FICHTNER

Consulting Engineers Limited

Humber Gate Waste Treatment Facility

HRG Limited

Site Condition Report

ENGINEERING CONSULTING

Document approval

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Contents

1 Introduction

Humber Resources Group Ltd (HRG) is applying to the Environment Agency (EA) under the Environmental Permitting Regulations (EPR's) for an Environmental Permit (EP) to operate a thermal waste treatment facility, to be known as the Humber Gate Waste Treatment Facility (the Facility). A detailed description of the Facility is presented in Section 2 of the supporting information.

1.1 The Objective

This Site Condition Report summarises the existing ground conditions for the land within the Installation Boundary (the 'Site') and describes the setting for the Facility at the time of applying for the EP. This report draws on the following sources of background information which are provided as Appendices:

- Desk Study and Ground Investigation Report, Mayer, 2023 (Appendix A);
- Additional Ground Investigation Report, Mayer, 2024 (Appendix A); and
- Flood Risk Assessment, WaterCo, 2025 (Appendix B).

The report:

a. considers the proposed activities to be carried out at the site;
b. identifies any land contamination risk the activities pose that may be linked to previous pollution events; and
c. provides a baseline for the existing ground conditions.

The report will present details on the following:

a. geology;
b. hydrogeology;
c. hydrology and flooding;
d. historical and present land use; and
e. existing ground conditions.

Plans and drawings can be found in Appendix A of the Application Pack, including:

- site location plan;
- installation boundary drawing; and
- emission points drawing.

2 Site details

2.1 Site address

The Site address is Humber Gate, Grimsby, DN31 2TT.

2.2 National grid reference

The grid reference for the centre of the Site is NZ 523644 412867.

2.3 Site location

The Site will be located on approximately 24 acres of land. The site is approximately 350m southwest of the Humber Estuary and 4.5km to the northwest of the town of Grimsby.

The Site is located in a mainly unused area of vegetation. The surrounding area is industrial, including a nearby chemical plant and power station.

A Site location plan and associated installation boundary drawing for the Facility are provided in Appendix A of the Application Pack.

As shown in Appendix A of the Application Pack, the site is split into two sections: Plot I in the north where the waste treatment facility will be built and Plot C in the south where the new office building, weighbridge and parking will be located. The areas of Plot I and Plot C are 7.06 hectares and 1.68 hectares, respectively. As Plot I cannot currently be accessed by heavy goods vehicles, the site will be connected to Plot C via a bridge across an existing ditch.

3 Condition of land at permit issue

3.1 Environmental setting

3.1.1 Geology

The Ground Investigation Report indicates that the solid geology within the installation boundary is as summarised in Table 1 below:

Table 1: Site Geology

Lithology	Plot I Description	Plot C Description
Artificial and made ground	Limited made ground identified, up to 0.3 m, comprising soils with brick, cobbles of brick and concrete.	Made ground identified in most locations, comprising concrete, brick, ash, surface roadstone, up to 2 m.
Solid geology	Glacial boulder clay (stiff brown clay and soft grey clay) with bedrock comprising chalk rock of the Cretaceous Flamborough Chalk Formation, chert, limestone, sandstone gravels, and occasional organic matter.	Glacial boulder clay (stiff brown clay and soft grey clay).
Superficial geology	Marine and estuarine alluvial deposits associated with Humber Estuary.	Marine and estuarine alluvial deposits associated with Humber Estuary.

3.1.2 Hydrogeology

The Ground Investigation Report indicates that the hydrogeology within the installation boundary is summarised in Table 2 below:

Table 2: Site Hydrogeology

Lithology	Description
Superficial geology	The Tidal Flat Deposits are classified as an Unproductive Strata.
Solid geology	The Flamborough Chalk Formation is classified as a Principal Aquifer.

3.1.3 Hydrology and Surface Waters

As shown in the Ground Investigation Report, two small drainage channels run onto the site. The Site's closest surface water feature is the Humber Estuary 320m to the southwest.

Flood defences are noted to be located 188m northeast on the Humber Estuary.

From the Flood Risk Assessment Report, the Site is located within Flood Zone 3 due to the high risk of tidal flooding (greater than or equal to a 1 in 100 chance of fluvial flooding and/or a 1 in 200 chance of tidal flooding).

