminated during maintenance, normal operation, or accidental spillage. Within the AOC sump, oil present on the surface of the effluent will be removed and collected for removal from site via a road tanker to an appropriate treatment facility. This drainage system is expected to serve the following areas of the Installation:

- CCGT area;
- Auxiliary boiler area, pump stations, gas final filtering and heating station, workshop, and store building areas;
- Transformer areas;
- Pump stations;
- Gas filtering area;
- Lube oil storage areas;
- Diesel storage areas;
- Heating station;
- Workshop;
- Store building areas;
- Equipment service drains; and
- Cooling water pumps.

Certain banded zones, such as those around diesel storage and transformers, may be isolated and their contents sent directly offsite for disposal, bypassing the sump system.

Once the surface water has passed through the AOC sump it will be directed to W1 for discharge.

In plant areas containing chemicals (e.g., caustic, acid, other hazardous fluids), any chemical spills are to be contained using kerbs and directed via funnels to a neutralisation pit for treatment. Sampling will be undertaken to determine the quality of the treated water. If the sample meets the discharge criteria of the existing permit it will be blended with the cooling tower water and discharged via W1. If it does not meet the discharge criteria it will be collected and tankered offsite for disposal at an appropriate facility.

5.2.3 Cooling Water Blowdown

Following use within the cooling towers, the cooling water blow down will be discharged via W1.

5.2.4 Sanitary Wastewater

Sanitary waste which will be produced from the welfare systems on site. This includes discharges from toilets, sinks, and showers from sources such as administration and control buildings, workshops and warehouse buildings, and gatehouses. The management of wastewater is still yet to be confirmed. As outlined in Section 4.3.6 there are two potential options for the management of wastewater, either for it to be discharged to the local sewer or for it to be treated within a packaged treatment plant. For the purpose of this application the treatment of the waste within the Installation Boundary has been considered. If this was to occur the sanitary waste would be routed to a package treatment plant. The sludge from the package treatment plant would be

periodically collected and removed offsite for disposal/ treatment at an appropriate facility. The wastewater would be discharged via W1. Peak discharge from the plant is expected to be <3m³/day. This is based on 30 permanent staff at the site generating 90l per day per person in line with the British Water Code of Practice ‘Flows and Loads – 4’⁷. The packaged treatment plant will be designed in accordance with BS EN 12566 for Small Sewage Treatment Plants and treat the water sewage in line with the General Binding Rules for ‘Small Sewage Discharge to a Surface Water’⁸.

5.2.5 Gas Turbine Wash Water

Wastewater generated during turbine washing will be contained and directed through underground drainage into the wastewater sump. The collected wastewater will then be removed off-site by road tankers for treatment offsite at an appropriate facility.

5.2.6 Firewater

In the event of a fire, firewater would be collected in the surface water drainage system, which would be closed (via isolation valves) to prevent contaminated water being released from the retention pond to the receiving waters.

Whilst such systems may be used for containment of firewater, any retained firewater on site would be analysed for composition and if uncontaminated it would be released via W1, or it would tankered off-site if found to be contaminated.

5.3 Emissions to Sewer

There will be no process emissions to sewer as a result of this Environmental Permit variation.

5.4 Emissions to Land

There will be no emissions to land as a result of this Environmental Permit variation.

5.5 Fugitive Emissions

Based on the various controls placed on the site plant and equipment, it is expected that fugitive emissions from the Installation, particularly process emissions to air and water will be negligible.

5.6 Odour

Due to the nature of the Installation and the use of natural gas as a fuel, it is expected that odour from the proposed CCGT operations will not be a significant issue.

5.7 Noise

A Noise Impact Assessment (NIA) has been undertaken to assess the potential noise impacts associated with the operation of the proposed changes (as outlined in Section 2.2) to the Installation on the nearest Noise Sensitive Receptor (NSR). The NIA can be found in Appendix G.

As part of the NIA, a three-dimensional noise model was developed by Uniper and Arup to predict noise from the Installation. An assessment of the likely noise impact has been undertaken at the nearest noise sensitive human and ecological receptors in line with the EA Guidance⁹ and British Standard BS 4142¹⁸.

The Installation includes embedded mitigation as outlined in Table 5-2.

Table 5-2: Noise Mitigation Measures

Main Noise Sources ¹	Noise mitigation measures
Transformer, incl. MBJ	Low noise design for the transformer.

⁹ <https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits/noise-and-vibration-management-environmental-permits>

Main Noise Sources ¹	Noise mitigation measures
HRSO (UHA), incl. Stack	Facades of building with sound reduction index R_w 49 dB (C-Cassette construction). High insulating doors and access doors. Low noise design for Heating, Ventilation and Air Conditioning (HVAC) System. Silencer for HRSO Stack.
Feedwater Pumps (ULA)	Installed inside sound enclosure.
Filterhouse (MBL)	Air Inlet equipped with a silencer.
Diffusor (MBR)	Installed inside sound enclosure.
Gas & Steam Turbine Building (UMC)	Facades of building with sound reduction index R_w 49 dB (C-Cassette construction). High insulating doors and access doors. Low noise design for HVAC System.
PCCs (UBA)	Low noise design for HVAC system/ air conditioning units.
Gas preheating, metering & filtering station (UEN)	Sound insulation for piping and valves, local sound enclosures for individual piping and valve as required.
Steampipes (UMY)	Steampipes outside building footprint to be installed inside sound enclosure.
Hybrid Cooling Tower	Low noise fans. Splash attenuators inside water chamber. Silencer for air inlets and air outlets.
Fuel Gas Reducing Station (UEN)	Sound insulation for piping and valves, local sound enclosures for individual piping and valve as required.
Electrical Auxiliary Boiler	Low noise design as per supplier.
HRSO Sampling Container (UHX) and Ammonia Dosing Container (USX)	Low noise design for HVAC System implemented by supplier's design.
Control Room and Administration Building (UCA)	Low noise design for HVAC System implemented by supplier's design.
Workshop and Storage Building (UST)	Low noise design for HVAC System implemented by supplier's design.
Combined Cooling Tower Circulating Water Pump Structure (UGJ) and Regeneration Plant (ULX)	Facades of building with sound reduction index R_w 35 dB. High insulating doors and gates. Low noise design for HVAC System implemented by supplier's design.
Water Treatment Plant Container (UGD)	Low noise design for HVAC System implemented by supplier's design.
Cooling Tower Treatment Plant (URD)	Sound enclosure for cooling tower pumps.
Space Heating System (USB)	Sound enclosure for the system or installed within building structure.

The results of the modelling concluded that the predicted noise emissions with embedded mitigation, arising from the Installation, do not exceed the background sound levels ($L_{A90, T}$) at the nearest NSRs. As noted in BS 4142, where the rating level does not exceed background sound levels, this is an indication of the specific sound source having a low impact dependent on context. Given that the predicted absolute noise levels are low and that the existing sound environment at the noise sensitive receptors includes an element of industrial noise,

no adjustment has been made for context, and it is concluded that the Installation would result in a low impact at the nearest residential receptors.

The impact at the nearest ecological receptor, North Killingholme Haven Pits SSSI, has been predicted and has been found to be low. Noise from the Installation would be of a similar magnitude to the lowest measured baseline sound levels at this location and well below the highest measured baseline sound levels. It is therefore concluded that the Installation would not cause a new impact on sensitive ecological receptors.

A low level of impact indicates that no further action is needed beyond the mitigation measures specified and embedded in the design.

6. Monitoring

6.1 Infrastructure

Monitoring of all Installation infrastructure will be undertaken as part of the Installation's management systems, operational protocols and practices. Routine operational checks and infrastructure audits are likely to comprise identification of issues relating principally to:

- Equipment degradation;
- Standing water in bunded/ kerbed areas; and
- Storage areas.

Any issues identified during operational checks or inspections will be recorded and actions assigned to relevant personnel and closed out once they have been actioned.

Ongoing process monitoring will be undertaken at key stages of the process for a suite of parameters, including flow rates, temperatures and pressures. This will help to ensure that the Installation remains efficient and any deviations in operational efficiency can be identified.

6.2 Emissions to Air

The requirement to carry out monitoring of emissions from combustion plant is provided in the LCP BATc (BAT 4). Monitoring of the exhaust gases of the HRSG Stack will be subject to Continuous Emissions Monitoring (CEMs) which is compliant with BAT 4.

Emission point A1 for the Installation will continuously monitor stack flow, oxygen, water vapour, stack gas temperature and stack gas pressure. All parameters will be monitored in accordance with BS EN14181. All monitoring equipment on site will be regularly maintained and calibrated to ensure accurate measurements are recorded.

For the auxiliary boiler, JT Heaters and emergency diesel generator, the anticipated operating hours mean that compliance with the MCPD ELVs is not required. For any new MCP, monitoring must be initially undertaken within the first 4 months of operation. Periodic monitoring is required every 1,500 hours of operation for MCP with limited operating hours (less than 500 hours per annum on a three year rolling average) with a thermal input capacity of equal to or less than 20MWth. Monitoring will be undertaken in accordance with Monitoring emissions to air, land and water (MCERTS) Guidance¹⁰.

The Environmental Permit will need to be updated to include the relevant BAT-AELs as shown in Table 6-1, together with the proposed monitoring methods.

Table 6-1: Proposed Emissions and Monitoring for Emissions to Air

Release Points	Parameter	Limit (mg/Nm ³) ¹	Reference Period	Monitoring Frequency	Monitoring Standard or Method
A1 (CCGT)	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	32.2	Yearly average	Continuous	BS EN 14181
		42.9	Daily mean of validated hourly averages		
		50	Monthly mean of validated hourly averages		
		100	95% of validated		

¹⁰ Environment Agency (2014), Monitoring emissions to air, land and water (MCERTS). Available at: <https://www.gov.uk/government/collections/monitoring-emissions-to-air-land-and-water-mcerts>

Release Points	Parameter	Limit (mg/Nm ³) ¹	Reference Period	Monitoring Frequency	Monitoring Standard or Method
	Carbon monoxide		hourly averages within a calendar year		
		100	Monthly mean of validated hourly averages		
		110	Daily mean of validated hourly averages		
		200	95% of validated hourly averages within a calendar year		
	Sulphur dioxide	-	-	At least every 6 months	Concentration by calculation, as agreed in writing with the Environment Agency.
	Oxygen	-	-		BS EN 14181
	Water Vapour	-	-		BS EN 14181
	Stack gas temperature	-	-		Traceable to national standards
	Stack gas pressure	-	-		Traceable to national standards
A2 (Auxiliary boiler)	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	No limit	Periodic	First monitoring measurements shall be carried out within four months of the issue date of the permit or of the date when the MCP is first put into operation, whichever is later. Then after 1,500 hours operation and no less frequent than every 5 years.	MCERTS
	Carbon monoxide	No limit			MCERTS

Release Points	Parameter	Limit (mg/Nm ³) ¹	Reference Period	Monitoring Frequency	Monitoring Standard or Method
A3 & A4 (JT heaters)	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	No limit	Periodic	First monitoring measurements shall be carried out within four months of the issue date of the permit or of the date when the MCP is first put into operation, whichever is later. Then after 1,500 hours operation and no less frequent than every 5 years.	MCERTS
	Carbon monoxide	No limit			MCERTS
A5 (emergency diesel generator)	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	No limit	Periodic	First monitoring measurements shall be carried out within four months of the issue date of the permit or of the date when the MCP is first put into operation, whichever is later. Then after 1,500 hours operation and no less frequent than every 5 years.	MCERTS
	Carbon monoxide	No limit			MCERTS

¹ Normalised to dry gas, 0°C, 101.3kPa, 15% oxygen

² As the net electrical efficiency (EE) of the CCGT is greater than 55%, the EE uplift has been applied to the higher end of the BAT-AEL range, e.g. for the annual average NO_x BAT-AEL - 30 mg/Nm³ x 59 / 55 and for the daily BAT-AEL - 40 mg/Nm³ x 59 / 55.

6.3 Emissions to Water

Table S3.2 of the existing Environmental Permit provides the emission parameters and associated emission limits and monitoring requirements for the emissions to water from the Installation (which are presented in Table 6-2).

As stated in Section 5.2, emissions of process wastewaters will be discharged from the Installation via Emission Point W1 (see Figure 1 in Appendix A).

The emissions from W1 will comprise the following streams:

- Cooling tower water blow down (containing small amounts of chemicals added for the conditioning of the cooling water);

- Combined effluents from onsite processes used for cooling tower water make-up (this will include HRSG blowdown, RO rejects (from demineralisation treatment plant), effluent from the condenser and treated water from the oil/ water separator);
- Cooling tower water sediment (comprising a concentrated solution of the solids already present in the raw river water);
- Surface water drainage (An Indicative Drainage Plan is presented in Figure 6, Appendix A);
- Treated surface water from oil separators; and
- Treated sanitary wastewater (if a connection to sewer is not available).

