



e3p

Phase II Geoenvironmental Site Assessment
Land at Greenbooth Road and Edenfield Road, Norden

Reference: 16-465-R2-3
Date: August 2023



PHASE II GEOENVIRONMENTAL SITE ASSESSMENT

Land at Greenbooth Road and Edenfield Road
Norden
Rochdale
OL12 7TD

Prepared for:

Stonebond.

**Report Ref: 16-465-R2-3
Date Issued: August 2023**

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QUALITY ASSURANCE

PROJECT NUMBER	16-465		
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DATE	January 2023	June 2023	August 2023
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QUALIFICATIONS	BSc (Hons), FGS	BSc (Hons), FGS	BSc (Hons), FGS
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EXECUTIVE SUMMARY

Site Address	Land at Greenbooth Road and Edenfield Road, Norden, Rochdale, OL12 7TD.
Grid Reference	E 385812, N 414724.
Site Area	2.62 Ha.
Proposed Development	Stonebond Properties Ltd intends to construct a low-rise residential development comprising 49 residential dwellings with associated gardens, estate roads, infrastructure, and a connecting bridge.
Current Site Use	The subject site is an irregularly shaped disused parcel of land located to the north of Greenbooth Road and Edenfield Road, Norden Rochdale, and is situated within a plateau in a small valley with a steep, wooded embankment to the north and east boundaries. Hardstanding comprises over half the land cover, but the site can be split into two distinct areas: the former Tack Lea Works (Woodhouse Mills) area occupying the northern and central portions of the site and the former Sheppard Mill area in the east and south-eastern part of the site. The site is predominantly old industrial land with five structures present in the centre of the Tack Lea Works area. The structures comprised an old boiler house, a coal hopper, a vehicle spray workshop, a coal bunker, and a gas substation. Concrete and brick-lined structures, believed to be historical filter tanks and reservoirs, are also present within an area of semi-mature woodland in the eastern section of the Tack Lea Works area. No structures were identified within the Sheppard Mill area. An earthen bund approximately 1 m in width and height is located to the immediate west of the old boiler house and bisects the Tack Lea Works area from northeast to southwest. Naden Brook enters from the northwest and generally flows in a south/southeast direction, adjacent to the site's western and southern boundary along Greenbooth Road. Woodhouse Lane Brook enters the site from the north and flows south, separating the Tack Lea Works area and Sheppard Mill area before entering Naden Brook. The south of the site has been artificially raised and levelled where previous industrial mills were located.
Site History	Earliest mapping (circa 1851) shows the site comprised industrial land with numerous buildings (Woodhouse Mill and Sheppard Mill) associated with bleaching, fulling, dyeing and finishing mills. Several reservoirs are present in the centre and east of the site, and a sandstone quarry is present in the northwest. Wooded areas are present in the centre and southeast of the site. From 1890, additional structures and reservoirs have been erected in the centre of the site along Naden Brook. The sandstone quarry is no longer present (replaced by woodland), and a pond is located in the northwest. Additional structures are also present to the northwest of Sheppard Mill. Wooded areas have also expanded to include the central and northern parts of the site.



Site History <i>Continued...</i>	From 1910, additional structures and tanks are present in the northwest of the site (in the location of the former sandstone quarry). Filter tanks have also been developed in the northeast within an area of woodland in the centre along Naden Brook. From 1929, unnamed structures in the northwest and filter tanks in the northeast have expanded. The unnamed structure to the northwest of Sheppard Mill has been demolished and replaced with a larger structure. From 1961, unnamed structures in the northwest and south along Naden Brook have been expanded further. The pond in the northwest and a number of reservoirs in the centre are no longer present, with new structures erected over the presumed infilled reservoirs. Since 1974, structures in the northwest have been expanded and several filter tanks are located in the centre within the wooded area. Filter tanks in the wooded area in the northeast and reservoirs in the east have been removed, with part of Sheppard Mill demolished. A tank is located to the southeast of Sheppard Mill. Since 1990, structures in the northwest and Sheppard Mill in the southeast have been expanded. Rochdale MBC hold records of a licensed historical landfill located in the eastern section of the Tack Lea Works area and west of Woodhouse Lane Brook within an area of semi-mature woodland. The landfill site was licensed to accept inert and industrial wastes (i.e., 'building wastes') to be used for 'land reclamation, tipping and landscaping' between 1987 and 1991. From 2003, Woodhouse Mill, Sheppard Mill, unnamed structures in the centre bordering Naden Brook and the tank southeast of Sheppard Mill are no longer present. From 2012 to the present, only five structures remain in the Tack Lea Works area. Extensive hardstanding is present across the north-western and south-eastern sections of the site and extensive vegetation/tree cover is present across the central and northern sections of the site.										
Environmental Setting	<table> <tr> <td>Drift Geology</td><td>Till – Devensian (Diamicton)</td></tr> <tr> <td>Bedrock Geology</td><td>Rough Rock -SANDSTONE</td></tr> <tr> <td>Faults</td><td>There are no faults close enough to the site to influence ground stability.</td></tr> <tr> <td>Hydrogeology</td><td> Secondary undifferentiated superficial aquifer with a Secondary A bedrock aquifer recorded. The site is not located within a groundwater source protection zone. No active groundwater abstraction points identified within a 1 km radius. The nearest active surface water abstraction point is located 498 m northwest of site (United Utilities) – located upstream of site. </td></tr> <tr> <td>Hydrology</td><td>Woodhouse Lane Brook bisects the site in the centre and runs from north to south before entering Naden Brook.</td></tr> </table>	Drift Geology	Till – Devensian (Diamicton)	Bedrock Geology	Rough Rock -SANDSTONE	Faults	There are no faults close enough to the site to influence ground stability.	Hydrogeology	Secondary undifferentiated superficial aquifer with a Secondary A bedrock aquifer recorded. The site is not located within a groundwater source protection zone. No active groundwater abstraction points identified within a 1 km radius. The nearest active surface water abstraction point is located 498 m northwest of site (United Utilities) – located upstream of site.	Hydrology	Woodhouse Lane Brook bisects the site in the centre and runs from north to south before entering Naden Brook.
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Environmental Setting <i>Continued...</i>	Hydrology <i>Continued...</i>	Naden Brook is located along the western and southern boundaries of the site. Naden Brook is classified by the EA as a Statutory Main River. Anecdotal evidence indicates the presence of a culverted watercourse beneath the former mill building in the Tack Lea Works area, which arises from a spring beneath the former mill building and discharges into Naden Brook. A second spring and stone-lined well is anticipated to be present in the basement area of the former dye house in the Tack Lea Works area. A second culverted watercourse is also anticipated to be present beneath the former mill building in the Sheppard Mill area, which discharges into Woodhouse Lane Brook. During the site walkover, a spring was identified in the far northwest part of the Tack Lea works area within an area of outcropping bedrock. Due to the local topography, any shallow groundwater will likely flow in a south-easterly direction, following the topographical gradient towards Naden Brook and Woodhouse Lane Brook.
	Flood Risk	Predominantly located within a currently defined "Flood Risk Zone 1". However, sections of the western and southern boundaries of the site are located within "Flood Risk Zones 2 and 3" and as such are considered to be affected by river flooding. There is a high potential for surface water flooding to occur at the site, with the highest risk areas being located in the southern sections of the site. The site is at risk of flooding from reservoirs in the area (i.e., from Greenbooth Reservoir located approximately 430 m to the north). There is a low to negligible potential for groundwater flooding to occur at the site.
Natural Landform and Geomorphology	Naden Brook flows in a southerly direction along the western and southern boundaries of the site. The subject site is situated within a plateau in a small valley with a steep, wooded embankment to the north and east boundaries. It would appear that the current site-level plateau will have been formed by the placement and upfilling of material before the construction of the historical development. Historical level raising has resulted in greater thicknesses of Made Ground overlying the natural glacial till and alluvial soils associated with Naden Brook.	



Previous Reports	The following previous reports have been provided for review: ✿ Encia Consulting Limited – Geoenvironmental Appraisal – Land at Greenbooth Road, Norden (Report Ref: 7112/1, June 2006); and, ✿ LK Consult – Geoenvironmental Risk Assessment – Land at Greenbooth Road, Norden (Report Ref: CL602-LKC 20 1618-01, September 2020). Details are set out in Section 2.1.
Utility Locations	A number of service covers have been identified in the north-western and central sections of the Tack Lea Works area. An above-ground water pipe was also identified in the eastern section of the Tack Lea Works area running north to south over Naden Brook. A review of online records identified the following utilities on-site: ✿ Low and medium pressure gas mains entering Tack Lea Works area from Greenbooth Road, runs northwest to a gas substation and vehicle spray workshop. ✿ 6Kv electricity cable entering the Tack Lea Works area from Greenbooth Road, runs northwest connecting the vehicle spray workshop and old boiler house before terminating at former electricity substation. Low voltage electricity cable splits off from 6Kv cable and runs east towards former filter tanks before turning north/northwest up wooded slopes towards the northern access track and Woodhouse Lane. Low voltage cables are entering the Sheppard Mill area from Edenfield Road, runs northwest before terminating at former Sheppard Mill building. ✿ 6-inch distribution water main entering the Tack Lea Works area from Greenbooth Road, runs northwest before terminating south of the vehicle spray workshop. A private pipe splits off from the water main, runs underneath the old boiler house to the northwest before terminating in the northwest section of the Tack Lea Works area. Another private pipe runs along the northern access track to the east before terminating at the coal hopper. ✿ Overhead telecoms cable entering the Sheppard Mill area from the east, runs to the west before terminating on the northern slope. A full utility survey, formal drainage survey and a review of online records is recommended to determine the presence of underground services
Landfill Sites and Ground Gases	There is one licenced historical landfill located on-site in the eastern section of the Tack Lea Works area and west of Woodhouse Lane Brook within an area of semi-mature woodland. The landfill site was licensed to accept inert and industrial wastes between 1987 and 1991. Several infilled ponds/reservoirs are located in the Tack Lea Works area in the northwestern section and beneath the old boiler house and coal bunker. Two infilled reservoirs are located in the southern section of the Sheppard Mill Area. A historical sandstone quarry (presumed infilled) is located in the northwestern section of the Tack Lea Works area. The site has also undergone extensive historical development and ground working. The Made Ground associated with these historical land uses together with recorded landfill may produce hazardous ground gases such as methane and carbon dioxide.



Radon	A BGS Radon Report was purchased for the site, which indicated that the northeast and northwest of the site is situated in an area where 1–3% of homes are above the "Action Level" and the rest of the site is situated in an area where 0–1% of homes are above the "Action Level". Therefore, full radon protective measures are not necessary for the construction of new dwellings or extensions.
Coal Mining/Land Stability	A coal mining assessment has indicated that the site is located within a CA reporting area but not within a high-risk development zone. Coal Authority mining report for the site concluded that no mine entries are located within 100 m of the site, no outcrops are recorded within close proximity of the site, and the site is not in a surface coal resource area. Therefore, no risk from coal mining is present and no further measures are required.
Brine Workings	The site is not located within an area deemed to be at risk from ground instability due to historical brine pumping activities and/or salt extraction.
Hazardous Installations	No hazardous installations that could potentially prejudice the proposed construction of highly sensitive residential dwellings have been identified within influencing distance of the subject site.
Environmental Permit Requirements	As parts of the proposed development works (i.e., demolition and construction) will be completed within 8 m of a main river, a Flood Risk Activity Permit (FRAP) will be required. Any material within the historical landfill located in the eastern section of the Tack Lea Works area is likely to be classified as waste and would therefore require an environmental permit to excavate and treat it before it could be re-used. A Material Management Plan (MMP) may not be a route for this material. It is noted that current proposals are to not develop in the area of the landfill, except for the proposed estate road and connecting bridge.
Initial Conceptual Site Model	Due to the developed nature of the site, a number of potential sources of contamination have been identified. Made Ground deposits are likely to be present across the site to significant depths in the footprints of current and historical buildings, filter tanks, ponds, reservoirs, infilled sandstone quarry, tanks and the historical landfill, which potentially may be impacted by heavy metals, non-volatile PAHs, petroleum hydrocarbons and asbestos. PCBs may also be present in the centre of the Tack Lea Works area where the former electricity substation was located. A number of potential sources of mobile contamination have been identified. Impacted Made Ground, current and historical buildings (bleaching, fulling dyeing and finishing mills, and vehicle spray workshop) and historical tanks represent potential sources of mobile contamination. If present these have the potential to leach from the soil and migrate downwards to the underlying secondary A aquifer (Bedrock) and laterally to Naden Brook and Woodhouse Lane Brook which are topographically lower than the site. Mobile contamination may also migrate laterally to the culverted watercourses and springs located on-site.



Initial Conceptual Site Model <i>Continued...</i>	Made Ground, current and historical filter tanks, ponds and reservoirs, the infilled sandstone quarry and the historical landfill are considered to be potential sources of hazardous ground gas. In addition, due to the historical uses on the site (bleaching, fulling dyeing and finishing mills, vehicle spray workshop, historical tanks and historical landfill), the Made Ground may be impacted by volatile contaminants (VOCs and SVOCs). If ground gases and volatile contaminants are present, these may pose a risk through inhalation or accumulation of gases / vapours within confined spaces.
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GROUND INVESTIGATION

Ground Investigation Works	E3P has completed an intrusive ground investigation comprising: ✿ 30 x Mechanically Excavated Trial Pits; ✿ 24 x Window Sample Boreholes; ✿ 3 x Cable Percussion Boreholes; ✿ 5 x Rotary Boreholes; ✿ 2 x BRE 365 Soakaways; ✿ 5 x Hand Pits; and, ✿ Construction of environmental monitoring installations.
Ground Conditions	Made Ground – 0.00 m to 5.80 m bgl Made Ground deposits were encountered within all exploratory hole locations to depths ranging between 0.00 m and 5.80 m bgl. However, in 23 locations in the Tack Lea Works area and 13 locations in the Sheppard Mill area, the full thickness of Made Ground could not be proven due to significant concrete and brick obstructions and basement features, which are indicative of relict foundations from the former buildings. The five hand pit locations within the eastern section of the Tack Lea Works area were all terminated within Made Ground. The site was predominantly covered with concrete hardstanding to a maximum proven thickness of 0.68 m bgl. In two locations within the eastern part of the Tack Lea Works area, reworked topsoil was encountered to a maximum proven thickness of 0.10 m bgl. Variable granular and cohesive Made Ground deposits were encountered beneath the concrete hardstanding and reworked topsoil, which generally comprised brown sandy gravel with sandstone, mudstone, limestone, concrete, brick, ceramic, glass, wood, metal and rare ash and plastic. In the Tack Lea Works area, Made Ground deposits were generally encountered between 1.00 m and 2.00 m bgl, with shallower deposits (< 1.00 m bgl) located along the northern boundary (i.e. closer to the valley edge). Deeper Made Ground deposits, ranging between 2.00 m and 5.80 m bgl, were encountered in the northwest part of the site (associated with the infilled sandstone quarry), the central part of the site (associated with infilled reservoirs) and the eastern part of the site (associated with the filter tanks, reservoirs and historical landfill).



Ground Conditions <i>Continued...</i>	In the Sheppard Mill area, Made Ground deposits were generally encountered between 2.00 m and 5.10 m bgl, with shallower deposits (< 1.00 m bgl) located along the northern boundary (i.e. closer to the valley edge). The deepest Made Ground deposits were encountered along the southern boundary associated with the former buildings and infilled reservoirs.
	DRIFT – 0.50 m to 15.00 m bgl Drift deposits were encountered within twenty-nine exploratory hole locations between depths of 0.50 m and 15.00 m bgl. Both granular and cohesive drift deposits were encountered, which generally comprised of a loose to dense brown clayey to sandy GRAVEL overlying brown gravelly CLAY with gravels of mudstone and sandstone. The strength of CLAY varied from soft to very stiff.
	Drift deposits were noted to be shallower (between 1.00 m and 2.50 m thick) along the northern parts of the Tack Lea Works area and Sheppard Mill area (i.e. closer to the valley edge). Deeper drift deposits (between 7.70 m and 11.00 m thick) were noted to be present along the western and southern boundaries of the Tack Lea Works area and the southern boundary of the Sheppard Mill area (i.e. towards the centre of the valley).
	SOLID The solid bedrock geology was encountered within five exploratory hole locations. Shallow bedrock was encountered between 1.60 m and 2.90 m bgl along the northern part of the Tack Lea Works area (i.e. closer to the valley edge). Along the southern boundaries of the Tack Lea Works area and Sheppard Mill area (i.e. towards the centre of the valley), deep bedrock was encountered between 11.60 m and 13.80 m bgl. The bedrock generally comprised greyish brown SANDSTONE. Outcrops of bedrock were also noted to be present in the northwest part of the Tack Lea works area and along the northern boundaries of the Tack Lea Works area and Sheppard Mill area.
	In the Encia Consulting 2006 Report, shallow bedrock of SANDSTONE was encountered in the central and western sections of the Tack Lea Works area at depths typically <2.00 m bgl. To the east of the former Tack Lea Mill Buildings and in the Sheppard Mill area, bedrock was found to be deeper and was encountered at depths ranging between 4.30 m and 5.00 m bgl. To the north of the Tack Lea Works area and Sheppard Mill area, bedrock can be seen outcropping in the valley and hillsides.
	GROUNDWATER – Perched groundwater was encountered during the ground investigation in one location in the Tack Lea Works area at 1.50 m bgl. Groundwater was encountered between 1.40–3.90 m bgl during the ground investigation, with deep groundwater encountered in one location within the Sheppard Mill area at 12.10 m bgl. During the monitoring, groundwater levels were recorded between 0.59 m and 4.89 m bgl.

CONTAMINATED LAND ASSESSMENT

Human Health	The Tier 2 human health risk assessment identified site-wide concentrations of heavy metals, asbestos, non-volatile PAHs, naphthalene, petroleum hydrocarbons, VOCs and SVOCs that would present unacceptable degrees of theoretical risk to the identified receptors associated with direct exposure pathways.
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Human Health <i>Continued...</i>	The majority of the identified elevated concentrations have primary exposure pathways related to dermal contact and ingestion of soils, inhalation of particulate and consumption of homegrown vegetables; with naphthalene, petroleum hydrocarbons, VOCs and SVOCs having a primary exposure pathway related to volatilisation to indoor air risk. The risk to chronic human health associated with the elevated concentrations of inorganic heavy metals and non-volatile PAH compounds can be mitigated through the installation of a suitable cover system in all proposed private gardens, landscaping and public open space to remove any potential for direct exposure to impacted soils. The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy; however, industry best practice will require the following minimum depths of certified clean cover: ✿ Private gardens – 600 mm ✿ Landscaped areas– 300 mm ✿ Public open space (POS) – 300 mm Asbestos in the form of chrysotile and amosite has been identified within localised areas in Made Ground deposits in the southern part of Sheppard Mill area (WS124 and WS18), the historical landfill in the eastern section of Tack Lea Works area (HP05) and the central section of Tack Lea Works (TP114 and TP116). Asbestos bulk fragments, in the form of hard cement were also identified in WS124, HP05 and WS10; and asbestos sheeting/board debris within HP05. Visual signs of ACM were encountered during the ground investigations in HP05. Impacted soils should be managed according to the asbestos risk mitigation conceptual site model. It is noted that the presence of asbestos sheeting and boarding will require a different remedial approach to those proposed within the asbestos risk mitigation conceptual site model (i.e., hand picking of visible bulk asbestos fragments). Where asbestos sheeting and boarding has previously been identified, any proposed earthworks within those areas may be required to be undertaken under license. In addition, any off-site disposal of materials from these areas would be considered hazardous unless the asbestos bulk fragments are pre-removed via hand picking techniques. Elevated concentrations of mercury have been identified within two locations within the Tack Lea Works area (WS111 at 0.60 m bgl and WS9 at 0.50 m bgl); and one location within the Sheppard Mill area (WS25 at 0.70 m bgl). Mercury occurs in three different forms; elemental mercury, inorganic mercury and methyl mercury. Inorganic and methyl mercury have an exposure pathway of dermal contact and ingestion, whereas elemental mercury could present a potential volatilisation to indoor air risk.
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Human Health <i>Continued...</i>	During remediation and enabling works, speciated mercury analysis should be completed at the locations WS111, WS9 and WS25 to assess whether elemental mercury is present which may pose a risk to future site users through vapour inhalation. If elemental mercury is identified, it may be necessary to delineate and excavate the soils as a hotspot and place them in an area of low sensitivity such as beneath areas of public open space or removed from site. Alternatively, if it is proven that there is no elemental mercury, a clean cover system will be sufficient. The elevated concentrations of naphthalene, TPH, and trichloroethene (TCE) identified within the Tack Lea Works area (TP116 and WS12) are considered to be localised occurrences and therefore these locations can be treated as localised hotspots. During a process of cut/fill enabling works, a hotspot removal should be undertaken where these soils may be chemically validated to assess chemical suitability for retention on-site in an area of no future sensitivity. However, elevated concentrations of naphthalene, TPH, VOCs and SVOCs have been identified throughout the Shepherd Mill area, and these do not appear to be localised hotspots. A Tier 3 vapour risk assessment is required in the Sheppard Mill area to assess the level of risk to the future site users by volatilisation to indoor air. The SVOCs identified in WS107 and TP116 within the Tack Lea Works area are not considered to pose a risk to future site users given the marginal concentrations. Furthermore, with regards to the elevated volatile contaminants (naphthalene, TPH, VOCs and SVOCs) identified in the Tack Lea Works area and the Sheppard Mill area, vapour resistant membranes may be required to be installed during the build phase for any proposed buildings situated within the immediate vicinity of the contamination hotspot / impacted soils. A Detailed Quantitative Risk Assessment (DQRA) may also be required to determine if any risks to human health and controlled water receptors remains following the hotspot removal. Chemical analysis of the natural subsoil deposits has indicated these soils to be acceptable for use within the proposed garden areas; however, further chemical validation samples will be required to confirm this. No suitable source of natural topsoil deposits has been identified on-site.
Controlled Waters	The ICSM developed within the context of the site setting has determined that the surface water features (Naden Brook, Woodhouse Lane Brook and the culverted water courses and springs) are the critical receptors at risk from a viable pollutant pathway, which would be the lateral migration of potentially mobile phase-soluble contaminants. The presence of low permeability cohesive drift deposits across the site affords protection from vertical migration to the underlying Secondary A bedrock aquifer. As such, this receptor is considered to be at a low risk. Though the risk to the underlying bedrock Secondary A aquifer is considered to be low, the risk to the surface water receptors is considered to be high, due to the presence of impacted soils within close proximity of surface water features, and the presence of high permeability strata in areas beneath the site.



Controlled Waters <i>Continued...</i>	The groundwater flow plan (Drawing 16-465-040, Appendix III) suggests that groundwater is flowing towards the central sector of the site from the north and southeast. Widespread naphthalene and TPH contamination has been identified in the soil analysis, with the majority of the impact noted within the Sheppard Mill area of the site. Thus, the source of the contaminants cannot be attributed to one area or point source and the majority of the contamination is considered present on a site wide basis. During the remediation and enabling works phase, the removal of the hardstanding currently present across the site may induce infiltration and potential mobilisation of contaminants present within the soils and groundwater directly into the surface water receptors. However, the areas of low permeability clay soils will act to inhibit migration. The supplementary controlled waters risk assessment completed by E3P has not identified any significant impact within the groundwater or surface water samples. The data suggests that there is no complete pollutant linkage and the identified contamination within the soils is not likely to be mobile. It will be necessary to instigate a watching brief during Remediation and Enabling Works to ensure that it can be demonstrated that all material that remains in-situ is suitable for retention. Surface water sampling is also recommended throughout the Remediation and Enabling Works to ensure that the water quality of the surface water features is not altered.
Ground Gas	Ground gas monitoring suggests that the site can be predominantly classified as CS1. However, CS2 measures are recommended for the whole site due to the presence of the historical landfill (eastern section of the Tack Lea Works area). Elevated concentrations of volatile contaminants (naphthalene, TPHs, VOCs, SVOCs, and mercury) have been identified within the Made Ground on-site, which present a potential volatilisation to indoor air risk. Elevated concentrations of volatile contaminants in the Tack Lea Works area are considered to be localised occurrences and therefore these locations can be treated as hotspots. However, elevated concentrations of volatile contaminants have been identified throughout the Shepherd Mill area and these do not appear to be localised hotspots. Further assessment, in the form of a Tier 3 vapour risk assessment is required in the Sheppard Mill area to assess the level of risk to the future site users by volatilisation to indoor air. Subject to the findings of the vapour risk assessment, vapour resistant membranes may be required.
Potable Water Infrastructure	Based on the assessment of current site conditions, it is likely that barrier pipe will be required at the proposed development. Post-remediation and enabling works ground conditions may be different from those identified during this ground investigation.



GEOTECHNICAL ASSESSMENT

Underground Obstructions	Significant concrete and brick obstructions and basement features, which are indicative of relict foundations from former buildings, were identified across the site. As such, the full thickness of the Made Ground could not be fully proven in localised areas within the northern and central parts of the Tack Lea Works area and the southeastern part of the Sheppard Mill area. During a phase of cut-and-fill enabling works to create a developable platform, all below-ground obstructions will require grubbing out to the base of the Made Ground to enable the construction of proposed plots.
Allowable Bearing Pressure	Medium dense gravels identified between 1.00–4.00 m bgl has been assessed as having an ABP of 152 –278 kN/m². Dense gravel identified between 2.50–7.00 m bgl has been assessed as having an ABP of 322–456 kN/m². Loose gravels have also been identified between 1.00–2.00 m bgl in the central section of the Tack Lea Works area (WS102, WS103, and WS105) and at 3.00 m bgl in the central section of the Sheppard Mill area (CP103) has been assessed as having an ABP of 52–80 kN/m². Firm gravelly CLAY has been identified between 2.00–3.00 m bgl with a net ABP of 56–80 kN/m². Stiff silty CLAY identified at 1.00–9.50 m bgl has been assessed as having a net ABP of 83–154 kN/m². Very stiff gravelly CLAY has been identified at 2.70–15.00 m bgl and has a net ABP of 156–452 kN/m². Soft gravelly CLAY was also identified at 1.00 m bgl in the central section of the Tack Lea Works area (WS102) and has been assessed as having a net ABP of 31 kN/m².
Foundation Options	Given the significant topographical variances on the site, prior to the detailed design of a suitable foundation solutions, a programme of remediation and enabling works will be required to remove the extensive buried obstructions and cut/fill the site in order to create proposed development platform levels suitable for residential development. Following the removal of obstructions and subsequent engineering of soils to a specific performance specification, proposed plots could be constructed utilising vibro stone columns to support a suitably reinforced spread footing. Where tree influence is present and clays prone to volumetric instability, an alternative foundation solution may need to be adopted to deepen the foundation or the cohesive stratum may be removed and replaced with a granular material. The depth of the granular infill will be plot specific and require calculation on receipt of development levels. The use of vibro stone columns will also be dependent on the removal of clays that have a shear strength of <30kN/m². This specifically applies to Plots 41-44, where soft clays with a shear strength of <30 kN/m² were encountered between 1.10 m and 2.20 m bgl in TP115. Where plots are in close proximity to slopes or the existing retaining walls, the proposed loadings may need to be transferred beneath the influencing depth of the retainer or slope to ensure no unacceptable loading is induced that would cause a geotechnical failure.



Foundation Options <i>Continued...</i>	Consideration should also be given to the historical landfill located in the eastern section of Tack Lea Works, as well as the potential presence of a quarry high wall associated with the historical sandstone quarry in the north of Tack Lea Works area. Where plots span such a feature, socketed piles into the bedrock will be required to reduce the risk of differential settlement. Therefore, upon completion of these enabling works, it is anticipated that the final foundation solution will be a combination of: ✦ Vibro Stone Columns (VSC) that will ensure a uniform ABP in the order of 100kN/m² for the construction of a doubly reinforced strip footing at ~600mm below remediated ground level (1050 mm below FFL); ✦ Shallow strip foundations, where viable, bearing on localised areas of firm to very stiff clays, medium dense sands and shallow bedrock; ✦ Mass trench fill, where viable, bearing on localised areas of firm to very stiff clays, medium dense sands and shallow bedrock; ✦ Piled foundations may be required where deep Made Ground and soft clays have been encountered; and for plots which span the historical sandstone quarry and associated high wall in the north-western section of the Tack Lea Works area; and ✦ Raft foundations may be required where obstructions cannot be removed. Foundation depths within the conjectured influence of former, existing or proposed trees will need to be deepened to ensure that structural loading bears within the underlying target founding stratum, which cannot be subject to volumetric instability associated with fluctuation in moisture content. It is recommended that, at working drawing stage, a foundation schedule is prepared for the development taking account of the physical change of natural clay soils and the current/proposed locations of trees.
Building Floor Slabs	Ground-bearing floor slabs are unlikely to be viable given the anticipated depths or reworked Made Ground > 600 mm and shallow cohesive soils.
Heave Precautions	Given that the underlying clay is of low volume change potential, heave precautions will not be required for the internal face of a foundation less than 1.5 m in depth. Heave precautions will be required to the underside of floor slabs (where there is no 200 mm void) and pile ground beams are required within the modelled influencing distance of trees.
Soakaway Drainage	The Made Ground and underlying granular soils are cohesive and impacted by low-level inorganic and petroleum hydrocarbons which would preclude the use of infiltration drainage systems.
Sulphate Assessment	E3P categorised the concrete requirements as DS-1 AC-1s. The LK Consult 2020 Report categorised the concrete requirement as DS-2 AC-3z in the Made Ground and DS-1 AC1 in the natural strata.
CBR Design %	Granular soils can be re-engineered to ensure 5% within the subgrade during favourable climatic conditions. Natural clay soils will provide a CBR in the order of 3–5% during drier climatic periods. However, if water is allowed to shed onto the formation, the CBR will reduce to < 2%, which will require specialist engineering of the subgrade.



Cut/Fill	Development levels are unknown at this time; however, significant cut-and-fill work will be required to prepare the development platform.
Civil Engineering Excavations	The E3P intrusive ground investigation has identified the presence of minor water ingress which may require localised dewatering/sump pumping during the construction of site drainage infrastructure. Due to the depth and variability of Made Ground and the likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with the guidance contained in CIRIA R97.
Waste Characterisation	Any material that is to be disposed of off-site should undergo assessment using Technical Guidance WM3: <i>Waste Classification – Guidance on the classification and assessment of waste</i> .
Waste Management	The eastern section of the Tack Lea Works area is occupied by a historical landfill where the material was deposited under a Waste Management License. Materials originating from licensed landfills are regulated under the Waste Framework Directive (WFD). Furthermore, materials originating from future excavations (both during remediation or construction) cannot be recovered for re-use using the normal processes and protocols such as the CL:AIRE DoW CoP. It is understood that this area will remain undeveloped with the exception of an access road, therefore the material should be retained in-situ where possible. Remediation options for this sector of the site warrant robust consideration given that options for re-use would either be an application for a new Environmental Permit (Deposit for Recovery – DFR) or alternatively the on-site processing of material to recover the fractions that would no longer cease to be a waste with the off-site disposal of all non-recoverable portions. E3P would recommend that a waste management and recovery strategy be defined to facilitate the safe and economic re-use of material from landfill. A volume of 'waste' will require removal from site, this should be considered as part of a site viability assessment. It is also noted that potential waste material may be present within former drains, the current and historical filter beds and tanks and at the base of the current and historical reservoirs located on-site. Further chemical analysis of these materials will be required to assess their chemical suitability for retention on-site in an area of no future sensitivity or off-site disposal.



RECOMMENDATIONS

Based on the findings of the geoenvironmental site assessment, the following additional works are recommended to be completed in due course:

- ✳ Further investigation of inaccessible areas - central section of the Tack Lea Works area (current buildings); and eastern section of Tack Lea Works area (historical landfill area - for the estate road and connecting bridge construction);
- ✳ Tier 3 Vapour Risk Assessment for the Sheppard Mill area;
- ✳ Plot-specific foundation schedule (upon receipt of the final development levels);
- ✳ Application for a Flood Risk Activity Permit (FRAP);
- ✳ Settlement Analysis for earthworks design;
- ✳ Slope stability assessment;
- ✳ A structural survey of Retaining Walls;
- ✳ Geotechnical earthworks strategy (infrastructure);
- ✳ Remediation and enabling works strategy;
- ✳ Construction phase Surface Water Management Plan; and,
- ✳ Waste management plan for any works in the area of the former historical landfill.



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DRAWING LIST

16-465-001 – Site Location Plan
16-465-002 – Proposed Development Plan
16-465-003 – Site Features Plan
16-465-004 – Historical Features Plan
16-465-005 – Exploratory Hole Location Plan
16-465-006 – Depth of Made Ground Plan
16-465-008 – Depth of Founding Strata Plan
16-465-009 – Concept Foundation Zoning Plan
16-465-010 – Conceptual Site Model
16-465-012 – Depth of Bedrock Plan
16-465-015 – Development Constraints Plan
16-465-020 – Detailed controlled waters risk assessment / groundwater flow plan
16-465-024 – Ground Gas Plan
16-465-025 – Cross-Section Location Plan
16-465-027 – Contamination Issues Plan – TPH
16-465-028 – Contamination Issues Plan – VOCs
16-465-029 – Contamination Issues Plan – SVOCs
16-465-030 – Contamination Issues Plan – Heavy Metals
16-465-031 – Contamination Issues Plan – Naphthalene
16-465-032 – Contamination Issues Plan – Non-Volatile PAHs
16-465-033 – Contamination Issues Plan – Asbestos
16-465-034 – Contamination Issues Plan – Leachate
16-465-035 – Contamination Issues Plan – Groundwater
16-465-036 – Contamination Issues Plan – Surface Water
16-465-037 – Controlled Waters Conceptual Site Model
16-465-040 – Groundwater Flow Plan



1. INTRODUCTION

1.1. BACKGROUND

Stonebond Properties Ltd has commissioned E3P to undertake a detailed Phase II Geoenvironmental Site Assessment for a semi-derelict former industrial land north of Greenbooth Road and Edenfield Road, Norden, Rochdale, OL12 7TD.

This report is required to determine potential contaminated land liabilities, remediation requirements and geotechnical engineering works that will be required as part of the proposed development.

1.2. PROPOSED DEVELOPMENT

Stonebond Properties Ltd intends to construct a low-rise residential development comprising 49 residential dwellings with associated gardens, estate roads, infrastructure, and a connecting bridge. Drawing 16-465-002 (Appendix III) identifies the proposed development layout.

A snapshot of the proposed development layout is indicated in Figure 1.1.

FIGURE 1.1 SNAPSHOT OF THE PROPOSED DEVELOPMENT



1.3. OBJECTIVES

The objectives of the geoenvironmental assessment are as follows:

- ✳ Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority information available in order to complete a desk study in line with Environment Agency (EA) document *Land Contamination: Risk Management (LCRM) (2023)*.
- ✳ Undertake a preliminary stage of sampling and analysis to provide an overview of the environmental issues identified.
- ✳ Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site in relation to the site's future use and in relation to off-site receptors.
- ✳ Assess the geotechnical information and provide preliminary recommendations in relation to foundations, pavement construction and floor slabs.

Provide recommendations regarding future works required.

1.4. SCOPE OF WORKS

The scope of work includes the following elements:

- ✳ A detailed review of historical information;
- ✳ Design of suitable intrusive ground investigation;
- ✳ Window sample probeholes with, and construction of, environmental monitoring installations;
- ✳ Mechanically excavated trial pits;
- ✳ Deep cable percussive boreholes with groundwater monitoring installations;
- ✳ Deep rotary boreholes with groundwater monitoring installations;
- ✳ Hand pits;
- ✳ BRE365 Infiltration Testing;
- ✳ In-situ geotechnical testing;
- ✳ Chemical and geotechnical laboratory analysis;
- ✳ Surface sampling (earthen bund);
- ✳ Groundwater monitoring and sampling;
- ✳ Surface water sampling;
- ✳ Ground gas monitoring;
- ✳ Contamination risk assessment and conceptual site model;
- ✳ Geotechnical assessment and interpretation; and



-  Factual and interpretive reporting.

1.5. LIMITATIONS

The limitations of this report are presented in Appendix I.

1.6. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.



2. GROUND INVESTIGATION

2.1. PREVIOUS GROUND INVESTIGATIONS

- ✿ Encia Consulting Limited – Geoenvironmental Appraisal – Land at Greenbooth Road, Norden (Report Ref: 7112/1, June 2006); and,
- ✿ LK Consult – Geoenvironmental Risk Assessment – Land at Greenbooth Road, Norden (Report Ref: CL602-LKC 20 1618-01, September 2020).

The key findings of the previous ground investigation reports are summarised below, and where necessary, data used to support the E3P geoenvironmental site assessment.

2.1.1. ENCIA CONSULTING 2006 REPORT

- ✿ Encia Consulting Limited (Encia), was commissioned to carry out a geo-environmental appraisal of land at Greenbooth Road, Norden, in support of proposals to develop the site for residential end use, comprising two to three-storey residential dwellings with associated gardens and adoptable roads and sewers.
- ✿ Encia's 2005 investigation covered three distinct areas; the Tack Lea Works area, the Sheppard Mill area and the Tenterhouse Mill area. Encia's 2006 report covered a wider area than is being considered within this E3P report, and as such, information relating to the Tenterhouse Mill area will not be discussed further unless considered pertinent to this report.
- ✿ Anecdotal evidence indicates the presence of a culverted watercourse running in a south-easterly direction beneath the former mill building in the Tack Lea Works area before discharging into Naden Brook. It is considered possible that this culvert channels water rising from a spring beneath the former mill building. Furthermore, it is understood that another 'spring' and stone-lined well is located in the basement area of the former dye house in the Tack Lea Works area.
- ✿ In the Tack Lea Works area, the old boiler house was noted to house an electricity sub-station and above-ground fuel tank.
- ✿ The eastern portion of the Tack Lea Works area is occupied by several disused filter beds/tanks which were formerly used to treat drainage from the mill building prior to discharge into the Naden Brook. It is understood that the current works are attached to the mains sewer drainage with an on-site pre-treatment facility located in the basement of the dye house.
- ✿ Conversations held with the site owner indicate that a culvert is located beneath the mill building in the Sheppard Mill area, running in a north-westerly direction before discharging into the Woodhouse Lane Brook.
- ✿ Japanese Knotweed was identified in parts of the Tenterhouse Mill area (located off-site to the southwest).
- ✿ Anecdotal evidence suggests that demolition materials were deposited in the eastern section of the Tack Lea Works area following the demolition of the old mill buildings. As such, deep-fill deposits are expected to be present adjacent to Naden Brook.
- ✿ Rochdale MBC hold records of one landfill site located in the eastern section of the Tack Lea Works area. The Waste Management License was issued on 1st June 1987 to Tack Lea Works. It is understood that the site was licensed to accept 'building wastes' to be used for 'land reclamation, tipping and landscaping'.

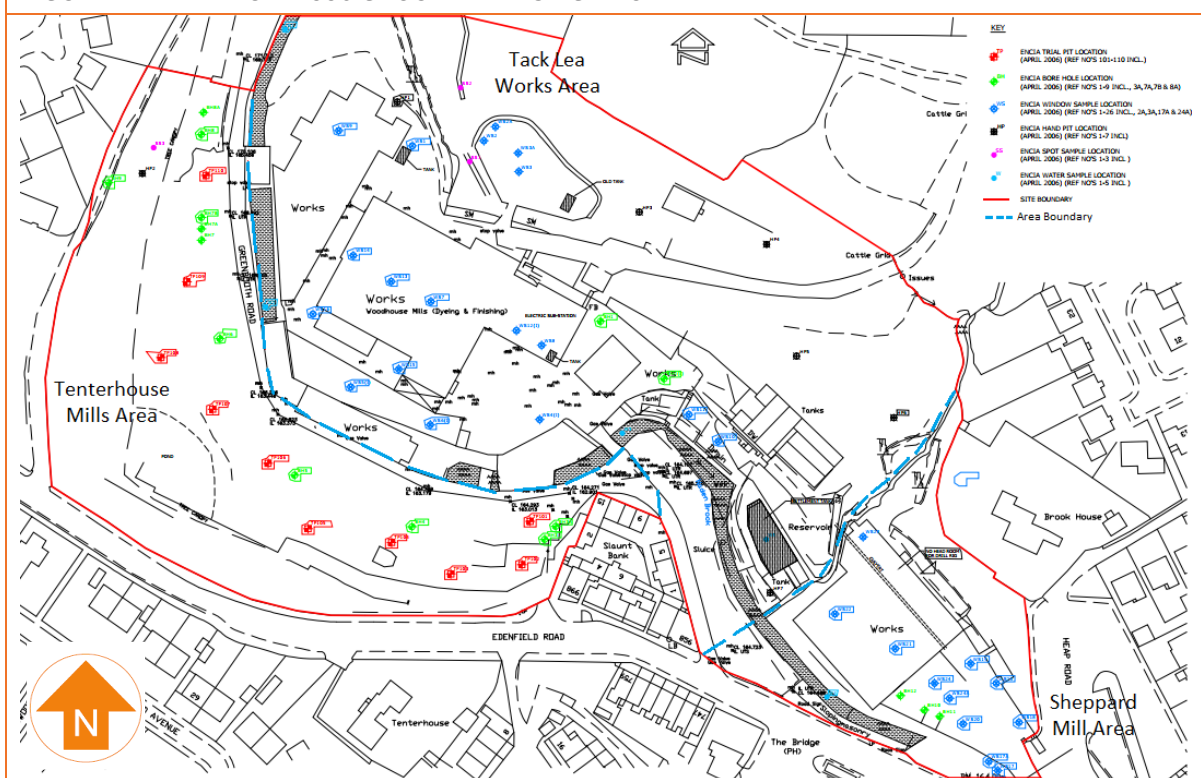


Encia's 2006 scope of works comprised of the following:

- Tack Lea Works area: three hand dug pits (HP1, HP5 & HP6; and 1 no. on Sheppard Mill area – HD7) to between 0.45 m and 0.80 m bgl; two cable percussive boreholes (BH1 & BH2) to between 0.40 m and 5.30 m bgl; and fourteen window sample boreholes (WS1, WS4-WS16) to between 0.65 m and 6.00 m bgl. Surface water samples were collected from Naden Brook (W4) and the setline tank/reservoir (W5). Groundwater was collected from BH10, BH12, WS19. Leaching tests were carried out on soil samples from WS17A, WS19, WS20, WS21 and WS25.
- Sheppard Mill area: one hand-dug pit (HP7) to a maximum depth of 0.50 m bgl; three cable percussive boreholes (BH10-BH12) to between 2.50 m and 4.32 m bgl; and eleven window sample boreholes (WS17, WS17A, WS18-WS24, WS24A & WS25) to between 0.40 m and 5.10 m bgl. Surface water samples were collected from Naden Brook (W1 to W3). Groundwater was collected from WS5 and WS12. Leaching tests were carried out on soil samples from HP1, BH2, WS4, WS6, WS8, WS9, WS11 and WS12.

A snapshot of the Encia 2006 Ground Investigation is indicated in Figure 2.1.

FIGURE 2.1 ENCIA 2006 GROUND INVESTIGATION



Hardstanding was found to be from 0.20 m to 0.30 m thick apart from beneath the main Tack Lea works building (Woodhouse Mills), with thicknesses of 0.70 m to 1.10 m of concrete slabs.

Made Ground was encountered in all exploratory hole locations reaching a maximum depth of 5.00 m bgl in BH2 (centre of the Tack Lea Works area) and 5.10 m bgl in WS17A (south-eastern section of the Sheppard Mill area). The base of the Made Ground could not be determined in a number of positions due to the presence of obstructions (e.g., concrete hardstanding, sandstone boulders). Made Ground was generally shallowest (< 1.00 m) in elevated locations above the valley floor (i.e., the north-western section of the Tack Lea Works area).



- ✚ In and around the Tack Lea Works area, Made Ground deposits were generally between 1.00 m and 2.00 m thick, although deeper Made Ground was encountered in the vicinity of the former boiler house (associated with infilled reservoir) and around the filter beds/tanks to the east. In these areas, Made Ground was found to range from 2.20 m to 5.00 m bgl. For the Sheppard Mill area, the Made Ground deposits were generally between 1.00 m and 2.00 m thick, although deeper Made Ground was encountered in the former reservoir areas in the south and southeast. In these areas, Made Ground was found to range from 2.50 m and 4.30 m bgl.
- ✚ The Made Ground on-site generally comprised a heterogeneous mixture of materials and was broadly categorised into three broad types:
 - Reworked Natural Soils – typically granular or cohesive deposits with occasional cobbles of sandstone and minimal potentially contaminative fragments (i.e., ash or clinker), present at shallow depth in undeveloped, vegetated, and wooded areas in the northern and eastern parts of the site and depth beneath the southern and western site areas.
 - Mixed Granular and Cohesive Ashy Fill – both granular and cohesive fill, containing fragments of ash, clinker, brick and concrete etc; present at various depths across much of the central, western, and southern parts of the site.
 - General Demolition Material – predominantly coarse fragments of concrete, brick and sandstone with many cobbles and boulders; interpreted as general demolition material; most extensive in the southern and south-eastern parts of the site (Shepherd Mill area).
- ✚ Natural drift deposits were found to be absent in the majority of locations within the Tack Lea Works and Sheppard Mill areas. Where drift deposits were encountered (southern boundary of Tack Lea Works area and north-eastern boundary of Sheppard Mill area), they typically comprised gravelly clay with cobbles of sandstone and saturated fine to coarse sand and gravel, extending vertically to depths of approximately 2.00 m to 4.00 m bgl.
- ✚ Shallow bedrock of sandstone was encountered in the central and western sections of the Tack Lea Works area at depths typically <2.00 m bgl. To the east of the Tack Lea Mill buildings and in the Shepherd Mill area, bedrock was found to be deeper and was encountered at depths ranging from 4.30 m (BH11) to 5.00 m bgl (BH2). To the north of the Tack Lea Works area and Sheppard Mill area, bedrock can be seen outcropping in the valley and hillsides.
- ✚ Visual and olfactory evidence of contamination was identified in a number of locations within the Sheppard Mill area, comprising slightly to very strong hydrocarbon odours within the Made Ground between 0.20 m and 4.30 m bgl.
- ✚ Some perched groundwater was found to be present within the Made Ground beneath the site, ranging in depth between 1.60 m and 3.10 m bgl. However, the 'true' groundwater was found to be present within the natural drift strata in the southern section of the Tack Lea Works area, ranging in depth between 0.90m and 2.10 m bgl. Groundwater appears to be flowing in a southern direction and being in hydraulic continuity with the Naden Brook. Beneath the Sheppard Mill area, groundwater levels appear to be perched in nature and range between 1.90 m to 4.80 m bgl, albeit that hydraulic continuity is likely within proximity to Naden Brook.
- ✚ Chemical analysis of soils identified arsenic contamination within the Made Ground across the Tack Lea Works area between 0.40 m and 0.70 m bgl. Hotspots of lead and mercury were also identified within the Made Ground in the north-western section of the Tack Lea Works area (WS09 at 0.50 m bgl, associated with a former dye works). Hotspots of hydrocarbons were identified within the Made Ground beneath the Sheppard Mill area (associated with the infilled reservoirs and historical tank) between 0.40 m and 1.00 m bgl.



- ✳ Elevated concentrations of phytotoxic elements (copper, nickel, zinc, and total sulphate) were identified within the Made Ground on the Tack Lea Works area in the north-western (associated with the former dye works), southern, and eastern section (associated with the filter beds/tanks) between 0.40 m and 1.00 m bgl.
- ✳ Elevated concentrations of leachable PAH and copper were identified within the Made Ground beneath the Sheppard Mill area (associated with the infilled reservoirs) between 0.50 m and 0.90 m bgl.
- ✳ Significant chromium, PAH, DRO and slight LRO contaminated groundwater was identified beneath the Shepherd Mill area (associated with the infilled reservoirs and historical tank). Elevated chromium was also identified within groundwater beneath the Tack Lea Works area and surface water samples from Naden Brook. Elevated ammoniacal nitrogen was identified within one groundwater sample located along the southern boundary of the Tack Lea Works area (bordering Naden Brook) and one surface water sample (filter bed/pond in the eastern section of Tack Lea Works area). Elevated copper was also recorded in the centre of the Tack Lea Works area (associated with the old boiler house/infilled reservoir).
- ✳ As the former Tenterhouse Mill site was used as a tannery during the 1960s and 1970s, thirteen soil samples were taken from across the site and submitted for anthrax bacteria testing. Targeted tests were also performed on samples of 'old leather hides' found in and around a buried chamber in the north-western part of the Tenterhouse Mill site. The test results showed that no anthrax spores/bacteria were present in the samples submitted for analysis.
- ✳ Elevated carbon dioxide concentrations (i.e., above 1.5%) have been recorded in seven monitoring wells on at least one occasion to date. The maximum elevated concentration recorded was 6.8 % in WS19 (Sheppard Mill area). No elevated concentrations of methane have been detected. No significantly elevated positive gas flow rates have been recorded. An initial appraisal of the hazardous gas regime beneath the site indicated that Characteristic Situation 1 classification would apply for the site. However, due to the relatively short period of monitoring undertaken, Encia recommended that gas protective measures in general accordance with Characteristic Situation 2 classifications be adopted as a precaution in any future development at the site.
- ✳ In terms of proposed foundations, predominantly strip footings/trench fill were considered suitable for the western and central sections of the Tack Lea Works area with piled foundations for the eastern section of the Tack Lea Works area and Sheppard Mill area.

2.1.2. LK CONSULT 2020 REPORT

- ✳ LK Consult was commissioned to carry out a contemporary risk assessment of the existing desk study and chemical data from Encia's 2006 report for land at Greenbooth Road, Norden in support of proposals to develop the site for residential end-use with associated access, parking and landscaping.
- ✳ The site may be considered as two areas of land. The central and western area is the former Tack Lea Works area with the eastern area the former Shepherd Mill area. These areas are split by Woodhouse Lane Brook which flows south into Naden Brook.
- ✳ Tack Lea Works: Two buildings remnant with a coal bunker on the northern boundary. The majority of hardstanding remains. Slopes to the north and east are heavily vegetated.
- ✳ Shepherd Mill: No buildings remain, although substantial hardstanding remains. Slopes to the northeast and southwest are heavily vegetated.



- ✚ Anecdotal evidence suggests that demolition materials were deposited alongside Naden Brook following the demolition of the old mill buildings and as such, deep fill deposits are expected to be present adjacent to the brook. An online search of records held by Rochdale Metropolitan Borough Council indicated that a historical landfill was created on-site under planning permission for “reclamation, tipping and landscaping”. Existing settlement tanks were filled on the condition that building waste and subsoil from the curtilage of Woodhouse Mill should be used and no off-site import. GMWDA reported in May 1989 that they had no objection to the extension of time application and that the site had been operated to a satisfactory standard.
- ✚ The coal bunker in the Tack Lea Works area has a suspected asbestos cement roof.
- ✚ Radon and specific SVOCs/VOCs from dye-works, bleach works, and spray booth/vehicle repair, PCBs and mineral oils should be considered as potential contamination sources/types.
- ✚ Asbestos in the form of Amosite was identified in the south-eastern section of the Sheppard Mill area (WS18) at a depth of 0.60-0.70 m bgl. Asbestos in the form of cement (likely chrysolite) was encountered at the surface in the eastern section of the Tack Lea Works area (associated with the filter beds/tanks area). These detections of asbestos had not been discussed within the Encia 2006 report.
- ✚ Soil Risk Assessment: elevated concentrations of contaminants within the shallow Made Ground (<1.00 m) have been identified on-site:
 - Elevated levels of lead in the Tack Lea Works area in the north-western (associated with the former dye works), southern, and eastern sections (associated with the filter beds/tanks), as well as the south-eastern section of the Sheppard Mill area.
 - Elevated levels of benzo(a)pyrene (used as a surrogate marker) on the Tack Lea Works area in the central (associated with the old boiler house and infilled reservoir) and eastern section (associated with the filter beds/tanks), as well as the Sheppard Mill area in the southern (associated with the infilled reservoir) and south-eastern (associated with former tank and Works) sections.
 - Elevated levels of naphthalene on the Tack Lea Works area in the central section (associated with the old boiler house and infilled reservoir), as well as the Sheppard Mill area in the southern (associated with infilled reservoir) and south-eastern (associated with former tank and Works) sections.
 - Elevated levels of 2-methylnaphthalene on the Sheppard Mill area in the southern (associated with infilled reservoir) and south-eastern (associated with former tank and Works) sections.
 - Elevated levels of aromatic TPHs on the Sheppard Mill area within the south-eastern (associated with former tank and Works) sections.
 - Elevated levels of 1,2,4-trimethylbenzene on the Sheppard Mill area within the south-eastern section (associated with the former tank).
- ✚ The source of the contamination is expected to be the ash, clinker, hydrocarbons (Shepherd Mill area) and demolition materials noted in the Made Ground. In addition, asbestos fibres were detected in one location and pieces of suspected asbestos cement were identified at the surface of another sampling location; however, these were not tested. The probability of contamination affecting site users was considered likely and remediation was recommended.



- ✿ Controlled Waters Risk Assessment: Made Ground across the site appears to be a source of low levels of leachable copper and zinc. There was also sporadic lead and mercury detected in leaching tests. However, elevated concentrations are considered to be caused by the leaching test preparation.
- ✿ Similarly, low levels are present in the groundwater and surface water samples. Limited ammoniacal nitrogen in sample W5 is likely related to the water sitting and residing filter beds/settling tank and within the area of infilled ground. The elevated PAH and TPH contamination are generally located in the Sheppard Mill area and co-incidental with the visual and olfactory observations of hydrocarbon contamination (associated with the former tank and Works); remediation was recommended in the Sheppard Mill area.
- ✿ Ground Gas Risk Assessment: Previous monitoring covered a range of atmospheric pressures and was considered to be a reasonable characterisation of the gas risk. The maximum GSV was 0.0068l/hr which equates to CS1 / Green. Carbon dioxide concentrations were recorded above 5%v/v on two occasions in WS19 only (Sheppard Mill area, associated with the former tank). The levels are only marginally elevated (maximum 6.8%v/v), and the concentrations recorded were relatively consistent. Taking this into account and the very low flow rates recorded, CS1 classification was considered appropriate.
- ✿ Concrete classification: The concentrations of soluble sulphate in the soil when contrasted to BRE Digest 200535 categorise the concrete requirement as DS-2 AC-3z in the Made Ground and DS-1 AC1 in the natural strata.
- ✿ Potable Water Supply: Probability of organic contaminants affecting potable water pipes is considered likely; remediation (i.e., barrier pipe) was likely to be required (subject to further risk assessment).
- ✿ Phytotoxic Risk Assessment: Sporadic elevated zinc concentrations in north-western and southern sections of the Tack Lea Works area were identified. Probability of phytotoxic contaminants affecting vegetation was considered likely; minor remediation (cover system) recommended.
- ✿ Remedial measures recommended for the site included earthworks inspections, hydrocarbon removal/treatment on Sheppard Mill, further chemical analysis and generic risk assessment of surface waters, an environmental cover system, basic Radon protective measures, and grubbing out of in-ground structures.
- ✿ In relation piling in contaminated land, given the depth of Made Ground, it is expected that some buildings may be piled into the bedrock. This may provide a preferential pathway for any mobile contaminants not previously identified to the Secondary A Aquifer. Once the method of piling has been determined, good practice for the drilling of piles on contaminated sites should be adhered to, such as guidance provided by the Environment Agency.

2.2. GENERAL OVERVIEW

The E3P ground investigation has been designed based on the findings of the desk study, with exploratory holes advanced to target specific potential contaminant sources identified within the previous ground investigations. The investigation has also been used to collect geotechnical information to assist in the design and construction of the proposed development.

Exploratory fieldwork was completed between 15th November -18th November 2022. The works are summarised in Table 2.1.



2.3. LIMITATIONS OF THE INVESTIGATION

Access to the eastern section of the Tack Lea Works area was limited due to dense vegetation, variable topographical level changes, existing structures (former filter beds/tanks and reservoirs), ecological constraints (i.e. badger setts), and Woodhouse Lane Brook, which separates the Tack Lea Works area and Sheppard Mill area. As such, only a limited number of exploratory holes could be advanced within this area.

Five former buildings were present in the central section of the Tack Lea Works area; no access was gained to the interiors of these buildings during the investigation.

Access to the northern and eastern sections of the Tack Lea Works area and the northern section of the Sheppard Mill area was limited due to significant topographical level changes (i.e., slopes).

Significant concrete and brick obstructions and basement features, which are indicative of relict foundations from former buildings, were identified across the site. As such, the full thickness of the Made Ground could not be fully proven in localised areas within the northern and central parts of the Tack Lea Works area and the southeastern part of the Sheppard Mill area.

E3P were unable to identify the locations of the culverted watercourses and springs associated with the former mill buildings believed to be present on-site. However, during the site walkover, a spring was identified in the far northwest part of the Tack Lea works area within an area of outcropping bedrock.

2.4. SCOPE OF INVESTIGATION

TABLE 2.1 SUMMARY OF FIELDWORK IN TACK LEA WORKS AREA

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
General Ground Conditions, Including the Presence/Nature of Obstructions	WS107	Window Sample Borehole	3.70	1.00 – 3.00
	WS108		1.25	0.50 – 1.00
	WS113		0.40	N/A
	WS114		3.09	1.00 – 3.00
	WS115		3.45	1.00 – 3.00
	TP106	Mechanically Excavated Trial Pit	1.80	N/A
	TP107		1.10	N/A
	TP108		1.20	N/A
	TP116		1.40	N/A
	TP119		1.60	N/A
	TP120		0.90	N/A
	CP101	Cable Percussion Borehole	15.00	1.00 – 5.00



POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
Former Buildings	WS101	Window Sample Borehole	4.50	1.00 – 3.00
	WS103		3.45	N/A
	WS105		2.58	1.00 – 2.50
	WS106		0.30	N/A
	WS106a		0.68	N/A
	WS109		0.60	N/A
	WS109a		0.50	N/A
	WS110		0.65	N/A
	WS110a		0.63	N/A
	WS111		4.65	N/A
	WS112		3.00	N/A
	WS116		0.78	N/A
	TP103	Mechanically Excavated Trial Pit	1.90	N/A
	TP104		0.80	N/A
	TP105		1.20	N/A
	TP109		0.70	N/A
	TP110		1.50	N/A
	TP111		0.50	N/A
	TP112		0.40	N/A
	TP113		1.10	N/A
	TP114		1.50	N/A
	TP117		2.10	N/A
	TP118		0.80	N/A
	CP102	Cable Percussion Borehole	7.00	N/A
Former Reservoir	WS102	Window Sample Borehole	3.45	N/A
	WS104		0.68	N/A
BRE 365 Soakaways	TP101	Mechanically Excavated Trial Pit	2.10	N/A
	TP115		2.20	N/A



POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
Former landfill	HP101	Hand pit	0.60	N/A
	HP102		0.70	
	HP103		0.50	
	HP104		0.40	
	HP105		0.20	
Earthen Bund	Bund01	Surface sample	N/A	N/A
Investigate Deep Groundwater	RB101	Rotary Borehole	15.00	3.00 – 13.80
	RB102		8.00	2.00 – 8.00
	RB102		5.00	1.00 – 2.90

TABLE 2.2 SUMMARY OF FIELDWORK IN THE SHEPPARD MILL AREA

POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
General Ground Conditions Including the Presence/Nature of Obstructions (including former buildings)	TP102	Mechanically Excavated Trial Pit	2.00	N/A
	TP121		0.60	N/A
	TP122		2.20	2.00 – 4.00
	TP123		2.20	N/A
	TP124		1.60	N/A
	TP125		2.10	N/A
	TP126		1.60	N/A
	TP127		1.90	N/A
	TP128		1.80	N/A
	TP129		1.90	N/A
	TP130		1.50	N/A



POTENTIAL SOURCE/RATIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
General Ground Conditions Including the Presence/Nature of Obstructions (including former buildings) <i>Continued...</i>	WS117	Window Sample Borehole	5.45	1.00 – 3.00
	WS118		0.40	N/A
	WS118a		0.40	N/A
	WS122		4.45	N/A
	WS123		1.65	N/A
	WS119		1.45	N/A
	WS120		0.80	N/A
	WS121		0.50	N/A
	WS124		3.45	0.50 – 1.50
	CP103	Cable Percussion Borehole	13.20	3.00 – 4.80
Investigate Deep Groundwater	RB104	Rotary Borehole	13.00	3.20 – 6.50
	RB105		15.00	4.00 – 9.00

Window sample probeholes were advanced to undertake in-situ detailed geotechnical testing, obtain environmental and geotechnical samples and install groundwater and ground gas monitoring wells.

Mechanically excavated trial pits were advanced to investigate ground conditions and to retrieve environmental and geotechnical samples, spatially distributed to offer the maximum site coverage whilst also being advanced to target specific contaminant sources.

Cable percussion boreholes were advanced to investigate deeper soil horizons and retrieve environmental and geotechnical samples.

Hand pits were advanced to investigate ground conditions within the historical landfill in the eastern section of the Tack Lea Works area to retrieve environmental samples. Due to dense vegetation, variable topographical level changes and existing structures (former filter beds/tanks and reservoirs) in the eastern section of the Tack Lea Works area, ground investigations within this area were limited to hand pits only.

Rotary boreholes were advanced to install deep groundwater monitoring wells and undertake further groundwater monitoring and sampling, in order to develop a robust groundwater conceptual site model and controlled waters risk assessment for the site.

The sampling locations are illustrated in Drawing 16-465-005 (Appendix III). The ground conditions encountered are indicated on the logs, which are provided in Appendix V.

Return visits were made to monitor installations for groundwater level and gas concentrations. In addition, selected wells were purged, and samples of groundwater were recovered for chemical analysis. Surface water samples were also taken from Naden Brook, Woodhouse Lane Brook and the spring identified in the far northwest part of the Tack Lea works area within an area of outcropping bedrock.

E3P was unable to locate and collect water samples from the culverted water courses and springs associated with the former mill buildings believed to be located on-site.



2.5. IN-SITU STANDARD PENETRATION TESTING (SPT)

In-situ geotechnical testing was conducted using the standard penetration test (SPT) and, where the ground is granular, a 60° cone (SPT(S)) was used instead of the sampling tube. The results are shown in the probehole logs in Appendix V, presented in Table 3.6, and discussed in Section 5.

2.6. PERMEABILITY TESTS

BRE 365 Soakaway testing was undertaken over a 24-hour period within the trial pits completed as TP101 and TP115. The results are presented in Table 3.10 and the test certificates are included in Appendix IX.

2.7. LABORATORY ANALYSIS

Selected soil samples were submitted for a range of chemical analyses comprising:

- ✦ Metals;
- ✦ pH, total sulphate, water-soluble sulphate (2:1 extract);
- ✦ Sulphide;
- ✦ Cyanide;
- ✦ Phenols;
- ✦ Total and speciated polycyclic aromatic hydrocarbons (PAHs);
- ✦ Semi-Volatile Organic Compounds (SVOC);
- ✦ Volatile Organic Compounds (VOC);
- ✦ Asbestos identification and quantification;
- ✦ Speciated and banded total petroleum hydrocarbon (TPH); and,
- ✦ Polychlorinated Biphenyls (PCBs).

I2 Analytical undertook the analytical work and the testing results are included in Appendix VI and discussed in Section 4.

Selected groundwater and surface water samples were submitted for a range of chemical analysis comprising:

- ✦ Metals;
- ✦ Cyanide;
- ✦ Phenols;
- ✦ Total and speciated polycyclic aromatic hydrocarbons (PAHs);
- ✦ Semi-Volatile Organic Compounds (SVOC);
- ✦ Volatile Organic Compounds (VOC); and,



 PFAS / PFOS.

I2 Analytical undertook the analytical work and testing results are indicated in Appendix VI and discussed in Section 4.

Selected samples were submitted to PSL Laboratory where the following geotechnical tests were undertaken:

-  Moisture Content;
-  Atterberg limits determinations;
-  Particle Size Distributions; and,
-  One-Dimensional Consolidation Tests.

Laboratory analysis sheets are included in Appendix VIII and are summarised in Section 5.



3. GROUND AND GROUNDWATER CONDITIONS

3.1. SUMMARY OF GROUND CONDITIONS

The ground investigation generally confirms the published geology and identifies the strata set out in Table 3.1.

TABLE 3.1 SUMMARY OF STRATA

HOLE	DEPTH TO STRATUM (m bgl)					
	MADE GROUND	SOFT TO FIRM CLAY	STIFF TO VERY STIFF CLAY	GRAVEL	SAND	BEDROCK (SANDSTONE)
WS101	0.00-3.00	3.00-4.00	4.00-4.50	-	-	-
WS102	0.00-0.80	0.80-2.00	-	2.00-3.45	-	-
WS103	0.00-0.60	-	-	0.60-2.45	-	-
WS104	0.00-0.68*	-	-	-	-	-
WS105	0.00-1.00	-	-	1.00-2.50	-	-
WS106	0.00-0.30*	-	-	-	-	-
WS106a	0.00-0.68*	-	-	-	-	-
WS107	0.00-2.00	2.00-3.00	-	3.00-3.70	-	-
WS108	0.00-1.25*	-	-	-	-	-
WS109	0.00-0.60*	-	-	-	-	-
WS109a	0.00-0.60*	-	-	-	-	-
WS110	0.00-0.60*	-	-	-	-	-
WS110a	0.00-0.63*	-	-	-	-	-
WS111	0.00-1.00	-	1.00-3.00	3.00-4.65	-	-
WS112	0.00-1.20	-	1.20-3.00	-	-	-
WS113	0.00-0.40*	-	-	-	-	-
WS114	0.00-0.50	0.50-1.00	-	1.00-4.08	-	-
WS115	0.00-3.45*	-	-	-	-	-
WS116	0.00-0.50	-	0.50-0.78	-	-	-
WS117	0.00-3.00	-	3.00-5.45	-	-	-
WS118	0.00-0.40*	-	-	-	-	-
WS118a	0.00-0.40*	-	-	-	-	-
WS119	0.00-0.80	0.80-1.00	-	1.00-1.45	-	-
WS120	0.00-0.50	-	-	0.50-0.80	-	-
WS121	0.00-0.50*	-	-	-	-	-
WS122	0.00-2.00	2.00-4.00	4.00-4.45	-	-	-
WS123	0.00-1.65*	-	-	-	-	-
WS124	0.00-3.45*	-	-	-	-	-



HOLE	DEPTH TO STRATUM (m bgl)					
	MADE GROUND	SOFT TO FIRM CLAY	STIFF TO VERY STIFF CLAY	GRAVEL	SAND	BEDROCK (SANDSTONE)
TP101	0.00-0.80	-	0.80-2.10	-	-	-
TP102	0.00-2.00*	-	-	-	-	-
TP103	0.00-1.10	-	-	-	1.10-1.90	-
TP104	0.00-0.80*	-	-	-	-	-
TP105	0.00-1.20*	-	-	-	-	-
TP106	0.00-1.80*	-	-	-	-	-
TP107	0.00-1.10*	-	-	-	-	-
TP108	0.00-1.20*	-	-	-	-	-
TP109	0.00-0.70*	-	-	-	-	-
TP110	0.00-1.50	1.50-1.60	-	-	1.60-1.80	-
TP111	0.00-0.50*	-	-	-	-	-
TP112	0.00-0.40*	-	-	-	-	-
TP113	0.00-1.10*	-	-	-	-	-
TP114	0.00-1.50*	-	-	-	-	-
TP115	0.00-1.10	1.10-2.20	-	-	-	-
TP116	0.00-1.40*	-	-	-	-	-
TP117	0.00-1.00	1.00-2.10	-	-	-	-
TP118	0.00-0.80*	-	-	-	-	-
TP119	0.00-1.50	-	-	1.50-1.60	-	-
TP120	0.00-0.90*	-	-	-	-	-
TP121	0.00-0.60*	-	-	-	-	-
TP122	0.00-1.50	1.50-2.20	-	-	-	-
TP123	0.00-2.20	-	-	-	-	-
TP124	0.00-0.50	0.50-1.60	-	-	-	-
TP125	0.00-1.00	1.00-2.10	-	-	-	-
TP126	0.00-1.60*	-	-	-	-	-
TP127	0.00-1.90*	-	-	-	-	-
TP128	0.00-1.80*	-	-	-	-	-
TP129	0.00-1.90*	-	-	-	-	-
TP130	0.00-1.20	-	-	1.20-1.50	-	-
CP101	0.00-3.70	-	4.90-15.00	3.70-4.90	-	-
CP102	0.00-5.80	-	-	5.80-7.00	-	-
CP103	0.00-3.00	-	4.80-12.10 12.30-13.20	3.00-4.80 12.10-12.30	-	-



HOLE	DEPTH TO STRATUM (m bgl)					
	MADE GROUND	SOFT TO FIRM CLAY	STIFF TO VERY STIFF CLAY	GRAVEL	SAND	BEDROCK (SANDSTONE)
HP101	0.00-0.60*	-	-	-	-	
HP102	0.00-0.70*	-	-	-	-	
HP103	0.00-0.50*	-	-	-	-	
HP104	0.00-0.40*	-	-	-	-	
HP105	0.00-0.20*	-	-	-	-	
RB101	0.00-2.80	2.80-3.60# 6.90-13.80#		3.60-6.90 (S&G)		13.80-15.00
RB102	0.00-0.60	0.60-1.60#		-	-	1.60-8.00
RB103	0.00-0.80	0.80-1.60#		1.60-2.90 (S&G)		2.90-5.00
RB104	0.00-3.20	6.50-11.80#		3.20-6.50 (S&G)		11.80-13.00
RB105	0.00-3.90	6.80-11.60#		3.90-6.80	-	11.60-15.00

Notes:

* Denotes Base of Made Ground not found, # Strength not determined, S&G – Sand and Gravel

3.2. MADE GROUND

Made Ground deposits were encountered within all exploratory hole locations to depths ranging between 0.00 m and 5.80 m bgl. However, in 23 locations in the Tack Lea Works area and 13 locations in the Sheppard Mill area, the full thickness of Made Ground could not be proven due to significant concrete and brick obstructions and basement features, which are indicative of relict foundations from the former buildings. The five hand pit locations within the eastern section of the Tack Lea Works area were all terminated within Made Ground.

Obstructions identified during the ground investigation are shown on the Development Constraints Plan, presented as Drawing 16-465-015 in Appendix III.

In all locations except WS101 and WS103 (central section of the Tack Lea Works area), concrete was encountered to a maximum proven depth of 0.68 m bgl (WS104). The concrete often contained rebar. In WS101 and WS103, dark brown clay with occasional rootlets (reworked topsoil) was encountered.

In the majority of locations, the concrete was underlain by brown sandy gravel with gravels of sandstone, mudstone, limestone, concrete, and brick.

In two locations in the Tack Lea Works area (TP118, and TP120) and one location in the Sheppard Mill area (TP121) a brown gravelly sand was encountered.

In five locations in the Tack Lea Works area (WS101, WS102, WS103, WS107 and WSS14) and three locations in the Sheppard Mill area (WS119, WS122 and WS124) a brown gravelly clay was encountered underneath the sandy gravel.

In one location within the Tack Lea Works area (TP113), a dark brown blackish slightly clayey slightly gravelly silt and a white sandy silt was encountered.

Frequent fragments of ceramic, glass, wood, and metal were encountered within the Made Ground. Ash was also encountered in one location within the Tack Lea Works area (WS115) and one location in the Sheppard Mill area (WS123). Intact empty plastic bottles of fabric softener were also encountered in one location within the Tack Lea Works area (TP114).



In the Tack Lea Works area, Made Ground deposits were generally encountered between 1.00 m and 2.00 m bgl, with shallower deposits (< 1.00 m bgl) located along the northern boundary (i.e. closer to the valley edge). Deeper Made Ground deposits, ranging between 2.00 m and 5.80 m bgl, were encountered in the northwest part of the site (associated with the infilled sandstone quarry), the central part of the site (associated with infilled reservoirs) and the eastern part of the site (associated with the filter tanks, reservoirs and historical landfill).

In the Sheppard Mill area, Made Ground deposits were generally encountered between 2.00 m and 5.10 m bgl, with shallower deposits (< 1.00 m bgl) located along the northern boundary (i.e. closer to the valley edge). The deepest Made Ground deposits were encountered along the southern boundary associated with the former buildings and infilled reservoirs.

A Depth of Made Ground Plan is presented as Drawing 16-465-006 in Appendix III.

3.3. DRIFT DEPOSITS

Drift deposits were encountered within twenty-nine exploratory hole locations between depths of 0.50 m and 15.00 m bgl. Both granular and cohesive drift deposits were encountered, which generally comprised a loose to dense brown clayey to sandy GRAVEL overlying a brown gravelly CLAY with gravels of mudstone and sandstone. The strength of CLAY varied from soft to very stiff.

Drift deposits were noted to be shallower (between 1.00 m and 2.50 m thick) along the northern parts of the Tack Lea Works area and Sheppard Mill area (i.e. closer to the valley edge). Deeper drift deposits (between 7.70 m and 11.00 m thick) were noted to be present along the western and southern boundaries of the Tack Lea Works area and the southern boundary of the Sheppard Mill area (i.e. towards the centre of the valley).

In seven locations across the Tack Lea Works area (TP130, WS102, WS103, WS105, WS107, WS111 and WS114) and two locations within the Sheppard Mill area (WS119 and WS120), a loose to dense brown clayey GRAVEL was encountered with gravels of sandstone and mudstone.

In four locations located across the Tack Lea Works area (WS114, TP130, CP101 and CP102) and two locations located across the Sheppard Mill area (WS120 and CP103), a loose to dense brown sandy GRAVEL was encountered.

In two locations located along the northern and southern boundaries of the Tack Lea Works area (RB101 and RB103), and two locations located along the southern boundary of the Sheppard Mill Area (TB104 and RB105), a brown fine to medium SAND & GRAVEL was encountered.

In TP103 (south-western boundary of the Tack Lea Works area), a brown gravelly SAND was encountered with gravels of sandstone and mudstone.

3.4. SOLID GEOLOGY

The solid bedrock geology was encountered within five exploratory hole locations. Shallow bedrock was encountered between 1.60 m and 2.90 m bgl along the northern part of the Tack Lea Works area (i.e. closer to the valley edge). Along the southern boundaries of the Tack Lea Works area and Sheppard Mill area (i.e. towards the centre of the valley), deep bedrock was encountered between 11.60 m and 13.80 m bgl. The bedrock generally comprised of a greyish brown SANDSTONE. Outcrops of bedrock were also noted to be present in the northwest part of the Tack Lea works area and along the northern boundaries of the Tack Lea Works area and Sheppard Mill area.



In the Encia Consulting 2006 Report, shallow bedrock of sandstone was encountered in the central and western sections of the Tack Lea Works area at depths typically <2.00 m bgl. To the east of the former Tack Lea Mill Buildings and in the Sheppard Mill area, bedrock was found to be deeper and was encountered at depths ranging between 4.30 m and 5.00 m bgl. To the north of the Tack Lea Works area and Sheppard Mill area, bedrock can be seen outcropping in the valley and hillsides.

A Depth to Bedrock Plan is presented as Drawing 16-465-012 in Appendix III.

3.5. GROUNDWATER

Groundwater strikes were predominantly encountered as seepages, with moderate ingress encountered in one location in the Tack Lea Works area (TP119). The depth of the groundwater strikes are shown on the exploratory hole records in Appendix V and are summarised in Table 3.2.

TABLE 3.2 SUMMARY GROUNDWATER STRIKES

LOCATION	DEPTH TO STRIKE (m bgl)	NOTES
WS122	2.50	Seepage with sheen
TP103	1.50	Seepage
TP114	1.50	Seepage (Perched)
TP119	1.50	Moderate ingress
TP122	2.00	Seepage
TP130	1.40	Seepage
CP101	3.70	Strike in borehole
CP103	3.00	Strike in borehole
CP103	12.10	Strike in borehole
RB103	1.90	Strike in borehole
RB105	3.90	Strike in borehole

During the monitoring programme, groundwater levels were recorded between 0.59 m and 4.89 m bgl.

3.6. VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

Visual and olfactory evidence of potential contamination has been identified during the ground investigation and these are summarised in Table 3.3.

TABLE 3.3 SUMMARY OF VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

LOCATION	DEPTH (m bgl)	STRATUM	NOTES
WS107	2.00	CLAY	Slight hydrocarbon odour
WS117	2.00	Made Ground	Slight hydrocarbon odour
WS122	2.00	CLAY	Slight hydrocarbon odour and sheen
TP116	1.10	Made Ground	Slight hydrocarbon odour
TP122	0.60	Made Ground	Slight hydrocarbon odour
TP123	0.60	Made Ground	Slight hydrocarbon odour



LOCATION	DEPTH (m bgl)	STRATUM	NOTES
TP124	0.60	Made Ground	Slight hydrocarbon odour
TP125	1.00	Made Ground	Slight hydrocarbon odour
TP126	0.70	Made Ground	Slight hydrocarbon odour
CP103	3.00	GRAVEL	Slight hydrocarbon odour
HP105	0.20	Made Ground	Asbestos Containing Material

3.7. SOIL CONSISTENCY

Undrained shear strength values were measured using both field hand shear vane tests and laboratory undrained triaxial tests. Results of the tests are presented in Table 3.4 and Table 3.5, which indicate the clay soils to vary between stiff and very stiff. Strength test data is generally consistent with the field descriptions of the aforementioned soils.

TABLE 3.4 SUMMARY OF HAND SHEAR VANE TESTS

LOCATION	DEPTH (m bgl)	SHEAR STRENGTH (kPa)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m ²)	CLASSIFICATION
TP101	1.00	134	314.90	Stiff high strength CLAY
TP101	1.50	137	321.95	Stiff high strength CLAY
TP101	1.90	142	333.70	Stiff high strength CLAY
TP110	1.50	43	101.05	Firm medium strength CLAY
TP110	1.00	52	122.20	Firm medium strength CLAY
TP115	1.50	20	47.00	Soft low strength CLAY
TP115	2.00	27	63.45	Soft low strength CLAY
TP117	1.50	54	126.90	Firm medium strength CLAY
TP117	2.00	34	79.90	Soft low strength CLAY
TP122	2.00	18	42.30	Very soft very low strength CLAY
TP124	1.00	38	29.30	Soft low strength CLAY
TP124	1.50	40	94.00	Firm medium strength CLAY
TP125	1.50	53	124.55	Firm medium strength CLAY



LOCATION	DEPTH (m bgl)	SHEAR STRENGTH (kPA)	CALCULATED ALLOWABLE BEARING PRESSURE (kN/m ²)	CLASSIFICATION
TP125	2.00	63	148.05	Firm medium strength CLAY

Notes

ABP Calculated using Stroud and Butler et al 1974.

