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REMEDiation STRATEGY REPORT

**FOR
ARKADY INDUSTRIAL ESTATE,
BRISCOE LANE,
NEWTON HEATH,
GREATER MANCHESTER**

**PREPARED FOR
CASSEL & FLETCHER
CONSTRUCTION LIMITED**

**REPORT NO. 6921L
JANUARY 2024**

SUB SURFACE NORTH WEST LIMITED

3 Peel Street
Preston
Lancashire
PR2 2QS

Tel: (01772) 561135 Fax: (01772) 204907

Email: preston@subsurface.co.uk

Website: www.subsurface.co.uk



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**REMEDIALATION STRATEGY REPORT FOR ARKADY INDUSTRIAL ESTATE,
BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER, M40 2XG**

CLIENT: CASSEL & FLETCHER CONSTRUCTION LIMITED

1. INTRODUCTION

Our brief is to provide a Phase III Remediation Strategy Report in accordance with the Planning Application Ref. 123295/FO/2019 dated March 2020 for submission to the Local Planning Authority (Manchester City Council).

We have prepared this Remediation Strategy Report following receipt of an email, dated 30th January 2024, from the Client.

The following Reports have previously been carried out for the site which should be read in conjunction with this remediation strategy report:

- Phase II Ground Investigation Report, ref. NTH 2707, dated March 2020, by Mini Soil Surveys
- Phase I Desk Study Report, ref. 6921, dated March 2020, by Sub Surface Consultants Limited
- Phase I Coal Mining Risk Assessment Report, ref. 6921A, dated April 2020, by Sub Surface Consultants Limited
- Phase II Ground Investigation Ref. 6921C, dated March 2021, by Sub Surface Consultants Limited
- Ground Gas Update Report, ref. 6921F, dated October 2021, by Sub Surface Consultants Limited
- PFAS Risk Assessment Report, ref. 6921H, dated October 2022, by Sub Surface Consultants Limited.
- Supplementary PFAS Investigation Report, ref. 6921K, dated October 2023, by Sub Surface Consultants Limited.

This Phase III Remediation Strategy Report has been prepared in general accordance with the Environment Agency's Land Contamination Risk Management (LCRM) guidance (October 2020, updated July 2023) and also meets the criteria for a Remediation Statement, as defined in Section 78H of Part 2A of the Environmental Protection Act 1990.

1.1 Site Location and Description

The site is located at 230 Briscoe Lane in the Newton Heath district of Greater Manchester, as indicated on Figure 1. The approximate National Grid Reference of the centre of the site is 386920, 399500.

As shown on Figure 2, the 'L' shaped about 0.46 hectare site is bounded to the south east by Briscoe Lane with a cemetery beyond, to the south west by the premises of Anglo-European, to the north west by the premises of Mont Blanc Coldstore Company with a triangular railway junction beyond, to the east by derelict industrial premises and to the south east by the premises of Basic Welding Services (former Public House) with the junction of Briscoe Lane and Riverpark Road beyond.

6921L Arkady Ind. Estate, Manchester

The topography of the general area surrounding the site has been assessed using Ordnance Survey Open Data (Terra 50 contours and points), and Environment Agency LiDAR data (SJ89NE DTM). Whilst the site is generally flat the topography of the surrounding area slopes generally down to the south south west, towards the River Medlock.

1.2 Proposed Development

The site is currently being developed with the construction of an 'L' shaped light industrial unit, with associated hardstanding, as shown on Figure 2.

1.3 Contact Details of Involved Parties

TABLE 1 INVOLVED PARTIES

Owner	Architect	Contractor
C R Greenberg Rechov Shoneh Halachot 4/6 Jerusalem Old City Israel	Equilibrium Architects Bank Chambers Bank Street Bury BL9 0DL Tel. 0161 797 2077 info@equilibriumarchitects.co.uk	Cassel & Fletcher Auldbank House 424 Bury Old Road Prestwich M25 1PR Tel. 0330 088 1446 info@casselfletcher.co.uk

2. SITE ASSESSMENT

2.1 Current Status

The site currently comprises a partially completed industrial unit occupying the approximate footprint of the previous unit which was destroyed by fire. We understand from the Client that the following works have taken place to date:

- Crushing of pre-existing slab.
- Foundations.
- Installation of the drainage scheme.
- Erection of the steel frame and cladding.
- Installation of the roller shutters and external doors.
- Construction of the internal blockwork.
- Erection of the 1st floor mezzanine floor and stair installation.

The building is constructed on traditional shallow foundations. The previous floor slab was crushed for the aggregate used to create the current ground levels. Waste materials from foundation excavations etc. were removed from site by a licensed waste contractor, Fox Brothers (Lancashire) Limited and disposed of at Port Clarence Waste Recovery Park, Off Huntsman Drive, Port Clarence, Middlesbrough, TS2 1UE, operated by Augean Plc. Waste transfer notes provided by the contractor are available on request.

No remediation has been carried out to date.

2.2 Summary of Previous Reports

The previous reports pertinent to this PFAS remediation statement are summarised below:

2.2.1 Phase I

The walkover survey was undertaken on 25th February 2020 at which time the site comprised of two concrete foundation blocks along the western boundary of the site. It was noted that the site was being used to store tanks situated on the eastern boundary, containers located south east and north east and pipe situated just east of the footings of the two previous buildings. It was also noted that two tracked excavators and a set of tracks from another excavator were on site and two skips suggesting the recent demolition of the two buildings on the site. One of the tracked excavators along with rubble was being used to block a gate located in the south of the site. There are also two sub stations that were identified on site, which were not denoted on the maps. The first sub station was located roughly halfway on the western site boundary with the second located towards the south, still on the western site boundary.

In the north and north east part of the site there were oil stains and standing water which had an oil sheen to it, however the source of the sheen was not identified. There was no olfactory evidence of contamination noted during the walkover survey.

The Phase I desk study identified that the site was previously occupied by a clay pit which was infilled by around 1934. A factory was then constructed by 1966 with minor alterations/extensions by 1979 and 1988. The factory was damaged by fire in 2018 and subsequently demolished.

The desk study identified numerous potential sources of contamination including general contaminants in made ground underlying the site, contaminants derived from the fire damage to the building possibly including solvents, PFAS and PAHs, contaminants derived from fuels and lubricants towards the north of the site where the historical railway and railway sidings once were, and migration of ground gases from the infilled clay pit on site and a refuse heap 30m north west.

The report recommended a ground investigation to obtain soil samples for contamination analysis and asbestos detection and, where possible, groundwater and surface water samples for contamination analysis. In addition it was recommended that gas standpipes should be installed and monitored over an extended period of time to allow for an assessment to be made.

2.2.2 Sub Surface Phase II Investigation . 6921C, March 2021

The 2021 investigation compromised nine mini boreholes taken out across the site in the positions indicated on Figure 2.

The exploratory holes encountered localised concrete surfacing then zones of granular made ground generally comprising slightly silty slightly sandy to sandy gravel sized fragments of stone, brick, slag, clinker and concrete with in parts cobble sized fragments of brick and concrete, and zones of cohesive Made Ground generally comprising slightly gravelly slightly sandy silty clay, the gravel sized fragments comprising brick, stone, slag, concrete and occasional plastic.

The made ground was generally directly underlain by cohesive, apparently glacial, drift deposits which were proven to 4.00m depth. These deposits were found to be generally firm or stiff, but locally soft, slightly gravelly silty clays, the gravel comprising siltstone, sandstone, coal and quartz. The exception was M9 where Made Ground was underlain directly by 0.05m of soft black slightly sandy fibrous peat.

No groundwater was encountered in the exploratory holes although it should be noted that they were only left open for a short period of time and groundwater levels may be subject to seasonal and/ or climatic variations. Standpipes were installed in M1A, M5, M6 and M9. M1A, M5 and M6 were monitored on one occasion, on 22 February 2021, and the depth to groundwater was found to be at 0.80, 1.00 and 0.50 metres depth respectively. M9 was inaccessible.

Contamination analyses were undertaken on thirteen soil samples in total which found no elevated concentrations of the determinands tested for. However analyses undertaken on groundwater samples taken from the standpipes installed in M1A and M6 found measurable amounts of several PFAS compounds as detailed in the table below:

TABLE 2 PREVIOUS GROUNDWATER PFAS ANALYSES

Determinant	LOD (ng/l)	M1A 0.80m (ng/l)	M6 0.50m (ng/l)
PFBA Perfluoro-n-butanoic acid	2	10.7	<7
PFPA Perfluoro-n-pentanoic acid	1	20.3	<2.5
PFHxA Perfluoro-n-hexanoic acid	1	28.4	3.74
PFBS Perfluoro-1-butanedisulfonate	1	<1	<1
PFHpA Perfluoro-n-heptanoic acid	1	29.1	11
6:2FTS Perfluoro-octane sulfonate 6:2	1	7.24	3.03
PFOA Perfluoro-n-octanoic acid	0.65	14.6	6.65
PFHxS Perfluoro-1-hexanedisulfonate	1	2.87	4.16
PFNA Perfluoro-n-nonanoic acid	1	<1	1.48
PFHpS Perfluoro-1-heptanedisulfonate	1	1.39	1.07
PFDA Perfluoro-n-decanoic acid	1	<1	1.49
Linear PFOS	0.65	48.2	36.5
Branched PFOS	1	41.4	26.7
PFUnA Perfluoro-n-undecanoic acid	1	<1	<1
PFDoA Perfluoro-n-dodecanoic acid	1	<1	<1
PFOSA Perfluoro-octanedisulfonamide	2	<2	<2
PFDS Perfluoro-1-decanedisulfonate	1	<1	<1
PFPeS Perfluoro-1-pentanedisulfonate	1	<1	<1
Total PFOS	1	89.6	63.2

The analyses were undertaken by ALS Lifesciences Limited subcontracted by Eurofins Chemtest Limited. The sample containers were plastic bottles supplied by Eurofins Chemtest Limited and we have received confirmation that the containers they provide do not contain PFAS compounds.

6921L Arkady Ind. Estate, Manchester

Sub Surface North West Limited
3 Peel Street, Preston, Lancashire, PR2 2QS
Tel: 01772 561135 Fax: 01772 204907 Email: preston@subsurface.co.uk

The Phase II report concluded that given the presence of the relatively low permeable cohesive deposits beneath the site and the distance to sensitive receptors the risk to controlled waters from PFAS contamination was low.

During the monitoring period standpipes installed in M1A, M5, M6 and M9 were lost/removed. In order to continuing monitoring after the fourth visit on 14 May 2021, four mini boreholes (M1B, M5A, M6A and MA) were taken out on 16 July 2021 and standpipes were installed.

2.2.4 PFAS Risk Assessment Report, ref. 6921H, dated October 2022, by Sub Surface Consultants Limited.

The PFAS Risk Assessment Report included desk based research to identify current and historic potential sources of per and polyfluoroalkyl substances (PFAS) contamination on the site and to carry out additional monitoring and sampling for contamination analyses and assessment in order to assess the potential risks to controlled waters from PFAS contamination.

The desk based assessment included a search of current and historical trade directories, local news sites, Google Streetview and historical planning applications. None of the current or historic industries in the local area were found to be particularly associated with the use of PFAS compounds, with the possible exception of a hide and skin yard which the report stated could conceivably include leather processing, although this was considered to be unlikely.

Contamination analyses were performed by an MCERTS and UKAS accredited laboratory (ALS Environmental) on seven soil samples plus one blank soil sample, and four samples of groundwater plus one blank water sample taken on 1st August 2022 from the standpipes installed in M1C, M5B, M6B and M10 to determine concentrations of the following PFAS compounds:

PFBA Perfluoro-n-butanolic acid	PFOA Perfluoro-n-octanoic acid	PFUnA Perfluoro-n-undecanoic acid
PFPA Perfluoro-n-pentanoic acid	PFHxS Perfluoro-1-hexanesulfonate	PFDoA Perfluoro-n-dodecanoic acid
PFHxA Perfluoro-n-hexanoic acid	PFNA Perfluoro-n-nonanoic acid	PFOSA Perfluoro-octanesulfonamide
PFBS Perfluoro-1-butanesulfonate	PFHpS Perfluoro-1-heptanesulfonate	PFDS Perfluoro-1-decanesulfonate
PFHpA Perfluoro-n-heptanoic acid	PFDA Perfluoro-n-decanoic acid	PFPeS Perfluoro-1-pentanesulfonate
6:2FTS Perfluoro-octane sulfonate 6:2	Linear PFOS	Total PFOS
	Branched PFOS	

For the purposes of this risk assessment the soil results were compared the perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) results with soil screening values published by the Environment Agency for assessing ecological risks (from *'Derivation and Use of Soil Screening Values for Assessing Ecological Risks'* Report-ShARE id26 Rev.2022).

The speciated PFAS analyses found no concentrations above the limit of detection levels. The limits of detection for PFOA and PFOS (1µg/kg) were below the SSVs (0.019mg/kg PFOA and 0.013mg/kg PFOS).

In the sand field blank, all PFAS compounds tested for were below the limit of detection.

To assess the risk to surface water bodies the water PFOS results were compared with the Environmental Quality Standard (EQS) and the PFOA results were compared with the Australian ESL for freshwater.

To assess the risk to groundwater resources the PFOA and total PFOS results were compared with the UK Health Security Agency recommendations for PFOS and PFOA (Based on The Drinking Water Inspectorate Guidance 2021). For PFHxS Perfluoro-1-hexanesulfonate, PFNA Perfluoro-n-nonanoic acid, Linear PFOS, and Branched PFOS, the US ATSDR Minimum Risk Level (MRL) was used. No appropriate thresholds were found for the other PFAS compounds tested for.

The exceedances of EQS, ESL, UK HSA and/ or US MRL values were as follows:

TABLE 3 GROUNDWATER PFAS ANALYSES

Determinant	LOD (ng/l)	Environmental Thresholds		Human Health Thresholds		Previous		Current
		EQS (ng/l)	Australian ESL Freshwater (ng/l)	US MRL (ng/l)	UK DWS (ng/l)	M1A 0.80m (ng/l)	M6 0.50m (ng/l)	M6B 1.20m (ng/l)
PFBA	2	-	-	-	-	10.7	-	89.1
PFPA	1	-	-	-	-	20.3	-	-
PFHxA	1	-	-	-	-	28.4	3.74	-
PFBS	1	-	-	-	-	-	-	7.03
PFHpA	1	-	-	-	-	29.1	11	31.8
6:2FTS	1	-	-	-	-	7.24	3.03	3.42
PFOA	0.65	-	19000	21	100	14.6	6.65	42.6
PFHxS	1	-	-	140	-	2.87	4.16	3.99
PFNA	1	-	-	21	-	-	1.48	4.03
PFHpS	1	-	-	-	-	1.39	1.07	-
PFDA	1	-	-	-	-	-	1.49	6.23
Linear PFOS	0.65	-	-	14	-	48.2	36.5	8.83
Branched PFOS	1	-	-	14	-	41.4	26.7	5.8
Total PFOS	1	0.65	0.23	-	100	89.6	63.2	14.6

In the blank water sample all PFAS compounds tested for were below the limit of detection.