It should be noted that the actual release point will be offshore however for the purpose of monitoring the point at which the effluent leaves the shore, the approximate locations are as follows:

- Existing W1 emissions point is located at TA 1680 2050
- Alternative W1 emission point is approximately TA 1704 1964.

The emissions from W2 will comprise uncontaminated surface water drainage from the Installation only. The effluent will be discharged from the Installation via W2 into IDB drains, the existing pond on site and then to the Humber.

The monitoring parameters for W1 and W2 are presented in Table 6-2. The parameters for W1 are consistent with what is currently included in the existing permit.

Table 6-2: Emission Limits and Monitoring Requirements for Emissions to Water

Emission Point Ref. & Location	Source	Parameter	Limit	Reference period	Monitoring Frequency	Monitoring standard
W1 on Figure 5 (TA 1680 2050 or TA 1704 1964 to be confirmed)	Cooling tower water blow down, combined process effluents used for cooling tower water make-up (including HRSG blowdown, RO rejects), effluent from the condenser and treated water from the oil/water separator), cooling tower water sediment, surface water, treated surface water from oil separators and treated sanitary wastewater (if a connection to sewer is not available).	Visual appearance	The discharge must so far as reasonably practicable have no significant adverse visible effect on the receiving water, watercourse bed or any plants or animals within the water course.	Instantaneous (visual examination)	N/A	Visual examination
		Temperature	≤10°C above river temperature, 30°C	Instantaneous	Continuous	BS EN ISO 10523:2012
		pH	6 - 9	Instantaneous	Continuous	BS EN ISO 10523
		Maximum daily flow	423,360 m ³ per day	24 hour period beginning 00:01	Continuous	-
		Oil or grease	No visible Emissions	24-hour flow proportional sample	Daily	No significant trace - visual examination
		Residual chlorine	500 µg/l	24-hour flow proportional sample	Daily	BS EN ISO 7393-1
W2 on Figure 5 TA 1575 1955	Uncontaminated surface water	Oil or grease	No visible Emissions	24-hour flow proportional sample	Daily	No significant trace - visual examination

7. Environmental Risk Assessment (Impact Assessment)

7.1 Introduction

This section discusses the potential impact on sensitive receptors and the surrounding area and shows how the emissions from Installation have been assessed. The EA document – ‘Risk assessments for your environmental permit’¹¹ (‘EA Risk Assessment guidance’), has been used to scope and assess the emissions from Installation.

Where necessary, baseline impact assessments and appropriate modelling has been completed to ensure that any predicted significant effects on sensitive receptors can be avoided/ mitigated.

The impact assessments are reported in the relevant sections or Appendices of this Main Supporting Document:

- Air Quality Impact Assessment (Appendix F);
- Noise Impact Assessment (Appendix G); and
- Qualitative Risk Assessment (Appendix H).

7.2 Installation Location and Sensitive Receptors

7.2.1 Human Receptors

The closest residential receptors to the Installation are situated to the west of the site. Table lists the human receptors in the vicinity of the Installation.

Table -1: Human Receptors in the Vicinity of the Installation

Receptor I.D.	Receptor Descriptor	Grid reference		Distance and direction from Installation
		x	y	
R1	Residential	514761	417335	2.5 km southwest
R2	Residential	514451	417646	2.3 km southwest
R3	Residential	514433	418197	1.9 km southwest
R4	Residential	514640	418825	1.3 km southwest
R5	Residential	513664	419614	2.0 km west
R6	Residential	514075	420602	1.7 km northwest
R7	School	514923	416108	3.6 km southwest
R8	Residential	517155	414968	4.9 km south
R9	Residential	517848	415385	4.9 km southeast
R10	School	518018	414928	5.3 km southeast
R11	School	518584	414754	5.6 km southeast
R12	School	518390	414644	5.6 km southeast
R13	Residential	515504	416121	3.6 km southwest
R14	Residential	515951	415723	3.9 km south
R15	Residential	519920	423664	5.6 km northeast
R16	Residential	521324	422416	6.1 km northeast
R17	Residential	523160	420394	7.3 km east

¹¹ Risk Assessments for your Environmental Permit, DEFRA and EA, Published on: 1st February 2016, Last updated on: 21st November 2023, accessed at: <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>

7.2.2 Ecological Receptors

EA Risk Assessment guidance requires that the effects of stack emissions on designated ecological sites be assessed where they fall within set distances of the source, up to 10 km (or 15 km for large emitters) for European designated sites and up to 2 km for nationally designated sites.

Statutory designated sites have been identified through a desk study of the Defra Magic mapping¹² website, which identifies Sites of Special Scientific Interest (SSSIs), Ramsar sites, Special Protection Areas (SPAs) and Special Areas for Conservation (SACs). In addition, non-statutory designated receptors have also been identified, including National Nature Reserves (NNR). Table lists the ecological receptors in the vicinity of the Installation.

Table -2: Ecological Receptors in the Vicinity of the Installation

Receptor ID	Receptor Descriptor	Designation	Grid reference		Distance and direction from Installation
			x	y	
E1	Humber Estuary, North Killingholme Haven Pits, Halton Marsh Clay Pits	SPA & Ramsar, SSSI, LWS	516258	419728	315 m east
E2	Humber Estuary	SAC	516533	420007	700 m northeast
E3	Swallow Wold	SSSI	516925	404973	14.5 km south
E4	Wrawby Moor	SSSI	503284	411173	14.9 km southwest
E5	Humber Estuary	SPA, Ramsar, SSSI	507196	423932	9.4 km northwest
E6	Burkinshaw's Covert	LWS	515627	418817	630 m south
E7	Burkinshaw's Covert	LWS	516293	418355	1.2 km southeast
E8	Chase Hill Wood	LWS	515692	418867	630 m south
E9	Chase Hill Wood	LWS	515513	419264	280 m southwest
E10	Scrub Lane Field	LWS	514404	419047	1.3 km west
E11	Swinster Lane Field	LWS	514322	419341	1.3 km west
E12	East View Meadow	LWS	513862	419977	1.7 km northwest
E13	Halton Marsh Clay Pits	LWS	515487	420700	930 m north
E14	Humber Estuary – SPA salt meadow habitat	SPA & Ramsar, SSSI, LWS	516786	419926	900 m east

7.2.3 Hydrology

There is one water body located to the south-east of the Installation Boundary, this is a natural pond and will require clean surface water drainage from the Installation in order to maintain the water level in the pond. The Installation is located within the catchment of the Humber Estuary.

The EA Flood Maps for Planning¹³ show that the majority of the Installation, is located within a Flood Zone 3 which is defined as “land having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year”. The EA Flood Map for Planning¹³ website also identifies that the site has a 3.3% chance of surface water flooding each year.

¹² Defra Magic mapping accessed at <http://magic.defra.gov.uk/MagicMap.aspx>

¹³ Environment Agency, (n.d) Flood Map for Planning. Available at: <https://flood-map-for-planning.service.gov.uk/location>

7.2.4 Geology

British Geological Survey's (BGS) GeoIndex (Onshore) online mapping¹⁴ indicates that the superficial geology is alluvium comprising slightly sandy clay over Glacial Till which contains occasional lenses of gravel and sand. This layer overlies the Burnham Chalk Formation which is a sedimentary bedrock. Areas of Made Ground and recycled aggregate stockpiles are also present across the site.

A Ground Investigation was carried out by Geotechnics Limited in 2024 which included the excavation of eight trial pits, five static cone penetration facilitated by a Membrane Interface Probe (MIP) and Monster Steek Apparaat (MOSTAP) soil sampling, and five shallow stockpile samples. The Factual and Interpretive Report for the Ground Investigations can be found in Annex 2 of the Site Condition Report provided in Appendix D. The intrusive phase of works was designed to characterise soils in Made Ground and stockpiles, as well as investigate any downward migration of contaminants through the underlying natural soils, without puncturing the base of these deposits and creating a preferential pathway for the downward migration of contaminants to the underlying Principal aquifer.

Chemical analysis of Made Ground and recycled aggregate stockpiles showed that there were no significant risks to human health from chemical contaminants, from the soil samples analysed as part of the investigation.

7.2.5 Hydrogeology

Glacial Till can contain sandy lenses which locally hold groundwater, however these are laterally and vertically limited. The Burnham Chalk formation underlying the drift geology has been classified as a Principal Aquifer. Principal aquifers are layers of rock that have high inter-granular and/or fracture permeability meaning they usually provide high levels of water storage. In addition, they may support water supplies and or river base flow on a strategic scale. The drift geology (glacial till) is classified by the EA as a non-aquifer of negligible permeability. As such, these formations are generally regarded as containing insignificant quantities of groundwater.

There are no Source Protection Zones, Drinking Water Safeguard Zones (groundwater and surface water) or Nitrate Vulnerable Zones within the Installation Site Boundary.^{15,16}

The factual and Interpretive report for the 2024 Ground Investigations stated that Groundwater was encountered sporadically during the intrusive investigation. Where encountered, groundwater was encountered close to or at the boundary between Made Ground and the underlying Alluvium deposits. Groundwater was encountered between depths of 2 – 3.7 m below ground level (bgl).

7.3 Pathways for Pollution

In order for a pollution risk to occur, there has to be a source - pathway - receptor linkage. Pathways to sensitive receptors primarily include, but are not limited to, the following:

- Oils and chemicals required for the operation of the Installation could be accidentally released and leach into the ground and groundwater;
- Oils and chemicals required for the operation of the Installation could be accidentally released into surface water via W1;
- Emergency scenarios result in a release of emission, effluent oils and chemicals to sensitive receptors i.e. as a result of a fire; and
- Flue gases released via the air Emission Points will be dispersed in the air to sensitive receptors.

¹⁴ British Geological Survey (No date) GeoIndex Onshore mapping (Online). Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.147436599.1275366957.1729849405-345094644.1729849405 (Accessed 25/10/2024)

¹⁵ Department of Environment, Food and Rural Affairs (No date). Data Services Platform – Source Protection Zones [Merged]. (Online). Available at: <https://environment.data.gov.uk/explore/6fd0120f-d465-11e4-abee-f0def148f590?download=true> (Accessed 04/11/2024).

¹⁶ Environment Agency (No date). Check for Drinking Water Safeguard Zones and NVZs. (Online). Available at: <https://environment.data.gov.uk/farmers/> (Accessed 04/11/2024).

In order to prevent and minimise the risk of pollution, the Installation will be designed and managed to isolate or reduce the effectiveness of these pathways, preventing contaminants from migrating off site other than through properly managed abatement systems.

7.4 Impact Assessment

The following sections provide an assessment of the impact of releases from the Installation, so as to underpin and justify the measures that will be put in place for their control and that will adequately protect the environment.

The risk assessment approach has been based on the following four sequential stages:

- Identify risks from the activity;
- Assess the risks and check that they are acceptable;
- Justify appropriate measures to control the risks, if necessary; and
- Present the assessment as detailed in the EA Risk Assessments guidance.

Activities with the potential to impact on the surrounding environment have been identified in line with guidance provided by the EA, and include the following assessments:

- Emissions to air;
- Emissions to water;
- Fugitive emissions;
- Noise and vibration;
- Odour;
- Emergency and accidental releases;
- Flood Risk;
- Site waste;
- Site closure; and
- Climate Change Risk Assessment.

A short description of the key potential risks from the Installation is provided in the following subsections with a accompanying Qualitative Risk Assessment presented in Appendix H.

7.4.1 Emissions to Air

The Installation will have five Emission Points to air, the HRSG Stack (A1), the Auxiliary Boiler (A2), the JT Heaters (A3 and A4) and the Emergency Diesel Generator (A5). Each combustion unit will be fitted with a stack which will release emission to air when in use. An Air Quality Impact Assessment (Appendix F) has been carried out.

The assessment concluded that the impacts on human health were found to be insignificant for hourly and annual mean NO₂, hourly mean CO and the CO 8-hour rolling mean at all human receptor locations.

The impacts on ecological receptors were assessed and for annual mean NO_x, the results were found to be insignificant at all but one of the ecological receptors. At receptor E2 (Humber Estuary SAC), the effects could not be screened out using the EA criteria set out in their Guidance on 'Air Emissions Risk Assessment for Environmental Permit'¹⁷, however the Predicted Environmental Concentration (PEC) is below the Critical Level and the impacts are therefore considered to be not significant.

¹⁷ Environment Agency (2016), 'Air emissions risk assessment for your environmental permit'. Available at: <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>

The impacts on ecological receptors for daily NO_x could not be screened out as insignificant for all receptors, however the PECs are all below the CL and are therefore considered to be not significant.

Nitrogen deposition and acid deposition can be screened out using the EA criteria, as the Process Contribution (PC) is less than 1% of the relevant critical loads for all ecological receptors assessed, indicating the effect of the Installation on nitrogen deposition and acid deposition is insignificant.

The emissions from the emergency diesel generator were assessed using the EAs Simple Calculation of Atmospheric Impact Limits (SCAIL) assessment tool. This assessment is presented in Annex A of Appendix F. The results of the SCAIL assessment indicate that the effects of the planned testing and maintenance activities and the emergency scenario would be insignificant for all human and ecological receptors.

