Net Zero Teesside

Deposit for Recovery Permit Application
Non-Technical Summary

Net Zero Teesside Power Limited

Project Reference: EPR/ZP3827SK/A001
Project number: 60675797
EPR-ZP3827SK-NTS-R03

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Quality information

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Glossary

Acronym	Definition
AN	Absolute non-hazardous
BAT	Best Available Technique
CCUS	Carbon Capture Use and Storage
CEMP	Construction Environmental Management Plan
CO_2	Carbon Dioxide
DCO	Development Consent Order
DfR	Deposit for Recovery
EA	Environment Agency
EPR	Environmental Permitting Regulations
EQS	Environmental Quality Standard
ESSD	Environmental Setting and Site Design
EU	European Union
HRA	Hydrogeological Risk Assessment
HV	High Voltage
IAR	Impact Assessment Report
LEP	Local Enforcement Position
MN	Mirror Non-hazardous
MRV	Minimum Reporting Value
MWe	Mega Watt electrical
NHIWAM	Non-Hazardous and Inert Waste Appropriate Measures
NISP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
NZT	Net Zero Teesside
NZTPL	Net Zero Teesside Power Limited
PCC	Post Combustion Capture
ROA	Remedial Options Appraisal
STDC	South Tees Development Corporation
WRP	Waste Recovery Plan

1. Introduction

1.1 Report Context

AECOM Limited (AECOM) has been instructed by Net Zero Teesside Power Limited ('NZTPL'), referred to as 'the Operator', to prepare the application for an environmental permit for a Deposit for Recovery (DfR) operation which will take place during the construction phase of the Net Zero Teesside Project.

This report has been prepared to support an application for an environmental permit and presents the Non-Technical Summary (NTS). The report should be read in conjunction with the other supporting application reports and risk assessments.

1.2 Background

Net Zero Teesside (NZT) is a low carbon electricity generating station, which forms part of a proposed Carbon Capture, Utilisation and Storage (CCUS) project located in Redcar, Teesside. It will be the UK's first commercial scale, full chain CCUS project and has recently (Feb 2024) received a Development Consent Order (DCO). It is a Nationally Significant Infrastructure Project (NSIP) which includes the construction and operation of a new gas-fired electricity generating station with post-combustion carbon capture (PCC) and CO_2 compression plant. It has a gross electrical output of up to 860 MWe and associated connections for natural gas, water, electricity and to a CO_2 pipeline network for the capture and storage of CO_2.

Prior to the construction of the facility, the land on which the PCC installation will be developed was subject to remediation by, South Tees Development Corporation (STDC). This involved the excavation, processing, testing and redeposit of excavated waste at the site under:

a. Planning approval R/2021/1048/FFM, with Remediation Verification Report submitted under R/2024/0817/CD; and

b. A Local Enforcement Position (LEP) issued by the Environment Agency (EA) (reference STDC/NZT/LEP, issued on the 19th June 2023 and extended on the 25th June 2024).

The STDC remediation involved the following works:

- demolition of existing structures within the Teesworks site: principally the former raw materials handling facility, sinter plant and conveyor systems;
- excavation of an agreed thickness of the made ground to remove unsuitable / contaminated materials including removal and crushing of derelict underground structures and obstructions within that depth;
- targeted removal of deeper underground structures;
- crushing and grading of suitable material to form a geotechnical material complaint with requirements in the Highways Spec series 600; and
- testing followed by placement and compaction of suitable material to form appropriate platform levels for development.

The LEP permitted the redeposit of up to 1,252,000 m^3 of excavated remediated waste to provide for the reclamation or improvement to land as detailed in the submitted Waste Recovery Plan (WRP)[1]. The STDC works associated with this LEP and WRP were completed in October 2024, to creating the development platform on which the PCC facility will be built. As a result, the waste material being considered for recovery under this application has already been lifted, processed and redeposited as part of the remediation works. The construction of the facility will also generate deeper made ground and natural, site won materials which will be sent for off-site disposal.

1.3 Proposed Recovery Operations

Following completion and validation/verification of the remediation works, NZTPL will lease the site and construction of the facility is expected to commence during Quarter 2 of 2025. The construction of the facility is anticipated to commence with a construction schedule lasting approximately 4 years.