TABLE 3.5 SUMMARY OF UNDRAINED SHEAR STRENGTH TEST RESULTS

LOCATION	SAMPLE DEPTH (m bgl)	LAB DESCRIPTION	UNDRAINED SHEAR STRENGTH (kN/m ²)	CONSISTENCY
CP101	8.00	Firm brown slightly gravelly very sandy CLAY	65	Firm

Results of the standard penetration tests, including undrained shear strengths derived from SPTs, are included in Table 3.6.

3.8. SIDE STABILITY AND EASE OF EXCAVATION

The sides of the exploratory trial pit excavations appeared to be generally stable during natural strata excavation and unstable within Made Ground.

The presence of brick and concrete cobbles within the Made Ground deposits meant that excavation was slow through the Made Ground and in some places, Made Ground could not be fully penetrated. The natural strata were excavated with relative ease.



TABLE 3.6 STANDARD/CONE PENETRATION TEST RESULTS

BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS101	1.00	Made Ground	1	1.01	Very Loose	N/A	N/A	N/A	10.08
WS101	2.00	Made Ground	8	7.31	Loose	N/A	N/A	N/A	73.08
WS101	3.00	Gravelly CLAY	9	7.83	N/A	Low Strength	Firm	39.13	80.46
WS101	4.00	Gravelly CLAY	28	23.66	N/A	High Strength	Very stiff	118.28	243.18
WS101	4.20	Gravelly CLAY	50	42.06	N/A	Very High Strength	Very stiff	210.30	432.38
WS102	1.00	Gravelly CLAY	3	3.02	N/A	Very low strength	Soft	15.12	31.09
WS102	2.00	Clayey GRAVEL	8	7.31	Loose	N/A	N/A	N/A	73.08
WS102	3.00	Clayey GRAVEL	50	43.48	Dense	N/A	N/A	N/A	434.83
WS103	1.00	Clayey GRAVEL	7	7.06	Loose	N/A	N/A	N/A	70.57
WS103	2.00	Clayey GRAVEL	50	45.68	Dense	N/A	N/A	N/A	456.77
WS105	1.00	Clayey GRAVEL	6	6.05	Loose	N/A	N/A	N/A	60.49
WS105	2.00	Clayey GRAVEL	17	15.53	Medium Dense	N/A	N/A	N/A	155.30
WS105	2.50	Clayey GRAVEL	50	44.41	Dense	N/A	N/A	N/A	444.09
WS107	1.00	Made Ground	10	10.08	Medium Dense	N/A	N/A	N/A	100.81
WS107	2.00	Silty CLAY	6	5.48	N/A	Low Strength	Firm	27.41	56.35



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS107	3.00	Clayey GRAVEL	37	32.18	Dense	N/A	N/A	N/A	321.77
WS107	3.40	Clayey GRAVEL	50	42.91	Dense	N/A	N/A	N/A	429.09
WS108	1.00	Made Ground	50	50.41	Dense	N/A	N/A	N/A	504.07
WS111	1.00	Silty CLAY	8	8.07	N/A	Medium Strength	Stiff	40.33	82.91
WS111	2.00	Silty CLAY	11	10.05	N/A	Medium Strength	Stiff	50.24	103.30
WS111	3.00	Sandy GRAVEL	32	27.83	Medium Dense	N/A	N/A	N/A	28.29
WS111	4.00	Sandy GRAVEL	18	15.21	Medium Dense	N/A	N/A	N/A	152.07
WS111	4.45	Sandy GRAVEL	50	41.82	Dense	N/A	N/A	N/A	418.18
WS112	1.00	Made Ground	11	11.09	Medium Dense	N/A	N/A	N/A	110.90
WS112	2.00	Silty CLAY	13	11.88	N/A	Medium Strength	Stiff	59.38	122.09
WS112	2.70	Silty CLAY	50	44.01	N/A	Very High Strength	Very Stiff	220.03	452.37
WS114	1.00	Sandy GRAVEL	25	25.20	Medium Dense	N/A	N/A	N/A	252.04
WS114	2.00	Sandy GRAVEL	17	15.53	Medium Dense	N/A	N/A	N/A	155.30



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS114	3.00	Clayey GRAVEL	19	16.52	Medium Dense	N/A	N/A	N/A	165.23
WS114	4.00	Clayey GRAVEL	50	42.24	Dense	N/A	N/A	N/A	422.43
WS115	1.00	Made Ground	2	2.02	Very Loose	N/A	N/A	N/A	20.16
WS115	2.00	Made Ground	5	4.57	Loose	N/A	N/A	N/A	45.68
WS115	3.00	Made Ground	50	43.48	Dense	N/A	N/A	N/A	434.83
WS117	1.00	Made Ground	19	19.15	Medium Dense	N/A	N/A	N/A	191.55
WS117	2.00	Made Ground	9	8.22	N/A	Medium Strength	Stiff	41.11	84.52
WS117	3.00	Silty CLAY	17	14.8	N/A	Medium Strength	Stiff	73.92	151.98
WS117	4.00	Silty CLAY	18	15.21	N/A	High Strength	Very Stiff	76.04	156.33
WS117	5.00	Silty CLAY	18	14.93	N/A	Medium Strength	Stiff	74.67	153.51
WS119	1.00	Clayey GRAVEL	50	50.41	Dense	N/A	N/A	N/A	504.07
WS122	1.00	Made Ground	0	0.00	N/A	N/A	N/A	N/A	N/A
WS122	2.00	Gravelly CLAY	7	6.39	N/A	Low Strength	Firm	31.97	65.74
WS122	3.00	Gravelly CLAY	8	6.96	N/A	Low Strength	Firm	34.79	71.52
WS122	4.00	Gravelly CLAY	50	42.24	N/A	Very High Strength	Very Stiff	211.21	434.25



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
WS123	1.00	Made Ground	37	37.30	Dense	N/A	N/A	N/A	373.02
WS123	1.50	Made Ground	50	47.51	Dense	N/A	N/A	N/A	475.08
WS124	1.00	Made Ground	10	10.08	Medium Dense	N/A	N/A	N/A	100.81
WS124	2.00	Made Ground	4	3.65	Very Loose	N/A	N/A	N/A	36.54
WS124	3.00	Made Ground	50	43.48	Dense	N/A	N/A	N/A	434.83
CP101	1.00	Made Ground	8	16.13	Loose	N/A	N/A	N/A	80.65
CP101	2.00	Made Ground	7	19.18	Loose	N/A	N/A	N/A	63.95
CP101	3.00	Made Ground	6	20.87	Loose	N/A	N/A	N/A	52.18
CP101	4.00	Sandy GRAVEL	50	211.21	Dense	N/A	N/A	N/A	422.43
CP101	5.00	Gravelly CLAY	14	69.69	N/A	Medium strength	Stiff	58.07	119.40
CP101	6.50	Gravelly CLAY	14	80.01	N/A	Medium strength	Stiff	57.15	117.49
CP101	9.50	Gravelly CLAY	17	109.61	N/A	Medium strength	Stiff	68.50	140.85
CP101	11.00	Gravelly CLAY	35	243.61	N/A	High strength	Very Stiff	135.34	278.26
CP101	12.50	Gravelly CLAY	51	372.61	N/A	Very high strength	Very Stiff	186.31	383.05
CP101	14.00	Gravelly CLAY	50	380.99	N/A	Very high strength	Very Stiff	173.18	356.06



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
CP101	15.00	Gravelly CLAY	50	401.79	N/A	Very high strength	Very Stiff	167.41	344.20
CP102	1.00	Made Ground	39	39.32	Dense	N/A	N/A	N/A	393.18
CP102	2.00	Made Ground	35	31.97	Dense	N/A	N/A	N/A	319.74
CP102	3.00	Made Ground	50	43.48	Dense	N/A	N/A	N/A	434.83
CP102	4.00	Made Ground	24	20.28	Medium Dense	N/A	N/A	N/A	202.76
CP102	5.00	Made Ground	24	19.91	Medium Dense	N/A	N/A	N/A	199.11
CP102	6.00	Sandy GRAVEL	50	40.99	Dense	N/A	N/A	N/A	409.94
CP102	7.00	Sandy GRAVEL	50	40.68	Dense	N/A	N/A	N/A	406.78
CP103	1.00	Made Ground	18	18.15	Medium Dense	N/A	N/A	N/A	181.47
CP103	2.00	Made Ground	19	17.36	Medium Dense	N/A	N/A	N/A	173.57
CP103	3.00	Sandy GRAVEL	8	6.96	Loose	N/A	N/A	N/A	69.57
CP103	4.00	Sandy GRAVEL	21	17.74	Medium Dense	N/A	N/A	N/A	177.42
CP103	5.00	Gravelly CLAY	14	11.61	N/A	Medium strength	Stiff	58.07	119.40
CP103	6.50	Gravelly CLAY	20	16.33	N/A	High strength	Very Stiff	81.64	167.85



BOREHOLES	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT "N" VALUE	CORRECTED "N" VALUE (N ₁) ₆₀	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING PRESSURE (kN/m ²)*
CP103	9.50	Gravelly CLAY	22	17.73	N/A	High strength	Very Stiff	88.65	182.27
CP103	11.00	Gravelly CLAY	50	38.67	N/A	Very high strength	Very Stiff	193.34	397.51
CP103	12.50	Gravelly CLAY	50	36.53	N/A	Very high strength	Very Stiff	182.65	375.53
CP103	13.20	Gravelly CLAY	50	35.62	N/A	Very high strength	Very Stiff	178.10	366.17

NOTES

* The Allowable Bearing Pressure (ABP) should be considered indicative.

The interpretation of in situ mass undrained shear strength (cu) data from SPT Blow Count (N) results and the influence of the Plasticity Index (PI) was reported in Standard Penetration Test in Insensitive Clays and Soft Rocks. Stroud (1974). The standard penetration test and the engineering properties of glacial materials subsequently. Stroud and Butler (1975) and (1989).

Allowable bearing pressure on sands. Soil Mechanics in Engineering Practice Terzaghi, K. & Peck, R.B. 1996.

Bold text denotes soft/loose/low strength soils.



3.9. CONSOLIDATION

Two undisturbed samples of CLAY were submitted for oedometer analysis. The results are provided in Table 3.7. The full results can be found in Appendix VIII.

TABLE 3.7 OEDOMETER CONSOLIDATION RESULTS

LOCATION	DEPTH (m)	SAMPLE TYPE	MOISTURE CONTENT (%)	OEDOMETER CONSOLIDATION		
				PRESSURE RANGE (kPa)	M _v (m ² /MN)	C _v (m ² /year)
CP101	8.00	U100	15	0–165	0.249	0.708
				165-330	0.087	0.944
				330-660	0.055	1.042
				660-1320	0.032	1.322
				1320-165	0.013	1.828
CP103	8.00	U100	15	0–165	0.220	0.936
				165-330	0.091	1.013
				330-660	0.057	1.246
				660-1320	0.032	1.588
				1320-165	0.011	1.495

The coefficient of volume compressibility (M_v) ranged from 0.011 m²/MN up to 0.249 m²/MN. When considering the overburden pressure of 160 kPa with an additional load of 100 kPa from construction, the coefficient of volume compressibility (M_v) ranges between 0.087 m² /MN and 0.091 m² /MN, which corresponds with a low compressibility.

The rate at which settlement is likely to occur is determined by the coefficient of consolidation (C_v). As shown in Table 3.7, the coefficient ranges from 0.944 m²/yr to 1.013 m²/yr, i.e., within 13 months.

3.10. PARTICLE SIZE DISTRIBUTION

Particle Size Distribution Tests have been undertaken on selected samples of granular material via wet sieve to obtain information on the soil fractions. The results are included in Table 3.8. The full results can be found in Appendix VIII.

TABLE 3.8 SUMMARY OF PARTICLE SIZE DISTRIBUTION TEST RESULTS

LOCATION	DEPTH (m)	SOIL FRACTION (%)			
		COBBLES	GRAVEL	SAND	SILT/CLAY
TP110	1.70	0	12	50	38
TP119	1.50	17	60	12	11
CP101	1.00	13	29	36	22
CP101	3.00	0	71	26	3
CP101	4.00	9	14	33	44
CP103	1.00	21	44	28	7
CP103	4.00	0	86	11	3



3.11. SOIL DENSITY/MOISTURE CONTENT RELATIONSHIP

Dry density/moisture content relationship analysis has been conducted on soils via proctor compaction tests utilising a 4.5 kg rammer. The results of the tests have been summarised in Table 3.9. The full test results can be found in Appendix VIII.

TABLE 3.9 SUMMARY DRY DENSITY AND MOISTURE CONTENT

LOCATION	LABORATORY DESCRIPTION	TOP DEPTH (m bgl)	METHOD OF COMPACTION	INITIAL MOISTURE CONTENT (%)	OPTIMUM MOISTURE CONTENT (%)	MATERIAL RETAINED ON 37.5 mm SIEVE (%)	MAX DRY DENSITY (mg/m ³)	MATERIAL RETAINED ON 20.0 mm TEST SIEVE (%)
TP110	Brown gravelly very sandy CLAY.	1.70	4.5kg	25	16	4	1.79	2
TP119	Brown sandy clayey GRAVEL with cobbles.	1.50	4.5kg	24	12	39	1.86	19
CP101	Brown very sandy very clayey GRAVEL with cobbles.	1.00	4.5kg	24	12	26	1.93	8
CP101	Brown very sandy slightly clayey GRAVEL	3.00	4.5kg	6.8	9	14	2.08	23
CP101	Brown very gravelly very sandy CLAY with cobbles.	4.00	4.5kg	19	13	12	1.90	1
CP103	Brown very sandy clayey GRAVEL with many cobbles.	1.00	4.5kg	16	10	28	1.98	8
CP103	Brown sandy slightly silty GRAVEL.	4.00	4.5kg	12	10	24	2.03	36

The proctor compaction tests have indicated that the materials on-site are variable with the material in all locations being wet of the optimum, except for CP101 at 3.00 m bgl. It should be noted that if this material is excavated for use in a cut/fill operation, careful consideration should be taken in the stabilisation of this material.

Engineering of this type of material will need to be completed during dry weather periods only.

3.12. SOIL INFILTRATION

Two In-situ BRE 365 Soakaway tests were undertaken over a 48-hour period within trial pits completed as TP101 and TP115.

The results are presented in Table 3.10 below and the test certificates are included within Appendix IX.



TABLE 3.10 BRE365 SOAKAWAY TESTING RESULTS

LOCATION	DEPTH (m)	MATERIAL	TEST NO.	SOIL INFILTRATION RATE (m/s)
TP101	2.00	Gravelly CLAY	Test No.1	N/A
TP115	1.90	Sandy CLAY	Test No.1	-1.66E-04
TP115	1.90	Sandy CLAY	Test No.2	8.89E-05
TP115	1.90	Sandy CLAY	Test No.3	9.85E-05

Soil infiltration was taken over the wetted area from between 75% and 25% of the effective depth. In TP101 where clay drift deposits were present, soakage potential was significantly reduced.

In TP115, the trial pit collapsed during the first test, the second and third tests were then undertaken within the granular Made Ground.

It is considered that soakaway drainage is not suitable for the proposed development. However, the application of soakaway drainage will ultimately be dependent on the specific requirements of the development. All soakaways should be designed in accordance with BRE Special Digest 365 – *Soakaway Design*.

3.13. SOIL PLASTICITY

The Atterberg limits determinations, summarised in Table 3.11, show the clay to be of predominantly low plasticity with discrete areas of moderate plasticity clay.

TABLE 3.11 SUMMARY OF PLASTICITY INDEX TEST RESULTS

LOCATION	DEPTH (m)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425 µm SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
WS101	4.00	17	NP*					
WS102	1.00	28	22	41	19	64	12.16	LOW
WS105	2.00	22	20	38	18	83	14.94	LOW
WS117	4.00	15	14	27	14	81	11.34	LOW
CP101	5.00	14	15	32	17	85	14.45	LOW
CP101	8.00	14	14	29	15	81	12.15	LOW
CP101	9.50	28	15	30	15	92	13.80	LOW
CP101	12.50	16	16	34	18	80	14.40	LOW
CP101	14.00	14	14	30	16	83	13.28	LOW
CP103	5.00	21	16	31	15	85	12.75	LOW



LOCATION	DEPTH (m)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425 µm SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
CP103	6.50	20	15	29	14	87	12.18	LOW
CP103	11.00	25	16	30	14	83	11.62	LOW
CP103	12.50	27	13	27	14	81	11.34	LOW

*NP = Non-Plastic

The results of the Atterberg limits testing confirmed that the soils would be deemed to be “Low Volume Change Potential” in accordance with the classification system utilised by the LABC/NHBC industry guidance.

3.14. pH AND SULPHATE

Chemical analyses for pH and soluble sulphate content contained in Appendix V (summarised in Table 3.12), shows that the soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with BRE *Special Digest 1* (2005).

In the LK Consultant 2020 Report, concentrations of soluble sulphate in the soil when contrasted to BRE Digest 200535 categorised the concrete requirements as DS-2 AC-3z in the Made Ground and DS-1 AC-1 in the natural strata.

TABLE 3.12 SUMMARY OF pH AND SULPHATE DATA

LOCATION	DEPTH (m)	SO ₄ IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
WS105	2.60	0.016	7.9	DS-1, AC-1
WS107	2.50	0.045	7.5	DS-1, AC-1
WS110	0.50	0.016	8.5	DS-1, AC-1
WS111	0.60	0.015	8.2	DS-1, AC-1
WS112	2.60	0.074	8.2	DS-1, AC-1
WS115	1.70	0.048	8.6	DS-1, AC-1
WS116	0.80	0.031	7.7	DS-1, AC-1
WS117	3.20	0.11	7.9	DS-1, AC-1
WS122	3.20	0.03	7.8	DS-1, AC-1
WS124	3.60	0.03	7.8	DS-1, AC-1
TP108	0.70	0.17	10.3	DS-1, AC-1
TP110	1.00	0.094	10.5	DS-1, AC-1
TP113	0.90	0.022	11.6	DS-1, AC-1
TP114	1.00	0.35	10.1	DS-1, AC-1
TP115	0.80	0.081	10	DS-1, AC-1
TP116	1.20	0.33	8.4	DS-1, AC-1



LOCATION	DEPTH (m)	SO ₄ IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
TP120	0.20	0.003	8.4	DS-1, AC-1
TP122	1.00	0.1	8.1	DS-1, AC-1
TP123	0.80	0.14	8.7	DS-1, AC-1
TP124	1.40	0.02	7.6	DS-1, AC-1
TP125	1.00	0.04	7.8	DS-1, AC-1
TP126	0.90	0.085	8.0	DS-1, AC-1
Bund01	-	0.042	8	DS-1, AC-1



4. TIER 2 QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

E3P has undertaken a Tier 2 qualitative risk assessment to determine if any potential contaminants within the underlying soils and groundwater pose an unacceptable level of risk to the identified receptors.

4.1. HUMAN HEALTH RISK ASSESSMENT

At Tier 2 stage, the long-term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published in LQM/CIEH S4UL (S4UL3267).

Where Tier 2 screening values are not provided by LQM, other screening values have been used and these are referenced in Table 4.1.

The results of this comparison have been summarised within Table 4.1.

TABLE 4.1 SUMMARY OF INORGANIC AND HYDROCARBON TOXICITY ASSESSMENT FOR A RESIDENTIAL END USE

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
Arsenic	mg/kg	37	25	40 38	TP113 WS110	1	Further Action
Cadmium	mg/kg	11	25	1.6	-	1	No further action
Chromium (VI)	mg/kg	6.0	25	2.8	-	1	No further action
Lead***	mg/kg	200	25	610 590 500 460 430 320 300 250	TP113 TP116 TP126 WS110 TP115 WS101 Bund01 TP122	1	Further Action
Mercury	mg/kg	1.2	25	7.8	WS111	4	Further Action
Nickel	mg/kg	130	25	69	-	1	No further action
Selenium	mg/kg	250	25	<1.0	-	1	No further action
Copper	mg/kg	2400	25	240	-	1	No further action
Zinc	mg/kg	3700	25	280	-	1	No further action
Cyanide – Total	mg/kg	791	25	<1.0	-	1	No further action
Phenols – Total	mg/kg	120	23	3	-	1	No further action
Asbestos	Fibres	NFD	23	Chrysotile, Amosite	WS124 HP05 TP114 TP116	3	Further Action
Naphthalene	mg/kg	2.3	15	12 10 4.5 4.3 2.5	TP123 WS122 TP122 TP126 WS117	4	Further Action
Acenaphthylene	mg/kg	170	15	0.22	-	2	No further action
Acenaphthene	mg/kg	210	15	24	-	1	No further action



DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
Fluorene	mg/kg	170	15	22	-	1	No further action
Phenanthrene	mg/kg	95	15	110	TP123	2	Further Action
Anthracene	mg/kg	2400	15	29	-	2	No further action
Fluoranthene	mg/kg	280	15	110	-	2	No further action
Pyrene	mg/kg	620	15	95	-	2	No further action
Benzo(a)Anthracene	mg/kg	7.2	15	57 20 16 14	TP123 TP122 WS117 TP126	2	Further Action
Chrysene	mg/kg	15	15	48 17	TP123 TP122	2	Further Action
Benzo(b)Fluoranthene	mg/kg	2.6	15	60 20 17 13 5 4.9	TP123 TP122 WS117 TP126 TP116 TP115	2	Further Action
Benzo(k)Fluoranthene	mg/kg	77	15	25	-	2	No further action
Benzo(a)Pyrene	mg/kg	2.2	15	53 18 13 13 4.5 4.1 2.2	TP123 TP122 WS117 TP126 TP115 TP116 Bund01	2	Further Action
Indeno(123-cd)Pyrene	mg/kg	27	15	24	-	2	No further action
Dibenzo(a,h)Anthracene	mg/kg	0.24	15	6.8 2.2 1.7 1.6 0.51 0.44 0.25	TP123 TP122 WS117 TP126 TP116 TP115 Bund01	2	Further Action
Benzo(ghi)Perylene	mg/kg	320	15	27	-	2	No further action
TPH C5-C6 (aliphatic)*	mg/kg	42	9	0	-	4	No further action
TPH C6-C8 (aliphatic)*	mg/kg	100	9	0	-	4	No further action
TPH C8-C10 (aliphatic)*	mg/kg	27	9	0.82	-	4	No further action
TPH C10-C12 (aromatic)*	mg/kg	74	9	23.1	-	4	No further action
TPH C12-C16 (aromatic)*	mg/kg	140	9	220 220	WS122 TP122	4	Further Action
TPH C16-C21 (aromatic)*	mg/kg	260	9	520 305 260	TP122 WS122 TP116	1	Further Action
TPH C21-C35 (aromatic)*	mg/kg	1100	9	850	-	1	No further action
Benzene	mg/kg	0.087	10	<0.001	-	4	No further action
Toluene	mg/kg	130	10	<0.001	-	4	No further action
Ethylbenzene	mg/kg	47	10	0.017	-	2	No further action
m/p-Xylene	mg/kg	56	10	0.026	-	2	No further action



DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PATH-WAY	ASSESSMENT
o-Xylene	mg/kg	60	10	0.039	-	2	No further action
Isopropylbenzene**	mg/kg	46.9	10	0.100	-	4	No further action
n-Propylbenzene#	mg/kg	34	10	0.061	-	4	No further action
1,2,4-Trimethylbenzene**	mg/kg	1.17	10	0.750	-	4	No further action
1,3-Dichlorobenzene	mg/kg	0.40	10	0.40	-	4	No further action
2-Methylphenol**	mg/kg	93.7	10	1.7	-	4	No further action
4-Methylphenol**	mg/kg	92.2	10	3.7	-	4	No further action

Notes

PL1 = soil ingestion, PL2 = dermal contact and ingestion, PL3 = dust inhalation; PL4 = Vapour/Gas Inhalation; PL5 = Vertical / Lateral Migration; PL6 = Corrosion of concrete; PL7=Tainting of water supply; PL8 = Uptake by plants

Abbreviations: GAC = general assessment criteria, n = number of samples, MC = maximum concentration; Loc of Ex = location of exceedance; NFD = no fibres detected.

* The Tier 2 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. E3P has utilised the Tier 2 values for aliphatic compounds for the volatile and semi-volatile fractions (C5-C12) and the Tier 2 values for aromatic compound for the non-volatile fractions (C12-C35). The comparison of a total (aliphatic/aromatic) compounds to an individual fraction is considered to be a conservative approach and satisfactory for the protection of human health.

** Atkins ATRISK

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CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment, January 2010

Referring to Table 4.1, the results of this direct comparison indicate that the data exceeds the screening criteria for a residential end-use for the following contaminants:

-  **Arsenic** (WS110 at 0.50m bgl and TP113 0.90 m bgl).
-  **Lead** (Bund01, WS101 at 0.80 m bgl, WS110 at 0.50 m bgl, TP113 at 0.90 m bgl, TP115 0.80 m bgl, TP116 1.20 m bgl, TP122 1.00 m bgl and TP126 0.90 m bgl).
-  **Mercury** (WS111 0.60 m bgl).
-  **Asbestos** (Chrysotile and Amosite) HP05 at 0.10 m bgl, TP114 at 1.00 bgl, TP116 at 1.20 m bgl, and WS124 at 3.40 m bgl).
-  **Naphthalene** (WS117 at 3.20 m bgl, WS122 at 3.20 m bgl, TP122 at 1.00 m bgl, TP123 at 0.80 m bgl and TP126 at 0.90 m bgl).
-  **Phenanthrene** (TP123 at 0.80 m bgl).
-  **Benzo(a)anthracene** (WS117 at 3.20 m bgl, TP122 at 1.00 m bgl, TP123 at 0.80 m bgl and TP126 at 0.90 m bgl).
-  **Chrysene** (TP122 at 1.00 m bgl and TP123 at 0.80 m bgl).
-  **Benzo(b)fluoranthene** (WS117 at 3.20m bgl, TP115 at 0.80 m bgl, TP116 at 1.20 m bgl, TP122 at 1.00 m bgl, TP123 at 0.80 m bgl, and TP126 at 0.90 m bgl).



- ✳ **Benzo(a)pyrene** (Bund01, WS117 at 3.20 m bgl, TP115 at 0.80 m bgl, TP116 at 1.20 m bgl, TP122 at 1.00 m bgl, TP123 at 0.80 m bgl and TP126 at 0.90 m bgl).
- ✳ **Dibenzo(a,h)anthracene** (Bund01, WS117 at 3.20 m bgl, TP115 at 0.80 m bgl, TP116 at 1.20 m bgl, TP122 at 1.00 m bgl, TP123 at 0.80 m bgl and TP126 at 0.90 m bgl).
- ✳ **TPH C12 – C16 (aromatic)** (WS122 at 3.20 m bgl and TP122 at 1.00 m bgl).
- ✳ **TPH C16 – C21 (aromatic)** (WS122 at 3.20 m bgl, TP116 at 1.20 m bgl, and TP122 at 1.00 m bgl).

Asbestos in the form of chrysotile hard/cement was identified within the Made Ground in WS124 at 3.40 m bgl (south of Sheppard Mill area) and HP05 at 0.10 m bgl (historical landfill in the eastern section of Tack Lea Works area). Asbestos in the form of chrysotile sheeting/board debris and loose fibrous debris was also identified in HP05 at 0.10 m bgl. Chrysotile and Amosite loose fibres were identified in TP114 at 1.00 m bgl and TP116 at 1.20 m bgl (central section of Tack Lea Works area).

Quantification testing was undertaken with the highest concentration recorded in WS124 at 0.705%. The remaining samples had concentrations of 0.002% (TP116), 0.011% (TP114) and 0.036% (HP05).

Exceedances of the heavy metal arsenic have been identified within the central section of the Tack Lea Works area (WS110 and TP113).

Exceedances of the heavy metal lead have been identified within the Tack Lea Works area (earthen bund sample, WS101, WS110, TP113, TP115 and TP116) and the Sheppard Mill area (TP122 and TP126).

Exceedances of the heavy metal mercury have been identified in WS111 (south-western section of the Tack Lea Works area).

Exceedances of volatile PAHs (naphthalene) have been identified in the Sheppard Mill area (WS117, WS122, TP122, TP123 and TP126).

Exceedances of non-volatile PAHs (phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene) have been identified within the Tack Lea Works area (earthen bund sample, TP115 and TP116) and the Sheppard Mill area (WS117, TP122, TP123 and TP126).

Exceedances for volatile petroleum hydrocarbons (TPH C12-C16) have been identified within the Sheppard Mill area (WS122 and TP122). Exceedances for non-volatile petroleum hydrocarbons (TPH C16-C21) have been identified within the Tack Lea Works area (TP116) and the Sheppard Mill area (WS122 and TP122).

VOCs (including ethylbenzene, p & m-xylene, o-xylene, isopropylbenzene, n-propylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, sec-butylbenzene and p-isopropyltoluene) have been identified above the limit of detection within TP122 and WS122 in the Shepherd Mill area. Concentrations have been screened against the LQM reference values; and where no values are currently available, concentrations have been screened against generic assessment criteria provided within the CL:AIRE guidance document, Soil Generic Assessment Criteria for Human Health Risk Assessment (January 2010) or ATKINS ATRISK Soil Screening Values.

SVOCs (including aniline, phenol, 1,3-dichlorobenzene, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, 2-methylnaphthalene, dibenzofuran, carbazole, dibutyl phthalate and anthraquinone) have been identified above the limit of detection within the central section of the Tack Lea Works area (WS107 and TP116) and the Shepherd Mill area (WS117, WS122, WS124, TP122, TP123, TP124 and TP126). Concentrations have been screened against the LQM reference values; and where no values are currently available, concentrations have been screened against generic assessment criteria provided within the CL:AIRE guidance document, Soil Generic Assessment Criteria for Human Health Risk Assessment (January 2010) or ATKINS ATRISK Soil Screening Values.



In addition, a number of VOC and SVOC compounds which currently do not have any screening values available have also been recorded at concentrations above the laboratory limit of detection (LOD). These are summarised in Table 4.2 below:

TABLE 4.2 SUMMARY OF VOC AND SVOC COMPOUNDS ABOVE LABORATORY LIMIT OF DETECTION

DETERMINANT	UNIT	LOD	N	LOCATION OF COMPOUND ABOVE LOD	CONC. OF COMPOUND ABOVE LOD (mg/kg)
1,3,5-Trimethylbenzene	mg/kg	0.005	2	WS122	0.26
				TP122	0.11
sec-Butylbenzene	mg/kg	0.005	1	WS122	0.03
P-Isopropyltoluene	mg/kg	0.005	1	WS122	0.13
Aniline	mg/kg	0.1	4	WS107	0.20
				WS117	0.20
				TP123	2.00
				TP126	0.30
2,4-Dimethylphenol	mg/kg	0.3	1	TP123	3.70
2-Methylnaphthalene	mg/kg	0.1	8	WS117	1.40
				WS122	13
				WS124	0.40
				TP116	0.30
				TP122	14
				TP123	14
				TP124	0.20
				TP126	2.60
Dibenzofuran	mg/kg	0.2	8	WS117	1.90
				WS122	6.70
				WS124	0.70
				TP116	0.30
				TP122	7.20
				TP123	19
				TP124	0.30
				TP126	2.40
Carbazole	mg/kg	0.3	5	WS117	1.60
				WS122	1.70
				TP122	4.10
				TP123	20
				TP126	2.30
Dibutyl phthalate	mg/kg	0.2	1	TP122	1.90



DETERMINANT	UNIT	LOD	N	LOCATION OF COMPOUND ABOVE LOD	CONC. OF COMPOUND ABOVE LOD (mg/kg)
Anthraquinone	mg/kg	0.3	2	TP123	5.30
				TP126	1.50

PCB analysis on a sample taken from TP118 which is located in the vicinity of the former electricity substation in the Tack Lea Works area showed no exceedances.

Chemical analysis on the sample taken from the earthen bund showed exceedances for the heavy metal lead and PAHs Benzo(a)pyrene and Dibenzo(a,h)anthracene.

The laboratory analysis confirms the assessment within the initial conceptual site model that the main constituents of concern were likely to be asbestos, heavy metals, PAHs, petroleum hydrocarbons, VOCs and SVOCs.

Encia Consulting identified the following exceedances of the GAC within the subject site boundary:

- ☛ **Lead** (HP7 0.25 m bgl, WS5 0.70 m bgl, WS9 0.50 m bgl, WS10 0.40 m bgl, WS25 0.70 m bgl);
- ☛ **Mercury** (WS9 0.50 m bgl, WS25 0.70 m bgl);
- ☛ **Asbestos** (Amosite Fibres - WS18 D2 0.60-0.70 m bgl);
- ☛ **Naphthalene** (WS12 0.70 m bgl, WS19 0.90 m bgl, WS19 D6 3.70 m bgl, WS21 0.50 m bgl, WS22 0.70 m bgl, WS19 0.40 m bgl, WS19 0.80 m bgl, WS25 0.50 m bgl);
- ☛ **Non-volatile PAHs:** BH10 1.00 m bgl, WS10 0.40 m bgl, WS12 0.70 m bgl, WS17A D1, WS12 0.80 m bgl, WS19 0.90 m bgl, WS20 D1 0.60 m bgl, WS22 0.70 m bgl, WS19 0.40 m bgl, WS24 A 0.30 m bgl);
- ☛ **TPH C16-C21 Aromatic** (BH10 1.00 m bgl, WS19 0.40 m bgl);
- ☛ **TPH C21-C35 Aromatic** (WS19 0.40 m bgl);
- ☛ **Trichloroethene (TCE)** (WS12 0.80 m bgl); and
- ☛ **1,2,4-Trimethylbenzene** (WS19 0.40 m bgl).

Elevated trichloroethene (TCE) was recorded in WS12 at 0.80 m bgl. Tetrachloroethene (PCE) was recorded above the limit of detection, however the concentration does not exceed the residential GAC.

Elevated 1,2,4-Trimethylbenzene was recorded in WS19 at 0.40 m bgl. Additional VOCs including benzene, toluene, ethylbenzene, m/p-xylene, styrene, o-xylene, isopropylbenzene, propylbenzene, 1,2,4 trimethylbenzene, 4-isopropyltoluene, 1,3,5 trimethylbenzene, sec-butylbenzene, n-butylbenzene were recorded above the limit of detection in WS19 at 0.40 m bgl, WS19 0.80 m bgl and WS25 0.50 m bgl.

SVOCs including 2-methylnaphthalene, carbazole and dibenzofuran were recorded in WS19 at 0.40 m bgl, WS19 at 0.80 m bgl and WS25 at 0.50 m bgl.

Potential visible asbestos was noted in WS10 as likely chrysotile cement.

Contamination Issues Plans for heavy metals, asbestos, non-volatile PAHs, Naphthalene, TPHs, VOCs and SVOCs in soils are presented as Drawings 16-465-027 to 16-465-033 in Appendix III, and snapshots are included in Figure 4.1 to Figure 4.7 below.



FIGURE 4.1 CONTAMINATION ISSUES PLAN – HEAVY METALS

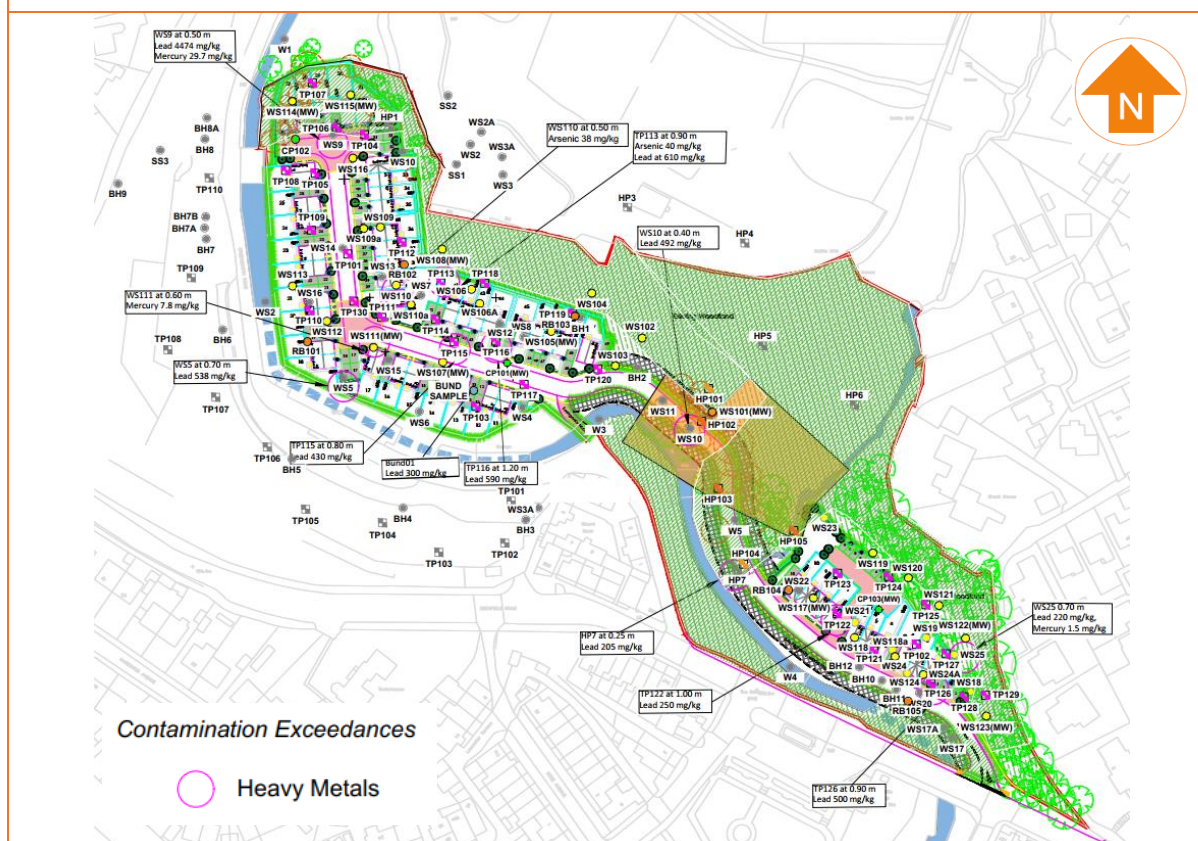


FIGURE 4.2 CONTAMINATION ISSUES PLAN – ASBESTOS

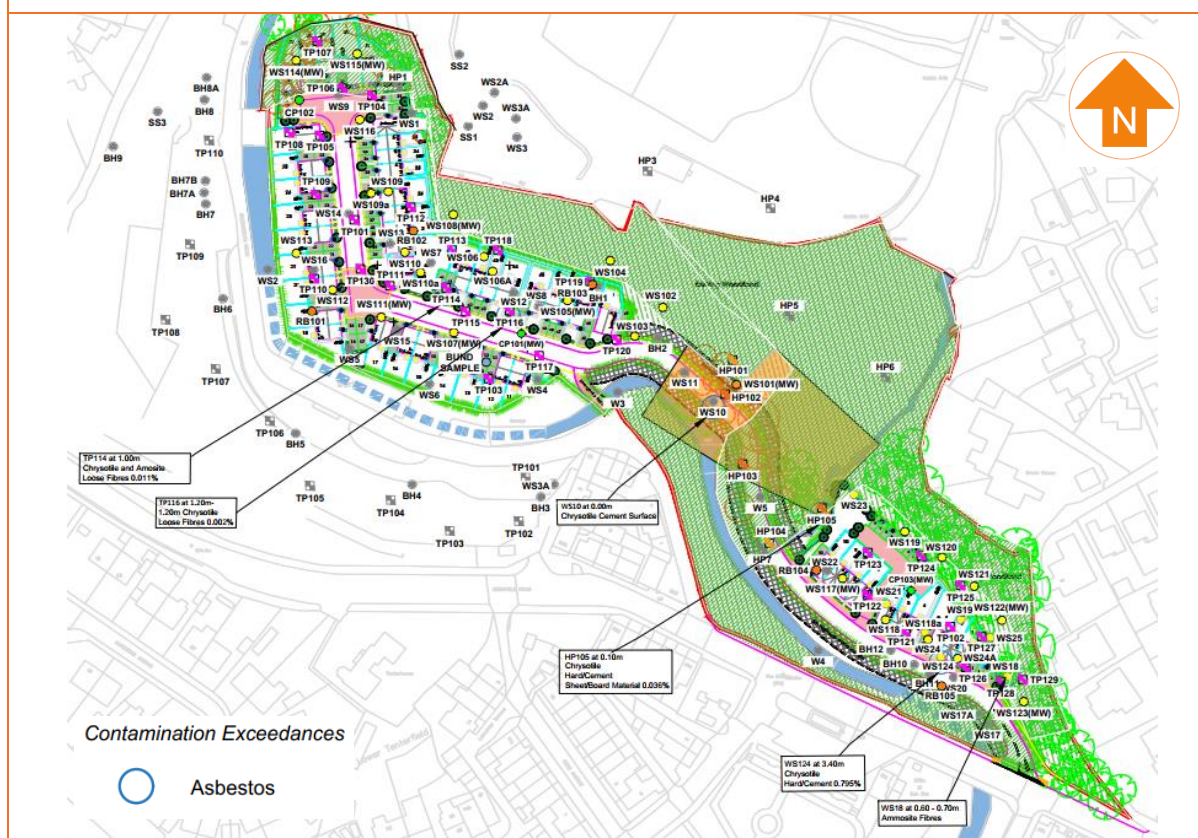


FIGURE 4.3 CONTAMINATION ISSUES PLAN – NON-VOLATILE PAH

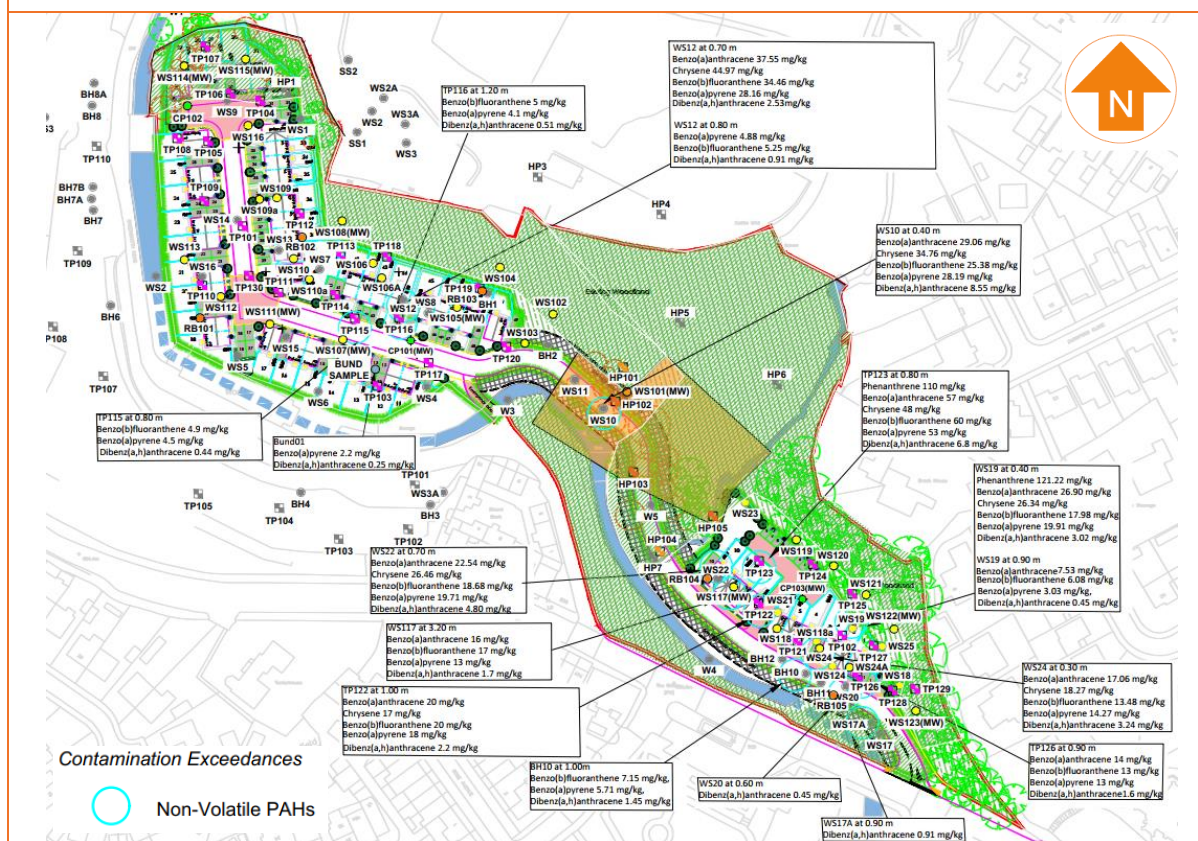


FIGURE 4.4 CONTAMINATION ISSUES PLAN – NAPHTHALENE

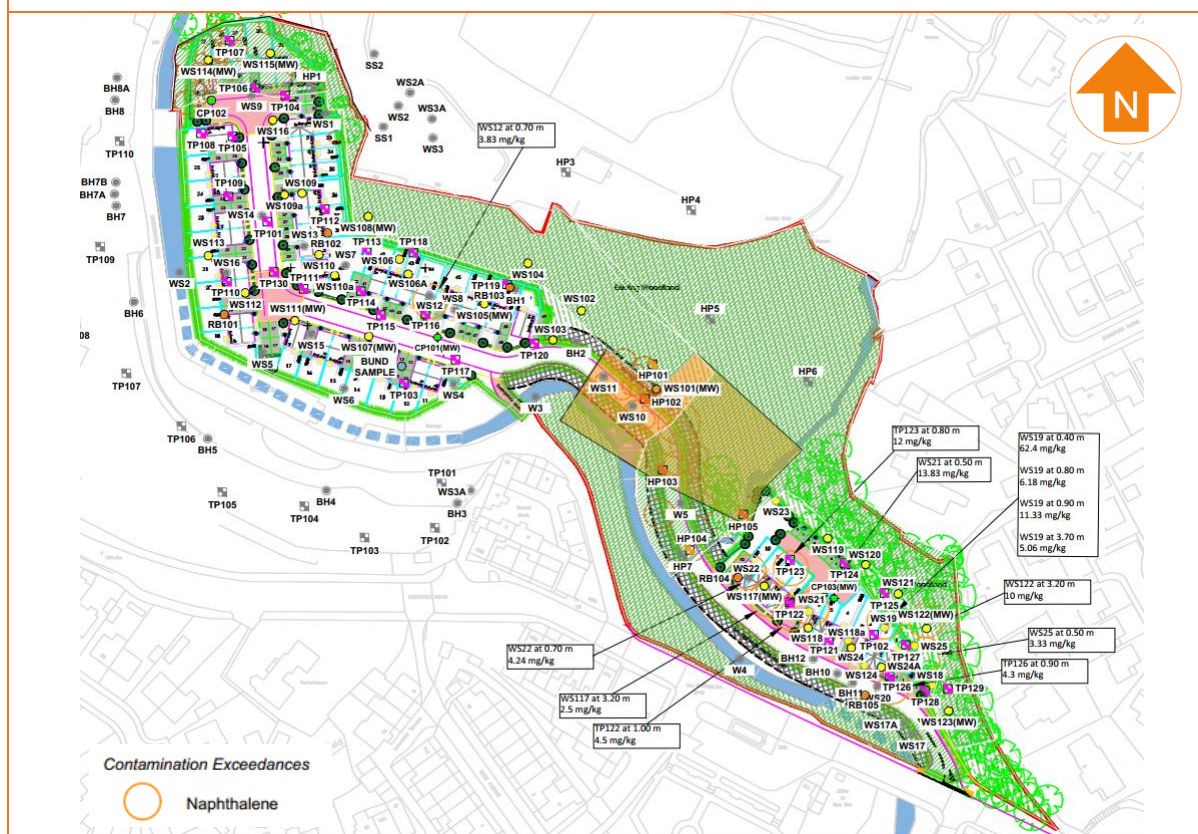


FIGURE 4.5 CONTAMINATION ISSUES PLAN – TPH

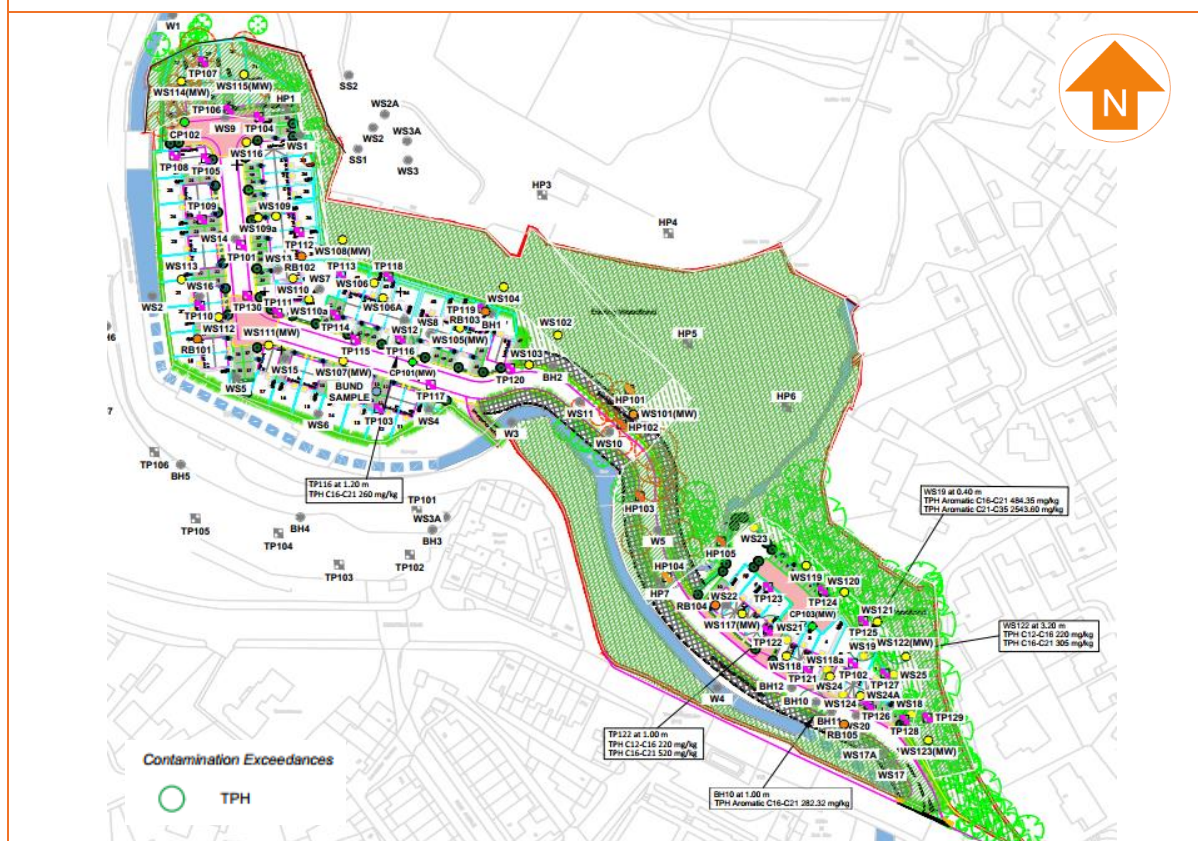


FIGURE 4.6 CONTAMINATION ISSUES PLAN – VOC

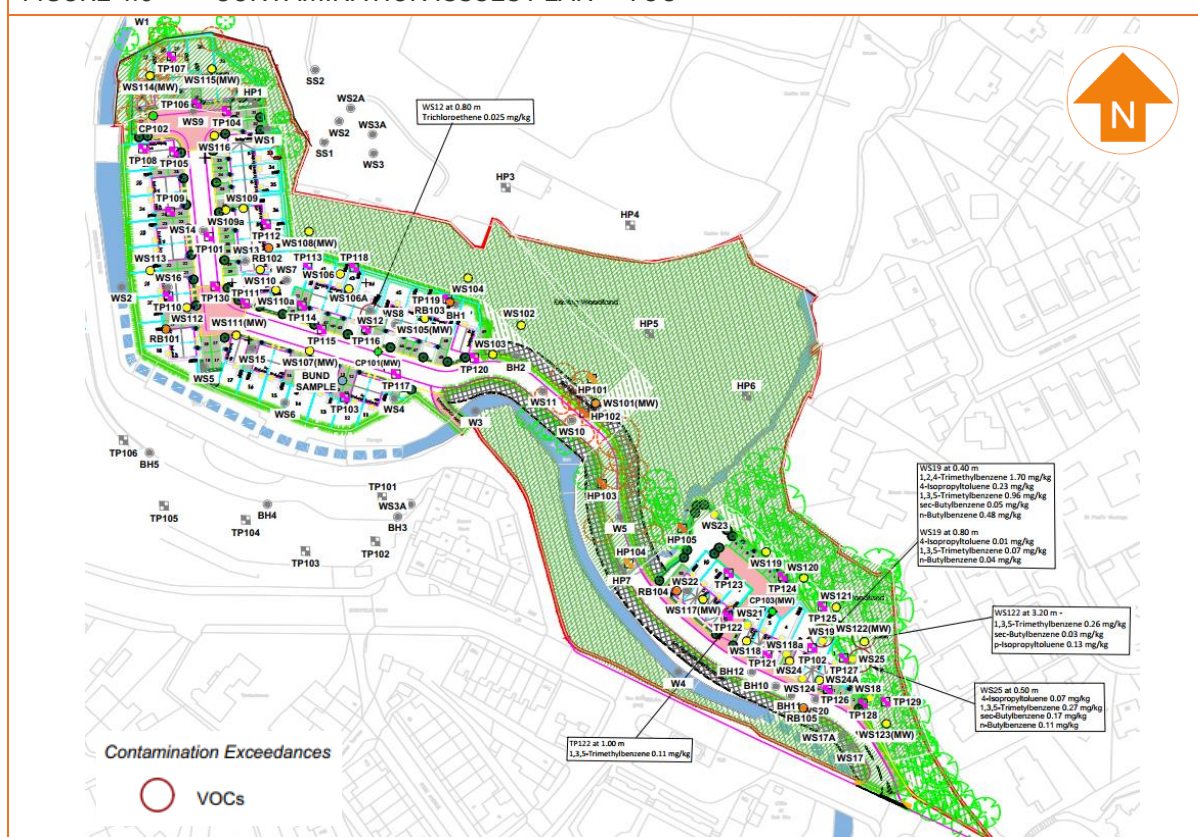
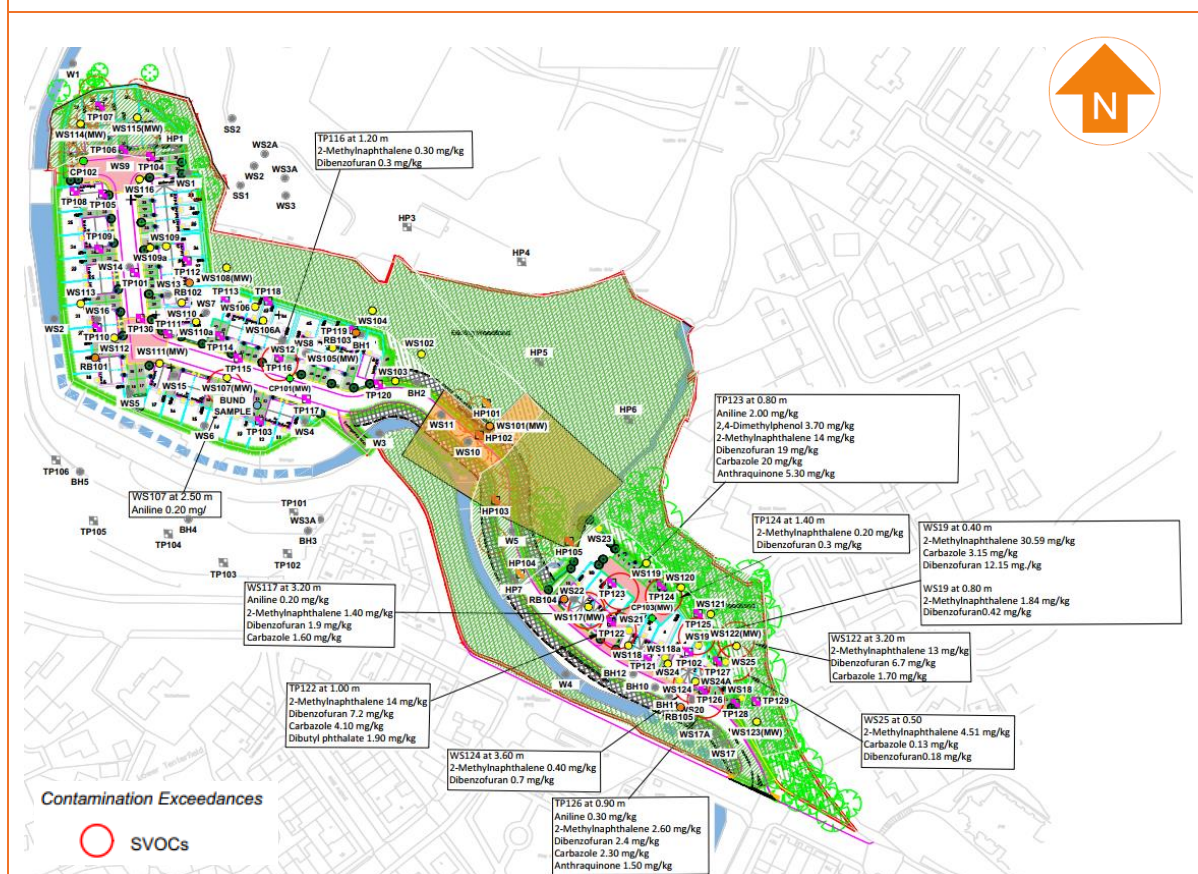


FIGURE 4.7 CONTAMINATION ISSUES PLAN – SVOC



In relation to these exceedances, the following can be determined:

- ✳ The main exposure pathways based on the Tier 2 exceedances are:
 - Soil ingestion;
 - Vapour inhalation (indoor);
 - Dermal contact and ingestion;
 - Consumption of homegrown vegetables; and
 - Fibre/dust inhalation.

HUMAN HEALTH RISK ASSESSMENT AND MITIGATION

The majority of the identified elevated concentrations have primary exposure pathways related to dermal contact and ingestion of soils, inhalation of particulate and consumption of homegrown vegetables; with naphthalene, petroleum hydrocarbons, VOCs and SVOCs having a primary exposure pathway related to volatilisation to indoor air risk.

The risk to chronic human health associated with the elevated concentrations of inorganic heavy metals and non-volatile PAH compounds can be mitigated through the installation of a suitable cover system in all proposed private gardens, landscaping and public open space to remove any potential for direct exposure to impacted soils.



The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy; however, industry best practice will require the following minimum depths of certified clean cover:

- ✳ Private gardens – 600 mm
- ✳ Landscaped areas– 300 mm
- ✳ Public open space (POS) – 300 mm

Asbestos in the form of chrysotile and amosite has been identified within localised areas in Made Ground deposits in the southern part of Sheppard Mill area (WS124 and WS18), the historical landfill in the eastern section of Tack Lea Works area (HP05) and the central section of Tack Lea Works (TP114 and TP116).

Asbestos bulk fragments, in the form of hard cement were also identified in WS124, HP05 and WS10; and asbestos sheeting/board debris within HP05. Visual signs of ACM were encountered during the ground investigations in HP05.

Impacted soils should be managed according to the asbestos risk mitigation conceptual site model shown in Figure 4.8.

FIGURE 4.8 ASBESTOS RISK MITIGATION CONCEPTUAL SITE MODEL



Notes

ND None Detect

0.001% Soils may contain $\leq 0.001\%$ asbestos using composite testing to ensure there is no potential risk to human health. This value is present within areas where there may be a short-term low-level exposure of soils containing trace asbestos fibres by construction workers where an appropriate level of asbestos management is employed (dust suppression)

0.1% Soils at a depth of $>1.00\text{m}$ bgl may contain $<0.1\%$ asbestos using composite testing where they will not be likely to be disturbed in the future and will therefore be in an area of low sensitivity. Risk assessment completed in accordance with Asbestos JIWG risk assessment tools.



Undefined- this will be dependent upon soils encountered during earthworks, which may be placed at these depths to ensure no potential risk to human health.

It is noted that the presence of asbestos sheeting and boarding will require a different remedial approach to those proposed within Figure 4.8 (i.e., hand picking of visible bulk asbestos fragments). Where asbestos sheeting and boarding has previously been identified, any proposed earthworks within those areas may be required to be undertaken under license. In addition, any off-site disposal of materials from these areas would be considered hazardous unless the asbestos bulk fragments are pre-removed via hand picking techniques.

Elevated concentrations of mercury have been identified within two locations within the Tack Lea Works area (WS111 at 0.60 m bgl and WS9 at 0.50 m bgl); and one location within the Sheppard Mill area (WS25 at 0.70 m bgl). Mercury occurs in three different forms; elemental mercury, inorganic mercury and methyl mercury. Inorganic and methyl mercury have an exposure pathway of dermal contact and ingestion, whereas elemental mercury could present a potential volatilisation to indoor air risk.

During remediation and enabling works, speciated mercury analysis should be completed at the locations WS111, WS9 and WS25 to assess whether elemental mercury is present which may pose a risk to future site users through vapour inhalation. If elemental mercury is identified, it may be necessary to delineate and excavate the soils as a hotspot and place them in an area of low sensitivity such as beneath areas of public open space or removed from site. Alternatively, if it is proven that there is no elemental mercury, a clean cover system will be sufficient.

The elevated concentrations of naphthalene, TPH, and trichloroethene (TCE) identified within the Tack Lea Works area (TP116 and WS12) are considered to be localised occurrences and therefore these locations can be treated as localised hotspots. During a process of cut/fill enabling works, a hotspot removal should be undertaken where these soils may be chemically validated to assess chemical suitability for retention on-site in an area of no future sensitivity.

However, elevated concentrations of naphthalene, TPH, VOCs and SVOCs have been identified throughout the Shepherd Mill area and these do not appear to be localised hotspots. A Tier 3 vapour risk assessment is required in the Sheppard Mill area to assess the level of risk to the future site users by volatilisation to indoor air.

The SVOCs identified in WS107 and TP116 within the Tack Lea Works area are not considered to pose a risk to future site users given the marginal concentrations. Screening criteria are not currently available for the identified SVOCs. Therefore further discussion for these compounds is included below:

Aniline

Aniline is a clear to slightly yellow liquid with a characteristic odour. It does not readily evaporate at room temperature, is slightly soluble in water and mixes readily with most organic solvents. Aniline is used to make a wide variety of products such as polyurethane foam, agricultural chemicals, synthetic dyes, antioxidants, stabilizers for the rubber industry, herbicides, varnishes and explosives.

This compound was detected at a concentration of 0.20 mg/kg in WS107 at 2.50 m bgl.

Aniline's production and use as a chemical intermediate in the synthesis of rubber accelerators and antioxidants, dyes and intermediates, photographic chemicals, isocyanates for urethane foams, pharmaceuticals, explosives, petroleum refining, diphenylamine, phenolics, herbicides, and fungicides and its use as a solvent and in the manufacture of dyes, medicinals, resins, varnishes, perfumes, and shoe blacks may result in its release to the environment through various waste streams.

If released to air, a vapor pressure of 0.667 mm Hg at 25 °C indicates aniline will exist solely as a vapor in the atmosphere. Vapor-phase aniline will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 4 hours.



If released to soil, aniline is expected to have very high to moderate mobility based upon measured Koc values of 43.8 to 497.7. The pKa of aniline is 4.60, indicating that this compound may exist partially in cation form in the environment and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts. Anilines are expected to bind strongly to humus or organic matter in soils due to the high reactivity of the aromatic amino group, suggesting that mobility may be much lower in some soils. Volatilization of the neutral species from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 2.02×10^{-6} atm-cu m/mole. Aniline has a vapor pressure close to 1 mm Hg and exists as a liquid under environmental conditions; therefore, aniline may volatilize from dry soil. Utilizing the Japanese MITI test, 85% of the Theoretical BOD(NH₃) was reached in 2 weeks indicating that biodegradation is an important environmental fate process in soil and water.

If released into water, aniline is not expected to adsorb to suspended solids and sediment based upon its Koc range. Volatilization of the neutral species from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 17.6 and 131 days, respectively. Measured BCF values of less than 1 suggest bioconcentration in aquatic organisms is low. Aniline has a reported aqueous hydrolysis half-life of greater than 50 years suggesting that hydrolysis is not an important environmental fate process.

Occupational exposure to aniline may occur through inhalation and dermal contact with this compound at workplaces where aniline is produced or used. Monitoring data indicate that the general population may be exposed to aniline via inhalation of ambient air, ingestion of food and drinking water contaminated with this chemical, dermal contact with consumer products containing aniline and via inhalation of tobacco smoke. (SRC)

The US EPA has classified aniline as a Group B2, probable human carcinogen.

No screening values are currently available for Aniline. It is noted that the concentration identified within WS107 at 2.50 m bgl is only marginally above the laboratory LOD. It is also noted that only a single detection of Aniline was recorded within the Tack Lea Works area, and that no detections have been identified within groundwater and surface water samples taken from across the site.

Therefore within the context of the developed site CSM and the lines of evidence approach, it can be determined that the residual compound in this instance is highly unlikely to pose any risk in terms of vapour migration and ingress to the dwelling.

2-Methylnaphthalene

2-methylnaphthalene is a white crystalline solid compound. This determinant is classified as a non-threshold substance, therefore even the smallest amount of exposure is considered to pose a theoretical risk to the critical receptor within the context of the developed CSM.

This compound was detected at a concentration of 0.30 mg/kg in TP116 at 1.20 m bgl.

The vapour pressure of 2-methylnaphthalene is 0.055 mm Hg at 25°C which is slightly lower than that of naphthalene (0.085 mm Hg @ 25°C). It is therefore determined that the compound is less volatile than naphthalene. This data is obtained from Pub Chem.

The Tier 2 CIEH / LQM S4UL for naphthalene is 2.3 mg/kg for a residential development scenario, however this assessment assumes dermal contact, inhalation of particulate and other direct exposure pathways. The developed CSM for the subject site will incorporate a clean cover systems in landscaped areas to ensure no direct exposure pathways.

When considering that 2-Methylnaphthalene has a notably reduced vapour pressure to that of naphthalene, the absence of the compound in the vast majority of samples tested and in due consideration of the maximum concentration of the determinant being only 1.40 mg/kg (with exception of TP126, WS122, TP122 and TP123), the potential for this compound to enter the vapour phase from soil with temperatures ~10°C is low.



There is no justifiable or peer reviewed toxicological data for an inhalation pathway for 2- methylnaphthalene, therefore it is not possible to develop a robust site-specific risk assessment model given the absence of suitable input parameters.

In light of the above, we must consider the lines of evidence to hand and given that the compound is a non-threshold substance with no peer reviewed, robust or justifiable toxicological data the suggested method to ensure safe regeneration is the adoption of the As Low As Reasonably Possible (ALARP) approach.

In this instance, the methodology for the analytical technique is considered to be the lowest reasonably possible method of determining the presence of the non-threshold substance and mitigating risk to the lowest practicable level.

The US national library for medicine confirms:

If released to soil, 2-methylnaphthalene is expected to have slight to no mobility based upon log K_{oc} values of 3.00-5.96. Volatilization from moist soil surfaces is expected based upon a Henry's Law constant of 5.18×10^{-4} atm-cu m/mole. However, adsorption to soil is expected to attenuate volatilization. 2- Methylnaphthalene is not expected to volatilize from dry soil surfaces based upon its vapor pressure.

This compound has a very low to no actual volatility, there is no inhalation of dust (indoor or outdoor air) or inhalation of vapour (indoor or outdoor) exposure. The total inhalation background is 1.52%. As discussed, herein it is highly unlikely that this compound can enter the vapour phase in the soil. Furthermore, the presence of a passively ventilated sub-floor void with a reasonable volume change potential (24hr) will ensure that in the extremely unlikely event that this compound could volatilise and migrate, the standard mitigation measure would ensure there is absolutely no potential for ingress into the habitable space.

It is noted that the concentration identified within TP116 at 1.20 m bgl is only marginally above the laboratory LOD. It is also noted that only a single detection of 2- methylnaphthalene was recorded within the Tack Lea Works area, and that no detections have been identified within groundwater and surface water samples taken from across the site.

Therefore within the context of the developed site CSM and the lines of evidence approach, it can be determined that the residual compound in this instance is highly unlikely to pose any risk in terms of vapour migration and ingress to the dwelling.

Dibenzofuran

Dibenzofuran is a white solid compound generally derived from coal tar.

This compound was detected at a concentration of 0.30 mg/kg in TP116 at 1.20 m bgl.

The US EPA have determined a threshold value of 7.8 mg/kg. As such, the concentrations within TP116, is not considered to be exceeding and will not present a risk to future end users.

In addition to the above, the relatively low volatility of this compound within soils with a temperature of ~10°C all but inhibits any volatilisation potential.

The US national library for medicine confirms:

Volatilisation from moist soil surfaces is expected to be an important fate process based upon an estimated Henry's Law constant of 2.1×10^{-4} atm-cu m/mole. However, adsorption to soil is expected to attenuate volatilisation. Dibenzofuran is not expected to volatilise from dry soil surfaces (SRC) based upon its vapour pressure.



It is noted that the concentration identified within TP116 at 1.20 m bgl is only marginally above the laboratory LOD. It is also noted that only a single detection of dibenzofuran was recorded within the Tack Lea Works area, and that no detections have been identified within groundwater and surface water samples taken from across the site.

Therefore within the context of the developed site CSM and the lines of evidence approach, it can be determined that the residual compound in this instance is highly unlikely to pose any risk in terms of vapour migration and ingress to the dwelling. There is not considered to be a risk to the future end user.

Furthermore, with regards to the elevated volatile contaminants (naphthalene, TPH, VOCs and SVOCs) identified in the Tack Lea Works area and the Sheppard Mill area, vapour resistant membranes may be required to be installed during the build phase for any proposed buildings situated within the immediate vicinity of the contamination hotspot / impacted soils. A Detailed Quantitative Risk Assessment (DQRA) may also be required to determine if any risks to human health and controlled water receptors remains following the hotspot removal.

Chemical analysis of the natural subsoil deposits has indicated these soils to be acceptable for use within the proposed garden areas; however, further chemical validation samples will be required to confirm this.

No suitable source of natural topsoil deposits has been identified on-site.



4.2. CONTROLLED WATERS RISK ASSESSMENT

E3P has undertaken a controlled waters risk assessment for the site based on the consideration of the conceptual site model and the sensitive receptors which are summarised in Table 4.3.

TABLE 4.3 CONTROLLED WATERS CONCEPTUAL MODEL AND SENSITIVITY PROFILE

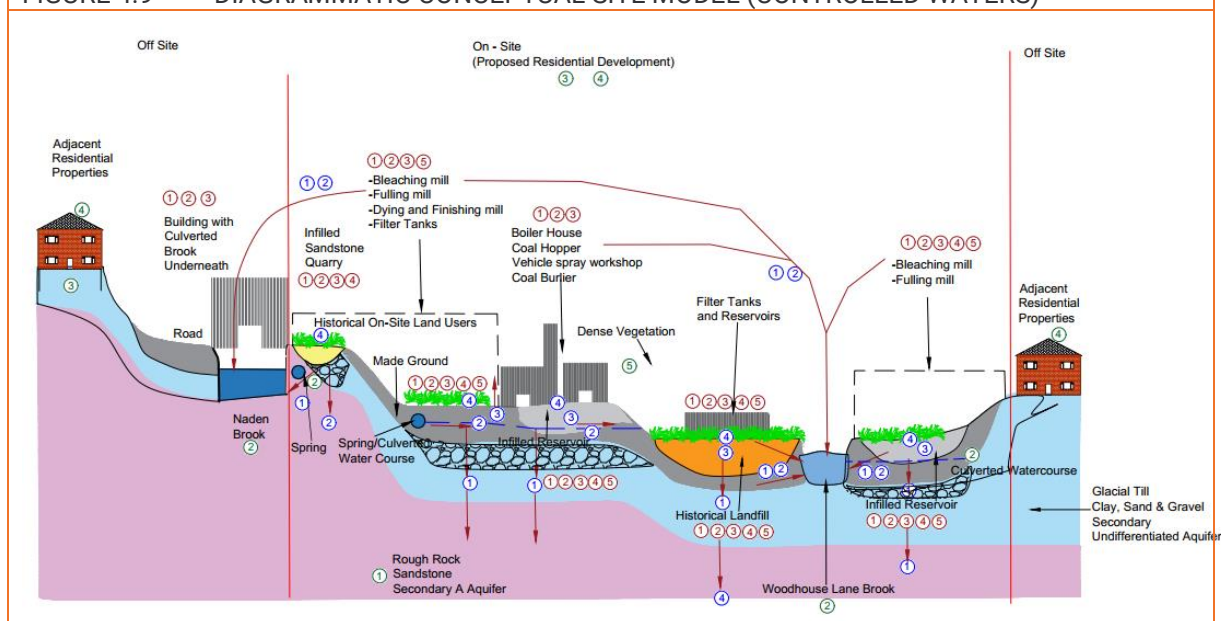
DISCUSSION		SENSITIVITY RATING
Contaminant Source		
Made Ground Made Ground has been encountered to depths up to 5.80 m bgl. Heavy metals, PAHs, hydrocarbons, VOCs and SVOCs exceedances have been encountered within this material. The Made Ground infill material is from historical features on-site, including historical buildings, infilled reservoirs and filter beds/tanks across the site.		High
Bleaching, fulling, dyeing and finishing mills, and vehicle spray workshop The presence of these former works on-site would have produced contaminants which may have entered soils historically.		High
Filter beds, tanks and reservoirs (current and historical) The presence of these on-site may produce hazardous ground gases (carbon dioxide and methane) as well as heavy metals.		High
Historical Tanks A number of tanks were present on-site in the north and central sections of the Tack Lea Works area and the south-eastern section of the Sheppard Mill area; these are likely sources of hydrocarbons, VOCs and SVOCs.		High
Pathway		
Vertical Migration CLAY deposits are present underneath the Made Ground. The presence of this low permeability drift will restrict the migration of contaminants into the Secondary A bedrock aquifer. However, the absence of drift deposits in certain locations on-site (NW part of Tack Lea Works area) means that the Made Ground may be in direct contact with the bedrock.		Medium
Lateral migration Lateral migration of contaminants is considered possible due to the presence of granular alluvium deposits across the site. Naden Brook is located on the southern and western boundary of the site and Woodhouse Lane Brook runs through the centre of the site. Naden Brook is classified by the EA as a Statutory Main River. Culverted watercourses and springs associated with the former mill buildings are also believed to be present on-site, though these were not identified during the ground investigation. During the site walkover, a spring was identified in the far northwest part of the Tack Lea works area within an area of outcropping bedrock.		High
Receptor		
Aquifer Classification in Superficial Drift Deposits	Secondary undifferentiated	Low
Aquifer Classification in Bedrock	Secondary A	Medium
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is not affected.	Low



DISCUSSION	SENSITIVITY RATING
Distance to the Closest Groundwater Abstraction Point	No active groundwater abstraction points identified within a 1 km radius. The nearest active surface water abstraction point is located 498 m northwest of site (United Utilities) – located upstream of site. Low
Is the Site Located Within 50 m of a Surface Watercourse?	Woodhouse Lane Brook is recorded in the centre of the site and runs north to south. Naden Brook is located along the western and southern boundaries of the site. Naden Brook is classified by the EA as a Statutory Main River. Culverted water courses and springs associated with the former mill buildings are also believed to be present on-site, though these were not identified during the ground investigation. During the site walkover, a spring was identified in the far northwest part of the Tack Lea works area within an area of outcropping bedrock. High
The ICSM developed within the context of the site setting has identified a viable pollutant pathway, which would be the lateral migration of potentially mobile phase-soluble contaminants towards Woodhouse Lane Brook and Naden Brook as well as the culverted watercourses and springs located on-site. The presence of low permeability cohesive drift deposits across the site will inhibit vertical migration to the underlying Secondary A bedrock aquifer.	

In addition to above, E3P has developed a diagrammatic conceptual model which considers the factors in Table 4.3. This is available as Drawing 16-465-037 and a snapshot is included in Figure 4.9.

FIGURE 4.9 DIAGRAMMATIC CONCEPTUAL SITE MODEL (CONTROLLED WATERS)



To ensure a robust appraisal of the identified risk to controlled waters, E3P has identified the sources of potential contamination that represent a risk to controlled waters from the initial CSM, we have then assessed the availability of ground investigation data in the form of analysis of the solid phase (soil) and dissolved phase within the perched groundwater or aquifer. The results of this assessment are presented in Table 4.4.

TABLE 4.4 QUALITATIVE RISK TO CONTROLLED WATERS FROM SOIL ANALYTICAL RESULTS

CONTAMINANT	ASSESSMENT RATING	DISCUSSION
BTEX > 1 mg/kg	The soil data analysis has identified concentrations of VOCs above 1 mg/kg in WS19.	Further discussion
Total VOC > 1 mg/kg		
Total SVOC > 1 mg/kg	The soil data analysis has identified concentrations of SVOCs above 1 mg/kg in WS117, WS122, TP122, TP123, TP126, WS19 and WS25.	Further discussion
C5-C10 > 5 mg/kg	All concentrations are below the laboratory LOD.	None
C10-C12 > 10 mg/kg	All concentrations are below or slightly exceeding the laboratory LOD.	None
C12-C16 > 50 mg/kg	The soil data analysis has identified concentrations of TPH C12-C16 above 50 mg/kg in WS122, TP116, TP122, BH10 and WS19.	Further discussion
Phenols > 2 mg/kg	All concentrations are below or slightly exceeding the laboratory LOD.	None
Naphthalene > 2 mg/kg	Concentrations of naphthalene above 2 mg/kg have been recorded in WS117, WS122, TP122, TP123, TP126, WS12, WS19, WS21, WS22 and WS25.	Further discussion
Total PAH > 10 mg/kg	Total concentrations of low-solubility PAH compounds greater than 10 mg/kg have been recorded in WS117, TP116, TP122, TP123, TP126, BH10, WS10, WS12, WS19, WS22 and WS24, with a maximum concentration recorded in TP123 at 334.80 mg/kg.	Further discussion
PCB > 1 mg/kg	No potential sources of PCB have been identified.	None
Heavy metals > 500 mg/kg	Concentrations of heavy metals above 500 mg/kg have been recorded in TP113, TP116, TP126, WS5 and WS9.	Further discussion

The Tier 2 assessment has included a comparison of leachate analysis from samples of the Made Ground, groundwater samples and surface water samples to environmental quality standards (EQS) due to Naden Brook, Woodhouse Lane Brook, and the culverted watercourses and springs located on-site.