Overall, it can be concluded that there are no significant effects from the Installation on air quality.

7.4.2 Emissions to Water

The Installation will have one water discharge point (W1) which will discharge into the Humber Estuary. At present there are two options for the discharge point being considered as outlined in Section 5.2 and 6.3. The discharge points for the existing W1 and the alternative W1 are located offshore in the Humber Estuary. The discharge point for the existing W1 is located off the jetty as shown on Figure 5, Appendix A at a depth of 2.1m below the Lowest Astronomical Tide (LAT). The discharge point for the alternative W1 is 250m from the shoreline at a depth of a minimum of 0.3m below the extreme low water level. The discharge for the alternative W1 is further offshore than the existing W1, which would afford better dilution than the existing W1.

The original Environmental Permit application included a H1 screening assessment for the emissions to water, which concluded that the results were acceptable. It is not considered that there has been any change to the emissions to water as a result of this Environmental Permit variation, and therefore it has not been considered necessary to reassess the impacts. Due to on-site treatment processes and the distance of the outfall from the shoreline ensuring sufficient dispersion, further assessment of the water discharge from the Installation operation is not required as part of this variation application.

7.4.3 Fugitive Emissions

Based on the various controls placed at the Installation, it is expected that fugitive emissions, particularly process emissions to air and water will be negligible.

7.4.4 Noise and Vibration

An NIA has been undertaken in accordance with BS 4142¹⁸ to assess the potential noise impacts associated with the operation of the proposed changes (as outlined in Section 2.2) to the Installation on the nearest NSR. The NIA can be found in Appendix G.

The nearest residential settlements are as follows:

- East Halton (approximately 1.2 km to the west);
- North Killingholme (approximately 2 km to the south-west); and
- South Killingholme (approximately 3 km to the south-west).

In addition, the nearest ecological receptor is North Killingholme Haven Pits SSSI which is located 0.35km east of the main site boundary of the Installation (location of the main noise sources).

The design of the Installation included embedded mitigation which is outlined in Table 5-2. The results of the NIA concluded that the predicted noise emissions with embedded mitigation, arising from the Installation, do not exceed the background sound levels at the nearest residential receptors. Given that the predicted absolute noise levels are low and that the existing sound environment at the noise sensitive receptors includes an element

¹⁸ British Standards (2019) 'BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound'. Available at: <https://knowledge.bsigroup.com/products/methods-for-rating-and-assessing-industrial-and-commercial-sound>

of industrial noise, it is concluded that the Installation would result in a low impact at the nearest residential receptors.

The impact at the nearest ecological receptor, North Killingholme Haven Pits SSSI is also predicted to be low. Noise from the Installation would be of a similar magnitude to the lowest measured baseline sound levels at this location and well below the highest measured baseline sound levels. It is therefore concluded that the Installation would not cause a new impact on sensitive ecological receptors.

A low level of impact indicates that no further action is needed beyond the mitigation measures specified and embedded in the design.

7.4.5 Odour

Due to the nature of the activity, it is unlikely that the operation of CCGT will result in the release of odour. If in the unlikely event odour is produced as a result of the operation of the CCGT, procedures which will be included within the EMS regarding odour management will be followed.

7.4.6 Emergency and Accidental Releases

All works at the Installation will be in accordance with the EMS. As outlined in Section 7.3, the main potential pollution pathways come from accidental released of oils, chemicals and effluent as well as from emergency scenarios such as a fire.

In order to minimise the risk of a spill occurring and to contain a spill, the following procedures will be implemented:

- The site will be designed and managed to minimise the likelihood of a spill occurring;
- Procedures relating to the storage of chemicals, oils and diesel will be incorporated into the EMS. These procedures will be reviewed at least annually or following a spill incident;
- All chemical storage areas will be bunded (the bunding will be impermeable and have 110% capacity of the largest container or 25% of the total aggregate volume of all containers within the shared bunded in accordance with the CIRIA c736 Guidance on Secondary Containment Systems¹⁹). All chemicals will be stored in accordance with their COSHH guidelines;
- All storage areas for chemicals, oil, and other hazardous substances will be kerbed and bunded, with drainage directed via funnels to the open drainage system leading to collection sumps. Potentially oil-contaminated drains will be routed through an oil/ water interceptor to the AOC sump, while chemically contaminated drains will be directed to the neutralisation pit for treatment. This will not form part of a closed drainage system;
- In addition, if there was a spill of multiple substances which were chemically incompatible (where reactions could generate toxic gases), this will be directed to a closed drainage system. In areas where surface water is likely to contain oil, the surface water will be directed to oil contaminated sumps before passing through oil interceptors;
- Personnel who are required to handle chemicals or oils will receive training on how to safely handle, manage and store the substances;
- Procedures to deal with accidental pollution, along with any necessary equipment required by the procedures (e.g. spillage kits), will be held on the Installation allowing. All personnel will have access to the procedures and be trained in their use. Suitable PPE will also be readily available for personnel to wear during a spill event; and
- Management and emergency procedures should prevent a significant spill from occurring. Emergency Spill procedures will contain the spill and prevent migration to wider areas of the Installation. Where necessary a phased approach contaminated land assessment process will be implemented which will include a

¹⁹ CIRIA, 2014, C736 Containment systems for the prevention of pollution. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C736F

thorough assessment in order to ensure containment of the spill. If required a remediation strategy and verification requirements will be implemented.

- In the event of a significant spill the Emergency Spill procedure will be implemented to prevent migration of the spill to drains, land and groundwater. The Operator will notify the EA following any significant spill. A suitably qualified person will then complete an assessment of the spill reviewing the type of substance, volume and identifying the potential receptors. Additional temporary containment measures may be applied if required. If contamination of land or groundwater is suspected then the Operator will follow the Land Contamination Risk Management Guidance²⁰. This will include the following stages:
 - Conduct a risk assessment (using a desk based approach, conducting a site walkover and if required conduct a site investigation).
 - Complete an options appraisal to identify remediation strategy
 - Implement the recommended remediation strategy (including any long term monitoring requirements).

Fire and gas detection and protection systems will be installed across the Installation. The design of the system is yet to be confirmed but is expected to include the follows in line with other Uniper operated sites:

- The layout has been designed such that location of areas and equipment minimise the risk of an ignition;
- Selection of electrical equipment located in outside areas will comply with the relevant industry regulation, standards, and Uniper requirements for operation in explosive atmosphere where applicable. All electrical and instrument equipment located outside in natural ventilated areas will be certified safe prior to operation;
- Pressure sensing instrumentation will be installed in the gas system connected to alarms which would alert operators to a loss of pressure and also trip systems which would initiate appropriate emergency actions such as automatic isolation of the gas supply if the pressure reached a pre-defined limit;
- The facility will be equipped with a fire and gas detection system, which could include heat sensors and smoke detectors. These will be connected to the DCS to alert personnel as soon as possible which will ensure rapid and reliable detection of outbreak of fires. The system will be able to perform the intended functions independently of other systems. Location of detectors shall be based on relevant scenarios, simulations, and tests;
- In the event of a fire within the turbine hall, a total flood CO₂ system will be employed to displace the oxygen and extinguish any fire. In addition to this the turbine halls will be fitted with fixed water spray protection systems; and
- The DCS will have a series of automated Emergency Shutdown (ESD) procedures in the event of an emergency.

The fire systems will not contain Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS).

If a fire was to occur which resulted in the production of firewater, the firewater would be retained within the retention pond. From the retention pond the fire water will be collected and tankered off-site for disposal if found to be contaminated.

The only abnormal operating conditions that will exist for the Installation will include events of emergency shutdowns, or failure of plant. These events will be managed within the EMS in order to reduce emissions to air and/ or to water during other than normal operating conditions from the Installation including the following elements:

- Set-up and implementation of a specific preventive maintenance plan for these relevant systems;
- Review and recording of emissions caused by abnormal events and associated circumstances and implementation of corrective actions if necessary; and

²⁰ Environment Agency (2020), Land contamination risk management (LCRM). Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

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

This plan would be regularly reviewed and amended as required to reflect the operation of the Installation.

As such, the appropriate design of the systems, including low-load design concepts for reducing the minimum start-up and shutdown loads for stable generation, will be implemented at the Installation.

7.4.7 Flood Risk Assessment

The EA Flood Maps for Planning¹³ show that the majority of the Installation, is located within a Flood Zone 3 which is defined as “land having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year”. The EA Flood Map for Planning¹³ website also identifies that the site has a 3.3% chance of surface water flooding each year. A Flood Risk Assessment was submitted with the DCO for North Killingholme, in 2013. It was concluded that the site benefits from existing coastal flood defences, these defences are expected to become less effective over time due to projected sea level rise and increased storm intensity driven by climate change. As such this risk has been incorporated into the design of the Installation.

In addition, the following mitigation measures have been considered to protect the Installation from flood, in accordance with the legislative and regulatory authority requirements:

- Flood resistance and resilience measures;
- Flood Emergency Response Plans;
- Flood Warnings and Alerts;
- Emergency access and egress; and
- Design capacity exceedance.

7.4.8 Site Waste

The details of anticipated waste streams generated by the operation of the CCGT are provided in Section 4.9.

The key process waste is anticipated to be waste lubricating oil, occasional waste glycol and filters, which will be collected and transported offsite to be disposed of via licensed 3rd party waste contractors, in line with regulatory requirements and existing Installation procedures.

It is therefore considered that further assessment of the waste from the Installation operation is not required as part of this variation application.

7.4.9 Site Closure

A Site Closure plan will be developed by the Operator at the end of the Installation’s operating life.

7.4.10 Climate Change Risk Assessment

Using the Environment Agency guidance on ‘Combustion power: examples for your adapting to climate change risk assessment’²¹, the following scenarios have been assessed:

- Summer daily maximum temperature may be around 7°C warmer than average summer temperatures now;
- Winter daily maximum temperature could be 4°C more than the current average, with the potential for more extreme temperatures, both warmer and colder than present;
- Daily rainfall intensity could increase by up to 20% on today's values resulting in flooding on the Site;

²¹ Environment Agency, (2023), ‘Combustion power: examples for your adapting to climate change risk assessment’ available at: <https://www.gov.uk/government/publications/adapting-to-climate-change-industry-sector-examples-for-your-risk-assessment/combustion-power-examples-for-your-adapting-to-climate-change-risk-assessment>.

- Average winter rainfall may increase by over 40% on today's averages resulting in potential increased risk of Site surface flooding and could impact Site wide drainage capacity;
- Sea level rise which could be as much as 0.6m higher compared to today's level;
- Drier summers which could see potentially up to 40% less rain than now;
- Flows in river could be 50% more than now at its peak and 80% less than now at its lowest (fluvial and surface flooding); and
- Storms.

Temperature increases in both summer and winter are expected to have minimal impact on the efficiency of the CCGT plant. The Installation is designed to operate across a wide range of ambient conditions, and no additional mitigation is required.

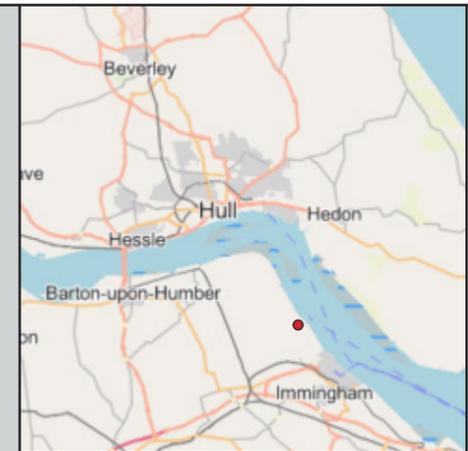
Rainfall-related risks are more significant. Increased daily rainfall intensity and higher average winter rainfall could lead to surface water flooding, structural deterioration, and drainage system overload. These risks have been addressed through design measures including flood resistance and resilience features, emergency response plans, and capacity exceedance provisions. The Installation is located in Flood Zone 3 and benefits from existing coastal flood defences, although these are expected to become less effective over time due to sea level rise and storm intensity.

Sea level rise of up to 0.6 metres poses a risk of fluvial flooding and prolonged discharge issues. Mitigation measures already incorporated into the Installation design are expected to manage these risks. Similarly, projected reductions in summer rainfall could affect water availability, but this is not expected to impact operations as there is an abstraction licence in place to manage water abstraction for the Installation.

Variability in river flows (with peaks up to 50% higher and lows 80% lower than current levels) presents risks of both fluvial and surface flooding. As part of the Non-Material Amendment application for the Development Consent Order (DCO), there were no changes to the risk of flooding in comparison to the approved development.

Increased frequency and intensity of storms could affect structural integrity and drainage. The Installation has been designed to meet relevant building standards and includes enhanced drainage systems to manage these events.

