



Bespoke Environmental Permit - Discharge Activity

Supporting Information – Padeswood Carbon Capture
Unit, Mold, Flintshire, CH7
4HB

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RSK General Notes

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Heidelberg Materials UK

Supporting Information – Padeswood Carbon Capture Unit, Mold, Flintshire, CH7 4HB

Project no. 663575

Executive Summary

RSK Environment Ltd has been commissioned by Heidelberg Materials UK (HMUK) on behalf of Worley to prepare a Bespoke Environmental Permit application to support the temporary discharge of surface water during the construction of Phase 1B of the works at the Padeswood Carbon Capture Unit (CCU). This document provides the technical and environmental information required by the Natural Resource Wales (NRW) in support of the permit application.

The proposed development comprises the development of a carbon capture unit associated with the existing cement works. This application focuses on the discharge from the enabling works related to the CCU covering an area of approximately 4.55 hectares. During construction, rainfall-dependent surface water runoff from exposed ground, haul roads, and active work areas will require controlled management and discharge. As no Standard Rules Permit applies to temporary construction-phase discharges of this nature, a Bespoke Environmental Permit is required under the Environmental Permitting (England and Wales) Regulations 2016.

The primary environmental risk associated with the proposed works is the mobilisation of suspended solids (silt) during construction activities. To mitigate this, a Surface Water Management Plan (SWMP) has been developed. The strategy incorporates passive, gravity-driven settlement through an attenuation basin, supplemented by treatment via a Siltbuster unit and an additional polishing stage using a natural plant-based treatment product to enhance sediment removal prior to discharge.

The target discharge quality will not exceed 40 mg/L Total Suspended Solids (TSS), subject to regulatory approval.

A comprehensive environmental risk assessment has been undertaken in accordance with Natural Resource Wales guidance. The assessment identifies potential risks to surface waters, particularly Beverley Brook, and evaluates pathways, receptors, and mitigation measures. Risks associated with spillages, equipment failure, vandalism, and high turbidity discharges have been assessed as low following the implementation of appropriate control measures, including secure fuel storage, spill response procedures, routine inspections, and monitoring.

The site is not located within a groundwater Source Protection Zone and is underlain primarily by superficial deposits of Glacial Devensian Till, with localised Head deposits, which is classified as a Secondary Aquifer, reducing the potential risk to groundwater. Areas of the site located within Flood Zones 2 and 3 from small streams and pluvial sources, presenting a low risk of flooding from surface water runoff.

Monitoring will include routine visual inspections, turbidity testing using NTU measurements correlated to TSS (where required), weekly inspections of drainage infrastructure, and increased checks following heavy rainfall events. Maintenance activities, inspection records, and monitoring data will be retained in accordance with regulatory requirements.

An Accident and Incident Management Plan and Emergency Response Procedure have been established to address potential environmental incidents. These outline responsibilities, reporting procedures, corrective actions, and liaison requirements with Natural Resource Wales (NRW).

The proposed discharge is temporary and will remain in place for the duration of construction, anticipated to conclude in December 2029. Upon completion of development works, the permit will be surrendered.

In summary, the proposed discharge activity has been designed to ensure that surface water runoff during construction is effectively managed, treated where necessary, and discharged in a controlled manner that protects receiving watercourses and complies with relevant environmental legislation. The assessment concludes that, with the proposed mitigation and management measures in place, the environmental risk associated with the discharge of uncontaminated surface water is negligible.

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1 Non-Technical Summary

1.1 Scope and objectives

RSK Environment Ltd were engaged by HmUK on behalf of Worley herein referred to as the “**Operator**” to prepare a Bespoke Environmental Permit application to discharge water during the construction phase at the Padeswood Carbon Capture Unit facility herein referred to as the “**Site**”.

To facilitate the controlled discharge of water from the constructed stormwater drainage system to nearby watercourses during the construction phase, a Bespoke Environmental Permit is required. During this phase, the discharge of surface water is classified as trade effluent.

To ensure that the effluent quality does not exceed the target discharge limit of 40 mg/L Total Suspended Solids (TSS), on-site treatment may be required to remove suspended solids (silt) prior to discharge.

This document is presented in support of the application to discharge treated water including water from possible dewatering activities.

This document presents pertinent background information required to support a Bespoke Environmental Discharge Permit application, in addition to the online B6 application form which has been submitted to the Natural Resource Wales (NRW).

2 Regulatory and Policy Framework

Under the Environmental Permitting (England and Wales) Regulations 2016, an environmental permit is required for the discharge of liquid effluent or wastewater to surface waters, including rivers, streams, lakes, and coastal waters. This requirement also applies to the temporary discharge of surface water, including rainfall-induced overland flow, to any watercourse from construction sites.

The discharge of surface water from the site during the construction phase is classified as trade effluent and is therefore a regulated activity under the Environmental Permitting regime. Surface water discharged from the site must be free from contaminants and contain no more than 40 mg/L of Total Suspended Solids (TSS).

The permanent design approvals for headwalls, drainage infrastructure, and the agreed final site discharge rate, obtained through the Lead Flood Authority (LFA) or Local Authority (LA), apply solely to the operational phase of the development. These approvals relate to the routine discharge of clean, uncontaminated surface water and do not provide consent for discharges to a watercourse during the temporary works or construction phase.

There is no associated Regulatory Position Statement or exemption available from the Natural Resource Wales which allows for short term, temporary discharge of uncontaminated water (wholly or mainly rainwater) from an excavation to surface water. In addition, there are currently no Standard Rules permits which cover the temporary discharge of rainfall from construction sites. As such a bespoke permit is required to be applied for.

3 Site Description

3.1 Site Overview

The site covers approximately 71.3ha with the Carbon Capture Unit (CCU) covering an area of approximately 4.55ha. The CCU area is located within the southwestern area of the wider site and forms a square shape. The CCU site is centred approximately on NGR SJ 28819 62016. The site is situated south of Chester Road and to the west of the railway line which runs in a north-south direction. A location map has been provided titled 'Site Location Plan' has been provided in Appendix 1.

The CCU site forms part of the wider cement plant at Padeswood which is situated in a semi-rural area located approximately 1.5km south of Buckley and 1.1km to the west of Penyffordd. Current development boundary demarcation and adjacent land uses of the CCU are described below

- **North:** to the north of the CCU the Padeswood cement works are located
- **East:** The site is bound by open grassland with woodland beyond, still within the wider site boundary of the Padeswood Cement Works.
- **South:** The site is bound to the south by a water course which flows from east to west.
- **West:** The site is bound to the west by open agricultural fields

Figure 1 below provides an illustration of the location of the proposed CCU (yellow outline) in relation to the site as a whole.

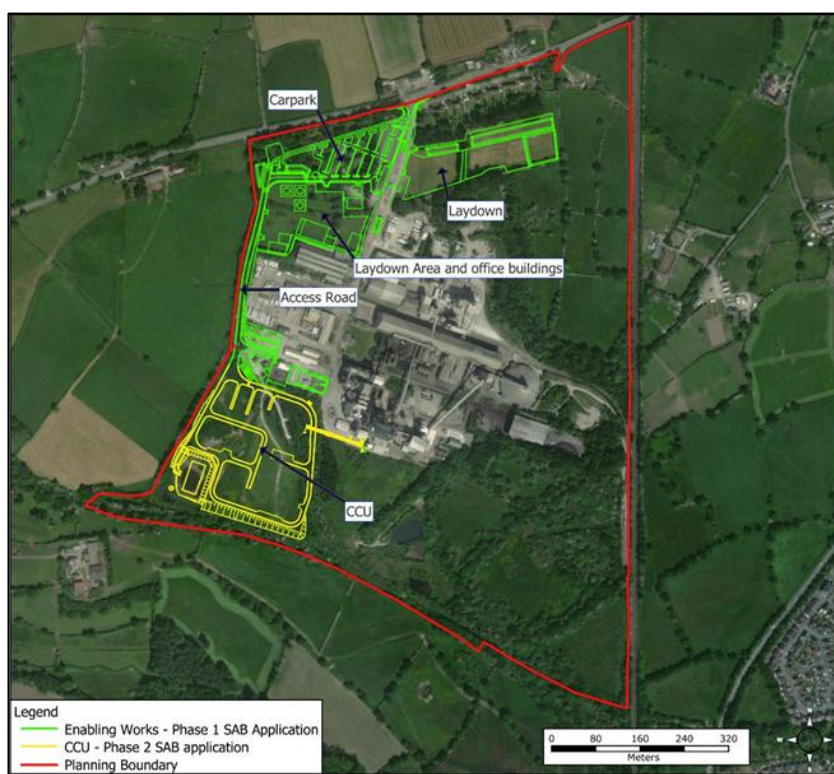


Figure 1. Site Plan

The site area falls towards the south from elevations of approximately 103m AOD at the northern boundary to approximately 95m AOD at the southern boundary. The current site earthworks plans show that the CCS site area will be constructed over two main levels, requiring extensive cut and fill construction works. Most of the site will be constructed to a level of 99.9 m AOD with the existing ponds, to the sites south-west, constructed at current levels (97 m AOD) with surface water run-off generally flowing to the east.

3.2 Development Proposal

The Carbon Capture Unit (CCU) site is currently predominantly undeveloped. As part of the project, the site will be developed and used to capture carbon dioxide from the neighbouring cement plant. This application focuses only on the construction of the CCU and the resulting discharge of surface water from the construction phase. To facilitate the sites development, earthworks will be undertaken to create necessary development platforms and infrastructure. The Site Clearance Plan has been provided as Appendix 2.

