



UNIPER UK LTD

Connah's Quay Power Station
EPR/NP3037AF
Variation: WPC15719

Application to vary the environmental permit at the existing Connah's Quay Power Station (CQ-B: permit NP3037AF) in support of the new build Connah's Quay Low Carbon Power Station (CQ-LCP) permit application.

April 2026

Written by:

Andy Black – HSSE Team, Connah's Quay Power Station (CQ-B)

Approved by:

Jonathan Spence – HSSE, Environment Team Leader

CONTENTS

FIGURE LIST	3
GLOSSARY	4
1.0 INTRODUCTION	6
1.1 Overview.....	6
1.2 The Operator	6
1.3 Proposed CQ-LCP Installation	7
1.4 Environmental Permit Variation	7
1.5 Regulatory Framework	7
2.0 ENVIRONMENTAL SETTING AND SITE CONDITION.....	9
2.1 Site Location.....	9
2.2 History of the Current Connah's Quay Power Station Site	9
2.2.1 Connah's Quay A Station (Coal Fired: 3 x 60MW Units): 1958 – 1992	9
2.2.2 Connah's Quay B Station (Gas Fired: 4 x 342MW Units): 1996 onwards	9
2.2.3 Connah's Quay Gas Treatment Plant (GTP: 1996 – 2023)	10
2.3 Proposed Future Developments.....	12
2.3.1 CQ Low Carbon Power Development (CQ-LCP: 2030 Onwards)	12
3.0 MANAGEMENT ARRANGEMENTS.....	13
3.1 Introduction.....	13
3.2 Overview.....	13
3.3 Organisation – Responsibilities and Structure.....	13
3.4 CQ-B/CQ-LCP Inter-Installation Structure, Communications, and Arrangements.....	13
3.4.1 Installation Boundary	14

3.4.2	Cooling Water Abstraction from the River Dee	14
3.4.3	Cooling Water Provision to CQ-LCP	14
3.4.4	Return of Purge Cooling Waters from CQ-LCP to CQ-B	16
3.4.5	Maximum Generation Output.....	16
4.0	PERMIT VARIATION.....	16
4.1	Removal of Gas Treatment Plant & Footprint from CQ-B Permit	17
4.1.1	Diesel Fuel	17
4.1.2	Lubricating Oils	17
4.1.3	Sylobead (Molecular Sieve Material)	17
4.1.4	Chubb/Angus Fire Tridol S 3% Fire Fighting Foam	17
4.1.5	Perlite (Cold Box).....	17
4.1.6	Sewage Treatment Plant	17
4.1.7	Oil/Water Interceptor	17
4.1.8	Gas Filters.....	18
4.1.9	GTP Site Footprint Removal from Current Installation Boundary	18
4.2	Formal Transfer of Land from CQ-B to CQ-LCP (Boundary Amendment)	18
4.3	Disconnection of GTP Surface Water Drains from W2 system	19
4.4	Provision of Cooling Waters from CQ-B to CQ-LCP	19
4.5	Reception of Waste Waters from CQ-LCP	20
4.6	Provision of Natural Gas Supply to CQ-LCP	21
4.7	Removal of Emission Point W3	21
4.8	Amendment of Table S3.2: Movement of Oil and Grease Monitoring Location	21
4.9	Removal of Chlorine Dioxide/Chlorite Monitoring Parameters	22
4.10	Replacement Auxiliary Generator Diesel Fuel Tanks	23
5.0	SUMMARY	23

FIGURE LIST

Figure 11: Existing Power Station Installation Boundary

Figure 13: Proposed Changes to Existing Connah's Quay Power Station Boundary

Figure 14: Future Revised Boundary and Emissions Plan for the Existing Connah's Quay Power Station

APPENDICES:

1: OMA Report – Discharges to Water: Connah's Quay Power Station: Responses to Report Dated 19th Feb 2019.

GLOSSARY

Abbreviation	Term
AGI	Above Ground Installation
AOD	Above Ordnance Datum
CCGT	Combined Cycle Gas Turbine
CCP	Carbon Capture Plant
CCS	Carbon Capture and Storage
CEMs	Continuous Emissions Monitoring Systems
CO ₂	Carbon Dioxide
CQ-A	Connah's Quay A: Former Coal Fired Power Station (Demolished)
CQ-B	Connah's Quay B: Current 4 x CCGT Power Station
CQ-LCP	Connah's Quay: Low Carbon Power
DCC	Direct Contact Cooler
EMS	Environmental Management System
GT	Gas Turbine
GTP	Gas Treatment Plant
ha	Hectare
HRSG	Heat Recovery Steam Generator
HMIP	Her Majesty's Inspectorate of Pollution
IPC	Integrated Pollution Control
IPPC	Integrated Pollution Prevention and Control
km	Kilometre
LNG	Liquefied Natural Gas
m	Metre
mm	Millimetre
MW	Megawatt
MWe	Megawatt Electrical
N ₂	Nitrogen

NH ₃	Ammonia
NO _x	Oxides of Nitrogen
NRA	National Rivers Authority
NRU	Nitrogen Rejection Unit
NRW	Natural Resources Wales
NTS	National Transmission System (Gas)
PRS	Pressure Reduction Station
PFA	Pulverised Fuel Ash
SCR	Selective Catalytic Reduction
Sm ³ /hr	Standard Cubic Metres Per Hour
ST	Steam Turbine
UK ETS	United Kingdom Emissions Trading Scheme

1.0 INTRODUCTION

1.1 Overview

Uniper UK Limited (referred to as 'The Operator') requests a variation to the existing environmental permit for Connah's Quay Power Station (hereby referred to as 'CQ-B' - permit no. NP3037AF).

This variation is required to support the separate environmental permit application for the proposed Connah's Quay Low Carbon Power development adjacent to CQ-B. The proposed installation is a Combined Cycle Gas Turbine (CCGT) equipped with Carbon Capture Plant (CCP). For the purposes of this document, the proposed new installation will be referred to as 'CQ-LCP'. CQ-B and CQ-LCP would both be regulated by Natural Resources Wales (NRW).