Appendix A – Figures



Legend

- Existing Installation Permit Boundary
- Land to be Surrendered

03	21/11/2025	IM	HW	HW
Rev	Date	By	Chkd	Appd



13 Fitzroy Street
 London W1T 4BQ
 Tel +44 20 7636 1531 Fax +44 20 7580 3924
 www.arup.com

Client

Uniper UK Limited

Project Title

North Killingholme Power Plant

Drawing Title

Figure 2: Land to be Surrendered

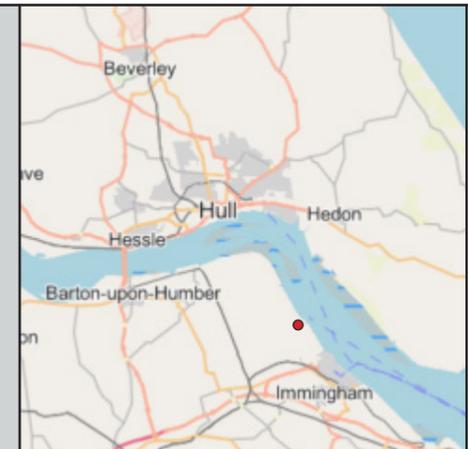
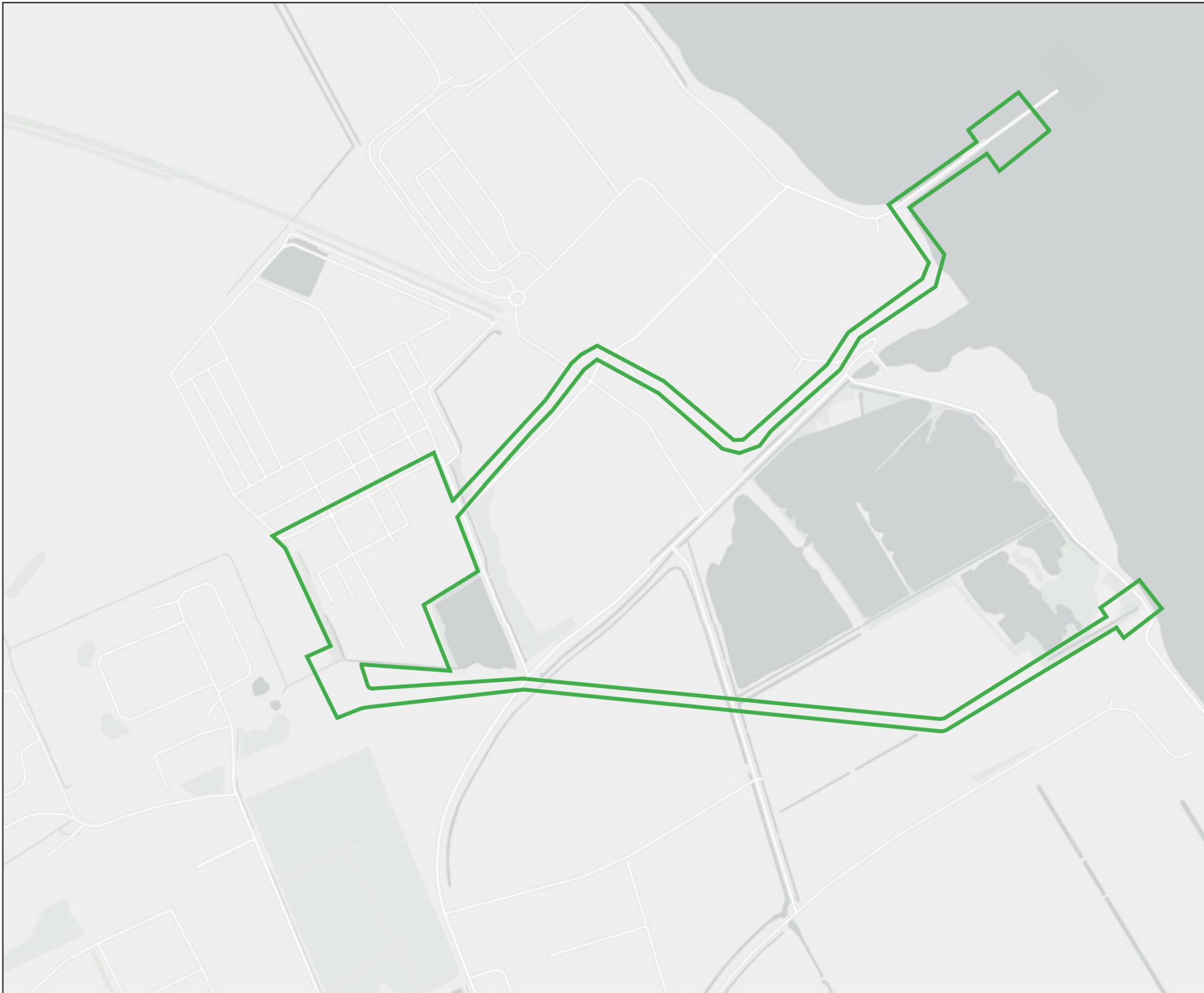
Role

Environmental Permit Variation

Arup Job No.
305719-70

Name
KLCP-ARP-EN-ATA010-0003

Scale
1:10,500 @ A3



Legend

 Environmental Permit Installation Boundary

03	21/11/2025	IM	HW	HW
Rev	Date	By	Chkd	Appd

ARUP

13 Fitzroy Street
 London W1T 4BQ
 Tel +44 20 7636 1531 Fax +44 20 7580 3924
 www.arup.com

Client

Uniper UK Limited

Project Title

North Killingholme Power Plant

Drawing Title

Figure 3: Revised Installation Boundary

Role

Environmental Permit Variation

Arup Job No.
305719-70

Name
KLCP-ARP-EN-ATA010-0001

Scale
1:10,500 @ A3

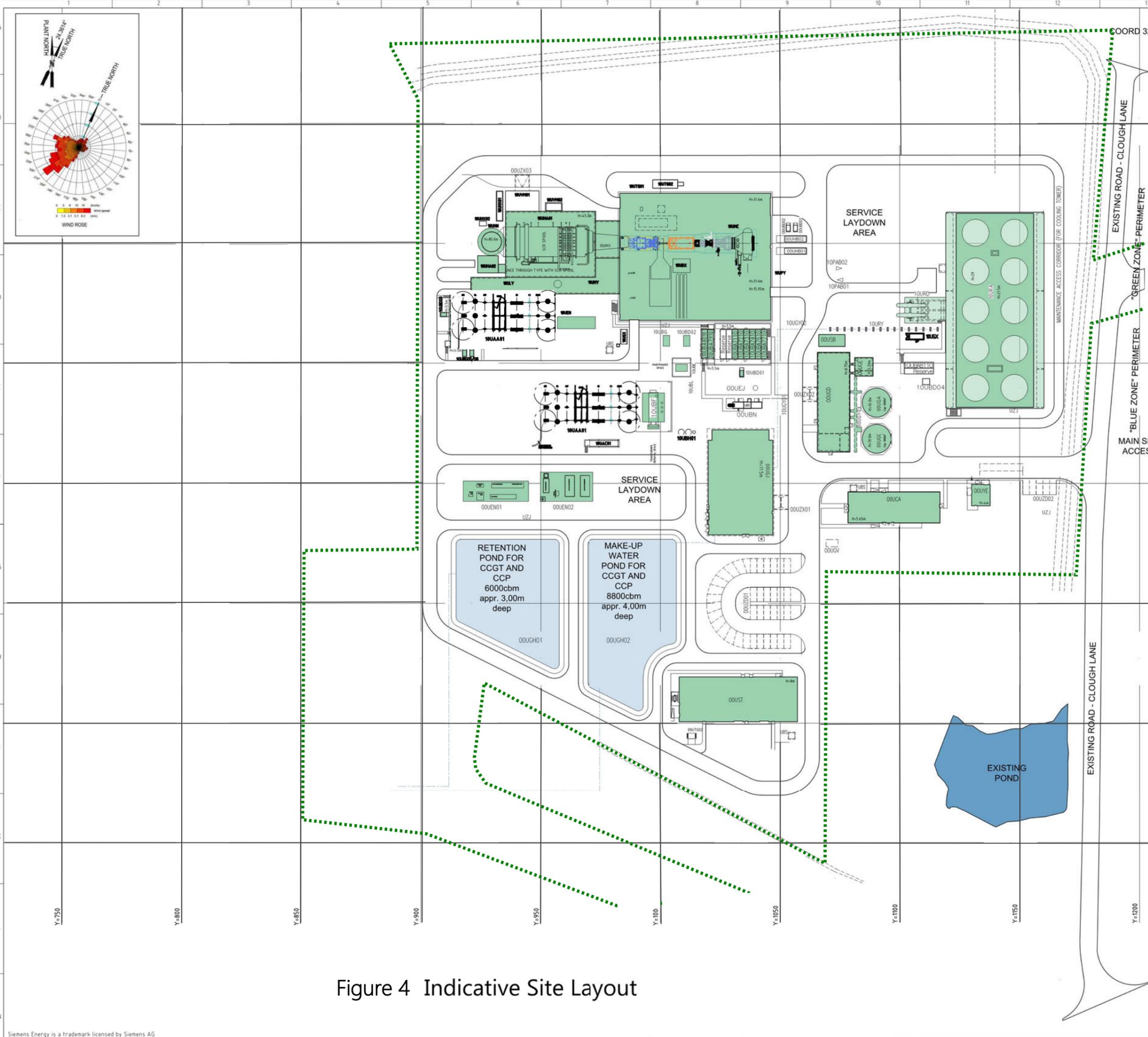


Figure 4 Indicative Site Layout

NOT BINDING FOR EXECUTION

LEGEND ON HOLD

10	PAB01/02	CIRCULATING WATER PIPING
10	UAA01	400kV AIR INSULATED SWITCHYARD (AIS)
10	UAC01	STRUCTURE FOR CONTROL CONTAINER FOR AIS
10	UAZ01	UNDERGROUND CONDUIT FOR 400kV CABLES
10	UBA1110/1120	STRUCTURE FOR HRSG PCC (CONTAINER)
10	UBA711-7710	STRUCTURE FOR GT&ST POWER CENTRE (CONTAINER)
10	UBA7910-20	STRUCTURE FOR PCC FOR LV & EXCITATION STEAM TURBINE
10	UBA81 10	STRUCTURE FOR BOP C.W. PUMP STN (CONTAINER)
10	UBD01	STRUCTURE FOR ELECTRICAL AUX BOILER TRANSFORMER
10	UBD03	STRUCTURE FOR GENERATOR EXCITATION TRANSFORMER
10	UBD04	STRUCTURE FOR COOLING TOWER SYSTEMS TRANSFORMER
10	UBE	STRUCTURE FOR AUXILIARY POWER TRANSFORMER
10	UBF	STRUCTURE FOR GENERATOR TRANSFORMER (GAS & ST TURBINE)
10	UBG	STRUCTURE FOR START UP TRANSFORMER
00	UBH01-xx	STRUCTURE FOR OIL SEPARATOR
10	UBN	STRUCTURE FOR STANDBY DIESEL GENERATOR (CONTAINER)
10	UBX01	STRUCTURE FOR GENERATOR CIRCUIT BREAKER
10	UBY	STRUCTURE FOR BUS DUCT
00	UCA	CENTRAL CONTROL & ADMINISTRATION BUILDING (UYC)
10	UEN01	STRUCTURE FOR GAS CONDITIONING & REDUCING STATION (ON HOLD)
10	UEN	STRUCTURE FOR GAS FINAL FILTERING & HEATING STATION
10	UEY	SLEEPERWAY, PIPERACK OR BRIDGE STRUCTURE
10	UGF	STRUCTURE FOR FIRE WATER STORAGE TANK
10	UGC	STRUCTURE FOR DEMINERALISED WATER TANK
10	UGD	WATER TREATMENT BUILDING (NO CONDENSATE POLISHING)
10	UGE	STRUCTURE FOR NEUTRALIZATION TANK
10	UGH01-04	UNDERGROUND STRUCTURE FOR RAINWATER LIFTING PUMPS (NOT SHOWN)
10	UGJ	STRUCTURE FOR COOLING TOWER MAKE UP WATER TREATMENT INCLUDING BIOCIDES TREATMENT
00	UGU	EFFLUENT RETENTION COLLECTION POND
10	UGV	STRUCTURE FOR SANITARY WASTEWATER SEPTIC TANK
10	UGY01/02	SLEEPERWAY OR BRIDGE STRUCTURE
10	UHA	STRUCTURE FOR HEAT RECOVERY STEAM GENERATOR (DRUM)
10	UHB	STRUCTURE FOR ELECTRICAL AUXILIARY BOILER
10	UHW	STRUCTURE FOR BOILER BLOWDOWN
10	UHX	STRUCTURE FOR SAMPLING CONTAINER
10	ULA	STRUCTURE FOR FEEDWATER PUMP STATION
10	ULX	STRUCTURE FOR CONDENSATE POLISHING PLANT
10	ULY	STRUCTURE FOR PIPE BRIDGE
10	UMC	GAS & STEAM TURBINE BUILDING
10	UMX	STRUCTURE FOR DIFFUSER
10	UMY	CABLE & PIPE BRIDGE STRUCTURE
10	UPY	BRIDGE STRUCTURE FOR C.W. PIPING
10	URA	STRUCTURE FOR HYBRID WET CELL COOLING TOWER
10	URD	STRUCTURE FOR C.W. PUMPING STRUCTURE
10	USG	STRUCTURE FOR FIRE FIGHTING PUMP STATION (CONTAINER)
10	UST	WORKSHOP & STORE BUILDING
10	USX	STRUCTURE FOR AMONIA DOSING CONTAINER
10	UTG02	STRUCTURE FOR BOTTLE STORAGE (SEE UST)
10	UTG01	STRUCTURE FOR H2 BOTTLE STORAGE
10	UVM01	STRUCTURE FOR AMMONIA STORAGE (SUN ROOF)
10	UVM02	STRUCTURE FOR SCR SKID
10	UYE	SECURITY GATE HOUSE (EXISTING BUILDING TO BE RENOVATED)
10	UZA	ROAD
10	UZD	VEHICULAR PARKING
10	UZJ	FENCE / GATE
10	UZJ01	NOISE PROTECTION WALL (NPC CONCEPT)