Plot I was identified as “more vulnerable” to flooding. During the 0.5% AEP (year 2099) Breach 1 event, the maximum estimated flood level is 3.66 m Above Ordnance Datum (AOD). As such, the ground level in Plot I will be raised to a minimum of 4.26 m AOD, 600 mm above the flood level. This will ensure that all areas where waste management will occur will be above design flood level.

Plot C was identified as “less vulnerable” to flooding and therefore does not require mitigations to be flood free. This plot only houses offices on raised steel foundations , weighbridges and car parking so was also deemed to be of minimal environmental risk if it were to flood. No waste is stored on this plot.

With regard to groundwater flooding, small area is noted to be at moderate to high risk of flooding, potentially linked to Made Ground recorded in this area. However, superficial deposits of clay were identified in the Ground Investigation Report. Given that previous boreholes have been capped and as clay is impermeable, the Flood Risk Assessment Report concluded that the risk of groundwater flooding is low.

With regard to surface water flooding, the Flood Risk Assessment Report indicated that the risk of surface water flowing is very low at the Site.

3.2 Pollution History

3.2.1 Site history

Plot C has been used historically for industrial use whereas Plot I remains undeveloped.

As shown within the historical mapping provided in the Ground Investigation Report, the site history (based on Ordnance Survey mapping data) is summarised in Table 3:

Table 3: Site history of Plots I and C

Date	Site land use	Adjacent site use
1854-1892	Open land The Oldfleet Drain is shown along the northeast boundary in the same position as today flowing towards the Humber Estuary. Another drainage channel looks to run from southwest to northeast.	Surrounding land shown as open with numerous land drains.
1902-1938	There is a small square in the east of Plot I which is possibly an orchard. Southern part of the Plot C may have been part of a rifle range.	The rifle range extends down to the estuary.
1947	No significant changes.	Rifle range, which was originally on southern part of the site, is now off-site to the east.

Date	Site land use	Adjacent site use
1965	Two rail lines/sidings running across the Site. The main line runs from the Site to the west in Plot I and off site to the East where it stops. A second line branches off this and runs in a curve past the orchard and down where it splits into a number of rail sidings. Line appears to run across a drainage channel, implying a bridge may have been present.	Land adjacent to the southwest has been developed as a works, including a number of buildings, tracks and a chimney with rail tracks and sidings.
1980	No significant changes.	The works have extended to the south and east of the Site with numerous additional buildings and chimneys.
1999	Three buildings identified at the south of the Site in Plot C.	Large water retention lagoons adjacent to the Site.
2001	No significant changes.	South Humber Power Station, 400m to the north.
2009	No significant changes.	Works to the southwest reduced significantly in size.
Present day	No significant changes. More vegetation present in Plot C.	Redevelopment of the former works area to the southwest restarting with ingoing development. Number of recent/current industrial land uses are located to the South and associated with the works. Chimneys recorded as 18m and 84m south with a number of electrical substations located between 88m and 121m to the south and southwest.

3.2.2 Historical Incidents

There are no records of pollution incidents to have occurred within the Installation Boundary.

There are two records of pollution incidents within 500m of the Installation Boundary. The information is summarised in Table 4.

Table 4: Historical incidents within 1km of the Installation Boundary

Location	Details
304m northeast	Date: 2002 Pollutant: Organic chemicals/products Water impact: Category 3 (Minor) Land impact: Category 4 (No Impact)

Location	Details
	Air impact: Category 4 (No Impact)
339m east	Date: 2002 Pollutant: Organic chemicals/products Water impact: Category 3 (Minor) Land impact: Category 4 (No Impact) Air impact: Category 4 (No Impact)

Due to the date and nature of these incidents, neither is considered likely to have an impact upon the Site.

3.2.3 Historical Pollution Potential

There are no records of pollution potential incidents to have occurred within the Installation Boundary.

There is one record of contaminated land within 500m of the Installation Boundary. The record is located 109 m east of the site where a deterioration in surface water quality was observed within land drains, following two assessments in 2009 and 2014. The contamination was linked to the Acordis landfill site where the EA found that there was a high potential for leachate overtopping the bund. Work has been recorded as ongoing since 2017.There is one record located 9m south for the discharge of substances identified under List 1 and 2 of European Directive E 2006/11/EC. The substances are mercury and cadmium from List 1, and chromium, copper, nickel, pH and zinc from List 2. This is associated with Bluestar Fibres Ltd and is linked to the effluent pipe present between Plots I and C.