This document is structured as follows:

- Section 1.0 provides an overview of the variation proposals, outlines the continued strategy for the installation and the relevant legal requirements.
- Section 2.0 summarises the installation's environmental setting and site condition.
- Section 3.0 summarises the management strategy for the installation.
- Section 4.0 details the variation to operating equipment, procedures, site footprint and management strategies Uniper wish to make to the existing Environmental Permit.

1.2 The Operator

CQ-B is operated by Uniper UK Limited (company registration number 02796628). The Operator is a UK-based company, wholly owned by Uniper SE (Uniper) through Uniper Holding GmbH.

Uniper is a European energy company with a global reach and operations in more than 40 countries. It has about 7,500 employees and plays a key role in ensuring a secure energy supply in Europe, particularly in its core markets of Germany, the United Kingdom, Sweden, and the Netherlands. Uniper's 14 gigawatts of flexible power generating capacity make it a mainstay of reliable power production. Uniper is a leading gas trader and one of northwestern Europe's most important LNG importers, and its broad procurement portfolio enhances supply security.

Uniper is committed to investing around €8 billion (~£6.9 billion) in growth and transformation projects between 2023 and the early 2030s. This includes developing new renewables projects, investing in renewable and low-carbon gases such as hydrogen, and new CCS or hydrogen ready power plants and by progressively transforming its existing fleet into Europe's leading source of decarbonised power. Together, these steps will enable the Uniper Group's Scope 1, 2 and 3 emissions to be carbon-neutral by 2040¹.

In the UK, Uniper owns and operates a flexible generation portfolio of six power stations, a fast-cycle gas storage facility, two high pressure gas pipelines, and regasification capacity at the Grain LNG terminal in Kent. Uniper makes its power production available to the market through its trading activities and provides customised balancing services to the UK system operator. Uniper are also progressing

¹ Group wide scope for 1, 2 and 3 emissions including offsetting, where economically viable. Scope 1 and 2 emissions are heading towards neutrality by 2040 as part of the EU Emissions Trading System (EU ETS). Scope 3 emissions will decrease in time with market developments, customer behaviour and political goals.

CCS and hydrogen projects, and expanding its onshore wind and solar portfolio, to further support energy security in the UK.

This variation is required and submitted to support Uniper's proposed CQ-LCP installation. The design of CQ-LCP (alongside intended modifications to CQ-B) demonstrates Uniper's commitment to deliver on its aim to accelerate the transition to a decarbonised future. CQ-LCP will be built with a clear route to decarbonisation, being equipped with post-combustion carbon capture technology, consistent with Uniper's commitments to low-carbon power. CQ-LCP is intended to connect to infrastructure that will be delivered by the Hynet Cluster for the transport and offshore geological storage of carbon dioxide.

1.3 Proposed CQ-LCP Installation

The design of CQ-LCP is subject to ongoing technical studies to provide flexibility and to align with the current grid connection, but it is expected to comprise the development of two CCGT units achieving a net electrical output capacity of up to 1,380 megawatts (MW, referred to as MWe for electrical output) (with CCP operational) onto the national electricity transmission network.

Further information on the proposed installation is provided in Section 2.3.1.

1.4 Environmental Permit Variation

Uniper is submitting this application to formally vary the CQ-B environmental permit. The variation is required to incorporate amendments that will enable the effective operation of the proposed CQ-LCP development. The changes being sought through this variation are set out in Section 4.0 of this document.

1.5 Regulatory Framework

CQ-B is regulated under Schedule 1 of the Environmental Permitting (England and Wales) Regulations (EPR) 2016, as amended. Table 1 (overleaf) summarises the listed and directly associated activities for which CQ-B is regulated by NRW:

Table 1: CQ-B Listed Activities and Directly Associated Activities

Activity Ref. No	Activity under EPR 2016 Schedule 1	Description of Specified Activity	Limits of Specified Activity
A1	Combustion Activity: Schedule 1, Part 2, Section 1.1 Part A (1) (a): Burning any fuel in an appliance with a rated thermal input of 50MW or more.	Operation of four individual CCGT Units, each comprising one gas turbine, fired on natural gas with a Heat Recovery Steam Generator (HRSG), Steam Turbine and generators for the production of electricity.	Combustion of natural gas in a CCGT. From receipt of natural gas to discharge of exhaust gases and wastes, raw materials to supply electricity, and from water intake to water discharge. Permitted to operate in single or double two-shifting mode
A2	Gas Treatment: Section 1.2 Part A (1) a),	Operation of a gas treatment plant to process sour gas from the Liverpool Bay for the removal of water and Nitrogen to meet national gas transmission standards.	Heating and cooling of gas. Combustion of post-split off gas with hydrocarbon contamination. Activation of compressors to process gas to national gas transmission pressure requirements.
A3	Directly Associated Activity	Surface Water Drainage: Handling and Storage of site drainage until discharge to river via the site surface water system.	Generation and handling of water to the point of discharge into River Dee.
A4	Directly Associated Activity	Raw Water Treatment: Use of reverse osmosis / de-ionising plant to process towns water to 99.9% pure water.	From receipt of towns mains water supply into site to point of use in boiler for steam raising to purge discharge to cooling water purge system into River Dee.
A5	Directly Associated Activity	Effluent Discharge: Disposal to existing final discharge pond of waste cooling waters, boiler blow down, steam condensate, water treatment plant effluent and sewage treatment effluents	From release of effluents to discharge at emission point W1.
A6	Directly Associated Activity	Waste Management: Waste generation and handling	From waste generation to dispatch from the installation.
A7	Directly Associated Activity	Operation of electrical transformers to support the installation.	Transformers and associated equipment contain insulating oil and potentially gas insulation stored within secondary containment systems sized to hold at least 110% of the largest volume.

2.0 ENVIRONMENTAL SETTING AND SITE CONDITION

2.1 Site Location

CQ-B is located approximately 0.5 kilometres (km) north-west of the town of Connah's Quay in Flintshire, North Wales.

CQ-B is situated at grid reference SJ 2770 7120 and covers an area of approximately 56.5 hectares (ha).

