Phase 2 Ground Investigation Report

Kimberly-Clark

Northfleet, Gravesend,

Kent, DA11 9AD

for

Hyro Energy Ltd

G-22-049

September 2023

Revision	Issue date	Report status, changes made	Author	Reviewer
0	07/09/23		DJ	GVR
1	27/09/23	Client comments reflected	DJ	GVR
2	10/02/25	Site Layout Revision	NAL	GVR

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Contents

Executive Summary

The executive summary should not be read or used in isolation and reference should be made to the full report which provides a detailed assessment of the risks potentially affecting the development.

Ground Conditions	The investigation revealed made ground of a reinforced concrete hardstanding 0.25m thick over a ballast gravel sub-base to 0.6m consistently across the proposed development area. This is underlain by the principal made ground of predominantly chalk gravel with flint, brick and ash. Extremely weak Chalk bedrock is encountered at depths of 1.7m->5.0m.
Groundwater	Groundwater was encountered below depths of 3.5m and some tidal response of 0.2-0.,7m was noted increasing towards the River Thames.
Contamination and Remediation	All potential contaminants tested were below GAC thresholds for commercial end use. No remediation is required for the proposed development.
Waste Classification	WAC testing has indicated that made ground soil arisings ground are likely to be classed as inert as natural soils are also expected to be for waste disposal purposes.
Ground Gas	No ground gas or radon protection measures are required for the proposed development, and no putrescible or organic matter was found.
Foundations and Floors	The current reinforced hardstanding is believed to be suitable for the proposed development loads, but this should be confirmed by a Structural Engineer. If lightly loaded buildings are proposed, in the northern third deepened strips/trench fill foundations (to maximum 2.5m depth) should be suitable for foundations bearing within the Chalk, which should give an allowable bearing capacity of at least 50kN/m². Elsewhere, made ground is generally >2.5m depth and buildings would require spread foundations supported on vibro stone columns or piled foundations, both end-bearing within competent chalk bedrock.
Roads and Pavements	The current reinforced hardstanding is believed suitable for site traffic and I is understood that no new roads are proposed as part of the development.
Excavations and Trenches	Shallow foundation and utility excavations within the made ground should be achievable using conventional plant. If groundwater is encountered in deeper excavations, temporary sump pumping should be adequate to maintain dry conditions for construction.
Concrete Classification	Buried concrete should be designed to BRE Special Digest 1:2005 Design Sulphate Class DS-1 with an ACEC site classification AC-1.
Drainage	The site already benefits from a surface water drainage collection system and the proposed development will not increase the existing run-off rate, so new surface water drainage is unlikely to be required. Due to the presence of destructured chalk across the site, the site may not be suitable for soakaway drainage systems.
Slope Stability and Retained Structures	No retaining structures or slope engineering mitigation measures will be required.

1.0 Introduction

1.1 Commission

GVR Geoservices Ltd (GVR Geo) was commissioned by Renewable Energy Systems (RES) on behalf of Hyro Energy Ltd to undertake a Phase 2 Ground Investigation for the proposed development of a hydrogen gas manufacturing plant at the Kimberly-Clark paper mill site in Northfleet, Kent, DN11 9AD. The site is on the south bank of the River Thames with a river frontage and in-river berthing docks. A site location plan is presented as Drawing No. G-22-049-001 in Appendix A.

1.2 Proposals

It is understood that Hyro Energy Ltd propose to construct a new hydrogen gas production facility at the site, including hydrogen electrolysers, substations, hydrogen storage tanks and supply connection pipelines, together with monitoring equipment containers which are not routinely occupied. In addition, at some point in the future (not under considered here) a new dual fuel hydrogen and natural gas fired boiler is to be installed to replace the existing natural gas fired boiler, initially running in tandem during commissioning. The proposed layout of the hydrogen facility is shown on RES Drawing No. 05135-RES-PRO-DR-PE-001 Rev. 7 in Appendix A. Much of the new proposed construction is to be containerised plant brought onto site and set up on prepared hardstanding but includes new underground infrastructure (e.g. cabling routes and surface water drainage measures) for the proposed development.

1.3 Objectives

The objectives of the ground investigation were:

- Inspect the ground for evidence of made ground and potential contamination, take soil samples for chemical laboratory testing.
- Undertake contaminated land risk assessment for the proposed end use.
- Prove shallow ground conditions for foundation design for potential future buildings.
- Undertake in-situ geotechnical tests and obtain soil samples for laboratory geotechnical testing.
- Provide a factual and interpretive report with recommendations for foundation design and mitigation measures for any proven contamination.

1.4 Information Sources

The following report has been used to determine the initial design of the Phase 2 ground investigation and to define the preliminary conceptual site model (CSM) in this report:

- GVR Geoservices Ltd, Phase 1 Geoenvironmental Desk Study, Northfleet, Kent, DA11 9AD, Ref. G-22-049, May 2023.

1.5 Limitations

This report has been prepared for Hyro Energy Ltd and their appointed agents only and should not be relied upon by any third party without the written permission of GVR Geo. If any unauthorised third party comes into possession of this report, they rely on it at their

own risk and the authors do not owe them any Duty of Care or Skill. This report is based on and limited to an assessment of the information and ground conditions identified here. GVR Geo is not responsible for ground conditions not revealed during these investigations.

2.0 Summary of Previous Reports

The following is a summary of the salient findings of the Phase 1 Desk Study and should not be read in isolation. For full details, reference should be made to the original report.

Site Description	The site is 560m long (N-S) and 215m wide (E-W) maximum dimensions of c. 10.1ha area, within the existing Kimberly-Clark paper mill facility, in Northfleet on the south bank of the River Thames, Kent. It is understood that the proposed development will comprise a hydrogen gas production plant, Green Hydrogen 3.
Site History	The site formerly comprised a chalk quarry which by the mid 19th Century was occupied by residential houses and gardens, tramway and earthworks embankments, wharf, iron foundry, brickworks and limekilns until the 1950s. Since the 1960s the site has been occupied by a paper mill with associated storage tanks, effluent treatment plant and boiler house (currently gas oil fired). The adjacent land has been occupied by a dockyard and wharf, chalk quarry, limekilns, paper mill, power station and cement works.
Geology	Superficial drift: BGS records including historic borehole records indicate superficial deposits to underlie the site, primarily comprising made ground, with potential alluvial deposits below the northern boundary adjacent to the River Thames. Solid geology: Chalk strata at shallow depth. No geologic faults recorded on site. The majority of the site lies within an area with very low risk of ground dissolution of soluble rock apart from the southern boundary which is at low risk.
Environmental	The site lies 40m south of the River Thames adjacent to a jetty. Superficial deposits below the northern boundary comprise a Secondary Undifferentiated aquifer of high groundwater vulnerability. Bedrock comprises a Principal Aquifer of high groundwater vulnerability. No Nitrate Vulnerable Zones within 2000m. 1 No. licensed surface water abstraction within 2000m, 865m NW. 15 No. licensed groundwater abstractions within 500m. 2 No. on site relating to boiler feed supply. Within Source Protection Zones from 1 to 3. No discharge consents relate to the site and 10 No. within 250m. 1 No. pollution incidents on site dated 2003 relating to firefighting run-off. 2 No. 31m NE dated 2006 relating to inert wastes.

Flooding	Site is designated to be at very low risk of tidal flooding. The main site area lies within a Flood Zone 2 and northern perimeter Flood Zone 3. High risk of surface water flooding. Moderate to high risk of groundwater flooding
Contaminants	Various previous contaminative land uses have been identified on site and adjacent to the site which present potentially contaminative processes and are considered to present a moderate to high risk of potential mobile contaminants to the site.
Ground Gas	Low risk of ground gas generation. No radon protective measures are required for buildings in this area
Drainage	The site is underlain by variable made ground directly overlying the Chalk bedrock which is classified as a Principal Aquifer with an anticipated shallow water table, therefore, it is unlikely that soakaway drainage systems will be suitable.
Recommendations for Ground Investigation	Targeted ground investigation to include: Exploratory holes to allow for in-situ testing and soil sampling, to assess shallow ground conditions for the installation and proposed route of supply pipelines and cabling and prove the presence or not of buried obstructions. Installation of gas/groundwater monitoring standpipes, if occupied fixed buildings with confined spaces are proposed. Geotechnical and chemical laboratory testing of soils and bedrock for contamination/pollution risk assessment and foundation design. Gas and groundwater monitoring (if required) – 6 visits over a 3 month period. Factual and interpretive report.

The executive summary should not be read or used in isolation and reference should be made to the full report which provides a detailed assessment of the risks potentially affecting the development.

2.1 Preliminary Conceptual Site Model

The Phase 1 preliminary Conceptual Site Model (CSM) is provided below.