3.2.4 Groundwater Abstractions

As shown in the Ground Investigation Report, there are no groundwater abstractions recorded within 1km of the Site.

3.2.5 Surface Water Abstractions and Discharges

As shown in the Ground Investigation Report, there is 1 record of surface water abstraction within 1km of the Site. The record is located 775m east. Its status is historical, despite the start date being recorded as 2019 with an expiry date of 2030. The abstraction record was held by NE Lincolnshire Council for a point abstract on Mawmbridge Drain for a transfer between sources.

There is one surface water discharge consent within 0.5km of the Site. The record is located 315m northeast of the Site. The consent is for historic unspecified trade discharges to the River Humber by an unnamed factory located at DN31 2SS.

3.2.6 Landfill

The Envirocheck report indicates that the Site has historically been used as a landfill from 1983 when the licence was issued to 2008, when the licence was surrendered. The landfill was operated by Acordis UK Ltd. No issues were recorded which may pose a risk to human health, water environment or the built environment in the context of the proposed commercial/industrial end use.

There are three historical landfill sites within 1km of the Site, as detailed in Table 5.

Table 5: Historical Landfill Sites

Location	Description
476m northwest in Grangetown at Mushroom Grove Allotments.	The licence is held by Borough Engineer, Langbaurgh Borough Council. The deposited waste is both inert and commercial waste. The last input was noted as April 1985.
231m northeast at Courtaulds No. 2 Landfill, Grimsby.	The licence is held by Acordis UK Ltd. The deposited waste is industrial waste. The licence was surrendered in October 2008.
458m east at Great Coates Site C, Grimsby.	The licence is held by Acordis UK Ltd. The deposited waste is industrial waste.

4 Permitted activities

4.1 Activities

The permitted activities will consist of the Schedule 1 installation activities (as defined in the Environmental Permitting Regulations) and directly associated activities listed in Table 6.

Table 6: Scheduled and Directly Associated Activities

Type of Activity	Schedule 1 Activity	Description of Activity
Energy from waste	Section 5.1A(1)(a) - incineration of hazardous waste with or without non- hazardous waste, and including high temperature or clinical waste incineration.	The incineration of hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 10 tonnes per day.
Waste treatment	Section 5.3A(1)(a)(iii) – hazardous waste installation, blending or repackaging.	The blending of hazardous waste with capacity > 10 tonnes per day.
Waste transfer	Section 5.6A(1)(a) - temporary or underground storage of hazardous waste.	The storage of hazardous waste exceeding 50 tonnes.
Directly Associated Activities		
Directly Associated Activities		The receipt, storage and handling of hazardous and clinical waste prior to incineration.
		Treatment of sewage produced onsite in packaged sewage treatment plant
		Discharge of treated effluent to Humber estuary
		Repacking of hazardous wastes prior to incineration
		Collection & treatment of non-process area run off and roof water to produce wet scrubber make up water through onsite effluent treatment plant
		Treatment of wet scrubber effluent prior to reuse, tankering offsite or discharge to Humber Estuary
		The handling, storage and transfer of raw and materials residues for transfer off-site.

Type of Activity	Schedule 1 Activity	Description of Activity
		Energy recovery via a steam boiler, steam turbine and generator producing electricity.
		Cleaning of containers
		Standby electrical generation to provide electrical power to the plant in the event of an interruption in the supply.

4.2 On-site fuel and chemical storage facilities

As identified in the Supporting Information document, the activities undertaken at the Facility will utilise a number of fuels and chemicals. These materials will be stored in accordance with current guidance.

The delivery and transfer details, and secondary and tertiary containment systems associated with the storage of these materials are presented in Table 7.

Table 7: Raw material containment facilities – Primary raw materials

Material	Delivery details	Transfer for storage details	Storage containment details
Urea	Delivered using tanker.	Unloading from sealed delivery vehicle into storage tank via standard hose connection, under supervision by trained site operatives. Storage tanks and unloading located in a covered area with a dedicated concrete sump or other bunding. Hardstanding in this area will have contained drainage. Tanks to have high tank level alarms or trips.	Primary: Tank Secondary: Bunding (110%) Tertiary: Impermeable surface with sealed drainage
Ammonia Solution	Delivered using tanker.	Unloading from sealed delivery vehicle into storage tank via standard hose connection, under supervision by trained site operatives. Storage tanks and unloading located in a covered area with a dedicated concrete sump or other bunding. Hardstanding	Primary: Tank Secondary: Bunding (110%) Tertiary: Impermeable surface with sealed drainage