Temporary drainage will be installed to accommodate the surface water flows associated with the consecration phases of the CCU. The proposed construction surface water drainage strategy for the site has water falling under gravity through two trapezoidal ditches to direct flow to an attenuation pond. Prior to discharging in the unnamed tributary of the Black Brook, which flows westwards along the southern boundary. Appendix 4 provides a location map showing the proposed discharge point. Prior to the discharge all flows will be treated via an installed 'Silt Buster', with an oil water separator in addition to a treatment agent (details provided in Section 4.5). The final outflow from the 'Silt Buster' is rated at a maximum rate of 28l/s.

The proposed development will incorporate a separate foul drainage system and surface water system which will be utilised following the completion of the development.

During construction of the development, surface water discharges from the site will be rainfall dependent and consist of run off from the active development area, including haul roads, earthworks, building footing and areas of disturbed/exposed ground following the installation of below-ground infrastructure.

3.3 Environmental Designations

An initial screening has been undertaken utilising Magic Maps¹ at distances of 200m, 500, and 1,000m using the discharge locations SJ 28709 61921 as the centre of the buffer radius. Figures 2-4 below illustrate the screening distances from the discharge location.

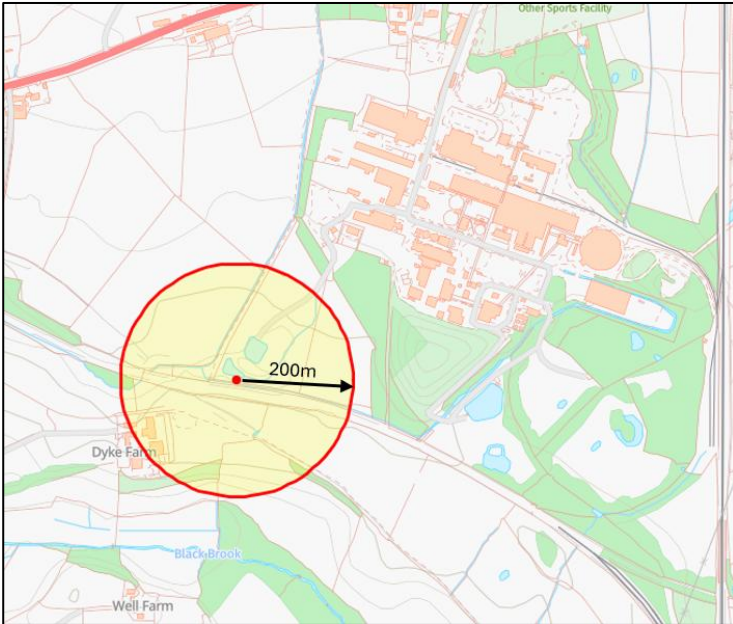


Figure 2. Screening at 200m

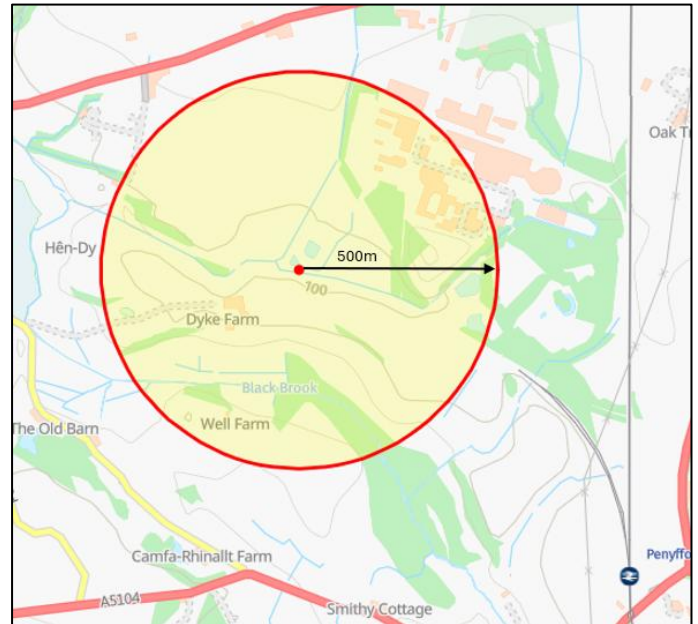


Figure 3. Screening at 500m

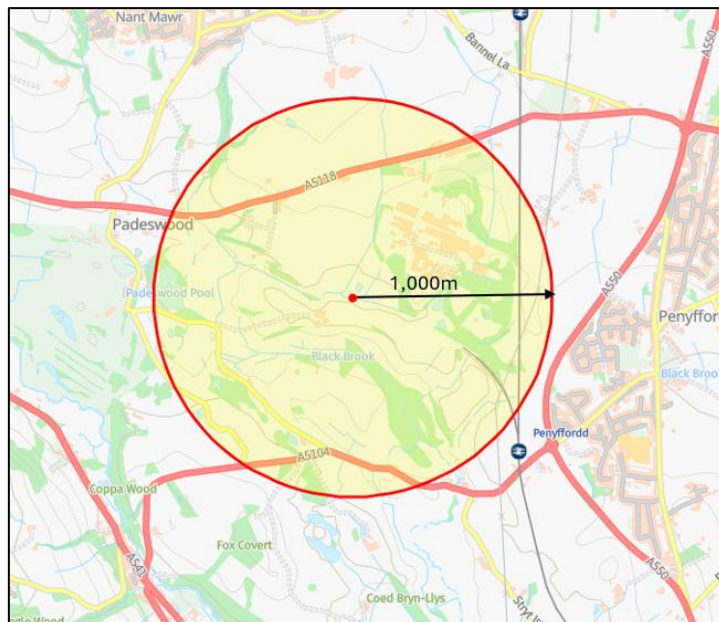


Figure 4. Screening at 1,000m

¹ [MAGIC](#)

The screenings illustrate that there are no European protected habitats and features within the screening distances.

When expanding the screening, to 2km the assessment identifies Deeside and Buckley Newt sites a designated SAC (Special Areas of Conservation (Wales)) in addition to the Buckley Claypits and Commons SSSI (Site of Special Scientific Interest) which are located approximately 1,880m northeast of the discharge location. Surface water originating on site is directed towards the attenuation basin located in the southwest corner of the site. Surface water from the attenuation basin is discharged to an unnamed tributary of the Black Brook via a Siltbuster unit. The unnamed tributary flows in a westerly direction before converging with the Black Brook. Considering there is no direct hydrological connection between the discharge location and the identified SAC and SSSI the potential impacts on the forementioned protected areas have not been considered further in this assessment.

There are no protected features downstream of the discharge point nor downstream of the Black Brook. The closest identified protect feature downstream of the discharge location is where the River Alyn joins the River Dee at SJ3987 5604. At this location the River Dee is a designated SAC (Special Areas of Conservation (Wales)) and SSSI (Special Scientific Interest (Wales)). The linear distance between the discharge location and the location where the European designation is identified is over 12km. Although a hydrological connection exists, the risk of significant effects arising from the proposed discharge is considered to be negligible due to the nature of the discharge and the embedded design and management controls incorporated into the site drainage strategy.

The site will discharge uncontaminated surface water arising from rainfall runoff only and includes attenuation infrastructure designed to retain runoff on site prior to discharge. Runoff will be treated via a Siltbuster unit to further remove suspended solids. The attenuation process reduces peak discharge rates and promotes settlement of suspended solids before water leaves the site. In addition, a series of embedded mitigation measures will be implemented to minimise sediment mobilisation and transport, including:

- use of silt fencing, straw bales to protect surface waters;
- Stockpiles positioned a minimum of 10m from drains and surface waters;
- installation of silt control measures at basin outlets prior to discharge.

A monitoring and adaptive management approach will also be adopted. Should elevated sediment levels be identified within site runoff, additional treatment measures, including the use of flocculants where appropriate and subject to suitable environmental controls, will be implemented to further improve water quality prior to discharge (refer to Section 4).

Collectively, these measures substantially reduce the potential for sediment-laden runoff or nutrient enrichment to reach downstream receptors and limit the magnitude and duration of any changes to receiving waters. Given the attenuation provided, the treatment and control measures incorporated into the drainage design, and the uncontaminated nature of the discharge, the potential for measurable deterioration of the forementioned habitats is considered to be low.

Taking account of the source–pathway–receptor relationship, the characteristics of the discharge (uncontaminated surface water), the attenuation measures embedded within the drainage design, and the proposed monitoring and contingency controls, it is concluded that the proposal is unlikely to result in significant adverse effects on the identified features, either alone or in combination with other plans or projects.

The site does not lie within a nutrient neutrality catchment.

3.4 Drainage and Catchments

The discharge from the site is located within the 'Alyn-Leadmill to Hope' water body which forms part of the wider 'Dee Management Catchment' which ultimately forms part of the Dee River Basin District.