These are presented in Table 4.5 and Table 4.6.

A comparison to Drinking Water Standards (DWS) has not been undertaken as part of this Tier 2 assessment due to the fact that the site is not located within a groundwater source protection zone and no active groundwater abstraction points are located within 1 km of the site. In the absence of EQS values, the data has been compared to the DWS.



TABLE 4.5 COMPARISON OF LEACHATE ANALYSIS WITH TIER 2 SCREENING LEVELS

DETERMINAND	UNIT	EQS ^{1,2}	DWS ^{3,4}	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA					
Arsenic	µg/l	50	10	4	25	-	No Further Action
Cadmium	µg/l	0.08- 0.25	5	4	<0.08	-	No Further Action
Chromium (VI)	µg/l	3.4	-	4	32	TP108	Further Assessment
Chromium (III)	µg/l	4.7	50	4	62	TP108	Further Assessment
Copper	µg/l	1	2000	4	26	TP108 TP115 TP126 RB105	Further Assessment
Total Cyanide	µg/l	1	50	4	5.5	TP115 RB105	Further Assessment
Lead	µg/l	1.2	10	4	15	TP126	Further Assessment
Mercury	µg/l	-	1.0	4	<0.50	-	No Further Action
Nickel	µg/l	4	20	4	2.2	-	No Further Action
Selenium	µg/l	-	10	4	<4.0	-	No Further Action
Zinc	µg/l	10.9	-	4	18	TP126	Further Assessment
pH	-	6-9		4	11.1	TP108 TP115	Further Assessment
Polycyclic Aromatic Hydrocarbons							
Naphthalene	µg/l	2	10	4	2.0	-	No Further Action
Anthracene	µg/l	0.1		4	<0.01	-	No Further Action
Benzo[b]fluoranthene	µg/l	0.00017*		4	<0.01	-	No Further Action
Benzo[k]fluoranthene	µg/l	0.00017*		4	<0.01	-	No Further Action



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DETERMINAND	UNIT	EQS ^{1,2}	DWS ^{3,4}	NO. OF LEACHATE SAMPLES	MAX CONC. IN LEACHATE	LOCATION OF EXCEEDANCE	ASSESSMENT
		AA					
Benzo(a)pyrene	µg/l	0.00017*	10	4	<0.01	-	No Further Action
Indeno(123-cd)pyrene	µg/l	0.00017*		4	<0.01	-	No Further Action
Fluoranthene	µg/l	0.0063		4	<0.01	-	No Further Action
Benzo(ghi)perylene	µg/l	1.7–4		4	<0.01	-	No Further Action
Aromatic Hydrocarbon							
TPH C5-C7 (benzene)	µg/l	10	1	4	<1.0	-	No Further Action
TPH C7-C8 (toluene)	µg/l	74	700	4	<1.0	-	No Further Action
TPH C8-C10 (xylene)	µg/l	30	300	4	<1.0	-	No Further Action
TPH C10-C12 (naphthalene)	µg/l	2	90	4	22	RB105	Further Assessment
TPH C12-C16	µg/l	-	90	4	53	-	No Further Action
TPH C16-C35	µg/l	-	90	4	<25	-	No Further Action
Aliphatic Hydrocarbon							
TPH C5-C6	µg/l	–	1000 ⁵	4	<1.0	-	No Further Action
TPH C6-C8	µg/l	–	1000 ⁵	4	<1.0	-	No Further Action
TPH C8-C10	µg/l	–	300	4	<1.0	-	No Further Action
TPH C10-C12	µg/l	–	300	4	<10	-	No Further Action
TPH C12-C16	µg/l	–	300	4	<10	-	No Further Action
TPH C16-C21	µg/l	–	300**	4	<10	-	No Further Action
TPH C21-C35	µg/l	–	300**	4	<10	-	No Further Action



Notes

Solubility <0.01µg/l

AA – Annual Average

* Polyaromatic hydrocarbons (PAH) - Benzo(a)pyrene (BaP), Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)-perylene and Indeno(1,2,3-cd)-pyrene. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS or the corresponding AA-EQS in water

** There are no WHO Guideline Values for aliphatic fractions C16-C21 and C21-C35, therefore the guideline value for aliphatic fractions inclusive of C8-C16 (300µg/l) has been applied.

1. [The Water Framework Directive \(Standards and Classification\) Directions \(England and Wales\) 2015 \(legislation.gov.uk\)](#)
2. [The Water Supply \(Water Quality\) Regulations 2018 \(legislation.gov.uk\)](#)
3. [Guidelines for drinking-water quality, 4th edition, incorporating the 1st addendum \(who.int\)](#)
4. [CL:AIRE publishes Petroleum Hydrocarbons in Groundwater guidance \(claire.co.uk\)](#)
5. A total TPH criteria of 1000 mg/kg will act as a surrogate criterion for remaining aliphatic and aromatic TPH fractions.



TABLE 4.6 COMPARISON OF GROUNDWATER ANALYSIS WITH TIER 2 SCREENING LEVELS

DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN GROUNDWATER				LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			29/11/22	22/06/23	05/07/23	18/07/23		
Arsenic	µg/l	50	10	23	0.74	0.61	0.31	0.68	-	No Further Action
Cadmium	µg/l	0.08-0.25	5	23	0.04	0.03	0.05	0.08	-	No Further Action
Chromium (VI)	µg/l	3.4	-	23	<5.0	<5.0	<5.0	<5.0	-	No Further Action
Chromium (III)	µg/l	4.7	50	23	0.7	<0.2	2.5	0.5	-	No Further Action
Copper	µg/l	1	2000	23	2.1	4.3	3.4	7.2	CP101 (29/11/22, 18/07/23) CP103 (22/06/23, 18/07/23) RB103 (22/06/23) RB102 (05/07/23, 18/07/23) RB105 (05/07/23, 18/07/23) RB101 (18/07/23)	Further Assessment
Total Cyanide	µg/l	1	50	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
Lead	µg/l	1.2	10	23	<0.2	0.6	<0.2	<0.2	-	No Further Action
Mercury	µg/l	-	1.0	23	<0.05	<0.05	<0.05	<0.05	-	No Further Action
Nickel	µg/l	4	20	23	2.1	0.6	8.8	0.7	RB102 (05/07/23)	Further Assessment
Selenium	µg/l	-	10	23	0.6	0.7	<0.6	1.9	-	No Further Action
Zinc	µg/l	10.9	-	23	8.3	5.8	13	4.7	RB105 (05/07/23)	Further Assessment
pH	6-9			23	7.7	7.8	7.9	8.1	-	No Further Action
Polycyclic Aromatic Hydrocarbons										
Naphthalene	µg/l	2	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Anthracene	µg/l	0.1	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action



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DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN GROUNDWATER				LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			29/11/22	22/06/23	05/07/23	18/07/23		
Benzo[b]fluoranthene	µg/l	0.00017*	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Benzo[k]fluoranthene	µg/l	0.00017*	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Benzo(a)pyrene	µg/l	0.00017*	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Indeno(123-cd)pyrene	µg/l	0.00017*	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Fluoranthene	µg/l	0.0063	10*	23	0.51	<0.01	<0.01	<0.01	CP103 (29/11/22)	Further Assessment
Benzo(ghi)perylene	µg/l	1.7–4	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Aromatic Hydrocarbon										
TPH C5-C7 (benzene)	µg/l	10	1	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C7-C8 (toluene)	µg/l	74	700	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C8-C10 (xylene)	µg/l	30	300	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C10-C12 (naphthalene)	µg/l	2	90	23	<10	<10	<10	<10	-	No Further Action
TPH C12-C16	µg/l	–	90	23	<10	<10	<10	<10	-	No Further Action
TPH C16-C35	µg/l	–	90	23	<10	<10	<10	<10	-	No Further Action
Aliphatic Hydrocarbon										
TPH C5-C6	µg/l	–	1000 ⁵	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C6-C8	µg/l	–	1000 ⁵	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C8-C10	µg/l	–	300	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C10-C12	µg/l	–	300	23	<10	<10	<10	<10	-	No Further Action
TPH C12-C16	µg/l	–	300	23	<10	<10	<10	<10	-	No Further Action
TPH C16 – C21	µg/l	–	300**	23	<10	<10	<10	<10	-	No Further Action



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DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN GROUNDWATER				LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			29/11/22	22/06/23	05/07/23	18/07/23		
TPH C21-C35	µg/l	–	300**	23	<10	<10	<10	<10	-	No Further Action
Volatile Organic Compounds										
Tetrachloroethylene	µg/l	0.4	10	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Trichloroethylene	µg/l	10	10	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Trichlorobenzene	µg/l	0.4	–	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Trichloromethane	µg/l	2.5	–	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Dichloromethane	µg/l	20	200	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Carbon Tetrachloride	µg/l	12	3	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Vinyl Chloride	µg/l	–	0.3	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action

Notes

Solubility <0.01µg/l

AA – Annual Average

* Polyaromatic hydrocarbons (PAH) - Benzo(a)pyrene (BaP), Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)-perylene and Indeno(1,2,3-cd)-pyrene. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS or the corresponding AA-EQS in water

** There are no WHO Guideline Values for aliphatic fractions C16-C21 and C21-C35, therefore the guideline value for aliphatic fractions inclusive of C8-C16 (300µg/l) has been applied.

1. [The Water Framework Directive \(Standards and Classification\) Directions \(England and Wales\) 2015 \(legislation.gov.uk\)](#)

2. [The Water Supply \(Water Quality\) Regulations 2018 \(legislation.gov.uk\)](#)

3. [Guidelines for drinking-water quality, 4th edition, incorporating the 1st addendum \(who.int\)](#)

4. [CL:AIRE publishes Petroleum Hydrocarbons in Groundwater guidance \(claire.co.uk\)](#)

5. A total TPH criteria of 1000 mg/kg will act as a surrogate criterion for remaining aliphatic and aromatic TPH fractions.



TABLE 4.7 COMPARISON OF SURFACE ANALYSIS WITH TIER 2 SCREENING LEVELS

DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN SURFACE WATER				LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			29/11/22	22/06/23	05/07/23	18/07/23		
Arsenic	µg/l	50	10	23	0.49	0.61	0.63	0.62	-	No Further Action
Cadmium	µg/l	0.08-0.25	5	23	0.06	0.03	0.05	0.11	Naden Brook (U) – 18/07/23	Further Assessment
Chromium (VI)	µg/l	3.4	–	23	<5.0	<5.0	<5.0	<5.0	-	No Further Action
Chromium (III)	µg/l	4.7	50	23	0.5	<0.2	0.7	0.6	-	No Further Action
Copper	µg/l	1	2000	23	5.1	6.5	7.2	9.4	Woodhouse Lane Brook (U + D) – 29/11/22, 22/06/23, 05/07/23, 18/07/23 Naden Brook (U, M and D) – 29/11/22, 22/06/23, 05/07/23 Spring – 22/06/23, 05/07/23 (U, M) – 18/07/23	Further Assessment
Total Cyanide	µg/l	1	50	23	1.0	<1.0	<1.0	<1.0	-	No Further Action
Lead	µg/l	1.2	10	23	<0.2	0.5	<0.2	0.4	-	No Further Action
Mercury	µg/l	–	1.0	23	<0.05	<0.05	<0.05	<0.05	-	No Further Action
Nickel	µg/l	4	20	23	3	3	6	3.6	Naden Brook (U) – 05/07/23	Further Assessment
Selenium	µg/l	–	10	23	<0.6	<0.6	<0.6	0.7	-	No Further Action
Zinc	µg/l	10.9	–	23	11	8.9	11	4.9	Woodhouse Lane Brook (U) – 29/11/22 (D) – 05/07/23 Naden Brook (D) – 05/07/23	Further Assessment



DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN SURFACE WATER				LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			29/11/22	22/06/23	05/07/23	18/07/23		
pH	6–9			23	7.9	7.9	7.7	7.7	-	No Further Action
Polycyclic Aromatic Hydrocarbons										
Naphthalene	µg/l	2	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Anthracene	µg/l	0.1	10*	23	0.16	<0.01	<0.01	<0.01	Woodhouse Lane Brook (D) – 29/11/22	Further Assessment
Benzo[b]fluoranthene	µg/l	0.00017*	10*	23	0.44	<0.01	<0.01	<0.01	Woodhouse Lane Brook (D) – 29/11/22	Further Assessment
Benzo[k]fluoranthene	µg/l	0.00017*	10*	23	0.16	<0.01	<0.01	<0.01	Woodhouse Lane Brook (D) – 29/11/22	Further Assessment
Benzo(a)pyrene	µg/l	0.00017*	10*	23	0.3	<0.01	<0.01	<0.01	Woodhouse Lane Brook (D) – 29/11/22	Further Assessment
Indeno(123-cd)pyrene	µg/l	0.00017*	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Fluoranthene	µg/l	0.0063	10*	23	0.83	<0.01	<0.01	<0.01	Woodhouse Lane Brook (D) – 29/11/22	Further Assessment
Benzo(ghi)perylene	µg/l	1.7–4	10*	23	<0.01	<0.01	<0.01	<0.01	-	No Further Action
Aromatic Hydrocarbon										
TPH C5-C7 (benzene)	µg/l	10	1	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C7-C8 (toluene)	µg/l	74	700	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C8-C10 (xylene)	µg/l	30	300	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action



DETERMINAND	UNIT	EQS ^{1,2}	DWS _{3,4}	NO. OF SAMPLES	MAXIMUM CONCENTRATION IN SURFACE WATER				LOCATION OF EXCEEDANCE	ASSESSMENT
		AA			29/11/22	22/06/23	05/07/23	18/07/23		
TPH C10-C12 (naphthalene)	µg/l	2	90	23	<10	<10	<10	<10	-	No Further Action
TPH C12-C16	µg/l	–	90	23	15	<10	<10	<10	-	No Further Action
TPH C16-C35	µg/l	–	90	23	40	<10	<10	<10	-	No Further Action
Aliphatic Hydrocarbon										
TPH C5-C6	µg/l	–	1000 ⁵	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C6-C8	µg/l	–	1000 ⁵	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C8-C10	µg/l	–	300	23	<1.0	<1.0	<1.0	<1.0	-	No Further Action
TPH C10-C12	µg/l	–	300	23	<10	<10	<10	<10	-	No Further Action
TPH C12-C16	µg/l	–	300	23	<10	<10	<10	<10	-	No Further Action
TPH C16 – C21	µg/l	–	300**	23	<10	<10	<10	<10	-	No Further Action
TPH C21-C35	µg/l	–	300**	23	<10	<10	<10	<10	-	No Further Action
Volatile Organic Compounds										
Tetrachloroethylene	µg/l	0.4	10	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Trichloroethylene	µg/l	10	10	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Trichlorobenzene	µg/l	0.4	–	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Trichloromethane	µg/l	2.5	–	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Dichloromethane	µg/l	20	200	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Carbon Tetrachloride	µg/l	12	3	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action
Vinyl Chloride	µg/l	–	0.3	23	<1.0	<3.0	<3.0	<3.0	-	No Further Action



Notes

Solubility <0.01µg/l

AA – Annual Average

* Polyaromatic hydrocarbons (PAH) - Benzo(a)pyrene (BaP), Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)-perylene and Indeno(1,2,3-cd)-pyrene. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS or the corresponding AA-EQS in water

** There are no WHO Guideline Values for aliphatic fractions C16-C21 and C21-C35, therefore the guideline value for aliphatic fractions inclusive of C8-C16 (300µg/l) has been applied.

1. [The Water Framework Directive \(Standards and Classification\) Directions \(England and Wales\) 2015 \(legislation.gov.uk\)](#)
2. [The Water Supply \(Water Quality\) Regulations 2018 \(legislation.gov.uk\)](#)
3. [Guidelines for drinking-water quality, 4th edition, incorporating the 1st addendum \(who.int\)](#)
4. [CL:AIRE publishes Petroleum Hydrocarbons in Groundwater guidance \(claire.co.uk\)](#)
5. A total TPH criteria of 1000 mg/kg will act as a surrogate criterion for remaining aliphatic and aromatic TPH fractions.



4.2.1. CONTROLLED WATER RISK ASSESSMENT AND MITIGATION

This comparison indicates that the data exceeds the EQS values for the following inorganic compounds:

- ✳ **Cadmium** (Surface Water – Naden Brook U);
- ✳ **Chromium (VI)** (Leachate – TP108 at 0.70 m);
- ✳ **Chromium (III)** (Leachate – TP108 at 0.70 m);
- ✳ **Copper** (Leachate – TP108 at 0.70 m, TP115 at 0.80 m, TP126 at 0.90 m, RB105 at 11.60 m, ; Groundwater - CP101, CP103, RB101, RB102, RB103, RB105, Surface Water - Woodhouse Lane U + D and Naden Brook U, M and D, Spring);
- ✳ **Cyanide** (Leachate – TP115 at 0.80 m, RB105 at 11.60 m);
- ✳ **Lead** (Leachate – TP115 at 0.80 m and TP126 at 0.90 m);
- ✳ **Nickel** (Groundwater - RB102, Surface Water – Naden Brook U)
- ✳ **Zinc** (Leachate – TP126 at 0.90 m; Surface Water - Woodhouse Lane U, Naden Brook D Groundwater – RB105);
- ✳ **pH** (Leachate – TP108 at 0.70 m and TP115 at 0.80 m);
- ✳ **Anthracene** (Surface Water - Woodhouse Lane D);
- ✳ **Benzo(b)fluoranthene** (Surface Water - Woodhouse Lane D);
- ✳ **Benzo(k)fluoranthene** (Surface Water - Woodhouse Lane D);
- ✳ **Benzo(a)pyrene** (Surface Water - Woodhouse Lane D);
- ✳ **Fluoranthene** (Groundwater - CP103; Surface Water - Woodhouse Lane D); and
- ✳ **TPH C10-C12 Aromatic** (Leachate – RB105 at 11.60 m).

Encia Consulting identified the following exceedances of the EQS within the subject site boundary:

- ✳ **Chromium (III)** (Leachate – BH2 at 0.50 m, WS8 at 0.40 m, WS9 at 0.50 m and WS11 at 0.60 m; Groundwater – BH10, BH12, WS4, WS5, WS12 and WS19; Surface Water – W1, W3, W4 and W5);
- ✳ **Copper** (Leachate – BH2 at 0.50 m, HP1 at 0.50 m, WS6 at 1.00 m, WS8 at 0.40 m, WS9 at 0.50 m, WS11 at 0.60 m, WS12 at 0.70 m, WS17A at 4.80 m, WS19 at 0.90 m, WS20 at 0.60 m, WS21 at 0.50 m and WS25 at 0.70 m; Groundwater – BH10 and WS12; Surface Water – W1, W3, W4);
- ✳ **Lead** (Leachate – HP1 at 0.50 m, WS4 at 0.50 m, WS6 at 1.00 m, WS11 at 0.60 m, WS19 at 0.90 m, WS20 at 0.60 m and WS25 at 0.70 m);
- ✳ **Nickel** (Leachate – WS21 at 0.50 m);



- ✳ **Zinc** (Leachate – BH2 at 0.50 m, HP1 at 0.50m, WS4 at 0.50 m, WS8 at 0.40 m, WS9 at 0.50 m, WS11 at 0.60 m, WS12 at 0.70 m, WS19 at 0.90 m and WS20 at 0.60m; Groundwater – BH10, BH12, WS4, WS5, WS12 and WS19; Surface Water – W1, W3, W4 and W5);
- ✳ **Naphthalene** (Leachate – WS21 at 0.50 m; Groundwater – WS19);
- ✳ **Anthracene** (Leachate – WS19 at 0.90 m, WS21 at 0.50m and WS25 at 0.70 m; Groundwater – BH12 and WS19);
- ✳ **Benzo(b)fluoranthene** (Leachate – WS21 at 0.50 m; Groundwater – BH12, WS4 and WS12; Surface Water – W4);
- ✳ **Benzo(k)fluoranthene** (Leachate – WS21 at 0.50 m; Groundwater – BH12, WS4 and WS12; Surface Water – W4);
- ✳ **Benzo(a)pyrene** (Leachate – WS21 at 0.50 m; Groundwater – BH12, WS4 and WS12; Surface Water – W4);
- ✳ **Indeno(123cd)pyrene** (Leachate – WS21 at 0.50 m; Groundwater – BH12, WS4 and WS12; Surface Water – W4);
- ✳ **Fluoranthene** (Leachate – WS4 at 0.50 m, WS8 at 0.40 m, WS9 at 0.50 m, WS12 at 0.70 m, WS17A at 4.80 m, WS19 at 0.90 m, WS20 at 0.60 m, WS21 at 0.50 m and WS25 at 0.70 m; Groundwater – BH10, BH12, WS4, WS12 and WS19; Surface Water – W4);
- ✳ **m&p-xylene** (Groundwater – WS19);
- ✳ **o-xylene** (Groundwater – BH12 and WS19);
- ✳ **TPH Aromatics C8-C10, C10-C12, C12-C16, C16-C21 and C21-C35** (Groundwater – BH12 and WS19);
- ✳ **TPH Aliphatic C8-C10** (Groundwater – BH12) (*Screened against DWS in absence of EQS value*);
- ✳ **TPH Aliphatic C10-C12** (Groundwater – BH12 and WS19) (*Screened against DWS in absence of EQS value*); and,
- ✳ **TPH Aliphatic C12-C16** (Groundwater – BH12) (*Screened against DWS in absence of EQS value*).

Note – Leachate sample WS21 underwent 25 times dilution and Water sample WS19 underwent 200 times dilution for PAH analysis.

Contamination Issues Plans for leachate, groundwater and surface water are presented as Drawings 16-465-034 to 16-465-036 in Appendix III, and snapshots are included in Figure 4.10 to Figure 4.12 below.



FIGURE 4.10 CONTAMINATION ISSUES PLAN – LEACHATE



FIGURE 4.11 CONTAMINATION ISSUES PLAN – GROUNDWATER

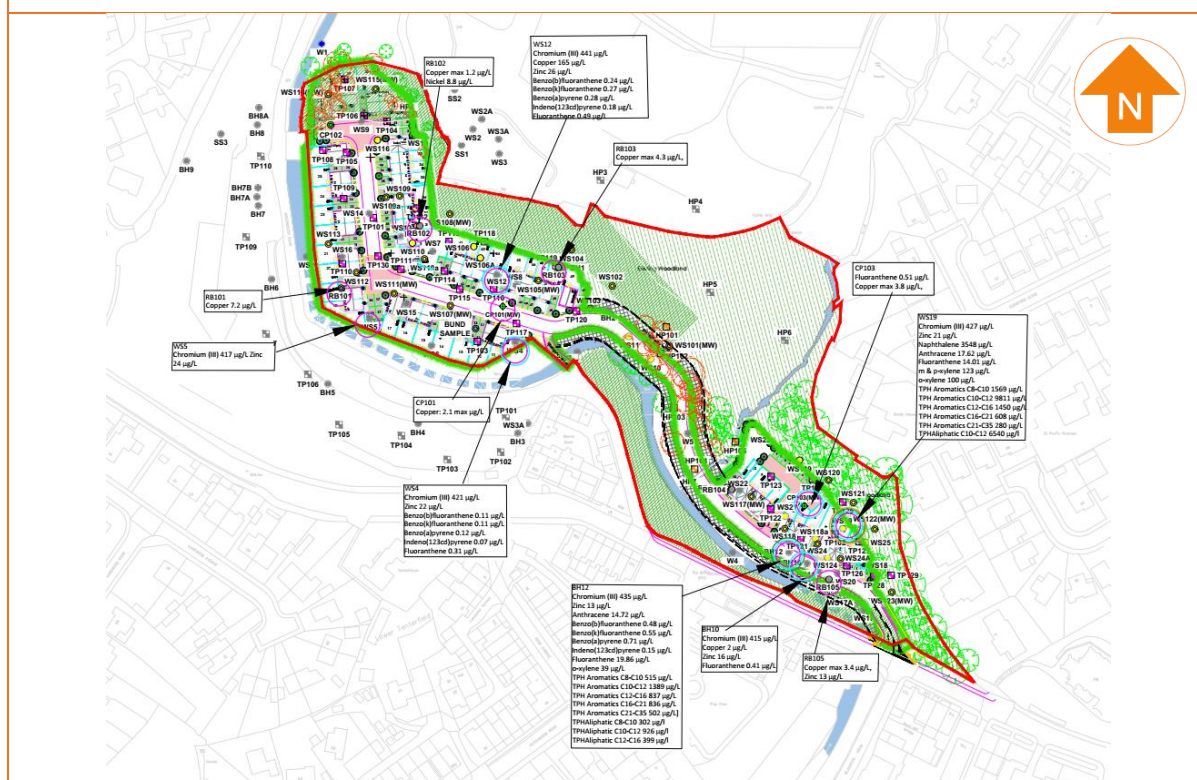
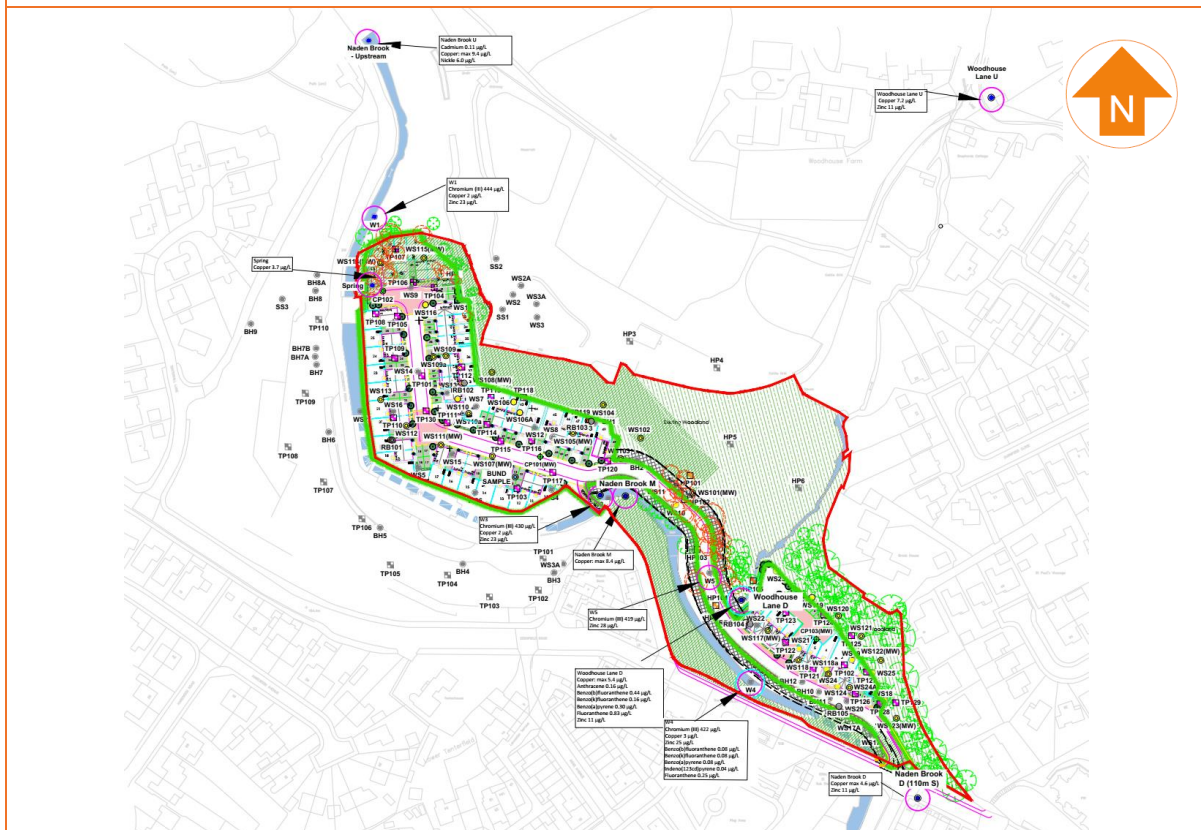


FIGURE 4.12 CONTAMINATION ISSUES PLAN – SURFACE WATER



4.2.2. M-BAT ASSESSMENT

Due to exceedances of the EQS for copper, nickel and zinc, an m-BAT assessment has been completed to assess the bioavailability of the metals with respect to surface water receptors (Naden Brook, Woodhouse Lane Brook and the on-site spring). The chemical values from the surface water analysis have been input into the assessment.

It is noted that E3P has been unable to undertake an m-BAT assessment on the Encia surface water sample data due to incomplete testing parameters (i.e., DOC and Ca).

Where the Risk Characterisation Ratio (RCR) is greater than 1, this indicates the bioavailable concentration is above the EQS and the receptor is therefore at risk.

The m-BAT assessment has confirmed that no exceedances of the RCR have been identified within surface water samples taken from Woodhouse Lane Brook, Naden Brook and the on-site spring, and as such, the concentrations of copper, nickel and zinc identified within these samples are not considered to be bioavailable.

Furthermore, this assessment is considered to be conservative given that several concentrations of copper, nickel and zinc within the surface water samples are greater than concentrations encountered within groundwater.

In light of the above assessment, E3P does not consider the site to pose an unacceptable level of risk to surface waters for copper, nickel and zinc. It should also be noted that the proposed development will largely encapsulate the site, thus limiting the potential for infiltration and therefore leaching potential.



However, further analysis of Naden Brook and Woodhouse Lane Brook should be undertaken as groundworks progress, to ensure no future mobilisation of contaminants is caused, which may pose a risk to the surface watercourses.

4.2.3. DISCUSSION OF CONTROLLED WATERS RISK ASSESSMENT

Historically, the site has been subjected to extensive infilling and a number of industrial uses including a bleaching and dyeing mill, filter beds/tanks and infilled reservoirs. Chemical by-products of manufacturing processes and compounds within the Made Ground may have subsequently leached down into the underlying ground and contaminated groundwater both within Made Ground and natural drift deposits.

The Tier 2 controlled waters risk assessment identified exceedances of the EQS for heavy metals (cadmium, chromium (III), copper, nickel and zinc), non-volatile PAHs (anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(123cd)pyrene, and fluoranthene) and naphthalene in both the leachate and dissolved phases (during the Encia investigation).

Exceedances of the EQS for chromium (VI), cyanide, lead and pH were also identified in the leachate phase only.

Exceedances of the EQS for TPHs (m&p-xylene, o-xylene, TPH Aromatic C8-C35 and Aliphatic C8-C16) were also identified in the dissolved phase within groundwater samples taken by Encia in the Sheppard Mill area (BH12 and WS19). An elevated concentration of TPH C10-C12 Aromatic was identified in the leachate sample from RB105 at 11.60 m (also located in the Sheppard Mill area). No TPH impact has been identified in the groundwater in RB102 where the monitoring well is installed in the sandstone bedrock.

No significant concentrations of VOCs or SVOCs were identified within samples submitted for analysis.

PFAS/PFOS testing on groundwater and surface water samples had no detections above the laboratory LOD.

Secondary A Aquifer (Bedrock)

The site is underlain by mixed geology, with cohesive clay and granular sand and gravel across the site.

The granular deposits will afford less protection to the underlying Secondary A aquifer in the bedrock, whereas clay deposits have been identified in excess of 5.00 m in areas, which will restrict the migration of contaminants.

Also, the proposed development will create hardstanding cover across the site, thus reducing the amount of infiltration generated. This will, in turn, reduce the number of contaminants present in leachate off the site and reduce the risk further to the underlying aquifer and on-site stream.

The sensitivity of the aquifer is further reduced given that the site is not located within a groundwater source protection zone and that no active groundwater abstraction points are located within a 1 km radius of the site. The closest active potable abstraction point is a surface water abstraction point located 498 m northwest of the site. It is noted that this abstraction point is located upstream of the site.

As such, the underlying Secondary A Aquifer is deemed to be at a low risk from on-site contamination.



Surface Water Receptor

A comparison of surface water samples from Naden Brook and Woodhouse Lane Brook to the Tier 2 assessment criteria (Table 4.7) has shown exceedances for copper within all samples upstream and downstream of the site. Exceedances for copper were also identified in the samples from the on-site spring on two occasions.

As a result of this, it can be said that the presence of copper cannot be attributed to the site, due to the presence of this within upstream samples. The m-BAT assessment has also shown that within surface water samples taken by E3P, copper, nickel and zinc are not considered to be bioavailable.

The exceedances relating to zinc in the surface water samples are marginal, of 11 µg/l when compared to the EQS value of 10.9 µg/l. Elevated concentrations of cadmium and nickel were only identified in the upstream sample from Naden Brook, suggesting that the contamination may be related to an off-site source.

Concentrations of chromium (III) were found to be in exceedance of the EQS within leachate samples taken by E3P and leachate, groundwater and surface water samples taken by Encia. Chromium (III) is generally considered to be of low solubility and mobility. However, concentrations were noted to be significantly elevated within groundwater and surface water samples (417-444 µg/l) when compared to leachate samples (14-132 µg/l). It is also noted that the elevated concentrations were present within Encia's surface water samples both upstream and downstream of the site (419-444 µg/l). As such, there is the potential that the chromium (III) contamination within the groundwater (on-site) and surface water is migrating from a currently unknown off-site source through the site and into the surface water receptors. However, given the sites history as a dyeing mill (where chromium (III) was actively used in certain dyeing agents), and the fact that concentrations within groundwater and surface water samples are similar, there is the possibility that the chromium (III) contamination is coming from site, and laterally migrating into the surface water courses, thus causing a detrimental impact on the surface water receptors. No exceedances were identified for chromium (III) during the four rounds of groundwater and surface water sampling completed by E3P, therefore there is considered to be a low risk to controlled waters.

The other contaminants of concern, non-volatile PAHs, were identified within the chemical testing in surface water samples taken downstream of Woodhouse Lane Brook (E3P, Woodhouse Lane Downstream) and Naden Brook (Encia, W4). However, concentrations of PAHs were identified to be less than the limit of detection in all surface water samples during the second, third and fourth rounds of monitoring. This suggests that there is no significant impact associated with non-volatile PAHs.

It is also noted that mobile contaminants identified within the soils and groundwater (PAHs, naphthalene and TPHs) have the potential to migrate laterally towards the surface water receptors as a result of the high permeability strata present beneath the site. The cohesive strata that is present beneath the site may also act as an impermeable barrier and channel mobile contaminants towards the surface water receptors. Given no elevated concentrations of naphthalene have been identified in leachate, groundwater or surface water samples taken by E3P, there does not appear to be a complete pollutant linkage. Although an elevated concentration of TPH C10-C12 Aromatic was identified in the leachate sample from RB105 at 11.60 m, no elevated TPH concentrations were recorded in groundwater and surface water samples taken by E3P. Where leachate analysis has been undertaken, this can overstate the risk and is not wholly representative of the site characterisation.

Conclusions & Recommendations

Though the risk to the underlying bedrock Secondary A aquifer is considered to be low, the risk to the surface water receptors is considered to be high, due to the presence of impacted soils within close proximity of surface water features, and the presence of high permeability strata in areas beneath the site which would afford the lateral and vertical migration of contaminants.



The groundwater flow plan (Drawing 16-465-040, Appendix III) suggests that groundwater is flowing towards the central sector of the site from the north and southeast.

Widespread naphthalene and TPH contamination has been identified in the soil analysis, with the majority of the impact noted within the Sheppard Mill area of the site. Thus, the source of the contaminants cannot be attributed to one area or point source and the majority of the contamination is considered present on a site wide basis.

During the remediation and enabling works phase, the removal of the hardstanding currently present across the site may induce infiltration and potential mobilisation of contaminants present within the soils and groundwater directly into the surface water receptors. However, the areas of low permeability clay soils will act to inhibit migration.

The supplementary controlled waters risk assessment completed by E3P has not identified any significant impact within the groundwater or surface water samples. The data suggests that there is no complete pollutant linkage and the identified contamination within the soils is not likely to be mobile.

It will be necessary to instigate a watching brief during Remediation and Enabling Works to ensure that it can be demonstrated that all material that remains in-situ is suitable for retention.

Surface water sampling is also recommended throughout the Remediation and Enabling Works to ensure that the water quality of the surface water features is not altered.

4.3. GROUND GAS RISK ASSESSMENT

Hazardous ground gas qualitative risk assessment is based on a conceptual site model (CSM) similar to that used for soil and groundwater contamination sources (i.e., source-pathway-receptor pollutant linkages).

The risk can be assessed based on knowledge of the ground conditions and CSM; and a measure of hazardous gas concentrations and gas flow at the site within monitoring standpipes.

4.3.1. SOURCES AND PATHWAYS OF GROUND GAS

Table 4.8 summarises the potential sources and pathways of ground gas within the context of the recorded site setting and proposed development.

TABLE 4.8 IDENTIFIED POTENTIAL SOURCES OF GROUND GAS

SOURCE
Made Ground Made Ground deposits were encountered within all exploratory hole locations to depths ranging between 0.00 m and 5.80 m bgl. However, in 23 locations in the Tack Lea Works area and 13 locations in the Sheppard Mill area, the full thickness of Made Ground could not be proven. The five hand pit locations within the eastern section of the Tack Lea Works area were all terminated within Made Ground. The site was predominantly covered with concrete hardstanding to a maximum proven thickness of 0.68 m bgl. In two locations within the eastern part of the Tack Lea Works area, reworked topsoil was encountered to a maximum proven thickness of 0.10 m bgl.



Variable granular and cohesive Made Ground deposits were encountered beneath the concrete hardstanding and reworked topsoil, which generally comprised a brown sandy gravel with gravels of sandstone, mudstone, limestone, concrete, brick, ceramic, glass, wood and metal and rare ash and plastic.

In the Tack Lea Works area, Made Ground deposits were generally encountered between 1.00 m and 2.00 m bgl, with shallower deposits (< 1.00 m bgl) located along the northern boundary (i.e. closer to the valley edge). Deeper Made Ground deposits, ranging between 2.00 m and 5.80 m bgl, were encountered in the northwest part of the site (associated with the infilled sandstone quarry), the central part of the site (associated with infilled reservoirs) and the eastern part of the site (associated with the filter tanks, reservoirs and historical landfill).

In the Sheppard Mill area, Made Ground deposits were generally encountered between 2.00 m and 5.10 m bgl, with shallower deposits (< 1.00 m bgl) located along the northern boundary (i.e. closer to the valley edge). The deepest Made Ground deposits were encountered along the southern boundary associated with the former buildings and infilled reservoirs.

TOC analysis recorded the highest concentration in TP122 at 1.0 m bgl with a concentration of 3.5%. The Made Ground at this location was observed to contain ash and occasional fragments of timber.

Drift Strata

Drift deposits were encountered within twenty-nine exploratory hole locations between depths of 0.50 m and 15.00 m bgl. Both granular and cohesive drift deposits were encountered, which generally comprised a loose to dense brown clayey to sandy GRAVEL overlying a brown gravelly CLAY with gravels of mudstone and sandstone. The strength of CLAY varied from soft to very stiff.

Drift deposits were noted to be shallower (between 1.00 m and 2.50 m thick) along the northern parts of the Tack Lea Works area and Sheppard Mill area (i.e. closer to the valley edge). Deeper drift deposits (between 7.70 m and 11.00 m thick) were noted to be present along the western and southern boundaries of the Tack Lea Works area and the southern boundary of the Sheppard Mill area (i.e. towards the centre of the valley).

Solid Strata

The solid bedrock geology was encountered within five exploratory hole locations. Shallow bedrock was encountered between 1.60 m and 2.90 m bgl along the northern part of the Tack Lea Works area (i.e. closer to the valley edge). Along the southern boundaries of the Tack Lea Works area and Sheppard Mill area (i.e. towards the centre of the valley), deep bedrock was encountered between 11.60 m and 13.80 m bgl. The bedrock generally comprised of a greyish brown SANDSTONE. Outcrops of bedrock were also noted to be present in the northwest part of the Tack Lea works area and along the northern boundaries of the Tack Lea Works area and Sheppard Mill area.

In the Encia Consulting 2006 Report, shallow bedrock of sandstone was encountered in the central and western sections of the Tack Lea Works area at depths typically <2.00 m bgl. To the east of the former Tack Lea Mill Buildings and in the Sheppard Mill area, bedrock was found to be deeper and was encountered at depths ranging between 4.30 m and 5.00 m bgl. To the north of the Tack Lea Works area and Sheppard Mill area, bedrock can be seen outcropping in the valley and hillsides.

Landfill Sites

There is one licenced historical landfill located on-site in the eastern section of the Tack Lea Works area and west of Woodhouse Lane Brook within an area of semi-mature woodland. The landfill site was listed as formerly receiving inert and industrial wastes between 1987 and 1991. The extent of the landfill is shown on Drawing 16-465-024 (Appendix III).



During the E3P intrusive ground investigation, one exploratory hole was advanced within the western boundary of the historical landfill (WS101). Ground conditions encountered within the borehole comprised Made Ground (dark brown gravelly clay, with gravels comprising fine to coarse subangular to subrounded of sandstone, and brick with fragments of metal and plastic) to 3.00 m bgl overlying a firm low strength brown gravelly CLAY to 4.50 m bgl. A monitoring well was installed within the Made Ground with a screening zone between 1.00-3.00 m bgl. It is noted that access to the historical landfill area was limited due dense vegetation, variable topographical level changes, and existing structures. As such, only one monitoring well was installed within the boundary of the historical landfill.

During the Encia 2006 intrusive ground investigation, two exploratory holes were advanced within the centre of the historical landfill (WS10 and WS11). Ground conditions encountered within the boreholes comprised Made Ground (brown and grey clayey fine to coarse gravel of brick, concrete and stone with many cobbles of red brick, concrete and sandstone) to 2.20 m and 3.00 m bgl respectively. A monitoring well was installed within WS11, with a response zone between 0.50 m and 3.00 m bgl. Ground gas monitoring results recorded a maximum methane concentration of <0.1 l/hr and maximum carbon dioxide concentration of 2.5 l/hr within WS11, indicating a CS1 classification would be applicable. Across the wider site, a maximum carbon dioxide concentration of 9.1 l/hr was recorded in WS9 (northwest section of Tack Lea Works area), indicating a CS2 classification would be applicable.

Several infilled ponds/reservoirs are located in the Tack Lea Works area in the northwestern section and beneath the old boiler house and coal bunker. Two infilled reservoirs are located in the southern section of the Sheppard Mill Area. A historical sandstone quarry (presumed infilled) is located in the northwestern section of the Tack Lea Works area.

The site has also undergone extensive historical development and ground working.

The Made Ground associated with these historical land uses together with recorded landfill may produce hazardous ground gases such as methane and carbon dioxide.

Other Gases

Elevated concentrations of naphthalene, volatile TPHs, VOCs, SVOCs, and mercury have been identified within the Made Ground on-site, which present a potential volatilisation to indoor air risk.

Elevated concentrations of naphthalene, VOCs and SVOCs within the northern sector of the site are considered to be localised occurrences and therefore these locations can be treated as hotspots. However, elevated concentrations of naphthalene, TPH, VOCs and SVOCs have been identified throughout the Shepherd Mill area of the site (southern sector) and these do not appear to be localised hotspots.

Further assessment, in the form of a Tier 3 vapour risk assessment is required across the site to assess the level of risk to the future site users by volatilisation to indoor air. Subject to the findings of the vapour risk assessment, vapour resistant membranes may be required.

Radon

As of February 2023, the UK Health Security agency (UKHSA) and the British Geological Society (BGS) have published an updated radon potential map for Great Britain.

The latest update to the radon map has the potential to reclassify areas that have previously been assured as low risk to be potentially be affected by radon.

A BGS Radon Report was purchased for the site, which indicated that the northeast and northwest of the site is situated in an area where 1–3% of homes are above the "Action Level" and the rest of the site is situated in an area where 0–1% of homes are above the "Action Level". Full radon protective measures are not necessary for the construction of new dwellings or extensions.

A full site-specific radon report is presented in Appendix XI.



The CIRIA C665 guidance on gas risk assessment includes recommendations for periods and frequencies for monitoring visits. These recommendations take into account the nature of the proposed development and the likely generation potential of the source.

The proposed development comprises private residential properties, which would be classified as a Type A development (high sensitivity) in accordance with BS8485:2015+A1:2019. It is considered that the likely generation potential of the identified gas sources (taking into account the likelihood of future increases in gas generation) would be classified as moderate to high.

Therefore within the context of the proposed residential end-use and ground gas generation potential, the gas assessment requires nine visits over six months, with at least two sets of readings at low or falling atmospheric pressure.

4.4. GROUND GAS RISK ASSESSMENT METHODOLOGY

The potential impact on the development from ground gases has been assessed with reference to standards and guidelines published in:

- ✿ CIRIA Report 665 – Assessing risks posed by hazardous ground gases to buildings (2007)
- ✿ BS8485:2015+A1:2019 – Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation (CS) and the proposed development based on building type.

Therefore, in accordance with BS8485, based on the measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) shall be derived for each monitoring point, from which the site characteristic hazardous gas flow rate (Q_{hgs}), and then the Characteristic Situation (CS) can be determined.

The following equation should be utilised:

$$Q_{hg} = q \left(\frac{C_{hg}}{100} \right)$$

Where:

q is the measured flow rate (in litres per hour) of combined gases from the monitoring standpipe
 C_{hg} is the measured hazardous gas concentration (in percentage volume/volume).

The subsequent derived gas screening value (GSV) should be the maximum Q_{hg} (flow rate x concentration as a percentage volume) for all the monitoring events.

A 'worst case check' may be carried out using the maximum recorded flow in any hole with the maximum concentration in any hole to present the plausible worst-case conditions. Adoption of the worst-case Q_{hg} requires thorough justification and reference to the CSM.

The final derived GSV can then be used to characterise the site as summarised in Table 4.9.



TABLE 4.9 SITE CHARACTERISATION BY GSV (BS8485:2015)

CS	HAZARD POTENTIAL	GSV (l/hr) FOR METHANE AND CARBON DIOXIDE	ADDITIONAL FACTORS
CS1	Very Low	< 0.07	Typically <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	< 0.70	Typical measured flow rate <70 l/h (otherwise consider an increase to CS3)
CS3	Moderate	< 3.5	N/A
CS4	Moderate to High	< 15	N/A
CS5	High	< 70	N/A
CS6	Very High	> 70	N/A

Notes

1. The CS is equivalent to the characteristic GSV in CIRIA C665.
2. The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter should be considered.
3. Gas Screening Value is the Borehole Gas Volume Flow Rate, in litres per hour, multiplied by the concentration in the air stream of the particular gas being considered.
4. The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.

NHBC guidance (Report No 10627R01) can also be considered, if appropriate, which is based on standard residential houses with precast concrete floors (block and beam) / suspended cast in situ concrete floor slabs.

The thresholds for GSVs based upon NHBC guidance are provided within Table 4.10.

TABLE 4.10 THRESHOLDS FOR GAS SCREENING VALUES (GSV) IN ACCORDANCE WITH NHBC REPORT NO 10627R01 – RESIDENTIAL END USE

NHBC – SUBFLOOR VOID				
CLASSIFICATION	Methane ¹		Carbon Dioxide ¹	
	TYPICAL MAXIMUM CONCENTRATION ³ (%V/V)	GAS SCREENING VALUE ^{2,4} (l/hr)	TYPICAL MAXIMUM CONCENTRATION ³ (%V/V)	Gas Screening Value ^{2,4} (l/hr)
Green	< 1	< 0.16	< 5	< 0.78
Amber 1	< 5	< 0.63	< 10	< 1.56
Amber 2	< 5	< 1.56	< 30	< 3.10
Red	> 20	> 1.56	> 30	> 3.10

Notes

- 1) The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter will be the decider as to what Traffic Light is allocated;
- 2) Gas Screening Value is the Borehole Gas Volume Flow Rate, in litres per hour, as defined in Wilson and Card (1999), which is the borehole flow rate multiplied by the concentration in the air stream of the particular gas being considered;
- 3) The Typical Maximum Concentrations can be exceeded in certain circumstances should the Conceptual Site Model indicate it is safe to do so;
- 4) The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.



It should be noted that in the first instance, this assessment has been carried out in accordance with BS8485:2015+A1(2019) and the thresholds given in Table 4.9.

4.5. MONITORING METHODOLOGY

Concentrations of methane (CH_4), carbon dioxide (CO_2) and oxygen (O_2) were measured using a calibrated infrared gas analyser (GFM435) with gas flow rates measured using an integrated flow meter.

Gas measurements were recorded for a minimum of 500 seconds at each location, at which point the maximum concentration of CH_4 and CO_2 , together with the lowest concentration of O_2 were recorded.

The results of the ground gas monitoring are presented in Table 4.11.

In addition to the raw data, the results for each individual standpipe have been assessed with reference to guidance provided in BS8485:2015+A1:2019. Based on the initial peak measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) have been derived for each monitoring point, from which an individual Characteristic Situation (CS) can ultimately be determined.



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TABLE 4.11 SUMMARY OF GROUND GAS MONITORING RESULTS

WELL	STRATA	DATE	CH ₄ PEAK (%V/V)	CH ₄ STEADY (%V/V)	CH ₄ Q _{hg} (l/hr)	CO ₂ PEAK (%V/V)	CO ₂ STEADY (%V/V)	CO ₂ Q _{hg} (l/hr)	O ₂ (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	PEAK FLOW (l/hr)	STEADY FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS101	Made Ground	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	1001	Steady	0.1	0.1	1.00 – 3.00	2.85	DRY
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	986	Steady	0.1	0.1		2.85	DRY
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	978	Falling	0.1	0.1		2.85	2.80
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	975	Falling	0.1	0.1		2.85	DRY
		20/01/2023	0.1	0.1	0.0001	0.2	0.2	0.0002	19.9	999	Steady	0.1	0.1		2.85	2.77
		06/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	1020	Falling	0.1	0.1		2.85	2.78
		22/02/2023	0.1	0.1	0.0001	0.2	0.2	0.0002	20.2	988	Steady	0.1	0.1		2.86	2.79
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	982	Falling	0.1	0.1		2.86	2.78
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	992	Steady	0.1	0.1		2.86	2.76
WS105	GRAVEL	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	1001	Steady	0.1	0.1	1.00 – 2.50	2.25	1.70
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	987	Steady	0.1	0.1		2.35	1.88
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	978	Falling	0.1	0.1		2.37	1.79
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	975	Falling	0.1	0.1		2.35	1.22
		20/01/2023	0.1	0.1	0.0001	0.7	0.7	0.0007	19.3	1000	Steady	0.1	0.1		2.37	1.05
		06/02/2023	0.1	0.1	0.0001	0.7	0.7	0.0007	19.4	1021	Falling	0.1	0.1		2.37	1.07
		22/02/2023	0.1	0.1	0.0001	0.6	0.6	0.0006	19.8	988	Steady	0.1	0.1		2.36	1.05
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	981	Falling	0.1	0.1		2.36	1.08
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	991	Steady	0.1	0.1		2.35	1.03



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WELL	STRATA	DATE	CH ₄ PEAK (%V/V)	CH ₄ STEADY (%V/V)	CH ₄ Q _{hg} (l/hr)	CO ₂ PEAK (%V/V)	CO ₂ STEADY (%V/V)	CO ₂ Q _{hg} (l/hr)	O ₂ (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	PEAK FLOW (l/hr)	STEADY FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
WS107	Made Ground	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	1000	Steady	0.1	0.1	0.50 – 1.50	1.40	1.30
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	986	Steady	0.1	0.1		1.53	1.40
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	978	Falling	0.1	0.1		1.53	1.35
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	972	Falling	0.1	0.1		1.53	1.11
		20/01/2023	0.1	0.1	0.0001	0.2	0.2	0.0002	18.6	999	Steady	0.1	0.1		1.53	1.32
		06/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.3	1020	Falling	0.1	0.1		1.53	1.29
		22/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	988	Steady	0.1	0.1		1.53	1.34
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	981	Falling	0.1	0.1		1.53	1.26
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	991	Steady	0.1	0.1		1.52	1.30
WS108	Made Ground	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	1000	Steady	0.1	0.1	0.50 – 1.00	0.80	DRY
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	986	Steady	0.1	0.1		0.85	DRY
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	977	Falling	0.1	0.1		0.85	DRY
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	976	Falling	0.1	0.1		0.85	DRY
		20/01/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	1000	Steady	0.1	0.1		0.85	DRY
		06/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20	1020	Falling	0.1	0.1		0.85	DRY
		22/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	988	Steady	0.1	0.1		0.85	DRY
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	981	Falling	0.1	0.1		0.85	DRY
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	991	Steady	0.1	0.1		0.85	DRY



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WS111	Made Ground	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.5	1000	Steady	0.1	0.1	0.50 – 1.00	1.90	DRY
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	986	Steady	0.1	0.1		2.00	DRY
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	977	Falling	0.1	0.1		2.00	DRY
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	975	Falling	0.1	0.1		2.00	DRY
		20/01/2023	0.1	0.1	0.0001	0.4	0.1	0.0004	19.7	999	Steady	0.1	0.1		2.00	1.62
		06/02/2023	0.1	0.1	0.0001	0.2	0.2	0.0002	19.3	1020	Falling	0.1	0.1		2.00	1.15
		22/02/2023	0.1	0.1	0.0001	0.3	0.1	0.0003	20.3	988	Steady	0.1	0.1		2.00	1.20
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	981	Falling	0.1	0.1		2.00	1.18
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	991	Steady	0.1	0.1		2.00	1.09
WS114	Sandy GRAVEL	29/11/2022	0.1	0.1	0.0026	0.1	0.1	0.0026	19.5	1000	Steady	2.6	0.1	1.00 – 3.00	2.55	DRY
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	985	Steady	0.1	0.1		2.65	DRY
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	976	Falling	0.1	0.1		2.65	DRY
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.4	975	Falling	0.1	0.1		2.65	DRY
		20/01/2023	0.1	0.1	0.0001	0.2	0.2	0.0002	19.7	998	Steady	0.1	0.1		2.65	DRY
		06/02/2023	0.1	0.1	0.0001	0.3	0.3	0.0003	19.8	1018	Falling	0.1	0.1		2.65	2.60
		22/02/2023	0.1	0.1	0.0001	0.4	0.4	0.0004	19.7	988	Steady	0.1	0.1		2.65	2.57
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	980	Falling	0.1	0.1		2.65	2.60
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	991	Steady	0.1	0.1		2.65	2.61



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WS115	Made Ground	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.5	1000	Steady	0.1	0.1	1.00 – 3.00	1.70	DRY
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	985	Steady	0.1	0.1		1.85	DRY
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	976	Falling	0.1	0.1		1.85	DRY
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	974	Falling	0.1	0.1		1.85	DRY
		20/01/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	998	Steady	0.1	0.1		1.85	DRY
		06/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20	1019	Falling	0.1	0.1		1.85	DRY
		22/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	988	Steady	0.1	0.1		1.85	DRY
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	980	Falling	0.1	0.1		1.85	DRY
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	981	Steady	0.1	0.1		1.85	DRY
WS117	Made Ground	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.5	1001	Steady	0.1	0.1	1.00 – 3.00	2.70	2.35
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	987	Steady	0.1	0.1		2.80	2.48
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	978	Falling	0.1	0.1		2.84	2.38
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.4	973	Falling	0.1	0.1		2.84	DRY
		20/01/2023	0.1	0.1	0.0001	0.9	0.9	0.0009	19.3	1000	Steady	0.1	0.1		2.83	2.54
		06/02/2023	0.1	0.1	0.0001	1.2	1.2	0.0012	18.9	1021	Falling	0.1	0.1		2.83	2.14
		22/02/2023	0.1	0.1	0.0001	1.4	1.4	0.0014	17.7	988	Steady	0.1	0.1		2.83	2.18
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	982	Falling	0.1	0.1		2.83	2.23
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	992	Steady	0.1	0.1		2.81	1.88



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WS122	Gravelly CLAY	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.5	1001	Steady	0.1	0.1	2.00 – 4.00	3.25	2.80
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	988	Steady	0.1	0.1		3.32	2.90
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.9	980	Falling	0.1	0.1		3.32	2.86
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	975	Falling	0.1	0.1		3.30	2.35
		20/01/2023	0.1	0.1	0.0001	0.7	0.7	0.0007	17.9	1000	Steady	0.1	0.1		3.30	2.09
		06/02/2023	0.1	0.1	0.0001	0.8	0.8	0.0008	18.5	1021	Falling	0.1	0.1		3.28	2.14
		22/02/2023	0.1	0.1	0.0001	0.7	0.7	0.0007	19.5	989	Steady	0.1	0.1		3.28	2.03
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	983	Falling	0.1	0.1		3.28	2.01
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	993	Steady	0.1	0.1		3.28	1.63
WS123	Made Ground	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.5	1001	Steady	0.1	0.1	0.50 – 1.50	1.30	DRY
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	988	Steady	0.1	0.1		1.40	DRY
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	980	Falling	0.1	0.1		1.40	DRY
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.4	975	Falling	0.1	0.1		1.40	DRY
		20/01/2023	0.1	0.1	0.0001	1.5	1.5	0.0015	18.8	1000	Steady	0.1	0.1		1.40	DRY
		06/02/2023	0.1	0.1	0.0001	1.2	1.2	0.0012	18.5	1022	Falling	0.1	0.1		1.40	DRY
		22/02/2023	0.1	0.1	0.0001	0.6	0.6	0.0006	19.7	990	Steady	0.1	0.1		1.40	DRY
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	984	Falling	0.1	0.1		1.40	DRY
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	994	Steady	0.1	0.1		1.40	DRY



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WELL	STRATA	DATE	CH ₄ PEAK (%V/V)	CH ₄ STEADY (%V/V)	CH ₄ Q _{hg} (l/hr)	CO ₂ PEAK (%V/V)	CO ₂ STEADY (%V/V)	CO ₂ Q _{hg} (l/hr)	O ₂ (%V/V)	ATMOS (mb)	ATMOS. DYNAMIC	PEAK FLOW (l/hr)	STEADY FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
CP101	Made Ground	29/11/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	1001	Steady	0.1	0.1	1.00 – 5.00	4.10	1.65
		12/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	988	Steady	0.1	0.1		4.34	1.80
		22/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20	978	Falling	0.1	0.1		4.34	1.63
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.5	977	Falling	0.1	0.1		4.34	2.12
		20/01/2023	0.1	0.1	0.0001	0.8	0.8	0.0008	15.3	1000	Steady	0.1	0.1		4.22	1.16
		06/02/2023	0.1	0.1	0.0001	0.7	0.7	0.0007	14.8	1022	Falling	0.1	0.1		4.20	1.32
		22/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.4	988	Steady	0.1	0.1		4.18	1.16
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	981	Falling	0.1	0.1		4.18	1.18
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	992	Steady	0.1	0.1		4.12	1.11
CP103	Sandy GRAVEL	29/11/2022	0.1	0.1	0.0003	0.1	0.1	0.0003	19.5	1001	Steady	0.3	0.1	3.00 – 4.80	4.80	2.00
		12/12/2022	0.1	0.1	0.0000	0.1	0.1	0.0001	19.8	988	Steady	0.1	0.1		4.97	2.20
		22/12/2022	0.1	0.1	0.0000	0.1	0.1	0.0001	20	979	Falling	0.1	0.1		5.00	2.15
		30/12/2022	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	974	Falling	0.1	0.1		5.00	1.87
		20/01/2023	0.1	0.1	0.0001	0.9	0.9	0.0009	14.9	1000	Steady	0.1	0.1		5.00	2.20
		06/02/2023	0.1	0.1	0.0001	0.9	0.9	0.0009	14.5	1021	Falling	0.1	0.1		4.99	2.15
		22/02/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	20.4	988	Steady	0.1	0.1		5.01	2.21
		06/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.7	983	Falling	0.1	0.1		5.03	2.16
		20/03/2023	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	992	Steady	0.1	0.1		5.05	2.57

Notes

CIRIA Characteristic Situation

Q_{hg}

CS1

<0.07

Typical Max CO₂ <5 % Typical Max CH₄ <1 %

Values in **BOLD** exceed CS1 Thresholds

CS2

<0.7

Flow rate not to exceed 70 l/hr otherwise consider increase to CS3

Values in **BLUE** denote water above level of response zone (flooded)

CS3

<3.5

CS4

<15

Quantitative Risk Assessment required to evaluate scope of protective measures



4.6. SUMMARY OF MONITORING RESULTS

4.6.1. GROUNDWATER

The water level within the monitoring wells was recorded to be above the top of the response zone (flooded) in CP103 throughout the monitoring period and in WS122 during the ninth round of monitoring.

WS108, WS115 and WS123 were dry throughout the monitoring period. WS111 was dry during the first four rounds of monitoring; and WS114 was dry during the first five rounds of monitoring. WS101 was dry during the first, second and fourth rounds of monitoring and WS117 was dry during the fourth round of monitoring.

Water levels were found between 1.03 m (WS105) and 2.90 m bgl (WS122).

4.6.2. BAROMETRIC PRESSURE

Visits 1, 2, 5, 7 and 9 were undertaken during steady pressure.

Visits 3, 4 and 8 were undertaken during falling pressure events; whilst Visit 6 was undertaken during high pressure although during the visit, the pressure began to fall.

It is therefore considered that the visits have been undertaken over representative conditions.

4.6.3. GAS FLOW

Throughout the monitoring period, flow rates were recorded to be 0.1 l/hr (limit of detection of the analyser).

4.6.4. GAS CONCENTRATIONS

The maximum methane value recorded within the monitoring wells was 0.1% v/v (limit of detection of the analyser).

Carbon dioxide was recorded at concentrations ranging from 0.1% v/v to 1.5% v/v (WS123).

4.7. CONCLUSION

The determined Characteristic Situation for each standpipe for each visit is presented in Table 4.12. This indicates that based on the peak flow rates the majority of the monitoring visits classify as Characteristic Situation (CS)1 – Very Low Gas Risk.



TABLE 4.12 GAS RISK PROFILE AND LOCATION

WELL	DATE	DEPTH TO WATER (m bgl)	MAX FLOW (l/hr)	MAX CH ₄ (%V/V)	MAX CH ₄ Q _{hg} (l/hr)	MAX CO ₂ (%V/V)	MAX CO ₂ Q _{hg} (l/hr)	CHARACTERISTIC SITUATION	NHBC TRAFFIC LIGHT
WS101	29/11/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	2.80	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	2.77	0.1	0.1	0.0001	0.2	0.0002	CS1	Green
	06/02/2023	2.78	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/02/2023	2.79	0.1	0.1	0.0001	0.2	0.0002	CS1	Green
	06/03/2023	2.78	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	2.76	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS105	29/11/2022	1.70	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	1.88	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	1.79	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	1.22	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	1.05	0.1	0.1	0.0001	0.7	0.0007	CS1	Green
	06/02/2023	1.07	0.1	0.1	0.0001	0.7	0.0007	CS1	Green
	22/02/2023	1.05	0.1	0.1	0.0001	0.6	0.0006	CS1	Green
	06/03/2023	1.08	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	1.03	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS107	29/11/2022	1.30	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	1.40	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	1.35	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	1.11	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	1.32	0.1	0.1	0.0001	0.2	0.0002	CS1	Green
	06/02/2023	1.29	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/02/2023	1.34	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	06/03/2023	1.26	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	1.30	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS108	29/11/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	06/02/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/02/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	06/03/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green



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August 2023

WELL	DATE	DEPTH TO WATER (m bgl)	MAX FLOW (l/hr)	MAX CH ₄ (%V/V)	MAX CH ₄ Q _{hg} (l/hr)	MAX CO ₂ (%V/V)	MAX CO ₂ Q _{hg} (l/hr)	CHARACTERISTIC SITUATION	NHBC TRAFFIC LIGHT
WS111	29/11/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	1.62	0.1	0.1	0.0001	0.4	0.0004	CS1	Green
	06/02/2023	1.15	0.1	0.1	0.0001	0.2	0.0002	CS1	Green
	22/02/2023	1.20	0.1	0.1	0.0001	0.1	0.0003	CS1	Green
	06/03/2023	1.18	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	1.09	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS114	29/11/2022	DRY	2.6	0.1	0.0001	0.1	0.0026	CS1	Green
	12/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	DRY	0.1	0.1	0.0001	0.2	0.0002	CS1	Green
	06/02/2023	2.60	0.1	0.1	0.0001	0.3	0.0003	CS1	Green
	22/02/2023	2.57	0.1	0.1	0.0001	0.4	0.0004	CS1	Green
	06/03/2023	2.60	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	2.61	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS115	29/11/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	06/02/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/02/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	06/03/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS117	29/11/2022	2.35	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	2.48	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	2.38	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	2.54	0.1	0.1	0.0001	0.9	0.0009	CS1	Green
	06/02/2023	2.14	0.1	0.1	0.0001	1.2	0.0012	CS1	Green
	22/02/2023	2.18	0.1	0.1	0.0001	1.4	0.0014	CS1	Green
	06/03/2023	2.23	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	1.88	0.1	0.1	0.0001	0.1	0.0001	CS1	Green



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WS122	29/11/2022	2.80	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	2.90	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	2.86	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	2.35	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	2.09	0.1	0.1	0.0001	0.7	0.0007	CS1	Green
	06/02/2023	2.14	0.1	0.1	0.0001	0.8	0.0008	CS1	Green
	22/02/2023	2.03	0.1	0.1	0.0001	0.7	0.0007	CS1	Green
	06/03/2023	2.01	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	1.63	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
WS123	29/11/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	DRY	0.1	0.1	0.0001	1.5	0.0015	CS1	Green
	30/12/2022	DRY	0.1	0.1	0.0001	1.2	0.0012	CS1	Green
	20/01/2023	DRY	0.1	0.1	0.0001	0.6	0.0006	CS1	Green
	06/02/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/02/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	06/03/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	DRY	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
CP101	29/11/2022	1.65	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	12/12/2022	1.80	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	22/12/2022	1.63	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	30/12/2022	2.12	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/01/2023	1.16	0.1	0.1	0.0001	0.8	0.0008	CS1	Green
	06/02/2023	1.32	0.1	0.1	0.0001	0.7	0.0007	CS1	Green
	22/02/2023	1.16	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	06/03/2023	1.18	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
	20/03/2023	1.11	0.1	0.1	0.0001	0.1	0.0001	CS1	Green
CP103	29/11/2022	2.00	0.1	0.1	0.0003	0.1	0.0003	Flooded	
	12/12/2022	2.20	0.1	0.1	0.0000	0.1	0.0001	Flooded	
	22/12/2022	2.15	0.1	0.1	0.0000	0.1	0.0001	Flooded	
	30/12/2022	1.87	0.1	0.1	0.0001	0.1	0.0001	Flooded	
	20/01/2023	2.20	0.1	0.1	0.0001	0.9	0.0009	Flooded	
	06/02/2023	2.15	0.1	0.1	0.0001	0.9	0.0009	Flooded	
	22/02/2023	2.21	0.1	0.1	0.0001	0.1	0.0001	Flooded	
	06/03/2023	2.16	0.1	0.1	0.0001	0.1	0.0001	Flooded	
	20/03/2023	2.57	0.1	0.1	0.0001	0.1	0.0001	Flooded	

Note - Values in BLUE denote water above level of response zone (flooded)



E3P have assessed the previous variables and come to the following conclusions:

- ✳ Throughout the monitoring period, flow rates were recorded to be 0.1 l/hr (limit of detection of the analyser).
- ✳ The maximum methane value recorded within the monitoring wells was 0.1% v/v (limit of detection of the analyser).
- ✳ Carbon dioxide concentrations were recorded at concentrations ranging from 0.1% v/v to 1.5% v/v (WS123).
- ✳ Made Ground has been encountered across the site to a maximum proven depth of 5.80 m bgl.
- ✳ Drift deposits comprising glacial till of SAND and CLAY have been encountered across the site at depths ranging between 0.50 – 15.00 m bgl.
- ✳ Ground gas monitoring suggests that the site can be predominantly classified as CS1. However, given the presence of the historical landfill located in the eastern section of the Tack Lea Works area, it is recommended that CS2 protection measures should be implemented as a minimum across the site until such time that further assessment can be completed once full access to the historical landfill is available.

Elevated concentrations of naphthalene, VOCs and SVOCs within the northern sector of the site are considered to be localised occurrences and therefore these locations can be treated as hotspots. However, elevated concentrations of naphthalene, TPH, VOCs and SVOCs have been identified throughout the Shepherd Mill area of the site (southern sector) and these do not appear to be localised hotspots.

Further assessment, in the form of a Tier 3 vapour risk assessment is required across the site to assess the level of risk to the future site users by volatilisation to indoor air. Subject to the findings of the vapour risk assessment, vapour resistant membranes may be required.

It is recommended that the full ground gas assessment and recommended protection measures (if applicable) are agreed with the local authority prior to their adoption on site. Furthermore, all protection measures adopted should be validated by a suitably qualified engineer.

For CS2:

Proposed new structures will require ground gas protection measures to provide protection with a score of 3.5, in accordance with Table 4 of BS8485 (see Table 4.8, Section 4.4).

One example of a combination of measures which can be used with a suspended floor to achieve the required score would be:

- ✳ Passive sub-floor dispersal layer of very good performance which meets all criteria out in Paragraph B.6 of BS8485:2015 (minimum 150 mm clear void space and with correct frequency of side ventilation) – Score 2.5.
- ✳ Lapped and taped gas resistant membrane in the floor slab construction which meets all the criteria as set out in Table 7 of BS8485:2015 – Score 2.0.



4.7.1. FOUNDATION DESIGN AND GROUND GAS

Example subfloor design details for strip/trench and piled foundations including installation of CS2 protection measures are presented within Figures 4.13 and 4.14 below.

FIGURE 4.13 STRIP / REINFORCED STRIP FOUNDATION DETAIL

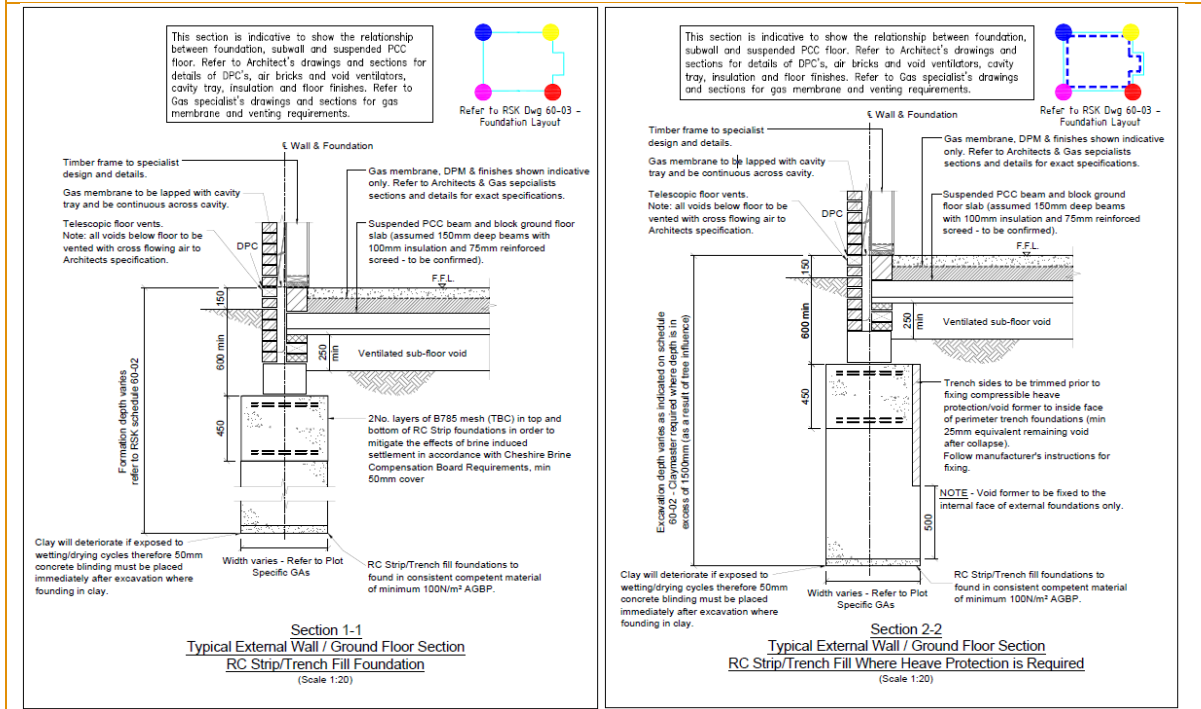
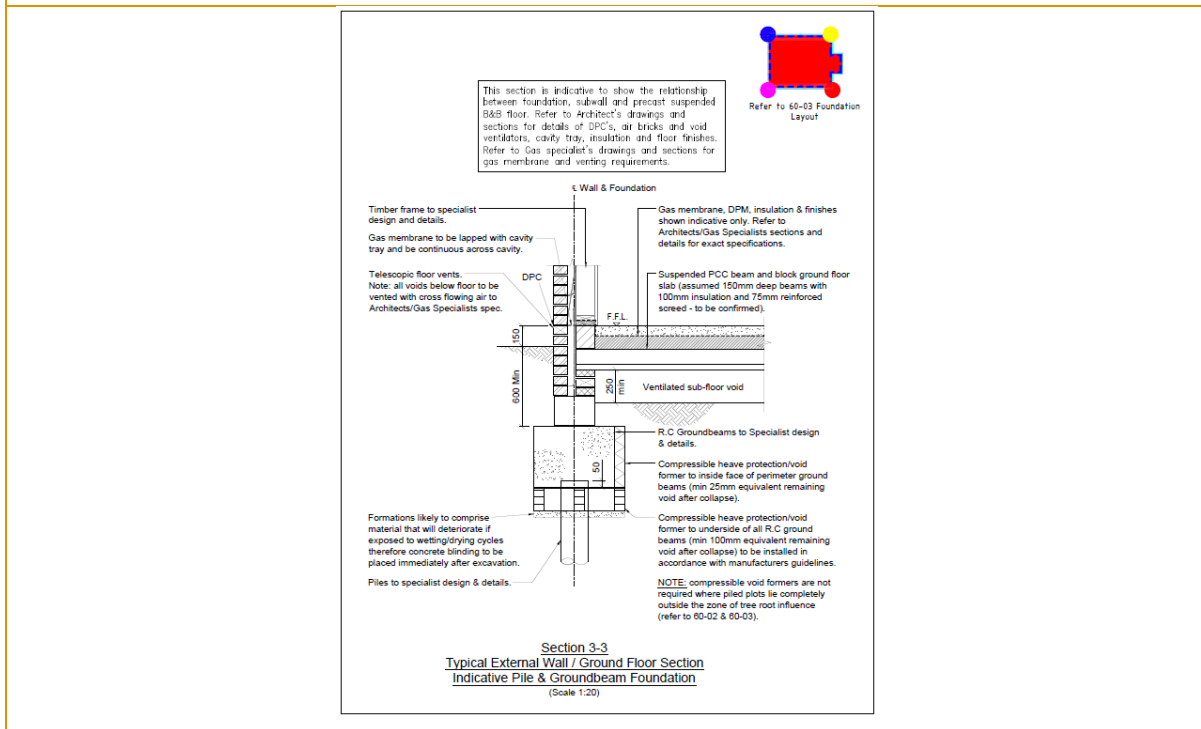


FIGURE 4.14 PILED FOUNDATION DETAIL



4.8. RESIDENTIAL BUILDING GAS RISK MITIGATION

4.8.1. BRITISH STANDARD BS8485 (2015)+A1 (2019)

British Standard BS8485:2015+A1(2019) provides two types of residential property that require assessment. These building types are:

- ✳ **Type A Building** – Private ownership with no building management controls on alterations to the internal structure, the use of rooms, the ventilation of rooms or the structural fabric of the building. Some small rooms are present. Probably conventional building construction (rather than civil engineering). Examples include private housing and some retail premises.
- ✳ **Type B Building** – Private or commercial property with central building management control of any alterations to the building or its uses but limited or no central building management control of the maintenance of the building, including the gas protection measures. Multiple occupancy. Small to medium sized rooms with passive ventilation of rooms and other internal spaces throughout ground floor and basement areas. May be conventional building or civil engineering construction. Examples include managed apartments, multiple occupancy offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres) and parts of hotels.

Based on the ground gas risk assessment and the proposed Type A Building, it is envisaged that a point score of 3.5 will be required for affected properties, as summarised in Table 4.13.

TABLE 4.13 BS8485 (2015)+A1(2019) POINTS REQUIRED FOR TYPE A AND TYPE B BUILDINGS

CHARACTERISTIC SITUATION	MINIMUM GAS PROTECTION SCORE (POINTS)	
	HIGH SENSITIVITY	
	TYPE A BUILDING	TYPE B BUILDING
1	0	0
2	3.5	3.5
3	4.5	4
4	6.5 ^{A)}	5.5 ^{A)}
5	— ^{B)}	6
6	— ^{B)}	— ^{B)}

BS8485 (2015)+A1(2019) Notes

A) Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.

B) The gas hazard is too high for this empirical method to be used to define the gas protection measures.

Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, for example, high performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system such as in institutional and/or fully serviced contractual situations.