2.2 History of the Current Connah's Quay Power Station Site

2.2.1 Connah's Quay A Station (Coal Fired: 3 x 60MW Units): 1958 – 1992

The footprint of the original coal fired power station (CQ-A) was previously occupied by saltings (areas of coastal land regularly covered by the tide). Reclamation commenced in 1950 and included the dredging and pumping of 800,000 tonnes of sand from the river delta to lift the ground level to around 2.5m AOD, creating the platform for CQ-A (and subsequently CQ-B). CQ-A was constructed in three 60MW phases over eight years with completion in 1958 and equipped with rail connection to the main London to Holyhead railway (enabling importation of coal from the Point of Ayr colliery at Talacre as the primary fuel source).

Embankments were created on land currently occupied by CQ-B to provide settlement lagoons and storage for the Pulverised Fuel Ash (PFA) produced by CQ-A. The PFA was turned into a slurry to pump across the site, enabling further land raising to occur. The former lagoons are now a landscaped feature of the nature reserve at CQ-B.

CQ-A ceased operation in 1984 and demolition was completed in 1992. The footprint of CQ-A was cleared of all standing structures.

2.2.2 Connah's Quay B Station (Gas Fired: 4 x 342MW Units): 1996 onwards

CQ-B is located on the south bank of the Dee Estuary in Connah's Quay, North Wales. CQ-B consists of a Gas Treatment Plant (GTP) and four CCGT units providing up to 1,530 MW of electricity for export to the National Grid. CQ-B began construction in 1993, and after a full commissioning program formally opened in 1996.

As part of the construction process, an Integrated Pollution Control (IPC) permit application was made to Her Majesty's Inspectorate of Pollution (HMIP) on 5th January 1995 and permit AP5790 was granted on the 14th August 1995.

The site moved to Environment Agency regulation on 1st April 1996 and in line with changes in legislation an Integrated Pollution Prevention and Control (IPPC) permit application was duly made on the 17th March 2006. IPPC permit MP3337SH was granted on the 9th February 2007. Emissions to air and water continue to be monitored in line with the requirements of the current environmental permit which is regulated by NRW (now numbered NP3037AF).

CQ-B was constructed on the former PFA settlement lagoons which were raised to the current height levels (maximum 7m AOD). Now owned and controlled by The Operator, CQ-B was originally operated by Powergen and transferred to E.ON following a corporate takeover in January 2002. E.ON transferred ownership to The Operator following formation of the company in 2016.

Each of the four CQ-B gas turbines (GT) exhaust directly to a Heat Recovery Steam Generator (HRSG), converting treated towns mains water to supply a steam turbine (ST) comprising separate high, intermediate, and low-pressure cylinders. Exhaust emissions from each HRSG are dispersed to the atmosphere via 85m high chimney stacks. Exhaust steam is condensed back into water and fed back to the HRSG for re-use.

Cooling water is abstracted from the River Dee during a limited tidal window (under abstraction consent 24/67/10/124) and used to cool the condenser. The cooling water is circulated through low level hybrid cooling towers, where the heat is rejected to atmosphere via conduction, convection, and evaporation.

The cooling water system maintains continual replacement during generation; fresh water is slowly added to the system to control water temperature and levels of conductivity. Purged waters are transferred to purpose-built purge storage ponds. These purge waters are then returned to the River Dee in the next tidal window, within continuously monitored parameters as specified in the environmental permit.

2.2.3 Connah's Quay Gas Treatment Plant (GTP: 1996 – 2023)

From conception in 1993, CQ-B's primary fuel source was a sour gas supply (sour due to nitrogen/water content), extracted via offshore rigs within the Liverpool Bay fields and transported to a coastal shore gas terminal (Point of Ayr - operated by ENI).

The ENI pipeline was not laid in time to meet site commissioning timescales and so a second gas pipeline passes under the River Dee to link CQ-B to the National Transmission System (NTS) at Burton Point. This dual fuel pipeline arrangement enabled CQ-B to utilise fuel from both the Liverpool Bay fields and the NTS as and when required.

The sour gas could be combusted untreated by CQ-B but contaminants within the feed meant this gas source did not meet the quality requirements of the Gas Safety (Management) Regulations standards for supply into the NTS.

With the arrangement of a permanent gas supply contract and the need to divert unused gas during times of non-generation, the decision was made to add a Gas Treatment Plant (GTP) to CQ-B. As such, in 1994 an additional IPC permit application for Connah's Quay GTP was submitted in 1995.

The GTP was integrated with the main power station as the Environment Agency regulation combined both into the same IPPC permit application, which was duly made on the 17th March 2006. IPPC permit MP3337SH was granted on the 9th February 2007 to regulate the joint CQ-B/GTP installation.

Previous technical details on the operation of the GTP was provided in the 2006 IPPC permit application, however a short overview is also provided here:

Designed to remove nitrogen and water contaminants from the ENI feed gas, the GTP was initially designed to operate to accept gas flows from 35,000 Sm³/hr to 236,000 Sm³/hr and was divided into three main sections:

- Feed gas pre-treatment.
- Nitrogen rejection unit (NRU); and,
- Gas compression.

2.2.3.1 Feed Gas Pre-Treatment

The feed pre-treatment section consisted of several molecular sieve adsorbers to remove water and any hydrogen sulphide (or other sulphur compounds) and any mercury contamination. In the life of the gas field no sulphur or mercury was found.

2.2.3.2 The Nitrogen Rejection Unit (NRU)

The NRU consisted of three separation columns, several heat exchangers and distribution vessels with associated control systems.

ENI feed gas was passed through a cold box to produce a methane rich gas with a nitrogen (N₂) content of approximately 1.5% and a nitrogen vent gas with a methane content of approximately 1.5%. The methane rich gas was produced at three pressure levels (26 bar, 14 bar and 8 bar) and the nitrogen rich vent gas at 1.5 bar. The cryogenic equipment consisted of three distillation columns, two pumps, and several plate fin heat exchangers.

2.2.3.3 Gas Compression

The GTP was equipped with four centrifugal compressors, with each compressor consisting of three process stages. The first stage compressed low pressure methane from the cold box from 7 barg to 13 barg. The intermediate pressure methane is then mixed with the first stage and compressed to 26 barg in the second stage. Finally, the gas was mixed again with the high-pressure methane rich stream from the cold box and compressed to a sufficient pressure to be accepted into the NTS.