The results were generally found to be below the published limit thresholds apart from Linear PFOS and Branched PFOS which were found to exceed the US MRL values in both samples from the previous investigation and Total PFOS which was found to exceed the EQS in both previous samples and in the sample taken from M6B in the current investigation. There were no significant exceedances of the human health thresholds.

The report concluded that the most likely source of PFAS contamination on the site was the use of firefighting foams used to suppress the 2018 fire. The perched water contamination appeared to be low scale and derived from the single fire fighting event. No evidence of any other historical or ongoing sources of PFAS contamination were found in the desk-based data search.

The infilled former clay pit shown to cover the site on the early Ordnance Survey Plan was demonstrated to extend to a maximum depth of 2.50m below ground level and therefore in our opinion did not represent a potential preferential flow pathway to the deeper groundwater.

The groundwater found in the standpipes was thought to be perched and was not anticipated to be in hydraulic continuity with deeper groundwater in the vicinity of the site due to the presence of significant relatively low permeability Till deposits (at least 5.5m below foundation level, probable much greater) and the anticipated depth to the groundwater table (circa 20m).

The report concluded that the concentrations of PFAS contamination recorded in M6A and previously in M1A and M6 are such that they are unlikely to present a significant risk to sensitive controlled water receptors and are highly unlikely to have a significant impact on the quality of the deep groundwater table.

2.2.5 Supplementary PFAS Investigation Report, ref. 6921K, dated October 2023, by Sub Surface Consultants Limited.

The Supplementary PFAS Investigation comprised:

- 11 No. mini boreholes
- 3 No. Falling head permeability tests
- Installation of standpipes followed by groundwater monitoring
- Contamination analyses
- Provision of an interpretative report on the above.

The work was undertaken in response to comments received from the Environment Agency regarding the use of potentially PFAS contaminated recycled concrete aggregate on the site, and to further characterise the groundwater PFAS contamination and obtain parameters to enable the design of an appropriate groundwater remediation strategy by a third party (Regenesis UK Limited).

Falling head permeability tests were undertaken in the Made Ground and Natural strata in M102, M104B, and M111. The 0.12m to 0.30m holes were filled with water and the water level was then monitored for a period of 180 minutes.

Water levels were found to have fallen insufficiently to determine the “Basic Time Lag” and hence the permeability could not be accurately determined. Details of the falling head permeability tests are appended.

There was initial movement in groundwater level during the first 15 minutes of reading and extrapolation of this data suggest that the upper made ground could have a coefficient of permeability of the order of 9.0×10^{-6} m/s, however this should be regarded as a very rough estimate and is likely to be highly variable across the site.

There was no movement in the water levels in the tests conducted in the natural clay and for this stratum we would recommend a very low hydraulic conductivity of the order of 1×10^{-11} is assumed (based on values suggested by Domenico and Schwartz, 1990).

In order to provide an assessment of the presence of contamination eight soil and six recycled concrete aggregate samples (including one field blank) were analysed for a suite of PFAS compounds.

Limited generic assessment criteria for the protection of human health were available for per and polyfluoroalkyl substances which are regarded as being emerging contaminants. For the purposes of the risk assessment the perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) results with soil screening values published by the Environment Agency for assessing ecological risks (from *'Derivation and Use of Soil Screening Values for Assessing Ecological Risks'* Report-ShARE id26 Rev.2022).

The speciated PFAS analyses on the soil and recycled concrete aggregate samples tested found no concentrations above the limit of detection levels. The limits of detection for PFOA and PFOS ($1\mu\text{g/kg}$) are below the SSVs (0.019mg/kg PFOA and 0.013mg/kg PFOS).

In the sand field blank, all PFAS compounds tested for were below the limit of detection.

Eight samples of groundwater taken from the standpipes installed in M1C, M5B, M6B, M10, M108, M109A, M110, and M111 and one field blank, all taken on 11th September 2023 were analysed for a suite of PFAS compounds.

To assess the risk to surface water bodies the PFOS results were compared with the Environmental Quality Standard (EQS) and the PFOA results were compared with the Australian ESL for freshwater.

To assess the risk to groundwater resources the PFOA and total PFOS results were compared with the UK Health Security Agency Tier 1 thresholds for PFOS and PFOA (taken from The Drinking Water Inspectorate Guidance, July 2022). For PFHxS Perfluoro-1-hexanesulfonate, PFNA Perfluoro-n-nonanoic acid, Linear PFOS, and Branched PFOS, the US ATSDR Minimum Risk Levels (MRL) were used. No appropriate thresholds were found for the other PFAS compounds tested for.

Samples where measurable PFAS compounds were recorded and where the levels of contamination have exceeded the EQS, ESL, UK DWI and/ or US MRL values were as follows:

TABLE 4 GROUNDWATER PFAS ANALYSES SUMMARY

Determinand	LOD (ng/l)	M108 1.10m (ng/l)	M109 1.30m (ng/l)	M110 1.18m (ng/l)	M111 5.04m (ng/l)	M6B 0.66m (ng/l)	M1C 0.94m (ng/l)
PFPA	<1	–	–	17.6 ^A	–	19.4 ^A	–
PFBS	<1	–	–	18.5 ^A	–	–	–
PFHxA	<1	–	–	23.3 ^A	–	–	–
PFHpA	<1	–	–	–	–	12.7 ^A	–
PFPeS	<1	–	–	11.2 ^A	–	–	–
PFOA	<0.65	–	–	14.7 ^A	–	27.1 ^{AC}	–
PFHxS	<1	–	–	47.3 ^A	–	–	–
Linear PFOS	<0.65	–	–	19.1 ^{AC}	–	–	–
Branched PFOS	<0.65	–	–	24.3 ^{AC}	–	–	–
6:2 FTAB	<10	12.6 ^A	–	–	–	–	–
Total PFOS	<0.65	6.66 ^{BD}	8.59 ^{BD}	43.5 ^{ABD}	0.975 ^{BD}	6.14 ^{BD}	7.08 ^{BD}

^A Exceeds DWS ^B Exceeds EQS ^C Exceeds US MRL ^D Exceeds Australian ESL

In the blank water sample all PFAS compounds tested for were below the limit of detection apart from 6:2 FTAB. It is conjectured that this may be due to an erroneous result.

The majority of the results were generally found to be below the published limit thresholds, the exceptions being PFPA, PFBS, PFHxA, PFHpA, PFPeS, PFOA, PFHxS, Linear PFOS, Branched PFOS, 6:2 FTAB, and Total PFOS, particularly in the samples taken from M110 and M6B. Total PFOS was found to be elevated in six of the eight samples tested.

The results suggest the PFAS concentrations may be attenuating by adsorption to soil particles, or may be migrating within the perched water towards the deeper made ground at the southern end of the site.

The report concluded that our opinion remains that the most likely source of PFAS contamination on the site remains the use of firefighting foams used to suppress the 2018 fire. The perched water contamination appeared to be generally low scale (when compared with the concentrations found on site where PFAS compounds have been produced/used on industrial scales).

No PFAS contamination was found in the recycled concrete aggregate or soil samples tested and therefore the report concluded that there is no significant soil source leaching into the perched groundwater and there has been no redistribution of PFAS contamination resulting from the re-use of the crushed site won concrete.

The finding of the groundwater analyses indicated the highest concentrations of PFAS compounds are to be found in the southern part of the site (M110). Given the low permeability of the made ground, the report opined this is unlikely to be due to migration and it is more likely that there has been some attenuation due to adsorption to the soil matrix. However, this part of the site was not previously characterised, and an alternative hypothesis would be that if during the 2018 incident the firefighting equipment was staged at the southern end of the site (as is likely for access) then there may have been greater initial contamination of the perched water in this part of the site due to spillage of PFAS containing aqueous film forming foams (AFFF) or greater runoff of PFAS contaminated water infiltrating the made ground.

The permeability assessment suggests that any migration of PFAS impacted perched groundwater through the natural cohesive strata will be limited.

2.3 Environmental Setting

2.3.1 Topography

The topography of the general area surrounding the site has been assessed using Ordnance Survey Open Data (Terra 50 contours and points), and Environment Agency LiDAR data (SJ89NE DTM). While the site is generally flat the topography of the surrounding area slopes generally down to the south south west, towards the River Medlock.

2.3.2 Potentially Contaminative Land Use

Within 250m of the site there are general construction supplies and an unspecified works. In addition, within 500 metres of the site boundary, there are twenty- two potentially contaminative industrial land uses.

2.3.3 Geology

The British Geological Survey (BGS) indicate that drift deposits, described as Till, Diamicton, are indicated to be present within the site.

The bedrock underlying the site is indicated to be mudstone, siltstone and sandstone of the Pennine Upper Coal Measures Formation and the Pennine Middle Coal Measures Formation.

There is a boundary between the Pennine Upper and Pennine Middle Coal Measures formation in the north east of corner of the site which is marked by a fossil (marine) horizon.

2.3.4 Hydrogeology

The Glacial Till drift deposits beneath the site were indicated to be a secondary undifferentiated aquifer, while the bedrock was indicated to be a Secondary A aquifer.

The vulnerability of groundwater to a pollutant found within the site and its immediate surrounding area was assessed as low.

Based on the information obtained to date the perched water does not appear to be in hydraulic continuity with the deeper water table in the vicinity of the site.

2.3.5 Surface Water

The Phase I Desk Study found that based on Ordnance Survey data there are no watercourses (river, stream or canal) within 250m of the site boundary, and no surface water features (ponds or lakes) were identified within 250m of the site boundary according to the Ordnance Survey.

The Water Framework Directive (WFD) indicates that the site is within the catchment of the River Medlock which is located some 330m to the east south east.

2.4 Updated Conceptual Ground Model

The conceptual ground model of a site has been updated with regards to contamination sources, pathways and receptors, following the ground investigation, as follows:

TABLE 5 CONCEPTUAL GROUND MODEL

Potential Source	Contaminants Associated with the Source	Pathway	Receptor	Mitigation Action
Chemicals used in aqueous fire fighting foams (AFFF) used to suppress 2018 fire.	<u>PFAS:</u> PFPA PFBS PFHxA PFHpA PFPeS PFOA PFHxS Linear PFOS, Branched PFOS 6:2 FTAB	Dermal contact	Site Operatives	Limit contact with contaminated groundwater by wearing appropriate personal protective equipment (PPE).
			End Users	Hard concrete surfacing will break the pathway.
		Vertical and lateral movement of mobile contaminants to surface water and groundwater	Controlled Waters	Limit infiltration of leachable contaminants to underlying aquifer. Groundwater should be discharged to a sewer or a licensed discharge point.
		Direct contact	Water supply Pipes	Existing water supply is not in direct contact with the impacted superficial groundwater. Should any new connections be made, barrier pipe will be adopted.

3. OPTIONS APPRAISAL

After careful consideration of the risks and benefits, timeframes, costs and sustainability of the available remedial options the Client has decided to adopt the following remedial measures:

- Application of Regenesi's SourceStop™ colloidal activated carbon along site perimeter to prevent migration of PFAS impacted superficial groundwater off site.
- Site wide concrete surfacing breaking the direct contact pathway with the end users of the site and reducing the potential for rainfall infiltration.

The SourceStop™ treatment is composed of fine particles of activated carbon (1-2µm) suspended in water. The liquid format allows SourceStop to penetrate and evenly coat the target soil particles in a thin layer of activated carbon, to which PFAS is adsorbed. The tiny particle size results in much more rapid and highly efficient sorption of PFAS compared to powdered or granular activated carbon, resulting in a quicker and more complete treatment.

4. REMEDIATION & VERIFICATION STRATEGY

4.1 Remediation Objectives

Elevated concentrations of PFAS compounds have been determined in the superficial groundwater within the made ground on site and remedial measures are therefore required to prevent the migration of the impacted groundwater to sensitive receptors. With regard to the risks to human health, the site is to be covered with continuous concrete surfacing which will break the source-receptor pathways with no requirement for further remediation.

The aims of the remediation strategy are:

- To protect sensitive controlled water receptors.
- To ensure the remediation is undertaken in a sustainable manner in compliance with current guidelines and with a suitably robust verification plan.
- To satisfy the requirements of the Local Planning Authority (Manchester City Council).

4.2 Preparatory Works

Preparations for remedial works need to address issues of health and safety, pollution and nuisance in relation to site operatives, visitors to the site and associated plant, surrounding residents and the general public who may be affected by on-site works.

The site area should be made secure to prevent unauthorised access during site remediation works when contaminated materials are to be exposed. Access to site should be regulated by the site manager with records kept of on-site personnel and visitors, lorry movements, materials imported and exported from the site etc. This information should be made available for the Phase IV Validation Report.

4.3 Groundwater Contamination Remediation: SourceStop™ Injection

4.3.1 Methodology

The detailed remediation strategy is set out in the appended proposal document from Regenesi ref. JiF73966 Rev 1, dated 20th October 2023.

The remediation methodology was previously proposed to comprise the injection of SourceStop™ across the whole area of the northern half of the site. However, in response to the latest investigation (Our ref. 6921K) the approach has been revised with the aim being to create a barrier around the perimeter of the site to reduce the risk of offsite PFAS migration in the perched water held in the Made Ground.

Regenesi have visited the site and are confident that there are no constraints preventing the injection process from being implemented along the full perimeter and they anticipate the injection points will be placed up to about 1m from the site perimeter.

In summary the methodology comprises:

- SourceStop™ injection to form a barrier along the approx. 320m internal perimeter of the building, as indicated on Figure 3.
- The barrier, combined with the new building's roof and proposed concrete floor/hardstanding (essentially capping/infiltration mitigation), will act to mitigate the off-site PFAS migration risk.
- The PFAS impacted perched water is present in the granular Made Ground, sitting on top of the natural clay strata. Considering the range of (perched) groundwater levels measured, an average lateral treatment interval of 1m, extending upwards from the natural clay's upper surface is proposed.
- The SourceStop™ colloidal activated carbon (CAC) will be applied to the PFAS granular Made Ground that is present at an average depth of 1.5m under the present ground level and underlain by relatively impermeable clay. The injection depth will be around 1.00m.
- The treatment immobilises the PFAS within the soil through sorption, preventing or drastically reducing further discharge of mass from the source area. This enhances the plume's natural attenuation (ENA) and avoids impact to downgradient receptors.