GAS PROTECTION SCORES FOR THE STRUCTURAL BARRIER	SCORE^A
Floor and Substructure Design	
Precast Suspended Segmental Subfloor (Beam and Block)	0
Cast in Situ Ground Bearing Floor Slab (With Only Nominal Mesh Reinforcement)	0.5
Cast in Situ Monolithic Reinforced Ground Bearing Raft or Reinforced Cast in Situ Suspended Floor Slab With Minimal Penetrations	1 or 1.5 ^B
Basement Floor and Walls Conforming to BS 8102:2009, Grade 2 Waterproofing^{C D}	2
Basement Floor and Walls Conforming to BS 8102:2009, Grade 3 Waterproofing^{C D}	2.5
Notes A) The scores are conditional on breaches of floor slabs, etc., being effectively sealed. B) To achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in (see A.2.2.2). C) The score is conditional on the waterproofing being provided by a suitable structural barrier with the design and detailing of the walls and floor meeting the requirements for Type B protection. The score cannot be assigned for Type A (waterproof membrane) or Type C (drained cavity wall). D) If a membrane is installed beneath and around the basement to provide Type A waterproofing (BS 8102:2009), it can be assigned a gas protection score in accordance with Table 7, if it meets all the criteria for a gas resistant membrane in that table. When practical, utilities should enter the building above floor level with any conduit or meter housing being properly vented outside of the building.	

PROTECTION ELEMENT SYSTEM		SCORE	COMMENTS
Gas protection scores for ventilation protection measures			
(a) Pressure Relief Pathway – Usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building.		0.5	Whenever possible a pressure relief pathway (as a minimum) should be installed in all gas protection measures systems. If the layer has a low permeability and/or is not terminated in a venting trench (or similar), then the score is 0.
(b) Passive Subfloor Dispersal Layer – Media used to provide the dispersal layer are: ☛ Clear void; ☛ Polystyrene void former blanket; ☛ Geocomposite void former blanket; ☛ No fines gravel layer with gas drains; and ☛ No fines gravel layer.	Very good performance	2.5	The ventilation effectiveness of different media depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing and type and the thickness of the layer. The selected score should be assigned taking into account the recommendations in Annex B of BS 8485 (2015). Passive ventilation should be designed to meet at least “good performance”.
	Good performance	1.5	



PROTECTION ELEMENT SYSTEM	SCORE	COMMENTS
(c) Active Dispersal Layer – Usually comprising fans with active abstraction (suction) from a subfloor dilution layer with roof level vents. The dilution layer may comprise a clear void or be formed of geocomposite or polystyrene void formers.	1.5 to 2.5	This system relies on continued serviceability of the pumps, therefore alarm and response systems should be in place. There should be robust management systems in place to ensure the continued maintenance of the system, including pumps and vents. Active ventilation should always be designed to meet at least “good performance”.
(d) Active Positive Pressurisation – Provided by the creation of a blanket of external fresh air beneath the building floor slab by pumps supplying air to points across the central footprint of the building into a permeable layer, usually formed of a thin geocomposite blanket.	1.5 to 2.5	This system relies on continued operation of the pumps, therefore alarm and response systems should be in place. The score assigned should be based on the efficient “coverage” of the building footprint and the redundancy of the system. Active ventilation should always be designed to meet at least “good performance”.
(e) Ventilated Car Park – Floor slab of occupied part of the building under consideration is underlain by a basement or undercroft car park.	4	Assumes that the car park is vented to deal with car exhaust fumes, designed to Buildings Regulations 2000, Approved Document F [9].



Gas Protection Score for the Gas Resistant Membrane		
Gas resistant membrane meeting all of the following criteria: ✳ Sufficiently impervious to the gases with a methane gas transmission rate < 40 ml/day/m²/atm (average) for sheet and joints (tested in accordance with BS ISO 151051 manometric method); ✳ Sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; ✳ Sufficiently strong to withstand in service stresses (e.g. settlement if placed below a floor slab); ✳ Sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools); ✳ Capable, after installation, of providing a complete barrier to the entry of the relevant gas; and ✳ Verified in accordance with CIRIA C735.	2	The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints. If a membrane is installed that does not meet all the criteria opposite, then the score is zero.
A) Membrane with a methane gas transmission rate < 40.0 ml/day/m²/atm (average) for sheets and joints (tested in accordance with BS ISO 151051:2007 manometric method) is regarded as sufficiently impervious. B) For example, reinforced LDPE (virgin polymer) membranes having a minimum mass per unit area of 370 g/m² and not significantly less than 0.4 mm thickness between the reinforcement scrim (tested in accordance with Procedure D (2 mm diameter tip) of BS EN ISO 98631:2016) installed above floor slabs are considered sufficiently strong to meet the performance criteria (see also C.3). Thicker and more robust membranes or an additional membrane protection layer should be installed directly beneath cast in situ floor slabs.		

4.8.2. NHBC

The NHBC Traffic Light guidance can still be used where the development proposals are based on the 'typical house' used in the modelling for the traffic light classification system.

A typical house is defined as a house (up to three storeys) with <100m² footprint and minimum 150mm depth clear ventilated void achieving sub slab ventilation of one complete air exchange per day.

NHBC expectations for verification to satisfy the Traffic Light gas regime classifications are as detailed in Table 4.15.



TABLE 4.15 TYPICAL NHBC EXPECTATION AND VERIFICATION REQUIREMENTS

GAS REGIME	MINIMUM GAS PROTECTION EXPECTATIONS	VERIFICATION OR INFORMATION REQUIREMENTS
Green	N/A – but need to comply with BR211 radon requirements, where applicable	
Amber 1	Ventilation – subfloor venting to achieve at least one air exchange per day (minimum 150 mm void height; 1500 mm²/m air vent opening or 500 mm²/m² floor area spaced at not more than 2 m centres on at least two opposing sides). Membrane – must be suitable for purpose. Membrane installation/design to achieve complete integrity across entire building footprint. Penetrations and joints sealed.	Construction drawings – showing position of membrane; sealing details and ventilation points to be provided. Membrane specification – technical data sheet(s) for gas membrane (including gas permeability data) to be provided. Installation – photographic evidence of installed membrane may be requested.
Amber 2	Ventilation – subfloor venting to achieve at least one air exchange per day. Membrane – must be suitable for purpose (criterion detailed in BS8485 clause 7.2.4). Membrane installation and design to achieve complete integrity across entire building footprint. Penetrations and joints sealed. Installer – installers must be experienced and appropriately trained and/or qualified.	Construction drawings showing position of membrane, sealing details and ventilation points to be provided. Membrane specification – technical data sheet(s) for gas membrane (including gas permeability data) to be provided. Installation – third party verification report with supporting evidence to be included (i.e. photographic evidence and certificates of conformity, observations relating to sealing, location of ventilators and standards of installation). Integrity testing – may be requested; testing plan to be agreed in advance.
Red	Standard residential housing is not generally acceptable without further ground gas risk assessment and/or possible remedial mitigation measures to reduce or remove the source of the ground gases.	

4.9. RADON

As of February 2023, the UK Health Security agency (UKHSA) and the British Geological Society (BGS) have published an updated radon potential map for Great Britain.

The latest update to the radon map has the potential to reclassify areas that have previously been assured as low risk to potentially be affected by radon.

A BGS Radon Report was purchased for the site, which indicated that the northeast and northwest of the site is situated in an area where 1–3% of homes are above the "Action Level" and the rest of the site is situated in an area where 0–1% of homes are above the "Action Level". Therefore, full radon protective measures are not necessary for the construction of new dwellings or extensions.

A full site-specific radon report is presented in Appendix XI.



4.10. POTABLE WATER SUPPLY

This section provides a summary of the ground investigation data with reference to the selection of potable water supply pipework. The assessment is made with reference to the UK Water Industry Research (UKWIR) publication "Guidance on the selection of Water Supply Pipes to be used in Brownfield Sites"

TABLE 4.16 PIPELINE SELECTION PE THRESHOLD CONCENTRATIONS

Contaminant Group	PE-threshold (mg/kg)	Concentrations at <u>Current</u> pipeline depth (mg/kg)
Total VOC	0.5	130
Total BTEX And MTBE	0.1	<1.0
Total SVOCs (Excluding PAH and those substances marked with an *)	2	110
EC5-EC10 Aliphatic and Aromatic Hydrocarbons	2	<1.0
EC10-EC16- Aliphatic and Aromatic Hydrocarbons	10	150
EC16-EC40 Aliphatic and Aromatic Hydrocarbons	500	460
Phenols (From SVOC Analysis)*	2	1.3
Cresols and Chlorinated Phenols (From SVOC Analysis)	2	N/A
Ethers*	0.5	N/A
Nitrobenzene*	0.5	N/A
Ketones*	0.5	N/A
Aldehydes*	0.5	N/A
Amines	Fail	N/A
Other Consideration		
Are there any exceedances of the PE threshold outside of the pipeline depth?	Yes	
Is free product present in soil and groundwater?	None	
Could hydrocarbon impact at greater depth than current pipeline depth be mobilised by rising groundwater levels?	Groundwater has been identified at depths deeper than 1.30 m bgl to date.	
Will soils impacted with the above determinands likely be utilised elsewhere on-site?	Currently unknown	
Will soils be imported to the site as part of any future earthworks	Currently unknown	

Notes - Pipeline depth is normally between 0.75m–1.35m

Based on the assessment of current site conditions, it is likely that barrier pipe will be required at the proposed development.

This will need to be confirmed with a UKWIR risk assessment post-remediation. Post-remediation and enabling works ground conditions may be different from those identified during this ground investigation.



4.11. CONCEPTUAL SITE MODEL

Following the completion of the intrusive ground investigation, chemical analysis and risk assessment, the conceptual model shown in Table 4.17 has been prepared for the site.

TABLE 4.17 CONCEPTUAL SITE MODEL

POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL1 PL2	Heavy metals, non-volatile PAH (Made Ground, historical mills, and industrial works.)	Dermal contact. Dermal contact and ingestion.	Future site users. Off-site receptors.	Likely	High	LOW

Assessment:
Heavy metals (arsenic, lead and mercury), and non-volatile PAHs (phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene) have been identified within Made Ground soils in the Tack Lea Works area (WS110, WS111, TP113, TP115, TP116, WS5, WS9 and WS10) and Sheppard Mill area (HP7, TP122, TP126 and WS25).

Elevated concentrations of lead and PAHs have also been identified within material sampled from the earthen bund in the centre of the Tack Lea Works area.

Recommendation:
A 600 mm reduced level garden cover system to garden and landscaped areas will prevent exposure to future site users. Construction works to be completed with PPE and the provision of welfare.

During remediation and enabling works, speciated mercury analysis should be completed at the locations WS111, WS9 and WS25 to assess whether elemental mercury is present which may pose a risk to future site users through vapour inhalation. If elemental mercury is identified, it may be necessary to delineate and excavate the soils as a hotspot and place them in an area of low sensitivity such as beneath areas of public open space or removed from site. Alternatively, if it is proven that there is no elemental mercury, a clean cover system will be sufficient.



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POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
PL3	ACM in Made Ground	Inhalation of dust.	Future site users. Off-site land users.	Likely	High	LOW
Assessment: Asbestos in the form of chrysotile and amosite has been identified within localised areas in Made Ground deposits in the southern part of Sheppard Mill area (WS124 and WS18), the historical landfill in the eastern section of Tack Lea Works area (HP05) and the central section of Tack Lea Works (TP114 and TP116). Asbestos bulk fragments, in the form of hard cement were also identified in WS124, HP05 and WS10; and asbestos sheeting/board debris within HP05. Visual signs of ACM were encountered during the ground investigations in HP05. Quantification testing was undertaken with the highest concentration recorded in WS124 at 0.705%. The remaining samples had concentrations of 0.002% (TP116), 0.011% (TP114) and 0.036% (HP05). Recommendation: Impacted soils will require placement in accordance with the asbestos CSM. Construction works completed with PPE/RPE and provision of welfare. Asbestos bulk fragments will require removal via hand picking techniques prior to the commencement of any earthworks.						
PL4	Volatile Contaminants such as hydrocarbons and solvents (Made Ground, historical mills and industrial works)	Inhalation of vapours. Migration through permeable strata and preferential pathways.	Future site users. Off-site receptors.	Likely	High	To be determined
Assessment: Elevated concentrations of naphthalene, TPH, and trichloroethene (TCE) have been identified within the Tack Lea Works area (TP116 and WS12); these are considered to be localised occurrences and therefore can be treated as localised hotspots. SVOCs identified in WS107 and TP116 within the Tack Lea Works area are not considered to pose a risk to future site users given the marginal concentrations. However, elevated concentrations of naphthalene, TPH, VOCs and SVOCs have been identified throughout the Shepherd Mill area and these do not appear to be localised hotspots.						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
Recommendation: During a process of cut/fill enabling works, a hotspot removal should be undertaken in the Tack Lea Works area where these soils may be chemically validated to assess chemical suitability for retention on-site in an area of no future sensitivity. A Tier 3 vapour risk assessment is required in the Sheppard Mill area to assess the level of risk to the future site users by volatilisation to indoor air. Visual and olfactory evidence of contamination has been identified in a number of locations; therefore, a watching brief should be completed during remediation works to monitor the locations where visual or olfactory hydrocarbon impact has been identified during all phases of investigation completed to date.						
PL4	Methane, carbon dioxide (Made Ground and potentially infilled features on and within 250 m of the site)	Inhalation of gas. Migration through permeable strata and preferential pathways. Explosion in confined spaces.	Future site users. Buildings. Off-site land users.	Low likelihood	Low	LOW
Assessment: Deep Made Ground, organic deposits and a historical landfill have been identified as potential sources of hazardous ground gas. Ground gas monitoring data suggests the site can be classified as CS1. However, given the presence of the historical landfill located in the eastern section of the Tack Lea Works area, it is recommended that CS2 protection measures should be implemented as a minimum across the site until such time that further assessment can be completed once full access to the historical landfill is available. It is noted that elevated concentrations of volatile contaminants (naphthalene, TPHs, VOCs, SVOCs, and mercury) have been identified within the Made Ground on-site, which present a potential volatilisation to indoor air risk. Elevated concentrations of volatile contaminants in the Tack Lea Works area are considered to be localised occurrences and therefore these locations can be treated as hotspots. However, elevated concentrations of volatile contaminants have been identified throughout the Shepherd Mill area and these do not appear to be localised hotspots.						
Recommendation: Due to the presence of the historical landfill in the eastern section of the Tack Lea Works area, allowances for CS2 protection measures should be implemented across the site until further monitoring and assessment can be undertaken within the historical landfill area.						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
Further assessment, in the form of a Tier 3 vapour risk assessment is required in the Sheppard Mill area to assess the level of risk to the future site users by volatilisation to indoor air. Subject to the findings of the vapour risk assessment, vapour resistant membranes may be required.						
PL5	Mobile contaminants such as metals, PAHs, hydrocarbons, volatile compounds (Made Ground, historical mills and works)	Surface runoff. Migration through permeable strata and preferential pathways. Perched waters migration.	Groundwater (Secondary A bedrock aquifer). Surface water (Woodhouse Lane Brook and Naden Brook).	Likely	Moderate	LOW
Assessment: Though the risk to the underlying bedrock Secondary A aquifer is considered to be low, the risk to the surface water receptors is considered to be high, due to the presence of impacted soils within close proximity of surface water features, and the presence of high permeability strata in areas beneath the site which would afford the lateral and vertical migration of contaminants. Widespread naphthalene and TPH contamination has been identified in the soil analysis, with the majority of the impact noted within the Sheppard Mill area of the site. Thus, the source of the contaminants cannot be attributed to one area or point source and the majority of the contamination is considered present on a site wide basis. During the remediation and enabling works phase, the removal of the hardstanding currently present across the site may induce infiltration and potential mobilisation of contaminants present within the soils and groundwater directly into the surface water receptors. However, areas of low permeability clay soils will act to inhibit migration. The supplementary controlled waters risk assessment completed by E3P has not identified any significant impact within the groundwater or surface water samples. The data suggests that there is no complete pollutant linkage and the identified contamination within the soils is not likely to be mobile. Recommendation: It will be necessary to instigate a watching brief during Remediation and Enabling Works to ensure that it can be demonstrated that all material that remains in-situ is suitable for retention.						



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POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
Surface water sampling is also recommended throughout the Remediation and Enabling Works to ensure that the water quality of the surface water features is not altered.						
PL6	Sulphate (potential ash within Made Ground)	Sulphate attack on concrete.	Building structure.	Likely	Low	LOW
Assessment: The Made Ground and natural soils at the site meet class DS-1, AC-1s. In the LK Consult 2020 Report, concentrations of soluble sulphate in the soil when contrasted to BRE Digest 200535 categorised the concrete requirement as DS-2 AC-3z in the Made Ground and DS-1 AC1 in the natural strata. Recommendation: Concrete should be designed in accordance with the chemical testing results.						
PL7	Organic contaminants such as hydrocarbons, solvents (Made Ground, scrap yards, mills and works)	Ingestion of tainted water supply.	Future site users. Water pipes.	Likely	Moderate	LOW
Assessment: Elevated concentrations of TPH have been identified at the proposed pipeline depth (0.75 m – 1.35 m). Recommendation: Based on the assessment of current site conditions, it is likely that barrier pipe will be required. This will need to be confirmed with a UKWIR risk assessment post-remediation. Post-remediation and enabling works ground conditions may be different from those identified during this ground investigation.						
PL8	Phytotoxic contaminants (Made Ground)	Direct Contact (plant uptake).	Flora.	Likely	Low	LOW
Assessment:						



POLLUTANT LINKAGE	CONTAMINANT (SOURCE)	PATHWAY	RECEPTOR	PROBABILITY	CURRENT RISK	RESIDUAL RISK AFTER MITIGATION
Contamination has been encountered within shallow Made Ground across the site which may be taken up by flora in soft landscaping. Copper and zinc are present within groundwater and leachate.						
Recommendation: Installation of a clean cover system within any areas of soft landscaping to prevent plant uptake of contaminants.						

Main exposure pathways:

PL1 = soil ingestion, PL2 = dermal contact and ingestion, PL3 = dust inhalation; PL4 = Vapour/Gas Inhalation; PL5 = Vertical / Lateral Migration; PL6 = Corrosion of concrete; PL7=Tainting of water supply; PL8 = Uptake by plants;



5. GEOTECHNICAL ASSESSMENT

5.1. PROPOSED DEVELOPMENT

Stonebond Properties Ltd intends to construct a low-rise residential development comprising 49 residential dwellings with associated gardens, estate roads, and infrastructure, including a connecting bridge. Drawing 16-465-002 (Appendix III) identifies the proposed development layout.

5.2. SUMMARY OF GROUND CONDITIONS

Made Ground

Made Ground deposits were encountered within all exploratory hole locations to depths ranging between 0.00 m and 5.80 m bgl. However, in 23 locations in the Tack Lea Works area and 13 locations in the Sheppard Mill area, the full thickness of Made Ground could not be proven due to significant concrete and brick obstructions and basement features, which are indicative of relict foundations from the former buildings. The five hand pit locations within the eastern section of the Tack Lea Works area were all terminated within Made Ground.

The site was predominantly covered with concrete hardstanding to a maximum proven thickness of 0.68 m bgl. In two locations within the eastern part of the Tack Lea Works area, reworked topsoil was encountered to a maximum proven thickness of 0.10 m bgl.

Variable granular and cohesive Made Ground deposits were encountered beneath the concrete hardstanding and reworked topsoil, which generally comprised a brown sandy gravel with gravels of sandstone, mudstone, limestone, concrete, brick, ceramic, glass, wood and metal and rare ash and plastic.

In the Tack Lea Works area, Made Ground deposits were generally encountered between 1.00 m and 2.00 m bgl, with shallower deposits (< 1.00 m bgl) located along the northern boundary (i.e. closer to the valley edge). Deeper Made Ground deposits, ranging between 2.00 m and 5.80 m bgl, were encountered in the northwest part of the site (associated with the infilled sandstone quarry), the central part of the site (associated with infilled reservoirs) and the eastern part of the site (associated with the filter tanks, reservoirs and historical landfill).

In the Sheppard Mill area, Made Ground deposits were generally encountered between 2.00 m and 5.10 m bgl, with shallower deposits (< 1.00 m bgl) located along the northern boundary (i.e. closer to the valley edge). The deepest Made Ground deposits were encountered along the southern boundary associated with the former buildings and infilled reservoirs.

Drift

Drift deposits were encountered within twenty-nine exploratory hole locations between depths of 0.50 m and 15.00 m bgl. Both granular and cohesive drift deposits were encountered, which generally comprised a loose to dense brown clayey to sandy GRAVEL overlying a brown gravelly CLAY with gravels of mudstone and sandstone. The strength of CLAY varied from soft to very stiff.



Drift deposits were noted to be shallower (between 1.00 m and 2.50 m thick) along the northern parts of the Tack Lea Works area and Sheppard Mill area (i.e. closer to the valley edge). Deeper drift deposits (between 7.70 m and 11.00 m thick) were noted to be present along the western and southern boundaries of the Tack Lea Works area and the southern boundary of the Sheppard Mill area (i.e. towards the centre of the valley).

Solid

The solid bedrock geology was encountered within five exploratory hole locations. Shallow bedrock was encountered between 1.60 m and 2.90 m bgl along the northern part of the Tack Lea Works area (i.e. closer to the valley edge). Along the southern boundaries of the Tack Lea Works area and Sheppard Mill area (i.e. towards the centre of the valley), deep bedrock was encountered between 11.60 m and 13.80 m bgl. The bedrock generally comprised of a greyish brown SANDSTONE. Outcrops of bedrock were also noted to be present in the northwest part of the Tack Lea works area and along the northern boundaries of the Tack Lea Works area and Sheppard Mill area.

In the Encia Consulting 2006 Report, shallow bedrock of sandstone was encountered in the central and western sections of the Tack Lea Works area at depths typically <2.00 m bgl. To the east of the Tack Lea Mill Buildings and in the Sheppard Mill area, bedrock was found to be deeper and was encountered at depths ranging between 4.30 m and 5.00 m bgl. To the north of the Tack Lea Works area and the Sheppard Mill area, bedrock can be seen outcropping in the valley and hillsides.

Groundwater

Perched groundwater was encountered during the ground investigation in one location in the Tack Lea Works area at 1.50 m bgl. Groundwater was encountered between 1.40–3.90 m bgl during the ground investigation, with deep groundwater encountered in one location within the Sheppard Mill area at 12.10 m bgl.

5.3. SITE PREPARATION

The site should be cleared and any vegetation below areas of proposed development stripped in accordance with Series 200 of the *Manual of Contract Documents for Highway Works (MCHW)*. This should include the following:

-  As parts of the proposed development works (i.e., demolition and construction) will be completed within 8 m of a main river, a Flood Risk Activity Permit (FRAP) will be required.
-  Roots present below the footprint of proposed structures and infrastructure should be grubbed out and the resulting void infilled with suitable compacted engineered fill.
-  Demolition of all existing buildings and removal of all concrete hardstanding.
-  Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.
-  Buried structures and old foundations have been encountered on-site. These should be excavated from below the proposed development footprint with the resulting void backfilled.



5.4. FOUNDATION CONDITIONS AND ASSESSMENT OF POTENTIAL BEARING CAPACITIES

In due consideration of the identified ground conditions, in-situ and laboratory geotechnical testing, E3P has undertaken an assessment of the net safe allowable bearing pressure (ABP) within the underlying natural stratum to assist in the detailed design of foundations and infrastructure and determine the target founding stratum. The results of this assessment are summarised in Table 5.1.

TABLE 5.1 SUMMARY OF ABP

GRANULAR SOILS			
Description	Depth (Range m bgl)	Relative Density	Allowable Bearing Pressure (kN/m ²)
Clayey GRAVEL	1.00 – 2.00	Loose	60 - 73
Sandy GRAVEL (1 location – CP103)	3.00	Loose	70
Sandy GRAVEL	1.00 – 5.00	Medium Dense	155 - 278
Clayey GRAVEL	1.00 – 7.00	Dense	322 - 457
COHESIVE SOILS			
Description	Depth (range m bgl)	Undrained Shear Strength (Cu) (kN/m ²)	Allowable Bearing Pressure (kN/m ²)
Soft Gravelly CLAY (1 Location – WS102)	1.00	15	31
Firm Gravelly CLAY	2.00 – 3.00	27 - 39	56 - 80
Stiff Silty CLAY	1.00 – 9.50	40 - 74	83 - 154
Very Stiff Gravelly CLAY	2.70 – 4.00	76 - 220	156 - 452

Based on the assessment of the relative undrained shear strength, relative in-situ densities and corresponding safe net allowable bearing pressure, the suitable target founding stratum has been identified as the underlying stiff to very stiff glacial clay and localised areas of medium-dense to dense gravel.

Medium dense gravels identified between 1.00–4.00 m bgl has been assessed as having an ABP of 152 – 278 kN/m². Dense gravel identified between 2.50–7.00 m bgl has been assessed as having an ABP of 322–456 kN/m².

Loose gravels have also been identified between 1.00–2.00 m bgl in the central section of the Tack Lea Works area (WS102, WS103, and WS105) and at 3.00 m bgl in the central section of the Sheppard Mill area (CP103) has been assessed as having an ABP of 52–80 kN/m².

Firm gravelly CLAY has been identified between 2.00–3.00 m bgl with a net ABP of 56–80 kN/m². Stiff silty CLAY identified at 1.00–9.50 m bgl has been assessed as having a net ABP of 83–154 kN/m². Very stiff gravelly CLAY has been identified at 2.70–15.00 m bgl and has a net ABP of 156–452 kN/m².



Soft gravelly CLAY was also identified at 1.00 m bgl in the central section of the Tack Lea Works area (WS102) and has been assessed as having a net ABP of 31 kN/m².

Given the significant topographical variances on the site, prior to the detailed design of a suitable foundation solutions, a programme of remediation and enabling works will be required to remove the extensive buried obstructions and cut/fill the site in order to create proposed development platform levels suitable for residential development.

Following the removal of obstructions and subsequent engineering of soils to a specific performance specification, proposed plots could be constructed utilising vibro stone columns to support a suitably reinforced spread footing. Where tree influence is present and clays prone to volumetric instability, an alternative foundation solution may need to be adopted to deepen the foundation or the cohesive stratum may be removed and replaced with a granular material. The depth of the granular infill will be plot specific and require calculation on receipt of development levels. The use of vibro stone columns will also be dependent on the removal of clays that have a shear strength of <30kN/m². This specifically applies to Plots 41-44, where soft clays with a shear strength of <30 kN/m² were encountered between 1.10 m and 2.20 m bgl in TP115.

Where plots are in close proximity to slopes or the existing retaining walls, the proposed loadings may need to be transferred beneath the influencing depth of the retainer or slope to ensure no unacceptable loading is induced that would cause a geotechnical failure.

Consideration should also be given to the historical landfill located in the eastern section of Tack Lea Works, as well as the potential presence of a quarry high wall associated with the historical sandstone quarry in the north of Tack Lea Works area. Where plots span such a feature, socketed piles into the bedrock will be required to reduce the risk of differential settlement.

Therefore, upon completion of these enabling works, it is anticipated that the final foundation solution will be a combination of:

- ✳ Vibro Stone Columns (VSC) that will ensure a uniform ABP in the order of 100kN/m² for the construction of a doubly reinforced strip footing at ~600mm below remediated ground level (1050mm below FFL);
- ✳ Shallow strip foundations, where viable, bearing on localised areas of firm to very stiff clays, medium dense sands and shallow bedrock;
- ✳ Mass trench fill bearing on localised areas of firm to very stiff clays, medium dense sands and shallow bedrock;
- ✳ Piled foundations may be required where deep Made Ground and soft clays have been encountered; and for plots which span the historical sandstone quarry and associated high wall in the north-western section of the Tack Lea Works area; and
- ✳ Raft foundations may be required where obstructions cannot be removed.

Foundation depths within the conjectured influence of former, existing or proposed trees will need to be deepened to ensure that structural loading bears within the underlying target founding stratum, which cannot be subject to volumetric instability associated with fluctuation in moisture content. An arboriculture survey has been undertaken by E3P to determine the areas of potential tree influence, with the findings discussed in a separate report (Report Ref: 80-742-R3-2, dated June 2022).

It is recommended that, at working drawing stage, a foundation schedule is prepared for the development taking account of the physical change of natural clay soils and the current/proposed locations of trees.



To determine if VSC is viable at the subject site, E3P has completed a Ground Improvement Design Risk Matrix that is summarised in Table 5.2.

TABLE 5.2 GROUND IMPROVEMENT DESIGN RISK MATRIX

RISK ITEM	COMMENT	PASS/FAIL
Soft clays with an undrained shear strength of less than 30 kN/m²	CLAY soils are generally firm to stiff with $C_u > 80$ kN. Isolated areas of softer clay soils were encountered with $C_u > 30$ kN/m ² ; however, it is considered that these will either be piled, or soft material excavated to remove the organic deposits.	PASS
Ground with peat layers close to foundation level or the base of the stone column, or where intermediate layers of peat are thicker than 200 mm, either as a single layer or the sum of the thicknesses of individual layers throughout the length of the stone column	None identified.	PASS
Voided filled ground, e.g., old water tanks, pottery, glass bottles, concrete rubble or brick fill of unsuitable grading	Made Ground beneath the site will require removal and processing to render the site suitable for VSC. The existing buildings substructure will also require excavation and processing into a graded aggregate suitable for Vibro treatment.	PASS – on completion of enabling works
Loose or non-engineered fill not previously subject to rising or fluctuating water levels saturation	None Identified	PASS
Filled ground still settling or expected to settle under its own weight or due to the effects of surcharging/upfilling where there is a high organic content or where decay is continuing	None Identified	PASS
Fill, containing degradable material where organic material forms more than 15% of fill by volume	None identified.	PASS
Clays with a plasticity index greater than 40%	None identified.	PASS
Highly sensitive soils liable to collapse or remoulding	None identified.	PASS
Cohesive soils with trees in influencing distance	Plots where tree influence has been modelled and will either be subject to a piled or mass trench-fill solution.	PASS
Overall Risk Rating and Suitability for Vibratory Ground Improvement		PASS



A summary of anticipated foundations is presented in Table 5.3

TABLE 5.3 ANTICIPATED FOUNDATIONS

LOCATION	ANTICIPATED FOUNDING STRATA DEPTH (m bgl)	GROUNDWATER (m bgl)	TARGET STRATUM	TREES	FOUNDATION TYPE	TYPE OF CONCRETE
WS101	>2.50	N/A	Stiff CLAY	Y	Engineered - VSC	-
WS102	>2.50	N/A	Dense GRAVEL	Y	Engineered - VSC	-
WS103	2.35	N/A	Dense GRAVEL	Y	Mass Trench	-
WS104*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS105	2.35	N/A	Medium Dense GRAVEL	Y	Mass Trench	DS-1 AC-1s
WS106*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS106a*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS107	>2.50	N/A	Dense GRAVEL	Y	Engineered - VSC	DS-1 AC-1s
WS108*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS109*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS109a*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS110*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
WS110a*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS111	1.45	N/A	Stiff CLAY	Y	Shallow Strip	DS-1 AC-1s
WS112	1.65	N/A	Stiff CLAY	Y	Mass Trench	-
WS113*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS114	1.35	N/A	Medium Dense GRAVEL	Y	Shallow Strip	-



Land at Greenbooth Road and Edenfield Road, Norden

Phase II Geoenvironmental Site Assessment

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LOCATION	ANTICIPATED FOUNDING STRATA DEPTH (m bgl)	GROUNDWATER (m bgl)	TARGET STRATUM	TREES	FOUNDATION TYPE	TYPE OF CONCRETE
WS115*	>2.50	N/A	TBC	Y	Engineered - VSC	-
WS116	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
WS117	>2.50	N/A	Stiff CLAY	Y	Engineered - VSC	DS-1 AC-1s
WS118*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS118a*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS119	1.35	N/A	Dense GRAVEL	Y	Shallow Strip	-
WS120	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS121*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
WS122	>2.50	2.50	Firm CLAY	Y	Engineered - VSC	DS-1 AC-1s
WS123*	>2.50	N/A	TBC	Y	Engineered - VSC	-
WS124*	>2.50	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP101	1.25	N/A	Stiff CLAY	Y	Shallow Strip	DS-1 AC-1s
TP102*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP103	>2.25	1.50	TBC	Y	Engineered - VSC	-
TP104*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP105*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP106*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP107*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP108*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s



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Phase II Geoenvironmental Site Assessment

August 2023

LOCATION	ANTICIPATED FOUNDING STRATA DEPTH (m bgl)	GROUNDWATER (m bgl)	TARGET STRATUM	TREES	FOUNDATION TYPE	TYPE OF CONCRETE
TP109*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP110	1.95	N/A	Firm CLAY	Y	Mass Trench	DS-1 AC-1s
TP111*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP112*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP113*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP114*	>2.50 [#]	1.50	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP115	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP116*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP117	1.45	N/A	Firm CLAY	Y	Shallow Strip	-
TP118*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP119	>2.50 [#]	1.50	TBC	Y	Engineered - VSC	-
TP120*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP121*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP122	>2.50 [#]	2.00	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP123*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP124	1.65	N/A	Firm CLAY	Y	Mass Trench	DS-1 AC-1s
TP125	1.45	N/A	Firm CLAY	Y	Shallow Strip	DS-1 AC-1s
TP126*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	DS-1 AC-1s
TP127*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-



LOCATION	ANTICIPATED FOUNDING STRATA DEPTH (m bgl)	GROUNDWATER (m bgl)	TARGET STRATUM	TREES	FOUNDATION TYPE	TYPE OF CONCRETE
TP128*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP129*	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
TP130	>2.50 [#]	N/A	TBC	Y	Engineered - VSC	-
CP101	>2.50	3.70	Dense GRAVEL	Y	Engineered - VSC	-
CP102	>2.50	N/A	Dense GRAVEL	Y	Engineered - VSC	-
CP103	>2.50	3.00	Firm CLAY	Y	Engineered - VSC	-
RB101	>2.50	N/A	TBC	Y	Engineered - VSC	-
RB102	1.60	N/A	BEDROCK	Y	Mass Trench	-
RB103	>2.50	1.90	TBC	Y	Engineered - VSC	-
RB104	>2.50	N/A	TBC	Y	Engineered - VSC	-
RB105	>2.50	3.90	TBC	Y	Engineered - VSC	-

Notes: * = Ground conditions not proven due to obstructions within Made Ground. # = Anticipated founding strata depth assumed as worst case scenario

5.5. GROUND FLOOR SLABS

Current building control regulations require that where the infilled ground is present to depths in excess of 600 mm, or where the substratum is variable in terms of the structure and settlement potential, or where clay soils are present within the influence of existing or proposed trees, a suspended floor slab is required.

In this instance, it is considered that for the majority of substructures, the underlying stratum would have in excess of 600 mm of infill and, as such, a suspended floor slab will be required.

Where a cast in-situ suspended slab is utilised with no subfloor void, appropriate compressible material (heave precautions) will be required in the construction of the substructure.

5.6. HEAVE PRECAUTIONS

The site has been proven to be underlain by clay soils, which are susceptible to volumetric instability due to fluctuations in moisture content, particularly within the influencing distance of trees as per the NHBC/LABC conjectured zones of influence.



As the clay is deemed to be low plasticity, heave precautions are not required to the internal face of the external load-bearing walls (outside or within tree influence).

If a ground beam is to be constructed within the zone of tree influence, heave precautions are required to the underside of this and edge beams.

If the ground floor slab is to be constructed with a beam and block floor, a minimum subfloor void of 200 mm is required within any structures located in the zone of conjectured tree influence.

If the ground floor slab is constructed with a cast in-situ suspended floor slab, then heave precautions that can tolerate 50 mm of clay swelling are required within any part of the floor slab to be located within the zone of influence of a tree.

A summary of heave precautions is presented in Table 5.4.

TABLE 5.4 SUMMARY OF HEAVE PRECAUTIONS

		MINIMUM VOID DIMENSION FOR FOUNDATIONS, GROUND BEAMS AND SUSPENDED IN-SITU CONCRETE GROUND FLOORS		MINIMUM VOID DIMENSIONS UNDER PRECAST CONCRETE AND SUSPENDED TIMBER FLOORS
Plasticity Index of Soil	Required Foundation Depth (m)	Thickness of Void Former Against Side of Foundation or Ground Beam (mm)	Thickness of Void Former on Underside of Edge Beam and Floor Slab (mm)	Void Dimension (mm)
High Plasticity (> 40)	> 2.5	Engineer Design		Engineer Design
	2.0–2.5	35	150	300
	1.5–2.0	25	75	
Moderate Plasticity (20–40)	> 2.5	Engineer Design		Engineer Design
	2.0–2.5	25	100	250
	1.5–2.0	25	50	
Low Plasticity (< 20)	2.0–2.5	N/A	50	200
	> 2.0	No Special Precautions		

5.7. HIGHWAYS CONSTRUCTION

A programme of remediation and enabling works will be required to remediate the proposed road subgrade in accordance with the requirements of the Manual of Contract Documents for Highway Works Volume 1 Specification for Highway Works (Series 600-Earthworks) for method compaction.

It is considered that the material can be re-engineered using method compaction to achieve a CBR in excess of 5% if works are completed in favourable climatic conditions.

The proposed development includes the construction of a connecting bridge linking the Tack Lea Works area and Sheppard Mill area. However, no investigation was undertaken in this area due to limited access. Therefore, further investigation is recommended in this area.



5.8. DRAINAGE

The presence of substantial depths of Made Ground across some areas of the site may result in settlement. It is therefore recommended that drain runs are designed using steeper gradients and flexible joints to allow for some differential settlement.

Due to significant variability in the characteristics of the Made Ground across the site, the lateral continuity cannot be assured, therefore it is not recommended that soakaways are utilised on-site.

5.9. CONCRETE DURABILITY

Based upon the results of the chemical analyses it is considered that subsurface concrete can be designed in accordance with Design Sulphate Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with the recommendations provided in BRE *Special Digest 1* (2005).

In the LK Consultant 2020 Report, concentrations of soluble sulphate in the soil when contrasted to BRE Digest 200535 categorised the concrete requirements as DS-2 AC-3z in the Made Ground and DS-1 AC-1 in the natural strata.

5.10. EXCAVATIONS

Trial pits were generally stable in natural strata; as such, it is considered that near-surface excavations will be feasible. In areas where Made Ground exceeded 2 m, excavations were generally less stable.

Site observations indicated that excavations should be feasible in the near-surface with normal plants; however, obstructions were identified in the near-surface, including former foundations, former floor slabs and basement features. It is anticipated that any obstructions will be grubbed out during the reduced-level dig for the substructure works.

Due to the depth and variability of the Made Ground and the likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with the guidance contained in CIRIA R97.

If local pumping of groundwater is required during the advancement of excavations for the proposed foundations, then consideration should be given to the potential for dewatering gravels in the surrounding areas that may cause structural damage to building substructures in close proximity to the site.

TABLE 5.5 CIVIL ENGINEERING EXCAVATION RISK MATRIX

RISK ITEM	PRESENT	COMMENT
Running Sands	No	No running sand has been identified.
Minor Water Ingress	Yes	Minor water ingress will require localised dewatering/sump pumping during the construction of the site drainage infrastructure. Ingress of water into foundation excavation will potentially flood foundation excavations, limiting the viability of spread foundations to be constructed.



Shallow Bedrock	Yes	Shallow bedrock of sandstone was encountered between 1.60 m and 2.90 m bgl along the northern part of the Tack Lea Works area (i.e. closer to the valley edge). Along the southern boundaries of the Tack Lea Works area and Sheppard Mill area (i.e. towards the centre of the valley), deep bedrock was encountered between 11.60 m and 13.80 m bgl. Outcrops of bedrock were also noted to be present in the northwest part of the Tack Lea works area and along the northern boundaries of the Tack Lea Works area and Sheppard Mill area. Previous investigations identified shallow bedrock of sandstone in the central and western sections of the Tack Lea Works area at depths typically <2.00 m bgl. To the north of the Tack Lea Works area and Sheppard Mill areas, bedrock can be seen outcropping in the valley and hillsides. To the east of the former Tack Lea Mill Buildings and in the Sheppard Mill area, bedrock was found to be deeper and was encountered at depths ranging between 4.30 m and 5.00 m bgl.
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5.11. SLOPE STABILITY

The site has significant topographical changes. As and when detailed topographic information is available and in due consideration of the proposed development design, structural and infrastructure loading, a detailed slope stability model will be required. This model will seek to determine the potential for newly imposed loadings to generate a risk of instability or failure within the off-site embankment and the need for any mitigation measures such as piled foundations to transfer loadings below the base of the slope.

5.12. CONSTRUCTION ACTIVITY AND INSPECTION

The following activities and inspections should be incorporated into the site works:

- Due to the variability of the soils at the site, it is recommended that sufficient allowance is made for the inspection of formations and sub-formations to foundations and pavement construction.
- Excavations, where access is required, should be subject to a risk assessment from a competent person and, where appropriate, mitigation measures such as benching back the sides or use of support systems in accordance with CIRIA R97 should be utilised.
- It is considered that dewatering may be required, especially following periods of heavy rainfall. Removal of surface water and water within trenches should be possible with conventional sump pumping. Discharge of any water should be agreed upon with the relevant regulatory body and be undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required and consideration should be given to the provision of space for settling tanks or an attenuation pond.
- Where access to confined spaces is required, appropriate mitigation measures should be addressed within the construction stage health and safety plan. Particular account should be taken of the gas results.



- ✳ The presence of potential contamination and mitigation measures should be addressed as part of the construction stage health and safety plan and should include measures to design out the risks, reduce their impact and, finally, to include the use of personnel protective equipment (PPE).

5.13. WASTE MANAGEMENT

The eastern section of the Tack Lea Works area is occupied by a historical landfill where the material was deposited under a Waste Management License.

Materials originating from licensed landfills are regulated under the Waste Framework Directive (WFD). Furthermore, materials originating from future excavations (both during remediation or construction) cannot be recovered for re-use using the normal processes and protocols such as the CL:AIRE DoW CoP.

It is understood that this area will remain undeveloped with the exception of an access road, therefore the material should be retained in-situ where possible.

Remediation options for this sector of the site warrant robust consideration given that options for re-use would either be an application for a new Environmental Permit (Deposit for Recovery – DFR) or alternatively the on-site processing of material to recover the fractions that would no longer cease to be a waste with the off-site disposal of all non-recoverable portions.

E3P would recommend that a waste management and recovery strategy be defined to facilitate the safe and economic re-use of material from landfill. A volume of 'waste' will require removal from site, this should be considered as part of a site viability assessment.

It is also noted that potential waste material may be present within former drains, the current and historical filter beds and tanks and at the base of the current and historical reservoirs located on-site. Further chemical analysis of these materials will be required to assess their chemical suitability for retention on-site in an area of no future sensitivity or off-site disposal.



5.14. GEOTECHNICAL RISK REGISTER

POTENTIAL CONSTRAINT	ABNORMAL	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Remediation of contaminated soils		All	100	The site will likely require remediation in the form of the removal of deleterious material and impacted soils.
Bedrock		All	25	Shallow bedrock was encountered between 1.60 m and 2.90 m bgl along the northern part of the Tack Lea Works area (i.e. closer to the valley edge). Along the southern boundaries of the Tack Lea Works area and Sheppard Mill area (i.e. towards the centre of the valley), deep bedrock was encountered between 11.60 m and 13.80 m bgl. The bedrock generally comprised of a greyish brown SANDSTONE. Outcrops of bedrock were also noted to be present in the northwest part of the Tack Lea works area and along the northern boundaries of the Tack Lea Works area and Sheppard Mill area. Previous investigations identified shallow bedrock of sandstone in the central and western sections of the Tack Lea Works area at depths typically <2.00 m bgl. To the east of the former Tack Lea Mill Buildings and in the Sheppard Mill area, bedrock was found to be deeper and was encountered at depths ranging between 4.30 m and 5.00 m bgl. To the north of the Tack Lea Works area and Sheppard Mill area, bedrock can be seen outcropping in the valley and hillsides. This represents a significant risk in terms of the viability for excavations to install infrastructure using standard construction equipment.
Obstructions		All	100	The site has been subject to significant historical development and, above-ground structures remain, potential subsurface obstruction from relict foundations, basements and slabs remain.



POTENTIAL CONSTRAINT	ABNORMAL	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Artificially levelled and filled platforms		All	100	The site appears to have been levelled and artificially backfilled.
Retaining walls		Across the site	10	Several retaining walls are present on-site. These will need to be assessed by a structural engineer before development.
Trench collapse		All	100	Made Ground present beneath the site is likely to be loosely compacted and possibly prone to collapse.
Infilled Ponds and Reservoirs		NW, Centre and South	20	The former infilled reservoirs and ponds will need to be identified and investigated to assess the nature of materials and the extent of any organic or deleterious elements.
Mature trees		All	75	An arboriculture survey has been undertaken by E3P to determine the areas of potential tree influence, with the findings discussed in a separate report (Report Ref: 80-742-R3-2, dated June 2022).
Volume change potential clay		All	TBC	The clay soils are classified as having low volume change potential.
Running sands		N/A	N/A	Data searches indicate low risk.
Ground dissolution		N/A	N/A	Data searches indicate no hazard.
Concrete design		All	100	E3P categorised the concrete requirements as DS-1 AC-1s. The LK Consult 2020 Report categorised the concrete requirement as DS-2 AC-3z in the Made Ground and DS-1 AC1 in the natural strata.
Low-permeability ground		All	100	Soakaways are not considered to be suitable due to deep Made Ground and underlying cohesive drift deposits.
Services/sensitive structures		All	100	A review of online services has identified several services within the site boundary. Piling may not be possible within proximity to any sensitive infrastructure.
Abnormal foundation solutions		All	100	Due to significant Made Ground and some soft clays, an engineered foundation solution will be required.



POTENTIAL CONSTRAINT	ABNORMAL	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Surface water features		ALL	10	Woodhouse Lane Brook runs through the centre of the site. Naden Brook borders the site's western and southern boundaries. Culverted water courses and springs associated with the former mill buildings are also believed to be present on-site, though these were not identified during the ground investigation. During the site walkover, a spring was identified in the far northwest part of the Tack Lea works area within an area of outcropping bedrock.
Flood Risk Activity Permit		Within 8 m of Main River	20	As parts of the proposed development works will be completed within 8 m of a main river, a Flood Risk Activity Permit (FRAP) will be required.
Slope		All	100	The site has significant topographical change, detailed assessment and modelling are required to assess the long-term stability in both the temporary and permanent state associated with current, temporary and permanent loading



5.15. FURTHER WORKS

Based on the findings of the intrusive ground investigation, the following additional works are recommended to be completed in due course:

- ✦ Further investigation of inaccessible areas - central section of the Tack Lea Works area (current buildings); and eastern section of Tack Lea Works area (historical landfill area - for the estate road and connecting bridge construction);
- ✦ Tier 3 Vapour Risk Assessment for the Sheppard Mill area;
- ✦ Plot-specific foundation schedule (upon receipt of the final development levels);
- ✦ Application for a Flood Risk Activity Permit (FRAP);
- ✦ Settlement Analysis for earthworks design;
- ✦ Slope stability assessment;
- ✦ A structural survey of Retaining Walls;
- ✦ Geotechnical earthworks strategy (infrastructure);
- ✦ Remediation and enabling works strategy;
- ✦ Construction phase Surface Water Management Plan; and,
- ✦ Waste management plan for any works in the area of the former historical landfill.



6. CONCLUSIONS AND RECOMMENDATIONS

6.1. CONTAMINATED LAND ASSESSMENT

Human Health	The Tier 2 human health risk assessment identified site-wide concentrations of heavy metals, asbestos, non-volatile PAHs, naphthalene, petroleum hydrocarbons, VOCs and SVOCs that would present unacceptable degrees of theoretical risk to the identified receptors associated with direct exposure pathways. The majority of the identified elevated concentrations have primary exposure pathways related to dermal contact and ingestion of soils, inhalation of particulate and consumption of homegrown vegetables; with naphthalene, petroleum hydrocarbons, VOCs and SVOCs having a primary exposure pathway related to volatilisation to indoor air risk. The risk to chronic human health associated with the elevated concentrations of inorganic heavy metals and non-volatile PAH compounds can be mitigated through the installation of a suitable cover system in all proposed private gardens, landscaping and public open space to remove any potential for direct exposure to impacted soils. The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy; however, industry best practice will require the following minimum depths of certified clean cover: - Private gardens – 600 mm - Landscaped areas– 300 mm - Public open space (POS) – 300 mm Asbestos in the form of chrysotile and amosite has been identified within localised areas in Made Ground deposits in WS124 (south of Sheppard Mill area), HP05 (historical landfill in the eastern section of Tack Lea Works area), TP114 and TP116 (central section of Tack Lea Works). Asbestos in the form of chrysotile and amosite has been identified within localised areas in Made Ground deposits in the southern part of Sheppard Mill area (WS124 and WS18), the historical landfill in the eastern section of Tack Lea Works area (HP05) and the central section of Tack Lea Works (TP114 and TP116). Asbestos bulk fragments, in the form of hard cement were also identified in WS124, HP05 and WS10; and asbestos sheeting/board debris within HP05. Visual signs of ACM were encountered during the ground investigations in HP05.
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Human Health
Continued...

It is noted that the presence of asbestos sheeting and boarding will require a different remedial approach to those proposed within the asbestos risk mitigation conceptual site model (i.e., hand picking of visible bulk asbestos fragments). Where asbestos sheeting and boarding has previously been identified, any proposed earthworks within those areas may be required to be undertaken under license. In addition, any off-site disposal of materials from these areas would be considered hazardous unless the asbestos bulk fragments are pre-removed via hand picking techniques.

Elevated concentrations of mercury have been identified within two locations within the Tack Lea Works area (WS111 at 0.60 m bgl and WS9 at 0.50 m bgl); and one location within the Sheppard Mill area (WS25 at 0.70 m bgl). Mercury occurs in three different forms; elemental mercury, inorganic mercury and methyl mercury. Inorganic and methyl mercury have an exposure pathway of dermal contact and ingestion, whereas elemental mercury could present a potential volatilisation to indoor air risk.

During remediation and enabling works, speciated mercury analysis should be completed at the locations WS111, WS9 and WS25 to assess whether elemental mercury is present which may pose a risk to future site users through vapour inhalation. If elemental mercury is identified, it may be necessary to delineate and excavate the soils as a hotspot and place them in an area of low sensitivity such as beneath areas of public open space or removed from site. Alternatively, if it is proven that there is no elemental mercury, a clean cover system will be sufficient.

The elevated concentrations of naphthalene, TPH and trichloroethene (TCE) identified within the Tack Lea Works area (TP116 and WS12) are considered to be localised occurrences and therefore these locations can be treated as localised hotspots. During a process of cut/fill enabling works, a hotspot removal should be undertaken where these soils may be chemically validated to assess chemical suitability for retention on-site in an area of no future sensitivity.

However, elevated concentrations of naphthalene, TPH, VOCs and SVOCs have been identified throughout the Shepherd Mill area and these do not appear to be localised hotspots. A Tier 3 vapour risk assessment is required in the Sheppard Mill area to assess the level of risk to the future site users by volatilisation to indoor air.

The SVOCs identified in WS107 and TP116 within the Tack Lea Works area are not considered to pose a risk to future site users given the marginal concentrations.

Furthermore, with regards to the elevated volatile contaminants (naphthalene, TPH, VOCs and SVOCs) identified in the Tack Lea Works area and the Sheppard Mill area, vapour resistant membranes may be required to be installed during the build phase for any proposed buildings situated within the immediate vicinity of the contamination hotspot / impacted soils. A Detailed Quantitative Risk Assessment (DQRA) may also be required to determine if any risks to human health and controlled water receptors remains following the hotspot removal.



Human Health <i>Continued...</i>	Chemical analysis of the natural subsoil deposits has indicated these soils to be acceptable for use within the proposed garden areas; however, further chemical validation samples will be required to confirm this. No suitable source of natural topsoil deposits has been identified on-site.
Controlled Waters	The ICSM developed within the context of the site setting has determined that the surface water features (Naden Brook, Woodhouse Lane Brook and the culverted water courses and springs) are the critical receptors at risk from a viable pollutant pathway, which would be the lateral migration of potentially mobile phase-soluble contaminants. The presence of low permeability cohesive drift deposits across the site affords protection from vertical migration to the underlying Secondary A bedrock aquifer. As such, this receptor is considered to be at a low risk . Though the risk to the underlying bedrock Secondary A aquifer is considered to be low, the risk to the surface water receptors is considered to be high, due to the presence of impacted soils within close proximity of surface water features, and the presence of high permeability strata in areas beneath the site. The groundwater flow plan (Drawing 16-465-040, Appendix III) suggests that groundwater is flowing towards the central sector of the site from the north and southeast. Widespread naphthalene and TPH contamination has been identified in the soil analysis, with the majority of the impact noted within the Sheppard Mill area of the site. Thus, the source of the contaminants cannot be attributed to one area or point source and the majority of the contamination is considered present on a site wide basis. During the remediation and enabling works phase, the removal of the hardstanding currently present across the site may induce infiltration and potential mobilisation of contaminants present within the soils and groundwater directly into the surface water receptors. However, the areas of low permeability clay soils will act to inhibit migration. The supplementary controlled waters risk assessment completed by E3P has not identified any significant impact within the groundwater or surface water samples. The data suggests that there is no complete pollutant linkage and the identified contamination within the soils is not likely to be mobile. It will be necessary to instigate a watching brief during Remediation and Enabling Works to ensure that it can be demonstrated that all material that remains in-situ is suitable for retention. Surface water sampling is also recommended throughout the Remediation and Enabling Works to ensure that the water quality of the surface water features is not altered.



Ground Gas	Ground gas monitoring suggests that the site can be predominantly classified as CS1. However, CS2 measures are recommended for the whole site due to the presence of the historical landfill (eastern section of the Tack Lea Works area). Elevated concentrations of volatile contaminants (naphthalene, TPHs, VOCs, SVOCs, and mercury) have been identified within the Made Ground on-site, which present a potential volatilisation to indoor air risk. Elevated concentrations of volatile contaminants in the Tack Lea Works area are considered to be localised occurrences and therefore these locations can be treated as hotspots. However, elevated concentrations of volatile contaminants have been identified throughout the Shepherd Mill area and these do not appear to be localised hotspots. Further assessment, in the form of a Tier 3 vapour risk assessment is required in the Sheppard Mill area to assess the level of risk to the future site users by volatilisation to indoor air. Subject to the findings of the vapour risk assessment, vapour resistant membranes may be required.
Potable Water	Based on the assessment of current site conditions, it is likely that barrier pipe will be required at the proposed development. Post-remediation and enabling works ground conditions may be different from those identified during this ground investigation.

6.2. GEOTECHNICAL ASSESSMENT

Significant concrete and brick obstructions and basement features, which are indicative of relict foundations from former buildings have been encountered within the Made Ground. As such, the full thickness of the Made Ground could not be proven across the vast majority of the site. Further investigations will be required to prove the depth to Made Ground across the site.

During a phase of cut-and-fill enabling works to create a developable platform, all below-ground obstructions will require grubbing out to the base of the Made Ground to enable the construction of proposed plots.

Medium dense gravels identified between 1.00–4.00 m bgl has been assessed as having an ABP of 152–278 kN/m². Dense gravel identified between 2.50–7.00 m bgl has been assessed as having an ABP of 322–456 kN/m².

Loose gravels have also been identified between 1.00–2.00 m bgl in the central section of the Tack Lea Works area (WS102, WS103, and WS105) and at 3.00 m bgl in the central section of the Sheppard Mill area (CP103) has been assessed as having an ABP of 52–80 kN/m².

Firm gravelly CLAY has been identified between 2.00–3.00 m bgl with a net ABP of 56–80 kN/m². Stiff silty CLAY identified at 1.00–9.50 m bgl has been assessed as having a net ABP of 83–154 kN/m². Very stiff gravelly CLAY has been identified at 2.70–15.00 m bgl and has a net ABP of 156–452 kN/m².

Soft gravelly CLAY was also identified at 1.00 m bgl in the central section of the Tack Lea Works area (WS102) and has been assessed as having a net ABP of 31 kN/m².



Given the significant topographical variances on the site, prior to the detailed design of a suitable foundation solutions, a programme of remediation and enabling works will be required to remove the extensive buried obstructions and cut/fill the site in order to create proposed development platform levels suitable for residential development.

Following the removal of obstructions and subsequent engineering of soils to a specific performance specification, proposed plots could be constructed utilising vibro stone columns to support a suitably reinforced spread footing. Where tree influence is present and clays prone to volumetric instability, an alternative foundation solution may need to be adopted to deepen the foundation or the cohesive stratum may be removed and replaced with a granular material. The depth of the granular infill will be plot specific and require calculation on receipt of development levels. The use of vibro stone columns will also be dependent on the removal of clays that have a shear strength of $<30\text{kN/m}^2$. This specifically applies to Plots 41-44, where soft clays with a shear strength of $<30\text{ kN/m}^2$ were encountered between 1.10 m and 2.20 m bgl in TP115.

Where plots are in close proximity to slopes or the existing retaining walls, the proposed loadings may need to be transferred beneath the influencing depth of the retainer or slope to ensure no unacceptable loading is induced that would cause a geotechnical failure.

Consideration should also be given to the historical landfill located in the eastern section of Tack Lea Works, as well as the potential presence of a quarry high wall associated with the historical sandstone quarry in the north of Tack Lea Works area. Where plots span such a feature, socketed piles into the bedrock will be required to reduce the risk of differential settlement.

Therefore, upon completion of these enabling works, it is anticipated that the final foundation solution will be a combination of:

-  Vibro Stone Columns (VSC) that will ensure a uniform ABP in the order of 100kN/m^2 for the construction of a doubly reinforced strip footing at $\sim 600\text{mm}$ below remediated ground level (1050mm below FFL);
-  Shallow strip foundations, where viable, bearing on localised areas of firm to very stiff clays, medium dense sands and shallow bedrock;
-  Mass trench fill bearing on localised areas of firm to very stiff clays, medium dense sands and shallow bedrock;
-  Piled foundations may be required where deep Made Ground and soft clays have been encountered; and for plots which span the historical sandstone quarry and associated high wall in the north-western section of the Tack Lea Works area; and
-  Raft foundations may be required where obstructions cannot be removed.

Foundation depths within the conjectured influence of former, existing or proposed trees will need to be deepened to ensure that structural loading bears within the underlying target founding stratum, which cannot be subject to volumetric instability associated with fluctuation in moisture content.

It is recommended that, at working drawing stage, a foundation schedule is prepared for the development taking account of the physical change of natural clay soils and the current/proposed locations of trees.

END OF REPORT



APPENDIX I LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information, it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



APPENDIX II

GLOSSARY

TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme



Land at Greenbooth Road and Edenfield Road, Norden

Phase II Geoenvironmental Site Assessment

August 2023

MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AIRE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection

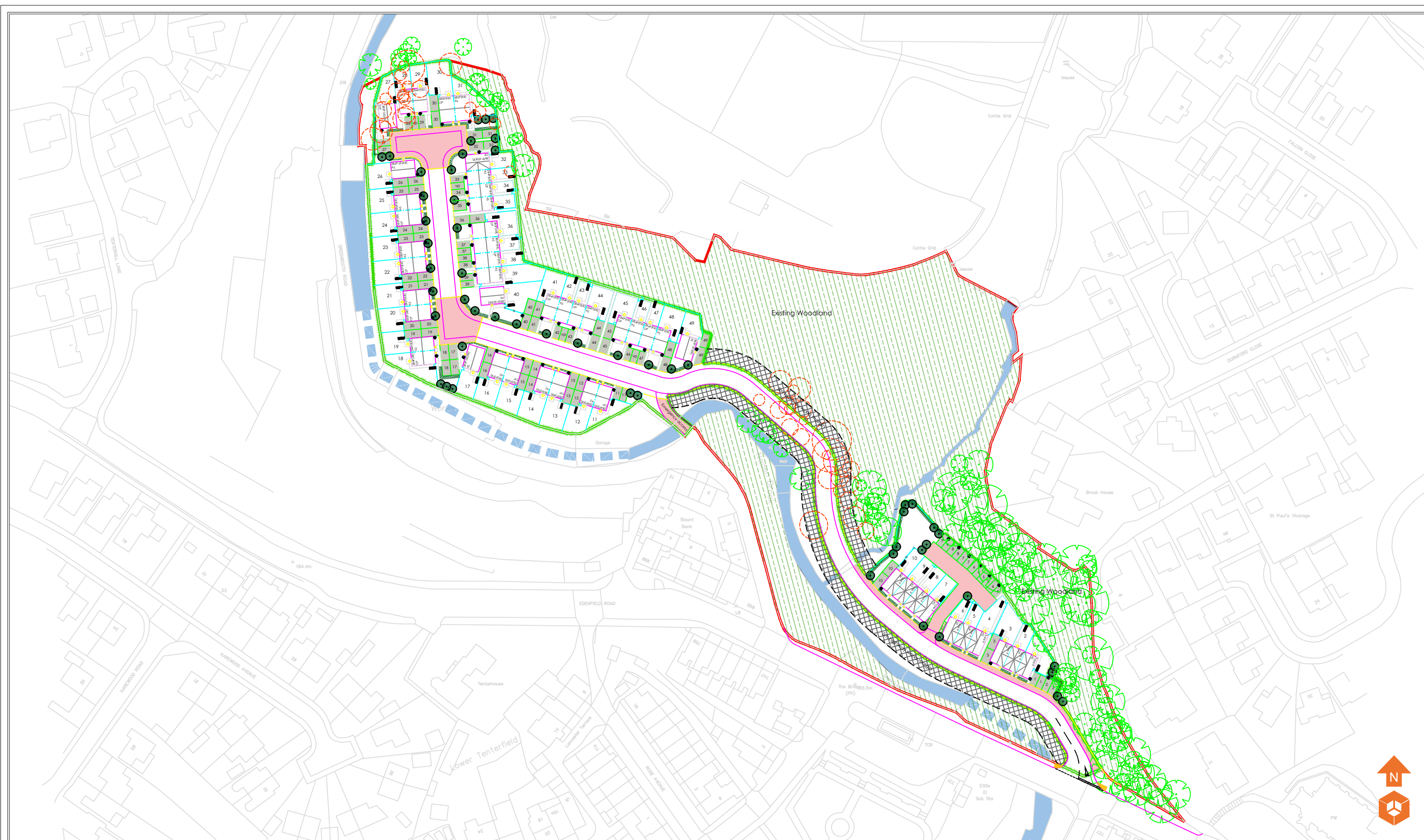


APPENDIX III

DRAWINGS

DRAWING 16-465-001 – SITE LOCATION PLAN





Notes:

P1	REVC	16.06.2023	OW	MW
P1	REVB	20.03.2023	EB	RJW
P1	REVA	17.11.2022	OW	MD
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road and
Edenfield Road, Norden

Job No:
16-465

Drawing No:
002

Drawing Title:

Proposed Development Plan

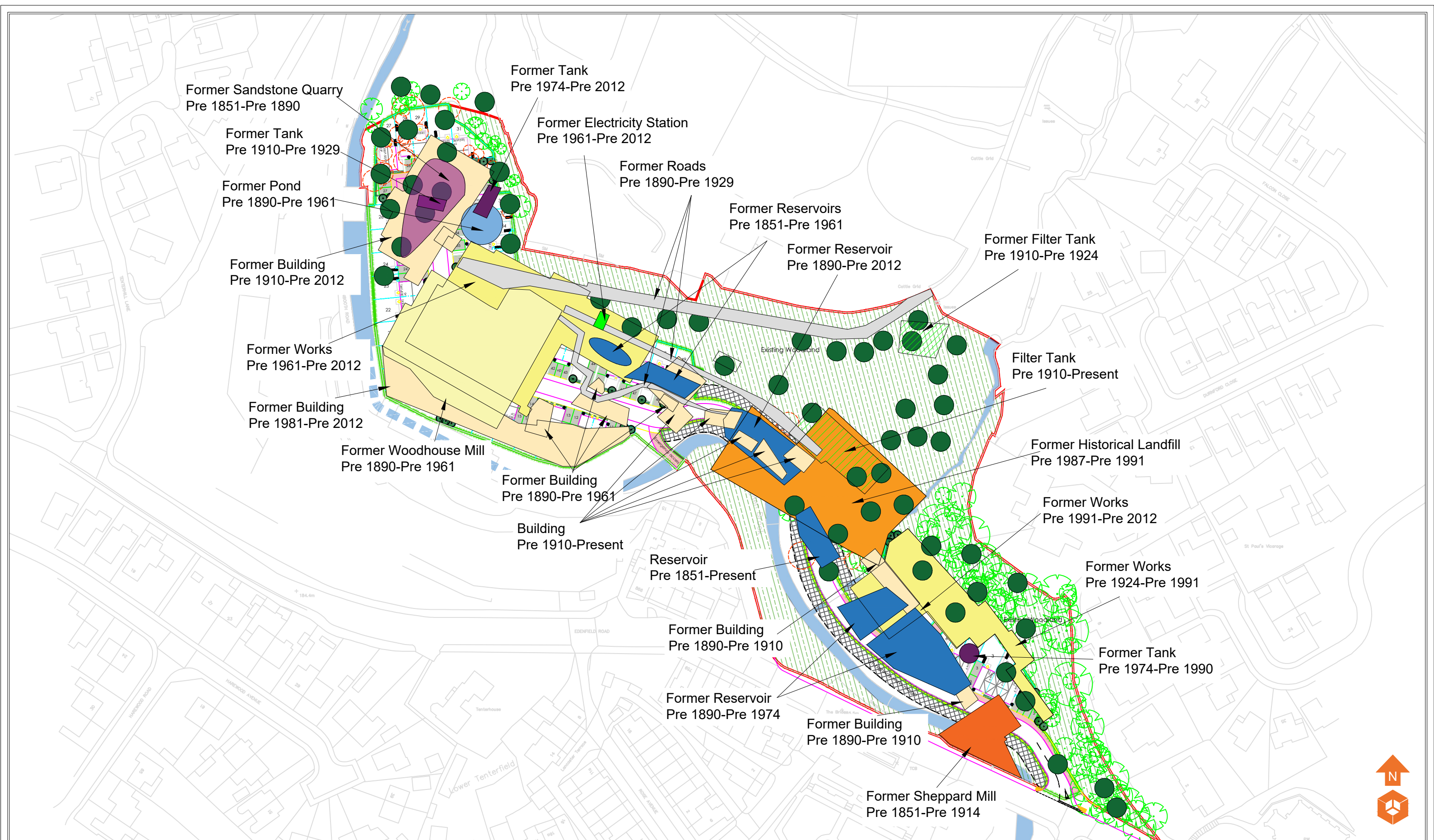
Date:
16.06.2023

Scale:
NTS@ A3



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Historical Features	
	Former Buildings
	Former Woodhouse Mill
	Works
	Former Water
	Former Ponds
	Former Reservoir
	Former Sheppard's Mill
	Former Roads
	Former Vegetation
	Former Filter Tanks
	Former Sandstone Quarry
	Former Electricity Station
	Former Tanks
	Former Historical Landfill

Notes:					
P1	REVG	04.07.2023	EB	MW	
P1	REVF	06.06.2023	OW	MW	
P1	REVE	11.04.2023	LM	MW	
P1	REVD	14.12.2022	OW	MW	
P1	REVC	12.12.2022	OW	MW	
P1	REVB	05.12.2022	EB	HM	
P1	REVA	31.10.2022	OW	MD	
Phase	Issue	Date	Drawn	Checked	

Client:	
Stonebond Properties Ltd	
Job Title:	
Land at Greenbooth Road and Edenfield Road, Norden	

Job No:	
16-465	
Drawing No:	
003	
Date:	
04.07.2023	
Scale:	
NTS @ A3	
Drawing Title:	
Historical Features Plan	



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Site Features

- Access Points
- Hard Standing
- Structures
- Surface Water Features
- Site Boundary
- Slope Direction
- Retaining Walls
- Access Bridge
- Spring
- Filter Tanks
- Gas Substation
- Vegetation
- Earth Bank
- Rock Outcrop
- Filter Tank
- Chimney Flue
- Chimney

Notes:

P1	REVI	05.07.2023	EB	MW
P1	REVH	04.07.2023	EB	MW
P1	REVG	06.06.2023	OW	MW
P1	REVF	15.05.2023	OW	MW
P1	REVE	17.04.2023	LM	MW
P1	REVD	11.04.2023	LM	MW
P1	REVC	14.12.2022	OW	MW
P1	REVB	17.11.2022	OW	MD
P1	REVA	28.10.2022	OW	MD
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond
Properties Ltd

Job Title:

Land at Greenbooth Road and
Edenfield Road, Norden

Job No:

16-465

Drawing No:

004

Drawing Title:

Site Features Plan

Date:

05.07.2023

Scale:

NTS@ A3

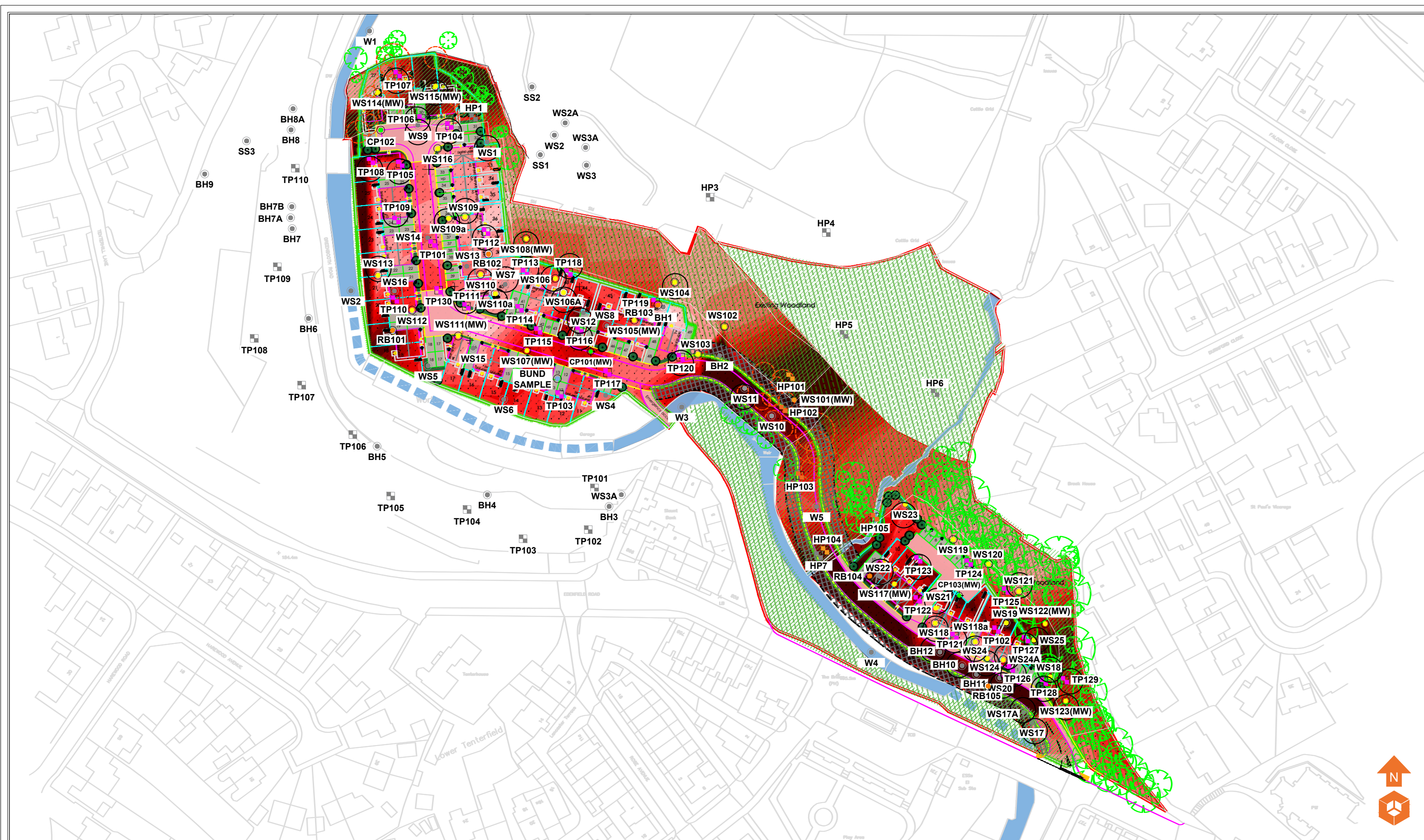


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Location Symbols		Notes:					Client:		Job No:		Date:		 Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JG Tel: 0161 707 9611 E-mail: info@e3p.co.uk Website: www.e3p.co.uk																																																									
	Approximate Window Sample Probehole Location		Approximate Rotary Borehole Location			Stonebond Properties Ltd		16-465		04.07.2023																																																												
	Approximate Trial Pit Location								Drawing No:		Scale:																																																											
	Approximate Cable Percussive Borehole Location								005		NTS@ A3																																																											
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Location Symbols

- WS101 Approximate Window Sample Probehole Location
- TP101 Approximate Trial Pit Location
- CP101 Approximate Cable Percussive Borehole Location
- BH101 Approximate Hand Dug Pit Location
- BUND101 Bund Sample Location
- TP101 Approximate Hand Dug Pit Location (Enica - April 2006)
- TP101 Approximate Trial Pit Location (Enica - April 2006)
- WS101 Approximate Window Sample Probehole Location (Enica - April 2006)
- BH101 Approximate Borehole Location (Enica - April 2006)

Made Ground Depth (m)

- Depth of Made Ground 0.00 - 0.99m
- Depth of Made Ground 1.00 - 1.99m
- Depth of Made Ground 2.00 - 2.99m
- Depth of Made Ground 3.00 - 3.99m
- Depth of Made Ground 4.00 - 4.99m
- Depth of Made Ground >5.00m
- Full extent of Made Ground not identified

Notes:

P1	REVD	12.07.2023	OW	MW
P1	REVC	12.04.2023	LM	MW
P1	REVB	16.01.2023	EB	HM
P1	REVA	15.12.2022	LM	HM
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd
Land at Greenbooth Road and Edenfield Road, Norden

Job No:

16-465
Drawing No:
006

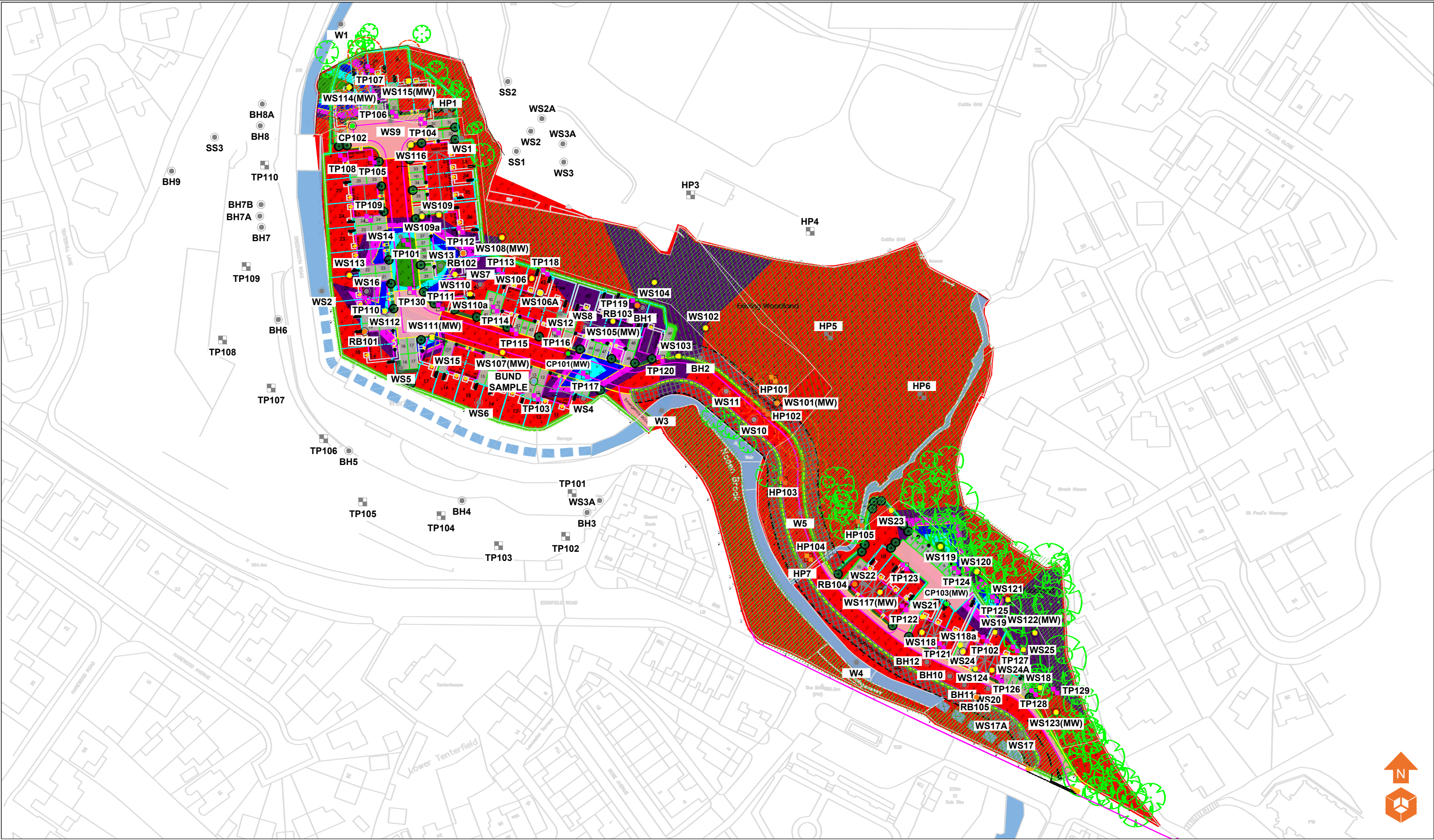
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12.07.2023
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Location Symbols

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- TP101 Approximate Trial Pit Location (Enica - April 2006)
- WS101 Approximate Window Sample Probehole Location (Enica - April 2006)
- BS101 Approximate Borehole Location (Enica - April 2006)
- RP101 Approximate Rotary Borehole Location

Shallow Spread Footings

- Depth to Founding Strata 0.00 - 1.24m
- Depth to Founding Strata 1.25 - 1.49m
- Mass Trench Fill Footings
- Depth to Founding Strata 1.50 - 1.74m
- Depth to Founding Strata 1.75 - 1.99m
- Depth to Founding Strata 2.00 - 2.24m
- Engineered Footings
- Depth to Founding Strata 2.25 - 2.49m
- Depth to Founding Strata >2.50m

Notes:

P1	REVC	26.07.2023	OW	MW
P1	REVB	16.01.2023	EB	HM
P1	REVA	03.01.2023	EB	HM
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Greenbooth Road and Edensfield Road, Norden

Job No:

16-465

Drawing No:

008

Date:

26.07.2023

Scale:

NTS@ A3

Drawing Title:

Depth of Founding Strata Plan



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Summary of Heave Precaution Requirements				
Volume Change Potential	Required Foundation Depth (m)	Minimum Void Dimensions for Foundations, Ground Beams & Suspended In-Situ Concrete Ground Floors		Minimum Void Dimensions Under Pre-Cast Concrete & Suspended Timber Floors
		Thickness of Void Former Against Side of Foundation of Ground Beam (mm)	Thickness of Void Former or Underside of Edge Beam & Floor Slab (mm)	Void Dimension (mm)
Low Volume Change Potential (<20%)	>2.00	No Special Precautions		200
	2.00-2.50	-	50	
Medium Volume Change Potential (20-40%)	1.50-2.00	25	50	250
	2.00-2.50	25	100	
High Volume Change Potential (>40%)	>2.50	Engineer Design		Engineer Design
	1.50-2.00	25	75	
	2.00-2.50	35	150	300
	>2.50	Engineer Design		Engineer Design

Minimum Width of Strip Footings								
Type of Ground (Including Engineered Fill)		Condition of Ground	Total Load of Load-Bearing Walling more than (kN/linear metre)					
			20	30	40	50	60	70
			Minimum Width of Strip Foundation (mm)					
Gravel	Sand	Medium Dense to Dense	250	300	400	500	600	650
Clay	Sandy Clay	Stiff	250	300	400	500	600	650
Clay	Sandy Clay	Firm	300	350	450	600	750	850

Items Considered		
Bearing Capacity		TBC
Trees		TBC
Historical		TBC
Groundwater Table		TBC
FFL		TBC
Client Layout		TBC
Contamination		TBC
Remediation		TBC
Volume Change Potential		TBC
Root Protection Areas		TBC
Is the Site Affected by Shallow Mining?		Yes/No
Are Mine Entries Present on or Within Influencing Distance of the Site?		Yes/No
Are Retaining Structures Present on the Site?		Yes/No (If on site and more than 900mm height diff. add geotechnical issues triangle)

Residual Risks			
Foreseeable Risks That Cannot be Avoided	Applicable (Y/N)	Action to Reduce Risk	Justification for Design Decision
Deep Excavations	Y	Identify locations on drawing and depths on schedule	Lesser risk than other alternatives
Trench Collapse	Y	Risk highlighted on drawing	Lesser risk than other alternatives
Use of Working Platform for Pile/Vibro Operations	Y	Compliance with working platform directive required	Pile/Vibro foundation less risky than other alternatives

Coal Mining Foundation Notes:

Where foundations are located over treated shallow workings spread and trench fill foundations (strips and rafts) are required to be suitably reinforced to span soft spots (3m span and 1.5m cantilever). It is desirable to maintain bearing pressures below 160kNm/m2 at the grouted horizons - Piles are not generally suitable unless founded below the grouted horizons (typically, this cannot be achieved with driven piles) and would require further detailed assessment. There is also a potential for pile installation to disturb workings or shafts Refer to CIRIA SP32 and C758 for details. Foundations, which encounter coal, should be brought below the coal. The sides of foundations should be protected when they are in contact with coal.