[1] Atkins, Land West of Warrenby Waste Recovery Plan, ref: LWWX-ATK-EEI-NZTXX-RP-EN-000001, 16 May 2023

The construction of the facility is expected to involve a number of works which will generate excavated material comprising previously remediated and redeposited materials. There are opportunities to recover previously remediated excavated materials to deliver aspects of the construction scheme which in turn will reduce the volume of excavated material sent for off-site disposal and reduce the need for the import of virgin material. It is understood from discussions with the Environment Agency (EA) that such material reuse must be completed under a Deposit for Recovery (DfR) permit.

The Operator intends to reuse excavated material from construction earthworks to refill, level and raise the Site and reduce the volume of excavated material being taken off site for disposal. There is also the potential to reuse excavated material from pipeline and cable construction within the installation boundary to refill pipeline and cable excavations.

There is also the potential need to treat excavated material either through screening and/or crushing operations prior to its reuse on site and these waste treatment operations are also included as part of this application.

2. Application Summary

2.1 Application Type

This application is for new bespoke environmental permit for a waste recovery activity. The application is made under the Environmental Permitting (England and Wales) Regulations 2016, as amended and has been prepared as a bespoke application.

The Operator has completed an enhanced pre-application consultation process with the Environment Agency which has confirmed BAT standards and related guidance to be followed.

2.2 Permitted Activities

The application will include the following activities:

Table 1. Permitted Activities

Activity Ref No	Name of Waste Operation	WFD Annex I & II Operations	Description of specified activity	Limits of specified activity
A1	Deposit for Recovery Operation	R5	Recycling/reclamation of other inorganic compounds	Use of waste types specified in Table 2 of the approved Waste Recovery Plan (WRP) for the purposes of construction works and/or restoration, reclamation or improvement of land. In any event the total quantity of waste used shall not exceed the amount needed to complete the recovery operation to the final levels in the approved WRP. No waste shall be deposited into a water body or subwater table.
		R11	Use of wastes obtained from any of the operations numbered R1 to R10	
A2	Waste Storage	R13	Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	Secure storage of wastes listed in Table 2 of the Waste Recovery Plan (WRP) for the purpose of recovery. Storage of wastes shall be limited to four years.
A3	Waste Treatment Activities	R5	Recycling/reclamation of other inorganic compounds	Treatment consisting of sorting, screening, and crushing of waste prior to reuse of the material for deposit for recovery.

2.3 The Operator

NZT Power Limited is a partnership between bp, and Equinor . NZTPL will be responsible for NZT in so far as it relates to the construction, operation and eventual decommissioning of the power station together with its carbon capture plant. NZTPL details are:

Net Zero Teesside Power Limited
Chertsey Road
Sunbury on Thames
Middlesex
TW16 7BP
Company Number: 12473751
Registration Date: 20/02/2020

3. Application Details

3.1 Site Operations

3.1.1 Deposit for Recovery Activity

As part of site construction, earthworks will be undertaken to prepare for the installation of foundations and the development platform before erecting buildings, plants, and utilities. Most earthwork activities will occur at depths of 2.5 to 3.5 meters, with some designated areas requiring excavation and/or foundations beyond 3.5 meters. The majority of the excavated material will be made ground, with a smaller amount of naturally occurring material encountered at greater depths. These excavated materials are expected to be classified as non-hazardous waste according to WM3 guidelines and will undergo chemical and geotechnical testing to ensure they meet the required specifications.

The material is proposed to be used in a recovery operation to facilitate the following activities:

- Structural backfill of the HV switchyard platform at Tod Point;
- Construction of an earth dyke/bund associated with fire water pond and filling and embankment for tank foundations;
- Other structural backfill projects;
- Use of sand materials for underground pipes;
- Filling and embankment of tank(s);
- Soil substitution as a structural fill; and
- Provision of base and sub-base courses during road construction.

Excavated material will be initially stockpiled in designated areas within the secure DFR installation boundary, on firm ground that provides a stable foundation. Stockpile management will include the following arrangements:

- Ensuring the ground is relatively level, properly drained, and not prone to flooding from nearby watercourses.
- Providing sufficient space for safe access for material sampling and the safe movement of mobile plant during placement and removal of materials.
- Sampling and testing the stockpile for chemical and geotechnical properties to confirm it is non-hazardous and suitable for its intended use.
- Conducting routine visual inspections to ensure the stockpile remains stable and removing any accumulated runoff material from the site after testing, prior to disposal via an appropriate route.