Source	Pathway	Receptor	Contaminant Linkage: Assessed Risk
Human Health			
Potential contaminants within the made ground/alluvium on site: PAHs, mineral oil and TPH, heavy metals, phenols, PCBs, water soluble sulphates and asbestos.	Direct contact and ingestion/inhalation of contaminated soil and dust	Construction workers	**Moderate to High** Mitigated by controlled removal of any proven contaminants prior to construction and use of appropriate PPE and good site hygiene practice during construction.
	Direct contact and ingestion/inhalation of contaminated soil and dust	End Users	**Moderate** Mitigated by the provision of an effective ground surface barrier. No further mitigation anticipated.
Off-site sources of soil or groundwater contaminants	Migration of contaminants in the adjacent land via leaching/surface water run-off or groundwater migration on to site and ingestion/inhalation of contaminated soils.	End users	**Low to Moderate** Mitigated by the provision of an effective ground surface barrier. No further mitigation anticipated.
Controlled Waters			
Contaminants within the made ground on site.	Vertical and lateral migration to groundwater.	Principal Aquifer (Chalk Strata)	**High** There is the potential for leachable contaminants in the made ground directly overlying the Chalk below the site to be currently impacting on this Principal Aquifer. Remedial action may be required during construction.
		Surface Waters (River Thames)	**Moderate** There is potential for leachable contaminants in the made ground and chalk groundwater to be impacting on surface water receptor. Remedial action may be required during construction.
Ground gas migration from infilled ground on site or adjacent land.	Migration through permeable natural strata and made ground and accumulation in confined spaces and inhalation.	End Users	**Low to Moderate** If present, mitigation could be in the form of gas protection measures if fixed buildings with confined spaces are proposed.

3.0 Site Setting

Grid Reference	Approx. OSGR 562689, 174568, NGR TQ 627 746
Area	The site comprises a roughly rectangular area of land, up to 560m N-S x up to 215m E-W maximum dimensions with an approximate area of 10.1ha.
Description	The site currently comprises the Kimberly-Clark papermill on the south bank of the River Thames, which lies within a former Chalk quarry. The papermill facility comprises a mixture of industrial buildings/warehouses, office buildings, a boiler house and effluent treatment plant, together with various storage tanks, open storage hardstanding areas and access roads. Access is currently gained via Crete Hall Road which passes through the centre of site with an E-W alignment. A site walkover on 2nd May 2023, indicated the following: The proposed hydrogen electrolysis plant is located in the northern area between the boiler house and effluent treatment plant. This part of the site currently comprises a level concrete hardstanding area primarily used for storage of materials (paper). Adjacent to the west of the boiler house are 3 No. sunken former storage tank bases with adjacent signage indicating the tanks were for gas oil. Chemicals currently stored on site included: aluminium sulphate, ferric chloride solution, RO preservative and cleaning products, phosphoric acid, anticorrosive primer, corrosion resistant paint, sodium hypochlorite and sulphuric acid.
Adjacent Land Use	The adjacent land comprises a wharf and jetty to the north with the River Thames beyond. To the south is a near vertical Chalk quarry highwall with a narrow strip of land between the site and the base of the highwall used as an HGV parking area. The land at the top of the Chalk highwall extending south away from the site comprises the B2175 London Road with predominantly residential development beyond. The land to the east is occupied by light industrial buildings and logistics warehousing and area of hardstanding for container storage and vehicle parking. To the west is a cement manufacturing works.

4.0 Fieldwork & Laboratory Testing

The following scope of fieldwork and laboratory analysis was undertaken:

- Drilling of 6 No. window sample boreholes (WS1,3,4,6,7,8) using a track-mounted dynamic sampling rig to maximum 5.0m depth depths across the site area, to assess shallow ground conditions.
- In-situ standard penetration tests (SPTs) were undertaken at 1.0m intervals. Disturbed samples were taken for chemical and geotechnical laboratory analysis.
- Contamination testing of 6 No. samples of made ground and 2 No. made ground soil leachate tests for a suite of parameters comprising: heavy metals, metalloids, non-metals, inorganics, speciated polyaromatic hydrocarbons (PAHs) and asbestos.
- Geotechnical testing of 6 No. soil samples for water-soluble sulphate and pH.

Fieldwork was undertaken between 26th and 27th July 2023. An exploratory hole location plan is included as Drawing No. G-22-049-003 in Appendix A, and copies of the exploratory hole records are provided in Appendix B. Geotechnical test results are presented in Appendix C and chemical test results are presented in Appendix D.

4.1 Exploratory Hole Rationale

Based on the findings of the desk study and the preliminary CSM, the location of the exploratory holes was based on the following rationale.

Exploratory Hole	Rationale
WS4,6,7 and 8	Site-wide ground conditions including the absence or presence of made ground, the potential variation of the superficial deposits depicted by the BGS records and the absence or presence of bedrock at shallow depth. including an area for a potential future location of a hydrogen manufacturing plant.
WS1, 3	Evidence of possible gas oil contamination from the former tanks to the north.

5.0 Ground Conditions

5.1 Soil Profile

The primary strata recorded during this investigation are summarised in the table below.

Depth Range to Top of Strata, m bgl (Thickness, m)	Strata Type
Ground Level (0.25)	MADE GROUND: Reinforced concrete with 8mm diameter rebar at 100mm spacings, set 100mm below the top of slab.
0.25 (0.35)	MADE GROUND: Yellow fine to coarse angular GRAVEL of flint and sand (ballast sub-base).
0.6 (1.1-4.4)	MADE GROUND: Grey and white GRAVEL of chalk, flint, brick, coal, ash and clinker.
1.7->5.0 (>0.5->4.4)	Extremely weak white CHALK, recovered as fine to coarse subangular to subrounded gravel and cobbles of extremely weak white chalk clasts in a matrix of firm to stiff completely degraded and destructured white putty chalk (Class E White Chalk Subgroup).

5.2 Material Properties

Made Ground

Made ground was encountered across the site in all WS-holes ranging between ground level and >5.0m depth. The site was covered in concrete hardstanding 0.25m in thickness, reinforced with rebar, detailed as above. The concrete was underlain by a GRAVEL of flint and sand (ballast sub-base) to a consistent depth of 0.6m.

A loose to medium dense GRAVEL of chalk, flint, brick, coal and clinker was observed at depths of between 0.6-5.0m. WS1 and WS3 at the north of the site, closest to the River Thames had the shallowest MADE GROUND being 1.7m bgl and WS8 at the south of the site having MADE GROUND to 5.0m with rockhead not being proved.

SPT N-values in the made ground ranged between 0 and 23 and typically ranged between 5 to 20. The N-value of 0 was taken at WS8 at 2.7m due to an obstruction halting progress where an SPT was undertaken which freed the obstruction over a void. This N value should be discounted from consideration as it does not provide a true representation of the made ground geotechnical condition.

Water soluble sulphate tests on 6 samples of made ground recorded a range of 12 - 35mg/l and pH values of 8.3 – 8.7.

Bedrock

Chalk bedrock was encountered from 1.7 to >5.0m depth and was encountered as: extremely weak white CHALK, recovered as fine to coarse subangular to subrounded gravel and cobbles of extremely weak white chalk clasts in a matrix of firm to stiff completely degraded and destructured white putty chalk (Class E White Chalk Subgroup). The Chalk was proved in all WS-holes except WS8 where it was not proven to at the terminal depth of 5m. In general, the depth to the Chalk increased to the south with distance from the river.

The results of 28 SPT tests in the chalk gave N-values of between 5 and 50 and typically ranged between 20 to 30 with a mean N value of 21.

Water soluble sulphate tests on 5 samples of the strata recorded a range of 8.3 to 102mg/l and pH values of between 8.2 and 8.8.

5.3 Groundwater

Groundwater levels were consistent during drilling between 4.06m-4.14m bgl, being encountered within the Chalk and made ground. Monitoring wells were installed to 5m depth in WS1, 3, 4 and 7.

Subsequent groundwater monitoring visits undertaken on 3 occasions in August 2023, including a visit over a 4 hour high tide period on 23 August, revealed groundwater levels typically at 3.6-4.0m bgl adjacent the River and 3.5-4.0m bgl to the south of the area. Tidal monitoring revealed tidal fluctuations in all boreholes with ranges of between 0.2-0.7m, being generally greater nearer the River. Groundwater monitoring data is presented in Appendix F.

5.4 Visual and Olfactory Contamination

Some coal and ash was noted within the MADE GROUND during the investigation, although no hydrocarbon or other suspicious odours were observed.

No suspected asbestos containing materials were observed during the investigation.

5.5 Obstructions

One obstruction was encountered in WS8 at 2.7m. A small flint cobble was pushed down by the SPT and removed during progression of the borehole.

6.0 Contamination Assessment

6.1 Generic Risk Assessment for Human Health

The assessment involves the screening of the measured concentrations of potential contaminants of concern obtained during the investigation against published generic assessment criteria (GAC) values which are representative of a 'minimal' or 'tolerable' risk to human health. The assessment criteria adopted are the LQM/CIEH Suitable for Use Levels (S4ULs) for Human Health Risk Assessment. Where no S4UL is available, reference is made to other relevant standards as appropriate.

A total of 6 made ground samples were tested from the selection of parameters noted above to allow an assessment of potential contaminants of concern.

Based on the proposed end use, GACs for a 'commercial' end-use have been adopted. A summary assessment table of all chemical test results and the GACs used is presented in Appendix E.

6.1.1 Metals, Metalloids, Non-metals

No samples exceeded the GAC thresholds.

6.1.2 Inorganics

No samples exceeded the GAC thresholds.

6.1.3 Polycyclic Aromatic Hydrocarbons

No samples exceeded the GAC thresholds.

6.1.4 Asbestos

No asbestos was detected.

6.2 Controlled Waters Risk Assessment

Given the nearby locality of the River Thames, two samples of the GRAVEL made ground were tested for mobile contaminants. The receptor at immediate risk is the underlying groundwater within the Chalk principal aquifer, so the results were compared against the freshwater GACs which are presented and summarised in Appendix E.

6.2.1 Metals, Metalloids, Non-metals

No samples exceeded the GAC thresholds.

6.2.2 Polycyclic Aromatic Hydrocarbons

No samples exceeded the GAC thresholds.