GROUND LEVEL -0.30
PLANT LEVEL +/-0.00

SYMBOL LEGEND

..... INSTALLATION PERMIT BOUNDARY

ZWISCHENPAUSE
INTERMEDIATE COPY
STAND: 2025-07-25 URSPRUNG

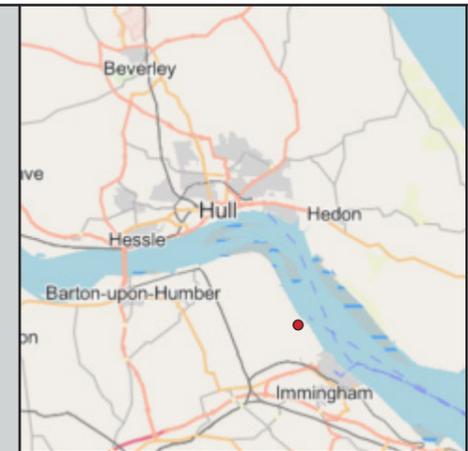
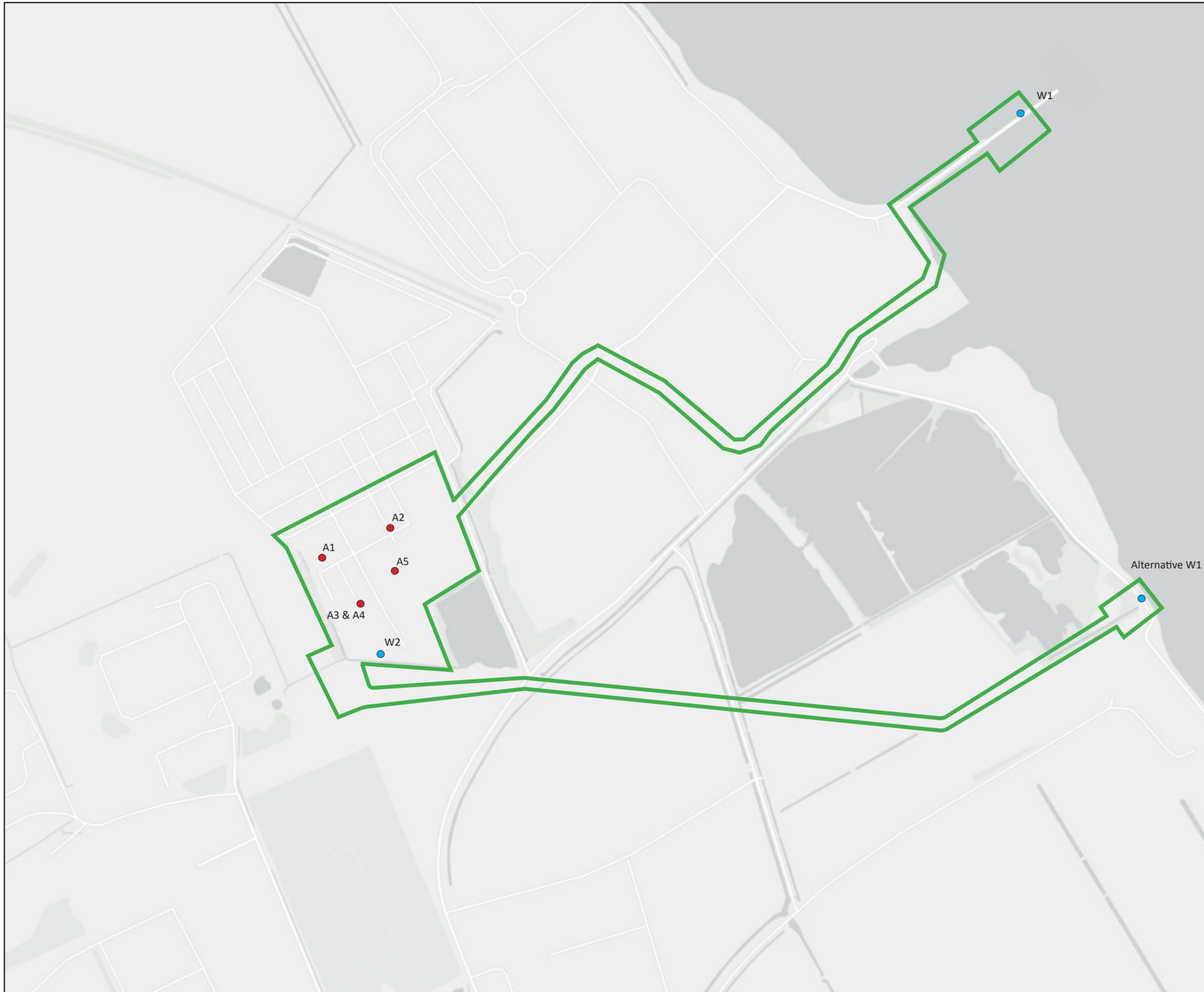
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U		Abg- Dept	BM TD BOP1	
U		erstellt mit Created with	AutoCAD 2018	
U		Handlung Handling	CONFIDENTIAL	
U		Index/Rev.		
U		Datum Date		
U		Gewicht Weight		
U		Datum Date		
U		Formal Format	DIN A11	
U		Name Name		
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U		gezeichnet Drawn	2025.05.28	Parsons
U		geprüft Checked	2025.05.28	Vowinkel
U		Siemens Energy is a trademark license by Siemens AG	2025	
U		Handlung Handling	CONFIDENTIAL	
U		Index/Rev.		
U		Blatt no. Sheet no.		

Refer to date for status

it - Study
0F (10) WCCT (Hybrid)
um)
COOLING TOWER NORTHEAST

CLD012-000101

SIEMENS energy



Legend

- Environmental Permit Installation Boundary
- Air Emission Points
- Water Discharge Points

04	21/11/2025	IM	HW	HW
Rev	Date	By	Chkd	Appd

ARUP

13 Fitzroy Street
 London W1T 4BQ
 Tel +44 20 7636 1531 Fax +44 20 7580 3924
 www.arup.com

Client

Uniper UK Limited

Project Title

North Killingholme Power Plant

Drawing Title

Figure 5: Emission Point Locations

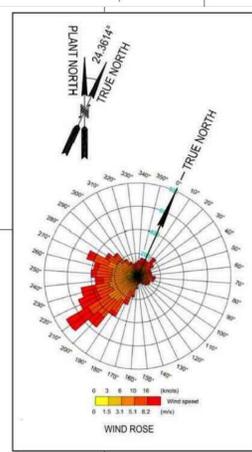
Role

Environmental Permit Variation

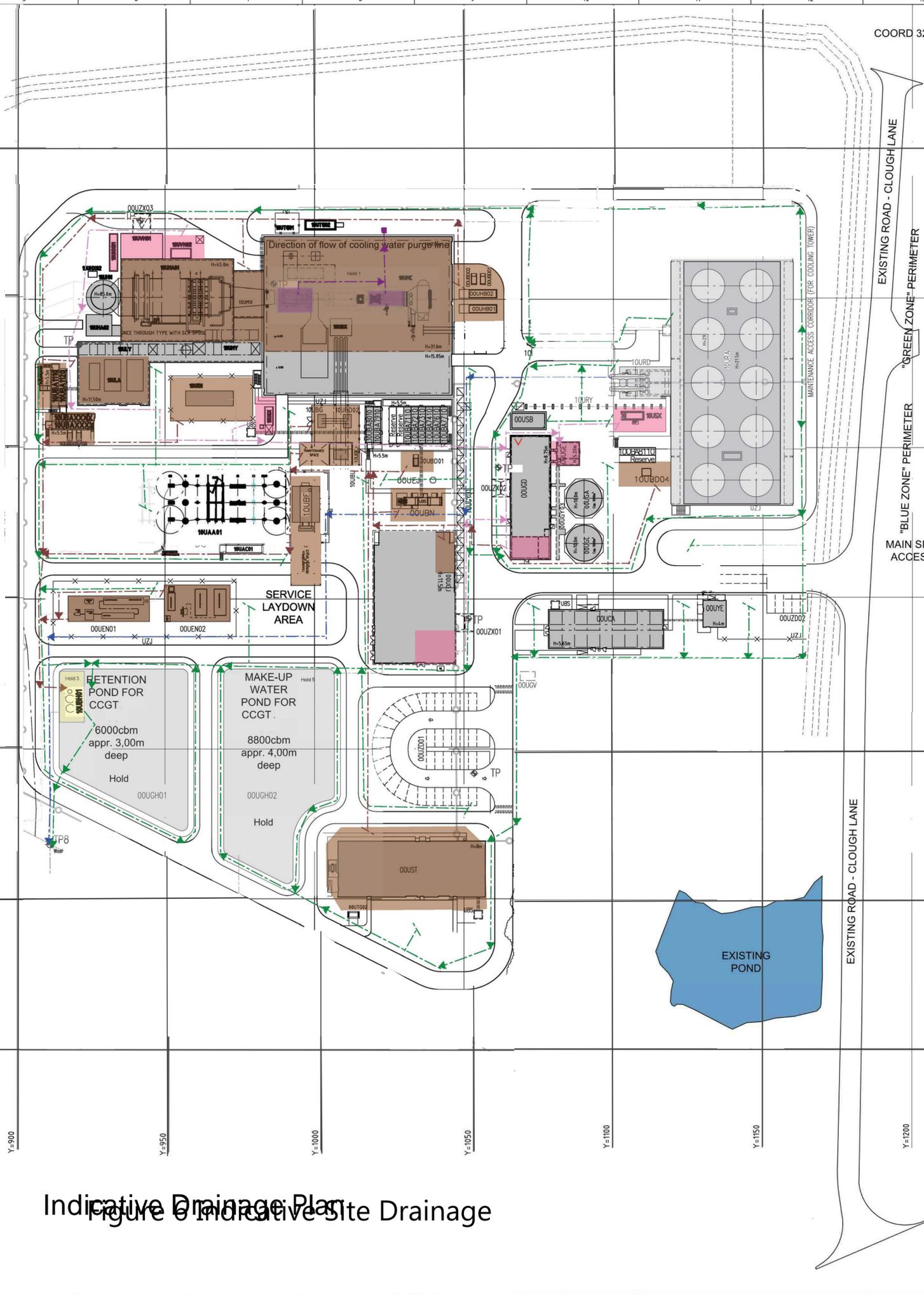
Arup Job No.
305719-70

Name
KLCP-ARP-EN-ATA010-0005

Scale
1:10,500 @ A3



- Uncontaminated surface water zone
- Potentially oil contaminated zone
- Potential chemical contaminated zones
- Wash Water from Turbine
- Structure for oil interceptors
- Catchment point of the uncontaminated surface water
- Direction of flow of uncontaminated surface water
- Catchment point of the potentially oil contaminated line
- Direction of flow of potentially oil contaminated line
- Catchment point of the potentially chemical contaminated line
- Direction of flow of potentially chemical contaminated line
- Direction of flow of cooling water purge line
- Direction of flow of wash water line from turbine casing
- Wash water sump



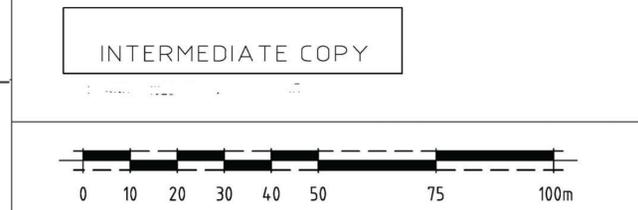
COORD 32 NOT BINDING FOR EXECUTION

STRUCTURE LEGEND (4000F-CLASS WCCT)