Depending on supply and demand requirements, the final product would then pass through the AGI and the under-river pipeline to the Burton Point AGI and pass into the NTS.

2.2.3.4 Ancillary Devices

The GTP was also equipped with:

- Ground level flare: safety flare capable of controlled flaring of the plant gas inventory in the event of an emergency de-pressurisation, as well as during plant regenerations and as part of routine molecular sieve de-pressurisation;
- A thermal oxidiser: a combustion plant with 45m stack which combusted the off gas (waste nitrogen from the treatment process with some hydrocarbon contaminants); and,
- Gas regen heater: the regen heater burned fuel gas to heat a flow of reject nitrogen which then passed through the molecular sieve adsorbers to regenerate them.

The GTP closed on 30th June 2023, and the plant was subsequently disconnected from the main power station and has seen no further operation since. Since this closure, CQ-B has utilised the pipeline from Burton Point (under the River Dee) to maintain its fuel supply. Following its closure in 2023, work to decontaminate and decommission the plant occurred and this part of the installation has been mothballed since.

As a part of this variation, The Operator requests removal of the GTP as a listed process from CQ-B's environmental permit and to move the GTP footprint into the CQ-LCP permit boundary.

Section 4.0 of this document provides further information on the decommissioning of the GTP and proposed installation boundary changes.

2.3 Proposed Future Developments

As CQ-B nears the end of its operational lifespan, the UK energy market has changed dramatically since the plant first started operating in 1996.

As outlined in Section 1.3, to keep up with ongoing changes in the energy market, the Operator plans to move forward with future development at their Connah's Quay site. Uniper UK will operate the new CQ-LCP facility. Additional information about CQ-LCP is provided below:

2.3.1 CQ Low Carbon Power Development (CQ-LCP: 2030 Onwards)

The Operator intends to develop CQ-LCP utilising an area CQ-B's existing installation footprint and adjacent land. CQ-LCP will be located northwest of CQ-B, and a significant section of land will transfer from CQ-B's installation boundary to CQ-LCP (see Section 4.2 for further detail).

2.3.1.1 Proposed CQ-LCP Installation

The design of CQ-LCP is subject to ongoing technical studies, to provide flexibility and to align with the current grid connection, but it is expected to comprise the development of two CCGT units achieving a net electrical output capacity of up to 1,380 megawatts (MW; referred to as MWe for electrical output) (with CCP operational) onto the UK national electricity transmission network.

CQ-LCP will generate electricity from combustion of natural gas within a combined cycle gas turbine (CCGT). Hot exhaust gas from the combustion process will be used to drive the gas turbine (GT), and steam, which will be generated from the heat of the exhaust gas, in the heat recovery steam generator (HRSG), which will be used to drive the steam-turbine (ST). The exhaust gas will then pass through pre-treatment stages, including selective catalytic reduction (SCR) using ammonia (NH₃) to reduce Oxides of Nitrogen (NO_x) in the gas and subsequently cooled using water via a direct contact cooler (DCC), in the CCP. The CCP will use an amine-based solvent to absorb carbon dioxide (CO₂) from the exhaust gas within a packed column (absorber), via a weak acid-base reaction. The CO₂-depleted exhaust gas then passes through water wash and acid wash sections and is released to atmosphere via an absorber stack. Continuous emissions Monitoring (CEMs) equipment will be located within the stack to monitor pollutants to air.

To minimise any potential impact of construction on the environment, CQ-LCP will utilise existing CQ-B facilities to supply several raw materials required for successful generation from CQ-LCP.

Additional information of the CQ-LCP plant is detailed in the environmental permit application WPCC15718, also submitted to NRW by The Operator.

2.3.1.2 CQ-LCP Operational Requirements

CQ-LCP will be comprised of two individual trains, each with a modern highly efficient GT with a combined nominal output of up to 1,380 MWe.

CQ-LCP will share and be supplied by CQ-B's existing utility connections for cooling water, towns mains water, natural gas, and a national electricity network grid connection. Section 3.4 provides further information on this planned arrangement.

CQ-LCP will be designed to operate within CQ-B's existing capacity limit and contractual arrangements. During its transition period to full operation, one train of the CQ-LCP may operate in parallel with up to two units of CQ-B, within the constraints of the existing national electricity network grid connection agreement.

Additional information on the proposed operational requirements for CQ-LCP can be found in the Supporting Statement for environmental permit application WPC15718 submitted by AECOM on behalf of The Operator.

3.0 MANAGEMENT ARRANGEMENTS

3.1 Introduction

CQ-B will maintain a certified ISO 14001 management system, incorporated within the overarching management framework that applies to all Uniper UK generation sites.

3.2 Overview

The Operator has a long-established Environmental Management System (EMS) which is certified to ISO 14001:2015. The Operators generation 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. Central procedures include the core management system requirements to ensure that there is consistency in the implementation of the EMS across all Uniper UK sites.

3.3 Organisation – Responsibilities and Structure

The shared EMS requires individual Uniper sites to follow the high-level management instructions whilst maintaining local management instructions that are specific to their plant and operations. This ensures the right actions are taken at the right time by the right people.

CQ-B will be managed separately to CQ-LCP. CQ-B's Local Management Instruction LMI2009: Environmental Roles and Responsibilities continue to define the site-specific environmental responsibilities of site staff, and the key environmental management responsibilities remain as defined:

- The Plant Manager holds overall responsibility for management of the CQ-B and compliance with the environmental permit. The Plant Manager holds extensive experience relevant to their responsibilities.
- The Operations & Maintenance Manager is responsible for day-to-day operation of CQ-B, ensuring operation is compliant with the site's environmental permit and that environmental impact is minimised throughout the installation.
- The Engineering Manager is responsible for the planning, implementation, and general management of maintenance activities, ensuring CQ-B continues to operate in accordance with its design and environmental requirements.
- The Environment Manager is responsible for the production of monitoring reports and data for submission to relevant regulators (e.g. NRW), liaising with The Operators central environment team and site management, to ensure the requirements of the environmental permit and EMS are met.