7.0 Revised Conceptual Site Model

Based on the findings of this ground investigation and considering the receptors identified in the Phase 1 desk study that was written after the ground investigation was undertaken, a revised Conceptual Site Model has been derived below.

Risk to human health or environmental receptors is based on an assessment of one or more contaminant source-pathway-receptor linkages. The contaminant 'source' is any substance which has the potential to cause significant harm to a relevant receptor and the 'pathway' is any route by which contamination may travel to impact on a 'receptor'. The revised CSM summarises the proven contaminant sources, pathways and receptors for this site and the likelihood of the existence of a plausible contaminant linkage.

The significance of the potential source-pathway-receptor linkages identified in the CSM is assessed using the following criteria:

Low Risk
Not likely to cause significant harm to human health or controlled waters. Remedial measures are unlikely to be required.

Moderate Risk
Possible significant harm to human health or controlled waters could occur depending on site specific circumstances. Remedial measures may be required.

High Risk
It is likely that significant harm to human health or controlled waters will occur unless appropriate remedial measures are incorporated into the development.

Conceptual Site Model and Preliminary Environmental Risk Assessment

Source	Pathway	Receptor	Contaminant Linkage: Assessed Risk
Human Health			
No proven contaminants within the made ground on site	Direct contact and ingestion/inhalation of contaminated soil and dust	Construction workers	**Low** All contaminants below GAC threshold for commercial end use. Use of appropriate PPE and good site hygiene practice during construction is recommended.
	Direct contact and ingestion/inhalation of contaminated soil and dust	End Users	**Low** Contaminants below GAC threshold and further mitigated by the provision of an effective ground surface barrier. No mitigation required.

Source	Pathway	Receptor	Contaminant Linkage: Assessed Risk
Off-site sources of soil or groundwater contaminants	Migration of contaminants in the adjacent land via leaching/surface water run-off or groundwater migration on to site and ingestion/inhalation of contaminated soils.	End users	**Low** No evidence off off-site contaminants migrating onto the site. No mitigation required.
Controlled Waters			
No proven leachable contaminants above GAC thresholds within the made ground on site.	Vertical and lateral migration to groundwater.	Principal Aquifer (Chalk) Surface Waters (River Thames)	**Low** No mitigation required. **Low** No mitigation required.
Asphyxiating or Explosive Ground Gases	Migration through permeable natural strata and made ground and accumulation in confined spaces and inhalation	End Users	**Low** No putrescible or natural organic matter found within the made ground and natural strata. If fixed buildings with confined spaces are proposed, no mitigation anticipated.

8.0 Remediation

8.1 Contaminants of Concern

The generic risk assessment and assessment of the data has confirmed that samples tested are below GAC thresholds for commercial end use and do not pose an unacceptable risk to the end users of the development.

8.2 Remedial Actions

No remediation mitigation measures are considered necessary. Consequently, the site is deemed suitable for the proposed use of a hydrogen production facility.

8.3 Gas Protection Measures

No gas protection measures are anticipated. No radon protective measures are required.

8.4 Utilities

The results of this assessment should be provided to the relevant water utility provider for their approval in advance of construction.

8.5 Waste Disposal

Notwithstanding comments in Section 7.2, any excess materials which the client intends to discard as part of the construction of the development would be classed as waste and must be appropriately handled in accordance with current Waste Legislation. The developer should be aware of and utilise the waste hierarchy where possible – Reduce → Reuse → Recycle → Recovery → Disposal. Where materials are unable to remain on site and disposal is the only option the waste should be classified and sent to an appropriate waste receiving facility. Waste Acceptance Criteria (WAC) testing would be required by the waste receiving facility prior to disposal.

Two samples of the made ground from WS4, 1 of the Thames Ballast sub-base and 1 of the gravel made ground, were subject to the full WAC testing suite. Based on the results obtained, these soils would fall into the inert threshold.

For waste disposal purposes, it is also considered that the bedrock would be classed as inert waste but should be subject to re-testing prior to off-site disposal or treatment, as required by the receiving waste disposal site operator.

If any materials are to be removed from site, this should be undertaken in accordance with Duty of Care Regulations, 1991 and the Hazardous Waste Regulations, 2005.

9.0 Geotechnical Appraisal

9.1 Foundations

It is anticipated that most of the modular hydrogen manufacturing units will be ground mounted on the existing reinforced heavy duty slab, subject to advice from a structural engineer.

Further investigation may be required for any proposed fixed permanent buildings, subject to the proposed loads.

If lightly loaded buildings are proposed near the front of the site (around WS1 and WS3), e.g. substation, depending on the proposed location, deepened strips/trench fill foundations (to maximum 2.5m depth) should be suitable for foundations bearing within the Chalk, which should give an allowable bearing capacity of at least 50kN/m². Buildings elsewhere, where made ground is generally >2.5m depth, would require piled foundations or spread foundations supported on vibro stone columns, both extending down and end-bearing within the competent chalk bedrock.

9.2 Floor Design

Due to the thickness of the made ground (>600mm), suspended floor slabs would be required for any proposed permanent buildings.

9.3 Roads and Pavements

The heavy duty floor slab within the proposed layout currently adequately supports heavy vehicles and bales of paper pulp. New road construction is not anticipated.

9.4 Excavations and Trenches

Shallow foundations and utility excavations within the made ground should be achievable using conventional plant.

Groundwater has been encountered at depths of >3.5m to date, so it is unlikely to affect groundworks for the proposed development. Where groundwaters are encountered, temporary sump pumping should be adequate to maintain dry conditions for construction.

9.5 Concrete Classification

Water soluble sulphate and pH tests on samples of made ground soils recorded soluble sulphate contents of 12-35mg/l and pH values of 8.3-8.7. Buried concrete coming into contact with the made ground soils should be designed to BRE Special Digest 1:2005 Design Sulphate Class DS-1 with an ACEC site classification AC-1 and conform to BS 8500-2.

9.6 Drainage

Due to the presence of highly destructed chalk across the area of intended development the site is unlikely be suitable for soakaway drainage systems.

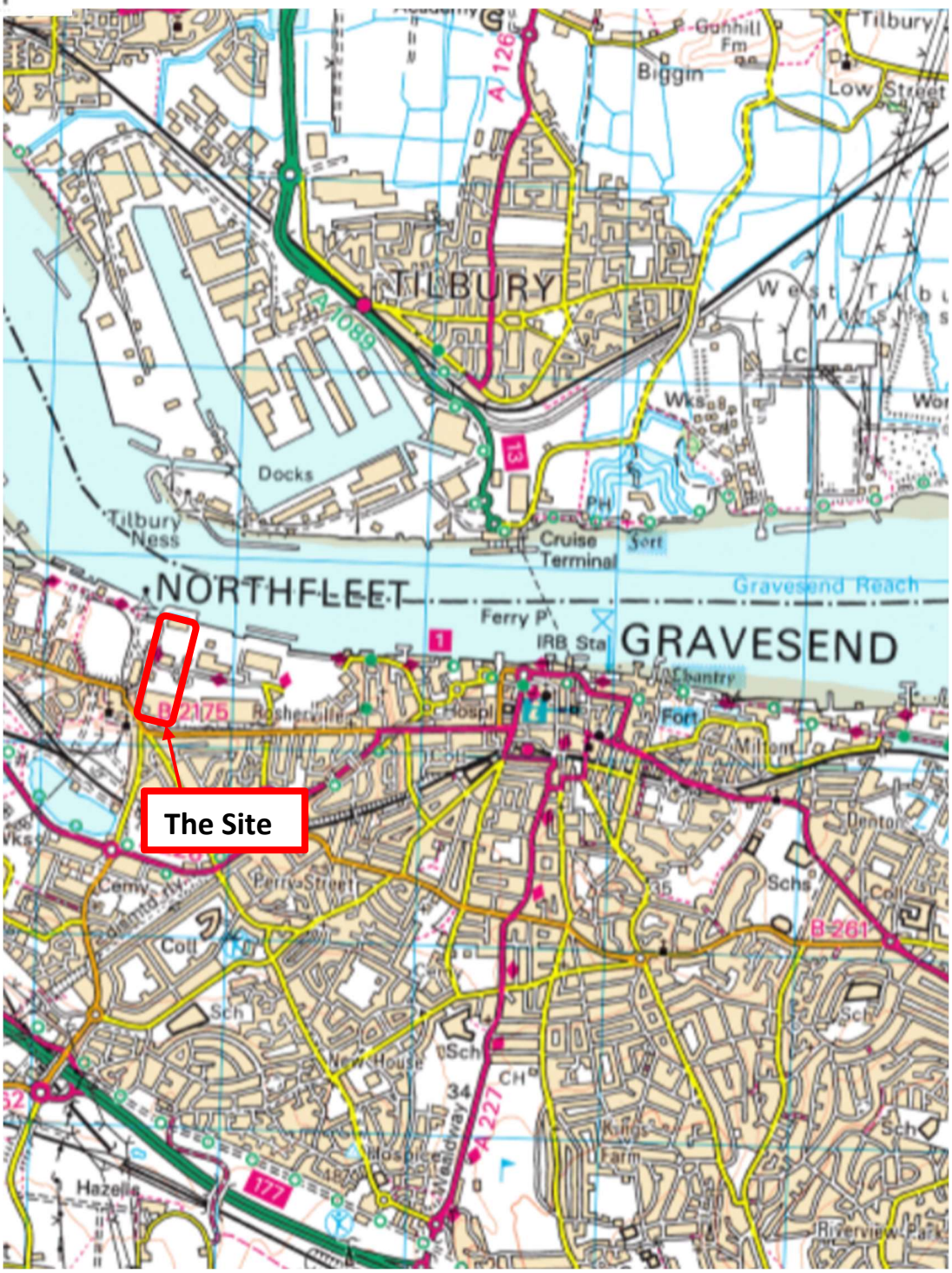
The site already benefits from a surface water drainage collection system and the proposed development is not considered to increase the existing run-off rate, so new surface water drainage is not considered necessary.