10	PAB01/02	CIRCULATING WATER PIPING
10	UAA01	400kV AIR INSULATED SWITCHYARD (AIS)
10	UAC01	STRUCTURE FOR CONTROL CONTAINER FOR AIS
10	UAZ01	UNDERGROUND CONDUIT FOR 400kV CABLES
10	UBA1110/1120	STRUCTURE FOR HRSG PCC (CONTAINER)
10	UBA711-7710	STRUCTURE FOR GT&ST POWER CONTROL CENTRE (CONTAINER)
10	UBA7910-20	STRUCTURE FOR PCC FOR LV & EXCITATION STEAM TURBINE
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10	UYE	SECURITY GATE HOUSE (EXISTING BUILDING TO BE RENOVATED)
10	UZA	ROAD
10	UZD	VEHICULAR PARKING
10	UZJ	FENCE / GATE
10	UZJ01	NOISE PROTECTION WALL (NPC CONCEPT)

SYMBOL LEGEND

OWNER/BECHTEL TERMINAL POINT LIST:-	
TP 1:	FUEL GAS
TP 2:	HV ELECTRICAL INTERFACE
TP 3:	ANGLIAN (POTABLE) WATER
TP 4:	ANGLIAN (NON-POTABLE) WATER
TP 5:	HUMBER ESTUARY COOLING TOWER MAKE UP WATER
TP 6:	CO2 EXPORT INTERFACE
TP 7:	CONSTRUCTION POWER (NOT SHOWN)
TP 8:	WASTEWATER DISCHARGE TO HUMBER



Project		KILLINGHOLME KLCP		PKZPC
Job number :		2122.C41502.001		Contents code
Origin no.	Date	10/10/2025	Created with	
Refer to date for status				
Coord.	Checked	Scale	1:750	Sheet
		Title		
		KLCP - Drainage Plan		
Drawn	14/10/2025	Kevin Lobo		
Coord.	14/10/2025	Daniel Cousins		
Checked	14/10/2025	Stephan De Goede		
Handling				
CONFIDENTIAL				
Drawing no.		UTL/24/KLCP/DAIM/000001		Index/Rev
				P1
Sheet no.		0001		

Indicative Drainage Plan
Figure 6 Indicative Site Drainage

Appendix B – Compliance Assessment Report



This form will report compliance with your permit as determined by an Environment Agency officer

Site	C.Gen Killingholme Power Plant - EPR/FP3838EB		Permit Ref	FP3838EB		
Operator/ Permit holder	C.GEN KILLINGHOLME LIMITED					
Date	05/12/2024		Time in	12:45	Out	13:30
What parts of the permit were assessed	1.1 General Management - Site inspection of permitted area					
Assessment	Site Inspection	EPR Activity:	Installation: X	Waste Op:	Water Discharge:	
Recipient's name/position	Director					
Officer's name	Gary Thackray		Date issued	19/12/2024		

Section 1 - Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations (EPR). A detailed explanation and any action you may need to take are given in the "Detailed Assessment of Compliance" (section 3). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our [Compliance Classification Scheme](#) (CCS). CCS scores can be consolidated or suspended, where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your [local office](#).

Permit Conditions and Compliance Summary			Condition(s) breached
a) Permitted activities	1. Specified by permit	A	
b) Infrastructure	1. Engineering for prevention & control of pollution	N	
	2. Closure & decommissioning	N	
	3. Site drainage engineering (clean & foul)	N	
	4. Containment of stored materials	N	
	5. Plant and equipment	N	
c) General management	1. Staff competency/ training	N	
	2. Management system & operating procedures	N	
	3. Materials acceptance	N	
	4. Storage handling, labelling, segregation	N	
d) Incident management	1. Site security	A	
	2. Accident, emergency & incident planning	N	
e) Emissions	1. Air	N	
	2. Land & Groundwater	N	
	3. Surface water	N	
	4. Sewer	N	
	5. Waste	N	
f) Amenity	1. Odour	N	
	2. Noise	N	
	3. Dust/fibres/particulates & litter	N	
	4. Pests, birds & scavengers	N	
	5. Deposits on road	N	
g) Monitoring and records, maintenance and reporting	1. Monitoring of emissions & environment	N	
	2. Records of activity, site diary, journal & events	N	
	3. Maintenance records	N	
	4. Reporting & notification	N	
h) Resource efficiency	1. Efficient use of raw materials	N	
	2. Energy	N	

KEY: C1, C2, C3, C4 = CCS breach category (* suspended scores are marked with an asterisk),
A = Assessed (no evidence of non-compliance), N = Not assessed, NA = Not Applicable, O = Ongoing non-compliance – not scored
MSA, MSB, TCM = Management System condition A, Management System Condition B and Technically Competent Manager condition which are environmental permit conditions from Part 3 of schedule9 EPR (see notes in Section 5/6).

Number of breaches recorded	0	Total compliance score (see section 5 for scoring scheme)	0
If the Total No Breaches is greater than zero, then please see Section 3 for details of our proposed enforcement response			

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- the part(s) of the permit that were assessed (e.g. maintenance, training, combustion plant, etc)
- where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- any non-compliances identified
- any non-compliances with directly applicable legislation
- details of any multiple non-compliances
- information on the compliance score accrued inc. details of suspended or consolidated scores.
- details of advice given
- any other areas of concern
- all actions requested
- any examples of good practice.
- a reference to photos taken

This report should be clear, comprehensive, unambiguous and normally completed within 14 days of an assessment.

Introduction

Permit variation No: EPR/FP3838EB/A001 issued 10/08/2017

Site inspection carried on site without the operator present.

Non-Compliances

There are no non-compliances associated with this report.

Root Cause

There is no root cause analysis associated with this report.

Site Inspection

The site was inspected from the access road off Clough Lane, through the security entrance on Haven Road, the site was entered.

Generally, the site appeared to be clean and tidy, there was no evidence of construction work on the site. The site is current approximately two thirds tarmacked and one third unmade land. The site is currently used to store pre-registered cars. This confirms that the site is still pre-construction.

The Operator was not present for this inspection. Contact details for the Regulatory Officer associated with the site will be included with the email this report is issued with.

The Environment Agency has had no contact with the Operator for a number of years to discuss the status of the site.

Recommended Actions

There are no actions associated with this Compliance Assessment Report (CAR) form.

Advice and Guidance

There is no advice and guidance associated with this report.

Section 3- Enforcement Response

Only one of the boxes below should be ticked

You must take immediate action to rectify any non-compliance and prevent repetition.

Non-compliance with your permit conditions constitutes an offence* and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.

**Non-compliance with MSA, MSB & TCM do not constitute an offence but can result in the service of a compliance, suspension and/or revocation notice.*

Other than the provision of advice and guidance, at present we do not intend to take further enforcement action in respect of the non-compliance identified above. This does not preclude us from taking enforcement action if further

relevant information comes to light or advice isn't followed.	
In respect of the above non-compliance you have been issued with a warning. At present we do not intend to take further enforcement action. This does not preclude us from taking additional enforcement action if further relevant information comes to light or offences continue.	
We will now consider what enforcement action is appropriate and notify you, referencing this form.	

Section 4- Action(s)

Where non-compliance has been detected and an enforcement response has been selected above, this section summarises the steps you need to take to return to compliance and also provides timescales for this to be done.

Criteria Ref.	CCS Category	Action Required / Advised	Due Date
See Section 1 above			

Section 5 - Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- advise on corrective actions verbally or in writing
- require you to take specific actions in writing
- issue a notice
- require you to review your procedures or management system
- change some of the conditions of your permit
- decide to undertake a full review of your permit

Any breach of a permit condition is an offence* and we may take legal action against you.

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and or suspension or revocation of the permit.
- A civil sanction Enforcement Undertaking (EU) offer may also be available to you as an alternative enforcement response for this/these offence(s).

See our Enforcement and Civil Sanctions guidance for further information

A breach of permit condition **MSA, MSB & TCM is not an offence but may result in the service of a notice requiring compliance and/or suspension or revocation of the permit.*

This report does not relieve the site operator of the responsibility to

- ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- ensure you comply with other legislative provisions which may apply.

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance which could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

MSA, MSB & TCM are conditions inserted into certain permits by Schedule 9 Part 3 EPR

MSA requires operators to manage and operate in accordance with a written management system that identifies and minimises risks of pollution.

MSB requires that the management system must be reviewed, kept up-to-date and a written record kept of this.

TCM requires the submission of technical competence information.

Section 6 – General Information

Data protection notice

The information on this form will be processed by the Environment Agency to fulfill its regulatory and monitoring functions and to maintain the relevant public register(s). The Environment Agency may also use and/or disclose it in connection with:

- offering/providing you with its literature/services relating to environmental matters
- consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive, local authorities) on environmental issues
- carrying out statistical analysis, research and development on environmental issues
- providing public register information to enquirers
- investigating possible breaches of environmental law and taking any resulting action
- preventing breaches of environmental law
- assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Information Regulations request.

The Environment Agency may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The Environment Agency will provide a copy of this report to the public register(s). However, if you consider that any information contained in this report should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within 28 days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

If a permit holder disagrees with the CAR form, they should raise their concerns to the officer or team which issued the form. This must be done within 14 calendar days of receipt. If the response does not resolve the issue, a permit holder can request an appeal of the regulatory decision. This request must be made within 28 calendar days of receipt of the response. More details on our regulatory appeals process can be found at

<https://www.gov.uk/guidance/appeal-a-regulatory-decision-from-the-environment-agency>.

If you are still dissatisfied, you can make a complaint to the Ombudsman. For advice on how to complain to the Parliamentary and Health Service Ombudsman phone their helpline on 0345 015 4033.

Appendix C – LCP BAT Assessment

Table C-1: BAT Conclusions for the LCP Process

BAT NO.	BATC REQUIREMENTS	DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
1	<p>Environmental Management Systems</p> <p>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:</p>		
	(i) Commitment of the management, including senior management.	The Installation will be operated under the Uniper central ISO14001:2015 accredited Environmental Management System (EMS), with site-specific procedures specific to the Installation.	Yes
	(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: <ul style="list-style-type: none"> (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. 	<p>The EMS comprises an environmental policy and all other relevant management documents.</p> <p>The site-specific procedures will define the roles and responsibilities for applicable site personnel.</p> <p>The EMS will include all elements listed under BATc 1 items as required under ISO14001:2015.</p>	
(v) Checking performance and taking corrective action, paying particular attention to: <ul style="list-style-type: none"> (a) monitoring and measurement (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. 	<p>a. Monitoring and Measurement</p> <ul style="list-style-type: none"> • Emissions to Air: The Installation will have an operational procedure document describing the monitoring of emissions to air as required by the LCP BRef. This procedure will also cover the procedures for monitoring emissions to air during periods of abnormal operation. <p>The document will include the responsibilities of site personnel with regards to emissions monitoring, applicable daily, monthly and annual emission limits for each pollutant, control measures applied for each pollutant, and reporting methods and requirements. The operator will ensure that all equipment on site is appropriately maintained and calibrated as required to ensure monitoring and reporting of emissions for regulatory compliance and other requirements; including equipment used for the continuous and discontinuous monitoring of emissions to air and water.</p>	Yes	

BAT NO.	BATC REQUIREMENTS	DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
		<ul style="list-style-type: none"> • Emissions to Water: The Installation operation will not include any direct discharge of untreated process waters that could be harmful to the environment to controlled waters. Any emissions to controlled waters will be controlled and monitored appropriately, in line with written procedures developed prior to commencement of operations. • Maintenance Plan: All plant and equipment at the Installation will be regularly maintained by qualified maintenance staff and contractors. • Key performance indicators to measure environmental performance and the effectiveness of the EMS will be established. <p>b. Corrective and Preventative Actions</p> <ul style="list-style-type: none"> • The Installation will be controlled and operated via a Distributed Control System (DCS) to continuously monitor the operation of the plant and equipment at the site. Any non-conformance or deviation in normal operating parameters will be identified by the DCS to allow the operator to take action to avoid a breach of permitted emission levels. • All actions arising from incidents, accidents and audits will be recorded. The corrective/preventative action that needs to be implemented to stop reoccurrence will also be recorded. Tracking the implementation of these actions will be through Management Review, and monitoring audit actions as part of the key performance indicators for the EMS <p>c. Records</p> <ul style="list-style-type: none"> • The EMS will clearly define the requirements for maintaining and storing records required for Permit compliance. • The EMS will detail the process for keeping documents, including period of retention, document issue to ensure only the most up-to-date procedures are used and location of the documents. Uniper has an electronic system that is available to all relevant employees and contractors. <p>d. Auditing</p>	