Material	Delivery details	Transfer for storage details	Storage containment details
		in this area will have contained drainage. Tanks to have high tank level alarms or trips.	
Powdered activated carbon	Delivered using tanker.	Pneumatic unloading from delivery vehicle into storage silo. Exhaust air to be de-dusted using fabric filters and automatic cleaning with compressed air after filling. Filter to be regularly inspected for leaks. Silos to be fitted with a high level alarm system to prevent overfilling.	Primary: Silo Secondary: Hardstanding Tertiary: Contained process drainage
Sodium hydroxide	Delivered by HGV or other large vehicle.	IBC's unloaded using forklift or similar mobile plant and transferred to dedicated storage area.	Primary: Tank Secondary: Bunding (110%) Tertiary: Impermeable surface with sealed drainage
Fuel oil	Delivered using tanker.	Unloading from delivery vehicle tanker into storage tank using sealed pipework. Storage tanks located with a dedicated concrete sump or other bunding. Hardstanding in this area will also have links to process drainage system.	Primary: Tank Secondary: Bunding (110%) Tertiary: Impermeable surface with sealed drainage

Various maintenance materials (oils, greases, insulants, antifreezes, welding and firefighting gases etc.) will be stored in an appropriate manner. Any gas bottles on-site will be kept secure in dedicated area(s).

4.3 Environmental Risk Assessment

An Environmental Risk Assessment has been carried out following the Environment Agency Horizontal Guidance Note H1. This is included within Appendix D of the Application Pack. The assessment considers all potential sources of air, land and water pollution that could occur due to emissions from the Facility or from accidents occurring at the Facility. The risk assessment also

details any mitigation measures that will be employed to reduce the frequency or impact of fugitive emissions or accidents.

The Environmental Risk Assessment identifies that the operation of the Facility will require the storage of various chemicals, which could pose a risk to the land, groundwater and/or surface water during operations. All process areas, loading/unloading areas, materials handling areas and roadways will be covered in concrete and/or tarmac hardstanding. As such, it is regarded that there will be little risk of ground/groundwater contamination during normal operation of the Facility.

Therefore, it is concluded that the Facility will pose little risk of pollution. However, periodic soil and groundwater samples at the Site will be undertaken to fulfil the requirements of Articles 14(1)(b), 14(1)(e) and 16(2) of the Industrial Emissions Directive (IED).

5 EC Guidance: Stage 1 – 3 Assessment

In accordance with European Commission Guidance concerning baseline reports under Article 22(2) of the IED, a Stage 1 – 3 assessment has been undertaken to identify hazardous substances used at the Facility.

Stages 1 – 3 of the assessment are described as follows:

1. Identify which hazardous substances are used, produced or released at the installation.
2. Identify which of these substances are classed as 'relevant hazardous substances' (defined within Article 3 of EC Regulation 1272/2008). Justify any hazardous substances which have been excluded due to their incapability to contaminate soil or groundwater.
3. For each relevant hazardous substance, identify the actual possibility for soil or groundwater contamination at the Site (including probability of release), taking into account quantities, storage and transport, risk of release.

The full stage 1 – 3 assessment of the primary raw materials and residues handled at the Facility is presented in Table 8. The substances handled at the Facility are identified in the context of their hazards and theoretical pollution risk, with justification as to whether the substance is of concern or not in the context of the Site.