4.3.2 Verification Plan

An appropriately qualified and experienced person should have a "watching brief" during the remediation and the observations of this person should be made available for the Phase IV Validation Report.

We understand that on completion of the initial injection work Regenesi will provide a Contract Completion Report that will include the following:

- Confirmation of the correct barrier installation.
- Quantitative details of the product installed.
- Results from their radius of influence testing.

To confirm the efficacy of the remediation scheme we propose to undertake post installation monitoring of the groundwater conditions.

The existing monitoring points are indicated on the appended Figure 4. These monitoring points were chosen in response to the previous proposed remediation methodology and were set out on an approximate 20m grid across the site. On the recommendation of Regenesis, in order to more effectively verify the SourceStop™ barrier it is proposed to install additional monitoring wells at approximately 10m centres along the perimeter of the site as shown on Figure 5.

The new wells will each comprise a hdpe standpipe with a gravel surround taken down to the natural clay stratum. The standpipes will be slotted from 0.50m, have an internal diameter of 50mm and have removable bungs to enable groundwater monitoring and sampling to be undertaken.

Groundwater sampling and analyses will be undertaken from the perimeter standpipes and from selected standpipes within the site on a monthly basis for the first six months. Following the initial monitoring period the results will be discussed with the Regulatory Authorities and it is anticipated that a second phase of monitoring would then be carried out on a quarterly or bi-annual basis as approved by the Regulator.

The purpose of the monitoring will be to:

- Verify the installation of the barrier.
- Monitor the performance of the barrier.

Verification of the barrier installation will be on a visual basis. We understand from Regenesis that groundwater in the sampling wells will be discoloured black by the SourceStop™ product when the injection has been successful.

Verification of the barrier performance will comprise analysis of the groundwater samples for PFOS and PFOA concentrations. As the aim of the chosen remediation methodology is to stop migration rather than destroy the PFAS contamination, firm remedial targets for the PFAS compounds are not appropriate and instead the analyses will aim to establish that PFAS concentrations at the perimeter are reducing. It is anticipated that if these compounds are not detected on the perimeter then this will suggest no elution from within it. The remediation will therefore be considered successful if the laboratory test results indicate the absence of PFOS and PFOA at the site perimeter, or if the results indicate a sustained downward trend in PFOS and PFOA concentrations.

The testing will be carried out at an MCERTS and UKAS accredited laboratory (ALS Laboratories UK Limited). The results will be reviewed after each monitoring visit by an appropriately qualified person and copies will be made available to the Regulators. The results will also be compiled for inclusion in the final verification report.

4.3.3 Contingency Plan

While Regenesis are confident that the SourceStop™ injection will prevent migration of the PFAS contamination and that no additional remediation will be required, should the verification analyses find that concentrations are not reducing at the perimeter then the remedial strategy will be reviewed with possible consideration given to either extending the injection zone within the building or the adoption of an additional technology such as a pump and treat approach to augment the SourceStop™ barrier subject to an appropriate cost benefit analysis.

4.4 Potable Water Supply Pipes

The existing water supply enters the property at the southern end of the site from Briscoe Lane (between monitoring locations M110 and M111. At this end of the site the groundwater is at depths of between 1.18m and 3.04m, significantly below the depth of the water supply pipe. A plan showing the latest groundwater depth readings for each of the standpipes is given on Figure 6.

There has been very little research into the possibility of PFAS permeation through polyethylene pipes. The evidence to date suggests where polyethylene water supply pipes are used for water supply connections there is unlikely to be any permeation of PFAS compounds with a chain length of C4 or greater. However, there is scant evidence as to whether the smaller molecules of short chain PFAS compounds, which may also be present albeit in lower concentrations, could permeate polyethylene supply pipes when submerged in PFAS contaminated groundwater. As a precaution we would recommend that barrier pipe is used for any future water supply pipes placed in areas where shallow perched groundwater depths were recorded.

5. RISKS TO SITE OPERATIVES

Measures need to be put in place to prevent site operatives coming into direct contact with contaminated materials by skin contact due to the potentially elevated concentrations of PFAS compounds.

Site personnel involved in earthworks and excavations should be made aware of the hazards of working with contaminated materials found on site. Strict personal hygiene should be observed and suitable personal protective equipment (PPE) should be worn. Washing and messing facilities should be made available on site and smoking should be prohibited.

6. ENVIRONMENTAL MITIGATION MEASURES & WASTE MANAGEMENT

6.1 Earthworks

Earthworks undertaken during dry weather might generate dust and in this instance dust should be damped down and dust masks made available to site operatives. In addition stockpiled materials should be sheeted over to prevent excessive airborne dust being formed which could potentially migrate off site.

If groundwater is to be pumped out of excavations, then contamination analyses should be undertaken for groundwater to be disposed of, and the results submitted to the appropriate authority or a waste disposal operator to determine the most cost effective method of disposal.

6.2 Waste Soil Management

We understand the majority of groundworks have been completed, however should any further excavations be required for the development, then classification of the waste soil arisings should be undertaken prior to removing it to a licensed waste disposal facility.

All vehicles carrying contaminated material should be securely sheeted and the wheels and undercarriages cleaned before leaving site to ensure that hazardous materials are not dropped onto public roads.

Transfer documentation for each load of contaminated material exported from the site will be obtained and made available for the Phase IV Validation Report.

7. CAVEATS AND ASSUMPTIONS

It should be appreciated that only a small proportion of the area to be developed has been sampled and consequently the recommendations made and opinions expressed in our reports can only be applied to such conditions as were encountered in the exploratory holes.

The exploratory holes indicate a nature and degree of similarity to the extent that we consider them likely to be representative of the natural ground conditions. However, no guarantee can be given. For the purposes of this remediation strategy it is assumed that the findings of the Phase I and Phase II investigations are representative of the site conditions, however with any site it is possible that unrecorded potentially contaminative activities may have taken place, or that zones of contamination exist which have not been encountered by the intrusive investigation.

We recommend that a contingency plan is put in place to deal with unforeseen contaminated ground being found. In this regard a “watching brief” should be employed during any further earthworks and during the implementation of the remediation scheme and the following procedure followed if unforeseen ground conditions are encountered:

- Cease work.
- Liaise with the Client and Regulatory Authorities
- Agree revised course of action with the Client and Regulatory Authorities.
- Revise Remediation Statement, if necessary.

8. VERIFICATION REPORT

On completion of the remedial works a Phase IV Verification Report should be produced by an appropriately qualified person. The report will include a recap of the methodology adopted and an assessment of the success of the remedial strategy. Documentary evidence in the report will include:

- Records of on-site observations including photographs.
- The Regeneration completion report.
- The results of the groundwater monitoring programme.
- Contamination analysis certificates.
- Transfer notes, discharge consents for any waste generated.

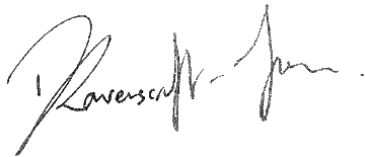
The report will be produced on successful completion of the remedial works and a copy will be made available to the Regulators. However, as discussed in Section 4.3.2 the results of each verification monitoring visit will be made available to the Regulators in the interim.

9. GENERAL

This Remediation Statement should be submitted to the Local Planning Authority (Manchester City Council), for approval in writing, prior to commencement.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Ms Anna Marsden at our Preston office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. 6921L
JANUARY 2024



D. Ravenscroft-Jones Cert Nat Sci (Open), BSc.(Hons), MSc., CEnv, MIEEnvSc, AMRSC
Principal Geoenvironmental Engineer
For and on behalf of
Sub Surface Consultants Limited



C. A. Marsden B.Sc.(Hons.), C.Eng., M.I.C.E.
Director
For and on behalf of
Sub Surface Consultants Limited.

PROPOSAL DOCUMENTS

Date: 20 October 2023

Ref: JiF73966 Arkady – Proposal (Rev 1)

FAO: Noah Fletcher
Cassel & Fletcher Construction Ltd

RE: Proposal for the treatment of per- and polyfluoroalkyl substances (PFAS) contamination at the Arkady site

Dear Noah,

Thank you for your interest in REGENESIS. Further to our initial budget estimate for the site on 18 01 2023, please find herein our updated proposal for the treatment of the PFAS contaminated (perched) groundwater underlying the source area at the Arkady site ('the site').

Background

From the information provided, REGENESIS understands that Cassel & Fletcher Construction Ltd (Cassel) are constructing a commercial warehouse on the footprint of an existing building that burnt down. PFAS contamination has been identified in the Made Gound underlying the site.

Following comments from the Environment Agency, Sub Surface North West Limited (Sub Surface), on behalf of Cassel, have undertaken supplementary investigation into the recycled concrete aggregate underlying the site, with the aim of improving the characterization of groundwater PFAS contamination (October 2023). The investigation comprised the advancement of 11no. mini boreholes to 4.0m Below Ground Level (BGL), installation of standpipes for groundwater monitoring, and the collection and analysis of groundwater samples.

Site Information (updated)

This section summarises the site information provided to REGENESIS by Sub Surface. This information has been used to inform the groundwater treatment design presented later on in this proposal.

- History:
 - The Sub Surface Phase I desk study (2020) identified that the site was previously occupied by a factory which was damaged by fire in 2018 and subsequently demolished.
- Development:
 - The site is currently being developed with the construction of and 'L' shaped light industrial unit, and associated hard standing.
- Current State:
 - Partial development, including:
 - Crushing of previous floor slab to create aggregate for the sub base to proposed new floor slab;
 - Foundation construction;
 - Installation of drainage scheme apart from the proposed attenuation tanks;

- erection of steel frame and cladding
- construction of the internal block work
- erection of the 1st floor mezzanine and floor and stair installation.
- Geology:
 - Made Ground: encountered to depths of 0.3m to 2.5m. The ground surface generally comprised compact very sandy fine to coarse gravel sized fragments of concrete with medium concrete cobble content, with localised very sandy fine to coarse gravel sized fragments of stone
 - The base of the made ground was found to vary from 0.15m depth (north western margin) to 2.50m depth (south eastern margin) in the previous investigation.
 - Note, a number of obstructions, preventing the advancement of investigatory boreholes, were encountered during the recent investigation, requiring slight adjustments to planned locations. We assume this occurrence likely during any subsequent injection works.
 - Natural drift deposits were encountered at depths of between 0.50m and 2.50m and comprised mainly firm, stiff or very stiff high strength locally medium strength, slightly gravelly silty CLAY, consistent with finding of the previous investigations
 - The natural clay depth is variable, and 1.5m BGL is considered to be a reasonable average.
- Hydrogeology:
 - From the recent investigation, one groundwater monitoring visit was undertaken on 11th September 2023 and standing water depths of between 0.20m and 3.58m were recorded;
 - Groundwater level: 1.20m bgl in the standpipes installed in the made ground and 1.50m to 2.50m in the standpipes installed in the natural strata.
 - The groundwater in the standpipes is thought to be superficial perched water held in the made ground above the clay stratum
 - Monitoring of wells screened in the natural strata, suggests a groundwater gradient of some 0.02 towards to the south, which is generally consistent with the topography of the area.
 - Permeability Test
 - M102 – MG to 0.65; CLAY to 4.0m BGL (base of installation)
 - M104B – MG to 0.55; CLAY to 4.0m BGL (base of installation)
 - M111 – MG to 0.6; CLAY to 4.0m BGL (base of installation)
 - There was initial movement in groundwater level during the first 15 minutes of reading and extrapolation of this data suggest that the upper made ground could have a coefficient of permeability of the order of 9.0×10^{-6} m/s, however this should be regarded as a very rough estimate and is likely to be highly variable across the site.

- Contaminants of Concern (COCs): PFAS
 - Soil & recycled aggregate (16no samples)
 - No concentrations above the limit of detection levels for PFOS and PFOA (1 µg/L);
 - Water (8 samples)
 - Speciated PFAS compounds analysed for (including linear, branched and total PFOS)
 - The tables below show values where measurable PFAS compounds have been recorded, and where the levels of contamination have exceeded the EQS, ESL, UK DWI and/ or US MRL values, as follows:

Table 1: GW PFAS levels (from the Sub Surface 2023 supplementary investigation)

Determinand	LOD (ng/l)	M108 1.10m (ng/l)	M109 1.30m (ng/l)	M110 1.18m (ng/l)	M111 5.04m (ng/l)	M6B 0.66m (ng/l)	M1C 0.94m (ng/l)
PFFA	<1	–	–	17.6 ^A	–	19.4 ^A	–
PFBS	<1	–	–	18.5 ^A	–	–	–
PFHxA	<1	–	–	23.3 ^A	–	–	–
PFHpA	<1	–	–	–	–	12.7 ^A	–
PFPeS	<1	–	–	11.2 ^A	–	–	–
PFOA	<0.65	–	–	14.7 ^A	–	27.1 ^{AC}	–
PFHxS	<1	–	–	47.3 ^A	–	–	–
Linear PFOS	<0.65	–	–	19.1 ^{AC}	–	–	–
Branched PFOS	<0.65	–	–	24.3 ^{AC}	–	–	–
6:2 FTAB	<10	12.6 ^A	–	–	–	–	–
Total PFOS	<0.65	6.66 ^{BD}	8.59 ^{BD}	43.5 ^{ABD}	0.975 ^{BD}	6.14 ^{BD}	7.08 ^{BD}

Table 2: GW PFAS levels (from the Sub Surface 2022 PFAS risk assessment presents the measurable PFAS levels from the current and 2020 investigation)

Determinant	LOD (ng/l)	Environmental Thresholds		Human Health Thresholds		Previous		Current
		EQS (ng/l)	Australian ESL Freshwater (ng/l)	US MRL (ng/l)	UK DWS (ng/l)	M1A 0.80m (ng/l)	M6 0.50m (ng/l)	M6B 1.20m (ng/l)
PFBA	2	-	-	-	-	10.7	-	89.1
PFPA	1	-	-	-	-	20.3	-	-
PFHxA	1	-	-	-	-	28.4	3.74	-
PFBS	1	-	-	-	-	-	-	7.03
PFHpA	1	-	-	-	-	29.1	11	31.8
6:2FTS	1	-	-	-	-	7.24	3.03	3.42
PFOA	0.65	-	19000	21	100	14.6	6.65	42.6
PFHxS	1	-	-	140	-	2.87	4.16	3.99
PFNA	1	-	-	21	-	-	1.48	4.03
PFHpS	1	-	-	-	-	1.39	1.07	-
PFDA	1	-	-	-	-	-	1.49	6.23
Linear PFOS	0.65	-	-	14	-	48.2	36.5	8.83
Branched PFOS	1	-	-	14	-	41.4	26.7	5.8
Total PFOS	1	0.65	0.23	-	100	89.6	63.2	14.6

It should be noted that since the time of the previous report the UK DWS values have been reduced by an order of magnitude and the range of applicable compounds expanded to cover all PFAS species.