BAT NO.	BATC REQUIREMENTS	DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
		<ul style="list-style-type: none"> The EMS will be subject to periodic review and update and will be subject to internal audits in accordance with the Company Internal Audit Plan, as well as external certification audits. 	
(vi)	Review, by senior management, of the EMS and its continuing suitability, adequacy and effectiveness.	Regular management review of the EMS will be undertaken at the Site.	Yes
(vii)	Following the development of cleaner technologies.	See 1ix. below.	-
(viii)	<p>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;</p> <p>(a) avoiding underground structures</p> <p>(b) incorporating features that facilitate dismantling</p> <p>(c) choosing surface finishes that are easily decontaminated</p> <p>(d) using an equipment configuration that minimises trapped chemicals and facilitates drainage or cleaning</p> <p>(e) designing flexible, self-contained equipment that enables phased closure</p> <p>(f) using biodegradable and recyclable materials where possible.</p>	<p>The Installation will be designed with consideration to decommissioning aspects.</p> <p>As the Installation is regulated under the Environmental Permitting Regulations 2016 (as amended) which requires sites to have a decommissioning plan in place to manage such considerations. A decommissioning plan will be developed for the Installation and will be subject to regular reviews to ensure that correct site operations are reflected in the plan.</p>	Yes
(ix)	Application of sectoral benchmarking on a regular basis.	The Installation is regulated under the Environmental Permitting Regulations 2016 (as amended), which requires the application of BAT for the operation of the Installation; this includes the requirement to undertake sectoral benchmarking as and when revised sector guidance is issued (e.g. BRef documents) and to implement compliance with the sector guidance within 4 years of issue. This is implemented through the Regulation 61 notice process.	Yes
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).	Fuel gas flow will be measured by custody transfer metering and its quality by gas chromatograph (GC) in accordance with local and international standards and test methods. See response under BATc 9 for further information.	Yes
(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).	See response to BATc 10 and 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.	The Installation will include dedicated appropriate waste storage areas on site; additionally, a waste procedure that includes the implementation of the waste hierarchy will be developed prior to commencement of operations.	Yes
(xiii)	A systematic method to identify and deal with potential uncontrolled and/or unplanned emissions to the environment, in particular:	The potential for fugitive emissions will be reviewed as part of the EMS environmental aspect and impact identification	Yes

BAT NO.	BATC REQUIREMENTS	DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
	<ul style="list-style-type: none"> (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. 	<p>procedure and on a regular basis through on-going site observations. The site operations will include a procedure describing the processes to be followed with respect to the monitoring and reporting of emissions for regulatory compliance (outside of those required under the Environmental Permitting Regulations 2016 (as amended)). Additionally, the Installation will have a site-specific emergency preparedness and response plan and accident management plan to cover management of potential uncontrolled and/ or unplanned emissions to the environment and accidents.</p>	
	(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.	Due to the inherent nature of the site operations, the potential for dust generation at the site will be minimal. Therefore, no specific dust management plan is proposed to be developed for the Installation.	Yes
	(xv) A noise management plan where a noise nuisance at sensitive receptors is expected or sustained, including; <ul style="list-style-type: none"> (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. 	An assessment of potential noise sources at the Installation and impact on the sensitive receptors in the vicinity of the site has been undertaken as part of the Environmental Permit variation application (Appendix G). The assessment concluded that with proposed mitigation, the Installation will result in a low noise impact.	Yes
	(xvi) For the combustion, gasification or co-incineration of malodorous substances, an odour management plan including: <ul style="list-style-type: none"> (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. 	The CCGT at the Installation will use unodorised natural gas directly from the National Transmission System (NTS) as a fuel, therefore is not likely to generate odour.	Yes
2	Monitoring 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, 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	<p>Periodic Operational Performance tests measuring the load, fuel used, and power output will be undertaken in accordance with applicable BE EN standards.</p> <p>The Installation aims to have a net efficiency of 59%.</p>	Yes

BAT NO.	BATC REQUIREMENTS	DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?																
	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.																		
3	<p>Monitoring BAT is to monitor key process parameters relevant for emissions to air and water including those given below.</p> <p>(a) Flue gas – Flow – Periodic or continuous determination.</p> <p>(b) Flue gas – oxygen content, temperature and pressure - Periodic or continuous determination.</p> <p>(c) Flue gas – Water vapour content - Periodic or continuous measurement.</p> <p>(d) Waste water from flue-gas treatment – Flow, pH, and temperature – Continuous measurement.</p>	<p>Flue gas flow at the Installation will be calculated in accordance with ISO 16911-2:2013 All parameters will be monitored in accordance with BS EN14181. All monitoring equipment on site will be MCERTS certified and will be regularly maintained and calibrated to ensure accurate measurements are recorded.</p> <p>Continuous monitoring of emissions to wastewater will be carried out for flow, pH and temperature, and as required under the Environmental Permit.</p>	Yes																
4	<p>Monitoring 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.</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Standard</th> <th>Minimum frequency</th> <th>Monitoring associated with</th> </tr> </thead> <tbody> <tr> <td>NO_x</td> <td>Generic EN standards</td> <td>Continuous⁽¹⁾</td> <td>BAT 42, BAT 43</td> </tr> <tr> <td>CO</td> <td>Generic EN standards</td> <td>Continuous⁽¹⁾</td> <td>BAT 49, BAT 56</td> </tr> <tr> <td>NH₃</td> <td>Generic EN standards</td> <td>Continuous⁽¹⁾</td> <td>BAT 7</td> </tr> </tbody> </table> <p>(1) For gas turbines, periodic monitoring is carried out with a combustion plant load of >70 %.</p>	Parameter	Standard	Minimum frequency	Monitoring associated with	NO _x	Generic EN standards	Continuous ⁽¹⁾	BAT 42, BAT 43	CO	Generic EN standards	Continuous ⁽¹⁾	BAT 49, BAT 56	NH ₃	Generic EN standards	Continuous ⁽¹⁾	BAT 7	<p>The flue gases from the CCGT will be monitored using MCERTS certified CEMs in accordance with BS EN 14181. This system will continuously monitor NO_x and CO. As no SCR is proposed, monitoring of NH₃ is not required. Further detailed on the monitoring of emissions to air to be carried out at the Installation are provided in Section 6.2 of the Main Supporting Document.</p>	Yes
Parameter	Standard	Minimum frequency	Monitoring associated with																
NO _x	Generic EN standards	Continuous ⁽¹⁾	BAT 42, BAT 43																
CO	Generic EN standards	Continuous ⁽¹⁾	BAT 49, BAT 56																
NH ₃	Generic EN standards	Continuous ⁽¹⁾	BAT 7																
5	<p>Monitoring BAT is to monitor emissions to water from flue-gas treatment 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.</p>	There will be no emissions to water from flue-gas treatment.	Not applicable																
6	<p>General Environmental and Combustion Performance 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 an optimised combustion and to use an appropriate combination of the techniques given below:</p> <table border="1"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Technique	Description	Applicability															
Technique	Description	Applicability																	

BAT NO.	BATC REQUIREMENTS		DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?	
	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.	Performance tests measuring the load, fuel used, and power output to calculate overall efficiencies will be undertaken in accordance with applicable BS EN standards and site procedures.	Yes
	Maintenance of the combustion system	Regular planned maintenance according to supplier's recommendations.	Generally applicable.	All plant and equipment at the Installation will be regularly maintained, including the combustion system, by qualified maintenance staff or contractors, as per site procedures.	Yes
	Advanced control system	The use of a computer-based automatic system to control the combustion efficiency	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and / or control command system.	The Installation's operations will be monitored and operated by suitably trained site personnel and managed via a Distributed Control System (DCS) to continuously monitor the operation of the plant and equipment at the site. Any non-conformance or deviation in normal operating parameters will be identified by the DCS to allow operators to take action to avoid a breach of permitted emission levels.	Yes

BAT NO.	BATC REQUIREMENTS		DEMONSTRATION OF BAT - OPERATOR RESPONSE		BAT?
		y and support the prevention and/ or reduction of emissions. This also includes the use of high-performance monitoring.			
	Good design of the combustion equipment	Good design of furnace, combustion chambers, burners and associated devices.	Generally applicable to new combustion plants.	The CCGT plant will be a new high efficiency F-class unit offering leading performance in its class and compliant with all relevant and most recent regulatory requirements, in addition to design features to optimise performance in terms of emissions and efficiency.	Yes
	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	The Installation will have a contractual agreement to receive natural gas from the NTS, ensuring compliance with nationally specified quality criteria. Input gas streams will be controlled and monitored through online measurement systems (GCs).	Yes

BAT NO.	BATC REQUIREMENTS	DEMONSTRATION OF BAT - OPERATOR RESPONSE		BAT?
		combustion of industrial process fuels.	Natural gas from the NTS will result in minimal sulphur dioxide and particulate emissions from the CCGT.	
7	<p>General Environmental and Combustion Performance</p> <p>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 NO_x emissions, BAT is to optimise the design and/or operation of SCR and/or SNCR (e.g. optimised reagent to NO_x ratio, homogeneous reagent distribution and optimum size of the reagent drops). The BAT-associated emission level (BAT-AEL) for emissions of NH₃ to air from the use of SCR and/ or SNCR is < 3–10 mg/Nm³ as a yearly average or average over the sampling period. The lower end of the range can be achieved when using SCR and the upper end of the range can be achieved when using SNCR without wet abatement techniques.</p>	It is considered that the BAT-AELs for NO _x can be met without the requirement for secondary abatement in the form of SCR, and therefore there will be no associated ammonia emission.		Not applicable
8	<p>BAT Associated Emission Levels</p> <p>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.</p>	It is considered that the BAT-AELs will be achieved through the use of primary combustion controls and that no emissions abatement systems are required.		Not applicable
9	<p>BAT Associated Emission Levels</p> <p>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):</p> <ol style="list-style-type: none"> 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 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). 	<p>A contractual agreement to receive natural gas from the NTS will be in place, which will include the requirement for the gas to comply with specified quality criteria. Equipment such as a GC will be put in place to periodically test the quality of the fuel if required and the parameters listed under BATc 9 for natural gas will be recorded.</p> <p>The Joint Environmental Programme (JEP) Report Characterisation of Power Plant Fuels for Compliance with LCP BREF Conclusion BAT 9 was produced to assist operators of LCP comply with BAT. The Installation will implement the requirements through include in the EMS.</p>		Yes

BAT NO.	BATC REQUIREMENTS	DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
	<p>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.</p> <p>Natural gas — LHV Natural gas — CH₄, C₂H₆, C₃, C₄+, CO₂, N₂, Wobbe index</p>		
10	<p>General Environmental and Combustion Performance 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:</p> <ul style="list-style-type: none"> • 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); • set-up and implementation of a specific preventive maintenance plan for these relevant systems; • review and recording of emissions caused by OTNOC and associated circumstances and implementation of corrective actions if necessary; • periodic assessment of the overall emissions during OTNOC (e.g. frequency of events, duration, emissions quantification/estimation) and implementation of corrective actions if necessary. 	<p>The plant and associated control systems will be designed to minimise the potential for OTNOC events to occur. In addition, the Uniper EMS procedure GMI-SHE049 Environmental Reporting, details how sites should address OTNOC in relation to BAT10 via their environmental aspects and impacts assessment.</p> <p>The Installation will be operated using an DCS to continuously monitor the operation of the plant and equipment at the Site. Any non-conformance or deviation in normal operating parameters is expected to be identified by the automated control system to allow operators to take action to avoid OTNOC events.</p> <p>Site operators will be trained to monitor plant operation and take appropriate action(s) in the event of a potential OTNOC event being identified.</p> <p>Start up and shutdown procedures will be put in place with the aim to minimise the time during which the plant is operating at non-optimal conditions and operators shall be trained in the appropriate actions required should the potential for an OTNOC event be identified.</p> <p>All plant and equipment at the Installation will be regularly maintained including those system provided to minimise the potential for OTNOC conditions to occur.</p> <p>Appropriate procedures will also be put in place to review any OTNOC events with periodic assessment of associated aspects.</p> <p>The records of OTNOC events will be retained on Site.</p>	Yes
11	<p>General Environmental and Combustion Performance BAT is to appropriately monitor emissions to air and/ or to water during OTNOC.</p>	<p>The flue gases from the Site will be monitored using MCERTS certified CEMs in accordance with BS EN 14181. This system will capture emissions data during all operating conditions, including OTNOC situations, and can be used to inform subsequent incident investigation.</p>	Yes

BAT NO.	BATC REQUIREMENTS			DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
12	Energy Efficiency In order to increase the energy efficiency of combustion, gasification and/or IGCC units operated $\geq 1\,500$ h/yr, BAT is to use an appropriate combination of the techniques given below.			The anticipated electrical efficiency of the CCGT plant will be greater than 59%, which is within the required BAT-AEEL range of 57 – 60.5% for CCGTs having a thermal input of >600MWth. There will be computerised control of the main combustion parameters to enable the combustion efficiency to be improved as standard.	Yes
	Technique	Description	Applicability	Combustion optimisation, optimisation of the working medium and the steam cycle are all inherent in the CCGT plant design. A holistic review of all on site energy consumers will be conducted to ensure maximum efficiency of the plant and minimisation of parasitic loads, to maximise energy efficiency.	Yes
	Combustion optimisation	Optimising the combustion minimises the content of unburnt substances in the flue gases and in solid combustion residues	Generally applicable		
	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			
	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			
	Minimisation of energy consumption	Minimising the internal energy consumption (e.g. greater efficiency of the feed-water pump)			
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	Preheating of combustion air is inherent in the CCGT plant design and fuel preheating will be explored.	Yes	