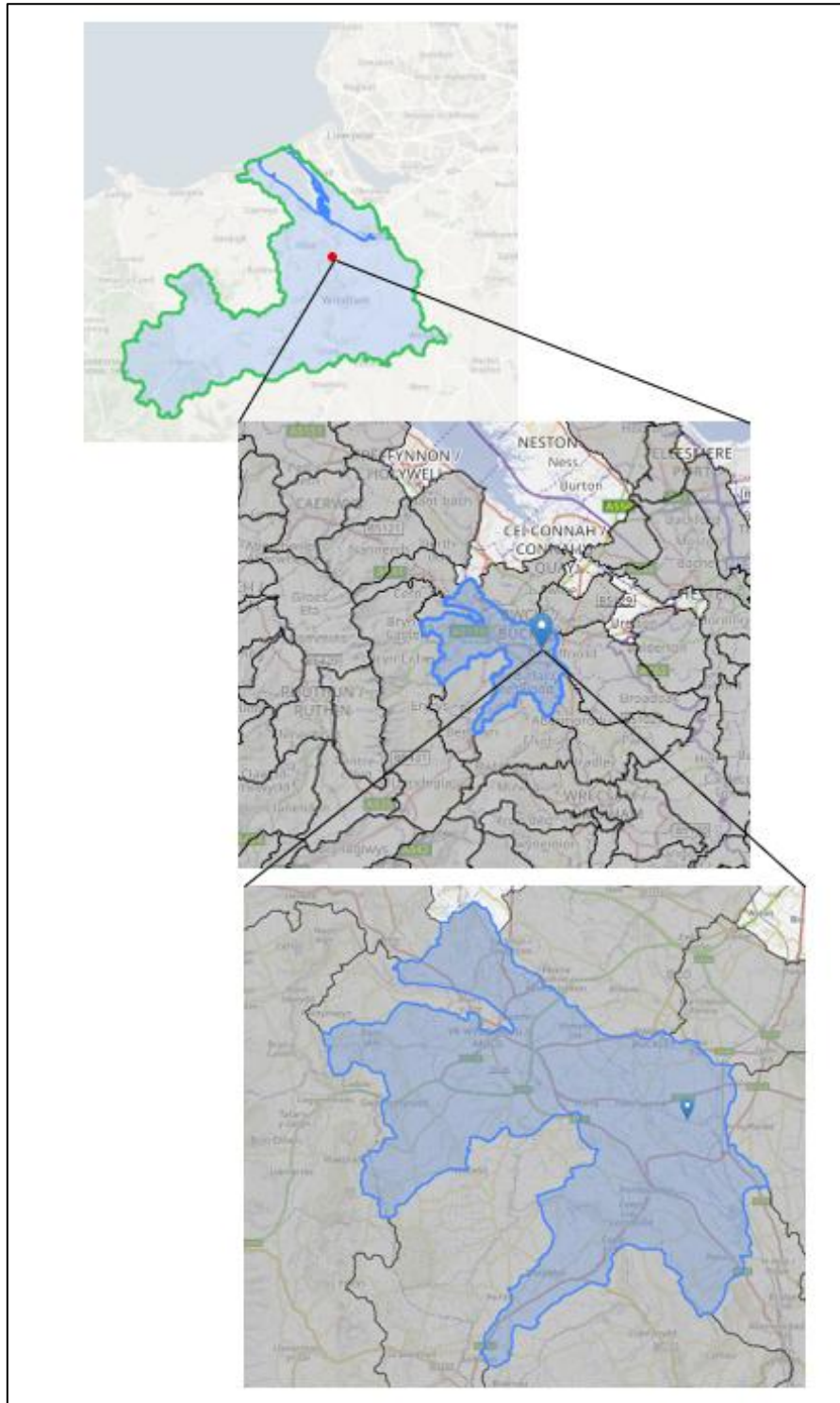


Figure 5. 'Alyn-Leadmill to Hope' water body

3.5 Geology

The geology of the site has been ascertained by reference to the British Geological Society (BGS) opensource mapping². The majority of the site is mapped as being underlain by superficial deposits of Glacial Devensian Till, with localised Head deposits identified at the southern boundary of the CCS site. An illustration of the underlying geology is provided in figures 6 and 7 below. The superficial deposits are in turn underlain by the Gwespvr Sandstone bedrock in the south-west of the site and the Pennine Lower Coal Measures in the north-east. The geological mapping boundaries, as well as geological faults and coal seams, are referenced in the geotechnical desktop study (215000-00190-000-CI-TEN-00003). The overlying Devensian Till is characterized as being a mixture of clay, sand and silt.

The soils identified beneath the site, are predominately a mix of mixed clays, sand and silts. These soil types can become readily mobilised within surface water runoff and bodies of water. This sediment can potentially then remain in suspension for extended periods of time.



Figure 6. Superficial Geology

² [BGS Geology Viewer - British Geological Survey](#)



Figure 7. Bedrock Geology

3.6 Hydrogeology

The superficial deposits (Till and Head) are designated as a 'Secondary Aquifer – undifferentiated' and the bedrock aquifer (Gwespys Sandstone and Pennine Lower Coal Measures) is designated as a 'Secondary A Aquifer'. Having reviewed the Source Protection Zones (SPZ) Merged map viewer from NRW³, it is confirmed that the site is not situated within a groundwater Source Protection Zone. The Licenced Water Abstraction Mapping from NRW⁴, confirms that there are no licensed surface water or groundwater abstractions within 500m of the site, the closest abstraction point is Padeswood Golf Course which is approximately 2.2km west of the discharge point.

3.7 Hydrology

Data taken from the Environment Agency's Catchment Data Explorer⁵ and DataMap Wales⁶ (Figure 4) shows that the site discharge is made to the Alyn-Leadmill to Hope catchment which sits within the Dee Management Catchment. The water body is noted as having an overall 'moderate' ecological status. The unnamed water course to which the discharge is made is a tributary of the 'Black Brook' which is a classified 'Main River' as noted by Natural Resource Wales (NRW)⁷ which is ultimately a tributary of the River Alyn.

Most of the proposed development area is located outside the mapped flood zones⁸ of flood risk from surface water and small watercourses and is therefore not considered to be at significant risk of fluvial flooding. Land directly adjacent to the unnamed tributary along the southern site boundary is within a high-risk area, with the central areas of the site confirmed to be within low-risk areas.

Groundwater was recorded as depths of 4.2m bGL decreasing to 3.1m bGL during the initial site investigation, undertaken by Golder Associates between 16-17th November 2022. Further groundwater monitoring was completed by Geotechnics between 25 June 2025 – 28 August 2025. Groundwater level data was recorded across nine boreholes, (MW25-001 – MW25-009). MW25-003 and MW25-005 were sampled at two different depths. The results presented show that groundwater levels did not change significantly between June to August 2025. Data logger information was collected for selected boreholes between 28th July 2025 and 28th August 2025. The data logger information for MW25-001 is presented in Figure 8 below. A detailed summary of this testing is presented in the Ground Investigation factual Report (Geotechnics, 2025)⁹.

³ [Source Protection Zones \(SPZ\) Merged | DataMapWales](#)

⁴ [Licenced Water Abstractions | DataMapWales](#)

⁵ [England | Catchment Data Explorer](#)

⁶ [Water Framework Directive \(WFD\) River Waterbody Catchments Cycle 2 | DataMapWales](#)

⁷ [Main Rivers | DataMapWales](#)

⁸ [Natural Resources Wales / Check your flood risk on a map \(Flood Risk Assessment Wales Map\)](#)

⁹ Padeswood Carbon Capture Plant - Feed Phase Ground Investigation, Ref PN254733 (Dated August 2025)

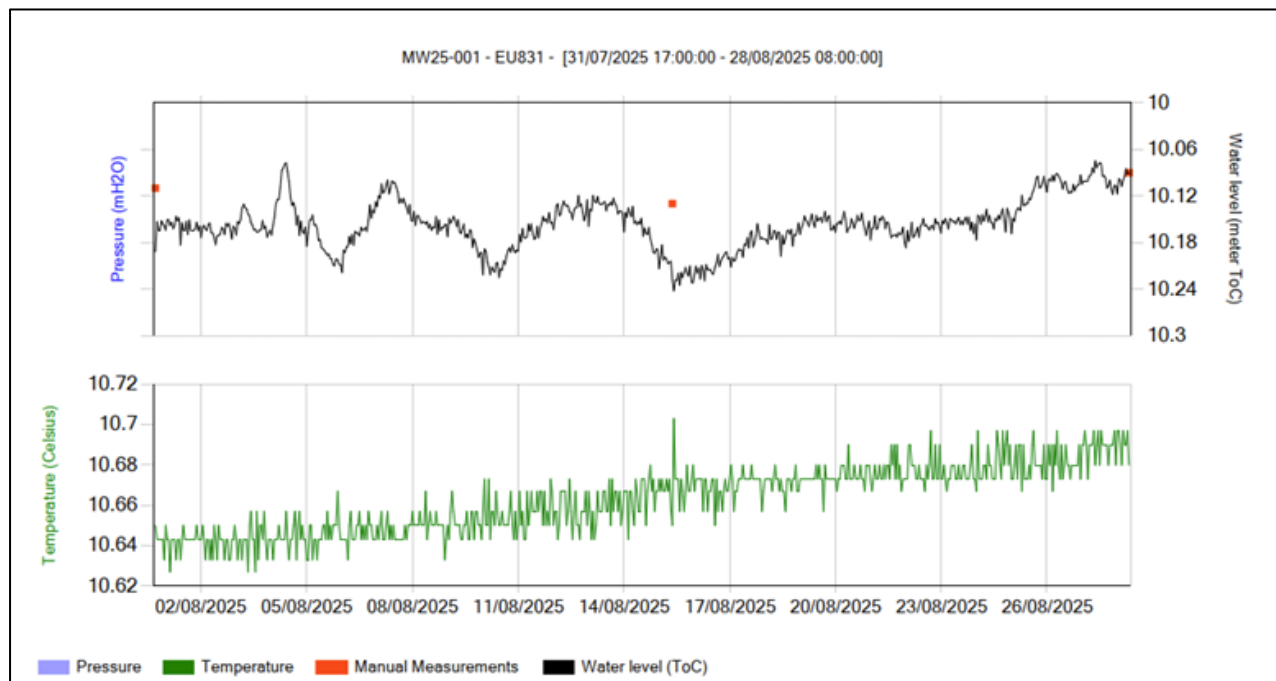


Figure 8. Data Logger information for BH MW25-001

4 Proposed discharge activities

4.1 Discharge Location

A summary of the proposed discharge, including receiving surface watercourse and associated NGRs is presented below.