Summary of Needs and Objectives

REGENESIS understands that there are no quantitative remediation targets for the site at present. The broad aim of the remediation is to reduce the risk of offsite PFAS migration in the perched water held in the Made Ground.

Proposed Treatment Approach: SourceStop

Arkady Treatment

The updated conceptual has indicated the PFAS contamination is present in the perched water, across the entire footprint of the building: an area closer to 4,000m², as compared to the previously estimated 1,500m² extent of impact. We expect this is the result of PFAS-containing aqueous film-forming foam (AFFF), employed by the fire service to extinguish the previous building.

Applying the previously proposed treatment strategy, of SourceStop application via a grid network across the entire treatment area, to the increased PFAS impacted area would necessitate a considerable cost increase (>£500K). REGENESIS propose an alternative strategy of applying SourceStop barrier along the approx. 320m internal perimeter of the building – See Figure 1. The barrier, combined with the new building's roof and (to be constructed) need concrete floor pad (essentially capping/infiltration mitigation), would act to mitigate off-site PFAS migration risk.

The perched was is present in the granular Made Ground, sitting on top of the natural clay strata, that is present at an average depth of 1.5m under the present ground level. Considering the range of (perched) groundwater levels measured, we propose an average treatment interval of 1m, extending upwards from the natural clay's upper surface.

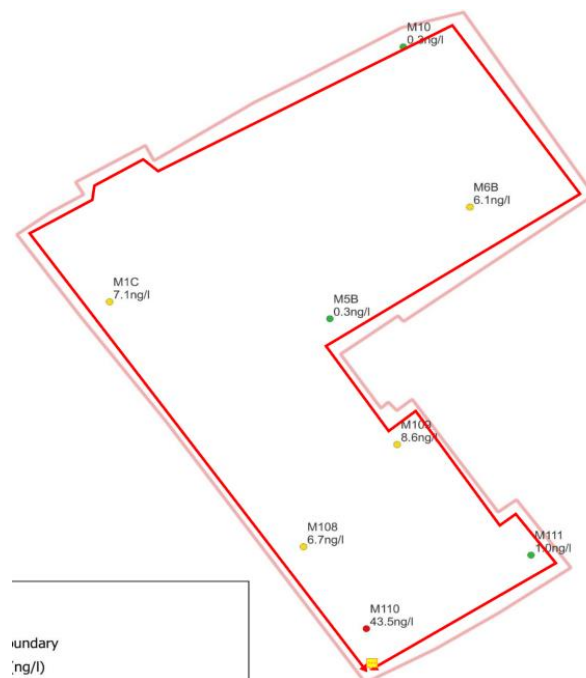


Figure 1: Indicative Treatment Area

SourceStop Technology

The site-specific treatment will comprise SourceStop™ colloidal activated carbon (CAC) application to the PFAS impacted Made Ground overlying the clay stratum. The treatment immobilises the PFAS within the soil through sorption, preventing or drastically reducing further discharge of mass from the source area. This enhances the plume's natural attenuation (ENA) and avoids impact to downgradient receptors.

The treatment is a sustainable, passive solution with no ongoing operational costs, no waste, and a safe and easy application

SourceStop is composed of fine particles of activated carbon (1-2µm) suspended in water. The liquid format allows SourceStop to penetrate and evenly coat the target soil particles in a thin layer of activated carbon, to which PFAS is adsorbed. The tiny particle size results in much more rapid and highly efficient sorption of PFAS compared to powdered or granular activated carbon, resulting in a quicker and more complete treatment.

Treatment Validation

To validate the SourceStop groundwater treatment approach we recommend a series of monitoring wells are installed prior to the SourceStop barrier injection, and within the barrier footprint. Groundwater monitoring should be undertaken prior to SourceStop injection (baseline), and then monthly post-injection for a minimum of 6-months. Ideally the 6-month post injection monitoring would commence after an initial 3-month period post injection, to allow the SourceStop to settle out of suspension onto the Made Ground matrix.

Price

The price for the completion of the works described above is £ £195,377.80 + VAT and will comprise approximately 3-weeks on site.

The above price is subject to confirmation following a site walkover, including marking-out and measurement of the proposed perimeter barrier, and the following assumptions ;

- **There will be a requirement to deploy our MTL;**
 - Our fixed price for provision and deployment of our MTL to the site, including preparation of the application package, payment of the fee, all liaison with the EA, reporting and Technically Competent Management is £5,000.00 + VAT.
 - The EA processing period is typically 10-12 weeks from receipt.
- There will be no overlying concrete floor at the time of construction and the subsequent construction of any foundations or floor will not remove the SourceStop treated material;
- There is reasonably free and unrestricted access on site.
- Enabling works:
 - A UXO survey has been undertaken for the treatment area and it has been deemed safe for intrusive ground works;

- Underground service clearance and hand-pitting of injection points to 1.5m BGL will not be required;
- The injection works are to be carried out on soft ground (no hardstanding removal required)
- The proposed application method is viable at the site;
- A suitable water supply is available at the work area free of charge, (fire hydrant or similar capable of supplying approximately 10,000 litres per day);
- On-site welfare facilities will be provided free of charge to REGENESIS:
- Cassel & Fletcher Construction responsibilities:
 - Establishment of temporary works compound;
 - Disposal all of waste (wooden pallets, plastic drums etc.); and
 - Performance monitoring (with support from REGENESIS, as required).

Closing

This proposal is provided in line with the attached T&C's.

I trust that this is of interest to you. Please do not hesitate to contact me if you have any questions or would like to discuss this further.

Yours sincerely,



Jim Forde MSc FGS

Technical Manager, UK and Scandinavia

Attachments: 1) T&Cs and Sales Order Acknowledgement Form.

CC'd: Jack Shore (REGENESIS Ltd)

Stopping PFAS at the Source

Focused PFAS Source Zone Treatment Service Featuring SourceStop



Stopping PFAS at the Source

Focused PFAS Source Zone Treatments Featuring SourceStop

REGENESIS offers the most advanced technology and soil fixation processes to immobilize PFAS (i.e., Per- and polyfluoroalkyl substances) at the source, effectively halting their movement in groundwater away from source zones to prevent PFAS exposure risk.



REGENESIS' source zone treatments for PFAS incorporate SourceStop[™], a proprietary technology comprised of micron-scale (<2 μm) colloidal activated carbon (CAC) applied to PFAS source zones in liquid form. Developed by REGENESIS' team of Research and Development scientists, SourceStop uniformly coats and permeates soils, resulting in substantially reduced PFAS leaching compared to other sorption materials used in direct mixing applications.



REGENESIS' PFAS source treatments are designed and applied by REGENESIS Remediation Services (RRS). RRS brings more than a decade of soil remediation expertise to immobilize PFAS quickly and effectively at their source and prevent future exposure risk.





Background

Treating PFAS Sources to Reduce Exposure Risk

The identification of PFAS-impacted groundwater plumes and source zones continues with increased frequency. In many cases, these 'forever chemical' source zones contain a high concentration of PFAS in shallow soils, which contribute to the development of groundwater plumes and create PFAS exposure risk to potential receptors.

PFAS-impacted soils are expensive to dispose of or incinerate, and acceptance of either approach decreases as certain PFAS become regulated as hazardous substances by the US EPA. Groundwater contamination emanating from these source zones is difficult and costly to treat. Due to PFAS' persistence, mobility, and actionable clean-up levels in the parts per trillion, these soil source areas can sustain PFAS groundwater plumes for many decades.

REGENESIS PFAS source zone treatments are applied to vadose soils at the source to prevent PFAS plume formation resulting from precipitation infiltration and soil leaching. They may also be applied to the capillary fringe and upper saturated zone to facilitate a stable or declining plume condition, a sought-after element for managing a PFAS plume under a Monitored Natural Attenuation (MNA) remedial strategy. These PFAS source treatments, featuring SourceStop, reduce contaminant flux into groundwater and are synergistically combined with PlumeStop® barriers downgradient of the source to halt plume migration and minimize PFAS exposure risk.

PFAS Source Zone Remedial Applications

Flexible Treatment Options Tailored for Each Site

REGENESIS' source treatments provide a targeted and holistic approach to the different media of concern within a PFAS source zone and the different elements of a PFAS plume risk mitigation strategy.



Mitigating PFAS Source-Zones is Key to Minimizing PFAS Exposure Risk

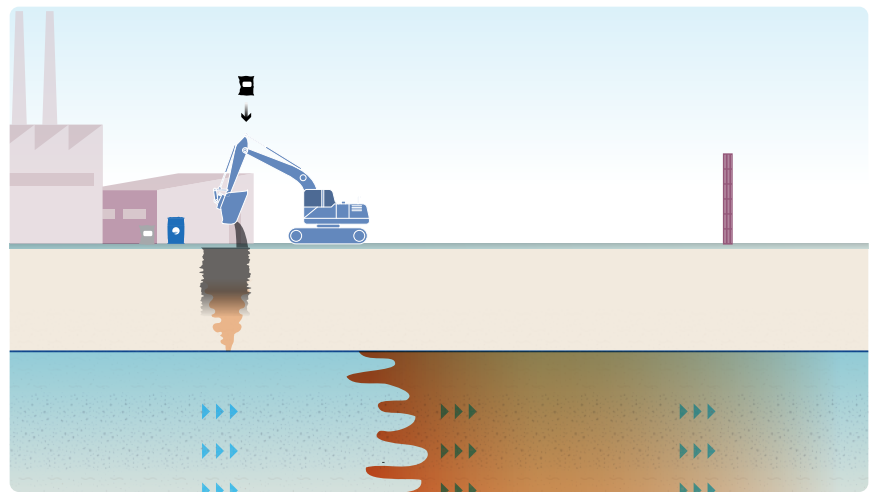
PFAS has been used in manufacturing and firefighting efforts for decades, resulting in potentially hundreds of thousands of PFAS release areas worldwide, where high levels of PFAS in soil and groundwater reside as long-term sources of groundwater contamination. These source areas include aqueous film-forming foams (i.e., AFFF) fire training sites, PFAS bulk chemical spill locations, Class B Firefighting System testing pads, oil and gas development sites, and metal-fume-suppression stations, to name a few. When left untreated, they can lead to extensive and persistent PFAS-contaminated groundwater plumes, posing unacceptable risks to human health and the environment.

PFAS' persistence and mobility allow them to travel far and wide in groundwater, resulting in plumes extending over long distances (i.e., miles/kilometers) and persisting over long timeframes (i.e., decades) if left untreated. Where possible, identifying PFAS source areas and quickly remediating them is essential for mitigating and effectively reducing long-term PFAS exposure risks and liabilities.

Soil Source Treatment

REGENESIS provides *in situ* sequestration and stabilization of PFAS impacted soils in the source area. This is completed by mixing a site-specific blend of amendments into the target soils, dramatically reducing the leachability of PFAS attached to the soils and minimizing precipitation infiltration while preventing further vertical migration.

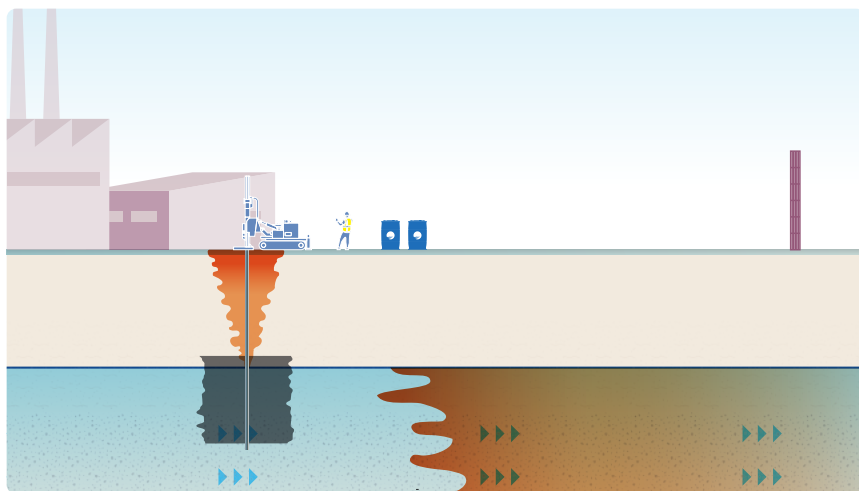
In addition to the blend of amendments used, SourceStop™ colloidal activated carbon (CAC) is applied to penetrate into the underlying soils and coat vertical flow paths to capture any residual contamination. The innovative treatment enhances the natural attenuation (ENA) of the plume and avoids impact on downgradient receptors. The treatment is a sustainable, passive solution safely and easily applied requiring no ongoing operational costs, and generating no waste.



In situ mixing of amendments in the vadose zone soils with SourceStop applied to base.

Groundwater Source Treatment

SourceStop is injected under low pressure into the groundwater and capillary fringe at the PFAS source zone, converting treated aquifer materials into an *in situ* purifying filter and rapidly removing high levels of PFAS from the groundwater.



In situ injection of SourceStop in the groundwater and capillary fringe.

Combining Source Zone Treatments with Downgradient Plume Treatments



Site objectives often require groundwater remedial targets to be met in a short timeframe and with added protections against PFAS exposure and liability risk. PFAS source treatment remedies can be combined with PlumeStop barriers installed downgradient of the source to quickly achieve these objectives. PlumeStop® barriers are backed by a PlumeShield™ warranty program to provide certainty and peace of mind.

Completing a PFAS Source Zone Treatment on your Site

Working with REGENESIS



Step 1 - Analysis

A soil sample is taken and tested in the REGENESIS laboratory using a blend of amendments, including powdered activated carbon, soil binding agents (e.g., Portland cement), and SourceStop.



Step 2 - Design

Upon receiving site data, REGENESIS will develop a soil fixation process design to ensure optimized permeability reduction and PFAS fixation within the target source zone. Site-specific soil sampling and amendment optimization performed by the REGENESIS laboratory may be included. The resulting design will specify the volume and optimum placement of SourceStop and the amount and type of fixation additives to be mixed into source zone soils.



Step 3 - Application

Implementation of the source zone treatment is conducted by RRS under the direction of REGENESIS' soil mixing experts.



Step 4 - Performance

Following treatment, the source area contamination is immobilized, and the PFAS groundwater plume, if present, attenuates.

Benefits

Complete, Rapid, and Sustainable Results Delivered Cost-Effectively

SourceStop, a high-concentration, micron-scale colloidal activated carbon, is utilized on REGENESIS' PFAS source zone treatments, benefitting your project in numerous ways.



Immediate, Cost-Effective and Long-Lasting Treatments

Immediately reduces PFAS leaching potential from source zone soils and groundwater. Sustained treatment minimizes PFAS exposure risk over the long term. SourceStop is significantly more effective at reducing PFAS leaching than other direct-mixing sorptive materials.