Anticipated Foundation Types

- TS** Traditional Strip Foundations
Minimum depth 900mm below proposed First Finished Level.
Maximum safe bearing pressure limited to 100kN/m2.
- MT** Mass Trench Fill Foundations
Minimum depth 1200mm below proposed First Finished Level.
Maximum safe bearing pressure limited to 100kN/m2.
- V** Vibro Stone Ground Compaction
In accordance with NBSIC Chapter 4.2.
- P** Piled Foundations
Where the proposed foundation depth exceeds 2.50m a piled foundation option rather than a trench fill / deep reinforced strip foundations may be adopted. Columns or tie beams supported by ground beams.
- R** Raft Foundations
Minimum safe bearing pressure limited to 50kN/m2 on approved engineered granular fill. Raft foundations to be designed by a structural engineer in accordance with Chapter 4.5 of NBSIC 2019. Raft foundations are considered suitable to mitigate against potential differential clay heave. Foundation in accordance with Section 4.2, sub-section 2(b).
- TB** Traditional Strip / Trench Block Foundations
Foundation strip installed at 600mm lower corner level with wall up to Trench Block and subsequent backfill to development level.
- Colours on Plot Corners to be Used When Referring to Foundation Schedule.
(Opening First Layer & Levels)

Depth to Target Founding Strata

- Footings 0.75 - 0.90m Deep
From First Finished Level
In accordance with NBSIC Chapter 4.2
- Footings 0.90 - 1.25m Deep
From First Finished Level
In accordance with NBSIC Chapter 4.2
- Footings 1.25 - 1.50m Deep
From First Finished Level
In accordance with NBSIC Chapter 4.2
- Footings 1.50 - 1.75m Deep
From First Finished Level
In accordance with NBSIC Chapter 4.2
- Footings 1.75 - 2.00m Deep
From First Finished Level
In accordance with NBSIC Chapter 4.2
- Footings 2.00 - 2.25m Deep
From First Finished Level
In accordance with NBSIC Chapter 4.2
- Footings 2.25 - 2.50m Deep
From First Finished Level
In accordance with NBSIC Chapter 4.2

Engineered Foundation Solutions

- Footings >2.50m Deep
From First Finished Level
In accordance with NBSIC Chapter 4.2
- Vibro
- Low Volume Change Potential Clay
Heave precautions required to underside of cast in-situ floor slab (with no sub-floor void) within corrected zone of tree influence. Heave precautions not required to foundation.

Structural Design Risk Management
Abnormal residual risks associated with the design outcomes on the drawing:

- Abnormal
- Abnormal

Tree Influence (Retained / Removed)

- 0.90 - 1.25m
- 1.25 - 1.50m
- 1.50 - 1.75m
- 1.75 - 2.00m
- 2.00 - 2.25m
- 2.25 - 2.50m
- >2.50m

Notes:				
P1	REVA	03.08.2023	OW	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Land Greenbooth Road and Edenefield Road, Norden

Job No:

16-465

Drawing No:

009

Date:

03.08.2023

Scale:

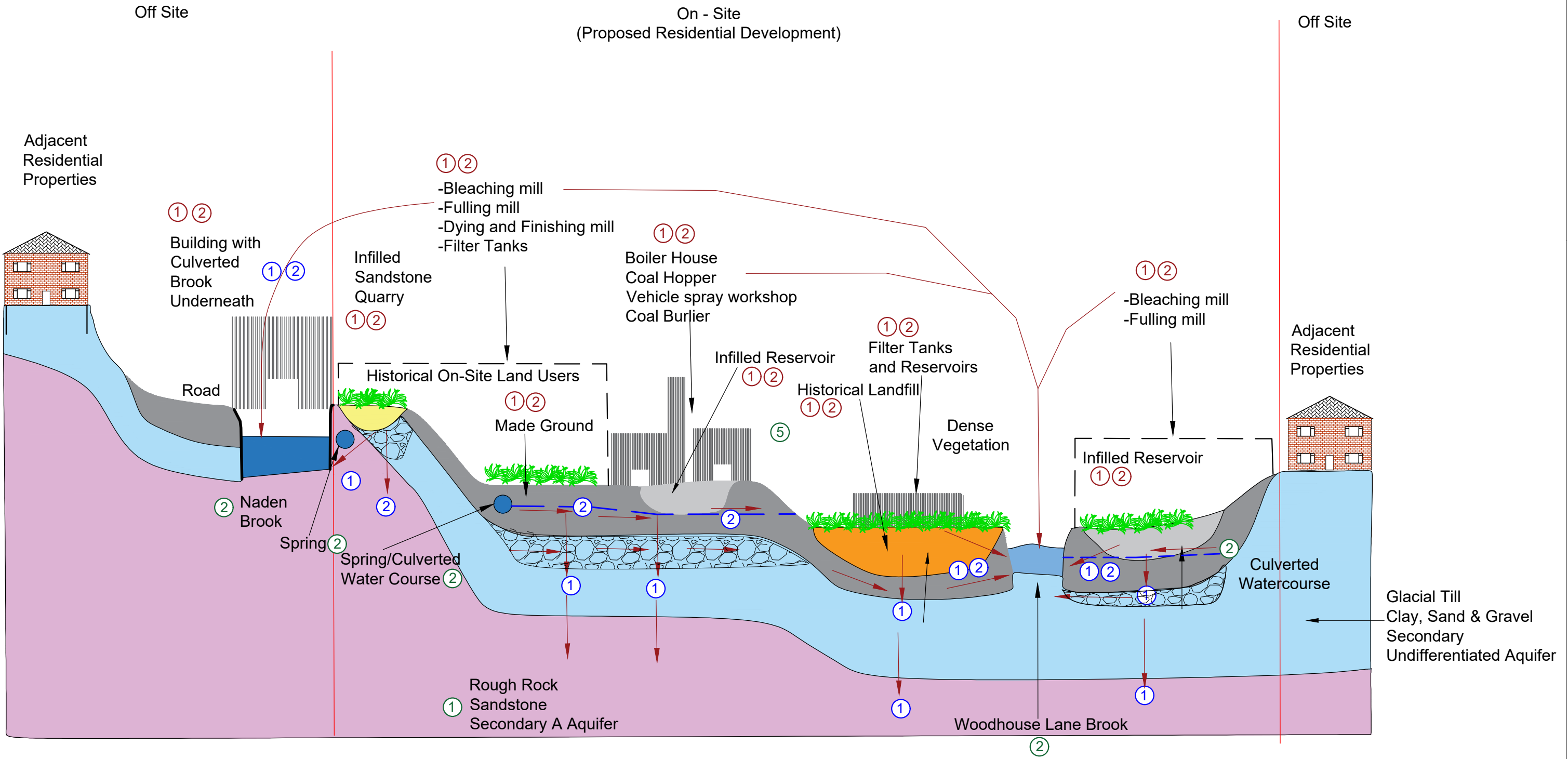
1:1000 @ A1

Drawing Title:

Concept Foundation Zoning Plan

Environmental Engineering Partnership Ltd
Taylor Road, Trafford Park
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Geology Key

- Made Ground
- Glacial Till (Clay, Sand & Gravel)
- Rough Rock (Sandstone)
- Brook / Stream
- Historical Landfill
- Spring / Culverted Watercourse
- Infilled Reservoir

Sources

- ① Heavy metals, heavy end hydrocarbons and non volatile polycyclic hydrocarbons (PAHs)
- ② Volatile Organic Compounds (VOCs) and TPHs
- ③ Asbestos Containing Materials (ACMs)
- ④ Hazardous Ground Gases (CO2/CH4)
- ⑤ pH and Sulphate

Receptors

- ① Secondary A Aquifer
- ② Surface Water Courses
- ③ Foundation/Concrete
- ④ Residential End Users
- ⑤ Flora and Fauna

Pathways

- ① Vertical Migration
- ② Lateral Migration
- ③ Inhalation of Gas/Vapor/Dust
- ④ Dermal Contact/Soil Ingestion

Pathways arrows

Notes:

Phase	Issue	Date	Drawn	Checked
P1	REVB	17.04.2023	LM	MW
P1	REVA	12.04.2023	OW	MW

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road and Edenfield Road, Norden

Job No:

16-465

Drawing No:

010

Date:

17.04.2023

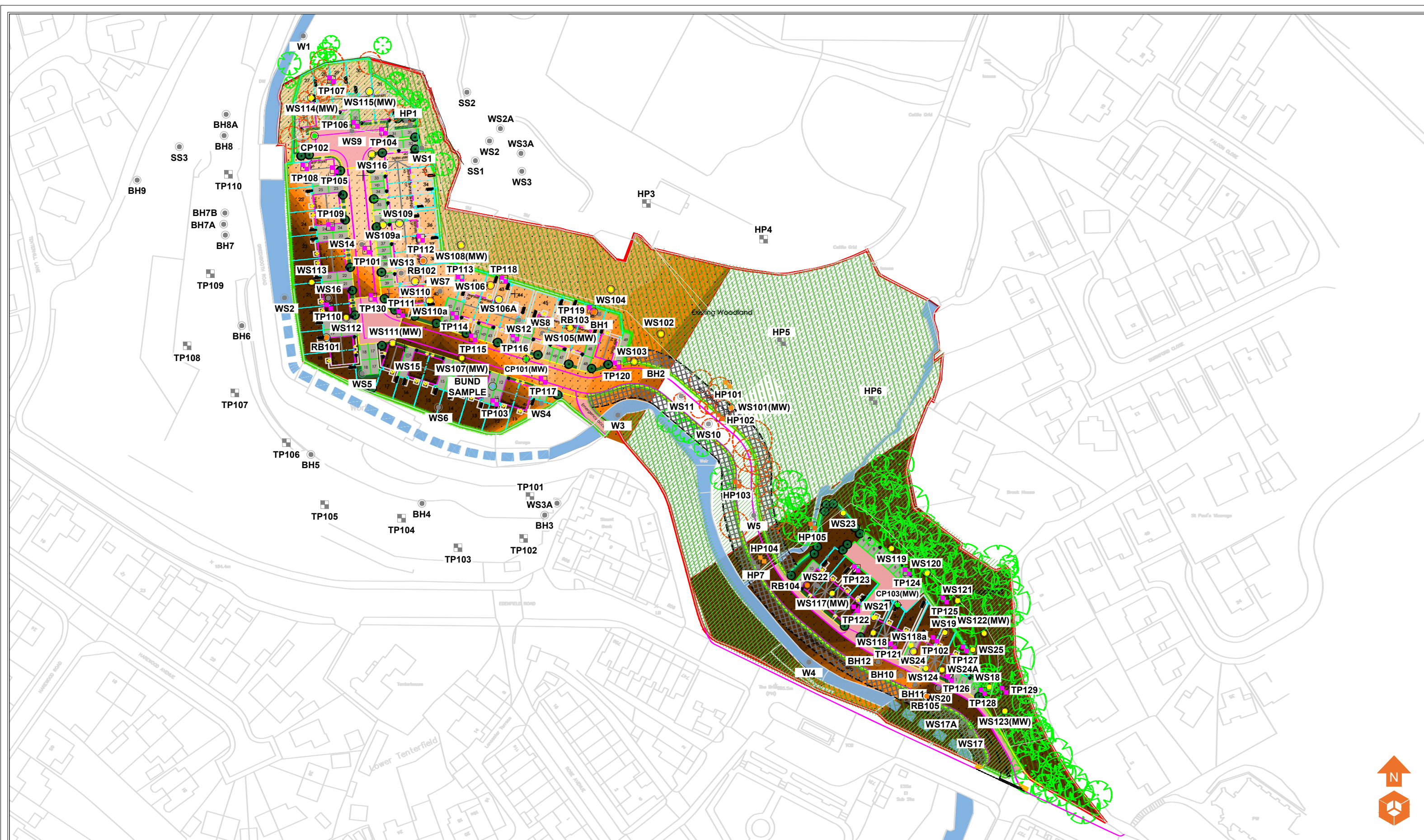
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1:1000 @ A3

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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location
- Approximate Cable Percussive Borehole Location
- Approximate Hand Dug Pit Location
- Bund Sample Location
- Approximate Hand Dug Pit Location (Enica - April 2006)
- Approximate Trial Pit Location (Enica - April 2006)
- Approximate Window Sample Probehole Location (Enica - April 2006)
- Approximate Borehole Location (Enica - April 2006)
- Approximate Rotary Borehole Location

Bedrock Depth (m)

- Depth to Bedrock 0.00 - 0.99m
- Depth to Bedrock 1.00 - 1.99m
- Depth to Bedrock 2.00 - 2.99m
- Depth to Bedrock 3.00 - 3.99m
- Depth to Bedrock 4.00 - 4.99m
- Depth to Bedrock >5.00m

Notes:

P1	REVB	27.07.2023	OW	MW
P1	REVA	12.04.2023	LM	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties
Ltd

Job Title:

Land at Greenbooth Road and
Edenfield Road, Norden

Job No:

16-465

Drawing No:

012

Date:

27.07.2023

Scale:

NTS@ A3

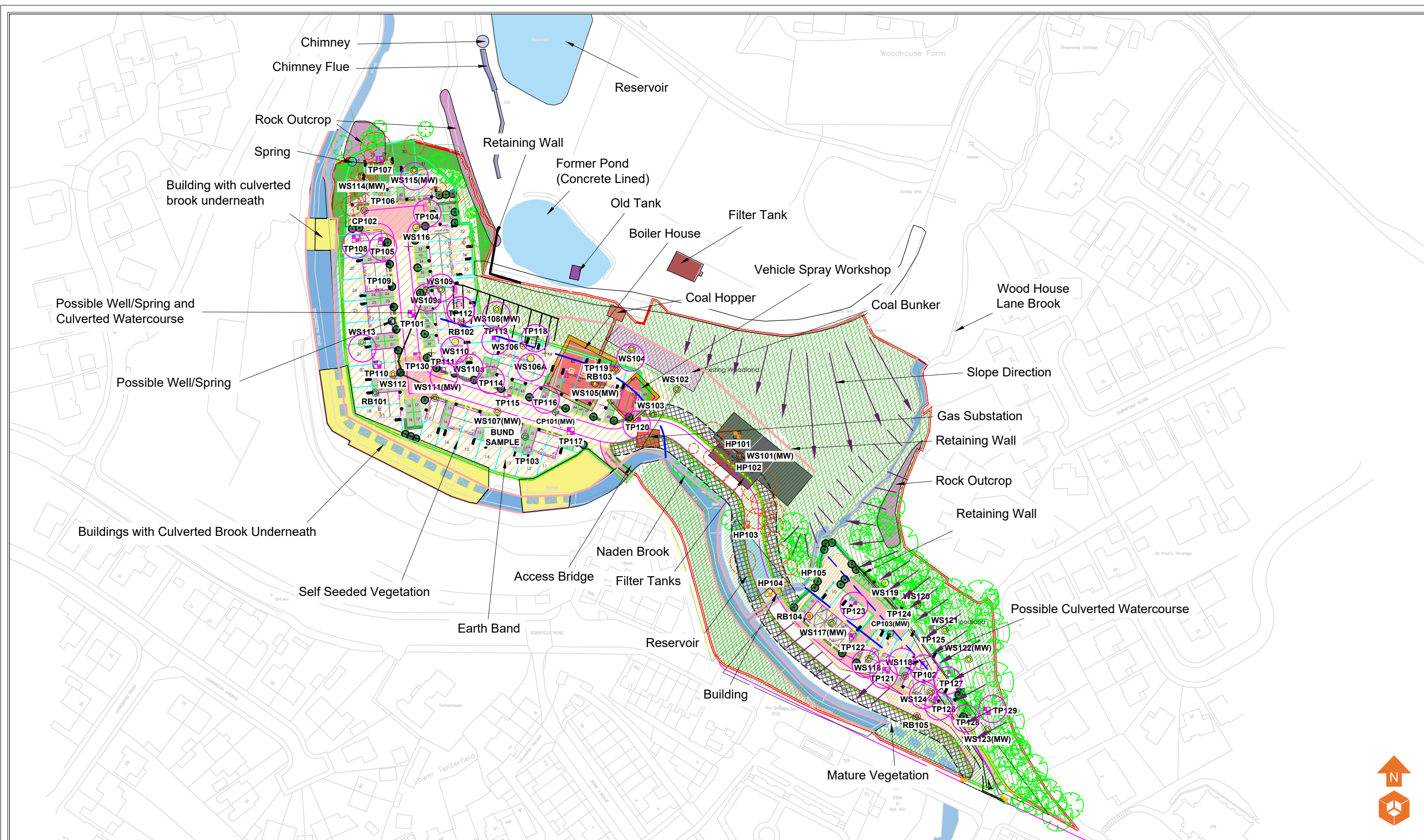
Drawing Title:

Depth to Bedrock Plan



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Location Symbols		Development Constraints			
	Approximate Window Sample Probehole Location		Obstruction		Well/Spring
	Approximate Trial Pit Location		Basement Feature		Culverted Watercourse
	Approximate Cable Percussive Borehole Location				Historical Landfill
	Approximate Hand Dug Pit Location				Buildings
	Bund Sample Location				
	Approximate Hand Dug Pit Location (Enica - April 2006)				
	Approximate Trial Pit Location (Enica - April 2006)				
	Approximate Window Sample Probehole Location (Enica - April 2006)				
	Approximate Borehole Location (Enica - April 2006)				

Notes:					
P1	REVH	09.08.2023	LM	MW	
P1	REVG	06.06.2023	OW	MW	
P1	REVF	15.05.2023	EB	MW	
P1	REVE	25.04.2023	OW	MW	
P1	REVD	17.04.2023	LM	MW	
P1	REVC	18.01.2023	OW	HM	
P1	REVB	16.01.2023	EB	HM	
P1	REVA	03.01.2023	EB	HM	
Phase	Issue	Date	Drawn	Checked	

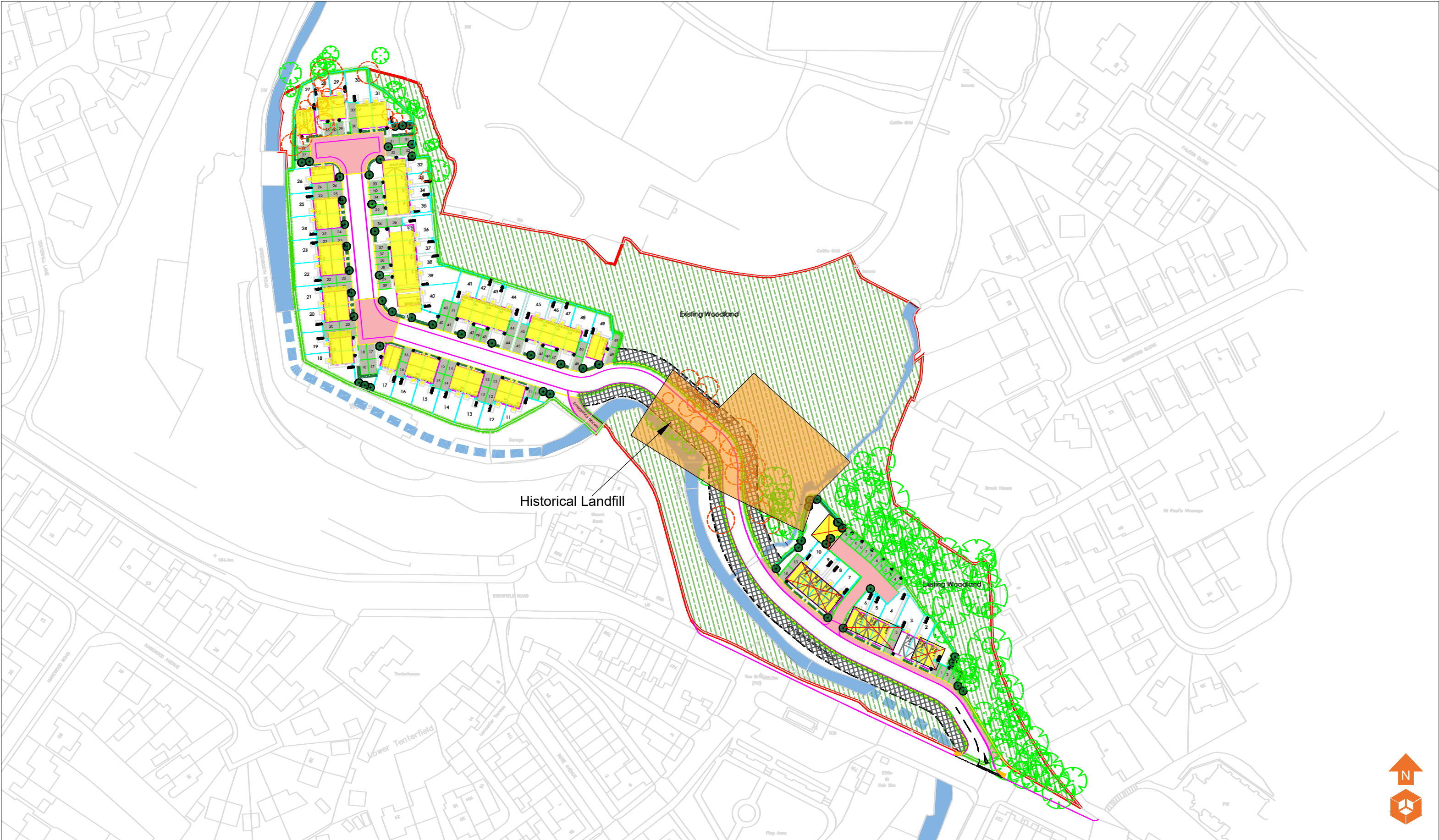
Client:	
Stonebond Properties Ltd	
Job Title:	
Land Greenbooth Road and Edenfeild Road, Norden	

Job No:	
16-465	
Drawing No:	
015	
Date:	
06.06.2023	
Scale:	
NTS@ A3	
Drawing Title:	
Development Constraints Plan	



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Ground Gas

 CS2

 Vapour Resistant Membranes may be required, subject to findings of Tier II Vapour Risk Assessment

Notes:				
P1	REVD	06.06.2023	OW	MW
P1	REVC	31.03.2023	OW	MW
P1	REVB	28.03.2023	OW	MW
P1	REVA	23.03.2023	OW	HM
Phase	Issue	Date	Drawn	Checked

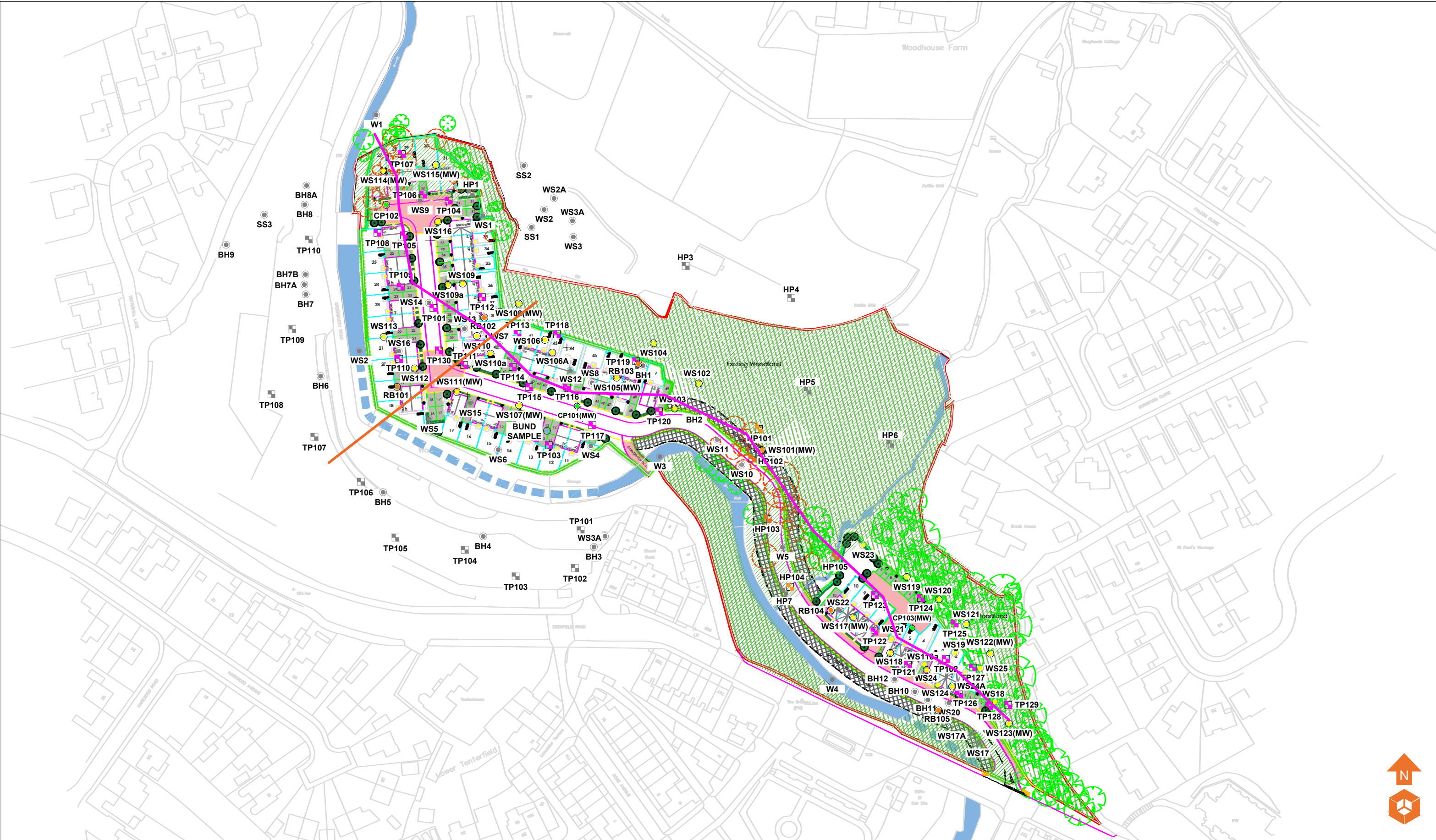
Client:	Stonebond Properties Ltd
Job Title:	Land at Greenbooth Road and Edenfield Road, Norden

Job No:	16-465
Drawing No:	024
Date:	06.06.2023
Scale:	NTS@ A3
Drawing Title:	Ground Gas Plan



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Location Symbols

	Approximate Window Sample Probehole Location		Inaccessible Area
	Approximate Trial Pit Location		Bund
	Approximate Cable Percussive Borehole Location		Cross Section Location 1
	Approximate Hand Dug Pit Location		Cross Section Location 2
	Bund Sample Location		
	Approximate Hand Dug Pit Location (Enica - April 2006)		
	Approximate Trial Pit Location (Enica - April 2006)		
	Approximate Window Sample Probehole Location (Enica - April 2006)		
	Approximate Borehole Location (Enica - April 2006)		

Notes:

P1	REVC	06.06.2023	OW	MW
P1	REVB	25.04.2023	EB	MW
P1	REVA	24.04.2023	EB	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road and Edenfield Road, Norden

Job No:

16-465

Drawing No:

025

Date:

06.06.2023

Scale:

NTS@ A3

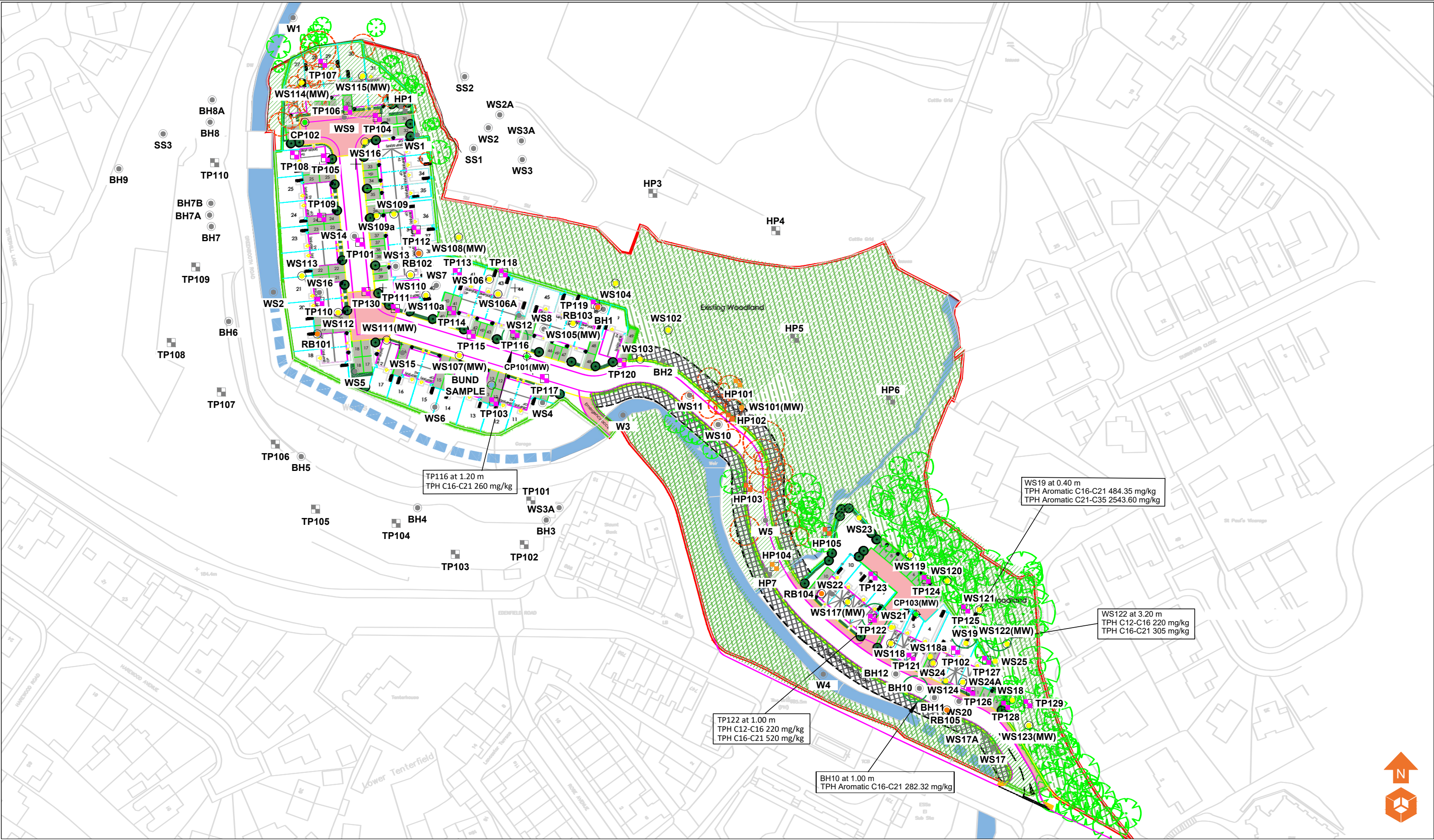
Drawing Title:

Cross Section Location Plan



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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location
- Approximate Cable Percussive Borehole Location
- Inaccessible Area
- Historical Landfill

Location Symbols

- Approximate Hand Dug Pit Location
- Bund Sample Location
- Approximate Hand Dug Pit Location (Enica - April 2006)
- Approximate Trial Pit Location (Enica - April 2006)
- Approximate Window Sample Probehole Location (Enica - April 2006)
- Approximate Borehole Location (Enica - April 2006)
- Approximate Rotary Borehole Location

Contamination Exceedances

- TPH

Notes:

P1	REVC	06.06.2023	OW	MW
P1	REVB	02.05.2023	OW	MW
P1	REVA	26.04.2023	OW	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road
and Edenfield Road, Norden

Job No:

16-465

Drawing No:

027

Date:

06.06.2023

Scale:

NTS@ A3

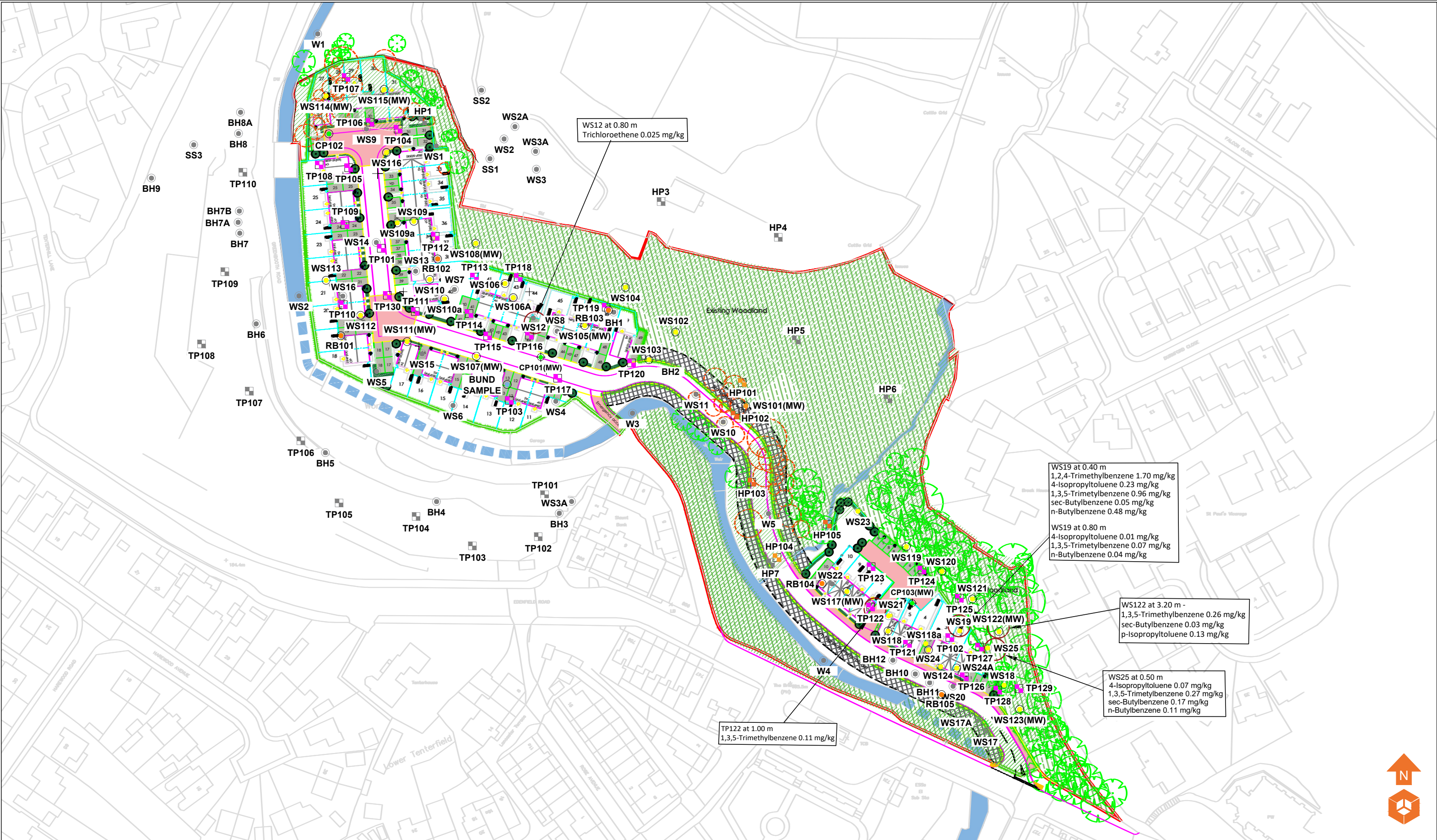
Drawing Title:

Contamination Issues Plan
- TPH



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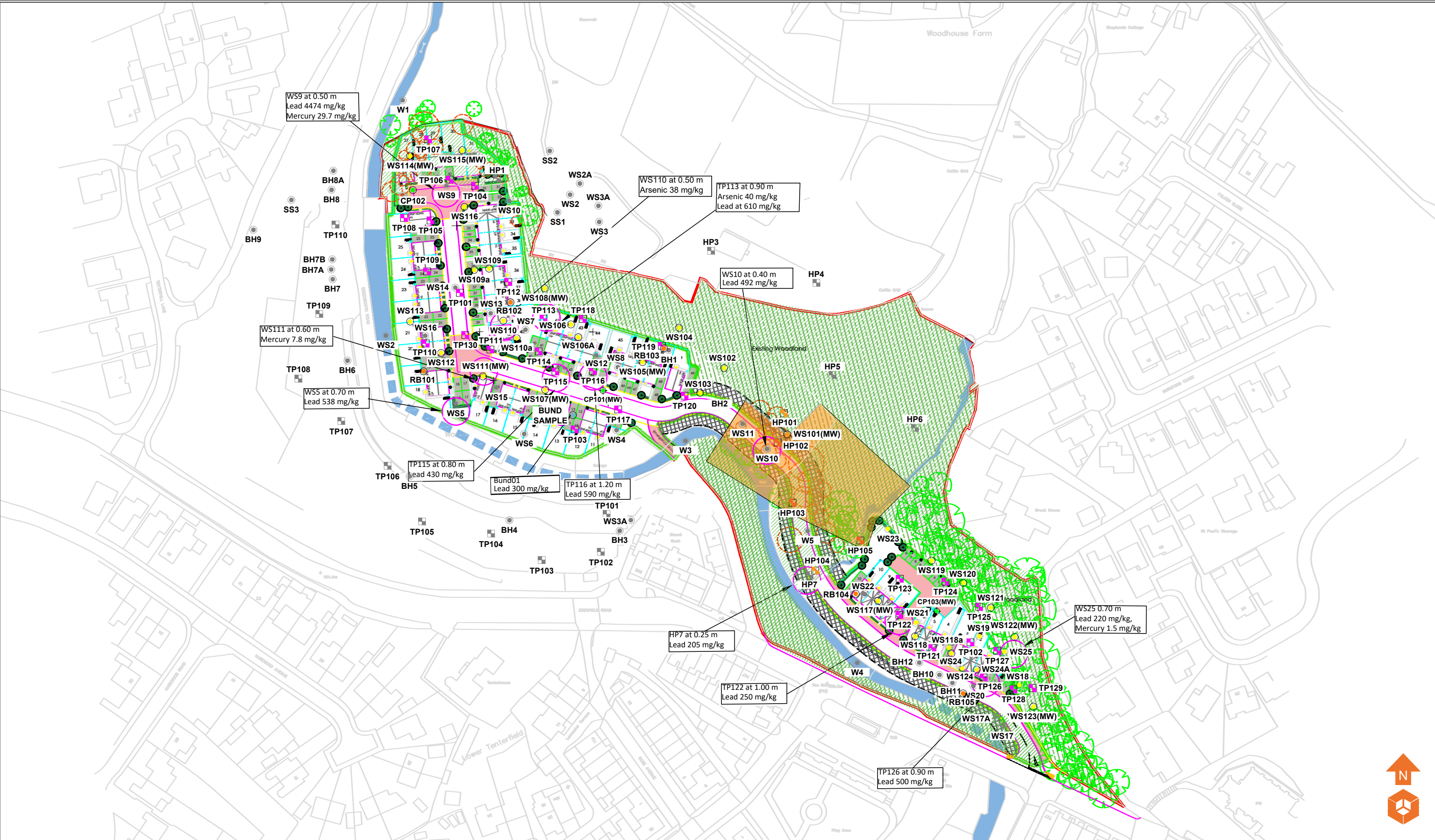


Location Symbols WST01 Approximate Window Sample Probehole Location TP01 Approximate Trial Pit Location CB01 Approximate Cable Percussive Borehole Location Inaccessible Area Historical Landfill WST01 Approximate Hand Dug Pit Location BUND01 Bund Sample Location TP01A1 Approximate Hand Dug Pit Location (Enica - April 2006) TP01A Approximate Trial Pit Location (Enica - April 2006) WST01 Approximate Window Sample Probehole Location (Enica - April 2006) BH01 Approximate Borehole Location (Enica - April 2006) ROT01 Approximate Rotary Borehole Location Contamination Exceedances VOCs		Notes: P1 REVC 06.06.2023 OW MW P1 REVB 02.05.2023 OW MW P1 REVA 26.04.2023 OW MW Phase Issue Date Drawn Checked Client: Stonebond Properties Ltd Job No: 16-465 Date: 06.06.2023 Drawing No: 028 Scale: NTS@ A3 Job Title: Land at Greenbooth Road and Edenfeild Road, Norden Drawing Title: Contamination Issues Plan - VOCs e3p Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.
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Location Symbols

- WS101 Approximate Window Sample Probehole Location
- TP101 Approximate Trial Pit Location
- BS101 Approximate Cable Percussive Borehole Location
- Inaccessible Area
- Historical Landfill

Location Symbols

- HP101 Approximate Hand Dug Pit Location
- Bund Sample Location
- Approximate Hand Dug Pit Location (Enica - April 2006)
- Approximate Trial Pit Location (Enica - April 2006)
- Approximate Window Sample Probehole Location (Enica - April 2006)
- Approximate Borehole Location (Enica - April 2006)
- Approximate Rotary Borehole Location

Contamination Exceedances

- Heavy Metals

Notes:

P1	REVC	06.06.2023	OW	MW
P1	REVB	02.05.2023	OW	MW
P1	REVA	26.04.2023	OW	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Land at Greenbooth Road and Edenfield Road, Norden

Job No:

16-465

Drawing No:
030

Date:

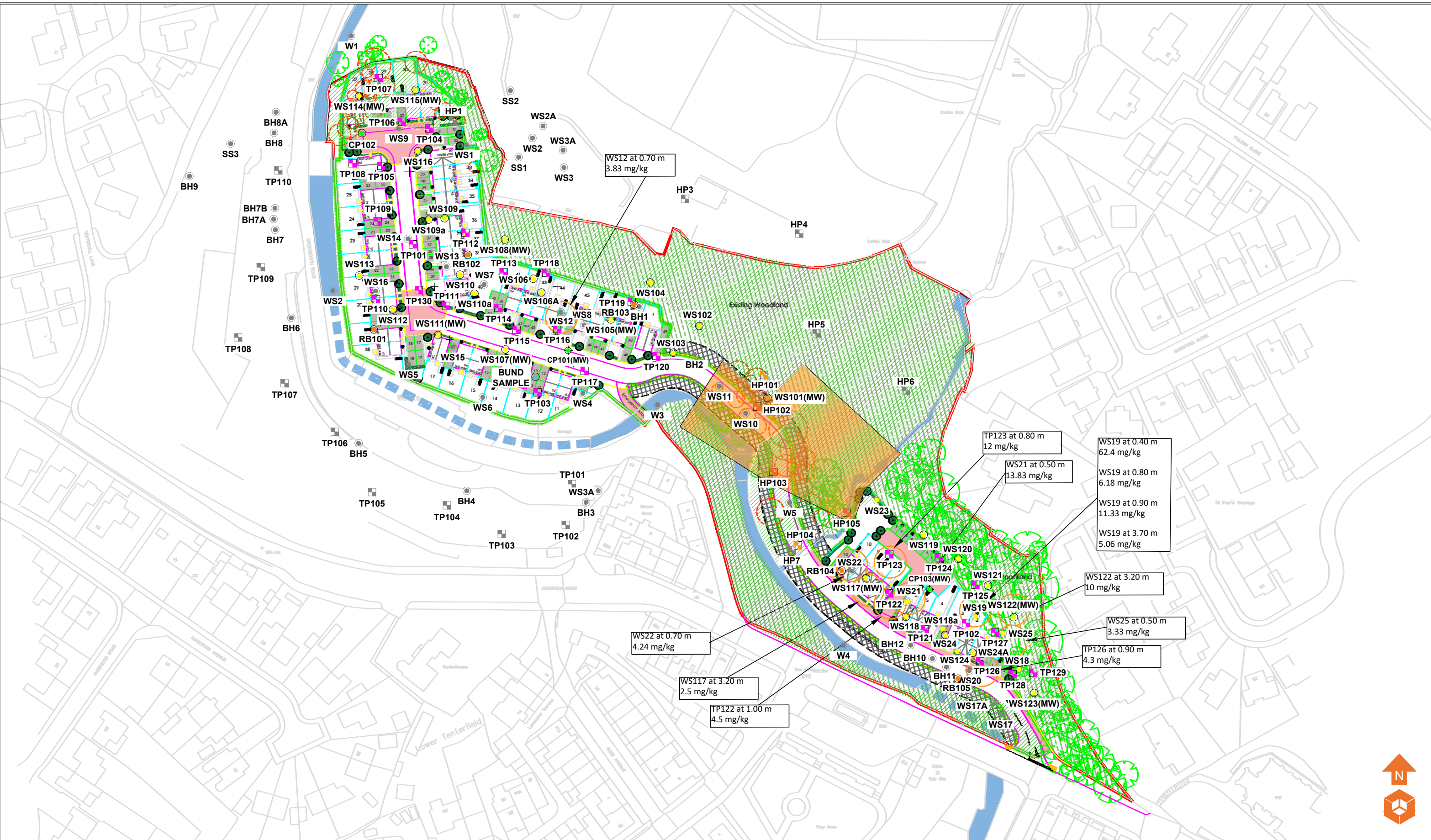
06.06.2023

Scale:
NTS@ A3



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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location
- Approximate Cable Percussive Borehole Location
- Inaccessible Area
- Historical Landfill

Location Symbols

- Approximate Hand Dug Pit Location
- Bund Sample Location
- Approximate Hand Dug Pit Location (Enica - April 2006)
- Approximate Trial Pit Location (Enica - April 2006)
- Approximate Window Sample Probehole Location (Enica - April 2006)
- Approximate Borehole Location (Enica - April 2006)
- Approximate Rotary Borehole Location

Contamination Exceedances

- Naphthalene

Notes:

P1	REVC	06.06.2023	OW	MW
P1	REVB	02.05.2023	OW	MW
P1	REVA	26.04.2023	OW	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road and Edenfield Road, Norden

Job No:

16-465

Drawing No:

031

Date:

06.06.2023

Scale:

NTS@ A3

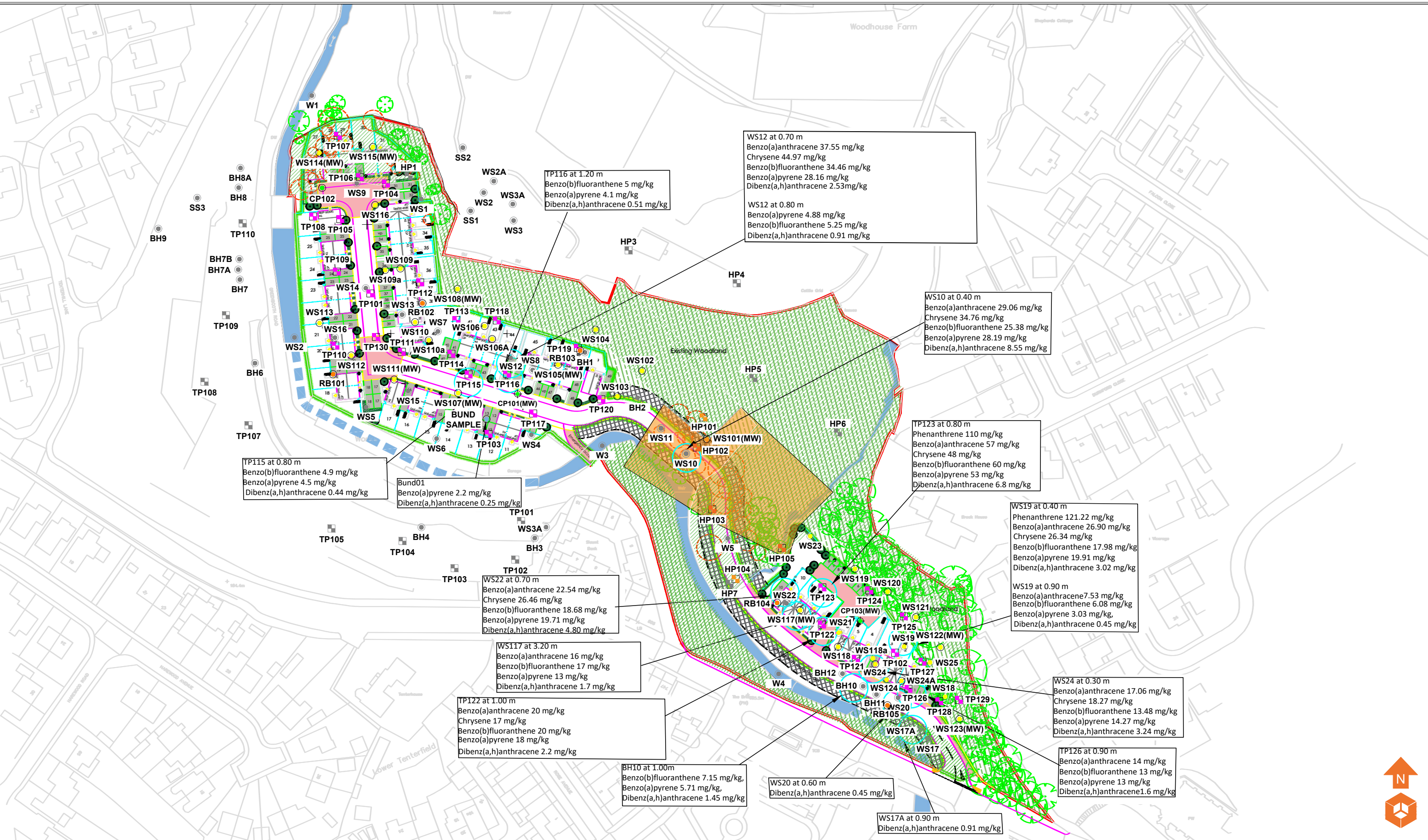
Drawing Title:

Contamination Issues Plan
- Naphthalene



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Location Symbols		Location Symbols		Contamination Exceedances	
	Approximate Window Sample Probehole Location		Approximate Hand Dug Pit Location		Non-Volatile PAHs
	Approximate Trial Pit Location		Bund Sample Location		
	Approximate Cable Percussive Borehole Location		Approximate Hand Dug Pit Location (Enica - April 2006)		
	Inaccessible Area		Approximate Trial Pit Location (Enica - April 2006)		
	Historical Landfill		Approximate Window Sample Probehole Location (Enica - April 2006)		
			Approximate Borehole Location (Enica - April 2006)		
			Approximate Rotary Borehole Location		

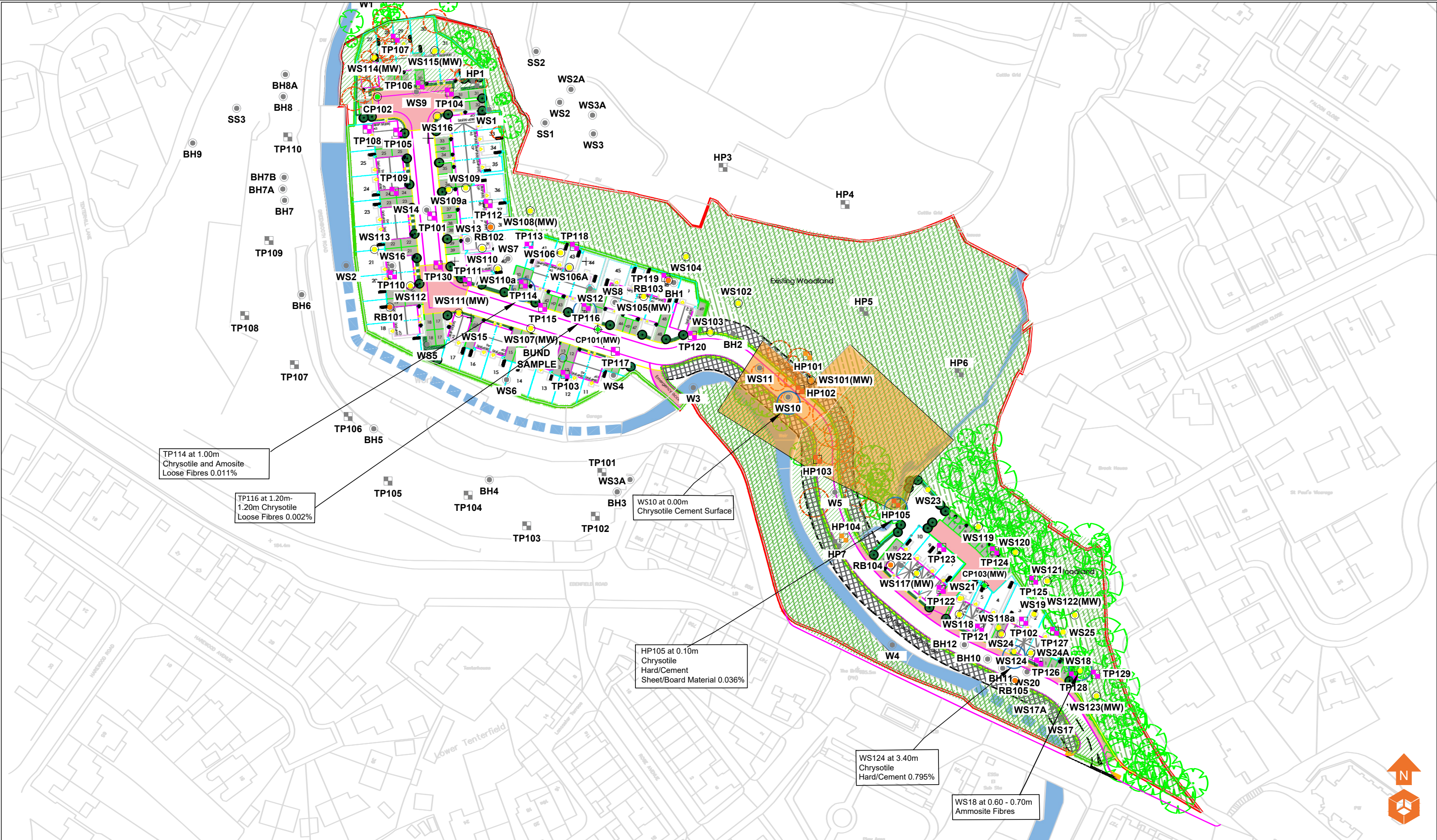
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P1	REVB	02.05.2023	OW	MW
P1	REVA	26.04.2023	OW	MW
Phase	Issue	Date	Drawn	Checked

Client:	
Stonebond Properties Ltd	
Job Title:	
Land at Greenooth Road and Edenfield Road, Norden	

Job No:	16-465
Drawing No:	032
Date:	06.06.2023
Scale:	NTS@ A3
Drawing Title:	
Contamination Issues Plan - Non-Volatile PAHs	

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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location
- Approximate Cable Percussive Borehole Location
- Inaccessible Area
- Historical Landfill

Location Symbols

- Approximate Hand Dug Pit Location
- Bund Sample Location
- Approximate Hand Dug Pit Location (Enica - April 2006)
- Approximate Trial Pit Location (Enica - April 2006)
- Approximate Window Sample Probehole Location (Enica - April 2006)
- Approximate Borehole Location (Enica - April 2006)
- Approximate Rotary Borehole Location

Contamination Exceedances

- Asbestos

Notes:

P1	REVB	02.05.2023	OW	MW
P1	REVA	26.04.2023	OW	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road and Edenfield Road, Norden

Job No:

16-465

Drawing No:

033

Date:

02.05.2023

Scale:

NTS@ A3

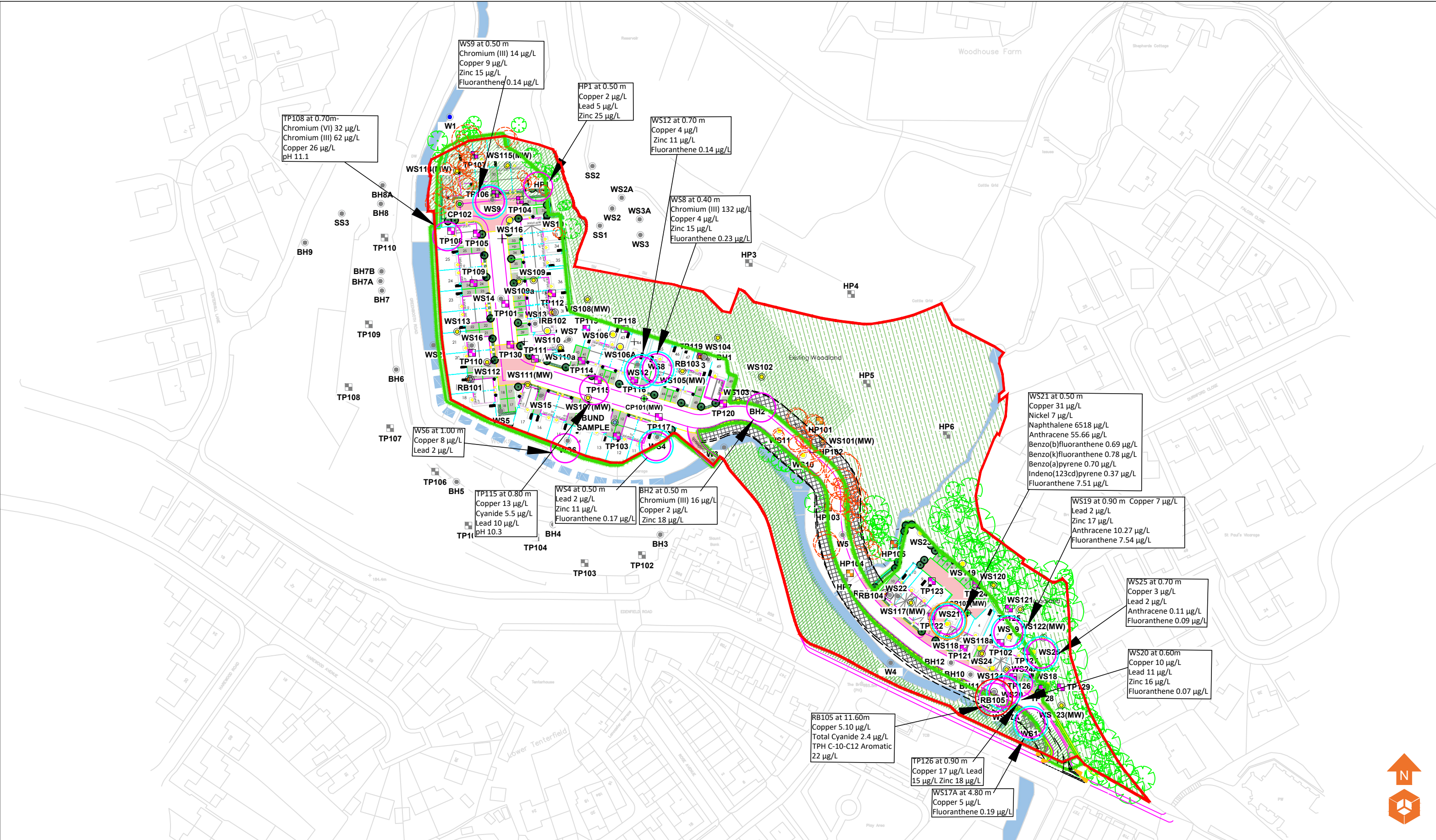
Drawing Title:

Contamination Issues Plan
- Asbestos



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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location
- Approximate Cable Percussive Borehole Location
- Inaccessible Area
- Historical Landfill

Location Symbols

- Approximate Hand Dug Pit Location
- Bund Sample Location
- Approximate Hand Dug Pit Location (Enica - April 2006)
- Approximate Trial Pit Location (Enica - April 2006)
- Approximate Window Sample Probehole Location (Enica - April 2006)
- Approximate Borehole Location (Enica - April 2006)
- Approximate Rotary Borehole Location

Contamination Exceedances

- Heavy Metals
- Non-Volatile PAH
- Naphthalene
- TPH

Notes:

P1	REVF	14.08.2023	EB	NS
P1	REVE	11.08.2023	EB	NS
P1	REVD	09.08.2023	LM	MW
P1	REVC	06.06.2023	OW	MW
P1	REVB	02.05.2023	OW	MW
P1	REVA	26.04.2023	OW	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road and
Edenfeild Road, Norden

Job No:

16-465

Drawing No:

034

Drawing Title:

Contamination Issues Plan
- Leachate

Date:

14.08.2023

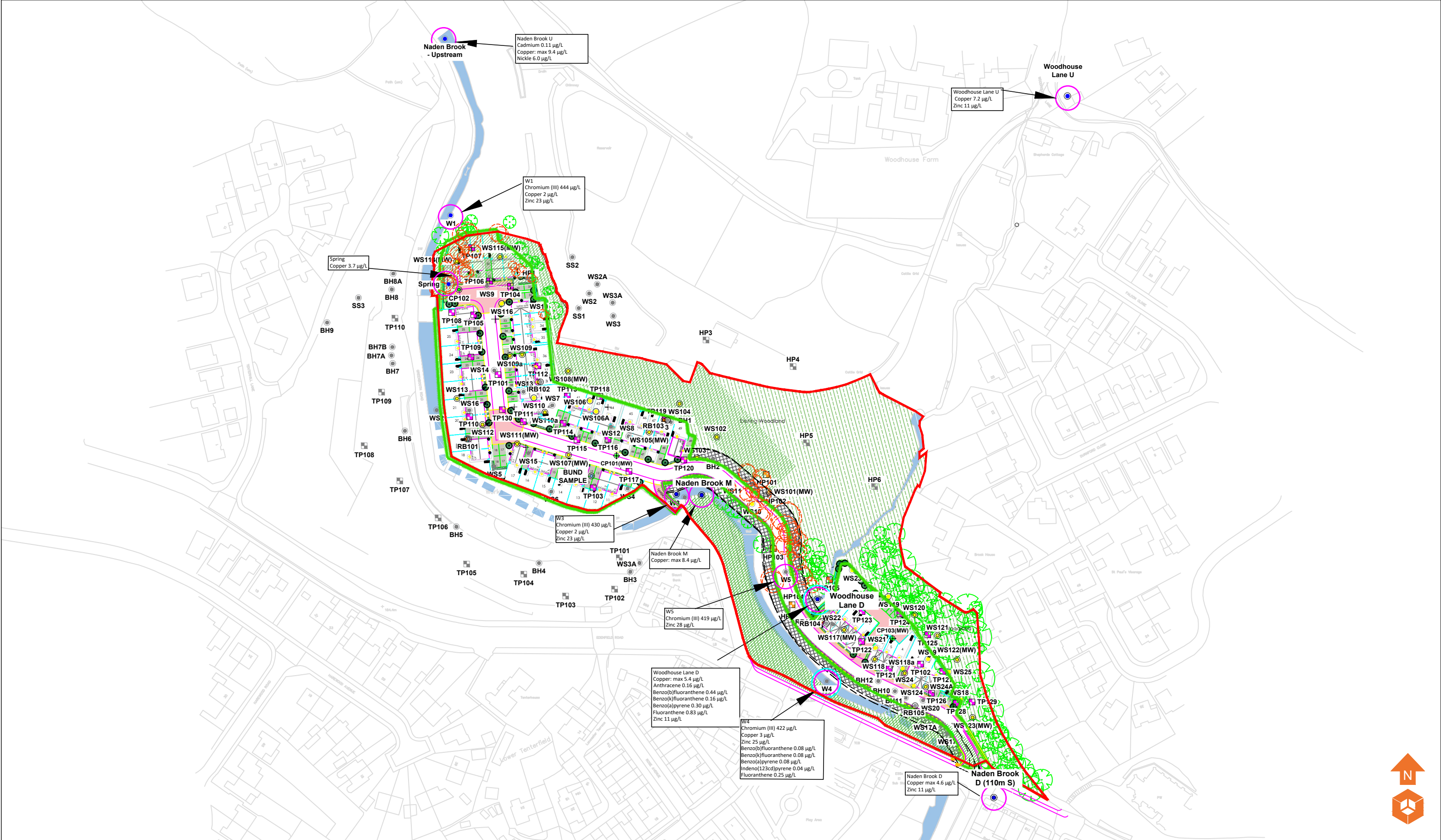
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NTS @ A3



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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location
- Approximate Cable Percussive Borehole Location
- Inaccessible Area
- Historical Landfill

Location Symbols

- Approximate Hand Dug Pit Location
- Bund Sample Location
- Approximate Hand Dug Pit Location (Enica - April 2006)
- Approximate Trial Pit Location (Enica - April 2006)
- Approximate Window Sample Probehole Location (Enica - April 2006)
- Approximate Borehole Location (Enica - April 2006)
- Approximate Rotary Borehole Location

Contamination Exceedances

- Heavy Metals
- Non-Volatile PAH

Notes:

P1	REVF	14.08.2023	EB	NS
P1	REVE	11.08.2023	EB	NS
P1	REVD	09.08.2023	LM	MW
P1	REVC	06.06.2023	OW	MW
P1	REVB	02.05.2023	OW	MW
P1	REVA	26.04.2023	OW	MW
Phase	Issue	Date	Drawn	Checked

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road and Edenfeild Road, Norden

Job No:

16-465

Drawing No:

035

Drawing Title:

Contamination Issues Plan - Surface Water

Date:

14.08.2023

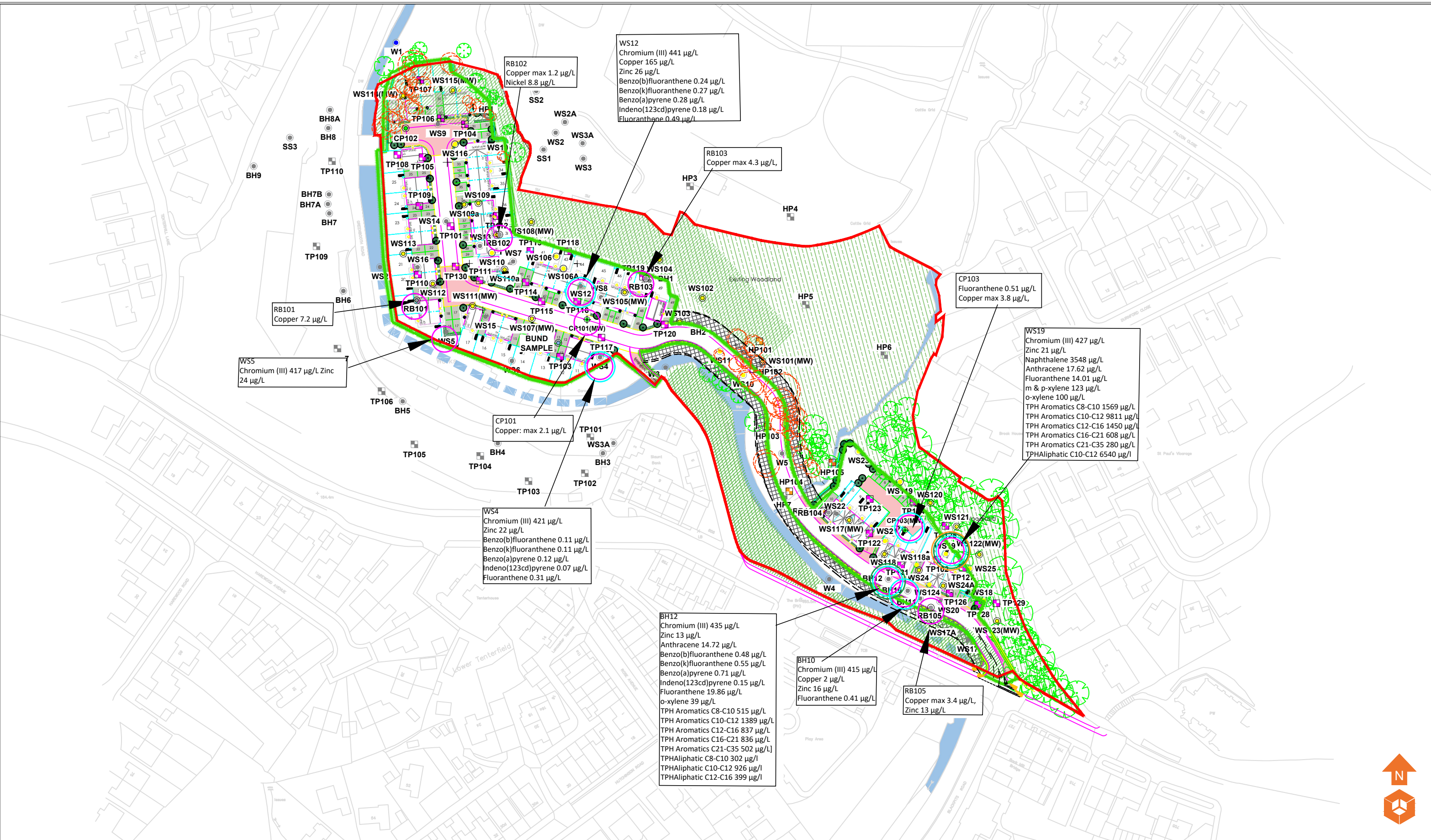
Scale:

NTS@ A3



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Location Symbols

- Approximate Window Sample Probehole Location
- Approximate Trial Pit Location
- Approximate Cable Percussive Borehole Location
- Inaccessible Area
- Historical Landfill

Location Symbols

- Approximate Hand Dug Pit Location
- Bund Sample Location
- Approximate Hand Dug Pit Location (Enica - April 2006)
- Approximate Trial Pit Location (Enica - April 2006)
- Approximate Window Sample Probehole Location (Enica - April 2006)
- Approximate Borehole Location (Enica - April 2006)
- Approximate Rotary Borehole Location

Contamination Exceedances

- Heavy Metals
- Non-Volatile PAH
- Naphthalene
- TPH

Notes:

Phase	Issue	Date	Drawn	Checked
P1	REVG	15.08.2023	EB	NS
P1	REVG	14.08.2023	EB	NS
P1	REVE	11.08.2023	EB	NS
P1	REVD	09.08.2023	LM	MW
P1	REVC	06.06.2023	OW	MW
P1	REVB	02.05.2023	OW	MW
P1	REVA	26.04.2023	OW	MW

Client:

Stonebond Properties Ltd

Job Title:

Land at Greenbooth Road and Edenfeild Road, Norden

Job No:

16-465

Drawing No:

036

Drawing Title:

Contamination Issues Plan - Groundwater

Date:

15.08.2023

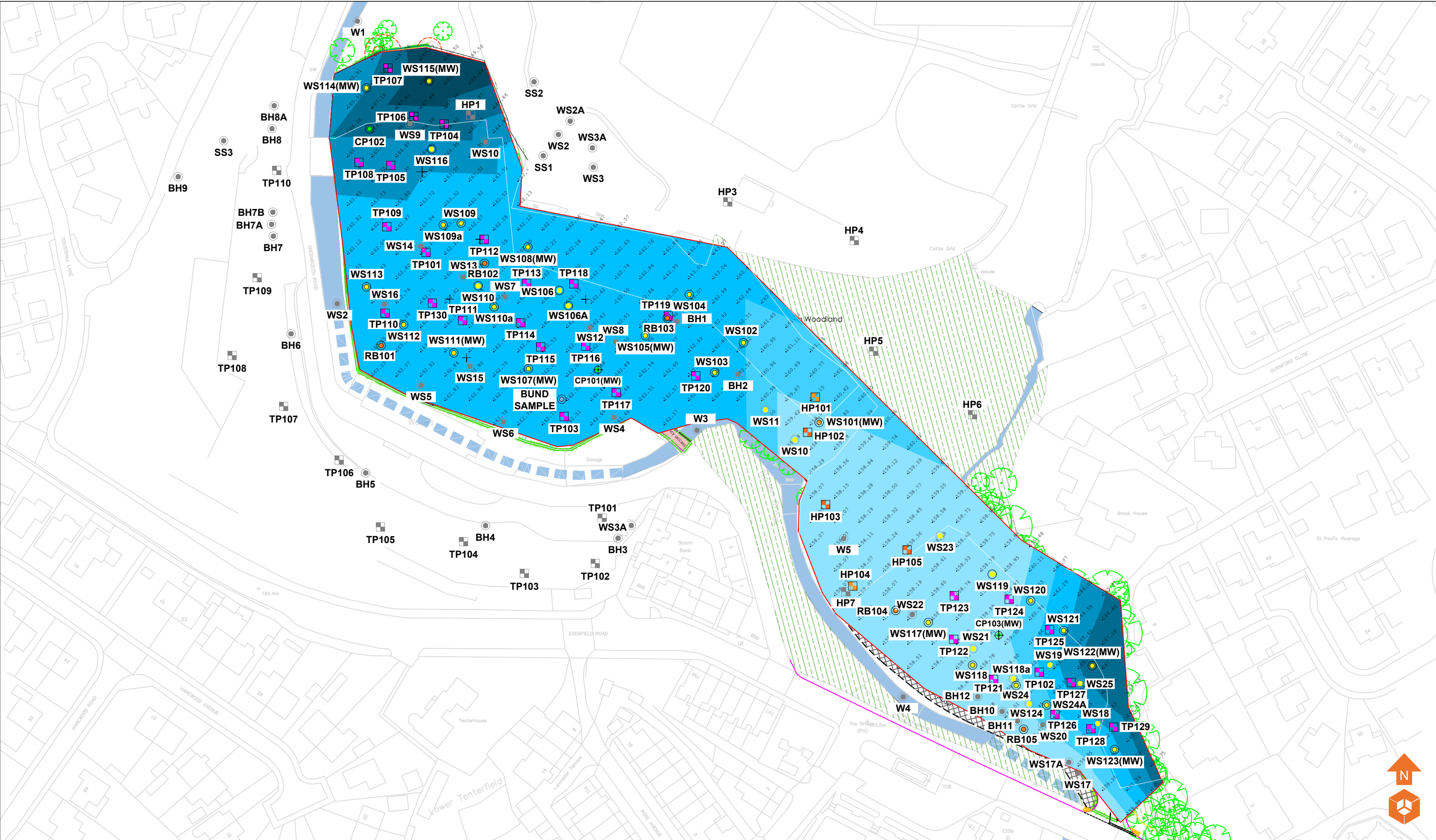
Scale:

NTS@ A3



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Location Symbols		Location Symbols		Groundwater Flow Depth		Notes:	Client: Stonebond Properties Ltd	Job No: 16-465	Date: 09.08.2023	 Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk							
 WS101 Approximate Window Sample Probehole Location	 TP101 Approximate Trial Pit Location	 BS101 Bund Sample Location	 HP101 Approximate Hand Dug Pit Location (Enica - April 2006)	 TP101 Approximate Trial Pit Location (Enica - April 2006)	 WS101 Approximate Window Sample Probehole Location (Enica - April 2006)						 BH101 Approximate Borehole Location (Enica - April 2006)	 RB101 Approximate Rotary Borehole Location	 Depth of <i>Groundwater Flow</i> 158.00 - 159.99m	 Depth of <i>Groundwater Flow</i> 160.00 - 161.99m	 Depth of <i>Groundwater Flow</i> 162.00 - 163.99m	 Depth of <i>Groundwater Flow</i> 164.00 - 165.99m	 Depth of <i>Groundwater Flow</i> 166.00 - 167.99m
P1	REVA	09.08.2023	LM	NS													
Phase	Issue	Date	Drawn	Checked													

APPENDIX IV

PHOTOGRAPHS

PLATE 1 TP101 EXCAVATION



PLATE 2 TP115 EXCAVATION



PLATE 3 TP124 ARISINGS



PLATE 4 TP116 EXCAVATION WITH OBSTRUCTIONS



PLATE 5 TP107 EXCAVATION WITH OBSTRUCTIONS



PLATE 6 HP105 EXCAVATION WITH VISIBLE ASBESTOS FRAGMENTS



APPENDIX V

E3P EXPLORATORY HOLE LOGS & CROSS SECTION

Borehole Log

Borehole No.