Discharge Point Ref:	Type of Activity	Discharge Point NGR	Receiving Surface Watercourse	Maximum daily discharge	Maximum Flow rate
Discharge Point 1	Water Discharge Activity	SJ 28709 61921 328709,361921	Unnamed tributary of the Black Brook	2,419.2m ³	28l/s

Table 1. Summary of Proposed Discharge Point

It is confirmed that no foul water will be present in the proposed discharge and that this permit application is not associated with the pumping or treatment of foul water. The discharge will solely consist of uncontaminated site run-off surface water.

4.2 Discharge volume and rate

The amount of surface water run-off requiring discharge will be dependent upon rainfall rates. It is not possible to accurately determine maximum flow/ discharge rates as this will be dependent on rainfall. But the maximum discharge will not exceed the flow rates as listed in Table 1 above.

Flows from the construction area will drain to temporary drainage ditches, which will consist of trapezoidal perimeter ditches, pipework and trapezoidal toe ditches. These will direct flows to an attenuation pond with a capacity of 1,035m³ prior to discharging via a Siltbuster at a maximum rate of 28l/s. A schematic (Temporary Perimeter Drainage Layout) showing the location of the drainage is provided in Appendix 3. The design and technical specification of the drainage system is provided in the report 'Temporary Perimeter Drainage Technical Note', this has been included as Appendix 6.

4.3 Discharge duration

The discharge will continue throughout the duration of the construction project with an estimated end date of December 2029. However, this is subject to change depend on several factors. On completion of the development an application for the surrender of the permit will be made.

4.3.1 Review of potential to discharge to foul sewer

Connection to a foul sewer is not considered feasible, and discharge to the surface water sewer will be required.

Furthermore, given the anticipated volume of water to be discharged and the fact that the discharge will predominantly comprise of rainfall, it is not expected to contain substances requiring treatment. As such, connection to the foul sewer network is neither viable nor considered good practice.

4.4 Effluent quality and treatment

4.4.1 Surface water pollution risk assessment

A review of the historical mapping indicates that the site previously comprised of undeveloped agricultural and grazing land, with the first indication of the development is noted on the historical Ordnance Survey map 1964. However, the site has been in operation since 1949. The boundary of the works has largely remained unchanged to the present day.

A Geotechnical Site Investigation was undertaken by Earth Environmental & Geotechnical¹⁰ in relation to the area that will form part of the Carbon Capture Unit (CCU). A total of 19 exploratory holes were undertaken during the investigation across the proposed development area and access road. During the investigations, there was no visual or olfactory evidence of contamination identified, and no man-made obstructions were encountered.

Given the nature of the underlying bedrock formation, A Coal Authority Mining Report was obtained for CCU area, and this also confirms an absence of any worked coal seams. An intact coal seam was found in RC10 (located towards the southern boundary) at a depth of 17.8m to 18.40m (0.6m thick) which could represent the Llwyneinion Half Yard coal seam.

Groundwater was only encountered during the investigation in RC1 (northwestern corner) and BH2 (within the permitted area of the cement works). It should be noted that the presence of water strikes can be masked by the use of the drilling (water and air) flush.

The ground investigation report concludes that there is a low risk from soil contamination during construction works, the results of the chemical testing all concentrations are less than screening criteria for a commercial/industrial end use. As such ground remediation isn't required and the risk to end users is considered to be low.

Several soil samples were subjected to leachate testing in order to measure the concentration of mobile contaminants of concern. Elevated lead was found in the sample taken from WS5, where Made Ground has been found. WS5 is located along a proposed access road. The risk to controlled waters is considered to be insignificant.

4.4.2 Effluent quality and treatment

Surface water discharges from the site will comprise rainfall, falling onto the development area, including haul roads, building footings and areas of disturbed/exposed ground attributed to the construction of the CCU.

As a result of general construction activity, silt may become entrained within site surface water drainage. In light of this, mitigation measures have been designed to minimise remobilisation and assist with the removal of silt from site surface water drainage, prior to discharge. A Surface Water Management Plan (SWMP) has been prepared and is included as Appendix 5 which sets out the proposed silt management strategy in detail.

Where possible surface water will be directed into the proposed drainage ditches which will divert flows to the attenuation basin. The surface water will be primarily treated to remove suspended solids through passive, gravity-driven silt settlement methods to allow

¹⁰ Geotechnical Site Investigation – Padeswood Works Part B (ref A5352/PartB/V1) Dated July 2023.

natural settlement. Further treatment will then be provided through the use of a Siltbuster unit (HB150R) prior to discharging into the watercourse.

To ensure that the effectiveness of the drainage channels an ongoing operation maintenance strategy will be put in place, maintenance includes

- Regular removal of silt from gullies via gully sucker.
- Regular inspection of flows within the inspection chamber.
- Jetting of pipelines between inspection chambers when blockages or silt build up is identified.

In addition, the design of the attenuation pond is such that a slope of 0.5% has been included which enables removal and maintenance of silt.

4.5 Use of Flocculants

Due to the limited effectiveness of settlement via gravity-driven processes, combined with the clay-rich nature of the underlying soils, settlement alone is unlikely to achieve the required effluent quality. As such, additional treatment measures may be necessary to ensure that discharged water meets appropriate environmental standards.

The surface water management strategy includes the use of a gel flocculant, specifically an anionic polyacrylamide, to enhance the removal of suspended solids. The flocculant promotes the agglomeration of fine silt particles into larger “flocs,” facilitating their settlement and separation from water prior to discharge. Flocculants used within passive, gravity-driven systems will comprise gel-based products.

To confirm the suitability of the proposed treatment approach, a settlement test and flocculant validation exercise were undertaken using site-derived soil samples. The testing compared samples collected from the Siltbuster system without the use of a treatment agent against samples treated with the addition of a flocculant. Settlement performance for both samples was monitored over defined time intervals. The observations and results of this testing are presented in [Appendix 8](#). The findings demonstrate that the use of a treatment agent achieved a 99.1% reduction in Total Suspended Solids (TSS) within 12 minutes. Whilst there is a near reduction in suspended solids, over a 12-minute period, in reality the retention time within the Siltbuster will be the shortest possible. The Siltbuster system will be appropriately calibrated and adjusted during operation to ensure compliance with the applicable regulatory limits for suspended solids.

The selected treatment agent is AQUATAN 100, a plant-based flocculant. Flows from the attenuation basin will initially be dosed with the flocculant within a dedicated Siltbuster dosing unit, prior to undergoing further treatment in the main Siltbuster unit. Figure 9 below provides an example schematic of the treatment system. The relevant Material Safety Data Sheets (MSDS) for AQUATAN 100 are provided in [Appendix 10](#).

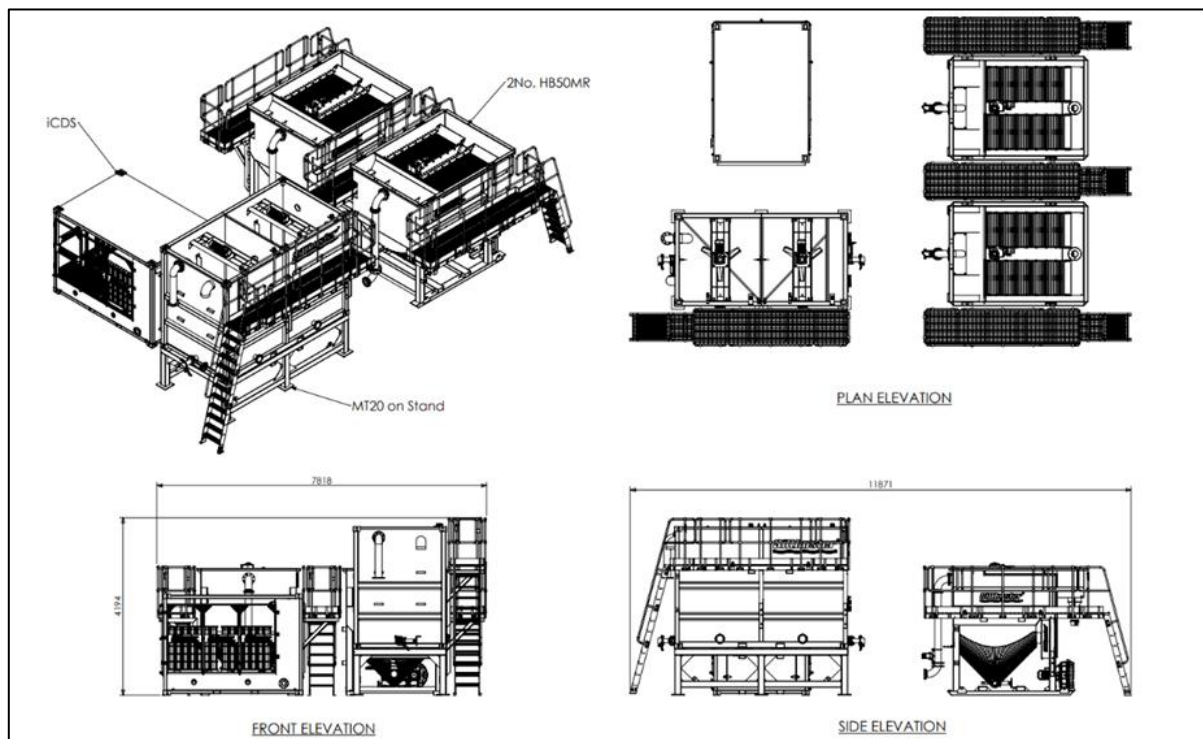


Figure 9. Schematic of the Siltbuster and dosing unit.