3.1.2 Waste Treatment Operations

In addition to the main recovery operations, it is recognised that excavated materials may need to undergo screening and/or crushing to ensure they are suitable for reuse in the recovery operation. These activities will be undertaken using crushing and screening equipped mobilised to site for the duration of the construction activities and will not form part of the final installation. The design and operation of the proposed waste treatment activities are intended to meet the indicative requirements of Best Available Technique (BAT).

The BAT standards used for the assessment are described in full in EPR/ZP3827SK/BAT-R01of the BAT Assessment Document which has been completed against the:

- “Best Available Techniques (BAT) Conclusions for Waste Treatment under Directive 2010/75/EU of the European Parliament and of the Council” (Decision 2018/1147); and
- Environment Agency Guidance “Non-hazardous and Inert Waste Appropriate Measures (NHIWAM) for Permitted Facilities (July 2021, Updated August 2023).

3.1.3 Operating Hours

The construction hours will be in accordance with the DCO condition 20, which states that “*Construction work and delivery or removal of materials, plant and machinery will not take place on bank holidays nor otherwise outside the hours of:*

a) 0700 to 1900 hours Monday to Friday; and

b) 0700 to 1300 hours on a Saturday.

The above construction hours do not preclude:

a) A start-up period from 0630 to 0700 Monday to Saturday and a shutdown period from 1900 to 1930 Monday to Friday and 1300 to 1330 on a Saturday; or

b) Maintenance at any time of plant and machinery engaged in the construction.

3.1.4 Waste Acceptance

Wastes accepted for reuse in the DfR operation will be received in accordance with a Waste Acceptance Procedure and waste acceptance criteria as defined in EPR/ZP3827SK/WRP-R06 Waste Recovery Plan (see Appendices E – G inclusive). All wastes will be non-hazardous in accordance with WM3 Waste Classification guidance[2] and will not pose an unacceptable risk to the environment (including controlled waters) or human health. The waste types to be accepted are shown in Table 2 below:

Table 2. Permitted Waste Codes

Waste Code	Description	Comment	Entry Type
01	**WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS**		
01 01	**Wastes from Mineral Excavation**		
01 01 02	Wastes from non-metalliferous excavation	Import only if needed. Restricted to waste overburden and inter-burden only	AN
01 04	**Wastes from Physical And Chemical Processing of Non-Metalliferous Minerals**		
01 04 08	Waste gravel and crushed rocks other than those containing dangerous substances	Import only if needed.	MN
01 04 09	Waste sand and clays	Import only if needed.	AN
10	**WASTES FROM THERMAL PROCESSES**		
10 02	**wastes from the iron and steel industry**		
10 02 02	unprocessed slag	**Unremediated slag from areas of deep excavation.**	AN
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**		
17 01	**Concrete, Bricks, Tiles and Ceramics**		
17 01 01	Concrete	Site won material associated with relic structures from deeper excavations. Imported only if needed	MN
17 01 02	Bricks	Site won material associated with relic structures from deeper excavations. Imported only if needed	MN
17 01 03	Tiles and Ceramics	Site won material associated with relic structures from deeper excavations. Imported only if needed	MN
17 01 07	Mixtures of Concrete, Bricks, Tiles and Ceramics	Site won material associated with relic structures from deeper excavations. Imported only if needed Metal from reinforced concrete must be removed	MN
17 05	**Soil Stones and Dredging Spoil**		
17 05 04	Soil and stones (topsoil, peat, subsoil and stones)	Import only if needed. Material deposited in place of non-waste topsoil must meet the British Standard for Topsoil - BS3882:2015.	MN
19	**WASTES FROM WASTE MANAGEMENT FACILITIES, OFFSITE WASTEWATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE**		
19 12	**Wastes from the Mechanical Treatment of Waste Not Otherwise Specified**		
19 12 09	Minerals (such as sand and stones) from the treatment of waste aggregates that are otherwise naturally occurring minerals (see specific guidance for further limitations)	Import only if needed. "It does not include residual 'fines' from mechanical treatment of mixed waste at transfer stations. Source materials must be: (a) properly classified as hazardous or non-hazardous (b) accurately described (characterised)"	AN