WS101

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385795.00 - 414723.00

Hole Type
WS

Location: Norden

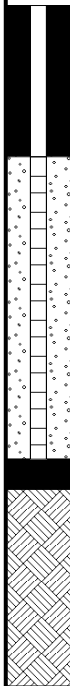
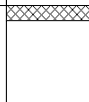
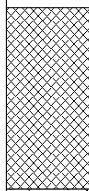
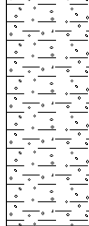
Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES	N=1 (0,0/0,1,0,0)	0.10			MADE GROUND: Dark brown clay with occasional rootlets. (Reworked Topsoil). No recovery.	1
		0.70			0.70				
		1.00			1.00			MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, and brick with fragments of metal and plastic. No recovery.	
		1.80	ES	N=8 (1,1/0,2,3,3)	1.80			MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone and brick.	2
		2.00			2.00				
		3.00			3.00				
		3.60			3.60				
		4.00	ES	N=28 (14,15/4,4,7,13)	4.00			Firm low strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Becoming very stiff very high strength from 4.00 m bgl; and very stiff very high strength from 4.20 m bgl.	3
		4.20			4.20				
		4.50		N=55 (17,17/55 for 150mm)	4.50				4
								End of borehole at 4.50 m	5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Monitoring well installed (response zone 1.00 - 3.00 m bgl). 3. No groundwater encountered.

Borehole Log

Borehole No.

WS102

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385771.00 - 414735.00

Hole Type WS

Location: Norden

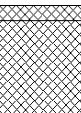
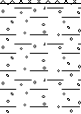
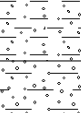
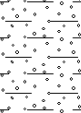
Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.10			MADE GROUND: Concrete.	
								MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete.	
		1.00		N=3 (1,0/0,0,0,3)	0.80			Soft very low strength brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone.	1
		2.00		N=8 (3,2/3,1,2,2)	2.00			Loose brown clayey GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. Becoming dense from 3.00 m bgl.	2
		2.60	ES						
		3.00		N=61 (10,10/6,5,14,36)					3
					3.45			End of borehole at 3.45 m	
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. No groundwater encountered.



Borehole Log

Borehole No.

WS103

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385765.00 - 414723.00

Hole Type
WS

Location: Norden

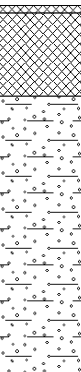
Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=7 (1,4/1,3,2,1)	0.05			MADE GROUND: Dark brown clay with occasional rootlets. (Reworked Topsoil). MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone and brick with occasional fragments of plastic. Loose brown slightly clayey GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. Becoming dense at 2.00 m bgl.	1
		0.80	ES		0.60				
		1.00							
		2.00		54 (6,4/54 for 225mm)	2.45				2
								End of borehole at 2.45 m	3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS104

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385759.00 - 414747.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.60		0 (50 for 75mm/0 for 0mm)	0.68			MADE GROUND: Concrete.	
								----- End of borehole at 0.68 m	1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.



Borehole Log

Borehole No.

WS105

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385744.00 - 414738.00

Hole Type WS

Location: Norden

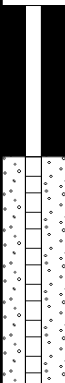
Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10			MADE GROUND: Concrete.	
		0.40	ES					MADE GROUND: Dark brown clayey gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete.	
		1.00		N=6 (3,3/2,1,2,1)	1.00				1
		2.00		N=17 (3,4/3,2,10,2)				Loose dark brown clayey GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Becoming medium dense from 2.00 m bgl and dense from 2.50 m bgl.	2
		2.50		0 (50 for 75mm/0 for 0mm)	2.58				
		2.60	ES					End of borehole at 2.58 m	3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Monitoring well installed (response zone 1.00 - 2.50 m bgl). 3. No groundwater encountered.



Borehole Log

Borehole No.

WS106

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385720.00 - 414750.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.60		0 (50 for 75mm/0 for 0mm)	0.68			MADE GROUND: Concrete.	
								End of borehole at 0.68 m	1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Terminated due to basement feature. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS106a

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385720.00 - 414747.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.60			MADE GROUND: Concrete.	
								End of borehole at 0.60 m	1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.



Borehole Log

Borehole No.

WS107

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385711.00 - 414729.00

Hole Type WS

Location: Norden

Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			MADE GROUND: Grey gravel. Gravel is fine to coarse subangular to subrounded of concrete. MADE GROUND: Brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, concrete and brick. Slight hydrocarbon odour.	1
		0.80	ES	N=10 (2,3/2,4,2,2)					
		1.00							
		2.00		N=6 (2,1/0,2,2,2)	2.00			Firm low strength brown silty sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	2
		2.50	ES						
		3.00		N=37 (6,6/7,6,13,11)	3.00			Dense brown sandy clayey GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	3
		3.40		65 (10,12/65 for 150mm)	3.70				
								End of borehole at 3.70 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Slight hydrocarbon odour from 1.00 m bgl. 3. Monitoring well installed (response zone from 0.50 - 1.00 m bgl). 4. No groundwater encountered.

Borehole Log

Borehole No.

WS108

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385705.00 - 414759.00

Hole Type WS

Location: Norden

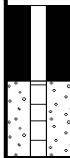
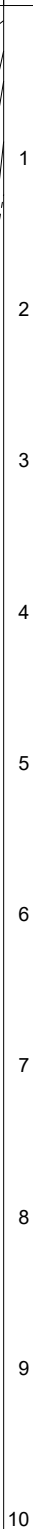
Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
			ES	63 (5,7/63 for 95mm)	0.10			MADE GROUND: Concrete.	
					0.30			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone and concrete.	
		0.60			0.50			MADE GROUND: Red angular and subangular cobbles of red brick.	
		1.00			0.90			MADE GROUND: Brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone and brick with occasional fragments of wood.	
					1.25			MADE GROUND: Fragments of wood. End of borehole at 1.25 m	

Remarks

1. Refused on timber. 2. Monitoring well installed (response zone from 0.50 - 1.00 m bgl). 3. No groundwater encountered.



Borehole Log

Borehole No.

WS109

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385687.00 - 414771.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.60			MADE GROUND: Concrete.	
								End of borehole at 0.60 m	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS109a

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385681.00 - 414771.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.50			MADE GROUND: Concrete.	
								----- End of borehole at 0.50 m	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS110

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385693.00 - 414750.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.50	ES		0.60			MADE GROUND: Concrete.	
								End of borehole at 0.60 m	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS110a

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385696.00 - 414747.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.60	ES	0 (50 for 0mm/0 for 0mm)	0.60			MADE GROUND: Concrete.	
		0.60						End of borehole at 0.60 m	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.



Borehole Log

Borehole No.

WS111

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385687.00 - 414732.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10			MADE GROUND: Concrete.	
		0.30			0.30			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, concrete and brick.	
		0.50	ES					MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of mudstone, brick, and concrete with occasional fragments of glass and ceramic.	1
		1.00		N=8 (2,2/2,2,2,2)	1.00			Stiff medium strength brown silty sandy CLAY.	
		2.00		N=11 (1,2/2,2,1,6)					2
		2.50	ES						
		3.00		N=32 (2,3/4,7,11,10)	3.00				3
		4.00		N=18 (3,2/4,5,4,5)				Medium dense brown clayey slightly sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. Becoming dense from 4.50 m bgl.	4
		4.50		0 (17,50/0 for 0mm)	4.65				5
								End of borehole at 4.65 m	6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Monitoring well installed (response zone from 0.50 - 1.00 m bgl). 3. No groundwater encountered.

Borehole Log

Borehole No.

WS112

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385672.00 - 414738.00

Hole Type WS

Location: Norden

Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES	N=11 (3,2/3,2,2,4)	0.10			MADE GROUND: Concrete.	1
		0.40			0.40			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse subangular to subrounded of concrete and brick.	
		0.80			1.20			MADE GROUND: Brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone brick and concrete.	
		1.00			1.20			MADE GROUND: Brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone brick and concrete.	
		2.00	ES	N=13 (0,0/3,3,3,4)	2.00			Stiff medium strength brownish grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Becoming very stiff very high strength from 2.70 m bgl.	2
		2.60			2.60			Stiff medium strength brownish grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Becoming very stiff very high strength from 2.70 m bgl.	
		2.70			2.70			Stiff medium strength brownish grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Becoming very stiff very high strength from 2.70 m bgl.	
		2.70			2.70			Stiff medium strength brownish grey silty sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Becoming very stiff very high strength from 2.70 m bgl.	
		3.00	ES	67 (10,11/67 for 150mm)	3.00			End of borehole at 3.00 m	3
		3.00			3.00			End of borehole at 3.00 m	
		3.00			3.00			End of borehole at 3.00 m	
		3.00			3.00			End of borehole at 3.00 m	

Remarks

1. Refused on cobble. 2. No groundwater encountered.



Borehole Log

Borehole No.

WS113

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385660.00 - 414759.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40		0 (50 for 0mm/0 for 0mm)	0.40			MADE GROUND: Concrete. ----- End of borehole at 0.40 m	1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.



Borehole Log

Borehole No.

WS114

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385657.00 - 414813.00

Hole Type WS

Location: Norden

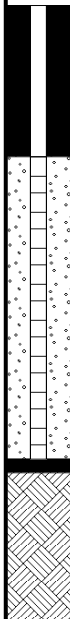
Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10			MADE GROUND: Concrete.	
		0.30	ES		0.50			MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
		1.00		N=25 (5,3/6,6,7,6)	1.00			Firm brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	1
		1.50	ES					Medium dense brown sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone.	
		2.00		N=17 (5,4/6,3,4,4)					2
		3.00		N=19 (4,3/2,5,6,6)	3.00			Dense brown clayey GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone.	3
		4.00		0 (58 for 85mm/0 for 0mm)	4.08			End of borehole at 4.08 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Monitoring well installed (response zone from 1.00 - 3.00 m bgl). 3. No groundwater encountered.



Borehole Log

Borehole No.

WS115

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385678.00 - 414813.00

Hole Type
WS

Location: Norden

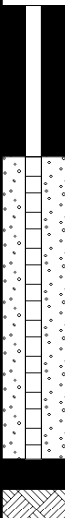
Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10			MADE GROUND: Concrete.	
		0.50			0.50			MADE GROUND: Grey gravel. Gravel is fine to coarse subangular to subrounded of sandstone, and concrete.	
		1.00		N=2 (0,0/0,0,1,1)				MADE GROUND: Black sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick, and concrete with ash and frequent fragments of metal and ceramic.	1
		1.70	ES						
		2.00		N=5 (1,2/1,2,1,1)					2
		3.00		N=63 (0,1/0,21,20,22)					3
		3.45			3.45			End of borehole at 3.45 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Monitoring well installed (response zone from 1.00 - 3.00 m bgl). 3. No groundwater encountered.





Borehole Log

Borehole No.

WS116

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385681.00 - 414798.00

Hole Type
WS

Location: Norden

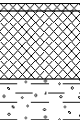
Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES	0 (50 for 0mm/0 for 0mm)	0.05			MADE GROUND: Concrete. MADE GROUND: Black sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete with some fragments of glass and metal. Brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. End of borehole at 0.78 m	1
		0.70			0.50				
		0.80	ES		0.78				
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. No groundwater encountered.



Borehole Log

Borehole No.

WS117

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385828.00 - 414651.00

Hole Type
WS

Location: Norden

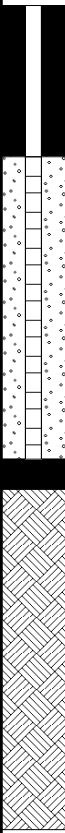
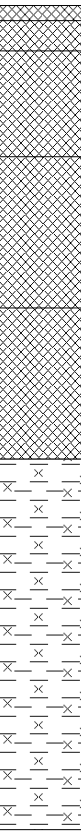
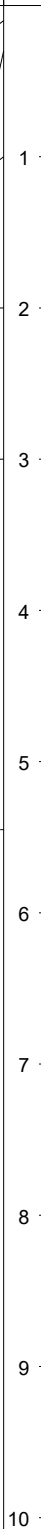
Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	ES	N=19 (13,6/5,4,5,5)	0.10			MADE GROUND: Concrete.	
		0.30			0.30			MADE GROUND: Grey gravel. Gravel is fine to coarse subangular to subrounded of sandstone and concrete.	
		0.60			0.60			MADE GROUND: Grey gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete.	
		1.00	ES	N=9 (4,2/2,3,2,2)	1.00			MADE GROUND: Brown clayey sandy gravel. Gravel is fine to coarse subangular to subrounded of brick, sandstone and mudstone.	
		2.00			2.00			MADE GROUND: Brownish grey silty slightly gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Slight hydrocarbon odour.	
		3.00			3.00			Stiff to very stiff medium to high strength brownish grey silty slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
		3.20	ES	N=18 (2,3/2,3,3,10)	3.20				
		4.00			4.00				
		5.00			5.00				
		5.45			5.45			End of borehole at 5.45 m	

Remarks

1. Complete. 2. Slight hydrocarbon odour from 2.00 m bgl. 3. Monitoring well installed (response zone from 1.00 - 3.00 m bgl). 4. No groundwater encountered.



Borehole Log

Borehole No.

WS118

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385840.00 - 414639.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40			MADE GROUND: Concrete.	
								----- End of borehole at 0.40 m	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS118a

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385852.00 - 414630.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40			MADE GROUND: Concrete.	
								----- End of borehole at 0.40 m	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS119

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385849.00 - 414666.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 18/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES	N=71 (4,3/6,5,10,50)				MADE GROUND: Concrete.	
		0.60	ES		0.50			MADE GROUND: Brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete. Brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone. Dense orangish brown slightly clayey GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone. End of borehole at 1.45 m	
		1.00			0.80				1
					1.00				
					1.45				

Remarks

1. Refused on cobble. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS120

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385861.00 - 414654.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 18/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.30	ES	54 (4 for 0mm/54 for 0mm)	0.10			MADE GROUND: Concrete.	1
		0.50			0.50			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone and concrete.	
					1.00			No recovery.	
					1.10			Brown sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone.	
								End of borehole at 1.10 m	
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. No groundwater encountered.





Borehole Log

Borehole No.

WS121

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385867.00 - 414645.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 18/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.05			MADE GROUND: Asphalt. MADE GROUND: Concrete.	
					0.50			----- End of borehole at 0.50 m	
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on concrete. 2. No groundwater encountered.



Borehole Log

Borehole No.

WS122

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385873.00 - 414639.00

Hole Type
WS

Location: Norden

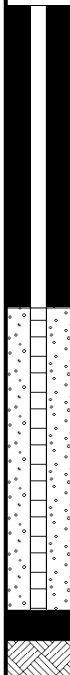
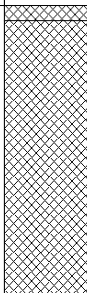
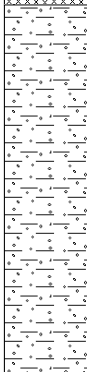
Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 18/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10			0.10			MADE GROUND: Concrete.	
		0.80	ES					MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of brick and concrete.	1
		1.00		N=0 (1,0/0,0,0,0)					
		2.00		N=7 (0,0/0,2,3,2)	2.00			Firm low strength brown silty slightly sandy gravelly CLAY. Gravel is fine to medium subrounded to rounded of sandstone. Becoming very stiff very high strength from 4.00 m bgl. Slight hydrocarbon odour and sheen.	2
		3.00	ES	N=8 (3,2/3,2,1,2)					3
		3.20							
		4.00		N=52 (3,4/6,9,13,24)					4
					4.45			End of borehole at 4.45 m	5
									6
									7
									8
									9
									10

Remarks

1. Complete. 2. Slight hydrocarbon from 2.00 m bgl and sheen. 3. Groundwater encountered as seepage at 2.50 m bgl. 4. Monitoring well installed (response zone from 2.00 - 4.00 m bgl).



Borehole Log

Borehole No.

WS123

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385882.00 - 414609.00

Hole Type
WS

Location: Norden

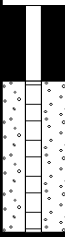
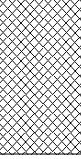
Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 18/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.05			MADE GROUND: Asphalt.	
					0.30			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse subangular to subrounded of concrete.	
		1.00	ES	N=37 (6,7/6,6,10,15)				MADE GROUND: Brown sandy gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, and brick with ash and fragments of glass.	1
		1.20							
		1.50		0 (13,13/0 for 0mm)					
					1.65			End of borehole at 1.65 m	
									2
									3
									4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Monitoring well installed (response zone from 0.50 - 1.50 m bgl). 3. No groundwater encountered.





Borehole Log

Borehole No.

WS124

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385858.00 - 414630.00

Hole Type
WS

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 18/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			MADE GROUND: Concrete.	
								MADE GROUND: Brown grey gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete with fragments of glass.	
		1.00		N=10 (5,4/3,2,2,3)	1.00			No recovery.	1
		2.00		N=4 (2,2/2,1,0,1)	2.00				2
		3.00		N=55 (6,10/14,16,13,12)				MADE GROUND: Dark brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone and brick. Slight hydrocarbon odour.	3
		3.40	ES		3.45			End of borehole at 3.45 m	4
									5
									6
									7
									8
									9
									10

Remarks

1. Refused on cobble. 2. Slight hydrocarbon odour from 3.00 m bgl. 3. No groundwater encountered.



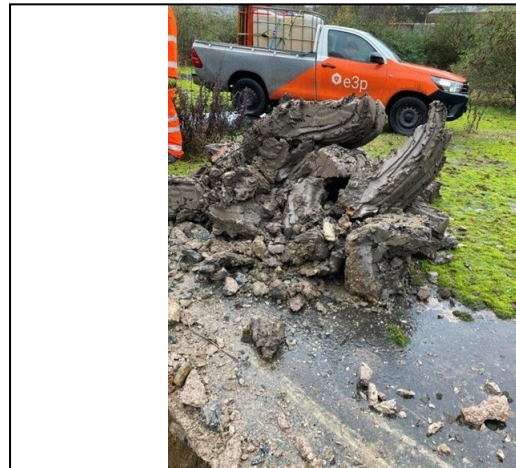
Project Name:	Land at Greenbooth Road and Edenfield Road	Project No.	16465	Co-ords: 385678.00 - 414765.00	Level:	Date	15/11/2022
Location:	Norden	Dimensions (m):	1.50	0.80	Scale	1:30	
Client:	Stonebond Properties Ltd	Depth	2.10		Logged	H. Mason	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.25			MADE GROUND: Concrete.	
				0.80			MADE GROUND: Brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete with occasional fragments of plastic.	
	1.00	HVP	134				Stiff high strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	1
	1.50	HVP	137					
	1.90	HVP	142					2
				2.10			End of Pit at 2.10m	3
								4

Trial Pit Photographs



Trial Pit 101



Trial Pit 101 Spoil

Remarks: 1. Complete. 2. Soakaway testing carried out in the trial pit. 3. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385858.00 - 414636.00
Level:

Date
15/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
2.00

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES		0.10			MADE GROUND: Asphalt.
							MADE GROUND: Brown slightly clayey sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete with occasional fragments of plastic and glass.
				2.00			End of Pit at 2.00m

Trial Pit Photographs



Trial Pit 102



Trial Pit 102 Spoil

Remarks: 1. Terminated due to instability. 2. No groundwater encountered.

Stability: Unstable

Project Name:	Land at Greenbooth Road and Edenfield Road	Project No.	16465	Co-ords: 385717.00 - 414714.00	Level:	Date	15/11/2022
Location:	Norden	Dimensions (m):	0.80	1.50	Scale	1:30	Logged
Client:	Stonebond Properties Ltd	Depth	1.90			H. Mason	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.50	0.80	ES		0.10			MADE GROUND: Concrete.	1
							MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete with occasional fragments of ceramic.	
				1.10			Brown gravelly SAND. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
				1.90			End of Pit at 1.90m	2
								3
								4

Trial Pit Photographs



Trial Pit 103



Trial Pit 103 Spoil

Remarks: 1. Terminated due to instability. 2. Water strike encountered as seepage at 1.50 m bgl.

Stability: Unstable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385684.00 - 414804.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
0.80

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60	ES		0.10			MADE GROUND: Concrete.
				0.80			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, concrete and brick with frequent fragments of timber.
							End of Pit at 0.80m

1
2
3
4

Trial Pit Photographs



Trial Pit 104



Trial Pit 104 Spoil

Remarks: 1. Terminated due to solid base, scraping for 5 minutes and made no progress. 2. No groundwater encountered.

Stability: Stable



Trial Pit Log

TrialPit No
TP105
Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385669.00 - 414795.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m):

1.50

Depth
1.20

0.80

Scale
1:30

Logged
H. Mason

Client: Stonebond Properties Ltd

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30			MADE GROUND: Concrete.	
							MADE GROUND: Dark brown slightly clayey sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete.	
	1.00	ES		1.20			End of Pit at 1.20m	1
								2
								3
								4

Remarks: 1. Terminated due to pipe in base of trial pit. 2. No groundwater encountered.

Stability: Stable



Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385675.00 - 414804.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	1.20	ES		0.10			MADE GROUND: Concrete.
							MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete with occasional fragments of wood.
				1.80			End of Pit at 1.80m

Trial Pit Photographs



Trial Pit 106



Trial Pit 106 Spoil

Remarks: 1. Terminated due to instability. 2. No groundwater encountered

Stability: Unstable

Project Name:	Land at Greenbooth Road and Edenfield Road	Project No.	16465	Co-ords: 385669.00 - 414816.00	Level:	Date	16/11/2022
Location:	Norden	Dimensions (m):	0.80	1.50	Scale	1:30	Logged
Client:	Stonebond Properties Ltd	Depth	1.10			H. Mason	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50	ES		0.20			MADE GROUND: Concrete.	
							MADE GROUND: Dark brown very sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick, and concrete with occasional fragments of metal and ceramic.	
				1.10			End of Pit at 1.10m	

Trial Pit Photographs



Trial Pit 107



Trial Pit 107 Spoil

Remarks: 1. Terminated due to concrete base, scraping for 5 minutes and made no progress. 2. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385657.00 - 414792.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.20

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.70	ES		0.20			MADE GROUND: Concrete with rebar.	
				1.20			MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete with occasional fragments of plastic.	1
							End of Pit at 1.20m	2
								3
								4

Trial Pit Photographs



Trial Pit 108



Trial Pit 108 Spoil

Remarks: 1. Terminated due to concrete base, scraping for 5 minutes and made no progress. 2. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385669.00 - 414777.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
0.70

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.40	ES		0.30			MADE GROUND: Concrete.
				0.70			MADE GROUND: Grey slightly sandy gravel. Gravel is fine to coarse subangular to subrounded of concrete and brick.
							End of Pit at 0.70m

1

2

3

4

Trial Pit Photographs



Trial Pit 109



Trial Pit 109 Spoil

Remarks: 1. Terminated due to basement feature in south of the trial pit. 2. No groundwater encountered.

Stability: Unstable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385663.00 - 414747.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20			MADE GROUND: Concrete with rebar.	
	1.00	ES					MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete with occasional fragments of metal and ceramic.	1
	1.50	HVP	43	1.50				
	1.70	B					Firm medium strength greyish blue sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
	1.70	HVP	52	1.80			End of Pit at 1.80m	2
								3
								4

Trial Pit Photographs



Trial Pit 110



Trial Pit 110 Spoil

Remarks: 1. Complete. 2. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385690.00 - 414744.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
0.50

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.30	ES		0.20			MADE GROUND: Concrete.	
				0.45			MADE GROUND: Brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone brick and concrete.	
				0.50			MADE GROUND: Concrete End of Pit at 0.50m	
								1
								2
								3
								4

Trial Pit Photographs



Trial Pit 111



Trial Pit 111 Spoil

Remarks: 1. Terminated due to concrete base, scraping for 5 minutes and made no progress. 2. No groundwater encountered.

Stability: Stable

Date
16/11/2022

Scale
1:30

Logged
H. Mason

Trial Pit Photographs



Trial Pit 112



Trial Pit 112 Spoil

Remarks: 1. Terminated due to fast ingress of surface water.



Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385711.00 - 414750.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.10

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.20			MADE GROUND: Concrete.
				0.60			MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone brick and concrete.
	0.80 0.90	ES ES		0.90 1.00 1.10			MADE GROUND: Dark brown blackish slightly clayey slightly gravelly silt. Gravel is fine to coarse subangular to subrounded of sandstone brick, and concrete. MADE GROUND: White sandy gravelly silt. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete. MADE GROUND: Dark brown to black slightly clayey slightly gravelly silt. Gravel is fine to coarse subangular to subrounded of sandstone brick, and concrete. End of Pit at 1.10m

Trial Pit Photographs



Trial Pit 113



Trial Pit 113 Spoil

Remarks: 1. Terminated due to pipe in base of trial pit. 2. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385708.00 - 414741.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

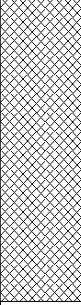
Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.50

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.50	1.00	ES		0.30			MADE GROUND: Concrete.	
							MADE GROUND: Dark brown sandy gravel with occasional cobbles. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick, and concrete with frequent plastic bottles. Cobbles are angular of concrete.	1
				1.50			End of Pit at 1.50m	2
								3
								4

Trial Pit Photographs



Trial Pit 114

Trial Pit 114 Spoil

Remarks: 1. Terminated due to instability. 2. Water strike encountered as seepage at 1.50 m bgl. 3. Brick wall in the south of the trial pit.

Stability: Unstable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385711.00 - 414735.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
2.20

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20			MADE GROUND: Concrete.	
	0.80	ES					MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete.	1
				1.10				
	1.50	HVP	20				Soft low strength brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	2
	2.00	HVP	27					
				2.20			End of Pit at 2.20m	3
								4

Trial Pit Photographs



Trial Pit 115



Trial Pit 115 Spoil

Remarks: 1. Complete. 2. No groundwater encountered.

Stability: Stable

Project Name:	Land at Greenbooth Road and Edenfield Road	Project No.	16465	Co-ords: 385723.00 - 414732.00	Level:	Date	16/11/2022
Location:	Norden	Dimensions (m):	0.80	1.50	Scale	1:30	Logged
Client:	Stonebond Properties Ltd	Depth	1.40			H. Mason	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10			MADE GROUND: Concrete with rebar.	
							MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of concrete and brick with occasional fragments of metal.	1
	1.20	ES		1.10			MADE GROUND: Dark brown clayey gravel. Gravel is fine to coarse subangular to subrounded of concrete and brick with occasional fragments of metal.	
				1.40			End of Pit at 1.40m	2
								3
								4

Trial Pit Photographs



Trial Pit 116



Trial Pit 116 Spoil

Remarks: 1. Terminated due to concrete and brick obstructions. 2. Hydrocarbon odour from 1.10 m bgl. 3. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385732.00 - 414720.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
2.10

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10			MADE GROUND: Concrete.	
	0.80	ES					MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete with occasional fragments of metal.	
				1.00				1
	1.50	HVP	54				Firm medium strength trending to soft low strength brown silty slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
	2.00	HVP	34					2
				2.10			End of Pit at 2.10m	
								3
								4

Trial Pit Photographs



Trial Pit 117



Trial Pit 117 Spoil

Remarks: 1. Complete. 2. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385723.00 - 414753.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60	ES		0.20			MADE GROUND: Concrete.
				0.80			MADE GROUND: Brown gravelly fine to medium sand. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete.
							End of Pit at 0.80m

Trial Pit Photographs



Trial Pit 118

Trial Pit 118 Spoil

Remarks: 1. Terminated due to lack of room for bucket movement. Two brick walls in the centre of the trial pit. 2. No groundwater encountered.

Stability: Stable

Project Name:	Land at Greenbooth Road and Edenfield Road	Project No.	16465	Co-ords: 385750.00 - 414744.00	Level:	Date	16/11/2022
Location:	Norden	Dimensions (m):	1.50	Scale	1:30	Logged	H. Mason
Client:	Stonebond Properties Ltd	Depth	1.60				

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.50	0.20			0.20			MADE GROUND: Concrete.	
	0.50	ES		0.50			MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone brick and concrete.	1
	1.10			1.10			MADE GROUND: Brown clayey gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone and brick.	
	1.50	B		1.50			Brown clayey GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	2
	1.60			1.60			End of Pit at 1.60m	3
								4

Trial Pit Photographs



Trial Pit 119



Trial Pit 119 Spoil

Remarks: 1. Complete. 2. Water strike encountered at 1.50 m bgl, moderate ingress.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385762.00 - 414726.00
Level:

Date
16/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
0.90

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES		0.05 0.15 0.30 0.90		   	MADE GROUND: Brown clay with frequent rootlets (Reworked Topsoil). MADE GROUND: Concrete. MADE GROUND: Brown slightly gravelly fine to medium sand. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone and brick. MADE GROUND: Dark brown slightly gravelly fine to medium sand. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone and brick.
							End of Pit at 0.90m

Trial Pit Photographs



Trial Pit 120



Trial Pit 120 Spoil

Remarks: 1. Terminated due to concrete obstruction and unable to move the bucket. 2. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385846.00 - 414633.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
0.60

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.40	ES		0.30			MADE GROUND: Concrete with rebar.
				0.60			MADE GROUND: Brown gravelly fine to medium sand. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone brick and concrete.
							End of Pit at 0.60m

1

2

3

4

Trial Pit Photographs



Trial Pit 121



Trial Pit 121 Spoil

Remarks: 1. Terminated due to concrete and rebar. 2. Plastic membrane at 0.30 m bgl. 3. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385831.00 - 414642.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
2.20

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 2.00	0.10	ES		0.10			MADE GROUND: Concrete with rebar.	1
							MADE GROUND: Grey gravel. Gravel is fine to coarse subangular to subrounded of sandstone and concrete.	
	0.60			0.60			MADE GROUND: Dark brown to black slightly sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick, concrete with ash and occasional fragments of timber.	
	1.50	HVP	40	1.50			Very soft very low strength brown silty sandy CLAY with organic material throughout.	2
	2.00			2.00			End of Pit at 2.20m	
				2.20				3
								4

Trial Pit Photographs



Trial Pit 122



Trial Pit 122 Spoil

Remarks: 1. Complete. 2. Hydrocarbon odour from 0.60 m bgl. 3. Water strike encountered at 2.00 m bgl.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385834.00 - 414657.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
2.20

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.80	ES		0.20			MADE GROUND: Concrete with rebar.	
				0.60			MADE GROUND: Grey sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, concrete, and brick with occasional fragments of metal.	
				1.20			MADE GROUND: Black sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick, and concrete with ash and occasional fragments of metal.	1
				2.20			MADE GROUND: Dark brown clayey gravel. Gravel is fine to coarse subangular to subrounded of concrete and brick with occasional fragments of metal and wood.	2
							End of Pit at 2.20m	3
								4

Trial Pit Photographs



Trial Pit 123



Trial Pit 123 Spoil

Remarks: 1. Terminated due to compact Made Ground. 2. Hydrocarbon odour between 0.60 - 1.00 m bgl. 3. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385852.00 - 414657.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.60

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.05			MADE GROUND: Asphalt.	
				0.20			MADE GROUND: Concrete.	
				0.60			MADE GROUND: Brown gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete.	
	1.00	HVP	38				Soft low strength brown silty slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone.	1
	1.40	ES		1.20			Firm medium strength grey silty gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone.	
	1.50	HVP	40	1.60			End of Pit at 1.60m	2
								3
								4

Trial Pit Photographs



Trial Pit 124



Trial Pit 124 Spoil

Remarks: 1. Terminated due to concrete base. 2. Hydrocarbon odour from 0.60 m bgl. 3. No groundwater encountered.

Stability: Stable

Project Name:	Land at Greenbooth Road and Edenfield Road	Project No.	16465	Co-ords: 385861.00 - 414648.00	Level:	Date	17/11/2022
Location:	Norden	Dimensions (m):	0.80	1.50	Scale	1:30	Logged
Client:	Stonebond Properties Ltd	Depth	2.10			H. Mason	

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.05			MADE GROUND: Asphalt.	
				0.20			MADE GROUND: Concrete.	
				0.60			MADE GROUND: Brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick and concrete.	
	0.80	ES					MADE GROUND: Brown slightly gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone and brick. Slight hydrocarbon odour.	
	1.00	ES		1.00			Firm medium strength grey silty slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	1
	1.50	HVP	53					
	2.00	HVP	63					
				2.10			End of Pit at 2.10m	2
								3
								4

Trial Pit Photographs



Trial Pit 125



Trial Pit 125 Spoil

Remarks: 1. Complete. 2. Hydrocarbon odour at 1.00 m bgl. 3. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385861.00 - 414627.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.60

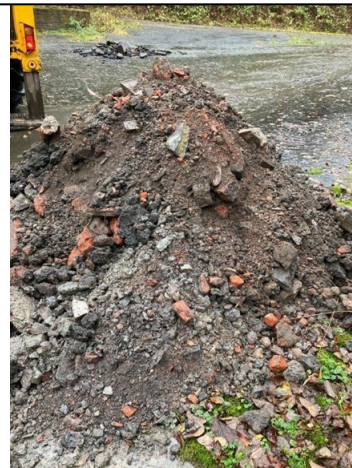
Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.90	ES		0.05			MADE GROUND: Asphalt. MADE GROUND: Grey gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete.	
				0.70			MADE GROUND: Brown gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick and concrete with occasional fragments of ceramic and wood. Slight hydrocarbon odour.	1
				1.60			End of Pit at 1.60m	2
								3
								4

Trial Pit Photographs



Trial Pit 126



Trial Pit 126 Spoil

Remarks: 1. Terminated due to compact Made Ground. 2. Hydrocarbon odour from 0.70 m bgl. 3. No groundwater encountered.

Stability: Stable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385870.00 - 414633.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.90

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.10			MADE GROUND: Asphalt.	
							MADE GROUND: Brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, mudstone, brick, and concrete, with frequent fragments of wood.	1
	1.20	ES						
				1.90			End of Pit at 1.90m	2
								3
								4

Trial Pit Photographs



Trial Pit 1217



Trial Pit 127 Spoil

Remarks: 1. Terminated due to instability. 2. No groundwater encountered.

Stability: Unstable

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385873.00 - 414618.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.80

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.05			MADE GROUND: Asphalt. MADE GROUND: Brown slightly clayey sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, brick and asphalt.
				1.10			MADE GROUND: Brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone and brick.
	1.60	ES		1.80			End of Pit at 1.80m

Trial Pit Photographs



Trial Pit 128



Trial Pit 128 Spoil

Remarks: 1. Terminated due to compact Made Ground, scraping from 5 minutes and made no progress. 2. No groundwater encountered.

Stability: Unstable



Trial Pit Log

TrialPit No
TP129
Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385882.00 - 414618.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m):

1.50

Depth
1.90

0.80

Scale
1:30

Logged
H. Mason

Client: Stonebond Properties Ltd

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10			MADE GROUND: Asphalt.	
	0.50	ES					MADE GROUND: Brown gravel. Gravel is fine to coarse subangular to subrounded of sandstone, concrete and brick with occasional fragments of plastic.	
	1.00			1.00			MADE GROUND: Brown gravelly clay. Gravel is fine to coarse subangular to subrounded of sandstone and brick. (Reworked).	1
	1.90			1.90			End of Pit at 1.90m	2
								3
								4

Remarks: 1. Terminated due to instability and surface water ingress. 2. No groundwater encountered.

Stability: Unstable



Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385681.00 - 414753.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m): 1.50

Scale
1:30

Client: Stonebond Properties Ltd

Depth
1.50

0.80

Logged
H. Mason

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
 1.40				0.10			MADE GROUND: Concrete with rebar.	1
							MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, concrete and brick.	
				1.20				
				1.50			Orangish brown sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	
							End of Pit at 1.50m	2
								3
								4

Trial Pit Photographs



Trial Pit 130



Trial Pit 130 Spoil

Remarks: 1. Terminated due to instability. 2. Water strike encountered as seepage at 1.40 m bgl.

Stability:

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385681.00 - 414753.00
Level:

Date
17/11/2022

Location: Norden

Dimensions (m):

1.50

Depth
1.50

0.80

Scale
1:30

Logged
H. Mason

Client: Stonebond Properties Ltd

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
								5
								6
								7
								8



Trial Pit 130 Spoil

Remarks: 1. Terminated due to instability. 2. Water strike encountered as seepage at 1.40 m bgl.

Stability:

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385798.00 - 414720.00
Level:

Date
15/11/2022

Location: Norden

Dimensions (m): 0.30
Depth 0.60

Scale
1:10

Logged
MW

Client: Stonebond Properties Ltd

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30	ES		0.60			MADE GROUND: Dark brown gravelly SAND with frequent cobbles and occasional roots and rootlets. Gravel is angular to subrounded fine to coarse brick, concrete and sandstone. Cobbles are angular and subangular brick and sandstone.
							End of Pit at 0.60m

Remarks: 1. Terminated due to sandstone cobble. 2. No groundwater encountered.

Stability: Stable



Trial Pit Log

TrialPit No
HP02
Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385795.00 - 414708.00
Level:

Date
15/11/2022

Location: Norden

Dimensions (m):
0.30
0.30
0.30
Depth
0.70

Scale
1:10

Logged
MW

Client: Stonebond Properties Ltd

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	ES		0.70			MADE GROUND: Dark brownish grey slightly clayey gravelly SAND with frequent cobbles, roots and rootlets. Gravel is angular to subrounded fine to coarse brick, concrete, sandstone and glass. Cobbles are angular to rounded brick and glass bottles.
							End of Pit at 0.70m

Remarks: 1. Terminated due to sandstone cobble. 2. No groundwater encountered.

Stability: Stable





Trial Pit Log

Trial Pit No
HP03
Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385801.00 - 414684.00
Level:

Date
15/11/2022

Location: Norden

Dimensions (m): 0.30

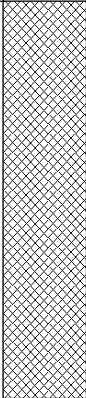
Depth
0.50

0.30

Scale
1:10

Logged
MW

Client: Stonebond Properties Ltd

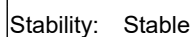
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES		0.50			MADE GROUND: Dark grey slightly clayey SAND with frequent roots and rootlets.
							End of Pit at 0.50m

Remarks: 1. Terminated due to sandstone cobble and dense root network. 2. No groundwater encountered.

Stability: Stable



Stability: Stable



Borehole Log

Borehole No.

CP101

Sheet 1 of 2

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385729.00 - 414729.00

Hole Type CP

Location: Norden

Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			MADE GROUND: Concrete.	
		1.00		N=8 (2,1/1,5,1,1)				MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, concrete, and brick.	1
		2.00		N=7 (1,1/4,1,1,1)					2
		3.00		N=6 (1,2/1,1,2,2)					3
		4.00 4.00	B	50 (3,5/50 for 265mm)	3.70			Dense brown sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	4
		5.00		N=14 (2,3/3,3,4,4)	4.90			Firm to stiff medium strength brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Becoming stiff high to very high strength from 11.00m bgl.	5
		6.50		N=14 (2,3/3,3,4,4)					6
		8.00	U						7
		9.50		N=17 (2,3/3,4,5,5)					8
									9
									10

Continued on next sheet

Remarks

1. Complete. 2. Water strike encountered as seepage at 3.70 m bg. 3. Monitoring well installed (response zone 1.00 - 5.00 m bgl). 4. Cased from 3.50 - 6.00 m bgl. 5. Chiselling from 4.00 - 6.00 m bgl (3 hours).



Borehole Log

Borehole No.

CP101

Sheet 2 of 2

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385729.00 - 414729.00

Hole Type
CP

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 15/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.00		N=35 (3,4/9,8,8,10)	15.00				11
		12.50		51 (4,9/51 for 255mm)					12
		14.00		50 (5,8/50 for 260mm)					13
		15.00		50 (5,7/50 for 270mm)					14
								End of borehole at 15.00 m	15
									16
									17
									18
									19
									20

Remarks

1. Complete. 2. Water strike encountered as seepage at 3.70 m bg. 3. Monitoring well installed (response zone 1.00 - 5.00 m bgl). 4. Cased from 3.50 - 6.00 m bgl. 5. Chiselling from 4.00 - 6.00 m bgl (3 hours).





Borehole Log

Borehole No.

CP102

Sheet 1 of 1

Project Name: Land at Greenbooth Road and Edenfield Road

Project No.
16465

Co-ords: 385660.00 - 414801.00

Hole Type
CP

Location: Norden

Level:

Scale
1:50

Client: Stonebond Properties Ltd

Dates: 16/11/2022 -

Logged By
H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			MADE GROUND: Concrete.	
		1.00		N=39 (3,5/22,3,5,9)				MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, concrete, and brick.	1
		2.00		N=35 (2,5/10,7,9,9)					2
		3.00		50 (2,4/50 for 290mm)					3
		4.00		N=24 (4,9/5,5,4,10)					4
		5.00		N=24 (3,4/4,7,3,10)					5
		6.00		50 (25 for 70mm/50 for 65mm)	5.80			Dense brown sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	6
		7.00		50 (25 for 70mm/50 for 55mm)	7.00			End of borehole at 7.00 m	7
									8
									9
									10

Remarks

1. Terminated due to cobbles and compact GRAVEL. 2. Cutter stuck at 6.00 m bgl, taking 1.5 hours to retrieve. 3. Chiselling from 0.30 - 5.40 m bgl and 6.00 - 7.00 m bgl. 4. No groundwater encountered.



Borehole Log

Borehole No.

CP103

Sheet 1 of 2

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385846.00 - 414648.00

Hole Type CP

Location: Norden

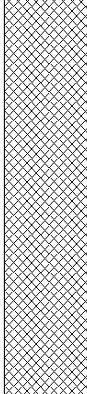
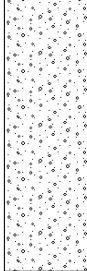
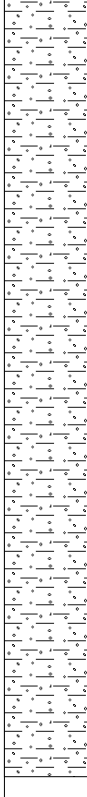
Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			MADE GROUND: Concrete.	
		1.00 1.00	B	N=18 (1,2/9,3,2,4)				MADE GROUND: Dark brown sandy gravel. Gravel is fine to coarse subangular to subrounded of sandstone, concrete, and brick.	1
		2.00		N=19 (2,4/12,4,2,1)					2
		3.00		N=8 (2,1/1,2,2,3)	3.00				3
		4.00 4.00	B	N=21 (3,4/4,6,7,4)				Loose brown sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Slight hydrocarbon odour and sheen. Becoming medium dense from 4.00m bgl.	4
		5.00		N=14 (2,3/3,4,3,4)	4.80			Firm to stiff medium strength brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Becoming very stiff high strength from 6.50m bgl and very stiff very high strength from 11.00m bgl.	5
		6.50		N=20 (3,4/4,4,5,7)					6
		8.00	U						7
									8
		9.50		N=22 (2,3/5,5,6,6)					9
									10

Continued on next sheet

Remarks

1. Terminated due to cobbles and compact GRAVEL. 2. Water strike encountered as seepage at 3.00 m bgl and 12.10 m bgl. 3. Hydrocarbon odour and sheen from 3.00 - 4.80 m bgl. 4. Monitoring well installed (response zone 3.00 - 4.80 m bgl). 5. Chiselling from 0.70 - 0.90 m bgl, 2.20 - 2.30 m bgl, and 12.30 - 13.20 m bgl.

Borehole Log

Borehole No.

CP103

Sheet 2 of 2

Project Name: Land at Greenbooth Road and Edenfield Road

Project No. 16465

Co-ords: 385846.00 - 414648.00

Hole Type CP

Location: Norden

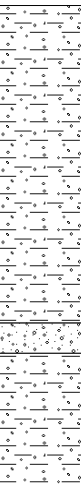
Level:

Scale 1:50

Client: Stonebond Properties Ltd

Dates: 17/11/2022 -

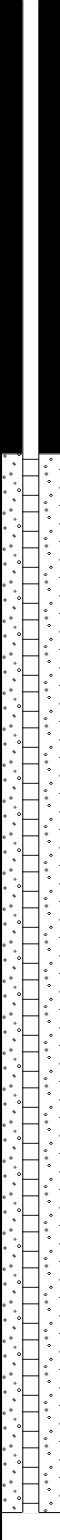
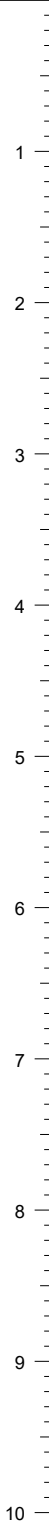
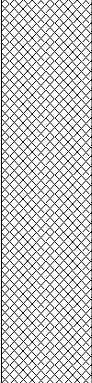
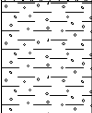
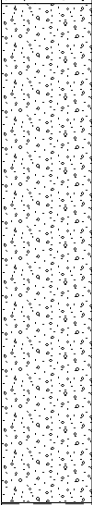
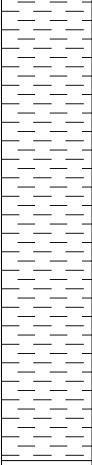
Logged By H. Mason

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		11.00		50 (4,5/50 for 250mm)				Brown sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. Very stiff brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.	11
					12.10				12
		12.50		50 (4,9/50 for 280mm)	12.30				
		13.20		50 (25 for 55mm/50 for 45mm)	13.20				13
								End of borehole at 13.20 m	14
									15
									16
									17
									18
									19
									20

Remarks

1. Terminated due to cobbles and compact GRAVEL. 2. Water strike encountered as seepage at 3.00 m bgl and 12.10 m bgl. 3. Hydrocarbon odour and sheen from 3.00 - 4.80 m bgl. 4. Monitoring well installed (response zone 3.00 - 4.80 m bgl). 5. Chiselling from 0.70 - 0.90 m bgl, 2.20 - 2.30 m bgl, and 12.30 - 13.20 m bgl.

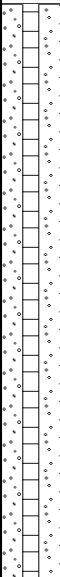
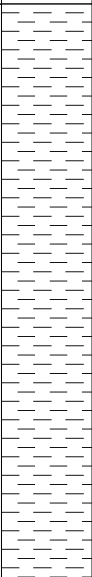
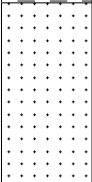
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Project Name:		Land at Greenbooth Road and Edenfield Road		Project No. 16465		Co-ords: 385659E - 414738N		Hole Type BH	
Location:		Norden				Level:		Scale 1:50	
Client:		Stonebond Properties Ltd				Dates:		05/06/2023 Logged By G. Brennan	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20		 MADE GROUND: Concrete.		
							 MADE GROUND: Black slightly sandy gravel. Gravel is fine to coarse angular to subrounded of ash, brick and mudstone.		
					2.80		 Grey slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone.		
					3.60		 Brown fine to medium SAND and GRAVEL. Gravel is fine to coarse angular to subrounded of mudstone and sandstone.		
					6.90		 Grey CLAY.		

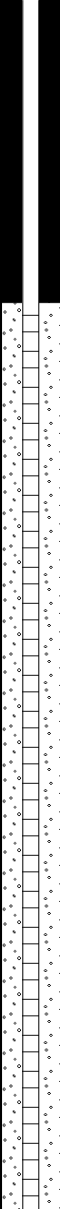
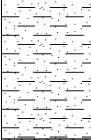
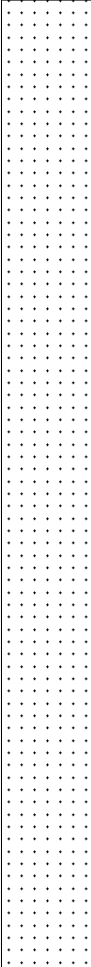
Remarks

1. Complete. 2. Monitoring well installed (response zone 3.00-13.80m bgl). 3. No Groundwater encountered.



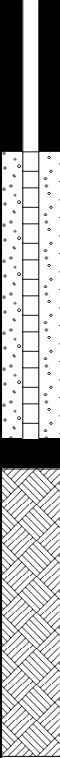
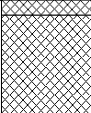
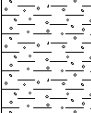
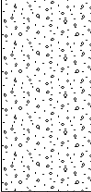
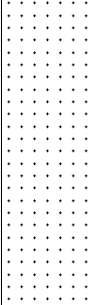
				Borehole Log				Borehole No. RB101	
Project Name: Land at Greenbooth Road and Edenfield Road				Project No. 16465		Co-ords: 385659E - 414738N		Sheet 2 of 2 Hole Type BH	
Location: Norden						Level:		Scale 1:50	
Client: Stonebond Properties Ltd						Dates: 05/06/2023		Logged By G. Brennan	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					13.80			Grey CLAY.	11
								Greyish brown SANDSTONE.	14
								End of Borehole at 15.00m	15
					15.00				16
									17
									18
									19
									20
Remarks 1. Complete. 2. Monitoring well installed (response zone 3.00-13.80m bgl). 3. No Groundwater encountered.									

				Borehole Log				Borehole No. RB102	
Project Name: Land at Greenbooth Road and Edenfield Road				Project No. 16465		Co-ords: 385693E - 414765N		Sheet 1 of 1 Hole Type BH	
Location: Norden				Level:				Scale 1:50	
Client: Stonebond Properties Ltd				Dates: 05/06/2023				Logged By G. Brennan	

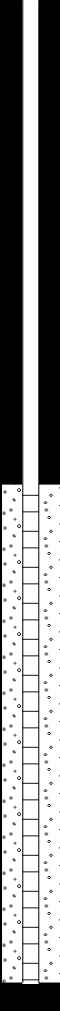
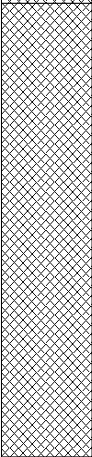
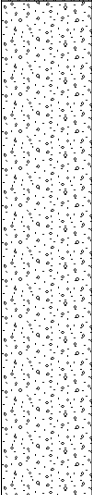
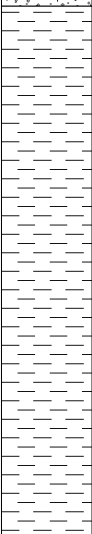
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.25			MADE GROUND: Concrete.	
					0.60			MADE GROUND: Black slightly sandy gravel. Gravel is fine to coarse angular to subrounded of ash, brick and mudstone.	1
					1.60			Brown sandy CLAY with bands of gravel. Gravel is fine to coarse angular to subrounded of mudstone and sandstone.	2
					8.00			Brownish grey SANDSTONE.	3
									4
									5
									6
									7
									8
								End of Borehole at 8.00m	9
									10

Remarks
 1. Terminated due to refusal on bedrock. 2. Monitoring well installed (response zone 2.00-8.00m bgl). 3. No groundwater encountered.



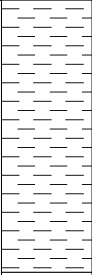
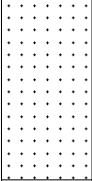
				Borehole Log				Borehole No. RB103 Sheet 1 of 1					
Project Name:		Land at Greenbooth Road and Edenfield Road		Project No.		16465		Co-ords: 385753E - 414747N		Hole Type BH			
Location:		Norden				Level:				Scale 1:50			
Client:		Stonebond Properties Ltd				Dates:				05/06/2023		Logged By G. Brennan	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description					
		Depth (m)	Type	Results									
	 1.90				0.10			MADE GROUND: Concrete. MADE GROUND: Black slightly sandy gravel. Gravel is fine to coarse angular to subrounded of ash, brick and mudstone.					
					0.80			Grey slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone.	1				
					1.60			Brown fine to medium SAND and GRAVEL. Gravel is fine to coarse angular to subrounded of mudstone and sandstone.	2				
					2.90			Brown SANDSTONE.	3				
					5.00		End of Borehole at 5.00m		5				
									6				
									7				
									8				
									9				
									10				
Remarks 1. Terminated due to refusal on bedrock. 2. Groundwater encountered as seepage at 1.90 m bgl. 3. Monitoring well installed (response zone 1.00-2.90m bgl).													

				Borehole Log				Borehole No. RB104	
Project Name: Land at Greenbooth Road and Edenfield Road				Project No. 16465		Co-ords: 385828E - 414651N		Sheet 1 of 2	
Location: Norden				Level:		Hole Type BH			
Client: Stonebond Properties Ltd				Dates: 06/06/2023		Scale 1:50			
Logged By G. Brennan									

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20		 MADE GROUND: Concrete.	1	
							 MADE GROUND: Black slightly sandy gravel. Gravel is fine to coarse angular to subrounded of ash, brick and mudstone.	2	
					3.20		 Brown fine to medium SAND and GRAVEL. Gravel is fine to coarse angular to subrounded of mudstone and sandstone.	3	
				6.50		 Grey CLAY.	4		
								5	
								6	
								7	
								8	
								9	
								10	

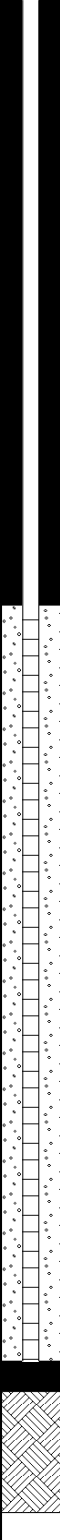
Remarks 1. Terminated due to refusal on bedrock. 2. Monitoring well installed (response zone 3.20-6.50m bgl). 3. No groundwater encountered.								
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				Borehole Log				Borehole No. RB104	
Project Name: Land at Greenbooth Road and Edenfield Road				Project No. 16465		Co-ords: 385828E - 414651N		Sheet 2 of 2	
Location: Norden				Level:		Hole Type BH			
Client: Stonebond Properties Ltd				Dates: 06/06/2023		Scale 1:50			
Logged By G. Brennan									

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					11.80		 Grey CLAY.	11	
							 Brown SANDSTONE with grey bands.	12	
							End of Borehole at 13.00m	13	
					13.00			14	
								15	
								16	
								17	
								18	
								19	
								20	

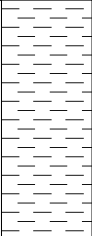
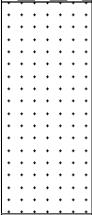
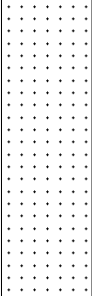
Remarks 1. Terminated due to refusal on bedrock. 2. Monitoring well installed (response zone 3.20-6.50m bgl). 3. No groundwater encountered.								
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				Borehole Log				Borehole No. RB105	
Project Name: Land at Greenbooth Road and Edenfield Road				Project No. 16465		Co-ords: 385870E - 414612N		Sheet 1 of 2	
Location: Norden				Level:		Hole Type BH			
Client: Stonebond Properties Ltd				Dates: 06/06/2023		Scale 1:50			
Logged By G. Brennan									

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20		MADE GROUND: Concrete.	1	
							MADE GROUND: Black slightly sandy gravel. Gravel is fine to coarse angular to subrounded of ash, brick and mudstone.	2	
									3
									4
					3.90		Brown GRAVEL. Gravel is fine to coarse angular to subrounded of sandstone.	5	
								6	
					6.80		Brown CLAY.	7	
								8	
								9	
								10	

Remarks 1. Complete. 2. Groundwater encountered as seepage at 3.90 m bgl. 3. Monitoring well installed (response zone 4.00-9.00m bgl).		
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				Borehole Log				Borehole No. RB105	
Project Name: Land at Greenbooth Road and Edenfield Road				Project No. 16465		Co-ords: 385870E - 414612N		Sheet 2 of 2	
Location: Norden				Level:		Hole Type BH			
Client: Stonebond Properties Ltd				Dates: 06/06/2023		Scale 1:50			
Logged By G. Brennan									

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					11.60		 Brown CLAY.	11	
							 Brownish grey SANDSTONE.	12	
							 Grey SANDSTONE.	13	
							End of Borehole at 15.00m	15	
					15.00			16	
								17	
								18	
								19	
								20	

Remarks 1. Complete. 2. Groundwater encountered as seepage at 3.90 m bgl. 3. Monitoring well installed (response zone 4.00-9.00m bgl).								
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APPENDIX VI

CHEMICAL TESTING

RESULTS

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i2 Analytical Ltd.
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Analytical Report Number : 22-98029-2

Replaces Analytical Report Number: 22-98029, issue no. 1
Additional analysis undertaken.

Project / Site name:	Edenfield Road	Samples received on:	21/11/2022
Your job number:	16-465	Samples instructed on/ Analysis started on:	21/11/2022
Your order number:	003525	Analysis completed by:	14/12/2022
Report Issue Number:	2	Report issued on:	15/12/2022
Samples Analysed:	3 leachate samples - 30 soil samples		


Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507222	2507223	2507224	2507225	2507226
Sample Reference				Bund	HP01	HP02	HP03	HP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	0.30	0.50	0.20	0.40
Date Sampled				18/11/2022	15/11/2022	15/11/2022	15/11/2022	15/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	-	-	-	-
Moisture Content	%	0.01	NONE	20	-	-	-	-
Total mass of sample received	kg	0.001	NONE	0.3	-	-	-	-

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	ASE	ASE	ASE	ASE	ASE

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	-	-	-	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1600	-	-	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.042	-	-	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	83	-	-	-	-
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	41.5	-	-	-	-
Sulphide	mg/kg	1	MCERTS	21	-	-	-	-
Total Sulphur	mg/kg	50	MCERTS	870	-	-	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.5	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.23	-	-	-	-
Acenaphthylene	mg/kg	0.05	NONE	0.09	-	-	-	-
Acenaphthene	mg/kg	0.05	NONE	0.41	-	-	-	-
Fluorene	mg/kg	0.05	NONE	0.39	-	-	-	-
Phenanthrene	mg/kg	0.05	NONE	3.6	-	-	-	-
Anthracene	mg/kg	0.05	NONE	0.93	-	-	-	-
Fluoranthene	mg/kg	0.05	NONE	6.8	-	-	-	-
Pyrene	mg/kg	0.05	NONE	5.6	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	NONE	2.6	-	-	-	-
Chrysene	mg/kg	0.05	NONE	2.5	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	2.3	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	1.7	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	NONE	2.2	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	1.4	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.25	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	1.5	-	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	32.4	-	-	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	-	-	-	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507222	2507223	2507224	2507225	2507226
Sample Reference				Bund	HP01	HP02	HP03	HP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	0.30	0.50	0.20	0.40
Date Sampled				18/11/2022	15/11/2022	15/11/2022	15/11/2022	15/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.3	-	-	-	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	50	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	300	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170	-	-	-	-

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	-	-	-	-	-
Toluene	µg/kg	5	NONE	-	-	-	-	-
Ethylbenzene	µg/kg	5	NONE	-	-	-	-	-
p & m-xylene	µg/kg	5	NONE	-	-	-	-	-
o-xylene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_ID_AL}	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_ID_AL}	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_ID_AL}	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_ID_AL}	mg/kg	1	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_ID_AL}	mg/kg	2	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_ID_AL}	mg/kg	8	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_ID_AL}	mg/kg	8	NONE	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_ID_AL}	mg/kg	10	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7 _{HS_ID_AR}	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8 _{HS_ID_AR}	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 _{HS_ID_AR}	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_ID_AR}	mg/kg	1	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_ID_AR}	mg/kg	2	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_ID_AR}	mg/kg	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_ID_AR}	mg/kg	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_ID_AR}	mg/kg	10	NONE	-	-	-	-	-

TPH (C5 - C6) _{HS_ID_TOTAL}	mg/kg	1	NONE	< 1.0	-	-	-	-
TPH (C6 - C8) _{HS_ID_TOTAL}	mg/kg	0.1	NONE	< 0.1	-	-	-	-
TPH (C8 - C10) _{HS_ID_TOTAL}	mg/kg	0.1	NONE	< 0.1	-	-	-	-
TPH (C10 - C12) _{EH_CU_ID_TOTAL}	mg/kg	2	NONE	< 2.0	-	-	-	-
TPH (C12 - C16) _{EH_CU_ID_TOTAL}	mg/kg	4	NONE	4.7	-	-	-	-
TPH (C16 - C21) _{EH_CU_ID_TOTAL}	mg/kg	1	NONE	20	-	-	-	-
TPH (C21 - C35) _{EH_CU_ID_TOTAL}	mg/kg	1	NONE	150	-	-	-	-
TPH (C35 - C40) _{EH_CU_ID_TOTAL}	mg/kg	10	NONE	58	-	-	-	-
TPH Total C5 - C40 _{EH_CU+HS_ID_TOTAL}	mg/kg	10	NONE	240	-	-	-	-

VOCs

Chloromethane	µg/kg	5	NONE	-	-	-	-	-
Chloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromomethane	µg/kg	5	NONE	-	-	-	-	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507222	2507223	2507224	2507225	2507226
Sample Reference				Bund	HP01	HP02	HP03	HP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	0.30	0.50	0.20	0.40
Date Sampled				18/11/2022	15/11/2022	15/11/2022	15/11/2022	15/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-
1,1-Dichloroethane	µg/kg	5	NONE	-	-	-	-	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Trichloromethane	µg/kg	5	NONE	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	5	NONE	-	-	-	-	-
1,2-Dichloroethane	µg/kg	5	NONE	-	-	-	-	-
1,1-Dichloropropene	µg/kg	5	NONE	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	-	-
Benzene	µg/kg	5	NONE	-	-	-	-	-
Tetrachloromethane	µg/kg	5	NONE	-	-	-	-	-
1,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Trichloroethene	µg/kg	5	NONE	-	-	-	-	-
Dibromomethane	µg/kg	5	NONE	-	-	-	-	-
Bromodichloromethane	µg/kg	5	NONE	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	5	NONE	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	5	NONE	-	-	-	-	-
Toluene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	5	NONE	-	-	-	-	-
1,3-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Dibromochloromethane	µg/kg	5	NONE	-	-	-	-	-
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	5	NONE	-	-	-	-	-
Chlorobenzene	µg/kg	5	NONE	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Ethylbenzene	µg/kg	5	NONE	-	-	-	-	-
p & m-Xylene	µg/kg	5	NONE	-	-	-	-	-
Styrene	µg/kg	5	NONE	-	-	-	-	-
Tribromomethane	µg/kg	5	NONE	-	-	-	-	-
o-Xylene	µg/kg	5	NONE	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Isopropylbenzene	µg/kg	5	NONE	-	-	-	-	-
Bromobenzene	µg/kg	5	NONE	-	-	-	-	-
n-Propylbenzene	µg/kg	5	NONE	-	-	-	-	-
2-Chlorotoluene	µg/kg	5	NONE	-	-	-	-	-
4-Chlorotoluene	µg/kg	5	NONE	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	5	NONE	-	-	-	-	-
tert-Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	5	NONE	-	-	-	-	-
sec-Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	5	NONE	-	-	-	-	-
p-Isopropyltoluene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	5	NONE	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	5	NONE	-	-	-	-	-
Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	NONE	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	5	NONE	-	-	-	-	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	5	NONE	-	-	-	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507222	2507223	2507224	2507225	2507226
Sample Reference				Bund	HP01	HP02	HP03	HP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	0.30	0.50	0.20	0.40
Date Sampled				18/11/2022	15/11/2022	15/11/2022	15/11/2022	15/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	NONE	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	NONE	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	NONE	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	NONE	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	NONE	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	NONE	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	-	-	-	-
Naphthalene	mg/kg	0.05	NONE	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	NONE	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	NONE	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	NONE	-	-	-	-	-
Acenaphthene	mg/kg	0.05	NONE	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	NONE	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	NONE	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-	-
Fluorene	mg/kg	0.05	NONE	-	-	-	-	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	NONE	-	-	-	-	-
Phenanthrene	mg/kg	0.05	NONE	-	-	-	-	-
Anthracene	mg/kg	0.05	NONE	-	-	-	-	-
Carbazole	mg/kg	0.3	NONE	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	-	-	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-	-
Fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Pyrene	mg/kg	0.05	NONE	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	-	-	-
Chrysene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	-	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507222	2507223	2507224	2507225	2507226
Sample Reference				Bund	HP01	HP02	HP03	HP04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	0.30	0.50	0.20	0.40
Date Sampled				18/11/2022	15/11/2022	15/11/2022	15/11/2022	15/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Indeno(1,2,3-cd)pyrene				mg/kg	0.05	NONE	-	-
Dibenz(a,h)anthracene				mg/kg	0.05	NONE	-	-
Benzo(ghi)perylene				mg/kg	0.05	NONE	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number	2507227	2507228	2507229	2507230	2507231
Sample Reference	HP05	WS101	WS105	WS107	WS110
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.10	0.80	2.60	2.50	0.50
Date Sampled	15/11/2022	18/11/2022	15/11/2022	16/11/2022	16/11/2022
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	-	< 0.1
Moisture Content	%	0.01	NONE	-	21
Total mass of sample received	kg	0.001	NONE	-	0.4

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	-	-	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.036	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	0.036	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	ASE	N/A	N/A	N/A	ASE

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	7.9	7.5	8.5
Total Cyanide	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	-	160	320	1100
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	-	-	0.016	0.045	0.016
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	-	-	32	90	32
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	-	-	15.8	44.9	16.2
Sulphide	mg/kg	1	MCERTS	-	-	2.8	57	6.4
Total Sulphur	mg/kg	50	MCERTS	-	-	120	1200	650
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	-	-	1.5	1.5	1.6

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	-	0.38	< 0.05	-	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	-	0.11	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	NONE	-	0.26	< 0.05	-	< 0.05
Fluorene	mg/kg	0.05	NONE	-	0.2	< 0.05	-	< 0.05
Phenanthrene	mg/kg	0.05	NONE	-	1.9	< 0.05	-	0.14
Anthracene	mg/kg	0.05	NONE	-	0.45	< 0.05	-	< 0.05
Fluoranthene	mg/kg	0.05	NONE	-	3.9	0.09	-	0.12
Pyrene	mg/kg	0.05	NONE	-	3.5	0.14	-	0.16
Benzo(a)anthracene	mg/kg	0.05	NONE	-	1.8	0.12	-	0.18
Chrysene	mg/kg	0.05	NONE	-	1.6	0.11	-	0.14
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	1.5	< 0.05	-	0.15
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	0.9	< 0.05	-	0.08
Benzo(a)pyrene	mg/kg	0.05	NONE	-	1.3	< 0.05	-	0.18
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	0.72	< 0.05	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	0.14	< 0.05	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	0.84	< 0.05	-	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	-	19.6	< 0.80	-	1.15
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	35	4.9	8.3	38
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	230	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	1.4	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.5	-	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507227	2507228	2507229	2507230	2507231
Sample Reference				HP05	WS101	WS105	WS107	WS110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	2.60	2.50	0.50
Date Sampled				15/11/2022	18/11/2022	15/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	1.6	1.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	2.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	33	16	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	89	36	21	85
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	320	72	29	460
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	0.7	< 0.3	0.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	35	38	17	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	45	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	270	250	48	140

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Toluene	µg/kg	5	NONE	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
p & m-xylene	µg/kg	5	NONE	-	-	-	< 1.0	-
o-xylene	µg/kg	5	NONE	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	< 1.0	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 _{HS, 1D, AL}	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH, CU, 1D, AL}	mg/kg	1	NONE	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 _{EH, CU, 1D, AL}	mg/kg	2	NONE	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 _{EH, CU, 1D, AL}	mg/kg	8	NONE	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 _{EH, CU, 1D, AL}	mg/kg	8	NONE	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35) _{EH, CU+HS, 1D, AL}	mg/kg	10	NONE	-	-	-	< 10	-

TPH-CWG - Aromatic >EC5 - EC7 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 _{HS, 1D, AR}	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH, CU, 1D, AR}	mg/kg	1	NONE	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH, CU, 1D, AR}	mg/kg	2	NONE	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH, CU, 1D, AR}	mg/kg	10	NONE	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH, CU, 1D, AR}	mg/kg	10	NONE	-	-	-	< 10	-
TPH-CWG - Aromatic (EC5 - EC35) _{EH, CU+HS, 1D, AR}	mg/kg	10	NONE	-	-	-	< 10	-

TPH (C5 - C6) _{HS, 1D, TOTAL}	mg/kg	1	NONE	-	< 1.0	< 1.0	-	< 1.0
TPH (C6 - C8) _{HS, 1D, TOTAL}	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	< 0.1
TPH (C8 - C10) _{HS, 1D, TOTAL}	mg/kg	0.1	NONE	-	< 0.1	< 0.1	-	< 0.1
TPH (C10 - C12) _{EH, CU, 1D, TOTAL}	mg/kg	2	NONE	-	< 2.0	< 2.0	-	< 2.0
TPH (C12 - C16) _{EH, CU, 1D, TOTAL}	mg/kg	4	NONE	-	< 4.0	< 4.0	-	< 4.0
TPH (C16 - C21) _{EH, CU, 1D, TOTAL}	mg/kg	1	NONE	-	14	6.9	-	< 1.0
TPH (C21 - C35) _{EH, CU, 1D, TOTAL}	mg/kg	1	NONE	-	120	170	-	< 1.0
TPH (C35 - C40) _{EH, CU, 1D, TOTAL}	mg/kg	10	NONE	-	27	75	-	< 10
TPH Total C5 - C40 _{EH, CU+HS, 1D, TOTAL}	mg/kg	10	NONE	-	160	250	-	< 10

VOCs

Chloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Chloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Bromomethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	< 1.0	-

Analytical Report Number: 22-98029
 Project / Site name: Edenfield Road
 Your Order No: 003525

Lab Sample Number				2507227	2507228	2507229	2507230	2507231
Sample Reference				HP05	WS101	WS105	WS107	WS110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	2.60	2.50	0.50
Date Sampled				15/11/2022	18/11/2022	15/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1-Dichloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1-Dichloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	< 1.0	-
Trichloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,1-Trichloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dichloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1-Dichloropropene	µg/kg	5	NONE	-	-	-	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
Benzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Tetrachloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dichloropropane	µg/kg	5	NONE	-	-	-	< 1.0	-
Trichloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
Dibromomethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Bromodichloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	5	NONE	-	-	-	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	5	NONE	-	-	-	< 1.0	-
Toluene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,2-Trichloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,3-Dichloropropane	µg/kg	5	NONE	-	-	-	< 1.0	-
Dibromochloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Tetrachloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dibromoethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Chlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
p & m-Xylene	µg/kg	5	NONE	-	-	-	< 1.0	-
Styrene	µg/kg	5	NONE	-	-	-	< 1.0	-
Tribromomethane	µg/kg	5	NONE	-	-	-	< 1.0	-
o-Xylene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Isopropylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Bromobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
n-Propylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
2-Chlorotoluene	µg/kg	5	NONE	-	-	-	< 1.0	-
4-Chlorotoluene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
tert-Butylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
sec-Butylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,3-Dichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
p-Isopropyltoluene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,4-Dichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Butylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507227	2507228	2507229	2507230	2507231
Sample Reference				HP05	WS101	WS105	WS107	WS110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	2.60	2.50	0.50
Date Sampled				15/11/2022	18/11/2022	15/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	0.2	-
Phenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	-	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	-	-	0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	NONE	-	-	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Isophorone	mg/kg	0.2	NONE	-	-	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	NONE	-	-	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	-	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Naphthalene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	-	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Dimethylphthalate	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Acenaphthylene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Acenaphthene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	NONE	-	-	-	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	NONE	-	-	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Fluorene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Phenanthrene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Anthracene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Carbazole	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Fluoranthene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Pyrene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Chrysene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	-	< 0.05	-

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 Project / Site name: Edenfield Road
 Your Order No: 003525

Lab Sample Number				2507227	2507228	2507229	2507230	2507231
Sample Reference				HP05	WS101	WS105	WS107	WS110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.80	2.60	2.50	0.50
Date Sampled				15/11/2022	18/11/2022	15/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Indeno(1,2,3-cd)pyrene				mg/kg	0.05	NONE	-	-
Dibenz(a,h)anthracene				mg/kg	0.05	NONE	-	-
Benzo(ghi)perylene				mg/kg	0.05	NONE	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number	2507232	2507233	2507234	2507235	2507236
Sample Reference	WS111	WS112	WS114	WS115	WS116
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.60	2.60	1.50	1.70	0.80
Date Sampled	16/11/2022	16/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	21
Total mass of sample received	kg	0.001	NONE	0.3	0.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	ASE	N/A	N/A	ASE	ASE

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.2	8.2	-	8.6	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	360	390	-	2800	110
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.015	0.074	-	0.048	0.031
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	31	150	-	96	62
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	15.3	74.4	-	48.2	31.1
Sulphide	mg/kg	1	MCERTS	2.4	82	-	7.1	10
Total Sulphur	mg/kg	50	MCERTS	330	2100	-	1900	67
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2	1.8	-	3.1	0.6

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.11	< 0.05	0.1	0.29	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	NONE	0.18	< 0.05	0.14	0.21	< 0.05
Anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	NONE	0.08	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	NONE	0.09	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	5.6	2.1	24	4.3
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	240	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	2	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	0.2	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507232	2507233	2507234	2507235	2507236
Sample Reference				WS111	WS112	WS114	WS115	WS116
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	2.60	1.50	1.70	0.80
Date Sampled				16/11/2022	16/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	23	-	16	38
Copper (aqua regia extractable)	mg/kg	1	MCERTS	39	21	20	83	19
Lead (aqua regia extractable)	mg/kg	1	MCERTS	80	31	19	25	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	7.8	0.6	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	36	25	53	51	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	80	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	76	71	120	37	77

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	-	-	-	-	-
Toluene	µg/kg	5	NONE	-	-	-	-	-
Ethylbenzene	µg/kg	5	NONE	-	-	-	-	-
p & m-xylene	µg/kg	5	NONE	-	-	-	-	-
o-xylene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_ID_AL	mg/kg	1	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_ID_AL	mg/kg	2	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_ID_AL	mg/kg	8	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_ID_AL	mg/kg	8	NONE	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_ID_AL	mg/kg	10	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_ID_AR	mg/kg	10	NONE	-	-	-	-	-

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	NONE	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	NONE	< 1.0	5.9	< 1.0	< 1.0	< 1.0
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	NONE	< 1.0	2.4	< 1.0	< 1.0	< 1.0
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

VOCs

Chloromethane	µg/kg	5	NONE	-	-	-	-	-
Chloroethane	µg/kg	5	NONE	-	-	-	-	-
Bromomethane	µg/kg	5	NONE	-	-	-	-	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507232	2507233	2507234	2507235	2507236
Sample Reference				WS111	WS112	WS114	WS115	WS116
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	2.60	1.50	1.70	0.80
Date Sampled				16/11/2022	16/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	-	-
1,1-Dichloroethane	µg/kg	5	NONE	-	-	-	-	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Trichloromethane	µg/kg	5	NONE	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	5	NONE	-	-	-	-	-
1,2-Dichloroethane	µg/kg	5	NONE	-	-	-	-	-
1,1-Dichloropropene	µg/kg	5	NONE	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	-	-
Benzene	µg/kg	5	NONE	-	-	-	-	-
Tetrachloromethane	µg/kg	5	NONE	-	-	-	-	-
1,2-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Trichloroethene	µg/kg	5	NONE	-	-	-	-	-
Dibromomethane	µg/kg	5	NONE	-	-	-	-	-
Bromodichloromethane	µg/kg	5	NONE	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	5	NONE	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	5	NONE	-	-	-	-	-
Toluene	µg/kg	5	NONE	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	5	NONE	-	-	-	-	-
1,3-Dichloropropane	µg/kg	5	NONE	-	-	-	-	-
Dibromochloromethane	µg/kg	5	NONE	-	-	-	-	-
Tetrachloroethene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	5	NONE	-	-	-	-	-
Chlorobenzene	µg/kg	5	NONE	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Ethylbenzene	µg/kg	5	NONE	-	-	-	-	-
p & m-Xylene	µg/kg	5	NONE	-	-	-	-	-
Styrene	µg/kg	5	NONE	-	-	-	-	-
Tribromomethane	µg/kg	5	NONE	-	-	-	-	-
o-Xylene	µg/kg	5	NONE	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	-	-
Isopropylbenzene	µg/kg	5	NONE	-	-	-	-	-
Bromobenzene	µg/kg	5	NONE	-	-	-	-	-
n-Propylbenzene	µg/kg	5	NONE	-	-	-	-	-
2-Chlorotoluene	µg/kg	5	NONE	-	-	-	-	-
4-Chlorotoluene	µg/kg	5	NONE	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	5	NONE	-	-	-	-	-
tert-Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	5	NONE	-	-	-	-	-
sec-Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	5	NONE	-	-	-	-	-
p-Isopropyltoluene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	5	NONE	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	5	NONE	-	-	-	-	-
Butylbenzene	µg/kg	5	NONE	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	NONE	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	5	NONE	-	-	-	-	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	5	NONE	-	-	-	-	-

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Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507232	2507233	2507234	2507235	2507236
Sample Reference				WS111	WS112	WS114	WS115	WS116
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	2.60	1.50	1.70	0.80
Date Sampled				16/11/2022	16/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	NONE	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	NONE	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	NONE	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	NONE	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	NONE	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	NONE	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	-	-	-	-
Naphthalene	mg/kg	0.05	NONE	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	NONE	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	NONE	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	NONE	-	-	-	-	-
Acenaphthene	mg/kg	0.05	NONE	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	NONE	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	NONE	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	-	-
Fluorene	mg/kg	0.05	NONE	-	-	-	-	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	NONE	-	-	-	-	-
Phenanthrene	mg/kg	0.05	NONE	-	-	-	-	-
Anthracene	mg/kg	0.05	NONE	-	-	-	-	-
Carbazole	mg/kg	0.3	NONE	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	-	-	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	-	-
Fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Pyrene	mg/kg	0.05	NONE	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	-	-	-
Chrysene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	-	-	-