The use of the flocculant does not alter the ambient pH or temperature of the treated water; therefore, discharge will occur at ambient conditions. A dosing trial has been completed to ensure that the flocculant is applied at an optimal rate, avoiding both over- and under-dosing. Where necessary, water may be recirculated through in-line pipe reactors containing additional flocculant or retained within designated detention basins to provide sufficient residence time for floc formation.

Monitoring will be undertaken at the designated discharge points to confirm that treatment measures are effective and that Total Suspended Solids (TSS) concentrations remain below the compliance limit of 40 mg/l. Water samples may be collected and submitted to an external laboratory for analysis of:

- Total Suspended Solids (TSS)
- pH

For rapid, on-site assessment, turbidity will also be monitored using a portable meter (measured in Nephelometric Turbidity Units, NTU), providing an immediate indication of water clarity. As there is no universal correlation between TSS and NTU, a site-specific relationship has been developed. The TSS–NTU correlation curve and corresponding lookup table are provided in Appendix 9. While not an exact equivalence, this approach provides a reliable screening tool for short-term, on-site decision-making.

Turbidity measurements will be taken at appropriate intervals at discharge locations. If readings indicate a potential exceedance of the TSS compliance limit, discharge will be suspended immediately and corrective actions implemented.

All surface water mitigation measures will be routinely inspected and maintained throughout their operational lifespan, including de-silting as required. Maintenance of

passive treatment systems will be undertaken by the site operator, with support from the equipment supplier where necessary.

To ensure ongoing compliance, regular sampling and monitoring of both the discharge point and the receiving watercourse will be carried out by the Operator throughout the construction phase.

4.5.1 Emergency Procedures

In the event that the discharge exceeds the permitted limit for suspended solids, or if a technical issue or malfunction occurs with the Siltbuster system, the unit will be shut down immediately. Any faults will be identified and resolved before the treatment system is restarted.

All onsite contractors will be trained in the operation and maintenance of the Siltbuster system. If technical issues cannot be resolved onsite, representatives from Siltbuster will be called to attend and carry out the necessary repairs.

As a contingency measure, the onsite attenuation pond has a capacity of 1,035 m³, which is sufficient to accommodate surface water while the Siltbuster system is offline.

4.6 Management of the dewatering activities

4.6.1 Environmental Management System

Worley have an internal Environmental Management System (EMS) in place along with a Construction Environmental Management Plan (CEMP). These have been included as Appendix 11 and 12 respectively.

4.7 Construction Plan

4.7.1 Construction Phase Plan (CPP)

A CCP has been developed which details the arrangements specific to the Heidelberg Materials Carbon Capture Plant project and introduces the management strategy and systems which will be employed to control the early site preparatory Works and Construction Execution phases of the project. The plan is a live document and will be amended and updated as required during the duration of the construction phase of the project.

The plan forms the basis of the HSE plans and sets out how health, safety, and welfare will be managed during the construction phase of a project.

The plan has been included as Appendix 7.

5 Risk assessment

This risk assessment seeks to show where environmental risk will be. The operator should assess the risks considered relevant to the proposed operation, in-line with the Natural Resource Wales (NRW) online risk assessment guidance¹¹ (dated 17 July 2024). This report forms part of the wider management system for the operation, and a copy will be kept in the site office.

5.1 Objectives

The purpose of this environmental risk assessment is to:

- Identify potential risk that the proposal may present to the environment.
- Screen out those that are insignificant and do not require detailed assessment.
- Where appropriate identify potential significant risks.
- Where appropriate choose suitable control measures; and
- Report the findings of the assessment.

5.2 Risk Assessment Process

An assessment of the environmental risks of the operations covered under this application for discharge consent has been prepared in accordance with NRW guidance published online along with guidance found at.gov.uk¹². It details six steps key steps to the risk assessment process prior to its submission with a permit application

1. Identify risks from the activity
2. Identify the relevant receptors
3. Identify pathways
4. Assess the risks
5. State methods of risk control
6. Present the Assessment

Further information on each of the stages of the risk assessment is below.

5.2.1 Step 1- Identify Risks

The following section of this document identifies those activities which present different types of risk to the environment associated with the proposed operation, including

- Any discharge, sewage or trade effluent to surface or groundwater.
- Odour – there are no potentially odorous activities or chemicals associated with the on-going construction works.

¹¹ [Natural Resources Wales / How to carry out a risk assessment for an Environmental Permit](#)

¹² [Risk assessments for your environmental permit - GOV.UK](#)

- Noise & vibration – Significant noise & vibration resulting from the discharge activity are not envisaged.
- Accidents – The potential for accidents to occur at the site exists. The potential for contamination of the watercourse will be managed through the control measures put in place for the construction activities.
- Fugitive emissions to air and water - No significant risks have been identified. The potential for contamination of the watercourse will be managed through the control measures put in place for the construction activities.
- Controlled releases to air / visible emissions – There are no point source emissions to air.
- Release of bioaerosols – There are no activities or associated activities identified.
- Pests - There are no activities or associated activities that will give rise to an increase in pests or vermin.
- Vandalism – No significant risk is identified. The site is manned during operational hours. Outside of these hours the site is secured and locked with contracted security in place.

5.2.2 Step 2 – Identify Receptors

These include all relevant environmental aspects, such as; people, vegetation, animals, properties, water bodies.

5.2.3 Step 3 - Identify Pathways

The document will demonstrate that the site has considered the risks associated with the proposed operation of the site

5.2.4 Step 4 – Assess Risks

The level of risk presented can be indicatively assessed using a scoring matrix. These allow us to identify which risk, if any, are significant, and will require additional consideration in a more detailed assessment.

5.2.5 Step 5 - Controlling risk

For any risks which are identified as part of the assessment process as being too high without additional management, this section of the report details how those risks can be controlled via management and mitigation to be within acceptable limits.

5.2.6 Step 6 – Present the assessment

The risk assessment is presented in tabulated format below. The risk assessment is organised by emission type.

5.3 Risks Assessment

The permitted activity on the site involves the discharge of uncontaminated surface water. The relevant risks associated with this activity are shown in the matrix below.

5.3.1 Risk Register

Permitted activity	Key Risks		
	Surface water discharges	Accidents	Uncontrolled discharges
Temporary discharge of uncontaminated surface water, from site construction	Discharges of uncontaminated surface water arising from site works and construction.	One-off accidents occurring on site. Spillages of oil and fuels from vehicles working around site. Vandalism leading to emissions of substances to the water course.	Uncontrolled discharges of surface water with high levels of slit. Leaks and spillages from onsite machinery Excess suspended solids may enter the receiving wate course.

Table 2. Risk Register

5.4 Assessment of Risks

Based on the identified potential risks and sources above, in accordance with the Environment Agency an assessment of the potential pathways and receptors has been undertaken which has identified the following potential pathways:

- Surface water discharges
- Accidents
- Uncontrolled discharges

A specific risk assessment relating to accidents is included below in **Table 3**.

Due to the nature of the identified pollutant – (silt) and the proximity of nearby surface waters and the general cohesive and low permeability nature of the underlying geology beneath the site, it is not considered necessary to consider risks to groundwater.

5.4.1 Surface water discharges

Prior to the commencement of construction activities at the site, rainwater falling across the development site would discharge by one of the following pathways:

- Infiltrate into the topsoil and percolate into the underlying geology (which may be in hydraulic connection with the nearby watercourse);
- Be intercepted by vegetation; or
- Flow via overland flow toward the nearby watercourse.

Accordingly, the surface watercourses which the proposed discharges will enter are the same as those which received run-off prior to the commencement of construction activities.

The water to be discharged from the site comprises stormwater from the development area. Storm water flows over site access roads into the stormwater drainage network, or overland towards the site boundaries.

As identified previously, the principal potential contaminant to surface waters is mobilised silt (suspended solids).

No other significant pollutants or priority hazardous substances associated with the proposed site discharge have been identified. All proposed flocculants and coagulants usage will be in accordance with manufacturer specifications and dosing rates. This will ensure no significant impact on receiving controlled waters.

The management and mitigation measures installed at the site will remove suspended solids and ensure that discharges from the site will be clean and uncontaminated. Regular monitoring will be undertaken to confirm appropriate discharge quality is maintained.

The discharge will be at ambient conditions so there will be no temperature effects as a result of the management and mitigation measures.

As the discharge will not contain any hazardous substances, sanitary determinants or other pollutants, detailed specific substances assessments are not considered to be necessary.

5.4.2 Accidents

The site will be secured by fencing with no public access. Therefore, accidental releases as a result of vandalism are unlikely. However, the potential for accidents/accidental releases of contaminants on the construction site cannot be discounted and as such is assessed.

The proposed site surface water discharge risk assessment (including accidents) is presented in the table below.