9.7 Slope Stability and Retained Structures

There are no significant changes in ground level across the site and no retained boundaries, For the proposed development, no retaining structures or slope engineering mitigation measures will be required.

Appendix A

Drawings



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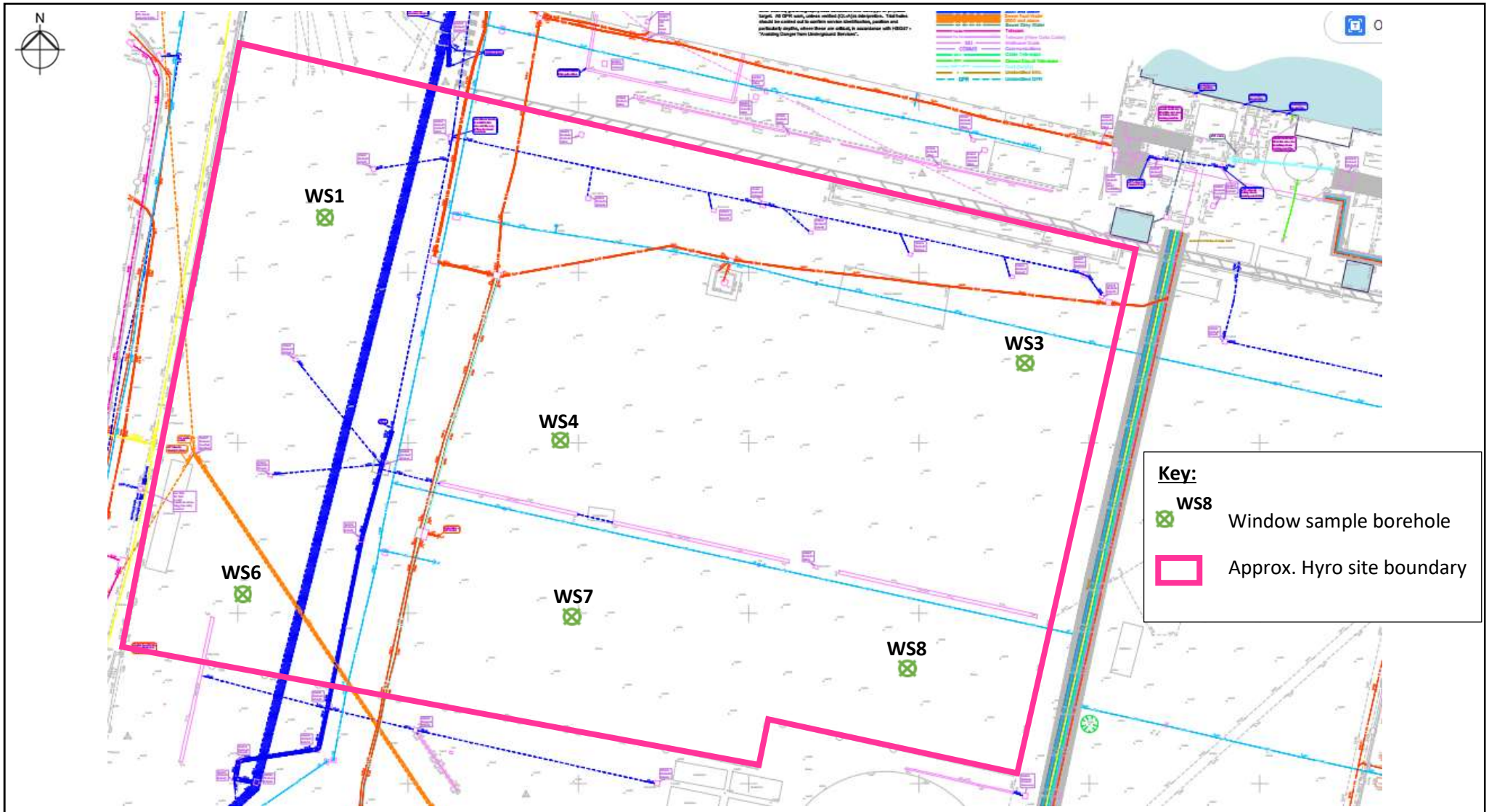

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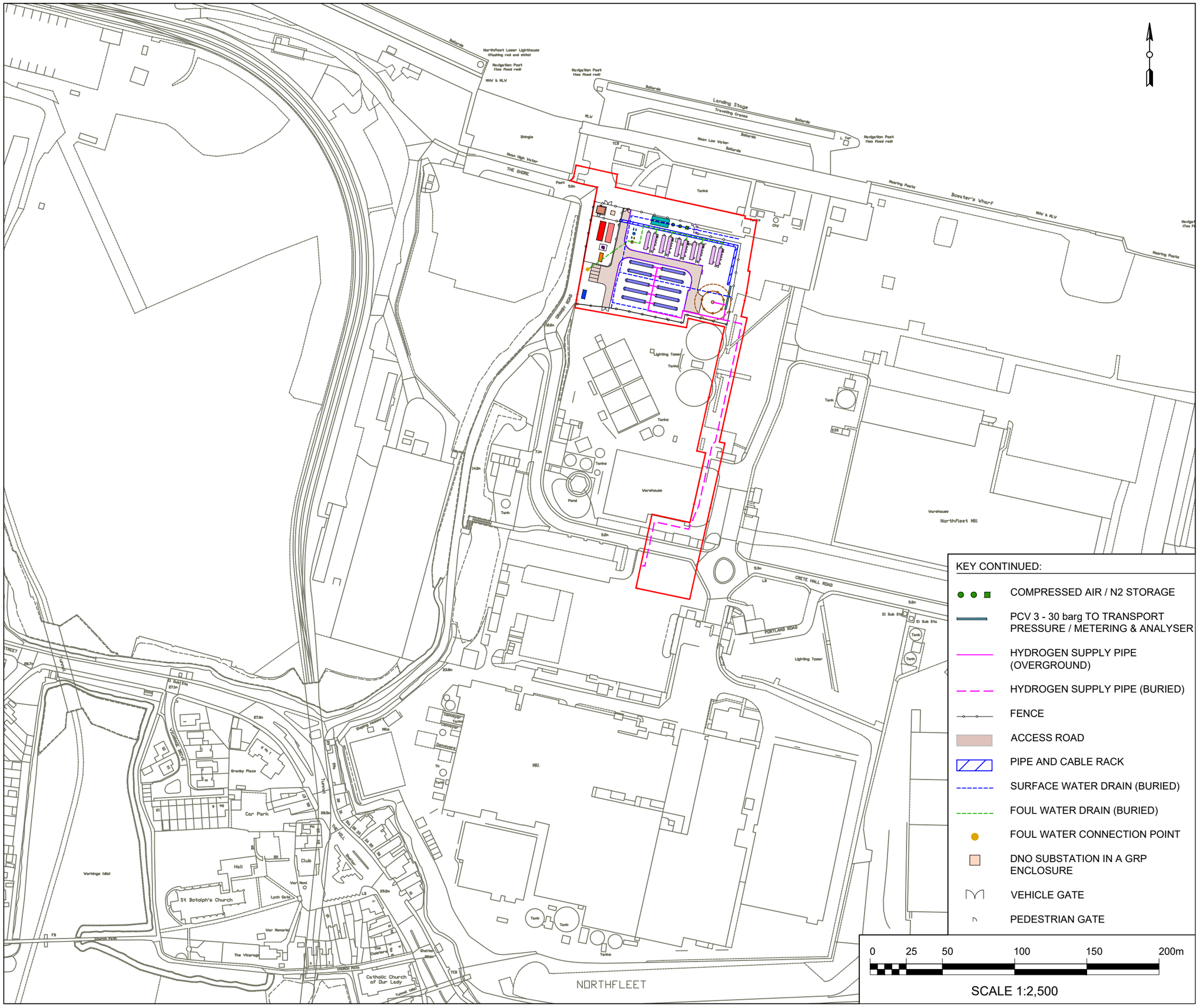
Job: Kimberly Clark, Northfleet	**Scale:** NTS
Title: Exploratory Hole Location Plan	**Revision:** 0
Client: Hyro Energy Ltd	**Drawing Number:** G-22-049-003



KEY:

- PROPOSED DEVELOPMENT BOUNDARY (1.39 HECTARES) (OUTSIDE EDGE OF LINE DENOTES BOUNDARY)
- HYDROGEN ELECTROLYSERS
- HYDROGEN STORAGE TANK
- HIGH VOLTAGE ROOM
- LOW VOLTAGE ROOM
- COMPRESSOR, AIR/N2 TANK AND PRODUCTION
- DNO SUBSTATION BUILDING
- VENT
- VENT THERMAL EXCLUSION FENCE (UP TO Ø18m ZONE)
- VENT SOUND EXCLUSION AREA (Ø25m)
- CONTROL ROOM
- MAINTENANCE STORAGE
- WASTE WATER BUFFER TANK WITH PUMP
- FEED WATER BUFFER TANK AND PUMPS
- TRANSFORMER
- VEHICLE BARRIER
- BOLLARD

KEY CONTINUED...