Table 8: Stage 1 - 3 assessment of materials at the Facility

Stage 1: Chemicals handled	Stage 2: Chemical characteristics and toxicity							Stage 3: Site specific characteristics			Stage 4: Site specific risk
Substance	**Concentration / State**	**CAS No.**	**EC/List No.**	**Hazard statements (CLP)**	**Hazard substance under Stage 2?**	**Environmental fate / behaviour**	**Potential Pollution Risk?**	**Approx. Quantity Stored**	**Delivery and Storage Arrangements/ Containment**	**Use details**	**Comments/ Chemical of concern?**
Waste and raw materials											
Hazardous and clinicalwaste	Solid, liquids, gases, pastes	N/A	N/A	N/A	Yes	Mostly insoluble, however potential for a wide range of contaminants and potential for liquids to be present.	Yes	1,500 tonnes	Incoming waste will be delivered in enclosed bins/vehicles or tankers and unloaded at the waste reception area or into designated tanks after sampling Packaged Waste will be stored in enclosed, secure areas on areas of impermeable surface with sealed drainage within buildings. All bulk storage has secondary containment. The whole of plot I is tertiary contained and designed in accordance with CIRIA 736.	To be incinerated or blended for transfer offsite for recovery or disposal.	Regular monitoring of the storage area to be undertaken to check for pests, litter, odour, leaks and spillages. Tanks are subject to periodic inspections, bunding and secondary and tertiary containment subject to periodic inspections and impermeable surface. All tanks fitted with actuated valves / overfill protection and level gauges.
Fuel Oil / Kerosene (saturated and aromatic hydrocarbons)	Liquid	68334-30-5	269-822-7	H226, H304, H373, H315, H332, H351, H411, H350	Yes	Insoluble, high toxic effects, volatile	Yes	30 m^3	Delivery to REC in dedicated road tankers, unloaded into enclosed storage tank with bunding using sealed pipework. Hardstanding in this area will also have links to process drainage system.	Fuel oil / Kerosene will be used for the auxiliary burners.	Periodic inspections of tank undertaken (preventative maintenance), refuelling undertaken on areas of hardstanding with contained drainage, overfill protection on tank. Tank is self-bunded with a >110% of capacity of the tank.
Urea solution	40%, Liquid	57-13-6	200-315-5	None	No	Water soluble, potential for mobility in soil and water systems	Yes	30 m^3	Delivered by road tanker and pumped into enclosed storage	Urea will be used for NOx abatement through SNCR.	Unloading operations on areas of hardstanding with contained drainage, storage in

Stage 1: Chemicals handled	Stage 2: Chemical characteristics and toxicity							Stage 3: Site specific characteristics			Stage 4: Site specific risk
Substance	**Concentration / State**	**CAS No.**	**EC/List No.**	**Hazard statements (CLP)**	**Hazard substance under Stage 2?**	**Environmental fate / behaviour**	**Potential Pollution Risk?**	**Approx. Quantity Stored**	**Delivery and Storage Arrangements/ Containment**	**Use details**	**Comments/ Chemical of concern?**
									tanks with bunding via a standard hose connection.		a bunded area, site drainage will be able to be isolated in a spill event, air emissions system is subject to advanced control measures.
Sodium Bicarbonate	100%, Solid	144-55-8	205-633-8	N/A	No	Moderately soluble in water, non-hazardous, slightly alkali solution	No	120m^3	Delivered on powder tanker and transferred directly to silos from dedicated offloading point.	Used for acid gas cleaning within first dry stage of flue gas treatment.	Fine powder so may present risk when spilled or explosion risk. Suitably designed offloading and storage system for controlled product prior to use in process.
Ammonia solution for SCR	25% NH_3, Liquid	1336-21-6	215-647-6	H314, H335, H400	Yes	Water soluble, potential for mobility in soil and water systems	Yes	10m^3	Delivered by road tanker and pumped into enclosed, double skinned storage tanks via flexible hose, direct feed from tank into the process.	Ammonia will be used on site in the event that additional NOx abatement dosing is required.	Unloading operations on areas of hardstanding with contained drainage, storage in a bunded area, site drainage will be able to be isolated in a spill event, air emissions system is subject to advanced control measures.
Powered activated carbon (PAC)	100%, Solid	7440-44-0	231-153-3	H252	Yes	Insoluble	No	30 m^3	Delivery of PAC will be via sealed bags/sacks or tanker and stored in a designated storage area or in a suitably designed silo. Bags / sacks can be emptied with local vacuum emptying system into dosing hoppers.	PAC will be used for the absorption of volatile heavy metals, volatile organic compounds and dioxins. Injected activated carbon is removed with the APCr at the bag filter and disposed of as hazardous waste at a suitable licensed facility.	Any spillages easily swep or vacuumed up, site containment and handling procedures are good. Silo located above an area of concrete impermeable surface.
Sodium hydroxide (NaOH)	32% Solution	1310-73-2	215-185-5	H290, H314	Yes	Water soluble, potential for mobility in soil and water systems	Yes	30 m^3	Delivered in IBCs by HGV or bulk tanker vehicle, and unloaded using a forklift to a dedicated storage area or directly into tank with road tanker. Sealed pipework and impermeable surface	Sodium hydroxide is dosed into the scrubber to neutralise acid gases. The scrubber blowdown will be treated on-site and contained in a storage tank prior to discharge offsite, reuse or tankering offsite to a suitably licenced disposal facility	Unloading operations on areas of hardstanding with contained drainage, storage in a bunded area, site drainage will be able to be isolated in a spill event.