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Leak/spillage of hazardous material on site (e.g. oils and fuels)	Unnamed Tributary of Black Brook	Infiltration The surface water drainage system (storm system) Over pumped using a pumping system	Containment measures for storage. Minimisation of storage volumes. Storage of fuels and oils at least 10m from edges of drainage ditches and water courses.	Unlikely	Contamination of the watercourse with hazardous material.	Low – low porosity of underlying soils and due to procedures detailed in environmental management plans (e.g. fuel/oil use and storage, waste/material storage).
Leaks from onsite vehicles and plant machinery	Unnamed Tributary of Black Brook	Infiltration The surface water drainage system (storm system)	Ensure all vehicles and plant are maintained as per manufacturers requirements. All re-fuelling to take place in designated areas away from drainage areas and on impermeable surfaces	Unlikely	Contamination of the watercourse with hazardous material.	Low – low porosity of underlying soils and due to procedures detailed in environmental management plans (e.g. fuel/oil use and storage, waste/material storage).
Leak of oil/fuel from pump	Unnamed Tributary of Black Brook	Via surface flow or installed surface water drainage system	Containment measures for pumps. Spill kit. Maintenance & inspection	Unlikely	Contamination of the watercourse with hazardous material.	Low – due to procedures detailed in environmental management plans (e.g. fuel/oil use and storage, waste/material storage).
Discharge of water containing solids/sediment.	Unnamed Tributary of Black Brook	Pumped / discharged via outfall	Monitoring of discharge to be visibly free of silt and grease/oils. pH/turbidity testing completed with in situ instrumentation.	Unlikely	Contamination of the watercourse with suspended solids (silt).	Low – implementation of management and monitoring plans to reduce the potential for additional silt to be present in the site surface water drainage. Suspended solids to be removed from site surface water drainage via a combination of both active and passive management systems prior to discharge. if water is silty, additional treatment measures will be implemented to reduce silt loading to an acceptable level.
Discharge of water containing chemicals from passive treatment process (Gel Flocculant)	Unnamed Tributary of Black Brook	Overland flow from site boundary, or discharged from outfall(s)	Use of flocculant gel product with known controlled release rates.	Unlikely	Contamination of the watercourse with hazardous material water with ecotoxins.	Low – If required, prior to use a dosing trial will be undertaken by the supplier of the passive management system to ensure that the combination of flocculant volumes of the chemicals are applied to the incoming water and that there are no significant residual chemicals in the treated water upon discharge. If monitoring and testing identify the potential imbalance in chemical dosing rates, the management system supplier will be contacted and a revised dosing trial will be undertaken and chemical dosing rates will be updated as necessary.

Hazard	Receptor	Pathway	Risk Management	Probability of exposure	Consequence	What is the overall risk?
Spillage of collected solids from sediment collection systems	Unnamed Tributary of Black Brook	Overland flow from site boundary, or discharged from outfall(s)	Preparation and review of activity specific method statements for cleaning sediment collection systems. Method statements to consider risks associated with spillages of collected solids. Discharges from outfalls prevented during sediment collection. Site spillage control procedures. Deployment of additional silt management / spill kits.	Very unlikely	Contamination of the watercourse with hazardous material with suspended solids (silt).	Low – settlement system to be cleaned in such a way as to prevent silt spillage. Discharge outfalls to be bunged during cleaning. Cleaning to be completed by competent persons.
Failure of pumping equipment – overflow of water from drainage etc.	Unnamed Tributary of Black Brook	Via surface flow or surface water drainage system	Management measures set out within site-specific Surface Water Management Plan.	Unlikely	Contamination of the watercourse with hazardous material with suspended solids (silt).	Low – water is contained on site within surface water detention basins if pumps fail.
Vandalism	Unnamed Tributary of Black Brook	Via surface flow	Site is secure without public access.	Unlikely	Contamination of local watercourse.	Low – due to security arrangements and nature of discharge equipment/ access to the area.

Table 3: Environmental Risk Assessment

6 Monitoring and Inspection

6.1 Monitoring Requirements

A programme of active inspection and routine monitoring is required during construction, the following sections set out the:

- Monitoring & discharge point(s)
- Monitoring parameters and frequency
- Emergency action

This monitoring plan is in relation to silt and silt treatment and will differ depending on what stage the silt management is at onsite.

6.2 Monitoring Locations

The monitoring points will depend on the current stage of the SWMP. Typically, these will include the discharge locations within the watercourse and the attenuation basins. The monitoring points are illustrated within the schematic provided in the Temporary Perimeter Drainage Layout, provided as Appendix 3.

6.3 Monitoring Procedures

The monitoring procedure should be carried out by the site team to enable continuous review of the measures implemented. A written / photographic record should also be kept. A comprehensive record of the effectiveness of the system will then be maintained to enable further review by any parties attending site.

Depending on site conditions as the development progresses and site levels change, other measures may be required to be installed once activities commence on site (to be identified through monitoring).

The monitoring and sampling procedures should be in line with the requirements set within the discharge permit, to be issued by the National Resource Wales.

As Total Suspended Solid (TSS) measurements are laboratory based and require days to process, the measurement or NTU (Nephelometric Turbidity Unit) on site using a turbidity meter (nephelometer) in combination with an NTU-TSS correlation curve is recommended for immediate results.

It is recommended that testing for the correlation curve is performed again during or shortly afterward a period of rainfall in order to produce multiple lines of evidence between NTU numbers and total suspended solids as compliance to permit discharge is measured in total mg of TSS/litre.

This curve will enable on site testing of the water discharge using a turbidity meter. It is assumed that the monitoring will be carried out manually using the turbidity meter by a member of the site team.

In addition to the water, the monitoring and inspection should include the following:

- The weather conditions;
- The road conditions;
- The silt control materials and equipment;
- Gullies, ditches and manholes;

Photographic records should be taken and kept, that will help in documenting the monitored elements.

A full visual inspection of monitoring locations, discharge locations and control / treatment measures will be undertaken each week, and any issues recorded, and any damage repaired. A site inspection form will be produced to record all active monitoring undertaken.

Routine inspection of protective measures in active work areas will be undertaken each day.

All inspections will be undertaken by trained site personnel. Increased inspections may be implemented following a heavy rainfall event.

The Surface Water Management Plan (SWMP) (Appendix 5) provides further details on the maintenance measures that be implemented during the construction phase.

6.4 Monitoring Parameters and Frequency

The monitoring points and parameters will depend on what silt management materials and techniques have been implemented. The monitoring approach which should be adopted is outlined in Section 7.

7 Maintenance and Monitoring Plan

The Construction Surface Water Management Plan (CSWMP), provided in Appendix 5, sets out the monitoring, inspection and maintenance procedures that will be implemented throughout the construction phase to ensure the effective management of surface water which is discharged during the construction phases.

Table 4 below summarises the minimum inspection, monitoring and maintenance requirements for each of the attenuation and detention basins installed across the site. Heidelberg Materials UK will be responsible for the overall management and maintenance of the attenuation and detention basins, associated surface water management infrastructure, and the final discharge point. Where specialist works are required, such as the removal of accumulated sediments from the attenuation and detention basins, appropriately qualified third-party contractors will be appointed to undertake these activities.

It is anticipated that the emptying of the basins shouldn't be required during the lifetime of the construction. However, should the need arise, the basins can be dredged to increase the capacity and allow for settlement.

All records shall be kept for a minimum of 3 years, from completion of the construction phase.

Infrastructure	Maintenance Activity	Minimum Frequency	Responsible Person	Record Location
Overview of drainage basins	Visual check of basins including levels	Weekly or as required	Site operator	Site diary/ maintenance log
Rock filters at inlets to drainage basins	Visual check of inlets – check for blockages	Weekly or as required	Site operator	Site diary/ maintenance log
Discharge point	Visual check for blockages	Weekly or as required	Site operator	Site diary/ maintenance log
	Turbidity of discharge			
Desilting basins	Removal of sediments	As required	Site operator/3rd party	Site diary/ maintenance log
Discharge quality	Sampling	Monthly or as required	Site operator/3rd party	Site diary
Overview of Siltbuster unit	Daily visual check of unit	Daily or as required	Site operator	Site diary/ maintenance log

Table 4. Maintenance and Monitoring Plan

8 Accident and Incident Management Plan

8.1 Purpose

To ensure all staff have procedures and systems in place to assess and handle emergencies and incidents when they arise on site.

8.2 Scope and Responsibility

This Accident and Incident Management Plan apply to all staff entering the site. The permit holder will review it on an annual basis. The permit holder is responsible for updating names and contact data, where required, between the review periods. Revision consists of, but is not limited to:

- Verifying contact names and ensuring telephone numbers are up to date,
- Confirming responsibilities are correct for current staff,
- Updating procedures to reflect changes in business activities or work practices,
- Revising procedures due to deficiencies identified in tests of the procedure or actual incidents,
- Following an emergency or accident.

8.3 Method

The Accident Management Plan includes consideration of the following:

- a) The nature of on-site hazards, e.g. high levels of suspended solids/turbidity within the discharge, and measures to be taken in the event of spillages or accidental releases.
- b) The most likely type and scale of an emergency incident or accident.
- c) The action(s) required to minimise environmental damage.
- d) Mitigation and response action(s) to be taken for different types of accident or emergency.

8.4 High levels of suspended solids

The approach to reacting to high levels of suspended solids

- To isolate the discharge to prevent further discharges to the environment
- Arrange for additional dosing to increase settlement
- Arrange for offsite removal of collected water from the attenuation basins

8.4.1 Incidents

A. Spill: including the following:

- Spills from onsite oils and fuels
- Spills/leaks of onsite chemicals (including flocculants)

- Drainage system failure

B. Failure of drainage system

E.g. collapse of drains. Abnormalities may be detected through site inspection by the site manager. Upon detection of any abnormality, the site manager should investigate and effect promptly all the required short term remedial work. They should inform their engineering supervisor or the on-site EHS coordinator and where appropriate call for urgent assistance from the outside parties.