KEY CONTINUED:

- COMPRESSED AIR / N2 STORAGE
- PCV 3 - 30 barg TO TRANSPORT PRESSURE / METERING & ANALYSER
- HYDROGEN SUPPLY PIPE (OVERGROUND)
- HYDROGEN SUPPLY PIPE (BURIED)
- FENCE
- ACCESS ROAD
- PIPE AND CABLE RACK
- SURFACE WATER DRAIN (BURIED)
- FOUL WATER DRAIN (BURIED)
- FOUL WATER CONNECTION POINT
- DNO SUBSTATION IN A GRP ENCLOSURE
- VEHICLE GATE
- PEDESTRIAN GATE

0 25 50 100 150 200m

SCALE 1:2,500

ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
7	BM	BS	CA	2025-01-31	UPDATED BOUNDARY
6	BM	DC	IB	2025-01-23	UPDATED LAYOUT AS PER FEED MODEL
5	BM	DC	IB	2024-08-02	UPDATED DEVELOPMENT BOUNDARY
4	BM	CA	BS	2023-09-01	ADDED SCALE BAR AND DELETE SHEETS 2-5

PURPOSE: PLANNING	COORDINATES: OSGB 1936
SCALE: 1:2,500 @A3	DATUM: N/A
LAYOUT DRAWING: N/A	T-LAYOUT NO: N/A

PROJECT TITLE
NORTHFLEET GREEN HYDROGEN FACILITY

DRAWING TITLE
INFRASTRUCTURE LAYOUT

RES DRAWING NUMBER	REV
05135-RES-PRO-DR-PT-001	7

BEAUFORT COURT,
EGG FARM LANE,
KINGS LANGLEY,
HERTS WD4 8LR. UK
TEL +44 (0) 1923 299200
WWW.RES-GROUP.COM

Appendix B

Exploratory Hole Logs

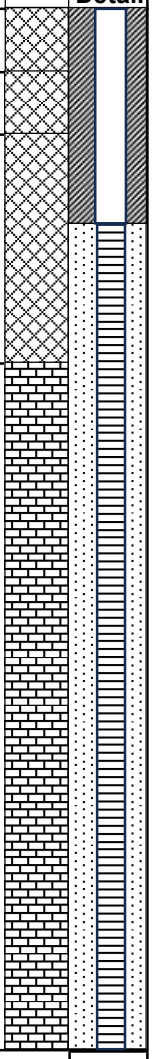
WINDOW SAMPLE LOG

Job Name	Drilling Equipment	WS1
Kimberly Clark, Northfleet, Gravesend	Track-mounted window sampler	
Job No.	**Engineer**	**Date**
G-23-049	DJ	27/07/2023
Client	**Ground Level (m) OD**	**Hole Depth (m)**
Hydro Energy Ltd		5.0

Samples/Tests Depth (m)	Samples/Tests No.	Strata No.	Strata Description	Depth (m)
		1	MADE GROUND: Concrete containing re-bar	0.25
		2	MADE GROUND: yellow fine to coarse angular GRAVEL of flint and sand (ballast sub-base).	0.5m 0.60
0.8	ES01	3	MADE GROUND: Grey and white GRAVEL of chalk, flint, brick, coal and clinker	1.0m
1.2-1.65	SPT N=14			1.5m 1.70
2.0-2.45 2.0	SPT N=28 D02	4	Extremely weak white CHALK, recovered as fine to coarse subangular to subrounded gravel and cobbles of extremely weak white chalk clasts in a matrix of firm to stiff completely degraded and destructred white putty chalk (Class E White Chalk Subgroup).	2.0m
3.0-3.45	SPT N=26			2.5m 3.0m
4.0-4.45	SPT N=34			3.5m 4.0m
5.0-5.45	SPT N=50			4.5m 5.0m 5.00
			Borehole terminated at 5.0m	5.5m 6.0m

Soil

Well Detail



Groundwater Observations	Observations
Groundwater observed at 4.07m bgl	Slotted pipe installed from 1.0-5.0m bgl, plain pipe from 1.0-GL with flush cast iron cover set in C30 concrete.

WINDOW SAMPLE LOG

Job Name	Drilling Equipment	WS3
Kimberly Clark, Northfleet, Gravesend	Track-mounted window sampler	
Job No.	**Engineer**	**Date**
G-23-049	DJ	27/07/2023
Client	**Ground Level (m) OD**	**Hole Depth (m)**
Hydro Energy Ltd		5.0

Samples/Tests		Strata		Depth	Soil	Well
Depth (m)	No.	No.	Strata Description	(m)		Detail
		1	MADE GROUND: Concrete containing re-bar.	0.25		
		2	MADE GROUND: yellow fine to coarse angular GRAVEL of flint and sand (ballast sub-base).	0.5m 0.60		
0.8	ES01	3	MADE GROUND: Grey and white GRAVEL of chalk, flint, brick, coal and clinker.	1.0m		
1.2-1.65	SPT N=7			1.5m 1.70		
2.0-2.45 2.0	SPT N=5 D02	4	Extremely weak white CHALK, recovered as fine to coarse subangular to subrounded gravel and cobbles of extremely weak white chalk clasts in a matrix of firm to stiff completely degraded and destructred white putty chalk (Class E White Chalk Subgroup).	2.0m		
3.0-3.45	SPT N=24			2.5m 3.0m		
4.0-4.45	SPT N=32			3.5m 4.0m		
5.0-5.45	SPT N=25			4.5m 5.0m 5.00		
			Borehole terminated at 5.0m	5.5m 6.0m		

Groundwater Observations

Groundwater observed at 4.06m bgl

Observations

Slotted pipe installed from 1.0-5.0m bgl, plain pipe from 1.0-GL with flush cast iron cover set in C30 concrete.

WINDOW SAMPLE LOG

Job Name	Drilling Equipment	WS4
Kimberly Clark, Northfleet, Gravesend	Track-mounted window sampler	
Job No.	**Engineer**	**Date**
G-23-049	DJ	27/07/2023
Client	**Ground Level (m) OD**	**Hole Depth (m)**
Hydro Energy Ltd		5.0

Samples/Tests		Strata		Depth	Soil	Well
Depth (m)	No.	No.	Strata Description	(m)		Detail
		1	MADE GROUND: Concrete containing re-bar	0.25		
0.4	ES01	2	MADE GROUND: yellow fine to coarse angular GRAVEL of flint and sand (ballast sub-base).	0.5m 0.60		
0.8	ES02	3	MADE GROUND: Grey and white GRAVEL of chalk, flint, brick, coal and clinker	1.0m		
1.2-1.65	SPT N=20			1.5m		
2.0-2.45	SPT N=5			2.0m		
				2.5m		
3.0-3.45	SPT N=7			3.0m		
				3.5m 3.50		
4.0-4.45	SPT N=40	4	Extremely weak white CHALK, recovered as fine to coarse subangular to subrounded gravel and cobbles of extremely weak white chalk clasts in a matrix of firm to stiff completely degraded and destructred white putty chalk (Class E White Chalk Subgroup).	4.0m		
4.2	D03			4.5m		
5.0-5.45	SPT N=35			5.0m 5.00		
			Borehole terminated at 5.0m	5.5m		
				6.0m		

Groundwater Observations

Groundwater observed at 4.13m bgl

Observations

Slotted pipe installed from 1.0-5.0m bgl, plain pipe from 1.0-GL with flush cast iron cover set in C30 concrete.

WINDOW SAMPLE LOG

Job Name	Drilling Equipment	WS6
Kimberly Clark, Northfleet, Gravesend	Track-mounted window sampler	
Job No.	**Engineer**	**Date**
G-23-049	DJ	27/07/2023
Client	**Ground Level (m) OD**	**Hole Depth (m)**
Hydro Energy Ltd		3.0

Samples/Tests		Strata		Depth	Soil	Well
Depth (m)	No.	No.	Strata Description	(m)		Detail
		1	MADE GROUND: Concrete containing re-bar	0.25		
		2	MADE GROUND: yellow fine to coarse angular GRAVEL of flint and sand (ballast sub-base).	0.60		
0.8	ES01	3	MADE GROUND: Grey and white GRAVEL of chalk, flint, brick, coal and clinker			
1.2-1.65	SPT N=23					
2.0-2.45	SPT N=17					
2.6	D02	4	Extremely weak white CHALK, recovered as fine to coarse subangular to subrounded gravel and cobbles of extremely weak white chalk clasts in a matrix of firm to stiff completely degraded and destructred white putty chalk (Class E White Chalk Subgroup).	2.50		
3.0	SPT N=50			3.00		
			Borehole terminated at 3.0m			

0.5m 1.0m 1.5m 2.0m 2.5m 3.0m 3.5m 4.0m 4.5m 5.0m 5.5m 6.0m

Groundwater Observations

No groundwater encountered during drilling

Observations

Borehole backfilled with gravel and a 300mm seal of C30 concrete.