Substantial Cost Savings

Remedies can be implemented at a fraction of the cost of alternatives like soil excavation and removal, resulting in dramatic project cost savings.



Highly Flexible

Flexible approaches are employed to provide the most cost-effective solution tailored for each site. Materials are applied using a range of direct mixing or injection methods.



Sustainable with No Hazardous Waste Streams Generated

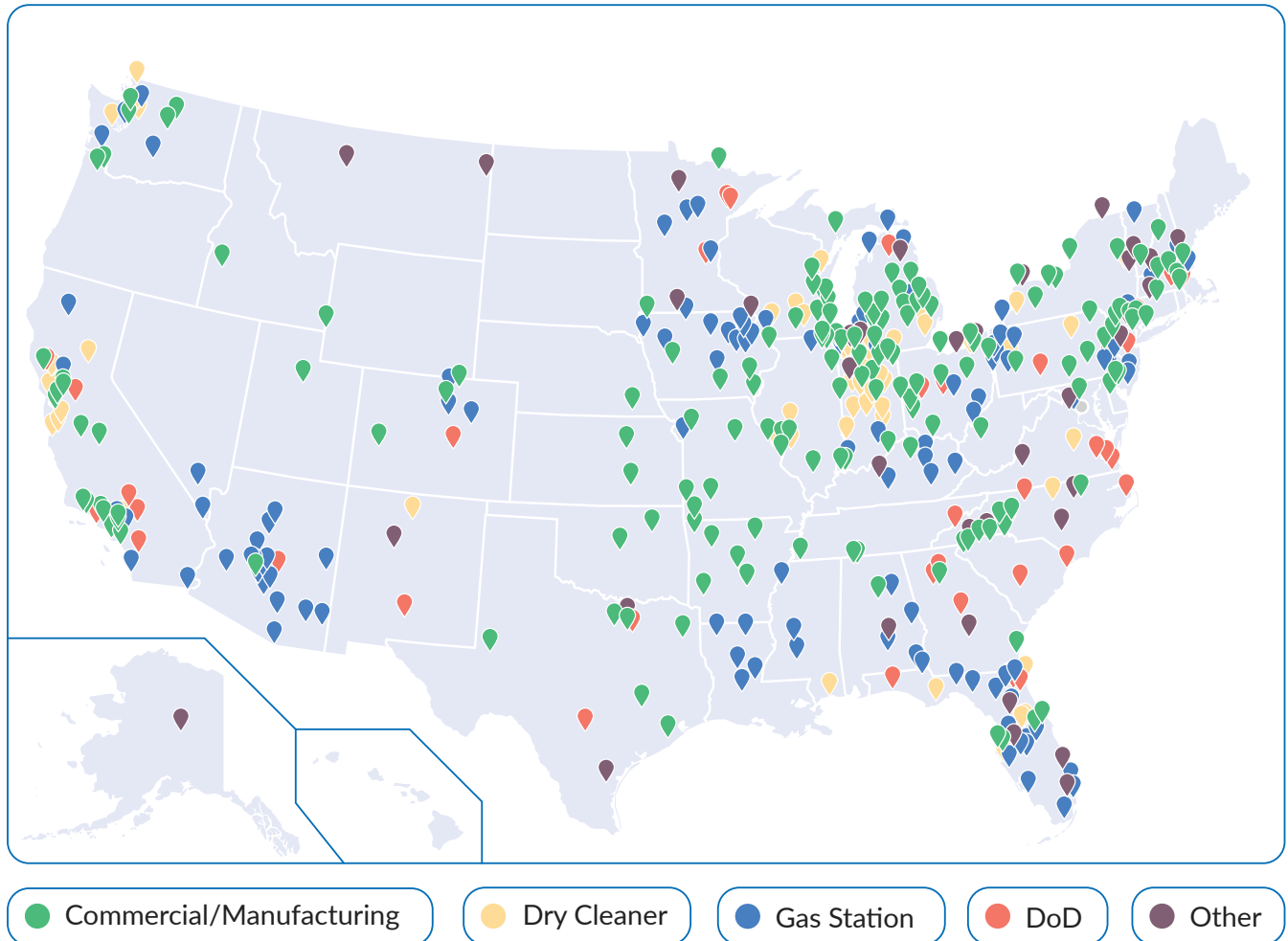
REGENESIS PFAS source zone treatments are sustainable, avoiding the generation of hazardous waste streams, energy consumption, and emissions.



Combine with PlumeStop Plume Treatments backed by PlumeShield

REGENESIS PFAS source zone remedies can be combined with PlumeStop permeable reactive barriers to cut off the plume and provide rapid offsite risk removal. Treatment performance warranty options are available through the PlumeShield warranty program.

RRS Has Completed a Wide Range of Remediation Works at Hundreds of Sites Across the Country



800+

Applications Completed

100+

Applications Per Year

13 Million+

Gallons Applied

-5° F

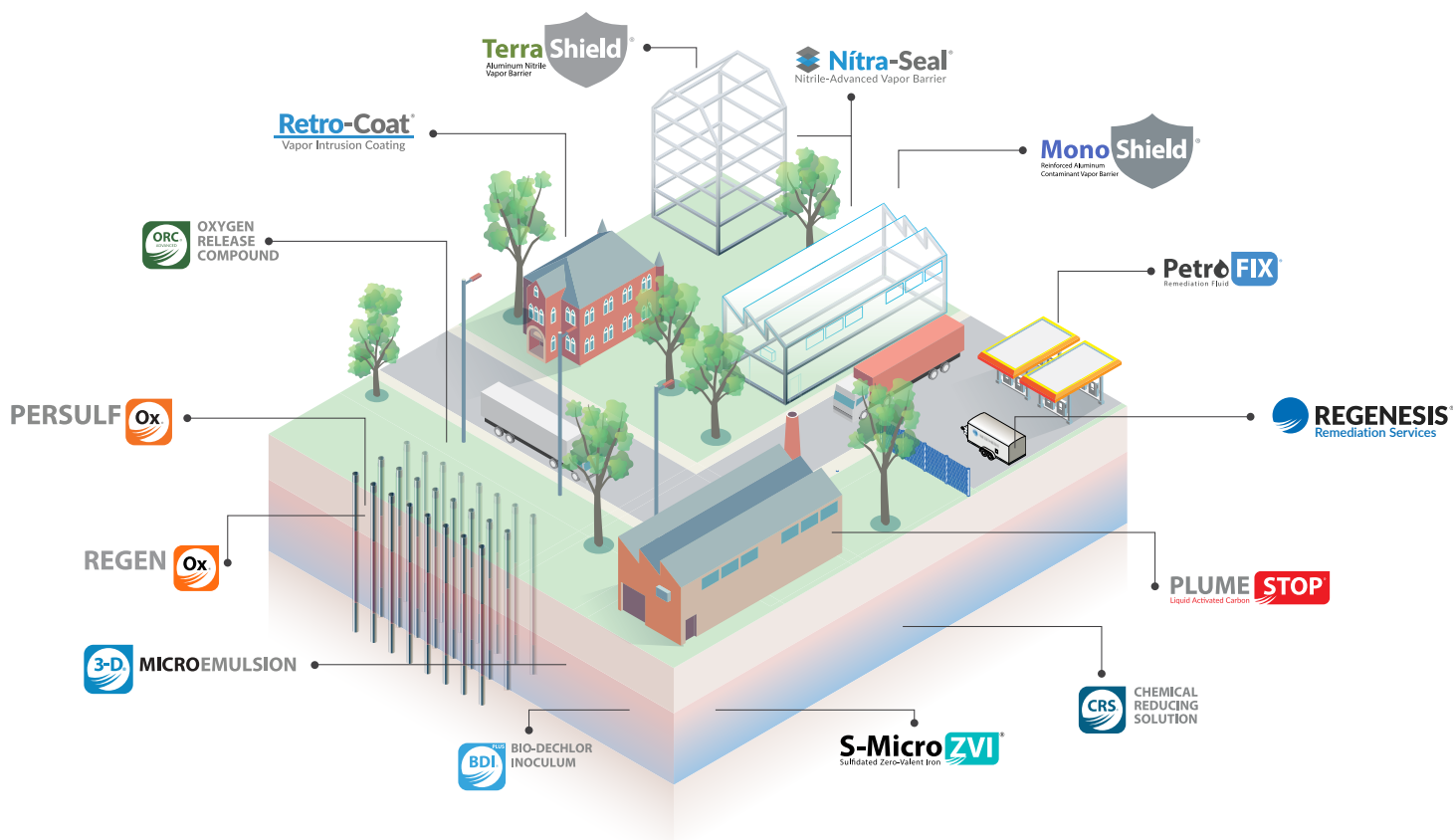
Lowest Project Temperature

15 Million+

Pounds Applied

123° F

Highest Project Temperature



About REGENESIS

At REGENESIS we value innovation, technology, expertise and people which together form the unique framework we operate in as an organization. We see innovation and technology as inseparably linked with one being born out of the other.

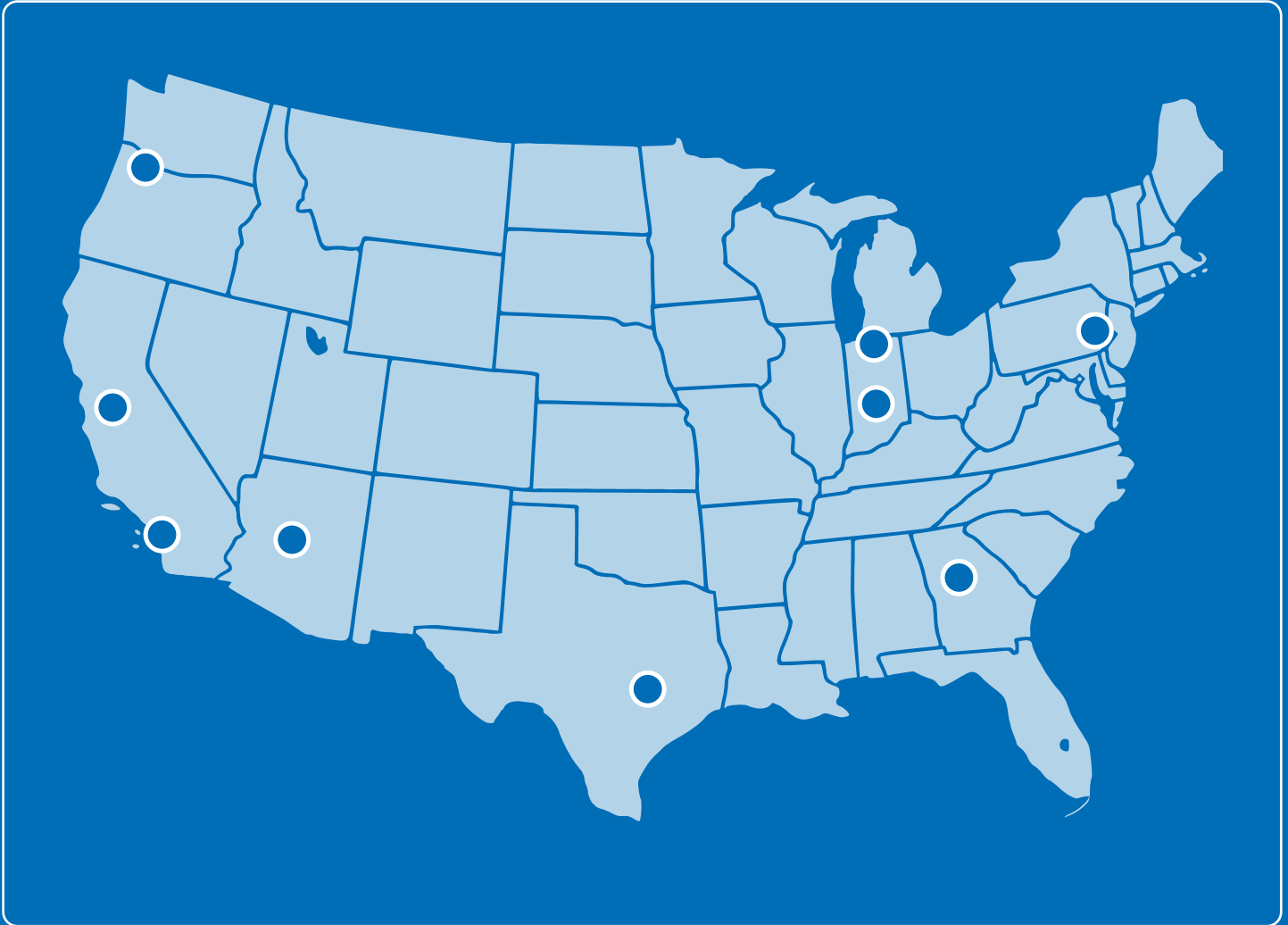
Inherently, innovation imparts new and better ways of thinking and doing. For us this means delivering expert environmental solutions in the form of the most advanced and effective technologies and services available today.

We value expertise, both our customers' and our own. We find that when our experienced staff collaborates directly with customers on complex problems there is a high potential for success including savings in time, resources and cost.

At REGENESIS we are driven by a strong sense of responsibility to the people charged with managing the complex environmental problems we encounter and to the people involved in developing and implementing our technology-based solutions. We are committed to investing in lasting relationships by taking time to understand the people we work with and their circumstances. We believe this is a key factor in achieving successful project outcomes.

We believe that by acting under this set of values, we can work with our customers to achieve a cleaner, healthier, and more prosperous world.

We're Ready to Help You Find the Right Solution For Your Site



Global Headquarters

1011 Calle Sombra
San Clemente, CA 92673 USA

Ph: (949) 366-8000
Fax: (949) 366-8090

Locations

San Clemente, CA
Sacramento, CA
Phoenix, AZ
Austin, TX
South Bend, IN

Indianapolis, IN
Philadelphia, PA
Atlanta, GA
Vancouver, WA



All Our Products are REACH Compliant

What is REACH?

The Registration, Evaluation, Authorisation and Restriction of Chemical Substances (REACH) Regulations were introduced by the European Chemicals Agency in 2007, with the aim of protecting users' health and the environment through better understanding of chemical substances.

Essentially, this means that all chemical substances used in the EU need to be tested and registered to prove that they are what they claim to be. This is important for in situ remediation projects where a responsible practitioner would want to be certain of what substances they are handling and injecting into the ground.

As of May 31st 2018, all substances manufactured or shipped within the EU need to be registered under REACH. To this end, at REGENESIS, we have assessed our full product portfolio and registered all appropriate substances.

Downstream User Obligations

Definition of 'Downstream User'

If you are based in the EU and are considering using any substance for remediation, then under REACH, you are considered to be a 'Downstream User'.