[2] Technical Guidance WM3: Waste Classification – Guidance on the Classification and Assessment of Waste

Waste Code	Description	Comment	Entry Type
19 12 12	Other wastes (including mixtures of materials) from the mechanical treatment of wastes other than those mentioned in 19 12 11	Site won material comprising recovered made ground materials placed during STDC remediation. Imported only if needed	MN
19 13	***Wastes from soil and groundwater remediation***		
19 13 02	Solid wastes from soil remediation other than those containing dangerous substances		MN
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**		
20 02	**Garden and Park Wastes (Including Cemetery Waste)**		
20 02 02	Soil and stones (topsoil, peat, subsoil and stones)	Import only if needed. Material deposited in place of non-waste topsoil must meet the British Standard for Topsoil - BS3882:2015.	AN

3.1.5 Waste Quantity

Calculations to determine the volume of excavated anticipated to be generated during the construction activities are presented in Appendix C of the EPR-ZP3827SK-WRP-R06 Waste Recovery Plan. The calculations show that:

- the overall material to be reused is around 192,115 m^3 or around 326,596 tonnes for all construction activities.
- There is an anticipated surplus of site-won material which will need to be sent offsite through an appropriate waste management route. However, as site-won material has to be evaluated and is subject to risk assessment against the site conceptual model to ensure it is suitable for reuse the volume of surplus may increase or decrease. The current anticipated volume of surplus is around 142,500 m^3.

3.2 Site Location and Current Condition

The installation boundary covers two discrete areas where reuse of material will take place:

- Main Site is the primary area of the DfR activity and encompasses the areas associated with the construction and installation of the main NZT production facility; and
- Tod Point a smaller area located to the southeast which will be used for construction and installation of the substation.

3.2.1 Main Site

The entirety of the Main Site is reclaimed land from mudflats and marshland of the Tees Estuary in the 19th and 20th centuries and is relatively flat, roughly rectangular in shape and covers an area of around 64.82 ha. The Main Site is located within the former Redcar steelworks site in Redcar, Teesside. The land was specifically used for iron and steel manufacture, together with associated ancillary development. The former steelworks shut in October 2015 and the Main Site comprised generally large-scale redundant plant and buildings (such as the raw materials handling facility, the sinter plant and extensive conveyor systems), with large open land areas that were previously utilised for raw materials storage and processing.

Slag rich Made Ground, which is a by-product of the Teesworks site former use for production of iron and steel, was placed to re-develop and raise the site and wider area (including on the dunes to the north) from the mudflats and marshland. The land surface prior to remediation in May 2023 was predominantly slag with some relict structures from the former steel works. The PCC Site was remediated by STDC which levelled and appropriately remediated the Site, under a LEP(ref: STDC/NZT/LEP) issued by the EA. This remediation has been completed and the current status of the Site at the time of writing is of a relatively level development platform at 7.3m AOD elevation.

The approximate centre of the Main Site is at national grid reference NZ 57000 25400. The address and postcode is Net Zero Teesside CCUS Project, Redcar, Cleveland, TS10 5QW.

3.2.2 Tod Point

In addition to the Main Site, a smaller discrete area known as Tod Point lies approximately 700m to the southeast of the Main Site. New substation infrastructure will be constructed in the Tod Point area, which is centred at NZ 57068 23840 and covers approximately 3 ha.

3.2.3 Adjacent Land Uses

Other residential and industrial uses are located as follows:

- To the northwest of the Main Site, there is an area of the decommissioned former iron-making plant within the Redcar steelworks. The operational Redcar Bulk Terminal is beyond, on the south bank of the River Tees.
- To the south lies an area of the decommissioned Redcar steelworks part of which will be temporarily leased as a construction laydown area for the NZTPL Construction. Beyond is the Northumbrian Water Ltd (NWL) Bran Sands sewage treatment plant, operational land of PD Ports Teesport and the Wilton International industrial complex.
- West of the Main Site, on the north bank of the River Tees, similar industrial complexes are present (at Seal Sands).
- The town of Dormanstown is located approximately 1.4 km southeast of the Main Site and 0.625 km east of Tod Point, whilst Redcar is situated approximately 1.8 km to the east of the Main Site and 2.2 km northeast of Tod Point.
- The Main Site is located approximately 400 m to the south of the North Sea shoreline and Tod Point approximately 2km south at its closest point.