WINDOW SAMPLE LOG

Job Name	Drilling Equipment	WS7
Kimberly Clark, Northfleet, Gravesend	Track-mounted window sampler	
Job No.	**Engineer**	**Date**
G-23-049	DJ	27/07/2023
Client	**Ground Level (m) OD**	**Hole Depth (m)**
Hydro Energy Ltd		5.0

Samples/Tests Depth (m)	Samples/Tests No.	Strata No.	Strata Description	Depth (m)	Soil	Well Detail
		1	MADE GROUND: Concrete containing re-bar	0.25		
0.4	ES01	2	MADE GROUND: yellow fine to coarse angular GRAVEL of flint and sand (ballast sub-base).	0.5m 0.60		
0.8	ES02	3	MADE GROUND: Grey and white GRAVEL of chalk, flint, brick, coal and clinker	1.0m		
1.2-1.65	SPT N=17			1.5m		
2.0-2.45 2.0	SPT N=7 D02			2.0m		
				2.5m		
3.0-3.45	SPT N=12			3.0m		
				3.5m 3.50		
4.0-4.45	SPT N=29	4	Extremely weak white CHALK, recovered as fine to coarse subangular to subrounded gravel and cobbles of extremely weak white chalk clasts in a matrix of firm to stiff completely degraded and destructred white putty chalk (Class E White Chalk Subgroup).	4.0m		
				4.5m		
5.0-5.45	SPT N=29			5.0m 5.00		
			Borehole terminated at 5.0m	5.5m		
				6.0m		

Groundwater Observations

Groundwater observed at 4.14m bgl

Observations

Slotted pipe installed from 1.0-5.0m bgl, plain pipe from 1.0-GL with flush cast iron cover set in C30 concrete.

WINDOW SAMPLE LOG

Job Name	Drilling Equipment	WS8
Kimberly Clark, Northfleet, Gravesend	Track-mounted window sampler	
Job No.	**Engineer**	**Date**
G-23-049	DJ	26/07/2023
Client	**Ground Level (m) OD**	**Hole Depth (m)**
Hyro Energy Ltd		5.0

Samples/Tests		Strata		Depth	Soil	Well
Depth (m)	No.	No.	Strata Description	(m)		Detail
		1	MADE GROUND: Concrete containing re-bar.	0.25		
		2	MADE GROUND: yellow fine to coarse angular GRAVEL of flint and sand (ballast sub-base).	0.5m 0.60		
0.8	ES01	3	MADE GROUND: Grey and white GRAVEL of chalk, flint, brick, coal and clinker.	1.0m		
1.2-1.65	SPT N=20			1.5m		
2.0-2.45	SPT N=8			2.0m		
2.0	D02					
				2.5m		
2.7-3.15	SPT N=0					
				3.0m		
				3.5m		
4.0-4.45	SPT N=5			4.0m		
				4.5m		
5.0-5.45	SPT N=5			5.0m 5.00		
			Borehole terminated at 5.0m	5.5m		
				6.0m		

Groundwater Observations

Groundwater observed at 4.14m bgl

Observations

Borehole backfilled with gravel and a 300mm seal of C30 concrete.

Appendix C

Geotechnical Test Results

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Analytical Report Number : 23-49175

Project / Site name:	Kimberly Clark, Northfleet	**Samples received on:**	01/08/2023
Your job number:	G-22-049	**Samples instructed on/ Analysis started on:**	03/08/2023
Your order number:	G-22-049 GVR 241	**Analysis completed by:**	15/08/2023
Report Issue Number:	1	**Report issued on:**	16/08/2023
Samples Analysed:	6 soil samples		

Signed: Izabela Wójcik

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 23-49175
Project / Site name: Kimberly Clark, Northfleet
Your Order No: G-22-049 GVR 241

Lab Sample Number				2771409	2771410	2771411	2771412	2771413
Sample Reference				WS1	WS3	WS4	WS6	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.00	2.00	4.20	2.60	4.00
Date Sampled				27/07/2023	27/07/2023	27/07/2023	27/07/2023	26/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	23	19	21	23	21
Total mass of sample received	kg	0.001	NONE	0.5	0.5	0.6	0.5	0.4

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	8.4	8.2	8.6	8.8
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.04	0.102	0.0686	0.0083	0.0291

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

Analytical Report Number: 23-49175
Project / Site name: Kimberly Clark, Northfleet
Your Order No: G-22-049 GVR 241

Lab Sample Number				2771414
Sample Reference				WS8
Sample Number				None Supplied
Depth (m)				2.00
Date Sampled				26/07/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	20
Total mass of sample received	kg	0.001	NONE	0.5

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0103

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

Analytical Report Number : 23-49175
Project / Site name: Kimberly Clark, Northfleet

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2771409	WS1	None Supplied	2	Beige clay with chalk.
2771410	WS3	None Supplied	2	Beige chalk.^^
2771411	WS4	None Supplied	4.2	Beige chalk.^^
2771412	WS6	None Supplied	2.6	Beige clay with chalk.
2771413	WS7	None Supplied	4	Beige clay with chalk.
2771414	WS8	None Supplied	2	Beige clay with chalk.

Analytical Report Number : 23-49175
Project / Site name: Kimberly Clark, Northfleet

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

^^Unaccredited sample matrix.

Appendix D

Chemical Test Results

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Analytical Report Number : 23-51446

Project / Site name:	Kimberley Clark, Northfleet	**Samples received on:**	01/08/2023
Your job number:	G-22-049	**Samples instructed on/ Analysis started on:**	17/08/2023
Your order number:	G-22-049 GVR 241	**Analysis completed by:**	22/08/2023
Report Issue Number:	1	**Report issued on:**	22/08/2023
Samples Analysed:	2 leachate samples - 6 soil samples		

Signed:

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 23-51446
Project / Site name: Kimberley Clark, Northfleet
Your Order No: G-22-049 GVR 241

Lab Sample Number				2783532	2783533	2783534	2783535	2783536
Sample Reference				WS1	WS3	WS6	WS7	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.80	0.80	0.40	0.80
Date Sampled				27/07/2023	27/07/2023	27/07/2023	26/07/2023	26/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	35	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	21	12	14	18
Total mass of sample received	kg	0.001	NONE	0.8	0.8	0.9	0.7	0.9
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	EWS	EWS	EWS	EWS	EWS
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	8.4	8.4	8.7	8.5
Total Sulphate as SO4	mg/kg	50	MCERTS	850	880	430	290	460
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0181	0.0349	0.012	0.0268	0.0112
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	1.8	0.9	0.6	0.2	0.6
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.09	0.08	< 0.05	< 0.05	0.51
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.06
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.06	0.83
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.6
Phenanthrene	mg/kg	0.05	MCERTS	0.15	0.2	0.07	0.39	3.6
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.06	0.77
Fluoranthene	mg/kg	0.05	MCERTS	0.07	0.11	0.06	0.45	5.3
Pyrene	mg/kg	0.05	MCERTS	0.07	0.1	0.06	0.37	4.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.06	0.07	< 0.05	0.25	2.7
Chrysene	mg/kg	0.05	MCERTS	0.05	0.07	0.05	0.29	2.4
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.05	< 0.05	0.23	3.2
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	0.16	1.4
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.19	2.6
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.1	1.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.28
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.12	1.3
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	2.67	31.2
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.7	3.4	6	9.1	7.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.4	0.3	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	5	3.9	8.5	11	7
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	9.6	16	29	34
Lead (aqua regia extractable)	mg/kg	1	MCERTS	15	6.7	23	36	69
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	7.7	24	9.9	14	8.7
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	29	43	30	33	45

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

Analytical Report Number: 23-51446
Project / Site name: Kimberley Clark, Northfleet
Your Order No: G-22-049 GVR 241

Lab Sample Number				2783537
Sample Reference				WS8
Sample Number				None Supplied
Depth (m)				0.70
Date Sampled				26/07/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	24
Moisture Content	%	0.01	NONE	7.2
Total mass of sample received	kg	0.001	NONE	0.8

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	EWS

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3
Total Sulphate as SO4	mg/kg	50	MCERTS	450
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0301
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	2.4

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.3
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.12
Fluorene	mg/kg	0.05	MCERTS	0.1
Phenanthrene	mg/kg	0.05	MCERTS	0.6
Anthracene	mg/kg	0.05	MCERTS	0.17
Fluoranthene	mg/kg	0.05	MCERTS	0.78
Pyrene	mg/kg	0.05	MCERTS	0.77
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.48
Chrysene	mg/kg	0.05	MCERTS	0.44
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.47
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.37
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.15
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.21

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	5.2

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	10
Copper (aqua regia extractable)	mg/kg	1	MCERTS	39
Lead (aqua regia extractable)	mg/kg	1	MCERTS	56
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58

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

4041

Analytical Report Number: 23-51446
Project / Site name: Kimberley Clark, Northfleet

Your Order No: G-22-049 GVR 241

Lab Sample Number				2783538	2783539
Sample Reference				WS3	WS6
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	0.80
Date Sampled				27/07/2023	27/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	8.3	8.4
Speciated PAHs					
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01
Total PAH					
Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2
Heavy Metals / Metalloids					
Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	3.8
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	0.09
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	< 0.4
Copper (dissolved)	µg/l	0.7	ISO 17025	3.2	8
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.2	0.5
Zinc (dissolved)	µg/l	0.4	ISO 17025	23	3.2

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

Analytical Report Number : 23-51446
Project / Site name: Kimberley Clark, Northfleet

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2783532	WS1	None Supplied	0.8	Grey clay and sand with gravel and stones.
2783533	WS3	None Supplied	0.8	Beige clay and sand with gravel and chalk.
2783534	WS6	None Supplied	0.8	Brown clay and sand with gravel and chalk.
2783535	WS7	None Supplied	0.4	Brown clay and sand with gravel.
2783536	WS7	None Supplied	0.8	Grey clay and sand with gravel and chalk.
2783537	WS8	None Supplied	0.7	Brown sand with gravel and stones.