3.4 CQ-B/CQ-LCP Inter-Installation Structure, Communications, and Arrangements

With CQ-B and CQ-LCP both under the control of The Operator, close and secure interactions between the sites will be maintained at all times. CQ-LCP will be reliant on several operational services and raw materials that will be provided by CQ-B, and therefore effective co-operation will be required between the two sites throughout their co-operational lives.

Operational equipment will link both control rooms and several interactions will require dual management via standardised Uniper control processes. This section provides further information on the various interacting services and the technical and control measures involved in each case. Further information on each of these interfaces is provided in Section 4.0.

3.4.1 Installation Boundary

An area of CQ-B's installation boundary will be surrendered and moved to the planned CQ-LCP installation. Figure 13 details the area to be transferred and the final CQ-B permit boundary.

CQ-B and CQ-LCP will maintain management and communication systems for effective collaboration on shared services and boundaries.

3.4.2 Cooling Water Abstraction from the River Dee

CQ-B will continue abstraction of cooling waters from the River Dee in line with the existing abstraction licence. There will be no change in how CQ-B manage or control this process.

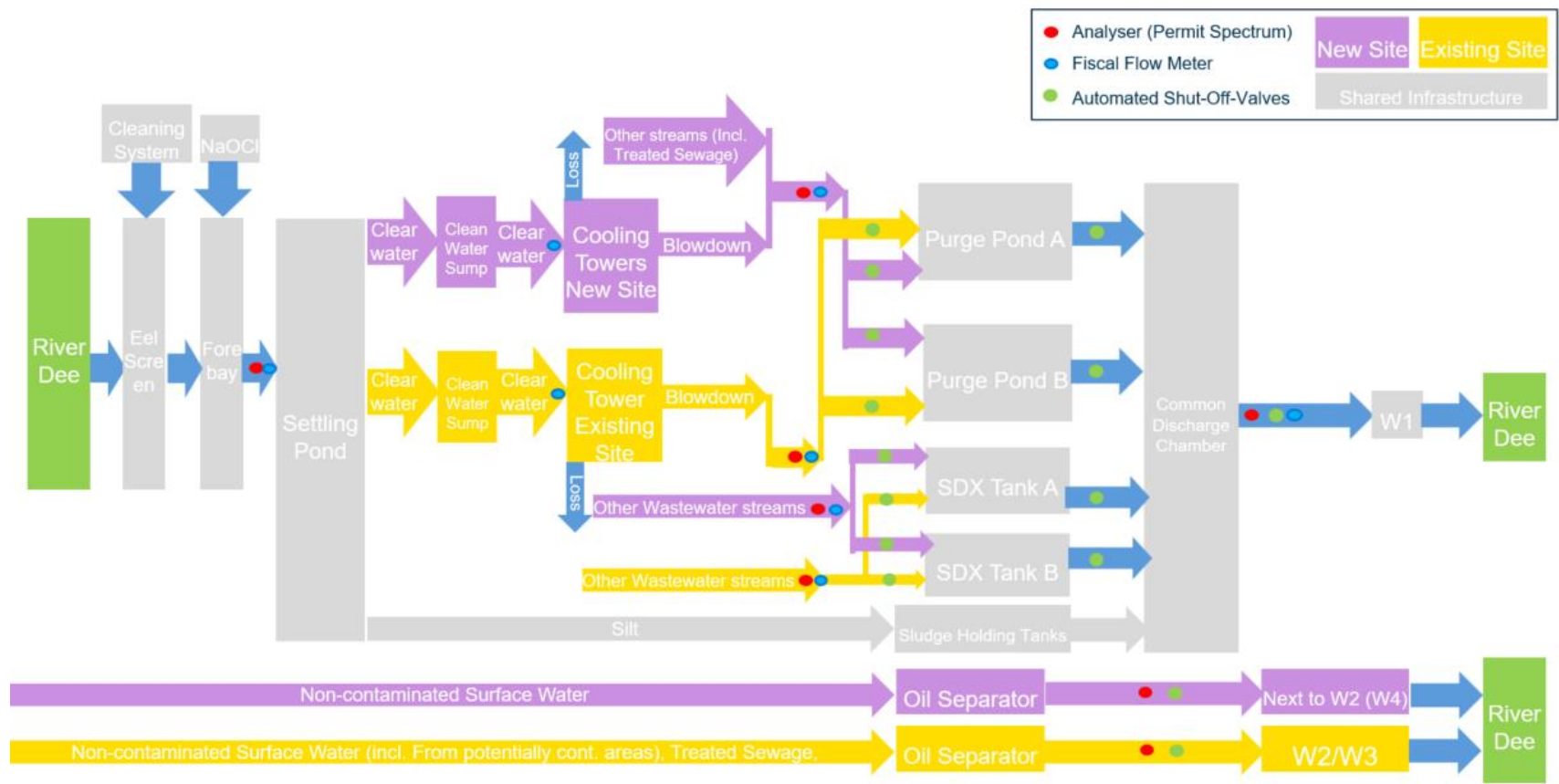
3.4.3 Cooling Water Provision to CQ-LCP

Based on the final CQ-LCP design, extra water transfer pumps are planned for the western end of the settlement pond within the CQ-B's boundary. CQ-B will control these pumps through its control room, operating them to meet permit requirements for noise, vibration, and energy efficiency.

These pumps would transfer freshly extracted cooling waters from the CQ-B settlement pond to CQ-LCP. As detailed design progresses, The Operator proposes to provide further information on these pumps, their location, final design, and transfer methods in a subsequent pre-operational condition.

The water flow diagram shown overleaf provides additional detail on the anticipated indicative water flows between CQ-B and CQ-LCP.

Water Flow Diagram Showing Interactions Between CQ-B and CQ-LCP



3.4.4 Return of Purge Cooling Waters from CQ-LCP to CQ-B

The Operator proposes that CQ-LCP will collate all cooling and process waste waters for transfer to CQ-B and eventual discharge into the River Dee. Subject to the final plant design of CQ-LCP, these waste waters are expected to include:

- Boiler blowdown effluent from the CCGT;
- Neutralised effluent from the demineralised water treatment plant; and,
- Domestic and sanitary effluents.