As a Downstream User, when considering the use of any product, it is advisable that you ensure your supplier is legally compliant under REACH regulations. This can be done by contacting your supplier to check the product you wish to use has been registered and looking on the Safety Data Sheet for the registration number.

Obligations under REACH

There are obligations about the usage of products under REACH too. At REGENESIS, we have strived to ensure that all the uses of our products are documented in the registration dossier for each specific substance.

As a Downstream User, you need to check that your intended use matches the conditions described in the exposure scenarios within the Safety Data Sheet. If your use is different from what has been envisaged, then the best thing to do is to call us to discuss your planned usage. We can then help you alter your usage or we may choose to modify the substance registration to cover this new use or you may choose to register the specific use directly with the European Chemicals Agency (ECHA).

Further Information

For more information on REACH and your obligations under it, please follow these links:

[About downstream users \(ECHA\)](#)

[What REACH means for users of chemicals \(HSE GOV UK\)](#)

[Reach information in your own language \(ECHA\)](#)

REGENESIS UK LTD LIMITED SERVICES CONDITIONS OF SALE

1 Contract

1.1 These Conditions shall govern all sales of goods and services ("the Goods") by Regenesis UK Limited ("Regenesis"), its subsidiaries or associated limited companies (in any case, "Regenesis" which in this document below shall include Regenesis' servants, agents, assignees, or others who have been specifically approved and authorised in writing by Regenesis to the Buyer to act on behalf of Regenesis) to any buyer ("the Buyer").

1.2 These Conditions, together with any accompanying Regenesis documentation, and any other documentation listed therein shall form the contract ("the Contract") between the parties (together, "the Contract Documents"). Any terms or conditions of the Buyer shall be excluded unless expressly agreed by Regenesis in writing and appended to these Conditions. Purchase orders by the Buyer shall constitute offers to buy and no contract shall exist until the order has been accepted by Regenesis, and such contract shall be subject to Regenesis' terms and conditions herein set out. The conditions of the Buyer's purchase order shall not form part of the Contract unless expressly agreed by Regenesis in writing. Telephone, email, fax and verbal orders accepted by Regenesis are only given under these Conditions, and to the exclusion of any other terms and conditions.

1.3 These Conditions take precedence over all and any other Contract Documents.

1.4 No variation of these Conditions shall be effective unless in writing and signed by or on behalf of both parties. Notwithstanding any variation, these Conditions shall continue to apply except insofar as they are specifically excluded in writing by Regenesis. The Buyer acknowledges that there are no representations outside the Contract Documents which have induced him to enter into the Contract.

1.5 A waiver of any provision must be in writing by Regenesis to be effective and a waiver of any provision, or failure or delay to exercise any right by Regenesis shall not constitute a waiver of any subsequent breach of the same or any other provision.

1.6 The provisions of this Contract are severable and if any one or more such provisions are judicially determined to be unenforceable in whole or in part the remaining provisions shall nevertheless remain binding and enforceable.

1.7 The Contract Documents and primarily these Conditions constitute the entire agreement between the parties and supersede all prior agreements or understandings between them.

1.8 Nothing in this Contract shall confer or purport to confer on any third party any rights, benefits or obligations.

1.9 The headings in these Conditions are for convenience only and shall not affect their interpretation.

1.10 The Buyer shall not without the prior written consent of Regenesis assign, transfer, or sub-let any obligations under the Contract or any part thereof. Where such consent is given, it shall not relieve the Buyer of any of its obligations under the Contract.

1.11 Regenesis reserves the right to sub-let its obligations under the Contract in part or as a whole.

2 Payment

2.1 The price of the Goods shall be Regenesis' quoted price.

2.2 The Buyer agrees that any changes to its original requirements and specifications used in the preparation of Regenesis' quoted price may invalidate the original quoted price or cause it to be changed. Regenesis at its sole discretion may choose to accept the changes and vary the price accordingly.

2.3 A quotation given by Regenesis will constitute an offer to treat only. Any order from the Buyer based on the quotation shall constitute an offer to buy, and no contract shall exist until accepted by Regenesis as herein provided.

2.4 The time for payment to Regenesis shall be of the essence of the Contract.

2.5 The Buyer shall pay invoices in full with no deduction or set off in respect of monies or liabilities which the Buyer may claim to be payable.

2.6 Regenesis shall be entitled to invoice the Buyer for the price of the Goods:

2.6.1 in advance where the Goods involve an element of design;

2.6.2 on account as work in relation to the Goods progresses;

2.6.3 or at any time after commencement and / or delivery of the Goods.

2.7 Payment of the full amount of each invoice shall be due on the date of each respective invoice. The final date for payment of each invoice will be 28 days after the date of each respective invoice.

2.8 Any payment on account will be allocated against the Buyer's longest outstanding invoices first, as determined solely by Regenesis.

2.9 Without prejudice to any other right or remedy available to Regenesis, Regenesis reserves all rights to charge interest on any amounts unpaid at 8% over Bank of England base rate from time to time, calculated on a daily basis, from the date of the invoice, until payment is received in full.

2.10 The price is exclusive of any VAT, or other taxes, fees or charges which shall be paid by the Buyer. Where required by statute, Regenesis reserves the right to charge CITB Levy at the standard rates in addition to any payments due. Unless otherwise indicated, the Price is exclusive of any applicable VAT which shall be paid by the Buyer. The Price is subject to increases in the cost of labour and materials to Regenesis. The Price shall include for one site visit to complete the Goods by Regenesis, and the price for any additional visits Regenesis deems necessary shall be payable by the Buyer.

3 Variations or changes

3.1 The Buyer may vary, add to, omit from, change or alter the performance of the Contract only by way of an express instruction agreed in writing in advance by Regenesis. No such instruction shall vitiate this Contract.

3.2 The Buyer shall be liable for all additional costs, expense, and delays arising from or in connection with any instruction, direction or variation. Regenesis shall not be liable for any loss of the Buyer arising from or connected to any change in or addition to or omission from the Goods.

3.3 The Buyer shall pay Regenesis the price of any change, variation, direction, instruction, addition or omission, as invoiced by Regenesis.

4 Delivery

4.1 The Buyer hereby accepts the general conditions of any carrier employed by Regenesis, as if the same were repeated here verbatim with the Buyer being Regenesis in that agreement and Regenesis being the carrier in that agreement.

4.2 Neither Regenesis nor any carrier shall be liable for damage or loss of goods in transit or for shortage on delivery unless notice in writing is given to the carrier concerned and Regenesis within 3 days of the date of delivery, or in the case of non-delivery or loss of goods within 14 days from the date of dispatch, and such other steps are taken by the Buyer (including, if necessary, shorter notice to the carrier concerned) as may be necessary to pursue the claim against the carrier.

4.3 Delivery will be made to the Buyer at a site as agreed. Any date of delivery or

period for delivery given is an estimate only and Regenesis will not be liable for any delay in delivery of the Goods, or the effects and / or consequences thereof, including but not limited to consequential loss, foreseeable and unforeseeable loss, costs, damages, expenditure etc.

4.4 Regenesis shall be entitled to use any method of transportation it may select for despatch of the Goods.

4.5 Regenesis shall provide the Buyer with any documents or certificates necessary to enable the Buyer to accept delivery. The Buyer shall be responsible for unloading and storage of the Goods upon delivery of the specified site. If through the Buyer's default, delivery cannot be effected, without prejudice to any other right or remedy available to Regenesis, the Buyer shall pay any costs incurred by Regenesis.

4.6 The cost of carriage, transportation, insurance and any other costs for services connected with the delivery of the Goods, shall be the responsibility of the Buyer.

5 Storage

Where Regenesis has notified the Buyer that the Goods are ready for delivery, the Buyer shall take delivery or arrange for storage. If the Buyer does not so take delivery or arrange for storage within 7 days of notification Regenesis shall be entitled to invoice and be paid for the Goods as though the Goods had been duly delivered in accordance with these instructions and Regenesis may arrange storage either at Regenesis' own premises or elsewhere on the Buyer's behalf and all charges for storage, insurance and demurrage shall be payable by the Buyer, and all risk shall pass to the Buyer on notification by Regenesis.

6 Performance

6.1 Regenesis shall endeavour to provide the Goods in reasonable time. Where Regenesis has been delayed by any act or omission for which the Buyer is responsible to any degree, any loss, expense, additional costs or the like incurred by Regenesis shall be recoverable from the Buyer as a debt.

6.2 Where the Goods include design, Regenesis undertakes to fulfil any design liability on the basis of the information provided by the Buyer in good time in advance of the Goods being performed on site. Where information is not physically provided by the Buyer, or not physically provided in good time by the Buyer, Regenesis shall not be liable in any way for any shortcomings of its design.

6.3 Where Regenesis has undertaken design work, and then the Buyer has purchased the Goods for use by way of its own installation or with its own staff, Regenesis does not accept liability for the performance or otherwise of the Goods, if they are not injected or applied as specified per Regenesis' design and other requirements. Regenesis undertakes that its Goods will perform as Regenesis has stated in writing to the Buyer. It cannot and does not take liability for how the Goods are used or installed by the Buyer or others, nor how the Goods may act or re-act in the given conditions of use.

6.4 The Buyer shall ensure that all its work connected to that of Regenesis is performed in good time commensurate with the work of Regenesis, by competent and suitably qualified personnel having appropriate qualifications as may be required by Regenesis and the site being worked on.

6.5 The Buyer shall maintain all field and work areas where Regenesis is required to provide the Goods or anything in connection therewith in a reasonably clear and safe condition and free from all rubbish and waste materials, including hazardous and non-hazardous materials.

6.6 The Buyer shall make it clear in writing in advance to Regenesis whether and to what extent any hazardous materials or hazards are or might be present on or around the areas of the Goods or the works connected thereto.

6.7 Where unexpected hazards or materials are found, Regenesis reserves its rights to entirely re-price the Goods, and shall not be responsible for any delay incurred.

6.8 The Buyer shall allow Regenesis full and unhindered access to all areas required for the Goods to be provided.

6.9 The Buyer shall ensure that all relevant authorities, planning, permissions, approvals, local and statutory rights have been satisfied prior to allowing Regenesis to commence any work.

6.10 The Buyer shall be liable for any damage, loss, shortage, charges, costs, expense, defect, flaw, failing or deficiency in the performance of the Contract as advised to the Buyer by Regenesis. Any such amounts shall be invoiced by Regenesis as provided for in these Conditions and be recoverable from the Buyer as a debt.

6.11 Where the Goods are to be provided by Regenesis in connection with or on a site where the Buyer is working, the Buyer shall be responsible for the safe execution of work in connection with the Goods and shall comply with all relevant legislation and reasonable requests of Regenesis, for securing the health and safety of all persons employed on the project, and such other persons who may be affected by the work or operations of the Buyer and Regenesis.

6.12 The Buyer shall be responsible for providing Regenesis with all reasonable health, safety and welfare facilities, including but not limited to, running hot and cold water, drinking water on tap, suitably reasonable toilets and washing facilities, dry and heated accommodation suitable to eat in, safe and dry storage, and access to a phone / fax line and mains electricity. Should the Buyer not provide any of the foregoing, Regenesis reserves the right to provide the same and all additional expense so incurred shall be recoverable from the Buyer as a debt, and in addition to the price for the Goods.

6.13 The Buyer indemnifies, and shall save harmless Regenesis for any breach of the Contract. If, as a consequence of any action and / or inaction of the Buyer, any person suffers personal injury or death, or any damage or interference is caused to any property or works, then the Buyer shall be liable for and shall indemnify Regenesis against any expense, loss, cost, claim, liability, damages and proceedings whatsoever arising.

6.14 If Regenesis notifies the Buyer of any failure in connection with the performance of the Contract or breach of this Contract, the Buyer will rectify immediately at its own expense and risk.

6.15 Should the Buyer fail in any way to comply with its obligations under the Contract, the Buyer shall immediately be liable to Regenesis for any loss, expense and/or damage which Regenesis may incur. The Buyer shall also be liable to Regenesis for any consequential loss arising out of or in connection with any default by the Buyer. There shall be no limit on the total liability of the Buyer for any loss of Regenesis arising under or in connection with this Contract.

7 Insurance

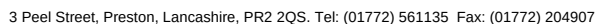
7.1 The Buyer shall maintain such insurances as required by Regenesis, including but not limited to employer's liability, public liability, all risk and professional indemnity, and as necessary to cover the liability of the Buyer and Regenesis in