C. Vandalism

Vandalism leading to damage to onsite plant and machinery

D. Enforced site shutdown

Follow site shut down procedure.

For all incidences, Emergency Response Procedures to be followed

9 Accident and Incident Report Form

Accident and Incident Report Form		
Location on Site:		Date & time of Incident:
Team/Staff involved:		
Incident / Non Conformance / Complaint (Delete as appropriate)		
1.What Happened?		2. What caused it?
Member of Site Management informed:		Name:
3.Immediate Correction required / taken		
Designated staff member to deal with incident resolution		
Corrective action required	Yes/No	Implemented by:
4. Is a schedule 5 notification required to be sent to the Environment Agency?		Yes/No
		S.5 report ref
Incident report signed by Site Manager Name:		Date:
5. Corrective action		
Target date corrective action to be completed:		
Corrective action agreed & signed by Site Manager:		Date
Corrective action confirmed as completed by:		Date

Table 5. Accident and Incident Report Form

10 Amendment Record Register

10.1 Purpose

The purpose of this procedure is to ensure all relevant people have access to the most up-to-date EMS documents.

10.2 Scope and Responsibility

All records made as part of the Management System and Site Permit shall:

- Be legible
- Be made as soon as reasonably practicable
- If amended, to be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval
- Be retained, unless otherwise agreed in writing by the Agency, for at least 6 years from the date when records were made, or in the case of the following records until permit surrender:
 1. Off-site environmental effects; and
 2. Matters which affect the condition of the land and groundwater.
- The permit holder is responsible for ensuring all EMS documents are up to date and the relevant people have copies.

10.3 Method

Changes to the management system documents will be made by the permit holder and will be saved as a new document. The updated documents will be stored electronically stored and distributed to all relevant parties.

A copy of updated documents required by the environmental permit will be sent to the Natural Resource Wales (NRW).

11 Emergency Response Procedure

11.1 Purpose

To ensure that incidents occurring within the site that have a potential risk of pollution to the environment are dealt with in a safe manner to ensure minimal environmental impact.

11.2 Scope and Responsibility

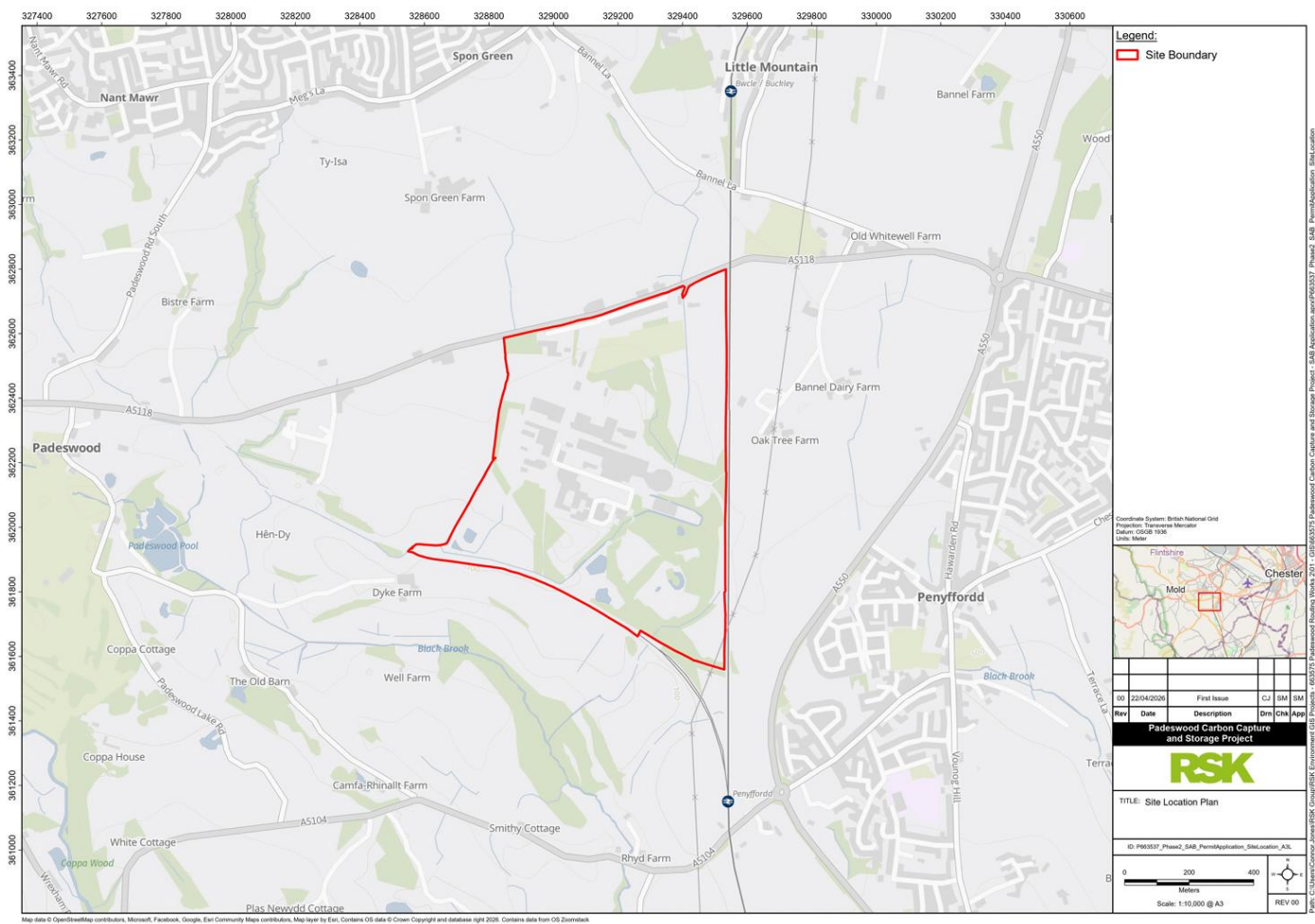
This procedure applies to all emergency situations; it is the responsibility of all employees and anyone entering the site to follow this procedure during an emergency situation.

11.3 Method

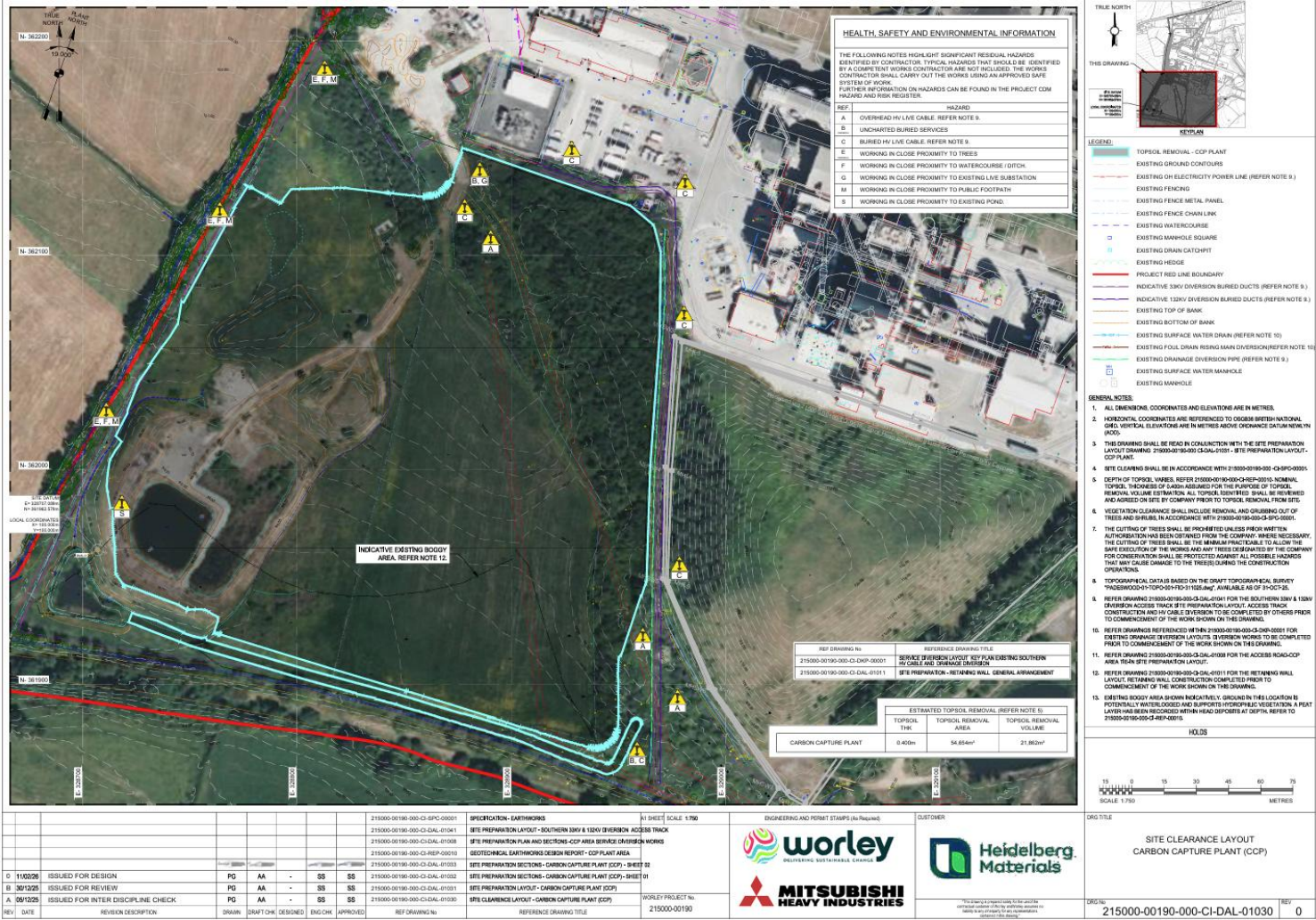
In the event of an emergency the following actions will be taken:

- Raise the alarm.
- Carry out emergency responses as per relevant procedure to minimise environmental consequences i.e. control of oil spills and leaks or fire – but only if:
 - Persons are trained to do so
 - There is access to appropriate equipment and PPE; and
 - It is safe to do so.
- Call the emergency services on 999, and NRW on 0300 065 3000
- If necessary, evaluate the site and any nearby premises at risk.
- In the short term, find out why the accident happened and take action to stop it happening again.
- Review the plan and inform the NRW of the outcome of the review and any changes which are required

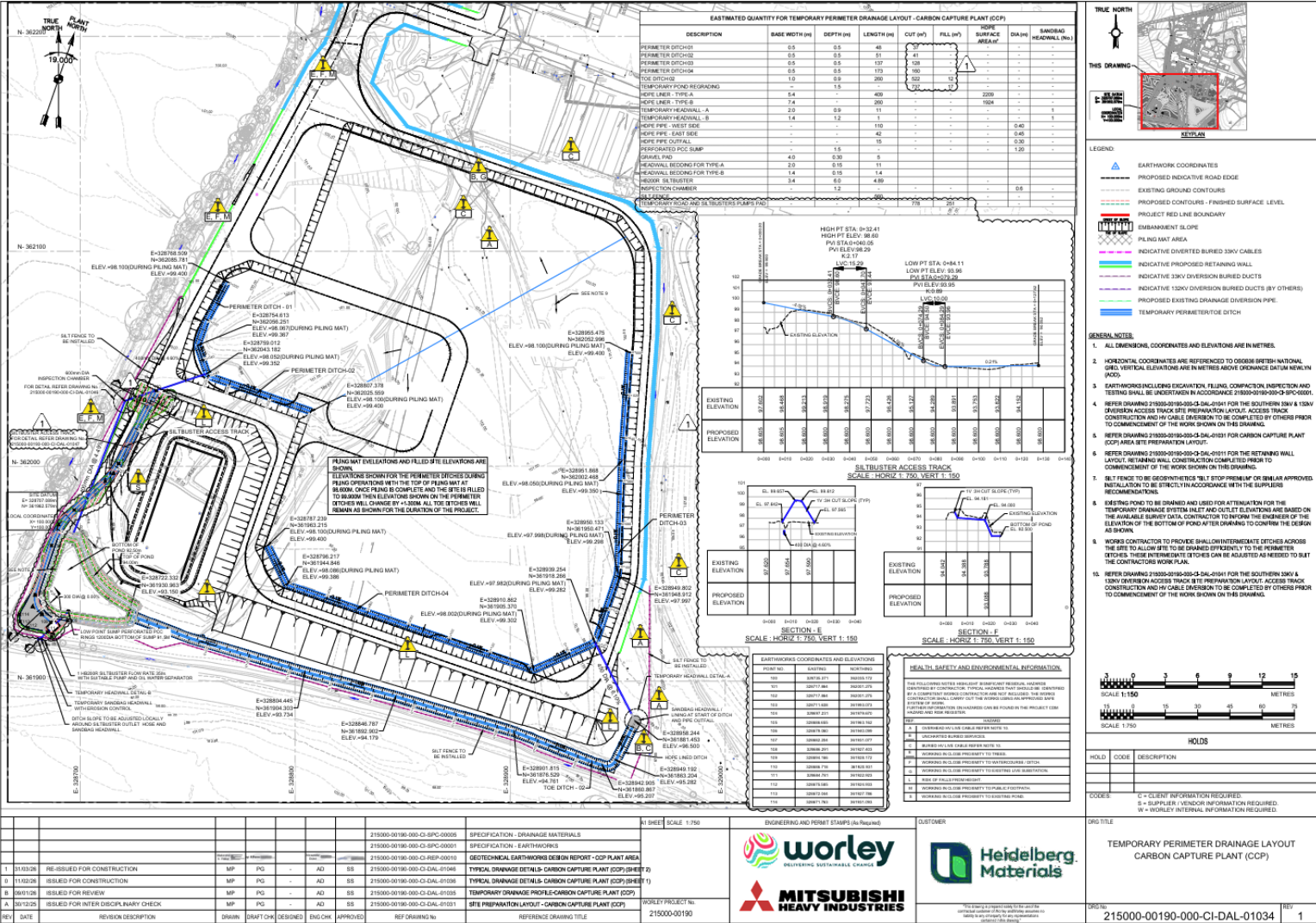
Appendix 1 – Site Location Plan



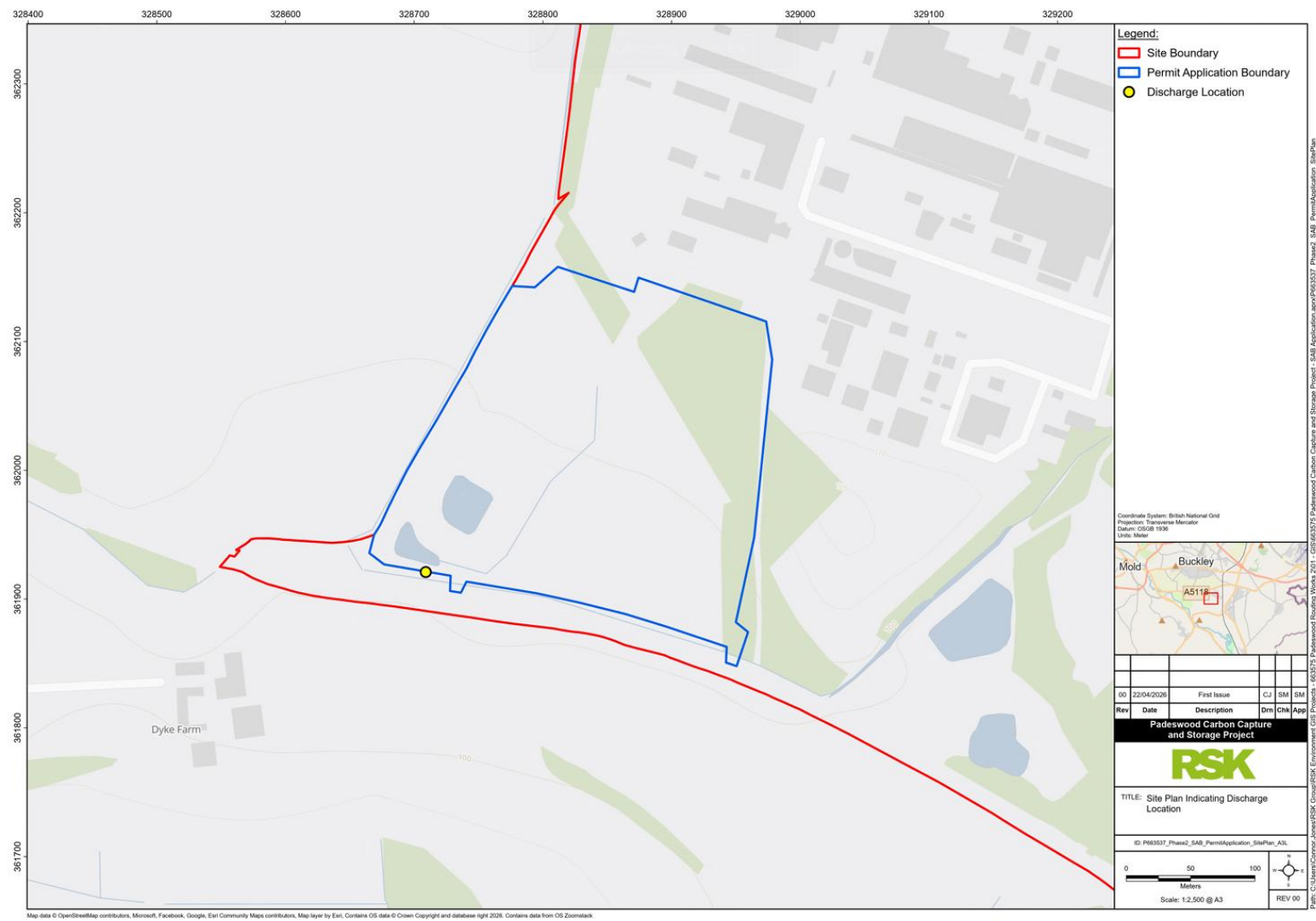
Appendix 2 – Site Clearance Layout



Appendix 3 – Temporary Perimeter Drainage Layout



Appendix 4 – Discharge Location



Appendix 5 – Surface Water Management Plan

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Appendix 6 – Temporary Perimeter Drainage Technical Note

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Appendix 7 – Construction Phase Plan

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Appendix 8 - Settlement Test and Flocculant Validation Report

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Appendix 9 – NTU-TSS Validation Curve

Appendix 10 – Material Safety Data Sheet

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Appendix 11 – Environment Management System

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Appendix 12 – Construction Environmental Management Plan

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Appendix 13 – Letter of Authority

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