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Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507232	2507233	2507234	2507235	2507236
Sample Reference				WS111	WS112	WS114	WS115	WS116
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.60	2.60	1.50	1.70	0.80
Date Sampled				16/11/2022	16/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number	2507237	2507238	2507239	2507240	2507241
Sample Reference	WS117	WS122	WS124	TP108	TP110
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	3.20	3.20	3.40	0.70	1.00
Date Sampled	17/11/2022	18/11/2022	18/11/2022	16/11/2022	16/11/2022
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	25	26
Total mass of sample received	kg	0.001	NONE	0.3	0.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	-	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.705	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.705	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	LFT	LFT	DSO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	7.8	8.6	10.3	10.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	560	290	270	1500	660
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.11	0.03	0.03	0.17	0.094
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	230	59	60	340	190
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	114	29.7	30.1	170	94.4
Sulphide	mg/kg	1	MCERTS	160	18	63	17	1.7
Total Sulphur	mg/kg	50	MCERTS	3500	520	1000	1100	420
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.9	1.1	2.7	1.5	1.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	-	-	-	0.43	0.08
Acenaphthylene	mg/kg	0.05	NONE	-	-	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	NONE	-	-	-	< 0.05	< 0.05
Fluorene	mg/kg	0.05	NONE	-	-	-	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	NONE	-	-	-	0.17	0.29
Anthracene	mg/kg	0.05	NONE	-	-	-	< 0.05	0.12
Fluoranthene	mg/kg	0.05	NONE	-	-	-	0.09	1.3
Pyrene	mg/kg	0.05	NONE	-	-	-	0.08	1.5
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	-	< 0.05	1.2
Chrysene	mg/kg	0.05	NONE	-	-	-	< 0.05	0.98
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	-	< 0.05	1.3
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	-	< 0.05	0.32
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	-	< 0.05	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	-	< 0.05	0.45
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	-	< 0.05	0.15
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	-	< 0.05	0.57

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	-	-	-	< 0.80	9.27
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	4.9	3.2	9	18
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-

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Lab Sample Number				2507237	2507238	2507239	2507240	2507241
Sample Reference				WS117	WS122	WS124	TP108	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.20	3.20	3.40	0.70	1.00
Date Sampled				17/11/2022	18/11/2022	18/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.3	< 0.2	0.3	< 0.2	0.8
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	52	20	4.9	160	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	56	18	8.6	62	42
Lead (aqua regia extractable)	mg/kg	1	MCERTS	79	36	15	25	190
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32	16	5.1	24	35
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	170	52	35	29	180

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	-	< 1.0	< 1.0	-	-
Toluene	µg/kg	5	NONE	-	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	5	NONE	-	17	< 1.0	-	-
p & m-xylene	µg/kg	5	NONE	-	26	< 1.0	-	-
o-xylene	µg/kg	5	NONE	-	39	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	< 1.0	< 1.0	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 HS_ID_AL	mg/kg	0.001	NONE	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_ID_AL	mg/kg	0.001	NONE	-	< 0.001	< 0.001	-	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_ID_AL	mg/kg	0.001	NONE	-	0.58	< 0.001	-	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_ID_AL	mg/kg	1	NONE	-	6.1	3.1	-	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_ID_AL	mg/kg	2	NONE	-	40	12	-	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_ID_AL	mg/kg	8	NONE	-	45	33	-	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_ID_AL	mg/kg	8	NONE	-	29	330	-	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_ID_AL	mg/kg	10	NONE	-	120	380	-	-

TPH-CWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.001	NONE	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.001	NONE	-	< 0.001	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.001	NONE	-	0.24	0.082	-	-
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	NONE	-	17	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	NONE	-	180	17	-	-
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	NONE	-	260	70	-	-
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	NONE	-	66	520	-	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_ID_AR	mg/kg	10	NONE	-	520	610	-	-

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	-	-	< 1.0	< 1.0
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	-	-	< 0.1	< 0.1
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	-	-	< 0.1	< 0.1
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	NONE	5.3	-	-	7.7	< 2.0
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	NONE	57	-	-	15	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	NONE	140	-	-	17	9.8
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	NONE	460	-	-	70	18
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	NONE	85	-	-	61	< 10
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	750	-	-	170	28

VOCs

Chloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Chloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Bromomethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Vinyl Chloride	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-

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Lab Sample Number				2507237	2507238	2507239	2507240	2507241
Sample Reference				WS117	WS122	WS124	TP108	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.20	3.20	3.40	0.70	1.00
Date Sampled				17/11/2022	18/11/2022	18/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Trichlorofluoromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1-Dichloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Cis-1,2-dichloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1-Dichloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
2,2-Dichloropropane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Trichloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1,1-Trichloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,2-Dichloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1-Dichloropropene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Trans-1,2-dichloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Benzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Tetrachloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,2-Dichloropropane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Trichloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Dibromomethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Bromodichloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Cis-1,3-dichloropropene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Trans-1,3-dichloropropene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Toluene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1,2-Trichloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,3-Dichloropropane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Dibromochloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Tetrachloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,2-Dibromoethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Chlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,1,1,2-Tetrachloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Ethylbenzene	µg/kg	5	NONE	< 1.0	17	< 1.0	-	-
p & m-Xylene	µg/kg	5	NONE	< 1.0	26	< 1.0	-	-
Styrene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Tribromomethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
o-Xylene	µg/kg	5	NONE	< 1.0	39	< 1.0	-	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Isopropylbenzene	µg/kg	5	NONE	< 1.0	100	< 1.0	-	-
Bromobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
n-Propylbenzene	µg/kg	5	NONE	< 1.0	61	< 1.0	-	-
2-Chlorotoluene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
4-Chlorotoluene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,3,5-Trimethylbenzene	µg/kg	5	NONE	< 1.0	260	< 1.0	-	-
tert-Butylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,2,4-Trimethylbenzene	µg/kg	5	NONE	< 1.0	750	< 1.0	-	-
sec-Butylbenzene	µg/kg	5	NONE	< 1.0	30	< 1.0	-	-
1,3-Dichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
p-Isopropyltoluene	µg/kg	5	NONE	< 1.0	130	< 1.0	-	-
1,2-Dichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,4-Dichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Butylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,2-Dibromo-3-chloropropane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,2,4-Trichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
Hexachlorobutadiene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-
1,2,3-Trichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	-	-

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Lab Sample Number				2507237	2507238	2507239	2507240	2507241
Sample Reference				WS117	WS122	WS124	TP108	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.20	3.20	3.40	0.70	1.00
Date Sampled				17/11/2022	18/11/2022	18/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	0.2	< 0.1	< 0.1	-	-
Phenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
2-Chlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
1,3-Dichlorobenzene	mg/kg	0.2	NONE	0.2	0.4	< 0.2	-	-
1,2-Dichlorobenzene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
1,4-Dichlorobenzene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
2-Methylphenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
Hexachloroethane	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	-	-
Nitrobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
Isophorone	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
2,4-Dimethylphenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
Naphthalene	mg/kg	0.05	NONE	2.5	10	< 0.05	-	-
2,4-Dichlorophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
Hexachlorobutadiene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	1.4	13	0.4	-	-
2-Chloronaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
Dimethylphthalate	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	-
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.22	-	-
Acenaphthene	mg/kg	0.05	NONE	5.7	11	0.97	-	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
Dibenzofuran	mg/kg	0.2	NONE	1.9	6.7	0.7	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
Diethyl phthalate	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
Fluorene	mg/kg	0.05	NONE	4.6	12	2.1	-	-
Azobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
Bromophenyl phenyl ether	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
Hexachlorobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
Phenanthrene	mg/kg	0.05	NONE	20	39	4.3	-	-
Anthracene	mg/kg	0.05	NONE	5.9	9.7	2.3	-	-
Carbazole	mg/kg	0.3	NONE	1.6	1.7	< 0.3	-	-
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	-	-
Anthraquinone	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
Fluoranthene	mg/kg	0.05	NONE	35	24	6.1	-	-
Pyrene	mg/kg	0.05	NONE	29	17	5	-	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	-	-
Benzo(a)anthracene	mg/kg	0.05	NONE	16	5.4	1.2	-	-
Chrysene	mg/kg	0.05	NONE	12	4.1	1.4	-	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	17	2.5	1.2	-	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	5.1	1	0.53	-	-
Benzo(a)pyrene	mg/kg	0.05	NONE	13	1.7	1.1	-	-

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Lab Sample Number				2507237	2507238	2507239	2507240	2507241
Sample Reference				WS117	WS122	WS124	TP108	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.20	3.20	3.40	0.70	1.00
Date Sampled				17/11/2022	18/11/2022	18/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	6.9	0.47	0.51	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	1.7	0.14	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	7.3	0.39	0.79	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Lab Sample Number	2507242	2507243	2507244	2507245	2507246
Sample Reference	TP113	TP114	TP115	TP116	TP120
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.90	1.00	0.80	1.20	0.20
Date Sampled	16/11/2022	16/11/2022	16/11/2022	16/11/2022	16/11/2022
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	16
Moisture Content	%	0.01	NONE	36	12
Total mass of sample received	kg	0.001	NONE	0.3	0.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile & Amosite	-	Chrysotile & Amosite	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.011	-	0.002	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.011	-	0.002	-
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO	DSO	DSO	DSO

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.6	10.1	10	8.4	8.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	9800	4000	1500	1200	140
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.022	0.35	0.081	0.33	0.003
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	43	700	160	660	6
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	21.5	349	81.2	332	3
Sulphide	mg/kg	1	MCERTS	6.8	7.6	17	260	88
Total Sulphur	mg/kg	50	MCERTS	6300	2000	850	4100	73
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.3	0.5	2	2.6	0.2

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.1	< 0.05	0.22	-	< 0.05
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.12	-	< 0.05
Acenaphthene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.2	-	< 0.05
Fluorene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.22	-	< 0.05
Phenanthrene	mg/kg	0.05	NONE	0.1	0.21	3.1	-	< 0.05
Anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.85	-	< 0.05
Fluoranthene	mg/kg	0.05	NONE	0.06	0.29	4.4	-	0.1
Pyrene	mg/kg	0.05	NONE	0.08	0.3	5.1	-	0.13
Benzo(a)anthracene	mg/kg	0.05	NONE	< 0.05	0.23	3.9	-	0.09
Chrysene	mg/kg	0.05	NONE	< 0.05	0.17	3.2	-	0.09
Benzo(b)fluoranthene	mg/kg	0.05	NONE	< 0.05	0.29	4.9	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	NONE	< 0.05	0.12	1.4	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	NONE	< 0.05	0.19	4.5	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	< 0.05	0.13	2.4	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	< 0.05	< 0.05	0.44	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	NONE	< 0.05	0.16	2.8	-	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	< 0.80	2.09	37.6	-	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	40	32	24	20	15
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507242	2507243	2507244	2507245	2507246
Sample Reference				TP113	TP114	TP115	TP116	TP120
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	0.80	1.20	0.20
Date Sampled				16/11/2022	16/11/2022	16/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	1.1	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	8.7	19	17	66	6.9
Copper (aqua regia extractable)	mg/kg	1	MCERTS	44	39	100	240	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	610	140	430	590	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.5	0.8	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	19	22	69	5.3
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	110	69	220	62

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Toluene	µg/kg	5	NONE	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
p & m-xylene	µg/kg	5	NONE	-	-	-	< 1.0	-
o-xylene	µg/kg	5	NONE	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	< 1.0	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_ID_AL	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_ID_AL	mg/kg	1	NONE	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_ID_AL	mg/kg	2	NONE	-	-	-	10	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_ID_AL	mg/kg	8	NONE	-	-	-	110	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_ID_AL	mg/kg	8	NONE	-	-	-	410	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_ID_AL	mg/kg	10	NONE	-	-	-	530	-

TPH-CWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.001	NONE	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	NONE	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	NONE	-	-	-	6.7	-
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	NONE	-	-	-	150	-
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	NONE	-	-	-	430	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_ID_AR	mg/kg	10	NONE	-	-	-	580	-

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	< 1.0
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	-	< 2.0
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	NONE	< 4.0	< 4.0	5.6	-	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	35	-	< 1.0
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	NONE	< 1.0	< 1.0	86	-	< 1.0
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	NONE	< 10	< 10	< 10	-	< 10
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	< 10	< 10	130	-	< 10

VOCs

Chloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Chloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Bromomethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Vinyl Chloride	µg/kg	5	NONE	-	-	-	< 1.0	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507242	2507243	2507244	2507245	2507246
Sample Reference				TP113	TP114	TP115	TP116	TP120
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	0.80	1.20	0.20
Date Sampled				16/11/2022	16/11/2022	16/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Trichlorofluoromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1-Dichloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1-Dichloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
2,2-Dichloropropane	µg/kg	5	NONE	-	-	-	< 1.0	-
Trichloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,1-Trichloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dichloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1-Dichloropropene	µg/kg	5	NONE	-	-	-	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
Benzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Tetrachloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dichloropropane	µg/kg	5	NONE	-	-	-	< 1.0	-
Trichloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
Dibromomethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Bromodichloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	5	NONE	-	-	-	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	5	NONE	-	-	-	< 1.0	-
Toluene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,2-Trichloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,3-Dichloropropane	µg/kg	5	NONE	-	-	-	< 1.0	-
Dibromochloromethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Tetrachloroethene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dibromoethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Chlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
p & m-Xylene	µg/kg	5	NONE	-	-	-	< 1.0	-
Styrene	µg/kg	5	NONE	-	-	-	< 1.0	-
Tribromomethane	µg/kg	5	NONE	-	-	-	< 1.0	-
o-Xylene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	-	-	-	< 1.0	-
Isopropylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Bromobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
n-Propylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
2-Chlorotoluene	µg/kg	5	NONE	-	-	-	< 1.0	-
4-Chlorotoluene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
tert-Butylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
sec-Butylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,3-Dichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
p-Isopropyltoluene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,4-Dichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Butylbenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-
Hexachlorobutadiene	µg/kg	5	NONE	-	-	-	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	5	NONE	-	-	-	< 1.0	-

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Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507242	2507243	2507244	2507245	2507246
Sample Reference				TP113	TP114	TP115	TP116	TP120
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	0.80	1.20	0.20
Date Sampled				16/11/2022	16/11/2022	16/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Phenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
2-Chlorophenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	-	-	-	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	NONE	-	-	-	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2-Methylphenol	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Hexachloroethane	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Nitrobenzene	mg/kg	0.3	NONE	-	-	-	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Isophorone	mg/kg	0.2	NONE	-	-	-	< 0.2	-
2-Nitrophenol	mg/kg	0.3	NONE	-	-	-	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	-	-	-	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Naphthalene	mg/kg	0.05	NONE	-	-	-	0.21	-
2,4-Dichlorophenol	mg/kg	0.3	NONE	-	-	-	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	-	-	-	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	0.3	-
2-Chloronaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Dimethylphthalate	mg/kg	0.1	NONE	-	-	-	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	NONE	-	-	-	< 0.1	-
Acenaphthylene	mg/kg	0.05	NONE	-	-	-	< 0.05	-
Acenaphthene	mg/kg	0.05	NONE	-	-	-	0.56	-
2,4-Dinitrotoluene	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Dibenzofuran	mg/kg	0.2	NONE	-	-	-	0.3	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Diethyl phthalate	mg/kg	0.2	NONE	-	-	-	< 0.2	-
4-Nitroaniline	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Fluorene	mg/kg	0.05	NONE	-	-	-	0.49	-
Azobenzene	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Phenanthrene	mg/kg	0.05	NONE	-	-	-	3.7	-
Anthracene	mg/kg	0.05	NONE	-	-	-	1	-
Carbazole	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	NONE	-	-	-	< 0.2	-
Anthraquinone	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Fluoranthene	mg/kg	0.05	NONE	-	-	-	8.3	-
Pyrene	mg/kg	0.05	NONE	-	-	-	7.7	-
Butyl benzyl phthalate	mg/kg	0.3	NONE	-	-	-	< 0.3	-
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	-	4.1	-
Chrysene	mg/kg	0.05	NONE	-	-	-	4.1	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	-	5	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	-	1.7	-
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	-	4.1	-

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 Project / Site name: Edenfield Road
 Your Order No: 003525

Lab Sample Number				2507242	2507243	2507244	2507245	2507246
Sample Reference				TP113	TP114	TP115	TP116	TP120
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	1.00	0.80	1.20	0.20
Date Sampled				16/11/2022	16/11/2022	16/11/2022	16/11/2022	16/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	-	2.1	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	-	0.51	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	-	2.2	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number	2507247	2507248	2507249	2507250	2507251
Sample Reference	TP122	TP123	TP124	TP125	TP126
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1.00	0.80	1.40	1.00	0.90
Date Sampled	17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	15
Total mass of sample received	kg	0.001	NONE	0.3	0.7

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO	LFT	LFT	LFT

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	8.7	7.6	7.8	8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	810	770	260	210	1000
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	g/l	0.00125	MCERTS	0.1	0.14	0.02	0.04	0.085
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/kg	2.5	MCERTS	210	280	39	79	170
Water Soluble SO ₄ (2:1 Leach. Equiv.) 1hr extraction	mg/l	1.25	MCERTS	104	141	19.5	39.6	84.5
Sulphide	mg/kg	1	MCERTS	82	4.5	11	55	44
Total Sulphur	mg/kg	50	MCERTS	1100	780	340	1400	910
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	3.5	2.5	1.5	0.7	1.7

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	3	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	-	-	-	-	-
Acenaphthylene	mg/kg	0.05	NONE	-	-	-	-	-
Acenaphthene	mg/kg	0.05	NONE	-	-	-	-	-
Fluorene	mg/kg	0.05	NONE	-	-	-	-	-
Phenanthrene	mg/kg	0.05	NONE	-	-	-	-	-
Anthracene	mg/kg	0.05	NONE	-	-	-	-	-
Fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Pyrene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	NONE	-	-	-	-	-
Chrysene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	NONE	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	-	-	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	NONE	-	-	-	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	9.7	6.2	3.2	15
Barium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507247	2507248	2507249	2507250	2507251
Sample Reference				TP122	TP123	TP124	TP125	TP126
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.80	1.40	1.00	0.90
Date Sampled				17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.1	0.5	0.3	0.2	0.7
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	20	18	16	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	54	51	24	14	43
Lead (aqua regia extractable)	mg/kg	1	MCERTS	250	73	24	17	500
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29	26	21	17	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	150	94	69	53	280

Monoaromatics & Oxygenates

Benzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	5	NONE	14	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	5	NONE	16	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 HS_ID_AL	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS_ID_AL	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS_ID_AL	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_ID_AL	mg/kg	1	NONE	3.6	6	< 1.0	3.9	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_ID_AL	mg/kg	2	NONE	70	18	< 2.0	24	10
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_ID_AL	mg/kg	8	NONE	170	20	< 8.0	< 8.0	38
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_ID_AL	mg/kg	8	NONE	370	120	< 8.0	< 8.0	150
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_ID_AL	mg/kg	10	NONE	610	170	< 10	31	200

TPH-CWG - Aromatic >EC5 - EC7 HS_ID_AR	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 HS_ID_AR	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 HS_ID_AR	mg/kg	0.001	NONE	0.032	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 EH_CU_ID_AR	mg/kg	1	NONE	18	9	< 1.0	3.2	3.5
TPH-CWG - Aromatic >EC12 - EC16 EH_CU_ID_AR	mg/kg	2	NONE	150	54	4.4	50	21
TPH-CWG - Aromatic >EC16 - EC21 EH_CU_ID_AR	mg/kg	10	NONE	350	170	10	120	120
TPH-CWG - Aromatic >EC21 - EC35 EH_CU_ID_AR	mg/kg	10	NONE	460	310	< 10	39	300
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_ID_AR	mg/kg	10	NONE	980	540	23	220	440

TPH (C5 - C6) HS_ID_TOTAL	mg/kg	1	NONE	-	-	-	-	-
TPH (C6 - C8) HS_ID_TOTAL	mg/kg	0.1	NONE	-	-	-	-	-
TPH (C8 - C10) HS_ID_TOTAL	mg/kg	0.1	NONE	-	-	-	-	-
TPH (C10 - C12) EH_CU_ID_TOTAL	mg/kg	2	NONE	-	-	-	-	-
TPH (C12 - C16) EH_CU_ID_TOTAL	mg/kg	4	NONE	-	-	-	-	-
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	NONE	-	-	-	-	-
TPH (C21 - C35) EH_CU_ID_TOTAL	mg/kg	1	NONE	-	-	-	-	-
TPH (C35 - C40) EH_CU_ID_TOTAL	mg/kg	10	NONE	-	-	-	-	-
TPH Total C5 - C40 EH_CU+HS_ID_TOTAL	mg/kg	10	NONE	-	-	-	-	-

VOCs

Chloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 22-98029
Project / Site name: Edenfield Road
Your Order No: 003525

Lab Sample Number				2507247	2507248	2507249	2507250	2507251
Sample Reference				TP122	TP123	TP124	TP125	TP126
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.80	1.40	1.00	0.90
Date Sampled				17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Trichlorofluoromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/kg	5	NONE	14	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/kg	5	NONE	16	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	5	NONE	110	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	5	NONE	130	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	5	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Your Order No: 003525

Lab Sample Number				2507247	2507248	2507249	2507250	2507251
Sample Reference				TP122	TP123	TP124	TP125	TP126
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.80	1.40	1.00	0.90
Date Sampled				17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	2	< 0.1	< 0.1	0.3
Phenol	mg/kg	0.2	NONE	0.4	1.3	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	NONE	< 0.3	1.7	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	0.4	3.7	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	NONE	< 0.3	3.7	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	NONE	4.5	12	0.27	0.11	4.3
2,4-Dichlorophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	14	14	0.2	< 0.1	2.6
2-Chloronaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	0.12	0.21
Acenaphthene	mg/kg	0.05	NONE	9.1	24	0.64	1.4	4.6
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	NONE	7.2	19	0.3	< 0.2	2.4
4-Chlorophenyl phenyl ether	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	NONE	10	22	0.53	3	3.9
Azobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	NONE	39	110	3.1	1.1	27
Anthracene	mg/kg	0.05	NONE	15	29	0.76	2.7	6.4
Carbazole	mg/kg	0.3	NONE	4.1	20	< 0.3	< 0.3	2.3
Dibutyl phthalate	mg/kg	0.2	NONE	1.9	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	NONE	< 0.3	5.3	< 0.3	< 0.3	1.5
Fluoranthene	mg/kg	0.05	NONE	45	110	3.4	9.5	32
Pyrene	mg/kg	0.05	NONE	37	95	2.8	9.1	26
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	NONE	20	57	1.4	2.6	14
Chrysene	mg/kg	0.05	NONE	17	48	1.1	2.2	10
Benzo(b)fluoranthene	mg/kg	0.05	NONE	20	60	1.4	0.86	13
Benzo(k)fluoranthene	mg/kg	0.05	NONE	8.7	25	0.46	0.55	5.7
Benzo(a)pyrene	mg/kg	0.05	NONE	18	53	1.1	0.67	13

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 Project / Site name: Edenfield Road
 Your Order No: 003525

Lab Sample Number				2507247	2507248	2507249	2507250	2507251
Sample Reference				TP122	TP123	TP124	TP125	TP126
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.80	1.40	1.00	0.90
Date Sampled				17/11/2022	17/11/2022	17/11/2022	17/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	8	24	0.58	0.16	6.4
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	2.2	6.8	0.15	< 0.05	1.6
Benzo(ghi)perylene	mg/kg	0.05	NONE	8.3	27	0.51	0.09	6.5

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Analytical Report Number: 22-98029

Project / Site name: Edenfield Road

Your Order No: 003525

Lab Sample Number				2507252	2507253	2507254
Sample Reference				TP108	TP115	TP126
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.70	0.80	0.90
Date Sampled				16/11/2022	16/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status			

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	11.1	10.3	8.2
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	5.5	< 1.0

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	1.2
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	4.6	25	4
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	32	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	62	1.6	1.5
Copper (dissolved)	µg/l	0.7	ISO 17025	26	13	17
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	10	15
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.3	0.9	2.2
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.7	5.3	18

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_ID_TOTAL_MS	µg/l	10	NONE	< 10	< 10	< 10
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Analytical Report Number: 22-98029

Project / Site name: Edenfield Road

Your Order No: 003525

Lab Sample Number				2507252	2507253	2507254
Sample Reference				TP108	TP115	TP126
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.70	0.80	0.90
Date Sampled				16/11/2022	16/11/2022	17/11/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status			
TPH-CWG - Aliphatic >C5 - C6 _{HS, 1D, AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 _{HS, 1D, AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 _{HS, 1D, AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 _{EH, 1D, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 _{EH, 1D, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 _{EH, 1D, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 _{EH, 1D, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) _{HS+EH, 1D, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7 _{HS, 1D, AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS, 1D, AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 _{HS, 1D, AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH, 1D, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 _{EH, 1D, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 _{EH, 1D, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 _{EH, 1D, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) _{HS+EH, 1D, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 22-98029

Project / Site name: Edenfield Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2507222	Bund	None Supplied	None Supplied	Brown clay and loam with gravel and vegetation.
2507228	WS101	None Supplied	0.8	Brown clay and loam with gravel and vegetation.
2507229	WS105	None Supplied	2.6	Brown clay and sand with gravel.
2507230	WS107	None Supplied	2.5	Grey clay and sand.
2507231	WS110	None Supplied	0.5	Brown clay and sand with gravel.
2507232	WS111	None Supplied	0.6	Brown clay and sand with gravel.
2507233	WS112	None Supplied	2.6	Grey clay and sand with gravel.
2507234	WS114	None Supplied	1.5	Brown sandy clay.
2507235	WS115	None Supplied	1.7	3.11.20.0
2507236	WS116	None Supplied	0.8	Brown clay and sand.
2507237	WS117	None Supplied	3.2	Grey clay and sand with gravel.
2507238	WS122	None Supplied	3.2	Grey clay with gravel.
2507239	WS124	None Supplied	3.4	Grey gravel with brick and stones.
2507240	TP108	None Supplied	0.7	3.11.20.9
2507241	TP110	None Supplied	1	Brown clay and sand with gravel.
2507242	TP113	None Supplied	0.9	10.4.8.17
2507243	TP114	None Supplied	1	Brown clay and sand with stones.
2507244	TP115	None Supplied	0.8	Brown clay and sand with gravel.
2507245	TP116	None Supplied	1.2	Brown clay and sand with gravel.
2507246	TP120	None Supplied	0.2	Brown sand.
2507247	TP122	None Supplied	1	Brown clay and sand with gravel.
2507248	TP123	None Supplied	0.8	Brown clay and sand with gravel and brick.
2507249	TP124	None Supplied	1.4	Brown clay with stones.
2507250	TP125	None Supplied	1	Light grey clay and sand with stones.
2507251	TP126	None Supplied	0.9	Brown loam and sand with gravel and brick.

Analytical Report Number : 22-98029

Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

Analytical Report Number : 22-98029

Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	NONE
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	NONE
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Sulphate, water soluble, in soil (1hr extraction)	Sulphate, water soluble, in soil (1hr extraction)	In-house method	L038-PL	D	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC

Analytical Report Number : 22-98029

Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

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Analytical Report Number : 22-10681

Project / Site name:	Edenfield Road	Samples received on:	30/11/2022
Your job number:	16 465	Samples instructed on/ Analysis started on:	30/11/2022
Your order number:	003602	Analysis completed by:	07/12/2022
Report Issue Number:	1	Report issued on:	07/12/2022
Samples Analysed:	4 water samples		


Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-10681
Project / Site name: Edenfield Road

Your Order No: 003602

Lab Sample Number				2517914	2517915	2517916	2517917
Sample Reference				CP101	CP103	Naden Brook Upstream	Naden Brook Downstream
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022	29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

PFAS Suite 3

PFBS C4 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PHPS C5 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFHxS C6 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFHpS C7 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFOS C8 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFNS C9 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFDS C10 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFUdS C11 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFDoS C12 Sulphonate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFBA C4 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFPeA C5 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFHxA C6 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFHpA C7 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFOA C8 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFNA C9 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFDA C10 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFUdA C11 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05
PFDoA C12 Carboxylic acid	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-10681

Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
EF - PFAS suite 3 in water by LC-MS/MS	PFAS suite 3 by LC-MS/MS	In-house method	UK	W	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C. Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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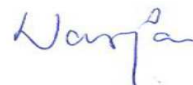
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Analytical Report Number : 22-12382

Project / Site name:	Edenfield Road	Samples received on:	21/11/2022
Your job number:	16-465	Samples instructed on/ Analysis started on:	09/12/2022
Your order number:	003525	Analysis completed by:	15/12/2022
Report Issue Number:	1	Report issued on:	15/12/2022
Samples Analysed:	1 soil sample		

Signed:



Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-12382
 Project / Site name: Edenfield Road
 Your Order No: 003525

Lab Sample Number				2527754
Sample Reference				TP118
Sample Number				None Supplied
Depth (m)				0.60
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	6.9
Total mass of sample received	kg	0.001	NONE	0.4

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	< 0.007
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PCBs

PCB Congener 077	mg/kg	0.001	NONE	< 0.001
PCB Congener 081	mg/kg	0.001	NONE	< 0.001
PCB Congener 105	mg/kg	0.001	NONE	< 0.001
PCB Congener 114	mg/kg	0.001	NONE	< 0.001
PCB Congener 118	mg/kg	0.001	NONE	< 0.001
PCB Congener 123	mg/kg	0.001	NONE	< 0.001
PCB Congener 126	mg/kg	0.001	NONE	< 0.001
PCB Congener 156	mg/kg	0.001	NONE	< 0.001
PCB Congener 157	mg/kg	0.001	NONE	< 0.001
PCB Congener 167	mg/kg	0.001	NONE	< 0.001
PCB Congener 169	mg/kg	0.001	NONE	< 0.001
PCB Congener 189	mg/kg	0.001	NONE	< 0.001

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	< 0.012
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 22-12382

Project / Site name: Edenfield Road

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2527754	TP118	None Supplied	0.6	Light brown sand with gravel.

Analytical Report Number : 22-12382
Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC. Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report



Analytical Report Number : 22-12382

Project / Site name: Edenfield Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP118	None Supplied	S	2527754	a	None Supplied	None Supplied	None Supplied



4041



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Analytical Report Number : 23-39721

Project / Site name:	Edenfield Road	Samples received on:	15/06/2023
Your job number:	16-465	Samples instructed on/ Analysis started on:	15/06/2023
Your order number:	005194	Analysis completed by:	23/06/2023
Report Issue Number:	1	Report issued on:	23/06/2023
Samples Analysed:	1 leachate sample		

Signed:

Elżbieta Suchy
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



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Analytical Report Number: 23-39721

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2716640
Sample Reference				RB105
Sample Number				None Supplied
Depth (m)				11.60
Date Sampled				06/06/2023
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH (automated)	pH Units	N/A	ISO 17025	8.1
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	2.4

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	2
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	2
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0.2
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	2.2
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	3.3
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Copper (dissolved)	µg/l	0.7	ISO 17025	5.1
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.5
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	4.2

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10



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Analytical Report Number: 23-39721

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number	2716640			
Sample Reference	RB105			
Sample Number	None Supplied			
Depth (m)	11.60			
Date Sampled	06/06/2023			
Time Taken	None Supplied			
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status	

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_ID_TOTAL_MS	µg/l	10	NONE	90
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TPH-CWG - Aliphatic >C5 - C6## HS_ID_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8## HS_ID_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10## HS_ID_AL	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_MS	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35)## HS+EH_ID_AL_MS	µg/l	10	NONE	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_MS	µg/l	10	NONE	22
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_MS	µg/l	10	NONE	53
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_MS	µg/l	10	NONE	15
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_MS	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	90

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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**Analytical Report Number : 23-39721****Project / Site name: Edenfield Road****Water matrix abbreviations:****Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025

Analytical Report Number : 23-39721
Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

- Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.



4041



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Analytical Report Number : 22-10677

Project / Site name:	Edenfield Road	Samples received on:	30/11/2022
Your job number:	16 465	Samples instructed on/ Analysis started on:	30/11/2022
Your order number:	003601	Analysis completed by:	09/12/2022
Report Issue Number:	1	Report issued on:	09/12/2022
Samples Analysed:	7 water samples		


Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.



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Analytical Report Number: 22-10677

Project / Site name: Edenfield Road

Your Order No: 003601

Lab Sample Number				2517889	2517890	2517891	2517892	2517893
Sample Reference				CP101	CP103	Woodhouse Lane Upstream	Woodhouse Lane Downstream	Naden Brook Upstream
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022	29/11/2022	29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.4	7.7	7.8	7.6	7.6
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	1.95	1.68	5.06	4.58	5.44

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	1.2	< 1.0	< 1.0
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	37	41	8.1	9.2	8
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.57	0.74	0.41	0.3	0.49
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04	0.02	0.05	0.03	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.7	< 0.2	< 0.2	0.3	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	2.1	1.1	3.2	4.2	5.1
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	610	450	12	1.3	2.3
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.1	1	2.8	3	1.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.6	< 0.6	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	8.3	4.3	11	8.2	7.4

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) _{EH_ID_TOTAL_MS}	µg/l	10	ISO 17025	< 10	< 10	< 10	95	< 10
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TPH-CWG - Aliphatic >C5 - C6 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) _{HS+EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	15	< 10
TPH-CWG - Aromatic >C16 - C21 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	40	< 10
TPH-CWG - Aromatic >C21 - C35 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	40	< 10



4041



Analytical Report Number: 22-10677

Project / Site name: Edenfield Road

Your Order No: 003601

Lab Sample Number				2517889	2517890	2517891	2517892	2517893
Sample Reference				CP101	CP103	Woodhouse Lane Upstream	Woodhouse Lane Downstream	Naden Brook Upstream
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022	29/11/2022	29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
TPH-CWG - Aromatic (C5 - C35) HS+EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	95	< 10

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tri bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



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Analytical Report Number: 22-10677

Project / Site name: Edenfield Road

Your Order No: 003601

Lab Sample Number				2517889	2517890	2517891	2517892	2517893
Sample Reference				CP101	CP103	Woodhouse Lane Upstream	Woodhouse Lane Downstream	Naden Brook Upstream
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022	29/11/2022	29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.46	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.16	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Analytical Report Number: 22-10677

Project / Site name: Edenfield Road

Your Order No: 003601

Lab Sample Number				2517889	2517890	2517891	2517892	2517893
Sample Reference				CP101	CP103	Woodhouse Lane Upstream	Woodhouse Lane Downstream	Naden Brook Upstream
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022	29/11/2022	29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	0.51	< 0.01	0.83	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	1.7	< 0.01	0.68	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	0.15	< 0.01	0.35	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	0.15	< 0.01	0.37	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.44	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.16	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	0.3	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample



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Analytical Report Number: 22-10677

Project / Site name: Edenfield Road

Your Order No: 003601

Lab Sample Number				2517894	2517895
Sample Reference				Naden Brook Midstream	Naden Brook Downstream
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.9	7.3
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	5.02	4.85

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	7.8	12
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.33	0.43
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.06
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.5	0.5
Copper (dissolved)	µg/l	0.5	ISO 17025	4	3.3
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	7.6	76
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.3	1.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.9	10

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) _{EH_ID_TOTAL_MS}	µg/l	10	ISO 17025	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 _{HS_ID_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 _{EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) _{HS+EH_ID_AL_MS}	µg/l	10	NONE	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 _{HS_ID_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 _{EH_ID_AR_MS}	µg/l	10	NONE	< 10	< 10



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Analytical Report Number: 22-10677

Project / Site name: Edenfield Road

Your Order No: 003601

Lab Sample Number				2517894	2517895
Sample Reference				Naden Brook Midstream	Naden Brook Downstream
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0
Tri bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0



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Analytical Report Number: 22-10677

Project / Site name: Edenfield Road

Your Order No: 003601

Lab Sample Number				2517894	2517895
Sample Reference				Naden Brook Midstream	Naden Brook Downstream
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05

Analytical Report Number: 22-10677
Project / Site name: Edenfield Road

Your Order No: 003601

Lab Sample Number				2517894	2517895
Sample Reference				Naden Brook Midstream	Naden Brook Downstream
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				29/11/2022	29/11/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-10677
Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 dphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector



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Analytical Report Number : 22-10677

Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
GC	Gas Chromatography				
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))				
CU	Clean-up - e.g. by Florisil®, silica gel				
1D	GC - Single coil/column gas chromatography				
2D	GC-GC - Double coil/column gas chromatography				
Total	Aliphatics & Aromatics				
AL	Aliphatics				
AR	Aromatics				
#1	EH_2D_Total but with humics mathematically subtracted				
#2	EH_2D_Total but with fatty acids mathematically subtracted				
-	Operator - understore to separate acronyms (exception for +)				
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total				



4041



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Analytical Report Number : 23-41412

Project / Site name:	Edenfield Road	Samples received on:	26/06/2023
Your job number:	16-465	Samples instructed on/ Analysis started on:	26/06/2023
Your order number:	005194	Analysis completed by:	01/07/2023
Report Issue Number:	1	Report issued on:	03/07/2023
Samples Analysed:	13 water samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-41412
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number	2726661	2726662	2726663	2726664	2726665
Sample Reference	CP101	CP103	RB101	RB102	RB103
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	22/06/2023	22/06/2023	22/06/2023	22/06/2023	22/06/2023
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH (L005B)	pH Units	N/A	ISO 17025	7.8	7.8	7.8	7.7	7.7
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	1.45	1.29	1.18	1.28	1.4

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	34	32	34	33	33
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.34	0.4	0.39	0.3	0.32
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03	0.02	< 0.02	0.03	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	0.8	3.8	0.7	0.7	4.3
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	0.6	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	230	U/S^^	3.6	7.1	U/S^^
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	< 0.5	0.6	< 0.5	< 0.5	< 0.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.7	< 0.6	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	0.6	5.8	0.6	1.3	2

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_1D_TOTAL_MS	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Environmental Science

Analytical Report Number: 23-41412

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726661	2726662	2726663	2726664	2726665
Sample Reference				CP101	CP103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0##	< 3.0##	< 3.0##	< 3.0##	< 3.0##
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trans-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tribromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0



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Environmental Science

Analytical Report Number: 23-41412

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726661	2726662	2726663	2726664	2726665
Sample Reference				CP101	CP103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Analytical Report Number: 23-41412
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726661	2726662	2726663	2726664	2726665
Sample Reference				CP101	CP103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-41412
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726666	2726667	2726668	2726669	2726670
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH (L005B)	pH Units	N/A	ISO 17025	7.8	7.4	7.8	7.5	7.5
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	1.49	0.97	8.23	7.59	8.37

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	25	31	16	16	16
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.33	0.31	0.61	0.58	0.61
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.02	0.03	0.02	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	0.6	1	3.7	3.1	5.1
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	140	100	0.51	0.5	1.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	< 0.5	0.6	2.9	2.6	3
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.1	3.9	5.2	5.2	8.9

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_1D_TOTAL_MS	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_1D_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C6 - C8 HS_1D_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C8 - C10 HS_1D_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C10 - C12 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_1D_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_1D_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_1D_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Environmental Science

Analytical Report Number: 23-41412

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726666	2726667	2726668	2726669	2726670
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0##	< 3.0##	< 3.0##	< 3.0##	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0#
Trichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0#
Trans-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0#
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tribromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0#
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0#
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0#
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0



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Environmental Science

Analytical Report Number: 23-41412

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726666	2726667	2726668	2726669	2726670
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

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Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726666	2726667	2726668	2726669	2726670
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number	2726671	2726672	2726673
Sample Reference	Naden Brook Upstream	Naden Brook Midstream	Naden Brook Downstream
Sample Number	None Supplied	None Supplied	None Supplied
Depth (m)	None Supplied	None Supplied	None Supplied
Date Sampled	22/06/2023	22/06/2023	22/06/2023
Time Taken	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status

General Inorganics

pH (L005B)	pH Units	N/A	ISO 17025	7.5	7.9	7.6
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	7.63	8.01	8.01

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	16	16	16
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.57	0.57	0.58
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02	0.02	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	3.4	6.5	3.2
Lead (dissolved)	µg/l	0.2	ISO 17025	0.5	< 0.2	0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	0.51	0.59	0.66
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.8	2.7	2.7
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	5.6	4.5	4.5

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) _{EH, ID, TOTAL, MS}	µg/l	10	ISO 17025	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 _{HS, ID, AL}	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C6 - C8 _{HS, ID, AL}	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C8 - C10 _{HS, ID, AL}	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C10 - C12 _{EH, ID, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 _{EH, ID, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 _{EH, ID, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 _{EH, ID, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) _{HS+EH, ID, AL, MS}	µg/l	10	NONE	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 _{HS, ID, AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS, ID, AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 _{HS, ID, AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH, ID, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 _{EH, ID, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 _{EH, ID, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 _{EH, ID, AR, MS}	µg/l	10	NONE	< 10	< 10	< 10



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Analytical Report Number: 23-41412
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726671	2726672	2726673
Sample Reference				Naden Brook Upstream	Naden Brook Midstream	Naden Brook Downstream
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#
Trichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#
Trans-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Tetrachloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Tribromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0



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Analytical Report Number: 23-41412
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726671	2726672	2726673
Sample Reference				Naden Brook Upstream	Naden Brook Midstream	Naden Brook Downstream
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05

Analytical Report Number: 23-41412
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2726671	2726672	2726673
Sample Reference				Naden Brook Upstream	Naden Brook Midstream	Naden Brook Downstream
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				22/06/2023	22/06/2023	22/06/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-41412
Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

Analytical Report Number : 23-41412
Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
-	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

^^ Analysis could not be completed due to sample matrix.

- Data reported unaccredited due to quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

- Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

Sample Deviation Report

Analytical Report Number : 23-41412

Project / Site name: Edenfield Road

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis. Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
CP101	None Supplied	W	2726661	c	pH at 20oC in water (automated)	L099-PL	c
CP103	None Supplied	W	2726662	c	pH at 20oC in water (automated)	L099-PL	c
Naden Brook Downstream	None Supplied	W	2726673	c	pH at 20oC in water (automated)	L099-PL	c
Naden Brook Midstream	None Supplied	W	2726672	c	pH at 20oC in water (automated)	L099-PL	c
Naden Brook Upstream	None Supplied	W	2726671	c	pH at 20oC in water (automated)	L099-PL	c
RB101	None Supplied	W	2726663	c	pH at 20oC in water (automated)	L099-PL	c
RB102	None Supplied	W	2726664	c	pH at 20oC in water (automated)	L099-PL	c
RB103	None Supplied	W	2726665	c	pH at 20oC in water (automated)	L099-PL	c
RB104	None Supplied	W	2726666	c	pH at 20oC in water (automated)	L099-PL	c
RB105	None Supplied	W	2726667	c	pH at 20oC in water (automated)	L099-PL	c
Spring	None Supplied	W	2726668	c	pH at 20oC in water (automated)	L099-PL	c
Woodhouse Lane Brook	Downstream	W	2726670	c	pH at 20oC in water (automated)	L099-PL	c
Woodhouse Lane Brook	Upstream	W	2726669	c	pH at 20oC in water (automated)	L099-PL	c



4041



Mark Wilson

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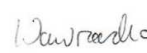
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Watford,
Herts,
WD18 8YS

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Analytical Report Number : 23-43533

Project / Site name:	Edenfield Road	Samples received on:	06/07/2023
Your job number:	16-465	Samples instructed on/ Analysis started on:	06/07/2023
Your order number:	005194	Analysis completed by:	12/07/2023
Report Issue Number:	1	Report issued on:	12/07/2023
Samples Analysed:	13 water samples		


Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



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Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738943	2738944	2738945	2738946	2738947
Sample Reference				CP101	CP103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.8	7.9	7.9	7.8	7.7
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	1.49	1.22	1.31	1.24	1.64

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	1.3	< 1.0	< 1.0	< 1.0
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	24	22	23	23	23
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.25	0.31	0.31	0.3	0.19
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03	0.04	0.04	0.05	0.05
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.9	2	1.5	1	0.8
Copper (dissolved)	µg/l	0.5	ISO 17025	1	< 0.5	< 0.5	1.1	< 0.5
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	330	400	370	230	540
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.8	< 0.5	< 0.5	8.8	< 0.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.7	3.3	1.7	1.6	1.4

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_ID_TOTAL_MS	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738943	2738944	2738945	2738946	2738947
Sample Reference				CP101	CP103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738943	2738944	2738945	2738946	2738947
Sample Reference				CP101	CP103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Analytical Report Number: 23-43533
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738943	2738944	2738945	2738946	2738947
Sample Reference				CP101	CP103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738948	2738949	2738950	2738951	2738952
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.9	7.9	7.4	7.7	7.4
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	1.06	1.39	6.66	7.5	7.15

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	1.1	< 1.0	< 1.0
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	23	24	16	16	16
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.25	0.3	0.57	0.59	0.63
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04	0.03	0.02	0.05	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	2.4	2.5	0.3	0.7	0.7
Copper (dissolved)	µg/l	0.5	ISO 17025	< 0.5	3.4	2.5	7.2	3.4
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	540	330	1.2	2.3	2.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	< 0.5	0.6	2.2	2.5	2.3
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	1	13	5.3	9.9	11

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_ID_TOTAL_MS	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738948	2738949	2738950	2738951	2738952
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738948	2738949	2738950	2738951	2738952
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01



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Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738948	2738949	2738950	2738951	2738952
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738953	2738954	2738955
Sample Reference				Naden Brook	Naden Brook	Naden Brook
Sample Number				Upstream	Midstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.7	7.6	7.3
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	7.4	6.97	7.43

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	1
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	15	16	16
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.6	0.61	0.57
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.03	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.7	0.7	0.5
Copper (dissolved)	µg/l	0.5	ISO 17025	3.1	5.8	4.6
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	2.4	0.91	0.83
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	6	2.3	2.4
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	5.4	4.8	11

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_ID_TOTAL_MS	µg/l	10	ISO 17025	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10



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Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738953	2738954	2738955
Sample Reference				Naden Brook	Naden Brook	Naden Brook
Sample Number				Upstream	Midstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0



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Analytical Report Number: 23-43533

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738953	2738954	2738955
Sample Reference				Naden Brook	Naden Brook	Naden Brook
Sample Number				Upstream	Midstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01



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Analytical Report Number: 23-43533
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2738953	2738954	2738955
Sample Reference				Naden Brook	Naden Brook	Naden Brook
Sample Number				Upstream	Midstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				05/07/2023	05/07/2023	05/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-43533

Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

Analytical Report Number : 23-43533
Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC. Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total



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Analytical Report Number : 23-46009

Project / Site name:	Edenfield Road	Samples received on:	19/07/2023
Your job number:	16-465	Samples instructed on/ Analysis started on:	19/07/2023
Your order number:	005194	Analysis completed by:	25/07/2023
Report Issue Number:	1	Report issued on:	25/07/2023
Samples Analysed:	13 water samples		

Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



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Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753864	2753865	2753866	2753867	2753868
Sample Reference				CP101	cp103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.8	7.9	7.8	7.9	8
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	0.45	0.88	0.37	1.18	1.67

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	24	24	24	24	25
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.25	0.38	0.3	0.51	0.68
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.08	0.04	0.08	0.02	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.5	0.2	< 0.2	0.4
Copper (dissolved)	µg/l	0.5	ISO 17025	1.6	2.2	7.2	1.2	1.5
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	400	250	83	390	370
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	0.6	< 0.5	0.7
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	0.6	< 0.6	1.4	1.9
Zinc (dissolved)	µg/l	0.5	ISO 17025	1	2.2	1.3	< 0.5	0.5

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Toluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Ethylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
p & m-xylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
o-xylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_ID_TOTAL_MS	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0##	< 1.0##	< 1.0##	< 1.0##	< 1.0##
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753864	2753865	2753866	2753867	2753868
Sample Reference				CP101	cp103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Chloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Bromomethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Vinyl Chloride	µg/l	3	NONE	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Trichlorofluoromethane	µg/l	3	NONE	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Chloroform	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Benzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Trichloroethene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Dibromomethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Toluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Chlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Ethylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
p & m-Xylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Styrene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Bromoform	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
o-Xylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Bromobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#



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Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753864	2753865	2753866	2753867	2753868
Sample Reference				CP101	cp103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Butylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01



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Analytical Report Number: 23-46009
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753864	2753865	2753866	2753867	2753868
Sample Reference				CP101	cp103	RB101	RB102	RB103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753869	2753870	2753871	2753872	2753873
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	8.1	7.8	7.7	7.6	7.6
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	1.21	0.46	0.85	10.4	11.4

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	1.2
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	25	23	25	12	12
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.35	0.48	0.42	0.61	0.6
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.02	0.03	0.02	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3	0.3	0.4	0.5	0.5
Copper (dissolved)	µg/l	0.5	ISO 17025	0.7	2.8	1	5.3	5.4
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	0.4	0.3
Manganese (dissolved)	µg/l	0.05	ISO 17025	180	430	110	1.9	2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	3.3	3.4
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.9	0.7	0.7	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	< 0.5	4.7	0.6	3.5	3.6

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_ID_TOTAL_MS	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0#	< 1.0#	< 1.0#	< 1.0#	< 1.0#
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0#	< 1.0#	< 1.0#	< 1.0#	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0#	< 1.0#	< 1.0#	< 1.0#	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10



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Environmental Science

Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753869	2753870	2753871	2753872	2753873
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0



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Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753869	2753870	2753871	2753872	2753873
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Butylbenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0#
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0#	< 3.0#	< 3.0#	< 3.0#	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753869	2753870	2753871	2753872	2753873
Sample Reference				RB104	RB105	Spring	Woodhouse Lane Brook	Woodhouse Lane Brook
Sample Number				None Supplied	None Supplied	None Supplied	Upstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



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Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753874	2753875	2753876
Sample Reference				Naden Brook	Naden Brook	Naden Brook
Sample Number				Upstream	Midstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.6	7.5	7.5
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	10.2	10.6	10.2

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0	1.8
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Heavy Metals / Metalloids

Calcium (dissolved)	mg/l	0.012	ISO 17025	12	12	12
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.62	0.61	< 0.15
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.11	0.04	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.6	0.5	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	9.4	8.4	0.8
Lead (dissolved)	µg/l	0.2	ISO 17025	0.3	0.3	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	2.8	2.1	0.26
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	3.6	3.4	< 0.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	4.9	4.2	< 0.5

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH1 (C10 - C40) EH_ID_TOTAL_MS	µg/l	10	ISO 17025	< 10	< 10	< 10
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TPH-CWG - Aliphatic >C5 - C6 HS_ID_AL	µg/l	1	ISO 17025	< 1.0#	< 1.0#	< 1.0#
TPH-CWG - Aliphatic >C6 - C8 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS_ID_AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) HS+EH_ID_AL_MS	µg/l	10	NONE	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 HS_ID_AR	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) HS+EH_ID_AR_MS	µg/l	10	NONE	< 10	< 10	< 10

Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753874	2753875	2753876
Sample Reference				Naden Brook	Naden Brook	Naden Brook
Sample Number				Upstream	Midstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

VOCs

Chloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0##	< 3.0##	< 3.0##
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0



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Analytical Report Number: 23-46009

Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753874	2753875	2753876
Sample Reference				Naden Brook	Naden Brook	Naden Brook
Sample Number				Upstream	Midstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Butylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0##	< 3.0##	< 3.0##
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01



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Analytical Report Number: 23-46009
Project / Site name: Edenfield Road

Your Order No: 005194

Lab Sample Number				2753874	2753875	2753876
Sample Reference				Naden Brook	Naden Brook	Naden Brook
Sample Number				Upstream	Midstream	Downstream
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-46009

Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

Analytical Report Number : 23-46009

Project / Site name: Edenfield Road

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

- Data reported unaccredited due to quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

- Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

APPENDIX VII

ORIGIN OF TIER 2 GENERIC ASSESSMENT CRITERIA

CONSTITUENT	ORIGIN OF RISK ASSESSMENT VALUE
Arsenic	2014 LQM/CIEH S4ULs
Cadmium	2014 LQM/CIEH S4ULs
Chromium	2014 LQM/CIEH S4ULs
Lead	2014 LQM/CIEH S4ULs
Mercury	2014 LQM/CIEH S4ULs – methylmercury
Nickel	2014 LQM/CIEH S4ULs
Selenium	2014 LQM/CIEH S4ULs
Copper	2014 LQM/CIEH S4ULs
Zinc	2014 LQM/CIEH S4ULs
Cyanide – Total	2014 LQM/CIEH S4ULs
Phenols – Total	2014 LQM/CIEH S4ULs
Naphthalene	General assessment criteria (GAC) developed by CIEH/LQM Suitable 4 Use Levels with supporting data from SR3, SR7 and existing Tox report where applicable. 1% SOM.
Acenaphthylene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Pyrene	
Benzo(a)Anthracene	
Chrysene	
Benzo(b/k)Fluoranthene ⁽ⁱⁱⁱ⁾	
Benzo(a)Pyrene	
Indeno(123-cd)Pyrene	
Dibenzo(a,h)Anthracene	
Benzo(ghi)Perylene	
TPH C₅-C₆ (aliphatic)	
TPH C₆-C₈ (aliphatic)	
TPH C₈-C₁₀ (aliphatic)	
TPH C₁₀-C₁₂ (aliphatic)	
TPH C₁₂-C₁₆ (aromatic)	
TPH C₁₆-C₂₁ (aromatic)	
TPH C₂₁-C₃₅ (aromatic)	



APPENDIX VIII

GEOTECHNICAL TESTING

RESULTS



LABORATORY REPORT



4043

Contract Number: PSL22/7526

Report Date: 07 December 2022

Client's Reference: 16-465

Client Name: E3P
Taylor Road
Urmston
Manchester
M41 7JQ

For the attention of: Harriet Mason/M. Wilson

Contract Title: Edenfield Road

Date Received: 25/11/2022

Date Commenced: 25/11/2022

Date Completed: 7/12/2022

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins
(Director)

R Berriman
(Quality Manager)

S Royle
(Laboratory Manager)

L Knight
(Assistant Laboratory Manager)

S Eyre
(Senior Technician)

T Watkins
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
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awatkins@prosoils.co.uk

Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP110		B	1.70		Brown gravelly very sandy CLAY.
TP119		B	1.50		Brown sandy clayey GRAVEL with cobbles.
CP101		U100	8.00		Firm brown slightly gravelly very sandy CLAY
CP103		U100	8.00		Brown slightly gravelly very sandy CLAY
CP101		B	1.00		Brown very sandy very clayey GRAVEL with cobbles.
CP101		B	3.00		Brown very sandy slightly clayey GRAVEL
CP101		B	4.00		Brown very gravelly very sandy CLAY with cobbles.
CP103		B	1.00		Brown very sandy clayey GRAVEL with many cobbles.
CP103		B	4.00		Brown sandy slightly silty GRAVEL.
WS105		SPT	2.00		Brown gravelly sandy CLAY
WS117		SPT	4.00		Dark brown gravelly very sandy CLAY
WS101		SPT	4.00		Brown very sandy slightly clayey silty GRAVEL
WS102		SPT	1.00		Dark brown very gravelly sandy CLAY
CP101		SPT	5.00		Brown gravelly very sandy CLAY
CP101		SPT	8.00		Brown gravelly very sandy CLAY
CP101		SPT	9.50		Brown slightly gravelly very sandy CLAY
CP101		SPT	12.50		Brown gravelly very sandy CLAY
CP101		SPT	14.00		Brown gravelly very sandy CLAY
CP103		SPT	5.00		Brown gravelly very sandy CLAY



4043

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Edenfield Road

Contract No:

PSL22/7526

Client Ref:

16-465

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

4043

PSL
Professional Soils Laboratory

Edenfield Road

Contract No:

PSL22/7526

Client Ref:

16-465

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m ³ Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS105		SPT	2.00		22			38	20	18	83	Intermediate Plasticity CI
WS117		SPT	4.00		15			27	14	13	81	Low Plasticity CL
WS101		SPT	4.00		17				NP			
WS102		SPT	1.00		28			41	22	19	64	Intermediate Plasticity CI
CP101		SPT	5.00		14			32	15	17	85	Low Plasticity CL
CP101		SPT	8.00		14			29	14	15	81	Low Plasticity CL
CP101		SPT	9.50		28			30	15	15	92	Low Plasticity CL
CP101		SPT	12.50		16			34	16	18	80	Low Plasticity CL
CP101		SPT	14.00		14			30	14	16	83	Low Plasticity CL
CP103		SPT	5.00		21			31	16	15	85	Low Plasticity CL
CP103		SPT	6.50		20			29	15	14	87	Low Plasticity CL
CP103		SPT	11.00		25			30	16	14	83	Low Plasticity CL
CP103		SPT	12.50		17			27	13	14	81	Low Plasticity CL

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.



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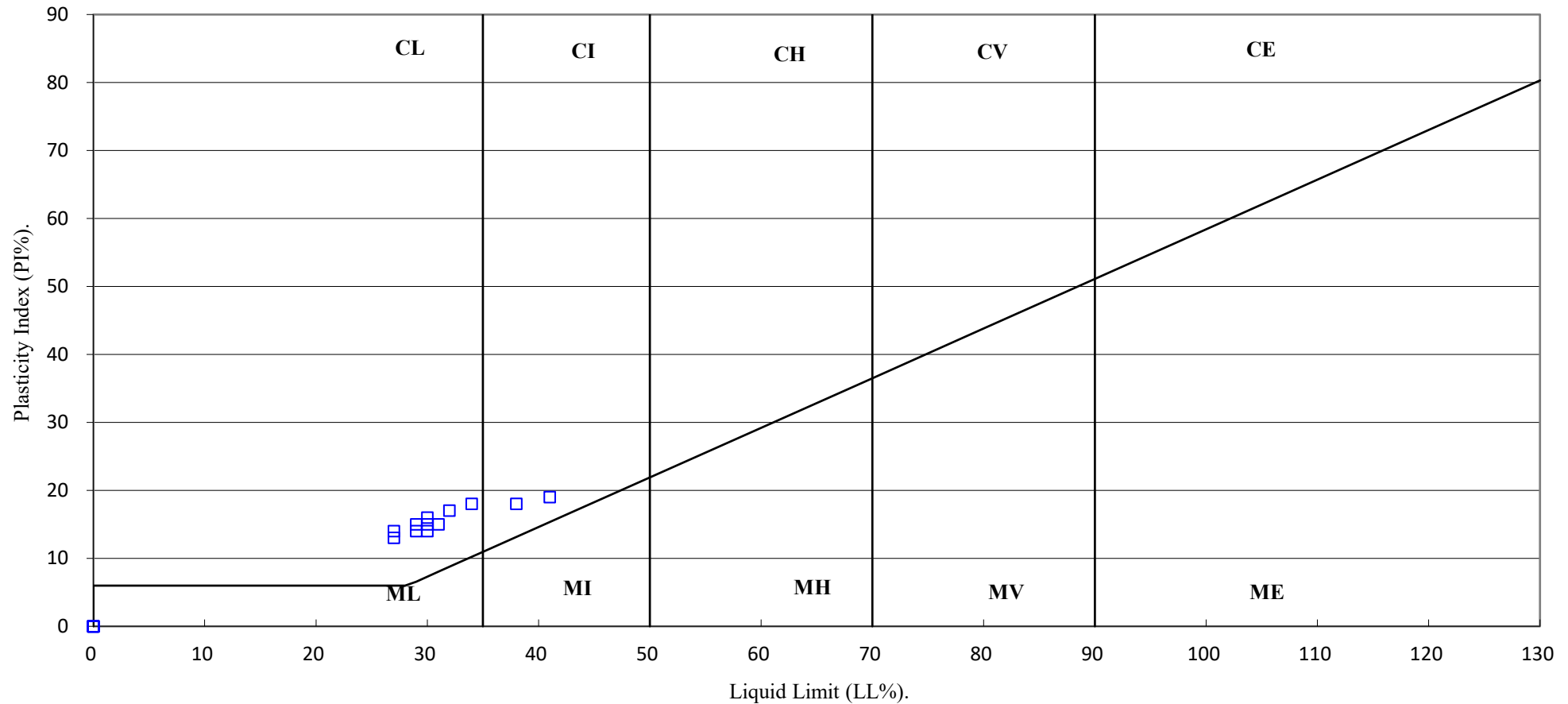
Edenfield Road

Contract No:

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Client Ref:

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



4043

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Contract No:

PSL22/7526

Client Ref:

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

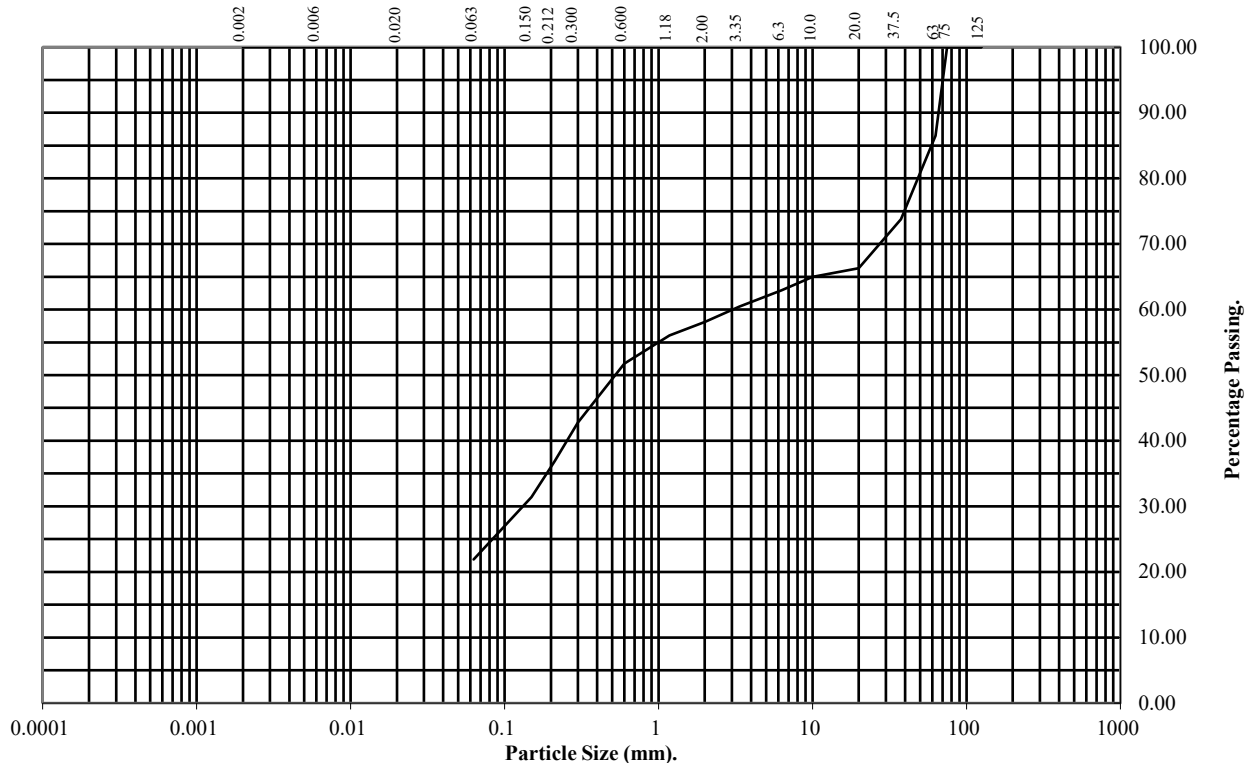
Hole Number: CP101

Top Depth (m): 1.00

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	87
37.5	74
20	66
10	65
6.3	63
3.35	60
2	58
1.18	56
0.6	52
0.3	43
0.212	37
0.15	31
0.063	22

Soil Fraction	Total Percentage
Cobbles	13
Gravel	29
Sand	36
Silt/Clay	22

Remarks:

See Summary of Soil Descriptions



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Contract No:
PSL22/7526
Client Ref:
16-465

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

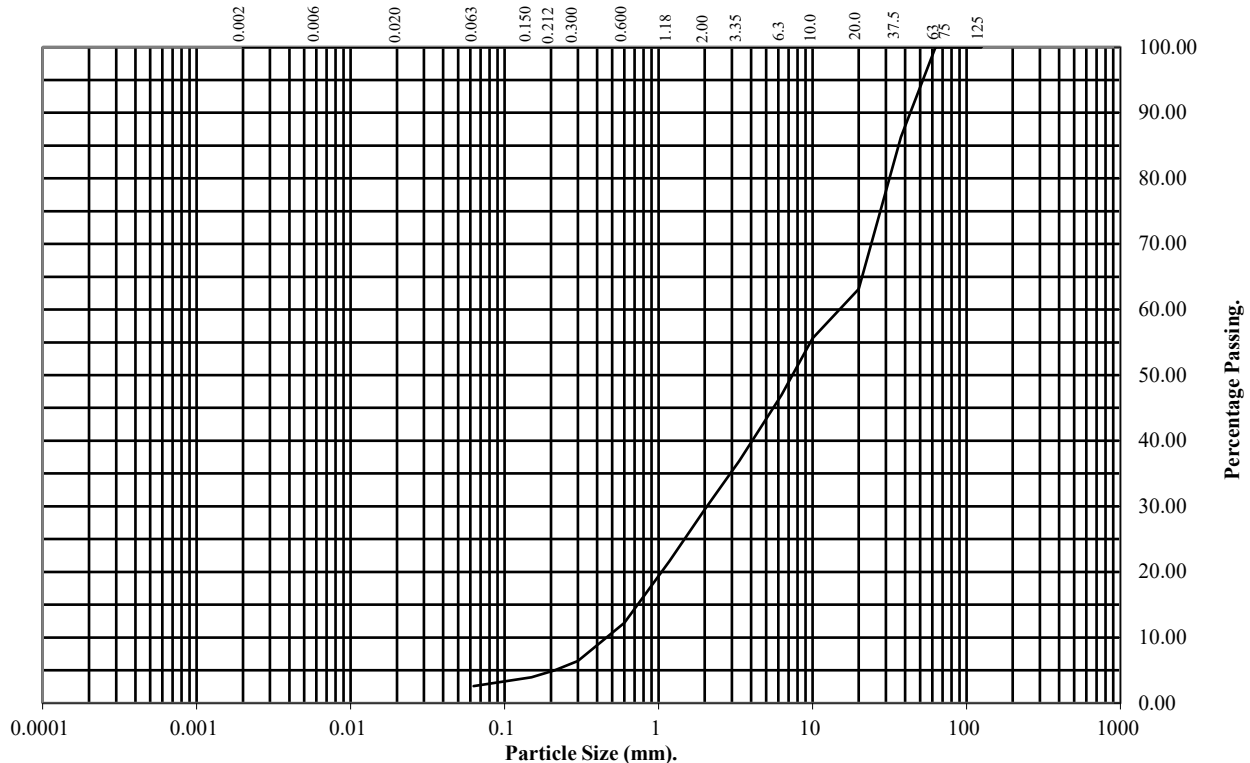
Hole Number: CP101

Top Depth (m): 3.00

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	86
20	63
10	56
6.3	47
3.35	37
2	29
1.18	22
0.6	12
0.3	6
0.212	5
0.15	4
0.063	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	71
Sand	26
Silt/Clay	3

Remarks:

See Summary of Soil Descriptions



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Contract No:

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Client Ref:

16-465

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:

CP101

Top Depth (m):

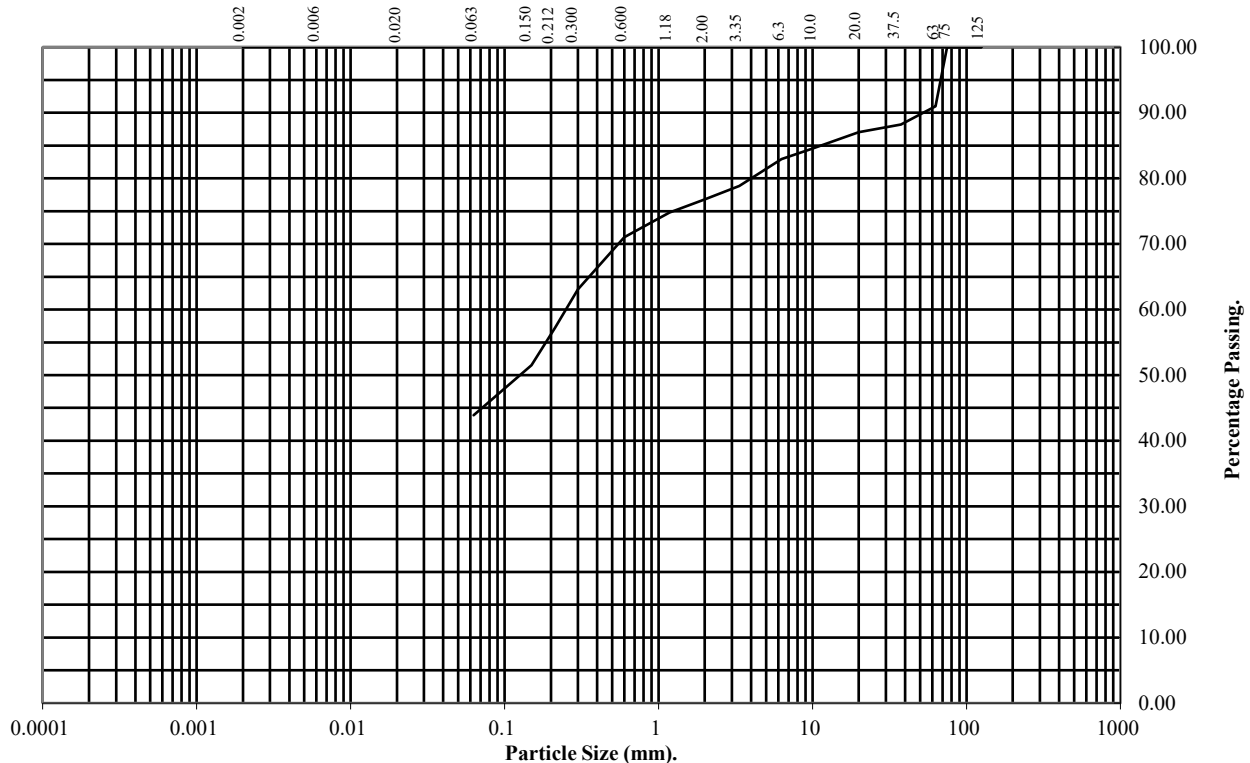
4.00

Sample Number:

Base Depth(m):

Sample Type:

B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	91
37.5	88
20	87
10	85
6.3	83
3.35	79
2	77
1.18	75
0.6	71
0.3	63
0.212	57
0.15	52
0.063	44

Soil Fraction	Total Percentage
Cobbles	9
Gravel	14
Sand	33
Silt/Clay	44

Remarks:

See Summary of Soil Descriptions



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Edenfield Road

Contract No:

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Client Ref:

16-465

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:

CP103

Top Depth (m):

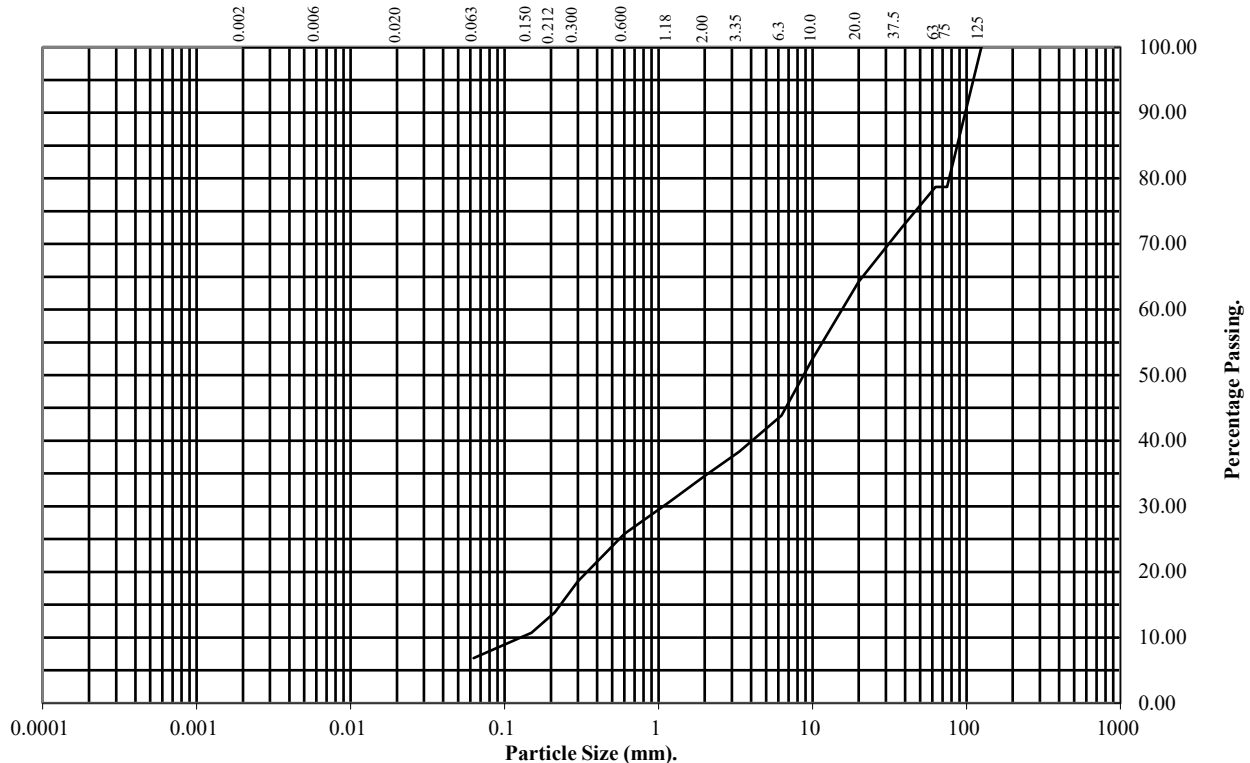
1.00

Sample Number:

Base Depth(m):

Sample Type:

B



BS Test Sieve (mm)	Percentage Passing
125	100
75	79
63	79
37.5	72
20	64
10	52
6.3	44
3.35	38
2	35
1.18	31
0.6	26
0.3	19
0.212	14
0.15	11
0.063	7

Soil Fraction	Total Percentage
Cobbles	21
Gravel	44
Sand	28
Silt/Clay	7

Remarks:

See Summary of Soil Descriptions



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Edenfield Road

Contract No:

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Client Ref:

16-465

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:

CP103

Top Depth (m):

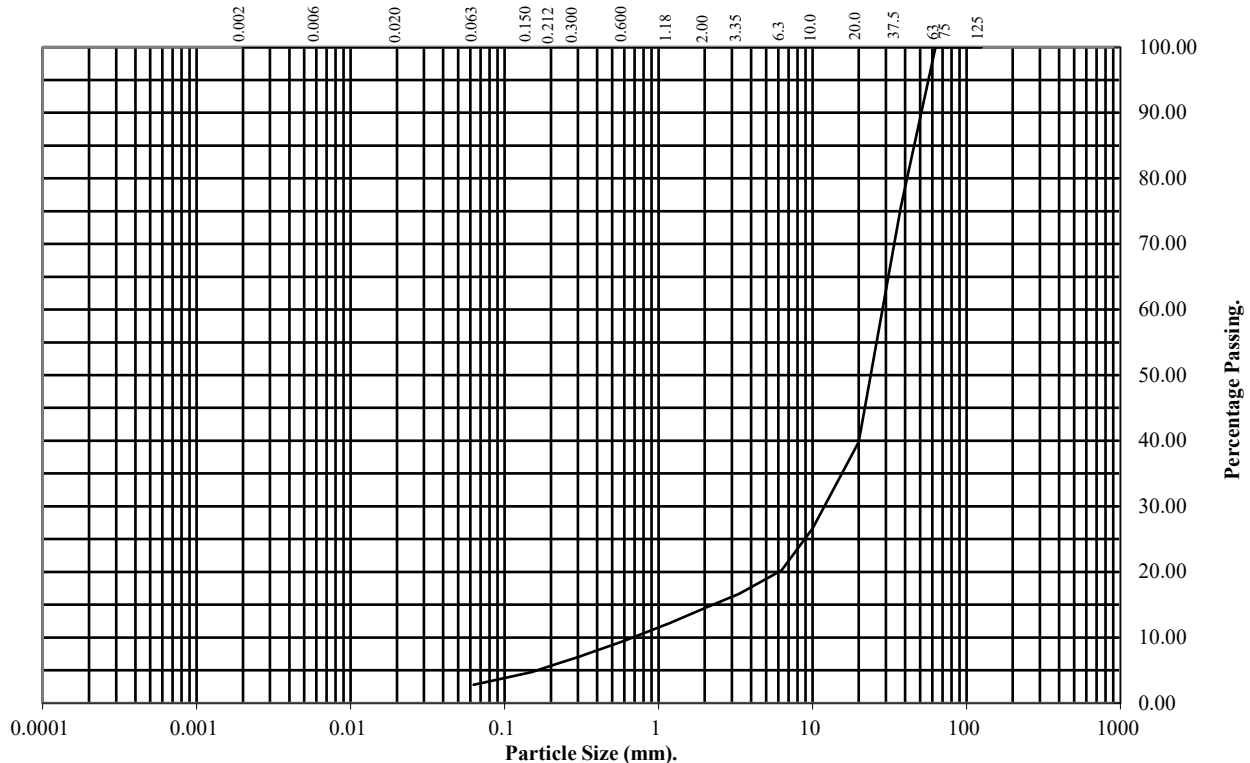
4.00

Sample Number:

Base Depth(m):

Sample Type:

B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	76
20	40
10	27
6.3	20
3.35	17
2	14
1.18	12
0.6	10
0.3	7
0.212	6
0.15	5
0.063	3

Soil Fraction	Total Percentage
Cobbles	0
Gravel	86
Sand	11
Silt/Clay	3

Remarks:

See Summary of Soil Descriptions



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Contract No:

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Client Ref:

16-465

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

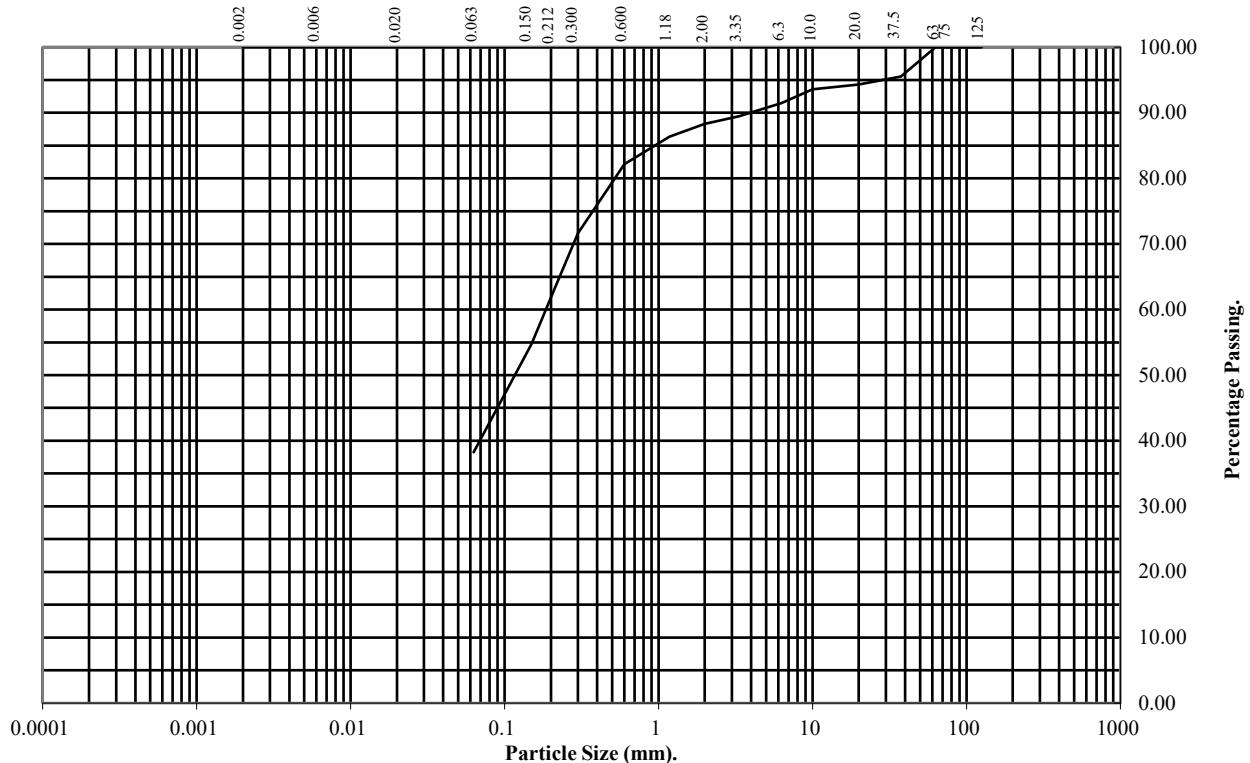
Hole Number: TP110

Top Depth (m): 1.70

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	96
20	94
10	94
6.3	91
3.35	89
2	88
1.18	86
0.6	82
0.3	72
0.212	63
0.15	55
0.063	38

Soil Fraction	Total Percentage
Cobbles	0
Gravel	12
Sand	50
Silt/Clay	38

Remarks:

See Summary of Soil Descriptions



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Edenfield Road

Contract No:
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Client Ref:
16-465

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

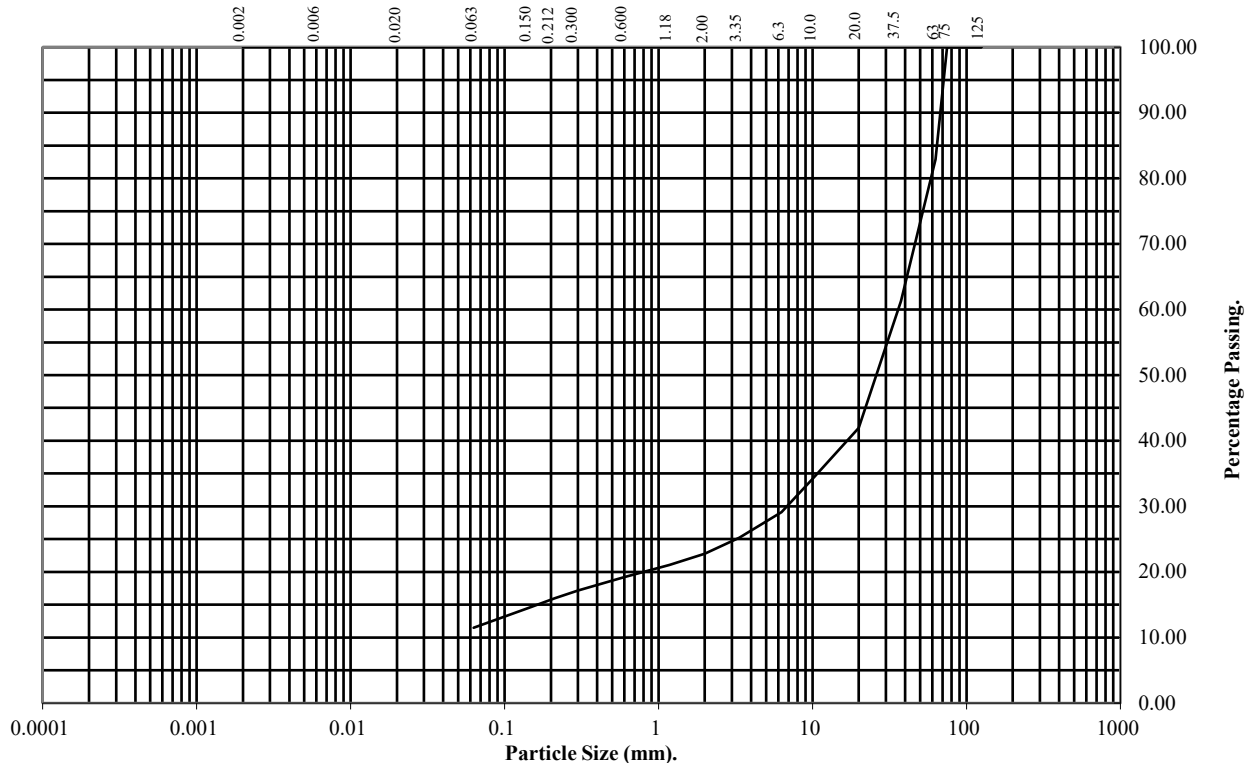
Hole Number: TP119

Top Depth (m): 1.50

Sample Number:

Base Depth(m):

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	83
37.5	61
20	42
10	34
6.3	29
3.35	25
2	23
1.18	21
0.6	19
0.3	17
0.212	16
0.15	15
0.063	11

Soil Fraction	Total Percentage
Cobbles	17
Gravel	60
Sand	12
Silt/Clay	11

Remarks:

See Summary of Soil Descriptions



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Edenfield Road

Contract No:
PSL22/7526
Client Ref:
16-465

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

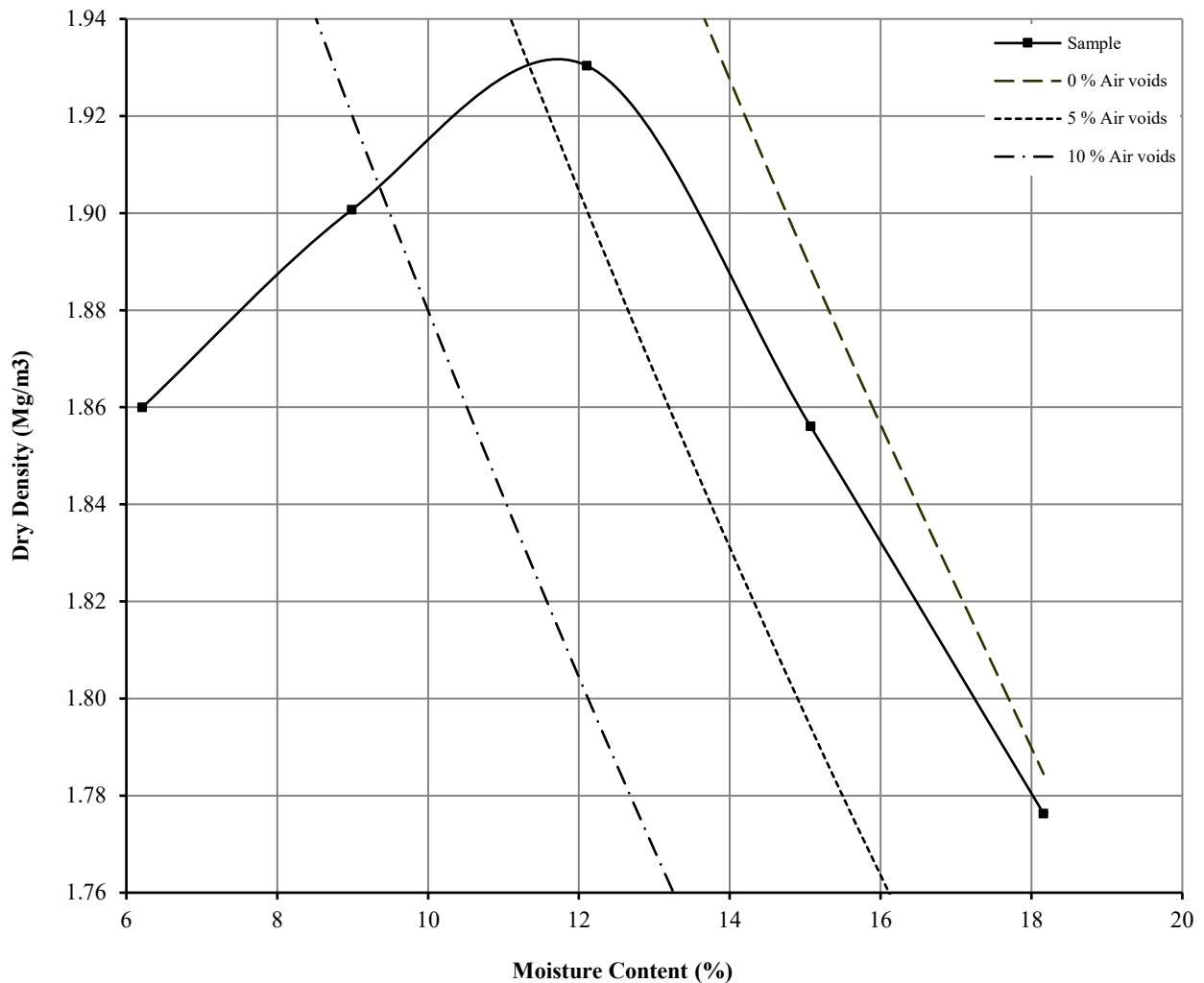
Hole Number: CP101

Top Depth (m) : 1.00

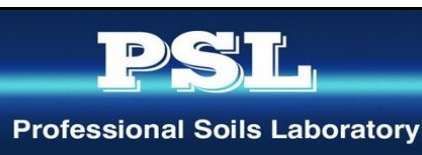
Sample Number:

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	24	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.64	Assumed	Material Retained on 37.5 mm Test Sieve (%):	26
Maximum Dry Density (Mg/m ³):	1.93		Material Retained on 20.0 mm Test Sieve (%):	8
Optimum Moisture Content (%):	12			
Remarks See summary of soil descriptions				



Edenfield Road

Contract
PSL22/7526
Client Ref
16-465

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

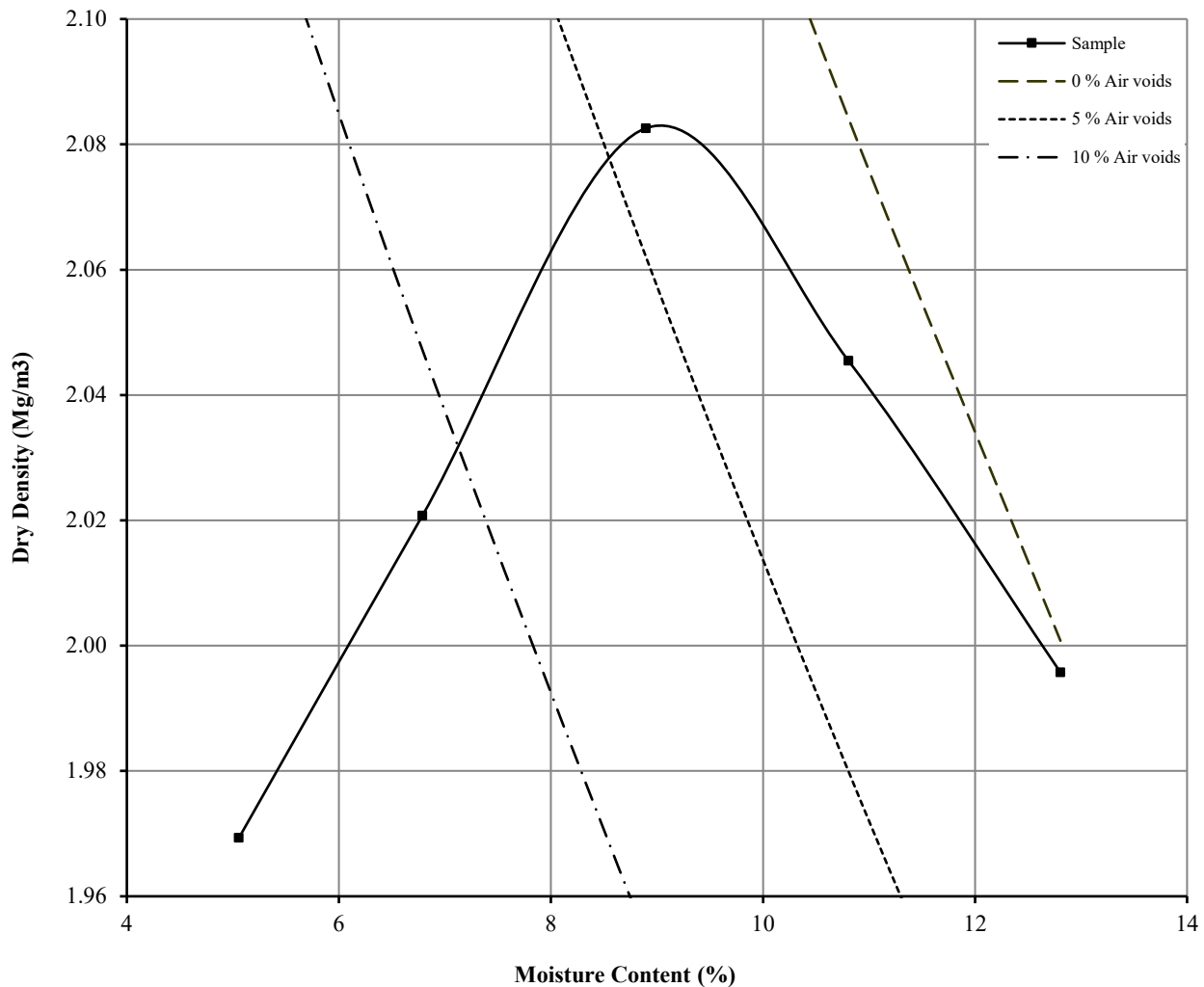
Hole Number: CP101

Top Depth (m) : 3.00

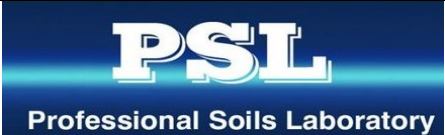
Sample Number:

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	6.8	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.69	Assumed	Material Retained on 37.5 mm Test Sieve (%):	14
Maximum Dry Density (Mg/m ³):	2.08		Material Retained on 20.0 mm Test Sieve (%):	23
Optimum Moisture Content (%):	9			
Remarks See summary of soil descriptions				

		Edenfield Road	Contract
			PSL22/7526
			Client Ref
			16-465

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

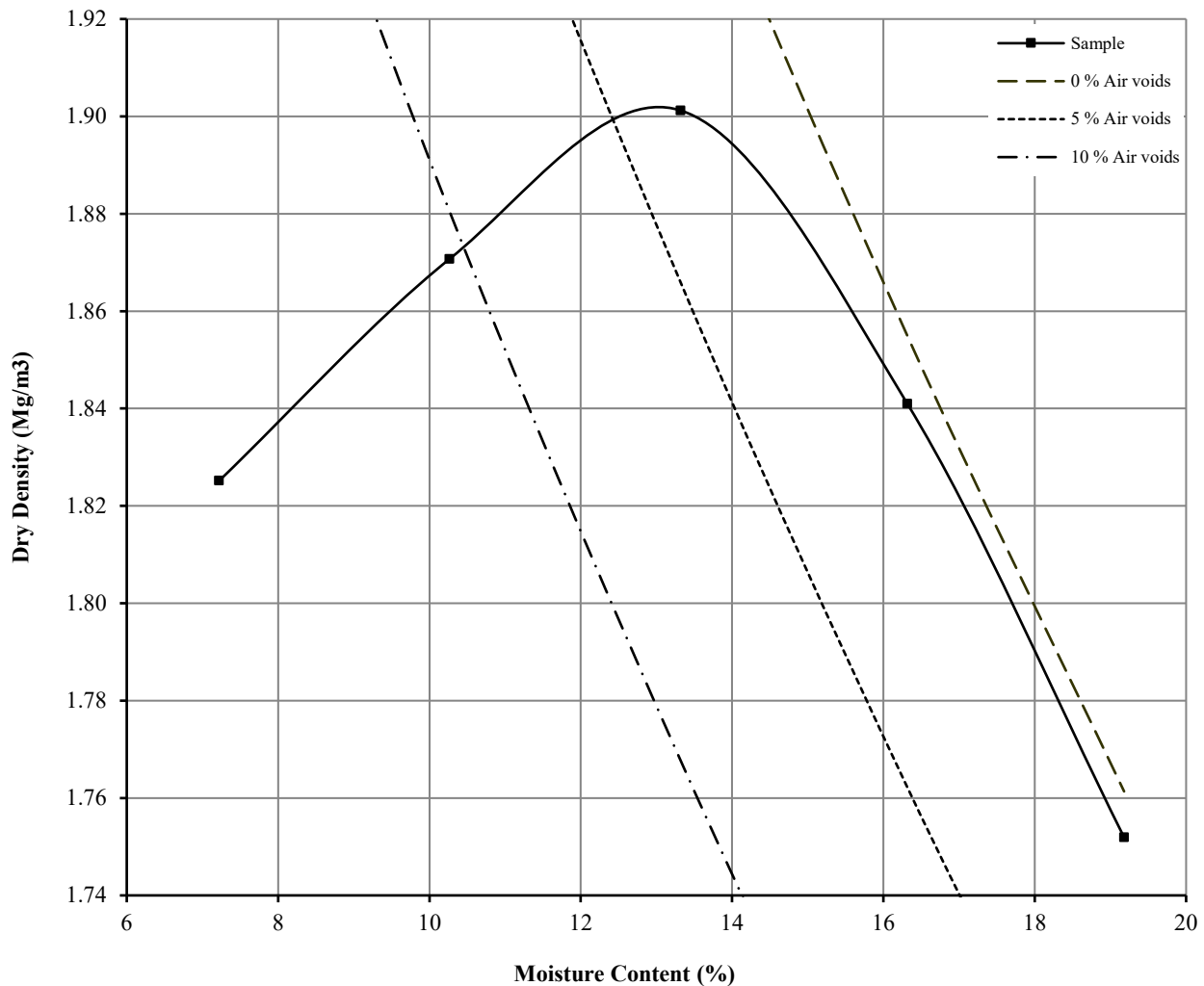
Hole Number: CP101

Top Depth (m) : 4.00

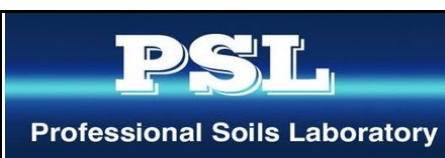
Sample Number:

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	19	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.66	Assumed	Material Retained on 37.5 mm Test Sieve (%):	12
Maximum Dry Density (Mg/m ³):	1.90		Material Retained on 20.0 mm Test Sieve (%):	1
Optimum Moisture Content (%):	13			
Remarks See summary of soil descriptions				



Edenfield Road

Contract
PSL22/7526
Client Ref
16-465

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

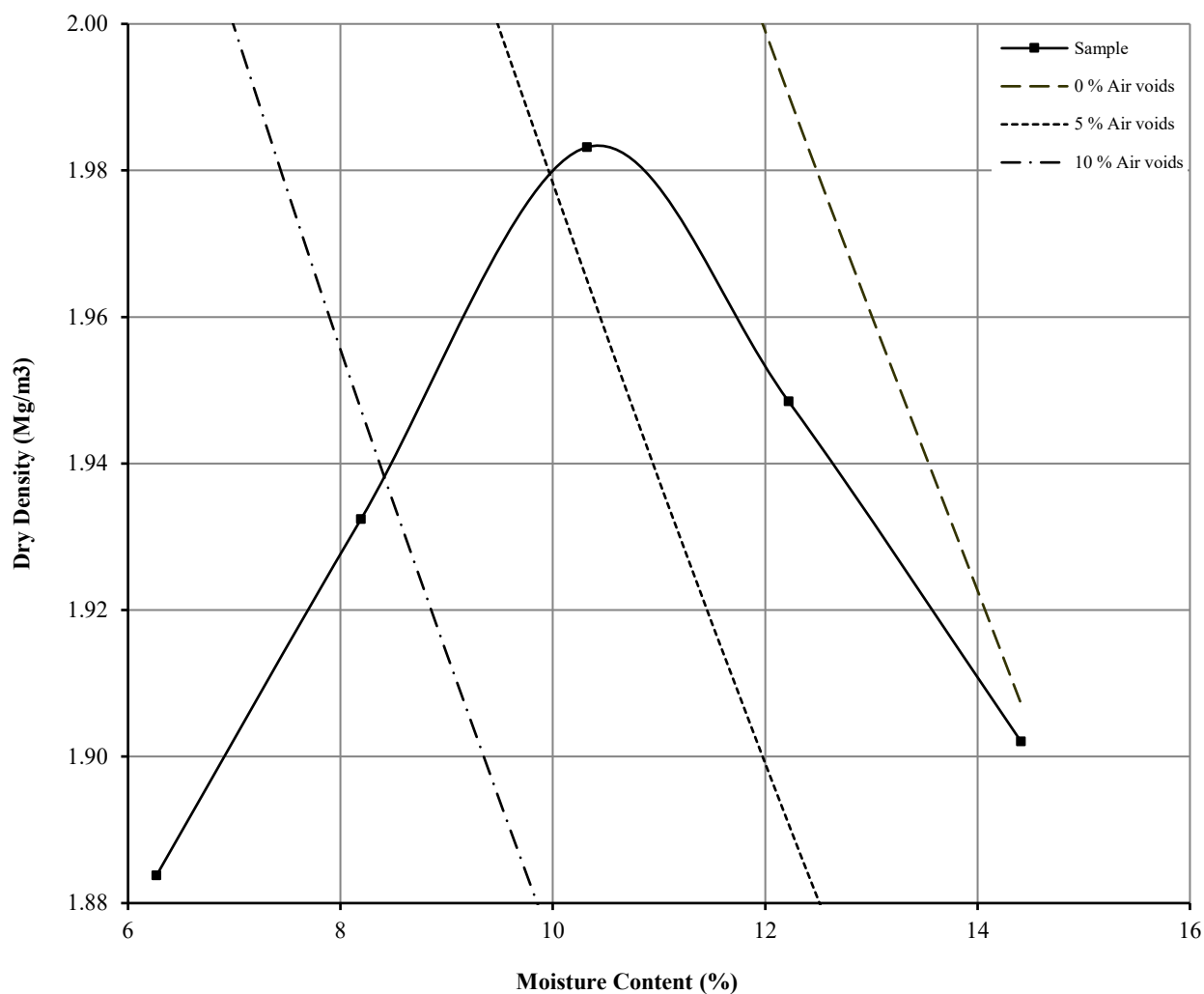
Hole Number: CP103

Top Depth (m) : 1.00

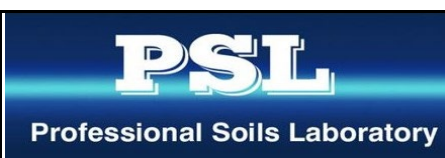
Sample Number:

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	16	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m3):	2.63	Assumed	Material Retained on 37.5 mm Test Sieve (%):	28
Maximum Dry Density (Mg/m3):	1.98		Material Retained on 20.0 mm Test Sieve (%):	8
Optimum Moisture Content (%):	10			
Remarks See summary of soil descriptions				



Edenfield Road

Contract
PSL22/7526
Client Ref
16-465

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

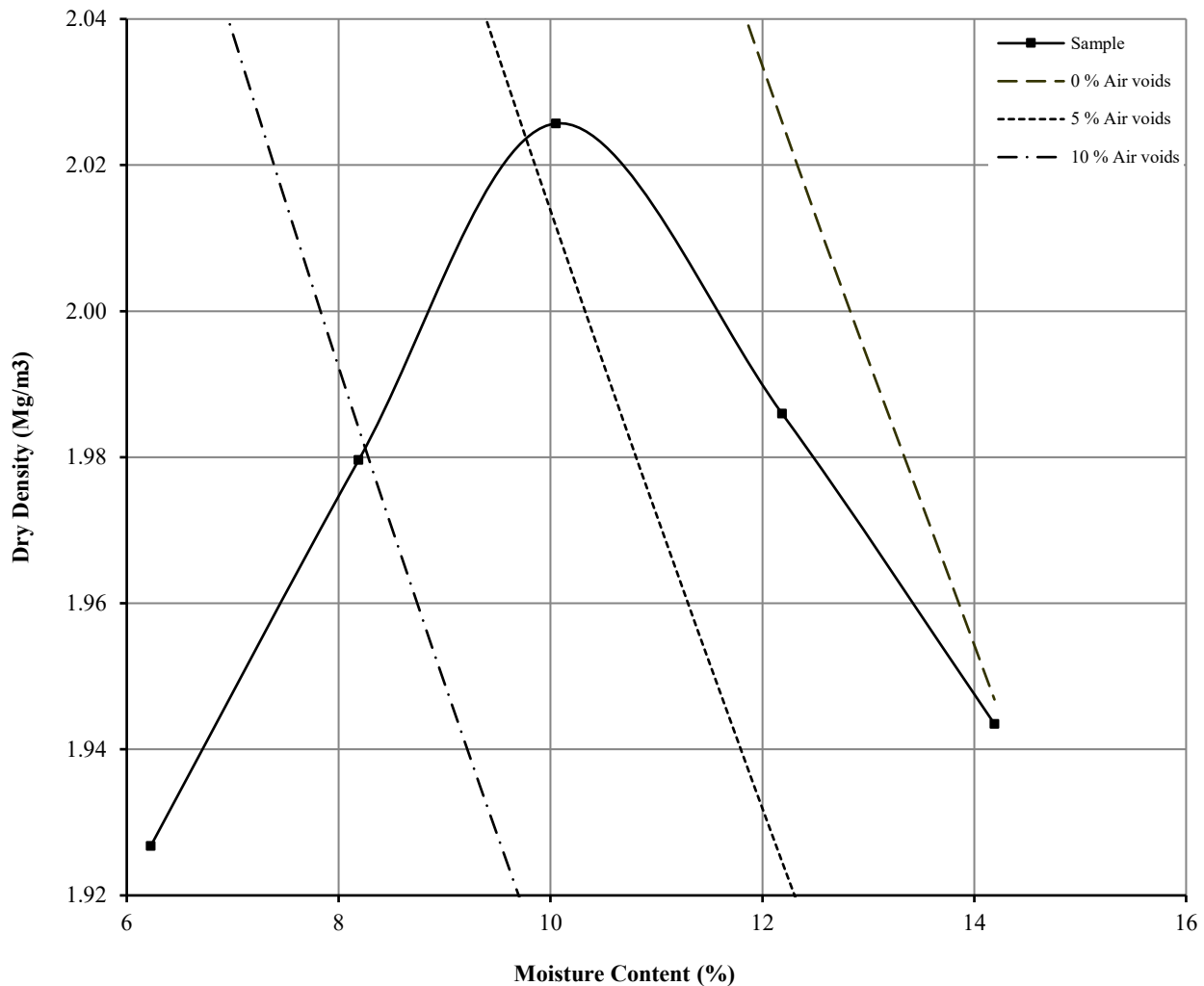
Hole Number: CP103

Top Depth (m) : 4.00

Sample Number:

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	12	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.69	Assumed	Material Retained on 37.5 mm Test Sieve (%):	24
Maximum Dry Density (Mg/m ³):	2.03		Material Retained on 20.0 mm Test Sieve (%):	36
Optimum Moisture Content (%):	10			
Remarks See summary of soil descriptions				



PSL
Professional Soils Laboratory

Edenfield Road

Contract
PSL22/7526
Client Ref
16-465

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.6 : 1990

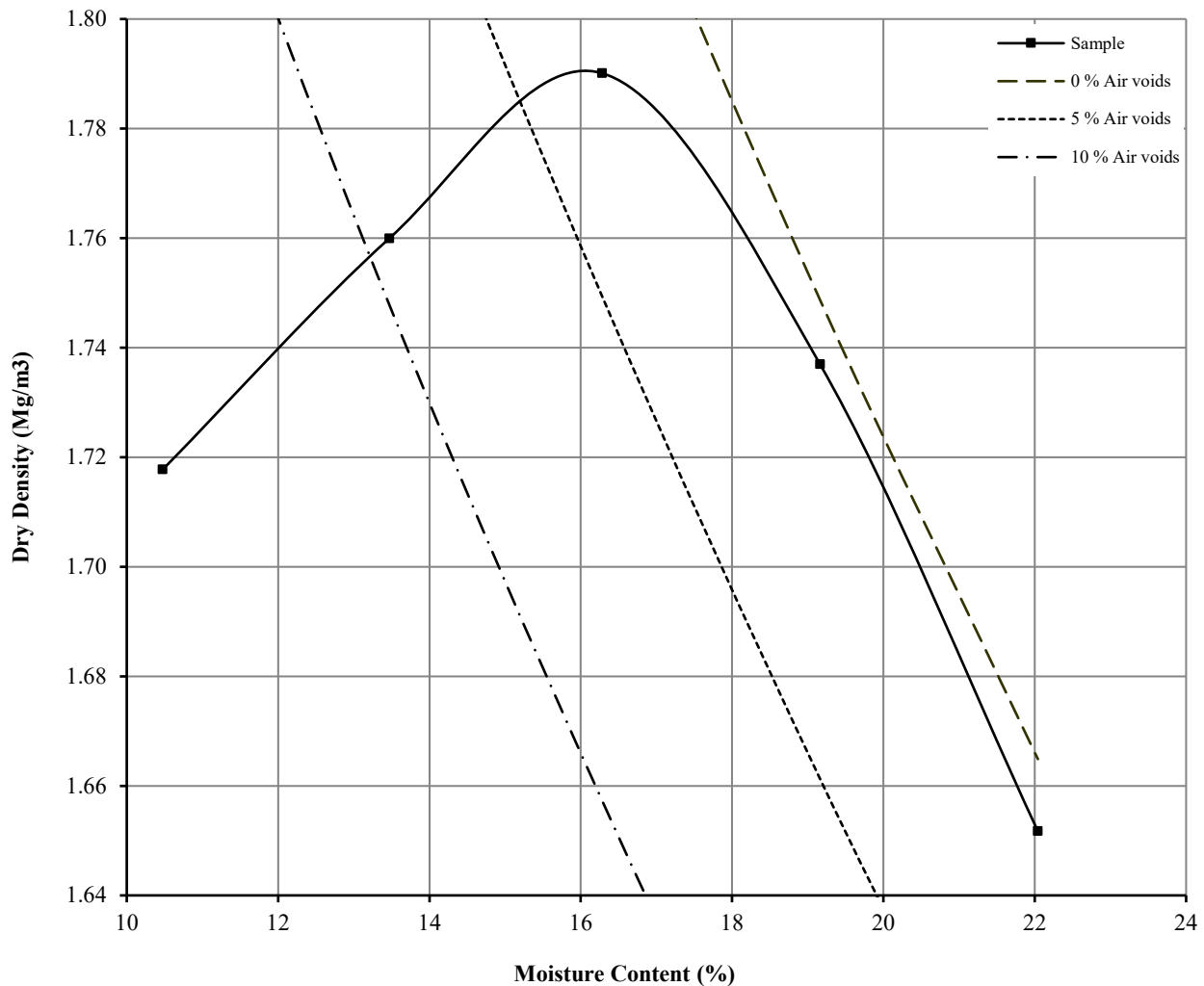
Hole Number: TP110

Top Depth (m) : 1.70

Sample Number:

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	25	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.63	Assumed	Material Retained on 37.5 mm Test Sieve (%):	4
Maximum Dry Density (Mg/m ³):	1.79		Material Retained on 20.0 mm Test Sieve (%):	2
Optimum Moisture Content (%):	16			
Remarks See summary of soil descriptions				



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Client Ref
16-465

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

Non compliance with BS 1377 : Part 4 : Clause 3.6 : 1990

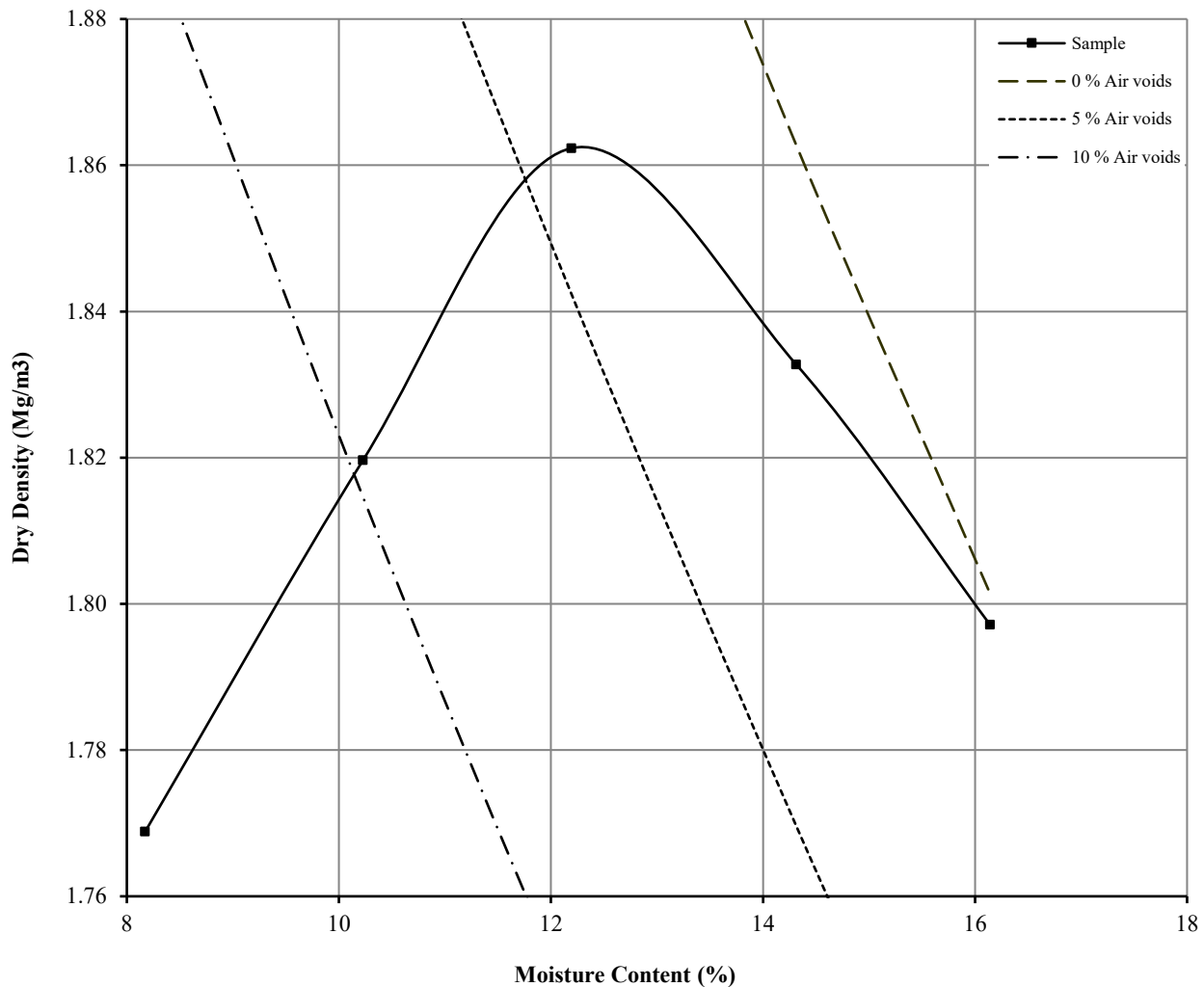
Hole Number: TP119

Top Depth (m) : 1.50

Sample Number:

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	24	Method of Compaction:	4.5kg	Separate Samples
Particle Density (Mg/m ³):	2.54	Assumed	Material Retained on 37.5 mm Test Sieve (%):	39
Maximum Dry Density (Mg/m ³):	1.86		Material Retained on 20.0 mm Test Sieve (%):	19
Optimum Moisture Content (%):	12			
Remarks See summary of soil descriptions				



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Client Ref
16-465

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

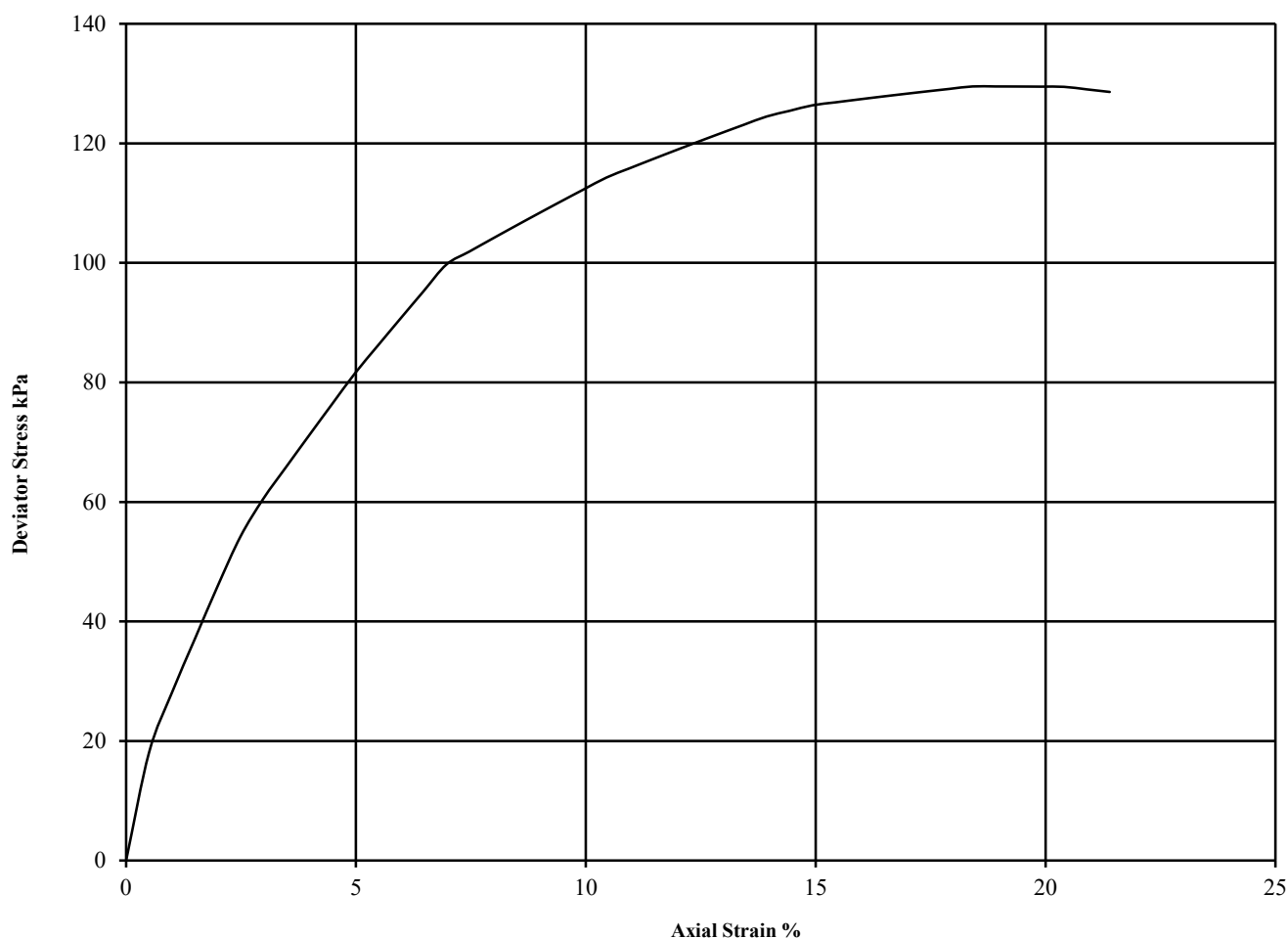
Hole Number: CP101

Top Depth (m): 8.00

Sample Number:

Base Depth (m):

Sample Type U100



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.33 See summary of soil descriptions
				θ_3	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$			
1	14	2.17	1.91	165	130	65	18.4	Plastic	



4043

PSL

Professional Soils Laboratory

Edenfield Road

Contract No:

PSL22/7526

Client Ref:

16-465

ONE DIMENSIONAL CONSOLIDATION TEST

BS 1377: Part 5: 1990: Clause 3

Hole Number: CP101

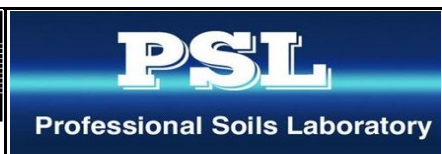
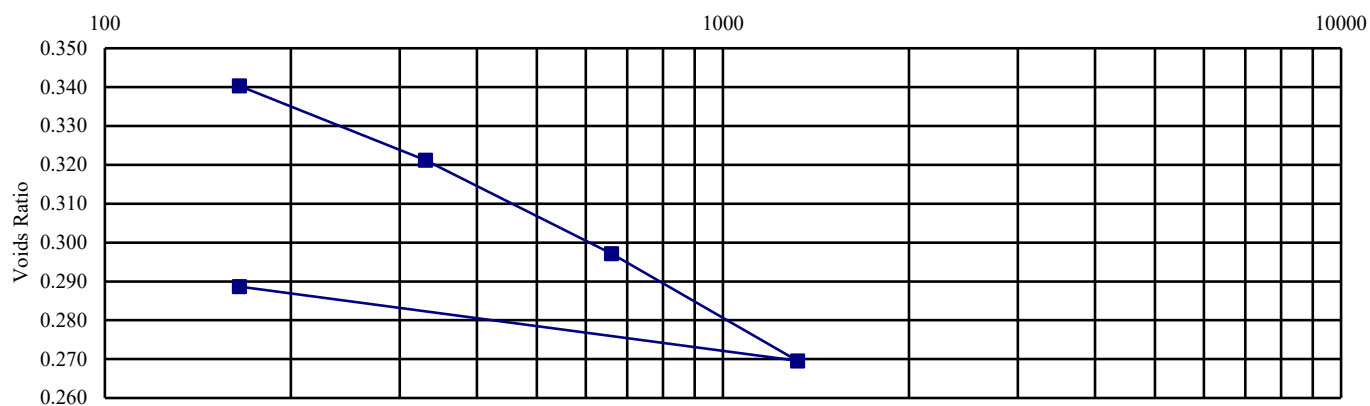
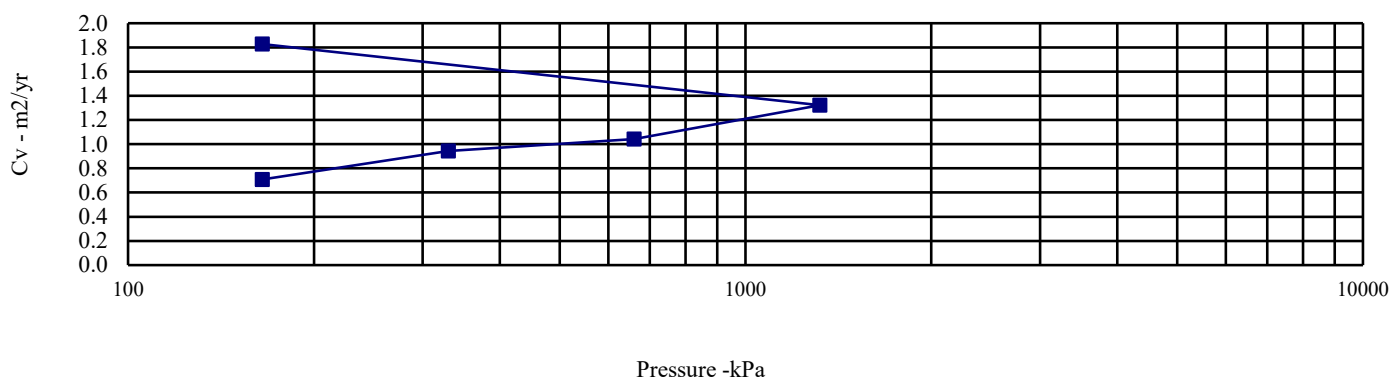
Top Depth (m): 8.00

Sample Number:

Base Depth (m) :

Sample Type: U100

Initial Conditions		Pressure Range		Mv	Cv	Specimen location	
Moisture Content (%):	15	kPa		m2/MN	m2/yr	within tube:	Top
Bulk Density (Mg/m3):	2.18	0	165	0.249	0.708	Method used to	
Dry Density (Mg/m3):	1.90	165	330	0.087	0.944	determine CV:	T90
Voids Ratio:	0.398	330	660	0.055	1.042	Nominal temperature	
Degree of saturation:	101.5	660	1320	0.032	1.322	during test ' C:	20
Height (mm):	20.018	1320	165	0.013	1.828	Remarks:	See summary of soil descriptions
Diameter (mm)	75.01						
Particle Density (Mg/m3):	2.65						
Assumed							



Edenfield Road

Contract No:

PSL22/7526

Client Ref:

16-465

ONE DIMENSIONAL CONSOLIDATION TEST

BS 1377: Part 5: 1990: Clause 3

Hole Number: CP103

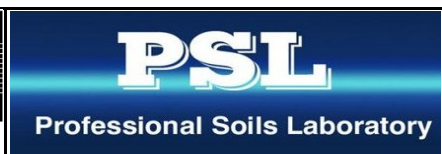
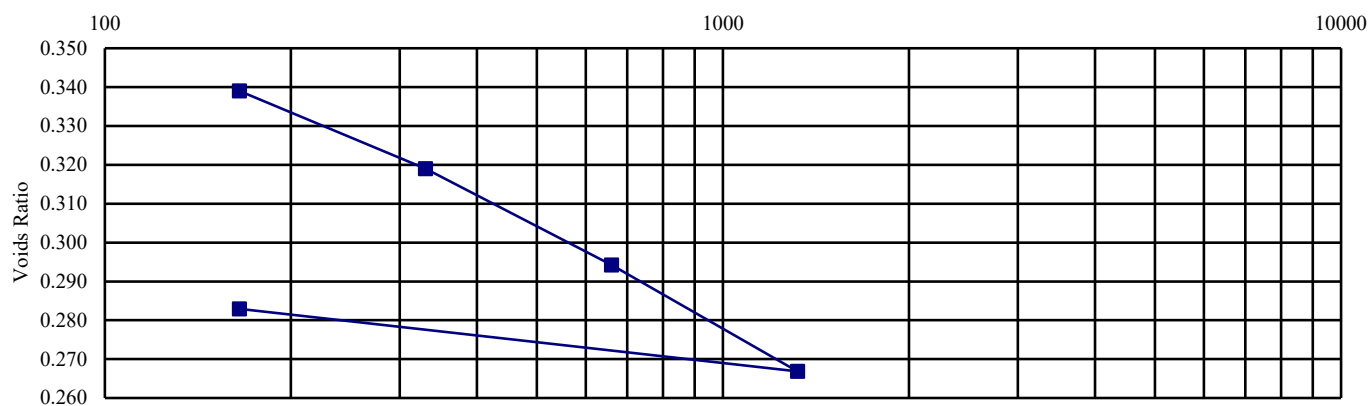
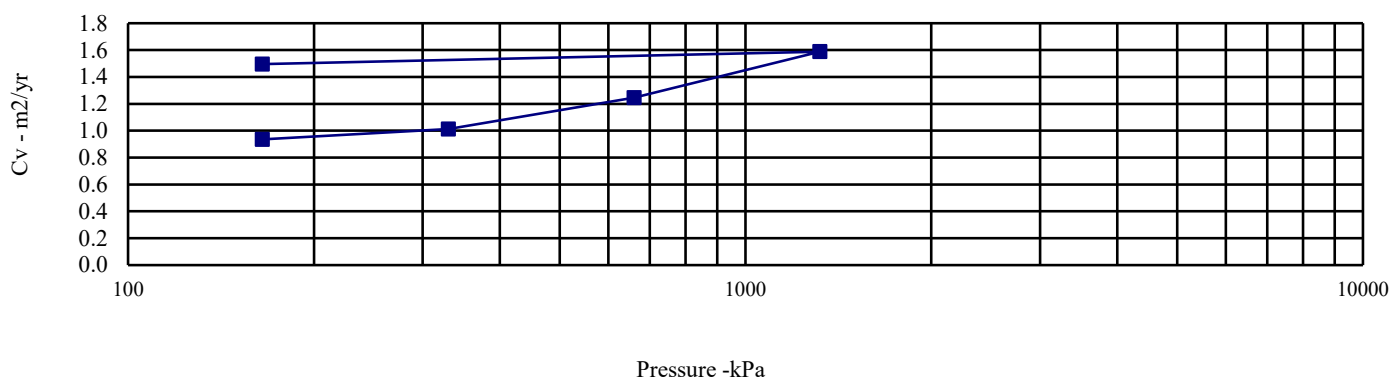
Top Depth (m): 8.00

Sample Number:

Base Depth (m) :

Sample Type: U100

Initial Conditions		Pressure Range		Mv	Cv	Specimen location	
Moisture Content (%):	15	kPa		m2/MN	m2/yr	within tube:	Top
Bulk Density (Mg/m3):	2.19	0	165	0.220	0.936	Method used to	
Dry Density (Mg/m3):	1.91	165	330	0.091	1.013	determine CV:	T90
Voids Ratio:	0.390	330	660	0.057	1.246	Nominal temperature	
Degree of saturation:	101.6	660	1320	0.032	1.588	during test ' C:	20
Height (mm):	20.004	1320	165	0.011	1.495	Remarks:	
Diameter (mm)	75.015					See summary of soil descriptions	
Particle Density (Mg/m3):	2.65						
Assumed							



Edenfield Road

Contract No:

PSL22/7526

Client Ref:

16-465

**APPENDIX IX
BRE 365 SOAKAWAY
PERMEABILITY TEST
CERTIFICATES**



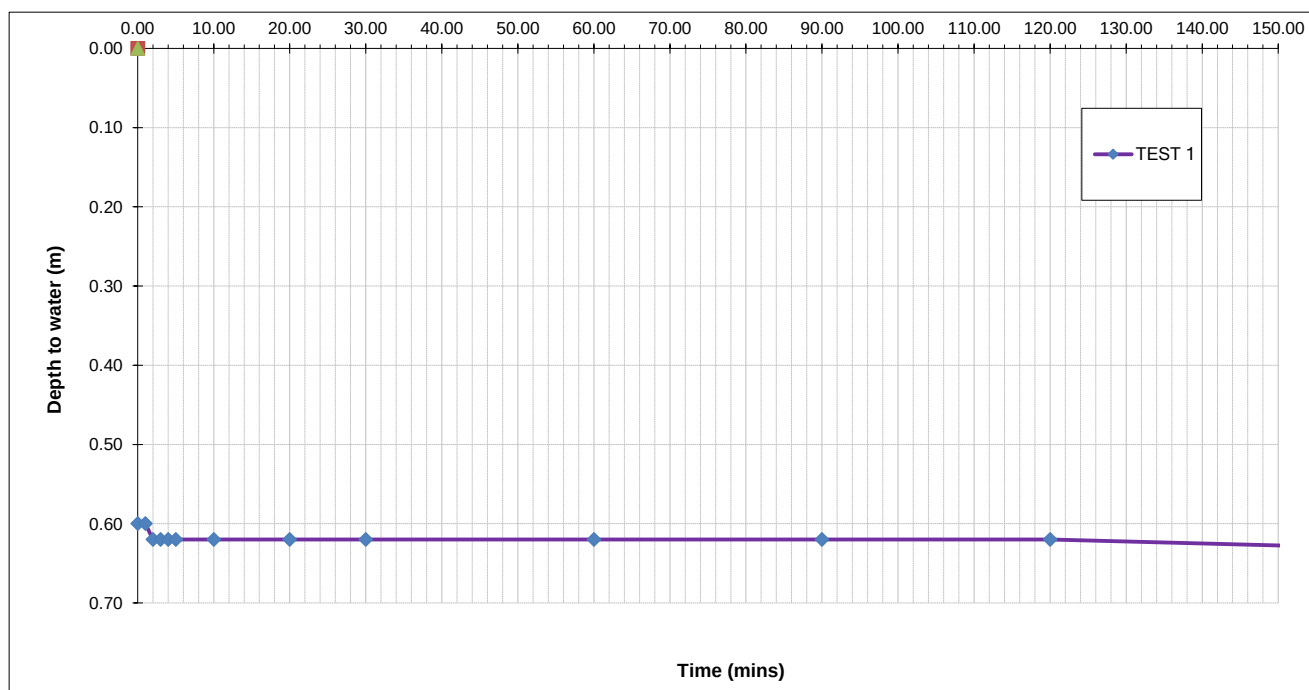
Site: Edenfield Road
Job Number: 16-465
Date of Test: 15/11/2022

Trial Pit Number: TP101
Length: 1.60 m
Width: 0.60 m
Depth: 2.00 m
Groundwater Level: m

		TEST 1		TEST 2		TEST 3	
		Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
		0.00	0.60	0.00	0.00	0.00	0.00
		1.00	0.60				
		2.00	0.62				
		3.00	0.62				
		4.00	0.62				
		5.00	0.62				
		10.00	0.62				
		20.00	0.62				
		30.00	0.62				
		60.00	0.62				
		90.00	0.62				
		120.00	0.62				
		240.00	0.65				
		300.00	0.65				
		360.00	0.65				
		420.00	0.65				
		480.00	0.65				
		1440.00	0.65				
Effective Storage Depth	m		1.40		2.00		2.00
75% Effective Storage Depth	m		1.05		1.50		1.50
(i.e. depth below GL)	m		0.95		0.50		0.50
25% Effective Storage Depth	m		0.35		0.50		0.50
(i.e. depth below GL)	m		1.65		1.50		1.50
Effective Storage Depth 75%-25%	m		0.70		1.00		1.00
Time to fall to 75% effective depth	mins		N/A		0.00		0.00
Time to fall to 25% effective depth	mins		0.00		0.00		0.00
V (75%-25%)	m3		0.67		0.96		0.96
a (50%)	m2		4.04		5.36		5.36
t (75%-25%)	mins		#VALUE!		0.00		0.00
SOIL INFILTRATION RATE	m/s		N/A		#DIV/0!		#DIV/0!

DESIGN SOIL INFILTRATION RATE, f

N/A



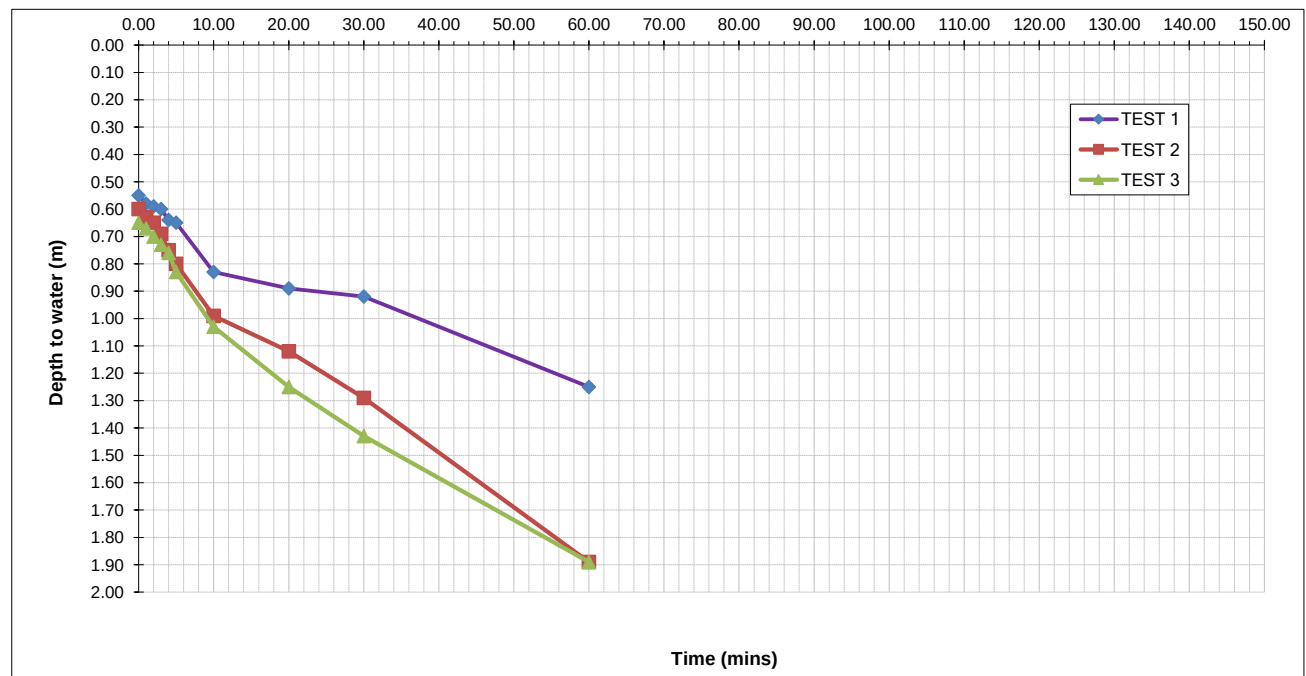


Site: Edenfield Road
Job Number: 16-465
Date of Test: 16/11/2022

Trial Pit Number: TP115
Length: 1.95 m
Width: 0.80 m
Depth: 1.90 m
Groundwater Level: m

		TEST 1		TEST 2		TEST 3	
		Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)	Time(min)	Depth to Water (m)
		0.00	0.55	0.00	0.60	0.00	0.65
		1.00	0.58	1.00	0.63	1.00	0.67
		2.00	0.59	2.00	0.65	2.00	0.70
		3.00	0.60	3.00	0.69	3.00	0.73
		4.00	0.64	4.00	0.75	4.00	0.76
		5.00	0.65	5.00	0.8	5.00	0.83
		10.00	0.83	10.00	0.99	10.00	1.03
		20.00	0.89	20.00	1.12	20.00	1.25
		30.00	0.92	30.00	1.29	30.00	1.43
		60.00	1.25	60.00	1.89	60.00	1.89
		SA Caved in					
Effective Storage Depth	m	1.35		1.30		1.25	
75% Effective Storage Depth	m	1.01		0.98		0.94	
(i.e. depth below GL)	m	0.89		0.93		0.96	
25% Effective Storage Depth	m	0.34		0.33		0.31	
(i.e. depth below GL)	m	1.56		1.58		1.59	
Effective Storage Depth 75%-25%	m	0.68		0.65		0.63	
Time to fall to 75% effective depth	mins	20.00		7.00		7.00	
Time to fall to 25% effective depth	mins	0.00		44.00		40.00	
V (75%-25%)	m3	1.05		1.01		0.98	
a (50%)	m2	5.27		5.14		5.00	
t (75%-25%)	mins	-20.00		37.00		33.00	
SOIL INFILTRATION RATE	m/s	-1.66E-04		8.89E-05		9.85E-05	

DESIGN SOIL INFILTRATION RATE, f -1.66E-04



APPENDIX X

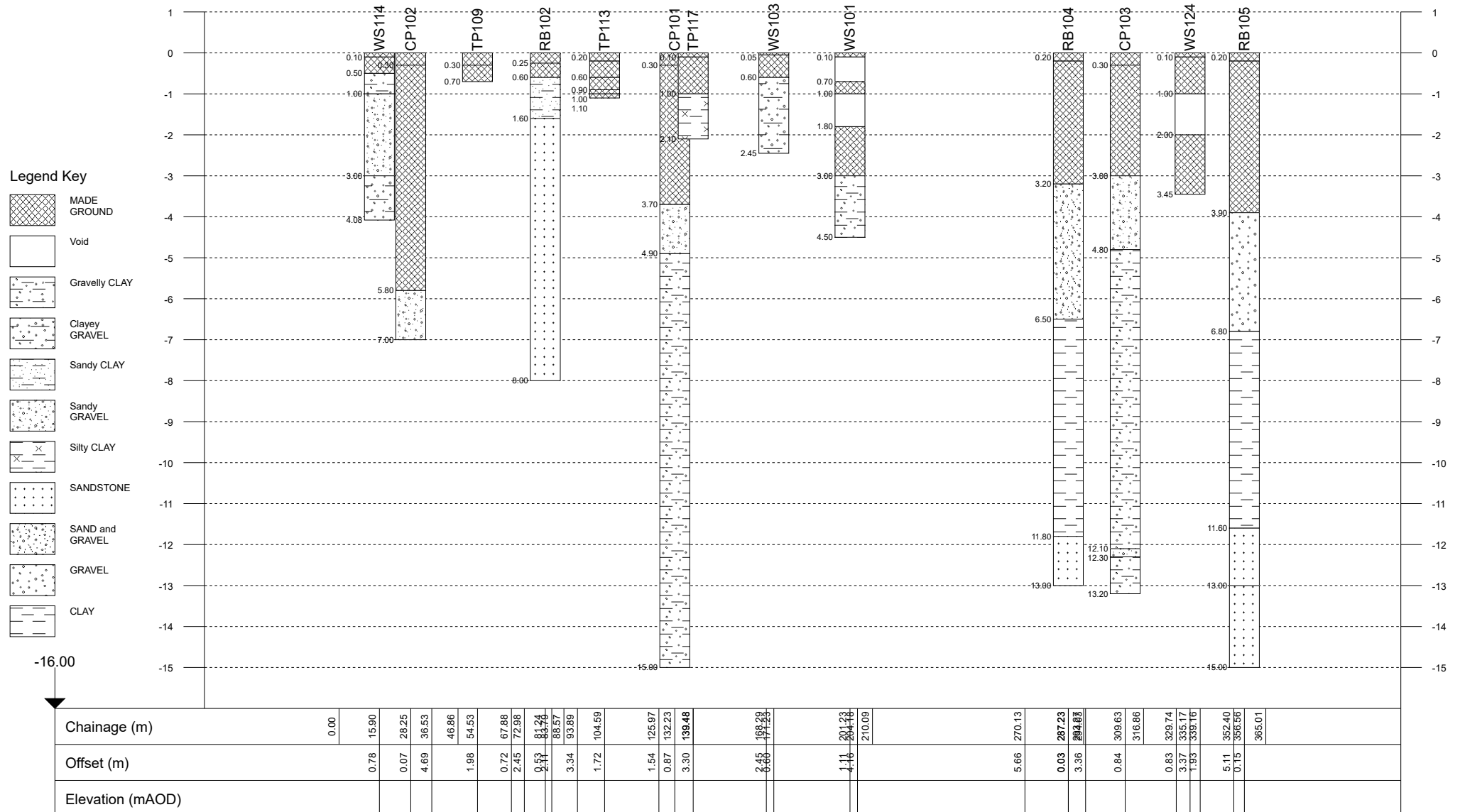
CROSS SECTIONS

Title: Section Line 1

Vertical Scale: 1:131

Horizontal Scale: 1:2115

Engineer: HM



Project Id: 16465

Project Title: Land at Greenbooth Road and Edenfield Road

Location: Norden

Client: Stonebond Properties Ltd

Title: Section Line 2

Vertical Scale: 1:131

Horizontal Scale: 1:413

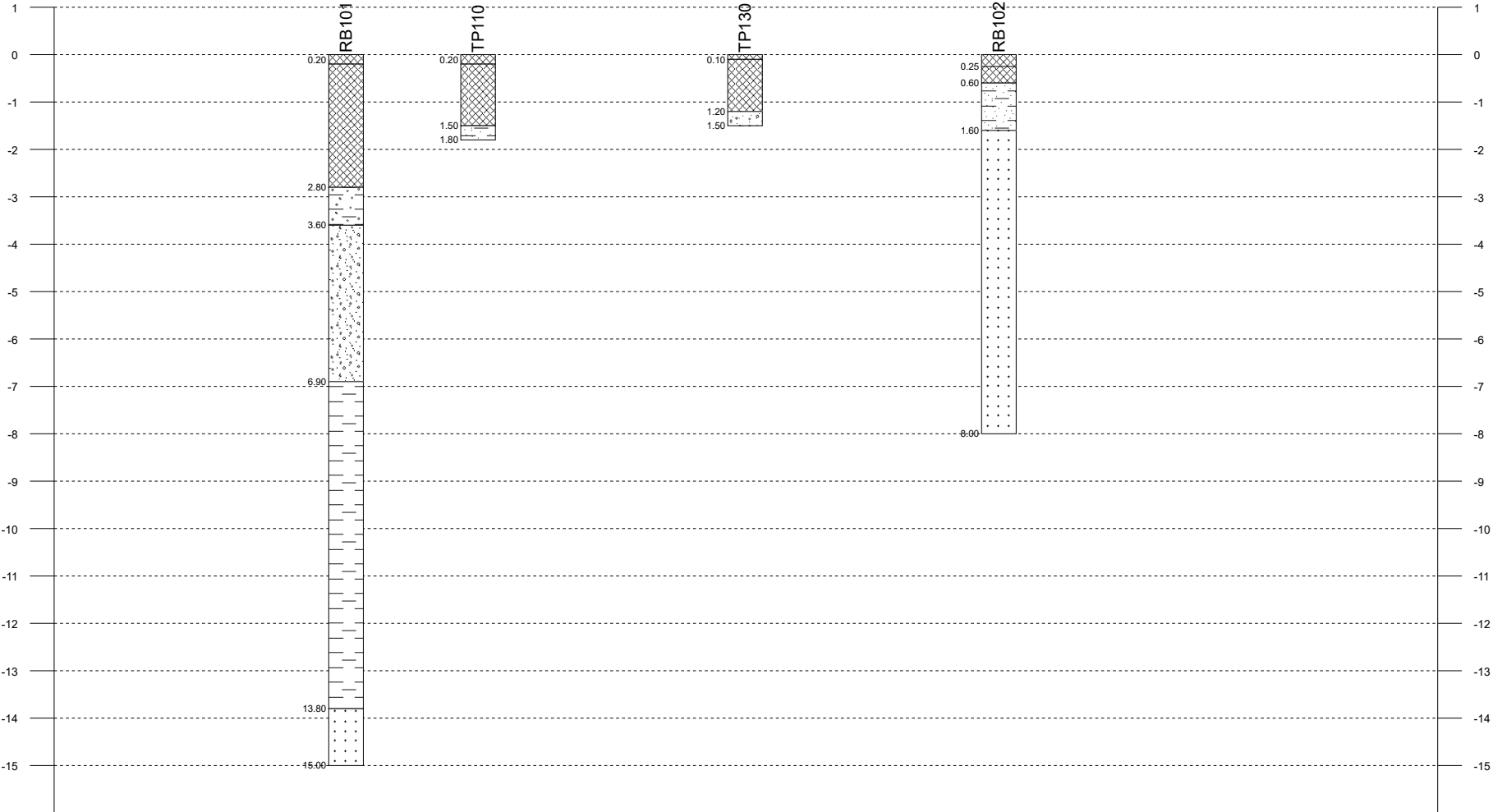
Engineer: HM



Legend Key

- MADE GROUND
- Sandy CLAY
- Sandy GRAVEL
- SANDSTONE
- Gravelly CLAY
- SAND and GRAVEL
- CLAY

-16.00



Chainage (m)

0.00

9.06

17.84

35.59

52.48

54.80

71.27

Offset (m)

0.75

3.71

2.99

1.24

3.14

Elevation (mAOD)

APPENDIX XI

BGS RADON REPORT

Claire Gleave
E3p
Evans Halshaw
Taylor Road
Urmston
Manchester
M41 7JQ

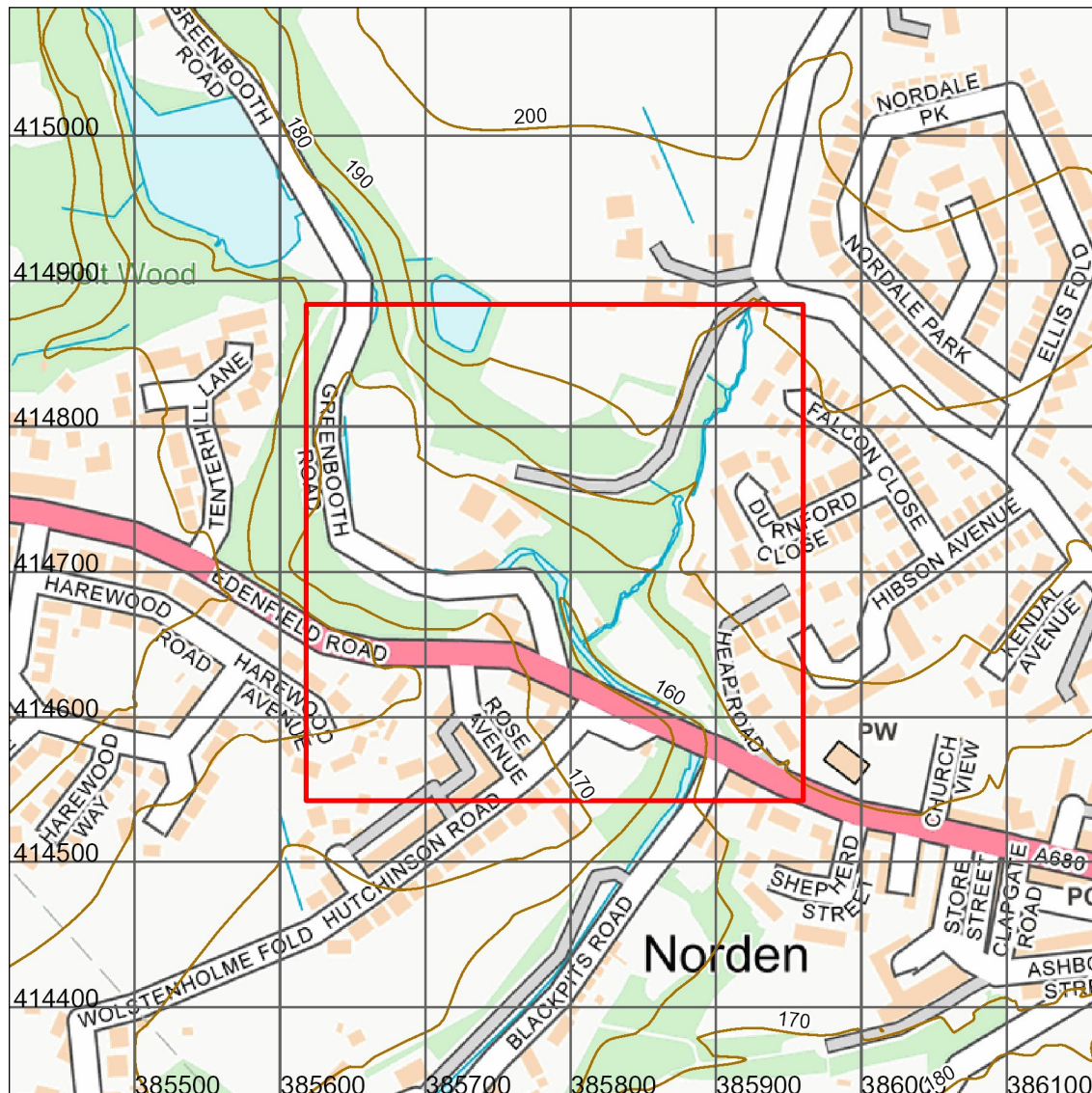
Radon Report

Advisory report on the requirement for radon protective measures in new buildings, conversions and extensions to existing buildings. The report also indicates whether a site is located within a radon Affected Area

Report Id: *BGS_330931/42069*

Client reference: 16465

Search location



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Search location indicated in red

*This report describes a site located at National Grid Reference 385789, 414713.
Note that for sites of irregular shape, this point may lie outside the site boundary.
Where the client has submitted a site plan the assessment will be based on the area given.*

Radon Report: UK

When extensions are made to existing buildings in high radon areas, or new buildings are constructed in these areas, the Building Regulations for England, Wales, Scotland and Northern Ireland require that protective measures are taken against radon entering the building.

This report provides information on whether radon protective measures are required. Depending on the probability of buildings having high radon levels, the Regulations may require either:

1. No protective measures
2. Basic protective measures
3. Full protective measures

This is an advisory report on the requirement for radon protective measures in new buildings, conversions and extensions. The report also indicates whether a site is located within a radon Affected Area

Requirement for radon protective measures

The determination below follows advice in *BR211 Radon: Guidance on protective measures for new buildings (2015 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Is the property in an area where radon protective measures are required for new buildings or extensions to existing ones as described in publication BR211 (2015 edition) Radon: Guidance on protective measures for new buildings?

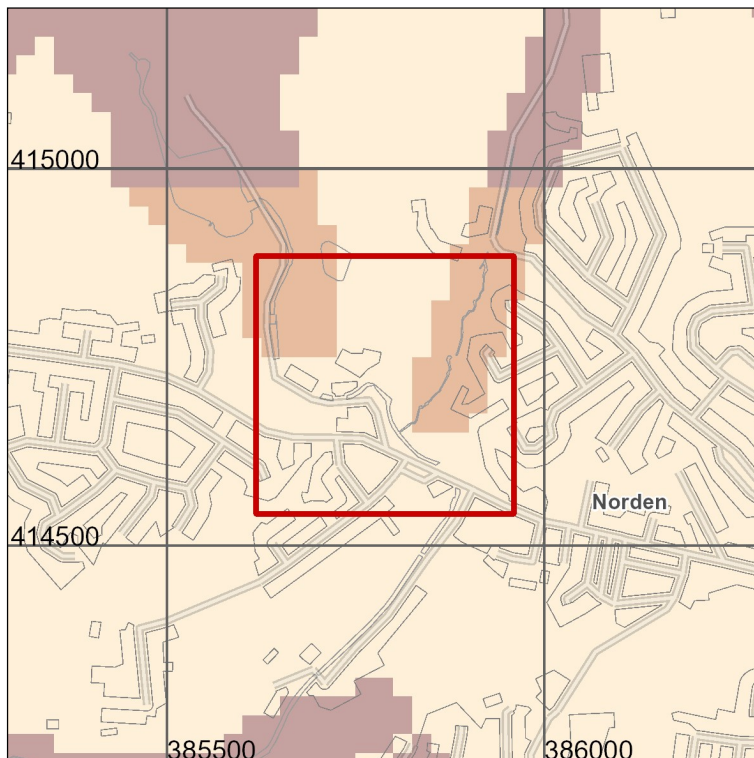
NO RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.

More details of the protective measures required are available in *BR211 Radon: Guidance on protective measures for new buildings (2015 Edition)*. Additional information and guidance is available from the Building Research Establishment website (<http://www.bre.co.uk/radon/>).

Whether or not the radon level in a building is above or below the radon Action Level can only be established by having the building tested. The UKHSA provides a radon testing service which can be accessed at www.ukradon.org or by telephone (01235 822622).

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Radon Affected Area



% Homes estimated to be at or above the action level
0-1%
1-3%
3-5%
5-10%
10-30%
30-100%

Contains OS data © Crown Copyright and database right 2023

Scale: 1:10 000 (1cm = 100 m)

Search area indicated in red

Is the property in a radon Affected Area as defined by the UK Health Security Agency (UKHSA) and if so what percentage of homes are estimated to be at or above the Action Level? YES

Additional Information

THE PROPERTY IS IN A RADON AFFECTED AREAS WHERE 1 TO 3% OF HOMES ARE ESTIMATED TO BE AT OR ABOVE THE ACTION LEVEL.

The UKHSA recommends a radon 'Action Level' of 200 Becquerels per cubic metre of air (Bq m^{-3}) for the annual average of the radon gas concentration in a home. Where 1% or more of homes are estimated to be at or above the Action Level the area should be regarded as a radon Affected Area.

This report informs you whether the property is in a radon Affected Area and the percentage of homes that are estimated to be at or above the radon Action Level at this location. Being in an Affected Area does not necessarily mean there is a high radon level within the property; the only way to determine the radon level is to carry out a radon measurement.

The UKHSA advises that radon gas should be measured in all properties within radon Affected Areas and that homes with radon levels at or above the Action Level (200 Bq m⁻³) should be remediated. Householders with levels between the Target Level (100 Bq m⁻³) and Action Level should seriously consider reducing their radon level, especially if they are at greater risk, such as if they are current or ex smokers. Whether or not a home is in fact above or below the Action Level or Target Level can only be established by having the building tested. The UKHSA provides a validated radon testing service which can be accessed at www.ukradon.org.

The information in this report provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as Law Society CON29 Enquiries of the Local Authority (2016); 3.14 Radon Gas: Do records indicate that the property is in a “Radon Affected Area” as identified by the UKHSA. The data can also be used to advise house buyers and sellers in Scotland and Northern Ireland.

If you are buying a new build property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

If you are buying a currently occupied property in a radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were at or above the radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and if the results of re-testing confirmed the effectiveness of the measures.

Further information on radon is available from the UKHSA at www.ukradon.org.

What is radon?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters enclosed spaces such as some buildings (particularly basements), caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level is at or above the Action Level, measures should be taken to reduce the concentration.

Radon in workplaces

The Ionising Radiation Regulations 2017 require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): **Radon in the workplace**. BRE publications may be obtained from the BRE Bookshop, Tel: 01923 664262, email: bookshop@bre.co.uk website: www.brebookshop.com

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- Although samples and records are maintained with all reasonable care, there may be some deterioration in the long term.
- The most appropriate techniques for copying original records are used, but there may be some loss of detail and dimensional distortion when such records are copied.
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Report issued by
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