These effluents would be collated within the CQ-LCP installation boundary and pass through a set of continuous emission to water analysers prior to entry into Purge Pond A. The analysers will assess CQ-LCP's waste waters for relevant parameters currently applied as emission limits to emission point W1 of the existing permit NP3037AF, which are:

- Maximum temperature;
- Salinity;
- pH;
- Total residual oxidant (TRO); and,
- Oil and grease.

These CQ-LCP analysers will record real time monitoring data across to the CQ-B control room to provide effective and correct monitoring of waste waters prior to eventual discharge via CQ-B emission point W1.

Both installations will have co-operative management procedures and the ability to monitor (and if needed the ability to isolate) waste waters prior to discharge. This will ensure CQ-B is always in full compliance with its W1 emission limits.

Further information on this planned arrangement is provided in Section 4.0.

3.4.5 Maximum Generation Output

The national electricity network grid connection for CQ-B and CQ-LCP will remain at a nominal output of 1,380MWe. It is anticipated that by the time the first train of CQ-LCP is completed, only two of the four CCGT units at CQ-B will still be operating, which will maintain security of supply up to the maximum output of 1,380MWe. Whilst CQ-LCP will always have priority for generation due to its low carbon nature, it is theoretically possible for CQ-LCP train 1 to operate in conjunction with two of CQ-B units. To ensure operations stay within transmission limits, both installations will always be managed collaboratively.

4.0 PERMIT VARIATION

The Operator proposes to vary to the environmental permit (EPR/NP3037AF) for CQ-B. The subsequent sections below provide further details on each requested amendment:

4.1 Removal of Gas Treatment Plant & Footprint from CQ-B Permit

As detailed in Section 2.2.3, CQ-B has been equipped with a GTP since 1996. The GTP has operated to process and treat sour gas emerging from the Liverpool Bay Gas Fields, removing nitrogen and moisture so that the treated gas met NTS standards.

Operation of the GTP ceased on 30th June 2023. Since then, the GTP has been decommissioned and drained of all polluting and/or operating substances. These included:

4.1.1 Diesel Fuel

Diesel fuel was held in the GTP emergency generator and emergency fire pump. Both fuel tanks and connected supply systems were fully emptied, and the recovered diesel fuel transferred to the main power station emergency generator fuel tanks.

4.1.2 Lubricating Oils

The GTP emergency generator, emergency fire pump, and compressors were drained of all lubricating oils. These were then disposed of via licenced waste contractors in line with The Operators waste management procedures and associated duty of care obligations.

4.1.3 Sylobead (Molecular Sieve Material)

Sylobead 564c was utilised as the main adsorbent for the molecular sieves within the GTP. All Sylobead content was removed and disposed of via licenced waste contractors in line with The Operators waste management procedures and associated duty of care obligations.

4.1.4 Chubb/Angus Fire Tridol S 3% Fire Fighting Foam

The GTP was equipped with a firefighting foam system, able to cover the GTP in the event of an emergency. Never used in active service, the 1,500 litre tank system was drained, flushed and decommissioned following closure of the GTP. All reserves of Tridol S and all related flushing's were removed and disposed of via licenced waste contractors in line with The Operators waste management procedures and associated duty of care obligations. No firefighting foams containing perfluorooctane sulfonic acid (PFOS) or perfluorooctanoic acid (PFOA) were used at CQ-B.

4.1.5 Perlite (Cold Box)

The cold box section of the GTP was insulated with ARKEMA perlite. Following testing, this was deemed non-hazardous and subsequently disposed of via licenced waste contractors in line with The Operators waste management procedures and associated duty of care obligations.

4.1.6 Sewage Treatment Plant

The onsite sewage treatment plant has been fully decommissioned, emptied, and flushed. All wastes and flushing's were then disposed of via licenced waste contractors in line with The Operators waste management procedures and associated duty of care obligations.

4.1.7 Oil/Water Interceptor

The onsite oil/water surface water drainage interceptor has been fully decommissioned, emptied and flushed. All wastes and flushing's were disposed of via licenced waste contractors in line with The Operators waste management procedures and associated duty of care obligations.

4.1.8 Gas Filters

All gas filters have been removed from site pipework, tested for Naturally Occurring Radioactive Materials (NORMs) and disposed of via licenced waste contractors in line with The Operators waste management procedures and associated duty of care obligations.

4.1.9 GTP Site Footprint Removal from Current Installation Boundary

The GTP is now decommissioned and mothballed. All polluting substances have been removed from the GTP. All electrical and water supplies have been disconnected and all relevant buildings locked.

The Operator intends to begin demolition of the GTP in March 2026.

A report covering the footprint of the GTP was provided with the original 2006 IPPC permit application for CQ-B. Since then, the GTP has continued to operate successfully with no release to ground or environmental incident. No spillage has occurred and there has been no loss of containment within the GTP site footprint. All potentially polluting substances have been removed from the plant by appropriately qualified and licensed specialists.

The Operator requests an amendment to the CQ-B environmental permit EPR/NP3037AF to remove the following listed activity:

- Gas Treatment: Section 1.2 Part A (1) a).

With the demolition of the GTP and removal from the environmental permit, The Operator will also cease any associated emissions to air monitoring and reporting for submission to NRW.

4.2 Formal Transfer of Land from CQ-B to CQ-LCP (Boundary Amendment)

Following demolition of the GTP, The Operator proposes that the GTP is removed from CQ-B's environmental permit (EPR/NP3037AF) installation boundary and the land transferred to the CQ-LCP environmental permit.

Figure 13 demonstrates The Operators proposal to transfer this land to CQ-LCP in two separate parcels.

- Land Parcel No. 1 – The first land parcel (shown as hatched blue in Figure 13) consists of land formerly supporting the GTP, Heavy Goods Store, and surrounding roads/areas of hardstanding. The Operator proposes to transfer this portion of land by the 1st December 2027 (date subject to confirmation).
- Land Parcel No. 2 – The second land parcel (shown as hatched black in Figure 13) consists of land supporting Purge Pond Tank A and one SDX tank. The Operator proposes to transfer this portion of land by the 1st October 2029 (date subject to confirmation).