BAT NO.	BATC REQUIREMENTS			DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
	Fuel preheating	Preheating of fuel using recovered heat	Generally applicable within the constraints associated with the boiler design and the need to control NOx emissions	A holistic review of all on site energy consumers will be conducted to ensure maximum efficiency of the plant and minimisation of parasitic loads, to maximise energy efficiency.	Yes
	Advanced control system	Computerised control of the main combustion parameters enables the combustion efficiency to be improved	Generally applicable to new units.		
	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		
	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: <ul style="list-style-type: none"> • flue-gas • grate cooling • circulating fluidised bed 			
	CHP readiness		Only applicable to new units where there is a realistic potential for the future use of heat in the vicinity of the unit		

BAT NO.	BATC REQUIREMENTS			DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
	Flue-gas condenser		Generally applicable to CHP units provided there is enough demand for low temperature heat		
	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		
	Wet stack				
	Cooling tower discharge				
	Fuel pre-drying				
	Minimisation of heat losses				
	Advanced materials				
	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		
	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		

BAT NO.	BATC REQUIREMENTS			DEMONSTRATION OF BAT - OPERATOR RESPONSE	BAT?
			combusting biomass, the applicability may be constrained by high temperature corrosion in the case of certain biomasses		
13	Water Usage and Emissions to Water 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.			The Installation will be serviced by a closed-loop cooling system with hybrid cooling towers, where a majority of the cooling water will be recycled. There will be some evaporative losses and blowdown - typically four cycles of concentration, meaning that the ratio of mineral concentration in the source water to that in the circulating water that must be maintained. It would not be possible to reuse the blowdown in the LCP due to the build-up of contaminants over time in the recirculated water. As a hybrid cooling system, the amount of water used is lower than that for fully wet cooling system. As such, only a nominal amount of water treatment chemicals is expected to be used, primarily for prevention of scaling and corrosion, and biofouling.	Yes
	Technique	Description	Applicability	Where practical, efforts will be made to recover wastewater streams to serve as cooling water make-up or as feed for the demineralisation system in order to reduce wastewater discharge. This will include HRSG blowdown, RO rejects (from demineralisation) and treated water from the oil/ water separator. The volumes of surface water run-off are extremely low in comparison to overall water usage on site and opportunities for reuse on site are limited due to the water quality requirements for on-site processes. CCGTs do not produce any ash from the combustion process; therefore, the techniques for dry bottom ash handling are not applicable.	Yes
	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.		
	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.		
14	Water Usage and Emissions to Water 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.			Separate drainage and sump systems are included in the design to segregate uncontaminated surface run-off water from contaminated process water and potentially contaminated run-off surface water. Contaminated water	Yes

BAT NO.	BATC REQUIREMENTS	DEMONSTRATION OF BAT - OPERATOR RESPONSE		BAT?
		will be treated in an onsite wastewater treatment facility and recycled- and reused within the process as far as reasonable possible, with the surplus discharged to the outfall (Emission Point W1).		
15	Water Usage and Emissions to Water In order to reduce emissions to water from flue-gas treatment, BAT is to use an appropriate combination of the techniques, and to use secondary techniques as close as possible to the source in order to avoid dilution.	The need for flue gas treatment is minimised by primary combustion controls identified in BAT 6, therefore there are no emissions to water from flue-gas treatment.		Not applicable
16	Waste Management 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 using appropriate techniques.	All waste generated will be managed in accordance with Uniper's EMS document GMI-SHE043 (Management of Waste). Uniper have a centrally coordinated waste management contract in place for all their sites, ensuring waste is managed with implementation of the waste hierarchy as a priority. Uniper's primary objective is not to produce waste in the first place and where it is produced, to reuse and recycle as much as possible. A waste working group within Uniper UK meet regularly, along with the waste contractor, with the aim of finding options for		Yes
17	Noise emissions In order to reduce noise emissions, BAT is to use one or a combination of the techniques given below.			
	Operational measures	These include: <ul style="list-style-type: none"> 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	The Site will have a maintenance schedule in place to ensure optimum operation of all plant and equipment. The GT, HRSG and ST will be situated within a building and all outdoor equipment will have noise attenuation enclosures, where required. Any maintenance work that is likely to cause significant noise that poses a nuisance risk will be undertaken during daylight hours, where feasible.

BAT NO.	BATC REQUIREMENTS		DEMONSTRATION OF BAT - OPERATOR RESPONSE		BAT?
	Low-noise equipment	This potentially includes compressors, pumps and disks.		The Installation will be a new plant, and all equipment will be selected to avoid noise impacts either via inherent design qualities, or where a noise risk exists, via the installation of noise attenuation measures.	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	All equipment being installed is new and mitigation will be in place where necessary to ensure levels of noise below applicable lowest observed adverse effect level (LOAELs), so that residual effects are expected to be not significant.	Yes
	Noise-control equipment	This includes: <ul style="list-style-type: none"> • noise-reducers • vibration or acoustic insulation, or vibration isolation • enclosure of noisy equipment • soundproofing of buildings 	The applicability may be restricted by lack of space		
	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		

BAT 18 – 27 are associated with the combustion of solid fuels only, and therefore are not considered to be applicable to the Installation.

BAT 28 – 39 are associated with the combustion of liquid fuels only, and therefore are not considered to be applicable to the Installation.

Table C-2: BAT conclusions for the combustion of gaseous fuels

BAT No.	BATc Requirements	Demonstration of BAT - Operator Response	Operating to BAT?
40	<p>Energy Efficiency & BAT-associated energy efficiency levels (BAT-AEELs)</p> <p>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 combined cycle for new gas turbines operating over 1,500 hours per year.</p> <p>New CCGT >600MW_{th} BAT-AEEL = Net electrical efficiency 57 - 60.5%</p>	The anticipated electrical efficiency of the CCGT plant will be greater than 59%, which is compliant with the required BAT-AEEL range of 57 – 60.5% for CCGTs having a thermal input of >600MW _{th} .	Yes

BAT No.	BATc Requirements	Demonstration of BAT - Operator Response	Operating to BAT?
41	NO_x, CO, NMVOC and CH₄ emissions to air	Only applicable to boilers and therefore not applicable to the Installation.	N/A
42	In order to prevent or reduce NO _x 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:		Yes
	Technique	Applicability	
	Advanced Control System	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system.	Operation of the CCGT unit will be controlled by trained site operators using a DCS, which will be used to control the operation of the plant and also record data on the plant performance, which can also be used by the operations team to identify potential issues.
	Water / Steam Addition	The applicability may be limited due to water availability.	Water/ steam addition for NO _x control is not applied as the plant will have Dry Low NO _x burners (DLN).
	Dry Low NO _x 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.	The CCGT will have DLN burners in place to ensure minimum emissions of NO _x .
	Low Load Design Concept	The applicability may be limited by the gas turbine design.	Not applicable as this is limited by the turbine design. Operational efficiency characteristics of the plant vary according to the load. No supplementary firing is undertaken in the HRSGs.
	Low NO _x Burners (LNB)	Generally applicable to supplementary firing for heat recovery steam generators (HRSGs) in the case of combined-cycle gas turbine (CCGT) combustion plants.	The CCGT will have DLN burners in place to ensure minimum emissions of NO _x .

BAT No.	BATc Requirements		Demonstration of BAT - Operator Response	Operating to BAT?
	Selective Catalytic Reduction (SCR)	Not applicable in the case of combustion plants operated < 500 h/yr. Not generally applicable to existing combustion plants of < 100 MWth	It is considered that the NOx BAT-AELs can be met with primary measures alone, and therefore SCR does not need to be installed	
43	Only applicable to natural gas engines and therefore not applicable to the Installation.			
44	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		Optimised combustion will ensure CO emissions meet the required emission limits.	Yes

Table C-3: BAT Associated Emission Levels (BAT-AELs) for the Combustion of Natural Gas in New CCGTs >50MWth

Pollutant	Yearly Average	Daily average or average over the sampling period	Demonstration of BAT - Operator Response
NOx	10-30 mg/Nm ³	15-40 mg/Nm ³	<p>The CCGT is expected to achieve the stated BAT-AELs without the SCR with energy efficiency uplifts applied as appropriate on confirmation of the CCGT supplier post FEED.</p> <p>Whilst it is recognised that SCR could be applied to reduce NOx emissions towards the lower end of the BAT-AEL range, this would result in an emission of ammonia, due to the potential for ammonia slip to occur.</p> <p>Ammonia contributes to nitrogen deposition on habitat receptors, with a deposition rate that is significantly greater than that of NO₂, and therefore it is considered that any emission of ammonia (even at the lower end of the BAT-AEL range of 3 – 10mg/Nm³) would increase the nitrogen deposition impacts more than any reduction in the NOx impacts would achieve. It is therefore considered that if SCR were applied, nitrogen deposition impacts at the closest habitat receptors would increase above the 1% threshold for determining insignificance on these receptors.</p> <p>As the predicted impacts of NO₂ at human health receptors and NOx at habitat receptors are considered to be either insignificant or not significant, it is not considered that there is any driver to reduce the NOx emissions below the upper end of the associated BAT-AEL range.</p>

CO	5-30 mg/Nm ³ (indicative BAT-AEL)	-	Performance to be confirmed following commencement of operation. IED ELV of 100 mg/Nm ³ proposed in the Main Supporting Document.
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In the case of a gas turbine equipped with DLN, these BAT-AELs apply only when the DLN operation is effective.

For plants with a net electrical efficiency (EE) greater than 55%, a correction factor may be applied to the higher end of the BAT-AEL range, corresponding to [higher end] x EE / 55, where EE is the net electrical efficiency of the plant determined at ISO baseload conditions.

Appendix D - Site Condition Report

See accompanying report

Appendix E – Combined Heat and Power Readiness Assessment

See accompanying report

Appendix F - Air Impact Assessment

See accompanying report.

Appendix G – Noise Impact Assessment

See accompanying report.

Appendix H - Qualitative Risk Assessment

See accompanying report.

Appendix I - Company Information and Directors

Company name – Uniper UK Limited

Registered office address – Compton House, 2300 The Crescent, Birmingham Business Park, Birmingham, B37 7YE

Company number – 02796628

Details of Company Secretaries

Secretary Name (Last name, First name)	Appointed on
Mr Daniel Robert Gething	02/02/2018

Details of Directors (Active only)

Director Name (Last name, First name)	Date of Birth	Appointed on
Matthew Bayes	██████	01/12/2017
Michael John Lockett	██████	24/09/2015
Pedro Antonio Lopez Estebaranz	██████	31/12/2019
Angela Adele Mitchell	██████	01/12/2017

Appendix J – Environmental Management System Certificate

Certificate of Approval

This is to certify that the Management System of:

Uniper UK Limited

Compton House, 2300 The Crescent, Birmingham Business Park, Birmingham, B37 7YE, United Kingdom

has been approved by LRQA to the following standards:

ISO 14001:2015

Approval number(s): ISO 14001 – 00006731

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

The generation and supply of electricity and steam with maintenance, associated activities and decommissioning.

David Derrick

Regional Director, UKAM

Issued by: LRQA Limited



Certificate Schedule

Location	Activities
Compton House, 2300 The Crescent, Birmingham Business Park, Birmingham, B37 7YE, United Kingdom	ISO 14001:2015 Head office activities to support the Generation Fleet in the UK.
Connahs Quay Power Station, Kelsterton Road, Connahs Quay, Deeside, CH5 4BP, United Kingdom	ISO 14001:2015 The generation of electricity and steam including the treatment and supply of natural gas.
Enfield Power Station, 111 Brancroft Way, Enfield, EN3 7PL, United Kingdom	ISO 14001:2015 The generation and supply of electricity to the grid and the maintenance of associated equipment.
CDCPK Killingholme Chase Hill Road, Killingholme, DN40 3LU, United Kingdom	ISO 14001:2015 The generation and supply of electricity and the maintenance of associated equipment. The provision of natural gas through high pressure pipelines and the maintenance of associated equipment including reception and distribution centres.
Taylor's Lane Power Station, Brentfield Road, Willesden, London, NW10 9BU, United Kingdom	ISO 14001:2015 The generation and supply of electricity and the maintenance of related equipment.
Ratcliffe on Soar Power Station, Ratcliffe on Soar, NG11 0EE, United Kingdom	ISO 14001:2015 Activities associated with plant decommissioning.
CDC (Cottam Development Centre) Power Station, Outgang Ln, Retford, DN22 0TF, Nottinghamshire, United Kingdom	ISO 14001:2015 The generation and supply of electricity and the maintenance of associated equipment.
Grain Power Station, Power Station Road, Isle of Grain, Rochester, ME3 0AF, United Kingdom	ISO 14001:2015 The generation of electricity, export of heat, and the operation and maintenance of related equipment.