Stage 1: Chemicals handled	Stage 2: Chemical characteristics and toxicity							Stage 3: Site specific characteristics			Stage 4: Site specific risk
Substance	**Concentration / State**	**CAS No.**	**EC/List No.**	**Hazard statements (CLP)**	**Hazard substance under Stage 2?**	**Environmental fate / behaviour**	**Potential Pollution Risk?**	**Approx. Quantity Stored**	**Delivery and Storage Arrangements/ Containment**	**Use details**	**Comments/ Chemical of concern?**
TMT 15	15% Solution – Liquid	17766-26-6	241-749-5	N/A	No		No	5m^3	Stored in IBCs or drums prior to use in WWT plant in dedicated vessel. Liquid transferred with dedicated pump.	TMT is used as a heavy metal precipitant with lime and sulphuric to make insoluble salts within wet scrubber solution that can then be filtered.	TMT is non-hazardous and should not pose an environmental risk where it is used. Stored and transferred on impermeable surface.
Sulphuric Acid	20% Solution	7664-93-9	231-639-5	H290, H314	Yes	Water soluble, potential for mobility I soil and water systems	Yes	2m^3	Stored in IBCs prior to use in WWT plant in dedicated vessel. Liquid transferred with dedicated pump.	Sulphuric Acid used to aid filtration and adjust pH within wet scrubber treatment with lime	Unloading operations on areas of hardstanding with contained drainage, storage in a bunded area, site drainage will be able to be isolated in a spill event.
Lime (Calcium Hydroxide)	100% powder, made into slurry in enclosed mixer	215-137-3	1305-62-0	H315, H318, H335	Yes	Moderately water soluble, high alkalinity	Yes	10m^3	Stored in Silo prior to use in WWT Plant. Lime delivered in sacks or powder tanker and transferred to silo via dedicated powder vacuum or bag loading system.	Lime used with other reagents to aid fluoride precipitation and adjust pH, aids filtration of final effluent produced.	Unloading operations on areas of hardstanding with contained drainage, storage in a bunded area, site drainage will be able to be isolated in a spill event.
Residues											
Incinerator Bottom Ash (IBA)	Solid	91082-83-6	293-798-7	N/A	Yes	Limited solubility, potential for the presence of heavy metals	Yes	96 tonnes	IBA is collected in the ash chamber underneath the rotary kiln. This is transferred into sealed skips and transferred from Building 12 to Building 29 where testing will be completed and most appropriate disposal method determined prior to transfer offsite.	Regular collections of IBA for transfer off-site to a hazardous or non-hazardous landfill depending on chemical analysis.	Heavy metals potentially make IBA produced due to concentration within the ash. Heavy metals typically insoluble in matrix they are produced and limited risk to environment.
Metals									Metal is separated from the bottom ash discharge system		

Stage 1: Chemicals handled	Stage 2: Chemical characteristics and toxicity							Stage 3: Site specific characteristics			Stage 4: Site specific risk
Substance	**Concentration / State**	**CAS No.**	**EC/List No.**	**Hazard statements (CLP)**	**Hazard substance under Stage 2?**	**Environmental fate / behaviour**	**Potential Pollution Risk?**	**Approx. Quantity Stored**	**Delivery and Storage Arrangements/ Containment**	**Use details**	**Comments/ Chemical of concern?**
									using a permanent magnet in a dust tight drum separator.		
APCr	Solid	90989-48-3	292-705-7	N/A	Yes	Presence of persistent organic pollutants (e.g. dioxins), volatiles.	Yes	96 tonnes	APCR collected into FIBC Bags in Building 12 prior to storage within Building 29 and transfer offsite.	APCr is collected in sealed Flexible Intermediate Bulk Containers (FIBCs) following displacement from the bag filters and hoppers in the flue gas treatment process. The FIBCs will be stored in Building 29 prior to transfer to a suitably licenced waste management facility for disposal/recovery.	Any leaks during loading/ unloading operations will be contained by concrete hardstanding, with measures to prevent overfilling in place. APCr storage and unloading will be in areas with contained drainage to the process drainage network.