The Operator proposes pre-operational conditions are used to manage these land parcel transfers. This is proposed as the final tender and design options for CQ-LCP are yet to be confirmed and are still subject to change.

Until the final transfer has been agreed, both parcels of land will remain within the CQ-B's environmental permit boundary (permit NP3037AF) and will be managed in accordance with existing CQ-B permit requirements.

Following successful completion of the land transfers, the site condition report for CQ-B will be updated accordingly.

4.3 Disconnection of GTP Surface Water Drains from W2 system

The GTP is installed with a purpose-built surface water collection and distribution system which drains surface waters via an oil/water separator to emission point W2 for eventual discharge into the River Dee.

When transfer of Land Parcel No. 1 (as defined in Section 4.2) is confirmed, the GTP footprint will be separated from existing CQ-B surface water discharge systems and any collated waters from that area of the site will no longer be discharged from emission point W2.

The Operator proposes that pre-operational conditions are used to confirm final amendments to these drainage systems as detailed in Section 4.2. Until a formal agreement is confirmed, surface water drainage from Land Parcel No. 1 will remain the responsibility of CQ-B.

Following successful separation of the surface water drainage systems, the site condition report for CQ-B will be updated accordingly.

4.4 Provision of Cooling Waters from CQ-B to CQ-LCP

CQ-LCP will be reliant on CQ-B for the provision of steam turbine cooling waters.

CQ-B will continue to abstract cooling water from the River Dee in compliance with the requirements of its NRW abstraction consent (24/67/10/124) and detailed in the 2006 IPPC permit application and current environmental permit.

Extensive design work and specialist assessment of the River Dee's conditions were undertaken to identify the optimal location for CQ-B's river water abstraction point, ensuring minimal environmental and ecological impact.

The Operator intends to maintain this approach and use existing cooling water abstraction and discharge equipment. CQ-B will continue to abstract cooling water from the River Dee for deposition into the CQ-B settling ponds for use by either CQ-B or CQ-LCP.

As the more sustainable form of generation, CQ-LCP will take generation priority over CQ-B, however it's possible that train one will operate alongside two units from CQ-B. Both locations will work together to ensure effective management of cooling water strategies.

Effective means of real time communication and monitoring will be maintained between both installations. CQ-B will retain full control and management of the cooling water make up pumps and abstraction of waters from the River Dee. The current tidal window requirements will continue to be followed, and the CQ-B settling pond tank filled for provision of cooling waters for use by either CQ-B or CQ-LCP.

As per Section 3.4.3, additional cooling water pumps will be installed within CQ-B's boundary. These pumps will be operated from the CQ-B control room. When cooling water is required by CQ-LCP, the two control rooms will communicate and (under CQ-B management) water will be discharged from the new pumps via a purpose-built cooling water pipeline to transfer water across the installation boundary into CQ-LCP. CQ-B will record all volumes of cooling water transferred to CQ-LCP to maintain accurate PRTR and end of year reporting data for water consumption.

The final design, location, and specification of these new internal transfer cooling water pumps are yet to be confirmed. Further technical information on their design, location, and operation will be provided in due course.

4.5 Reception of Waste Waters from CQ-LCP

CQ-B will continue to discharge purge cooling waters to the River Dee in compliance with the requirements of the NRW environmental permit.

CQ-LCP will be reliant on CQ-B for the discharge of purge cooling waters back to the River Dee. It is expected that CQ-LCP will produce the following waste waters:

- Boiler blowdown waters;
- Purge cooling waters;
- Water treatment plant neutralisation effluent; and,
- Effluent treatment plant waters (domestic sewage).

CQ-LCP will collate these waters into a combined feed which it will transfer into the existing CQ-B purge ponds (purge pond A during normal operation) for return to the River Dee.

CQ-LCP will be equipped with a full set of emissions to water analysers to record the parameters required by CQ-B's environmental permit for discharges to W1, including:

- Water temperature;
- Salinity;
- pH;
- Total residual oxidant (TRO); and,
- Oil and grease.

The purge cooling waters from CQ-LCP will be combined with CQ-B's waste waters for eventual disposal via the main CQ-B purge cooling water disposal route (emission point W1 to the Dee estuary).

These waters will continue to pass through the existing CQ-B continuous analysers for all discharges to W1 as required by the current environmental permit. No exceedance of any parameters will be allowed to occur in line with current operational and working practices.

As detailed in Section 4.2, Purge Pond A and one SDX tank will be removed from CQ-B's existing installation boundary to be transfer to, and used by, CQ-LCP.

At a date to be agreed (indicatively 1st October 2029), CQ-LCP will be assigned ownership of Purge Pond A (the most northern pond). This pond will be removed from the existing CQ-B EPR/NP3037AF installation boundary and transferred to CQ-LCP's installation boundary.

All the waste waters will be collated from CQ-LCP and discharged into Purge Pond A. The pond will then be equipped with continuous analysers for all parameters. CQ-B will apply parallel emission limits to these incoming waters to match those of the emission point W1 in environmental permit EPR/NP3037AF.

When the relevant purge tidal window is reached, the continuous analysers will be used to verify all waste waters in Pond A are within the emission limits for emission point W1. Then the CQ-B control room will oversee the purge discharge in line with permit emission limit requirements.

All installed sets of continuous analysers will report monitoring data to the control rooms of both CQ-B and CQ-LCP.

CQ-LCP will have no ability to oversee or control the final discharge from emission point W1 of the CQ-B installation. Emission point W1 control valves FCV039 and FCV101 will remain within the control of CQ-B only.

4.6 Provision of Natural Gas Supply to CQ-LCP

As detailed in Section 2.3.1.2, a new tie-in connection will take Natural Gas from the existing CQ-B AGI to supply fuel to CQ-LCP. This new connection will be comprised of a 600 mm diameter pipe spur and will include new natural gas filters, a pressure reduction station (PRS), metering, and conditioning equipment.

An appropriate fiscal gas meter will be installed to monitor and record the volumes of natural gas consumed by CQ-LCP for compliance with the environmental permit and the UK ETS monitoring plan.