3.2.4 Site Condition

Details of the site condition at the time of the application is presented in the EPR-ZP3827SK-ESSD-R02 Environmental Setting and Site Design (ESSD) report presented in section 4 of the Application.

3.3 Management Arrangements

Works will take place in accordance with the Construction Environmental Management Plan (CEMP)[3] that is required to discharge condition 16 in Schedule 2 of the Development Consent Order (DCO 2024 No 0000) which came into force on the 11th March 2024. The CEMP will include controls and mitigations to be employed during construction that include but are not limited to:

- Air quality management plan;
- Noise and vibration management plan;
- Surface water and flood risk management plan;
- Landscape and biodiversity plan;
- Site waste management plan;
- Construction site lighting management plan;
- Invasive non-native species management plan;
- Pollution incident prevention plan; and
- Groundwater monitoring plan .

The CEMP will meet the requirements of the EA management system guidance[4] and full details of the proposed management system are provided in the Management Systems Summary (Document ref: EPR/ZP3827SK/MSS-R01).

3.4 Monitoring Arrangements

Regarding site monitoring, it is anticipated that this will include:

- Monitoring in accordance with the approved Construction Environmental Management Plan (CEMP) during the placement of materials.
- Conducting site checks and visual inspections at a frequency appropriate to the phase of activity.

[3] Balfour Beatty, NZT/NEP Construction Environmental Management Plan, ref:MCC21001-257-A00-XX-PRM-EV-00009, December 2024
[4] Environment Agency, “Develop a Management System: Environmental Permits, February 2016, amended April 2023.

- Implementing groundwater monitoring as determined through the development of the site conceptual model and hydrogeological risk assessment, which will support the permit application.

3.5 Waste Recovery Plan

A Waste Recovery Plan (EPR/ZP3827SK/WRP-R06) has been completed to outline the recovery scheme to be undertaken at the Site (See Application Section 6). The WRP was submitted to the Environment Agency Deposit for Recovery Team for review as part of the pre-application engagement processes and an opinion confirming that the proposed activities were considered to be recovery was received in November 2024.

The WRP submitted with the application has been updated only in as far as:

- Providing additional cross-sectional drawings identified by the EA in their feedback; and
- To finalise the Waste Acceptance Procedure and associated waste acceptance criteria which were being derived from the hydrogeological risk assessment which was being completed at the time of pre-application engagement.

3.6 Hydrogeological Risk Assessment

An assessment of the anticipated impact of proposed works on groundwater has been completed through a review of the hydrogeological risk assessment (HRA) for the site (see EPR-ZP3827SK-HRA-R01 in Application Section 8). This document presents:

- The site conceptual model for the proposed DfR Activities;
- The output of the quantitative risk assessments (generic and detailed);
- The proposed groundwater monitoring arrangements; and
- The outputs of the Remedial Options Appraisal (RQA).

The HRA models confirm there are no predicted inputs to groundwater at the sources above the minimum reporting value (MRV), or exceedance of the environmental quality standards (EQS) at surface water receptor compliance points.

3.7 Environmental Impacts

An assessment of the environmental impact associated with the recovery operations has been completed (See EPR/ZP3827SK/IAR-R02 Application Section 5). This assessment involves the following:

- Information to identify potential receptors and sources of hazards associated with the proposed operations;
- Judgement, to review the probability of exposure and the magnitude of risk to identified receptors; and
- Actions that can manage the risk to reduce the magnitude of impact.

The assessment covers both normal operations and abnormal/emergency scenarios and shows that:

- There were no anticipated significant environmental impact issues associated with the proposed site activities; and
- There were no anticipated human health impacts associated with the site activities.

3.8 Permit Surrender

After completing the waste recovery activity, the operator will submit a notification of surrender to the Environment Agency (EA). This notification will formally indicate the cessation of waste recovery operations and demonstrate that the site has met all necessary regulatory requirements during a period of surrender monitoring. The operator will ensure that all relevant documentation and evidence are included in the submission to support the surrender process.