6 Previous Contamination and Site Investigations

6.1 Site Investigations

As stated within Article 22 (2) of the EA Industrial Emissions Directive (IED):

> *"Where the activity involves the use, production or release of relevant hazardous substances [RHS] and having regard to the possibility of soil and groundwater contamination at the site of the installation, the operator shall prepare and submit to the competent authority a baseline report before starting operation of an installation or before a permit for an installation is updated for the first time after 7 January 2013".*

Furthermore, the EA guidance note '*H5: Site Condition Report – Guidance and Templates*' states that "*where a facility involves the use, production or release of RHS*", a baseline report must be submitted as part of the application.

Mayer carried out a ground investigation work, as reported in both of the Ground Investigation Reports from November 2023 and November 2024. The results are presented below.

6.1.1 Soil Contamination Monitoring & Results

Mayer submitted 66 soil samples. The assessment was carried out in accordance with relevant UK legislation and against Generic Assessment Criteria (GAC) based on Category 4 screening levels (C4SLs) assuming a commercial/industrial land end use.

No Asbestos Containing Materials were identified. No significant levels of metals, phenols, Polychlorinated Biphenyls (PCBs), Perfluorooctane Sulfonate (PFOS), Perfluorooctanoic Acid (PFOA), Total Petroleum Hydrocarbons (TPH), Poly Aromatic Hydrocarbons (PAH), and Semi-Volatile Organic Compounds (SVOCs) were measured within the samples and none of these exceeded the adopted GAC.

6.1.2 Groundwater Monitoring & Results

Four groundwater samples were collected in August 2024. The measured concentrations of metals, organics, PFOS, PFOA were low and not considered to be significant. The monitoring showed that there is a groundwater flow with a fairly shallow gradient towards the estuary, as expected.

6.1.3 Gas Monitoring & Results

Mayer carried out a ground gas monitoring on three occasions from mid-July to mid-August 2024. The results from the investigation showed on average low levels of methane and carbon dioxide, but in two locations, the measured levels of methane were extremely elevated.

Mayer considered this is most likely due to the peat deposits underlying the site. In accordance with CIRIA 665, the maximum concentration of methane should be used to determine the potential risks for future users. Due to the irregular methane concentrations measured, this would indicate the highest characteristic situation is present, which Mayer believes is not the case.

Mayer recommended that further monitoring in the existing borehole wells (BH03 and BH05) is carried out once the site level has been raised to establish the effect of tidal influence on methane concentration, as well as to observe the effect the elevated ground has on ground gas generation. Further information on the ground gas regime will be used to determine a remedial strategy for the

site, and how this will influence the design/construction. The baseline ground conditions with regards to ground gas will need to be determined prior to commencement of operation. These records will be retained on site and made available to the Environment Agency upon request.

7 Ongoing Management

Any additional data obtained on the ground conditions at the Site, either prior to commencement of construction, or through the construction phase, will be collated within this Site Condition Report. This Site Condition Report will be updated following completion of any additional site investigations, groundwater monitoring or ground gas monitoring, and will be maintained throughout the lifetime of the Facility.

During the lifetime of the permit, the Site Condition Report will be updated to take into account the following:

- any changes to the permitted activities or the Installation Boundary;
- any measures taken to protect the underlying land and groundwater;
- any pollution incidents that may have had an impact on land and associated remediation; and
- any soil, gas or groundwater monitoring (where undertaken).

At the end of the operational life of the Facility, the Site Condition Report will be updated to include for decommissioning and site closure. It will be demonstrated that all sources of pollution risk have been removed and whether decommissioning has had any impact on the land. Any required remedial works will be documented and incorporated into the report. A statement of site condition will be made to confirm that:

- the permitted activities have stopped;
- decommissioning is complete, and the pollution risk has been removed; and
- the land is in a satisfactory condition.

8 Conclusions

This report has identified the historical and current condition of land, the activities to be permitted at the Facility, and detail on the reagents and residues to be involved with the operations undertaken at the Facility.

During the Operational phase of the Facility, any records which demonstrate how the land and groundwater have been protected will be maintained. This information will include inspection records of site infrastructure, pollution/incident reports, records of any ground investigations undertaken, and any monitoring records of soil, gas and/or water during the life of the permit. Where it is identified that pollution has occurred, records will be maintained to demonstrate any pollution incidents that may have affected the land or groundwater. These records will be retained to be used at Permit Surrender.

Appendices

A Geoenvironmental Assessment

B Flood Risk Assessment

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