4.7 Removal of Emission Point W3

CQ-B uses emission point W3 to drain surface waters captured from the roof of the heavy goods store and service roads surrounding the purge ponds and GTP. W3 contains and releases collated surface waters for discharge into the Rockcliffe drain (via a pH analyser). This drain eventually flows into the River Dee within close proximity of emission point W2.

When the transfer of Land Parcel No. 1 (as defined in Section 4.2) is confirmed, emission point W3 will no longer be required by, or located within the footprint of, CQ-B. Therefore, with the transfer of land to CQ-LCP, The Operator proposes to cap emission point W3 and cease the discharge of surface waters into the Rockcliffe Drain via NP3037AF emission point W3.

The Operator proposes that pre-operational conditions are used to govern the formal time and detail of this emission point removal. This is proposed as the final tender and design options for CQ-LCP are yet to be formally confirmed and are still subject to change.

Until the final transfer has been agreed, emission point W3 will remain within CQ-B's environmental permit footprint (permit NP3037AF) and will be managed in accordance with the existing permit requirements.

Following removal of emission point W3 from the CQ-B permit, monitoring and reporting of emissions from W3 will cease and the site condition report for CQ-B updated accordingly.

4.8 Amendment of Table S3.2: Movement of Oil and Grease Monitoring Location

NRW completed an OMA To Water audit at CQ-B on 26th November 2018. This audit highlighted that the location of the main continuous analyser for oil/grease for the main W1 discharge outfall is located upstream of the site's Purge Ponds and not at the usual 'end of pipe' discharge point.

An analyser has been in this location since the original construction of CQ-B. The current analyser is a two-channel laser aligned machine which effectively monitors process waters prior to entry into the two 10,000 m³ capacity Purge Water Ponds, preventing contamination of these larger water bodies prior to discharge.

During the audit, it was highlighted that NRW's preferred location for this continuous monitoring system was at the point of final outfall into the River Dee. Therefore, the subsequent OMA audit report made

the following recommendation regarding CQ-B's main SDX oil/grease analyser, requiring The Operator to make an assessment as follows:

- Recommendation – When this analyser is due for replacement, a feasibility study should be completed for monitoring oil in the combined final discharge. If deemed feasible, the oil and water analyser shall be relocated to monitor the combined final discharge.

The analyser is currently not due for replacement and remains in active operation. The Operator submitted a formal response to NRW on 18th February 2019, and a copy of this submission is included as Appendix 1 of this variation.

This response reached the following conclusions:

- An effective oil in water analyser has been in its current physical position since the construction of CQ-B in 1996. In the 30-year period since then it has successfully monitored the drainage for 98% of contained oil at the installation. The remaining 2% of oil is stored in the 40 gearboxes located within the cooling towers. Real time monitoring ensures that operational staff would be alerted instantly to an episode of gearbox failure, and that it would require full failure of three gearboxes to contaminate the purge discharge ponds with enough oil to exceed the limit on W1. Furthermore, cooling water pump restraints ensure that even if three gearboxes were to simultaneously fail, it would take several hours for their oil contents to reach the purge discharge ponds.
- The purge discharge ponds are only emptied within a short time window which surrounds high tide. This periodic constraint on an emission window provides additional time for site staff to take suitable action to prevent emissions should a gearbox failure occur.
- Additionally, the purge discharge window process is only authorised after a final manual sample including analysis for the presence of oil, which must be below emission point W1 emission limits. Therefore, the likelihood for the 2% of oil stored on site to both leak and be discharged to the River Dee is extremely low, with several successful preventative measures in place to ensure such an exceedance cannot occur.

Following a review of potential analyser relocation options, The Operator cannot finalise a suitable physical position which could ensure effective monitoring of final discharge, preventing pollution of the River Dee.

Due to these factors, The Operator intends to maintain operation of the existing oil in water analyser at its current location and remain confident that adequate measures remain in place to prevent any potential exceedance of the environmental permit limits for emission point W1 at CQ-B. We therefore request that table S3.2 of permit NP3037AF is amended to require monitoring of oil and grease at the SDX drain discharge point prior to entry into the purge ponds rather than the W1 emission point.

4.9 Removal of Chlorine Dioxide/Chlorite Monitoring Parameters

The Operator ceased the use of Chlorine Dioxide as a cooling water biocide in 2020. The main chemical ingredients for Chlorine Dioxide production are no longer easily obtainable from mainland Europe.

Since 2020, Sodium Hypochlorite has been used as the cooling water biocide at Connah's Quay. The Chlorine Dioxide dosing equipment and emission analysers have been removed from CQ-B.

Therefore, Uniper requests the removal of Residual Chlorine Dioxide and Residual Chlorite Ion as monitoring parameters for emission points W1 and W2 (as currently detailed within table S3.2 of the site's present-day environmental permit - NP3037AF/V005).

4.10 Replacement Auxiliary Generator Diesel Fuel Tanks

Uniper is assessing design options for new larger volume diesel tanks to serve the four auxiliary diesel generators at Connah's Quay Power Station.

The purpose of this installation is to provide the onsite fuel capacity to enable the generators to operate continuously for 72 hours, in order to comply with the National Electricity System Operator (NESO) Grid Code modification GC0156. Under GC0156, non-contracted electricity generation sites, including Connah's Quay Power Station, must maintain 72-hour resilience of critical systems during a total loss of grid supply.

The power station was originally constructed with four 7,500m³ diesel storage tanks. These tanks remain in service and are fully bunded, with a purpose-designed bunded fuel delivery point. However, the existing storage capacity does not meet the 72-hour resilience requirement.

Uniper intends to replace the four existing tanks with two larger, double-skinned tanks of capacity yet to be determined. The new tanks will provide 110% containment and meet the requirements of the Environment Agency's and DEFRA's guidance, *Oil storage regulations for businesses* (applicable in Wales). Uniper will confirm the final capacity once it has been defined.

5.0 SUMMARY

The Connah's Quay site maintains a continuous history of electrical generation dating back to 1958. This variation will ensure the existing Connah's Quay installation continues to meet Welsh energy needs whilst supporting increasingly sustainable options for long-term security of supply.