- respect of personal injuries or deaths arising out of or in the course of, or caused by the carrying out of the Contract, and damage to property. The Buyer shall indemnify Regenesis for any action and / or inaction of the Buyer which shall cause Regenesis to suffer loss or expense or become liable in damages. All insurance is to be to the reasonable satisfaction of Regenesis.
- 7.2 Regenesis may require written evidence of these insurances as a condition precedent to any Goods being provided. In the event that the Buyer fails to provide the same, Regenesis may provide such insurance and add any costs incurred plus 10%, which shall be recoverable from the Buyer as a debt.
- 7.3 Regenesis and / or its agents shall be under no liability in respect of any loss, theft or damage of or to plant, tools, materials, equipment, or facilities of the Buyer, whether they be unfixed or fixed on site.
- 8 Title and Risk**
The Buyer acknowledges and confirms that risk in the Goods shall be deemed to have transferred to the Buyer upon or at the time the Goods are shipped from a Regenesis designated warehouse. If any dispute or difference arises regarding retention of title or risk in the Goods, the Incoterms 2000 CPT provisions regarding retention of title and risk shall be deemed to be incorporated in relation to this issue only.
- 9 Cancellation / Return of Goods**
- 9.1 A 20% re-stocking fee will be charged for all returned goods. All requests to return goods must be approved in advance in writing by Regenesis. Returned goods must be in original condition. No product will be accepted for return after 90 days following delivery. The Buyer shall be responsible for any transportation costs for returned goods, and if applicable shall reimburse Regenesis for all costs incurred by Regenesis to any third party in relation to that order.
- 9.2 An order for special non-standard goods other than those held in stock by Regenesis at the date of the Buyer's order, may not be cancelled once an order has been accepted by Regenesis.
- 10 Defective goods**
- 10.1 Regenesis will not be liable hereunder in any way if when the goods which the Buyer alleges are defective, are tested or examined by Regenesis, the alleged defect appears to have been caused by the Buyer's misuse, neglect, improper installation, any cause beyond the range of intended use of the product, or by accident, fire or other hazard.
- 10.2 Unless the Buyer gives Regenesis clear written notice giving Regenesis clear and reasonable opportunity to correct any default, to be received by Regenesis seven working days prior to any costs being incurred, the Buyer shall not recover from Regenesis any cost, loss or expense which it claims or attributes to be Regenesis' liability.
- 10.3 Except as otherwise stated in this Clause, Regenesis shall have no liability to the Buyer for any consequential loss of the Buyer arising out of or in connection with the provision of any Goods pursuant to this Contract and the total liability of Regenesis for any other loss of the Buyer so arising under the terms of this Contract shall not exceed the price payable by the Buyer for the Goods under this Contract.
- 10.4 There are no warranties, conditions, guarantees or representations whether express or implied by statute or otherwise, orally in writing, except as provided herein.
- 11 Force majeure**
Regenesis shall not be liable for non-performance or delay in performance or for any loss or damage to the goods due to act of God, war, riot, embargo, labour dispute, civil commotion, fire, theft, shortage of labour or materials, confiscation, delays in delivery or services of manufacturers, suppliers and sub-contractors, prohibition of import or export or any other unforeseen event (whether or not similar in nature to those specified) outside its reasonable control.
- 12 Default of the Buyer**
- 12.1 Without prejudice to any other rights or remedies which Regenesis might possess, Regenesis shall be entitled to immediately terminate the Contract in the event that:
- 12.1.1 the Buyer fails to properly perform, carry out and/or complete its obligations arising under and / or in connection with the terms of the Contract in any way; or
- 12.1.2 the Buyer takes any action, or fails to take any action, which would lead Regenesis to reasonably believe that there was a risk of the Buyer being or becoming insolvent; or
- 12.1.3 if in the opinion of Regenesis, the Buyer is guilty of gross misconduct or fails to comply with the provisions of this Contract in any way.
- 12.2 In the event of termination, Regenesis shall without prejudice to any claim or right or remedy available to Regenesis, render an invoice for the full balance of the Goods and the Buyer shall be liable for all costs and losses arising to Regenesis foreseeable or not.
- 12.3 In the event of termination, any amounts owed by the Buyer to Regenesis shall become due for payment immediately. The final date for those payments to be paid is seven days after the due date.
- 13 Confidential Information**
- 13.1 "Confidential Information" means any and all information related to Regenesis' business (including but not limited to trade secrets, technical information, business forecasts and strategies, marketing plans, customer and supplier lists, personnel information, financial data, and proprietary information of third parties provided to Regenesis in confidence) that is labelled or identified as "confidential" or "proprietary" or that the Buyer otherwise knows, or would reasonably be expected to know, Regenesis considers to be confidential or proprietary or Regenesis has a duty to treat as confidential.
- 13.2 During the duration of this Contract and at all times thereafter, the Buyer will (a) hold all Confidential Information in strict trust and confidence, (b) refrain from using or permitting others to use Confidential Information in any manner or for any purpose not expressly permitted or required by this Contract, and (c) refrain from disclosing or permitting others to disclose any Confidential Information to any third party without obtaining Regenesis' express prior written consent on a case-by-case basis.
- 13.3 The Buyer will protect the Confidential Information from unauthorized use, access, or disclosure with no less security as the Buyer protects its own confidential or proprietary information, and with no less than the higher standards of reasonable care and duty.
- 13.4 Unless and except to the extent expressly authorized by Regenesis to do so expressly in advance in writing, the Buyer will not attempt to reverse engineer, de-encrypt, or otherwise derive the design, internal logic, structure or inner workings (including algorithms and source code) of any software, products, models, prototypes, or other items provided by Regenesis that use, embody, or contain Confidential

Information.

- 14 Dispute Resolution**
The governing law of the Contract shall be the law of England, and subject to the adjudication and arbitration provisions below, the parties hereby submit to the exclusive jurisdiction of the English courts.
- 14.1 **Adjudication.** If any dispute or difference arises between Regenesis and the Buyer either party may refer the dispute to adjudication in accordance with this Clause and pursuant to the provisions contained in the Scheme for Construction Contracts (England and Wales) Regulations 1998. The Buyer shall be liable for and shall reimburse all costs incurred by Regenesis in any adjudication, including the costs of employing any external consultants and the Adjudicator's fees and expenses.
- 14.2 **Arbitration.** If any dispute or difference arises as to any matter or thing of whatsoever nature arising from or in connection with the Contract between Regenesis and the Buyer either during the progress or after the completion or abandonment of the Contract, it shall be referred to arbitration in accordance with this Clause and the JCT 1998 Edition of the Construction Industry Model Arbitration Rules. If the parties fail to agree upon the appointment of an Arbitrator within 14 days of a Notice of Arbitration being served, either party shall apply to the Chartered Institute of Arbitrators to have an Arbitrator appointed.

GROUNDWATER MONITORING RESULTS



Job Number:

6921K

Sheet:

1 / 1

Site: ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, MANCHESTER, M40 2XG

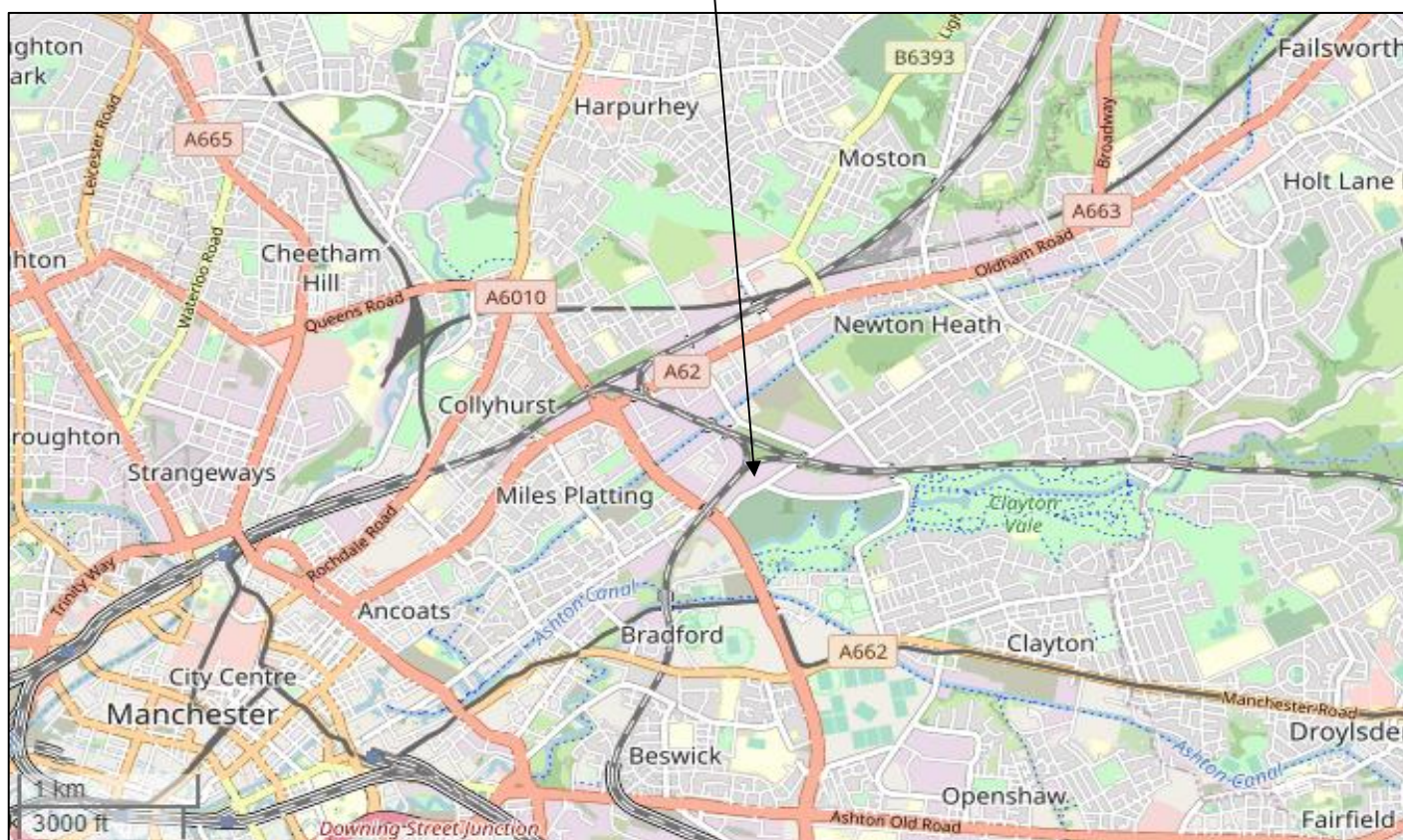
Client: CASSEL & FLETCHER CONSTRUCTION LIMITED

Engineer:

GROUNDWATER MONITORING RESULTS SHEET

Remarks:

FIGURES



SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site

ARKADY INDUSTRIAL ESTATE, BRISCOE LANE,
NEWTON HEATH, GREATER MANCHESTER

Client

CASSEL & FLETCHER CONSTRUCTION LIMITED

Site Location

Date Drawn

26/05/2022

Date Checked

Orientation



Job No.

6921L

Drawn By

DJ

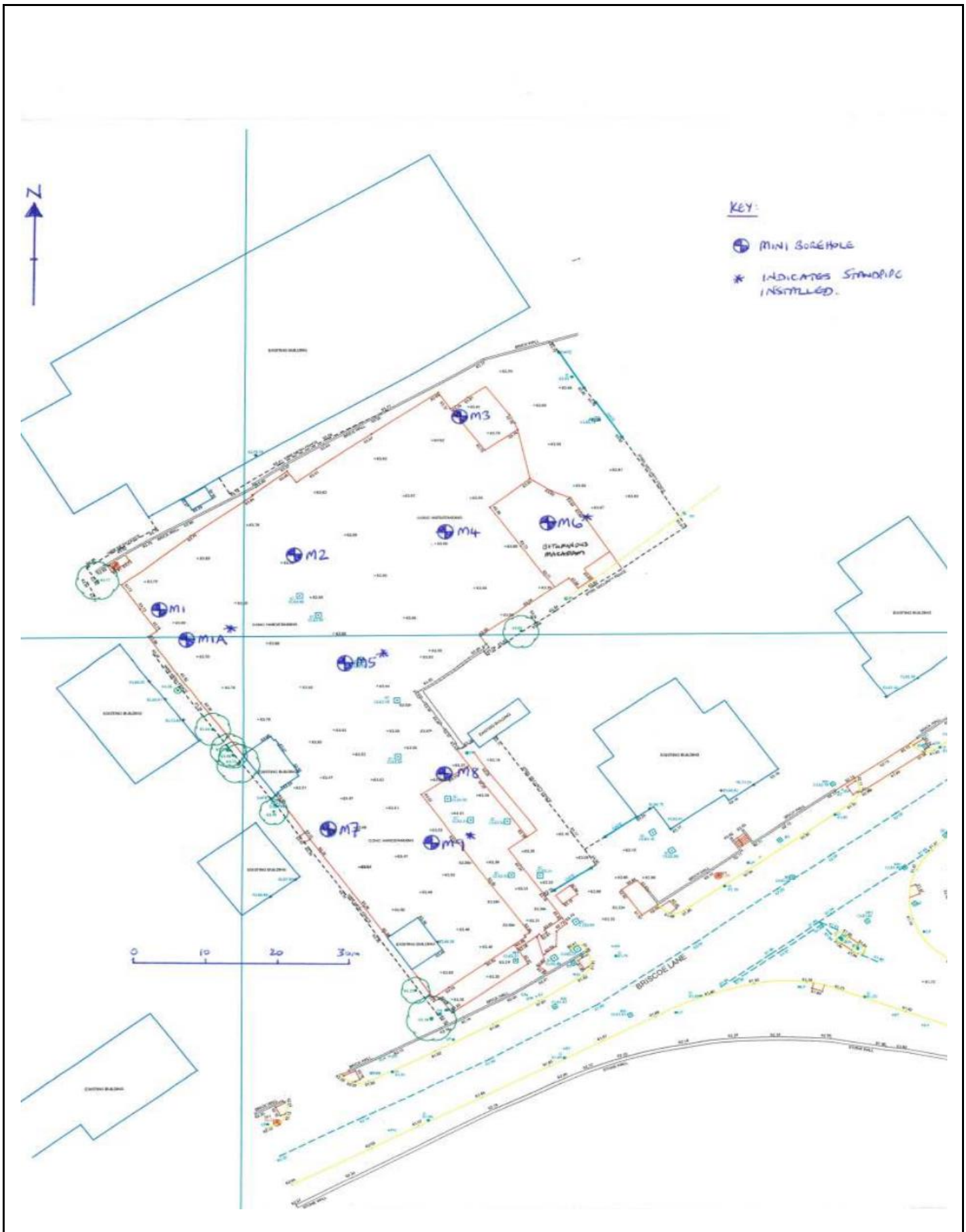
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Scale