Analytical Report Number : 23-51446
Project / Site name: Kimberley Clark, Northfleet

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	W	ISO 17025
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

Analytical Report Number : 23-51446
Project / Site name: Kimberley Clark, Northfleet

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 23-51446
Project / Site name: Kimberley Clark, Northfleet

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS7	None Supplied	S	2783535	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS7	None Supplied	S	2783536	c	Speciated EPA-16 PAHs in soil	L064-PL	c
WS8	None Supplied	S	2783537	c	Speciated EPA-16 PAHs in soil	L064-PL	c

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Analytical Report Number : 23-51465

Replaces Analytical Report Number: 23-51465, issue no. 1
Report format change.
WAC Certificate added by laboratory

Project / Site name:	Kimberley Clark, Northfleet	**Samples received on:**	01/08/2023
Your job number:	G-22-049	**Samples instructed on/ Analysis started on:**	17/08/2023
Your order number:	G-22-049 GVR 241	**Analysis completed by:**	23/08/2023
Report Issue Number:	2	**Report issued on:**	07/09/2023
Samples Analysed:	2 leachate samples - 2 soil samples		

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 23-51465
Project / Site name: Kimberley Clark, Northfleet
Your Order No: G-22-049 GVR 241

Lab Sample Number				2783680	2783682
Sample Reference				WS4	WS4
Sample Number				None Supplied	None Supplied
Depth (m)				0.40	0.80
Date Sampled				27/07/2023	27/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	38	< 0.1
Moisture Content	%	0.01	NONE	6	17
Total mass of sample received	kg	0.001	NONE	0.7	0.8
General Inorganics					
pH - Manual	pH Units	N/A	MCERTS	8.4	8
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	0.1	1.5
Loss on Ignition @ 450oC	%	0.2	MCERTS	1.1	7.2
Acid Neutralisation Capacity	+/- mmol/kg	-999	NONE	3.7	18
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.27
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.42
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.4
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	1.7
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.34
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	2.3
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.2
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	1.3
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	0.61
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.5
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.15
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.58
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05
Total PAH					
Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.85	13.9
Monoaromatics & Oxygenates					
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
Total BTEX	µg/kg	5	MCERTS	< 5.0	< 5.0
Petroleum Hydrocarbons					
Mineral Oil (C10 - C40) EH_CU_1D_AL	mg/kg	10	NONE	< 10	< 10

Analytical Report Number: 23-51465
Project / Site name: Kimberley Clark, Northfleet
Your Order No: G-22-049 GVR 241

Lab Sample Number				2783680	2783682
Sample Reference				WS4	WS4
Sample Number				None Supplied	None Supplied
Depth (m)				0.40	0.80
Date Sampled				27/07/2023	27/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
PCBs by GC-MS					
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001
Total PCBs by GC-MS					
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007

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

Analytical Report Number: 23-51465
Project / Site name: Kimberley Clark, Northfleet

Your Order No: G-22-049 GVR 241

Lab Sample Number				2783681	2783683
Sample Reference				WS4	WS4
Sample Number				None Supplied	None Supplied
Depth (m)				0.40	0.80
Date Sampled				27/07/2023	27/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
10:1 WAC Leachate					
Arsenic	mg/l	0.001	ISO 17025	0.002	0.0066
Barium	mg/l	0.00005	ISO 17025	0.0031	0.0118
Cadmium	mg/l	0.0001	ISO 17025	< 0.0001	< 0.0001
Chromium	mg/l	0.0004	ISO 17025	0.002	< 0.0004
Copper	mg/l	0.0007	ISO 17025	0.0046	0.012
Mercury	mg/l	0.0005	ISO 17025	< 0.0005	< 0.0005
Molybdenum	mg/l	0.0004	ISO 17025	0.0023	0.0031
Nickel	mg/l	0.0003	ISO 17025	0.0007	0.0014
Lead	mg/l	0.001	ISO 17025	< 0.0010	0.0017
Antimony	mg/l	0.0017	ISO 17025	< 0.0017	< 0.0017
Selenium	mg/l	0.004	ISO 17025	0.0046	< 0.0040
Zinc	mg/l	0.0004	ISO 17025	0.0012	0.0035
Chloride	mg/l	0.15	ISO 17025	0.9	0.8
Fluoride	mg/l	0.05	ISO 17025	0.23	0.42
Sulphate	mg/l	0.1	ISO 17025	2.8	8.8
Total dissolved solids	mg/l	4	ISO 17025	38	62
Total monohydric phenols	mg/l	0.01	ISO 17025	< 0.010	< 0.010
Dissolved organic carbon	mg/l	0.1	NONE	7.98	6.58
10:1 WAC Leachate					
Arsenic	mg/kg	0.01	NONE	0.0195	0.0658
Barium	mg/kg	0.0005	NONE	0.0305	0.118
Cadmium	mg/kg	0.0008	NONE	< 0.0008	< 0.0008
Chromium	mg/kg	0.004	NONE	0.02	< 0.0040
Copper	mg/kg	0.007	NONE	0.046	0.12
Mercury	mg/kg	0.005	NONE	< 0.0050	< 0.0050
Molybdenum	mg/kg	0.004	NONE	0.0227	0.0307
Nickel	mg/kg	0.003	NONE	0.0066	0.014
Lead	mg/kg	0.01	NONE	< 0.010	0.017
Antimony	mg/kg	0.017	NONE	< 0.017	< 0.017
Selenium	mg/kg	0.04	NONE	0.046	< 0.040
Zinc	mg/kg	0.004	NONE	0.012	0.035
Chloride	mg/kg	1.5	NONE	9	8
Fluoride	mg/kg	0.5	NONE	2.3	4.2
Sulphate	mg/kg	1	NONE	28	88
Total dissolved solids	mg/kg	40	ISO 17025	380	620
Total monohydric phenols	mg/kg	0.1	NONE	< 0.10	< 0.10
Dissolved organic carbon	mg/kg	1	NONE	79.8	65.8

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

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Waste Acceptance Criteria Analytical Results

Report No:	**23-51465**						
					Client:	**GVRGEOSERVIC**	
Location	**Kimberley Clark, Northfleet**						
Lab Reference (Sample Number)	2783680 / 2783681				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	27/07/2023				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS4						
Depth (m)	0.40						
Solid Waste Analysis							
TOC (%)**	0.1				3%	5%	6%
Loss on Ignition (%) **	1.1				--	--	10%
BTEX (µg/kg)**	< 5.0				6000	--	--
Sum of PCBs (mg/kg)**	< 0.007				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85				100	--	--
pH (units)**	8.4				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	3.7				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0020			0.0195	0.5	2	25
Barium *	0.0031			0.0305	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	0.0020			0.020	0.5	10	70
Copper *	0.0046			0.046	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0023			0.0227	0.5	10	30
Nickel *	0.0007			0.0066	0.4	10	40
Lead *	< 0.0010			< 0.010	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	0.0046			0.046	0.1	0.5	7
Zinc *	0.0012			0.012	4	50	200
Chloride *	0.90			9.0	800	15000	25000
Fluoride*	0.23			2.3	10	150	500
Sulphate *	2.8			28	1000	20000	50000
TDS*	38			380	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	7.98			79.8	500	800	1000
Leach Test Information							
Stone Content (%)	38						
Sample Mass (kg)	0.70						
Dry Matter (%)	94						
Moisture (%)	6.0						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.

*= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation

** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

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Waste Acceptance Criteria Analytical Results

Report No:	**23-51465**						
					Client:	**GVRGEOSERVIC**	
Location	**Kimberley Clark, Northfleet**						
Lab Reference (Sample Number)	2783682 / 2783683				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	27/07/2023				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS4						
Depth (m)	0.80						
Solid Waste Analysis							
TOC (%)**	1.5				3%	5%	6%
Loss on Ignition (%) **	7.2				--	--	10%
BTEX (µg/kg)**	< 5.0				6000	--	--
Sum of PCBs (mg/kg)**	< 0.007				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	13.9				100	--	--
pH (units)**	8.0				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	18				--	To be evaluated	To be evaluated
Eluate Analysis	10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0066			0.0658	0.5	2	25
Barium *	0.0118			0.118	20	100	300
Cadmium *	< 0.0001			< 0.0008	0.04	1	5
Chromium *	< 0.0004			< 0.0040	0.5	10	70
Copper *	0.012			0.12	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0031			0.0307	0.5	10	30
Nickel *	0.0014			0.014	0.4	10	40
Lead *	0.0017			0.017	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0035			0.035	4	50	200
Chloride *	0.80			8.0	800	15000	25000
Fluoride*	0.42			4.2	10	150	500
Sulphate *	8.8			88	1000	20000	50000
TDS*	62			620	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	6.58			65.8	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.80						
Dry Matter (%)	83						
Moisture (%)	17						

Results are expressed on a dry weight basis, after correction for moisture content where applicable.

*= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepencies with current legislation

** = MCERTS accredited

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Analytical Report Number : 23-51465
Project / Site name: Kimberley Clark, Northfleet

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2783680	WS4	None Supplied	0.4	Brown sand with gravel and stones.
2783682	WS4	None Supplied	0.8	Beige clay and sand with gravel and chalk.

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Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270.	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025

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Project / Site name: Kimberley Clark, Northfleet

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031-PL	W	ISO 17025
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Sample Deviation Report

Analytical Report Number : 23-51465

Project / Site name: Kimberley Clark, Northfleet

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS4	None Supplied	S	2783680	c	BTEX in soil (Monoaromatics)	L073B-PL	c
WS4	None Supplied	S	2783680	c	Total BTEX in soil (Poland)	L073-PL	c
WS4	None Supplied	S	2783682	c	BTEX in soil (Monoaromatics)	L073B-PL	c
WS4	None Supplied	S	2783682	c	Total BTEX in soil (Poland)	L073-PL	c

Appendix E

GVR Geo Generic Assessment Criteria

Soil Testing: Generic Assessment Criteria Summary Table (Commercial end-use)

Parameter	No. of samples tested	Range of results (mg/kg unless stated otherwise)	GAC	No. of samples exceeding GAC
Metals, Metalloids, Non-metals				
Arsenic	6	3.4-9.1	640	0
Cadmium	6	<0.2-0.4	190	0
Chromium III	6	3.9-11	8,600	0
Chromium VI	6	<1.8	33	0
Copper	6	9.6-39	68,000	0
Lead	6	6.7-69	2,330	0
Mercury, Inorganic	6	<0.3	110	0
Nickel	6	7.7-24	980	0
Zinc	6	29-58	730,000	0
Inorganics				
pH, pH units	6	8.3-8.7	<2.5 - >9.5	0
Total Organic Carbon, % mass	6	0.2-2.4	N/A	N/A
Sulphate Aqueous Extract as SO4, mg/l	6	12-349	500	0
Total Sulphate as SO4	6	290-880	2,400	0
Polycyclic Aromatic Hydrocarbons				
Naphthalene	6	<0.05-0.51	460	0
Acenaphthylene	6	<0.05-0.06	97,000	0
Acenaphthene	6	<0.05-0.83	97,000	0
Fluorene	6	<0.05-0.6	68,000	0
Phenanthrene	6	0.07-3.6	22,000	0
Anthracene	6	<0.05-0.77	54,000	0
Fluoranthene	6	0.06-5.3	23,000	0
Pyrene	6	0.07-4.4	54,000	0
Benzo(a)anthracene	6	<0.05-2.7	170	0
Chrysene	6	0.05-2.4	350	0
Benzo(b)fluoranthene	6	<0.05-3.2	44	0
Benzo(k)fluoranthene	6	<0.05-1.4	1,200	0
Benzo(a)pyrene	6	<0.05-2.6	35	0
Indeno(1,2,3-c,d)pyrene	6	<0.05-1.2	510	0
Dibenzo(a,h)anthracene	6	<0.05-0.28	3.6	0
Benzo(g,h,i)perylene	6	<0.05-1.3	4,000	0
Others				
Asbestos	6	NAD-present	Present	0

Soil Leachate Testing: Generic Assessment Criteria Summary Table (Commercial end-use)

Parameter	No. of samples tested	Range of results (µg/l unless stated otherwise)	GAC	No. of samples exceeding GAC
Polycyclic Aromatic Hydrocarbons				
Naphthalene	2	<0.01	2 [1]	0
Acenaphthylene	2	<0.01	-	0
Acenaphthene	2	<0.01	-	0
Fluorene	2	<0.01	-	0
Phenanthrene	2	<0.01	-	0
Anthracene	2	<0.01	0.1 [1]	0
Fluoranthene	2	<0.01	0.0063 [1]	0
Pyrene	2	<0.01	-	0
Benzo(a)anthracene	2	<0.01	-	0
Chrysene	2	<0.01	-	0
Benzo(b)fluoranthene	2	<0.01	0.00017 [1]	0
Benzo(k)fluoranthene	2	<0.01	0.00017 [1]	0
Benzo(a)pyrene	2	<0.01	0.00017 [1]	0
Indeno(1,2,3-c,d)pyrene	2	<0.01	0.00017 [1]	0
Dibenzo(a,h)anthracene	2	<0.01	-	0
Benzo(g,h,i)perylene	2	<0.01	0.00017 [1]	0
Metals, Metalloids, Non-metals				
Arsenic	2	<1.0-3.8	50 [1]	0
Cadmium	2	<0.08-0.09	0.25 [1]	0
Chromium VI	2	<5.0	3.4 [1]	0
Chromium (total)	2	<0.4	4.7 [1]	0
Copper	2	3.2-8	2000 [1]	0
Mercury	2	<0.5	0.07 [1]	0
Nickel	2	0.5-1.2	4.0 [1a]	0
Zinc	2	3.2-23	10.9 [1a]	0

GAC source references:

[1] Freshwaters specific pollutants and operational environmental quality standards (EQS) and where no values are available the previous superseded UK Surface Waters, Freshwater EQS guidance values are used

[1a] Freshwater EQS bioavailable thresholds

Appendix F

Groundwater Monitoring Data

Ground Gas and Groundwater Monitoring Record

Job Name: Kimberly Clark, Northfeet
Client: Hyro Energy Ltd
Date: 09/08/2023

Job No.: G-22-049
Operator: GeoEnginSeerLtd
Visit 1 **of** 3

Monitoring Well	GAS CONCENTRATIONS												HYDROCARBONS		FLOW		LEVELS (mbgl)			
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		Peak VOCs (ppm)	Product thickness (mm)	Flow rate (l/hr)		Water level	Base of well	Response Zone Strata	Comments - Time Pressure 1018 steady
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Max.	Min.			Peak	Steady				
WS1																	3.90	4.95	Round 1	16:35
WS3																	3.70	4.25	Round 1	16:28
WS4																	3.94	4.96	Round 1	16:20
WS7																	3.79	4.60	Round 1	16:15
WS1																	3.70	4.95	Round 2	16:50
WS3																	3.95	4.25	Round 2	16:55
WS4																	3.96	4.96	Round 2	16:42
WS7																	3.94	4.60	Round 2	16:37
Max.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**3.96**	**4.96**		
Min.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**3.70**	**4.25**		
GSV (l/hr)	**0**				**0**															

WEATHER AND SITE CONDITIONS

Barometric pressure (mbar):			1038	Before			1037	After		
Pressure trend:				Falling		Steady	x	Rising		
Air Temperature (Deg. C):			8	Before			8	After		
State of ground:	x	Dry		Moist		Wet		Snow		Frozen
Wind:	x	Calm		Light		Moderate		Strong		
Cloud cover:		None	x	Slight		Cloudy		Overcast		
Preciptation:	x	None		Slight		Moderate		Heavy		

Job Name: Kimberly Clark, Northfeet
Client: Hyro Energy Ltd
Date: 23/08/2023

Job No.: G-22-049
Operator: GeoEnginSeerLtd
Visit 2 **of** 3

Monitoring Well	GAS CONCENTRATIONS												HYDROCARBONS		FLOW		LEVELS (mbgl)			
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		Peak VOCs (ppm)	Product thickness (mm)	Flow rate (l/hr)		Water level	Base of well	Response Zone Strata	Comments Time Pressure 1020mb and rising
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Max.	Min.			Peak	Steady				
WS1																	4.16	4.95	Round1	13:15
WS3																	3.97	4.25	Round1	12:40
WS4																	3.49	4.96	Round1	12:30
WS7																	4.60	4.60	Round1	12:00
WS1																	3.90	4.95	Round2	14:40
WS3																	3.90	4.25	Round2	14:15
WS4																	3.49	4.96	Round2	13:50
WS7																	4.60	4.60	Round2	13:35
WS1																	3.60	4.95	Round3	14:05
WS3																	3.80	4.25	Round3	14:25
WS4																	4.30	4.96	Round3	14:40
WS7																	4.30	4.60	Round3	15:10
WS1																	3.60	4.95	Round4	15:45
WS3																	3.90	4.25	Round4	15:45
WS4																	4.20	4.96	Round4	16:10
WS7																	4.40	4.60	Round4	16:35
Max.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**4.60**	**4.96**		
Min.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**3.49**	**4.25**		
GSV (l/hr)	**0**				**0**															

WEATHER AND SITE CONDITIONS

Barometric pressure (mbar):			1025	Before			1026	After		
Pressure trend:			x	Falling		Steady		Rising		
Air Temperature (Deg. C):			13	Before			13	After		
State of ground:	x	Dry		Moist		Wet		Snow		Frozen
Wind:	x	Calm		Light		Moderate		Strong		
Cloud cover:	x	None		Slight		Cloudy		Overcast		
Preciptation:	x	None		Slight		Moderate		Heavy		

Job Name: Kimberly Clark, Northfeet
Client: Hyro Energy Ltd
Date: 30/08/2023

Job No.: G-22-049
Operator: GeoEnginSeerLtd
Visit 3 **of** 3

Monitoring Well	GAS CONCENTRATIONS												HYDROCARBONS		FLOW		LEVELS (mbgl)			
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppm)		Hydrogen sulphide (ppm)		Oxygen (%v/v)		Peak VOCs (ppm)	Product thickness (mm)	Flow rate (l/hr)		Water level	Base of well	Response Zone Strata	Comments: Time, Pressure 1010mb Rising
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Max.	Min.			Peak	Steady				
WS1																	3.60	4.95	Round 1	11:40
WS3																	4.00	4.25	Round !	12:00
WS4																	4.30	4.96	Round !	12:20
WS7																	4.50	4.60	Round 1	12:40
WS1																	3.90	4.95	Round 2	13:20
WS3																	3.90	4.25	Round 2	13:35
WS4																	4.40	4.96	Round 2	13:50
WS7																	4.60	4.60	Round 2	14:10
Max.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**4.60**	**4.96**		
Min.	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0**	**0**	**0**	**0**	**3.60**	**4.25**		
GSV (l/hr)	**0**				**0**															

WEATHER AND SITE CONDITIONS

Barometric pressure (mbar):			1033	Before			1035	After				
Pressure trend:			x	Falling		Steady		Rising				
Air Temperature (Deg. C):			10	Before			10	After				
State of ground:	x	Dry		Moist		Wet		Snow		Frozen		
Wind:	x	Calm		Light		Moderate		Strong				
Cloud cover:		None	x	Slight		Cloudy		Overcast				
Preciptation:	x	None		Slight		Moderate		Heavy				