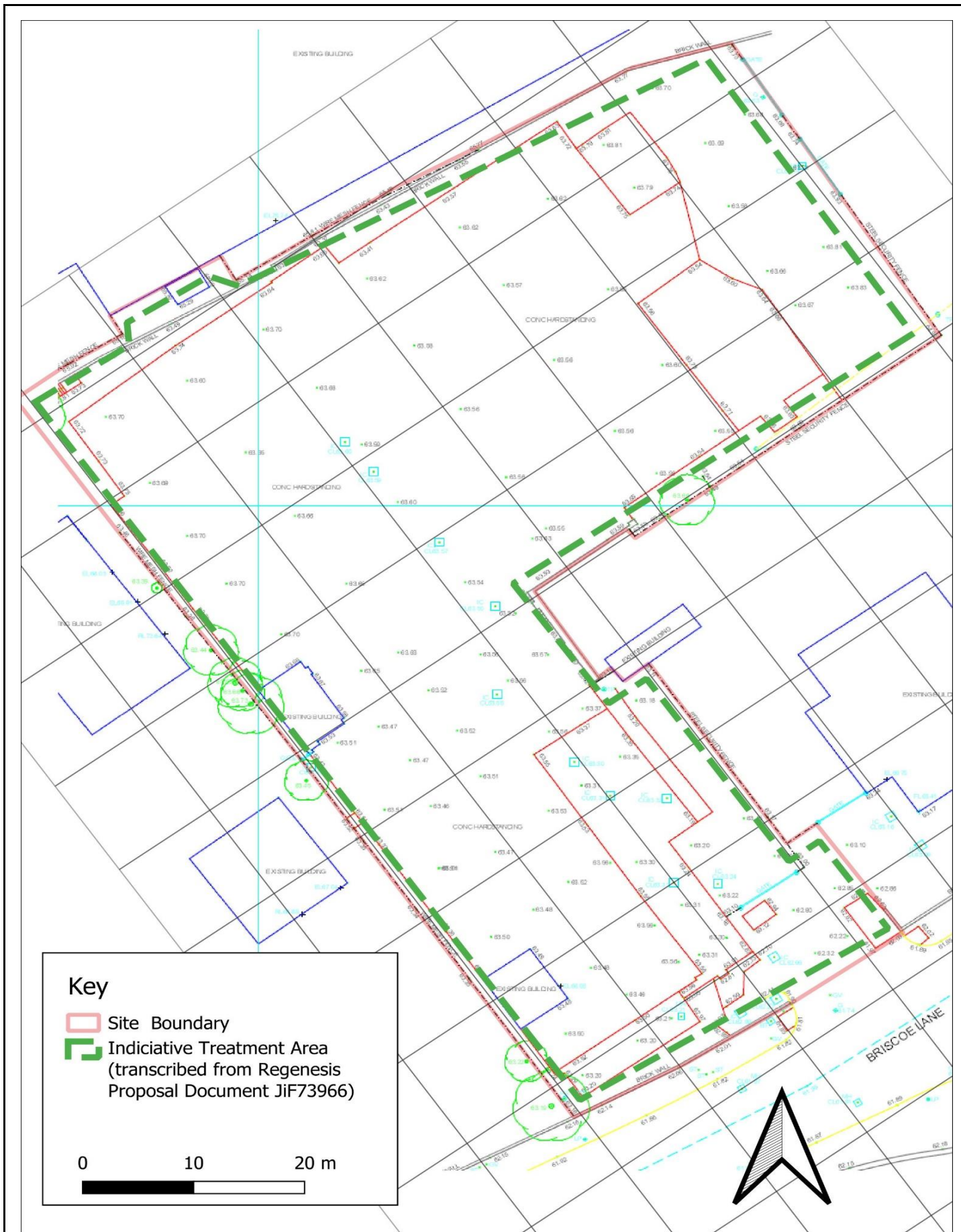
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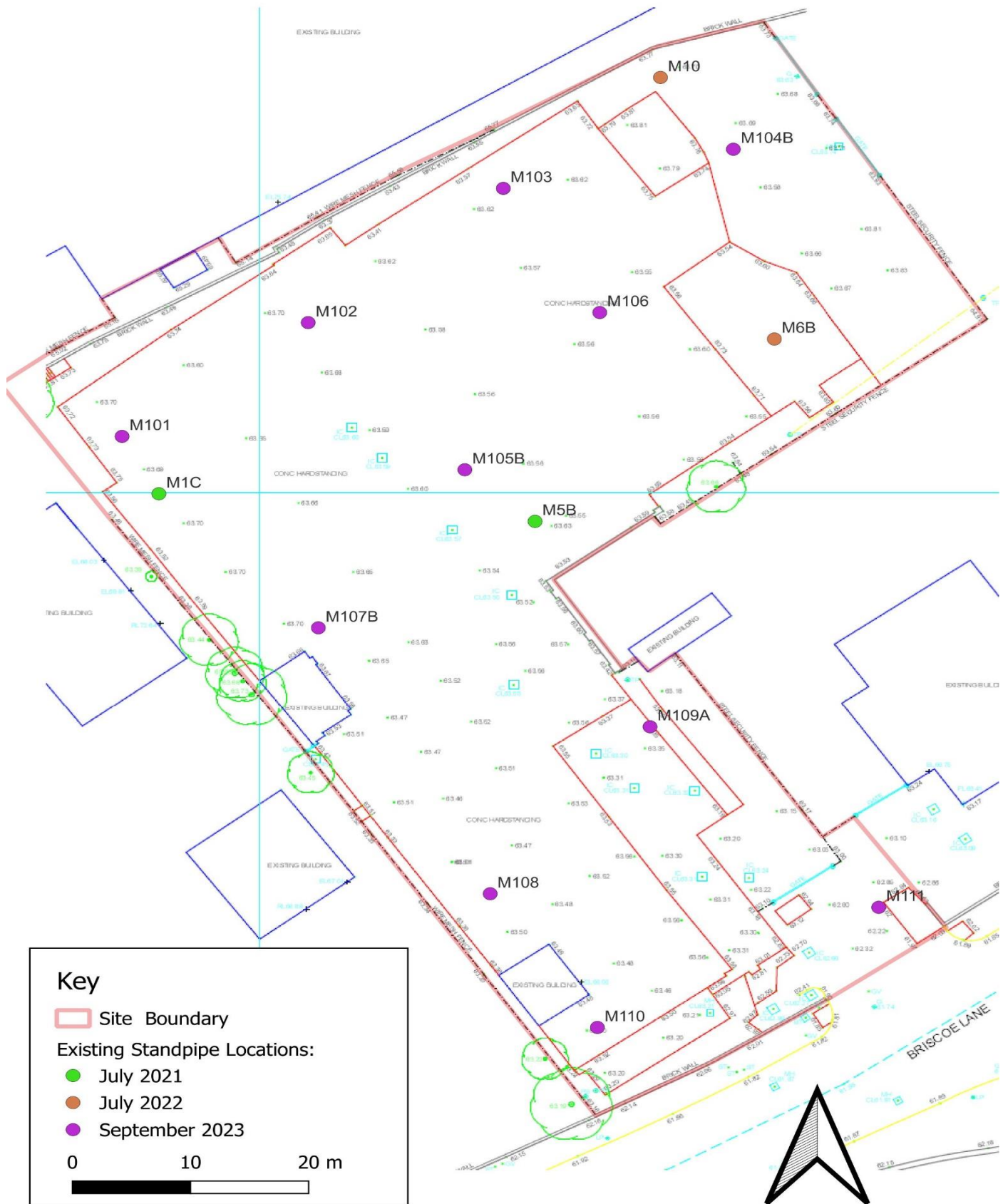
Figure No.

1



 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	6921C Borehole Locations (March 2021)			
Site ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER	Date Drawn 18-Jan-24	Date Checked	Orientation 	Job No. 6921L
Client CASSEL & FLETCHER CONSTRUCTION LIMITED	Drawn By DJ	Checked By	Scale —	Figure No. 2





SUB SURFACE

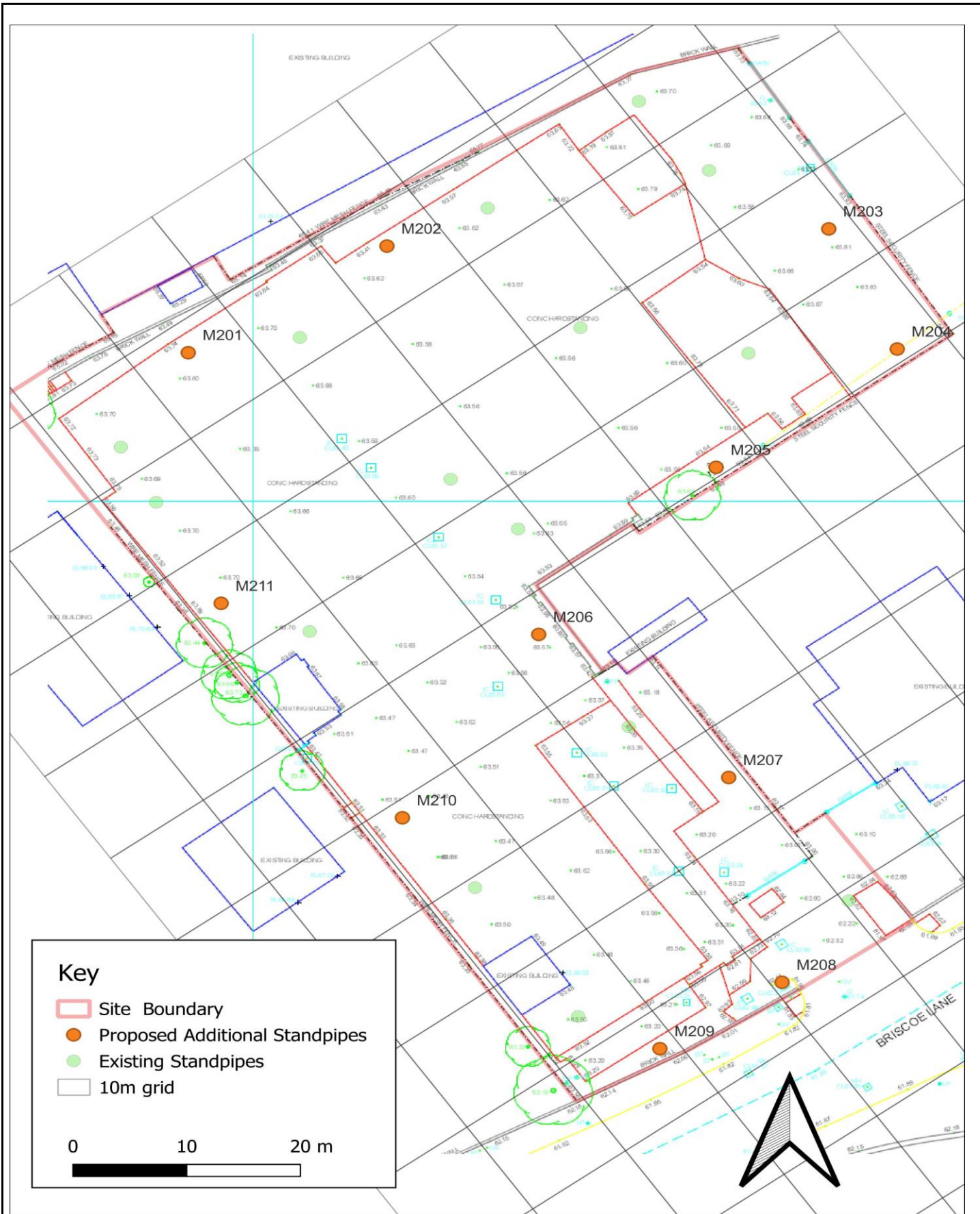
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site
ARKADY INDUSTRIAL ESTATE, BRISCOE LANE,
NEWTON HEATH, GREATER MANCHESTER

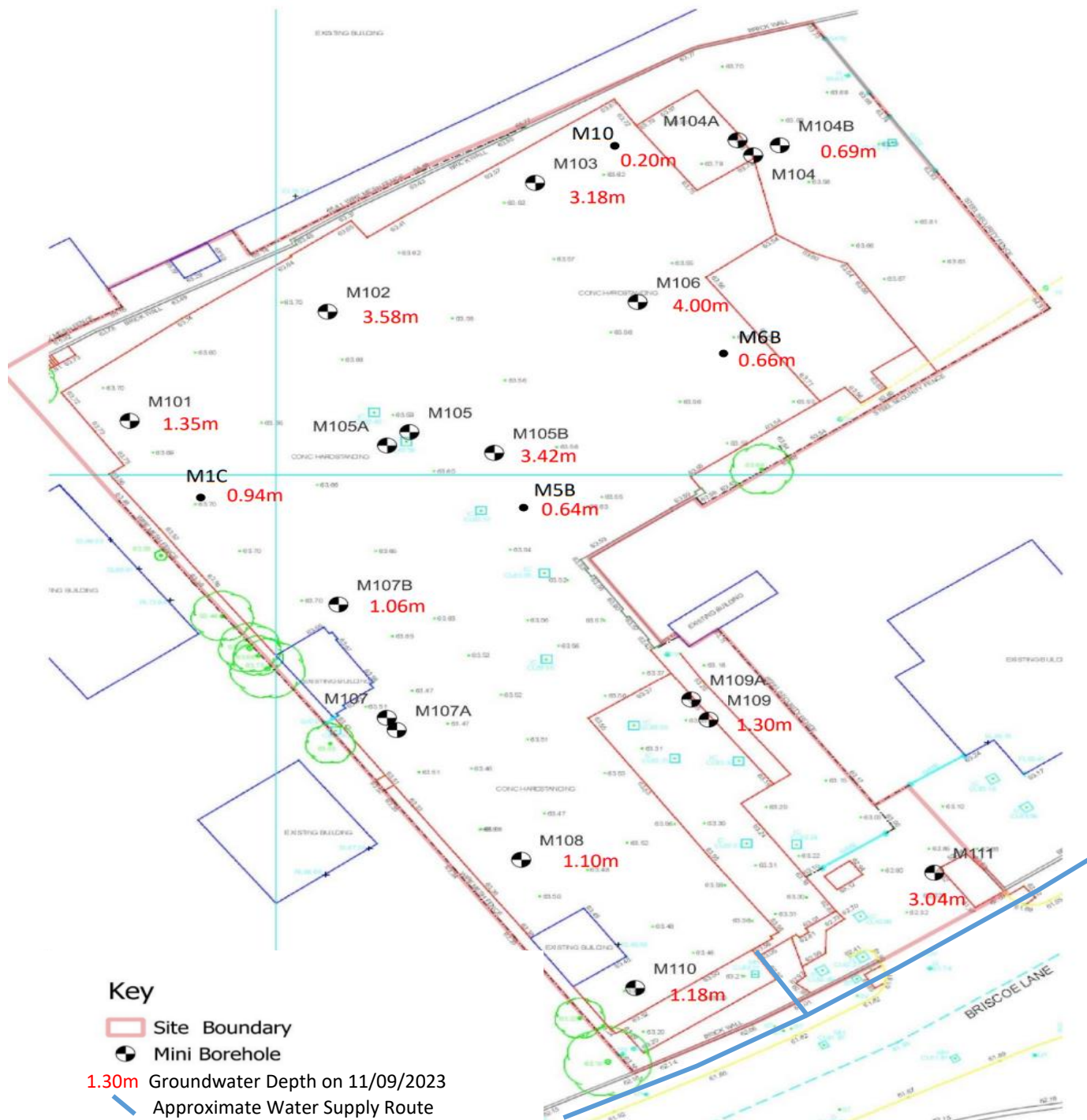
Client
CASSEL & FLETCHER CONSTRUCTION LIMITED

Existing Standpipe Locations

Date Drawn 18-Jan-24	Date Checked	Orientation 	Job No. 6921L
Drawn By DJ	Checked By	Scale —	Figure No. 4



 SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Additional Verification Monitoring Standpipes			
Site ARKADY INDUSTRIAL ESTATE, BRISCOE LANE, NEWTON HEATH, GREATER MANCHESTER	Date Drawn 22-Jan-24	Date Checked	Orientation 	Job No. 6921L
Client CASSEL & FLETCHER CONSTRUCTION LIMITED	Drawn By DJ	Checked By	Scale -	Figure No. 5



SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site
ARKADY INDUSTRIAL ESTATE, BRISCOE LANE,
NEWTON HEATH, GREATER MANCHESTER

Client
CASSEL & FLETCHER CONSTRUCTION LIMITED

Groundwater Depths From Most Recent Monitoring & Approximate Water Supply Route.

Date Drawn 22-Jan-24	Date Checked	Orientation 	Job No. 6921L
Drawn By DJ	Checked By	Scale —	Figure No. 6