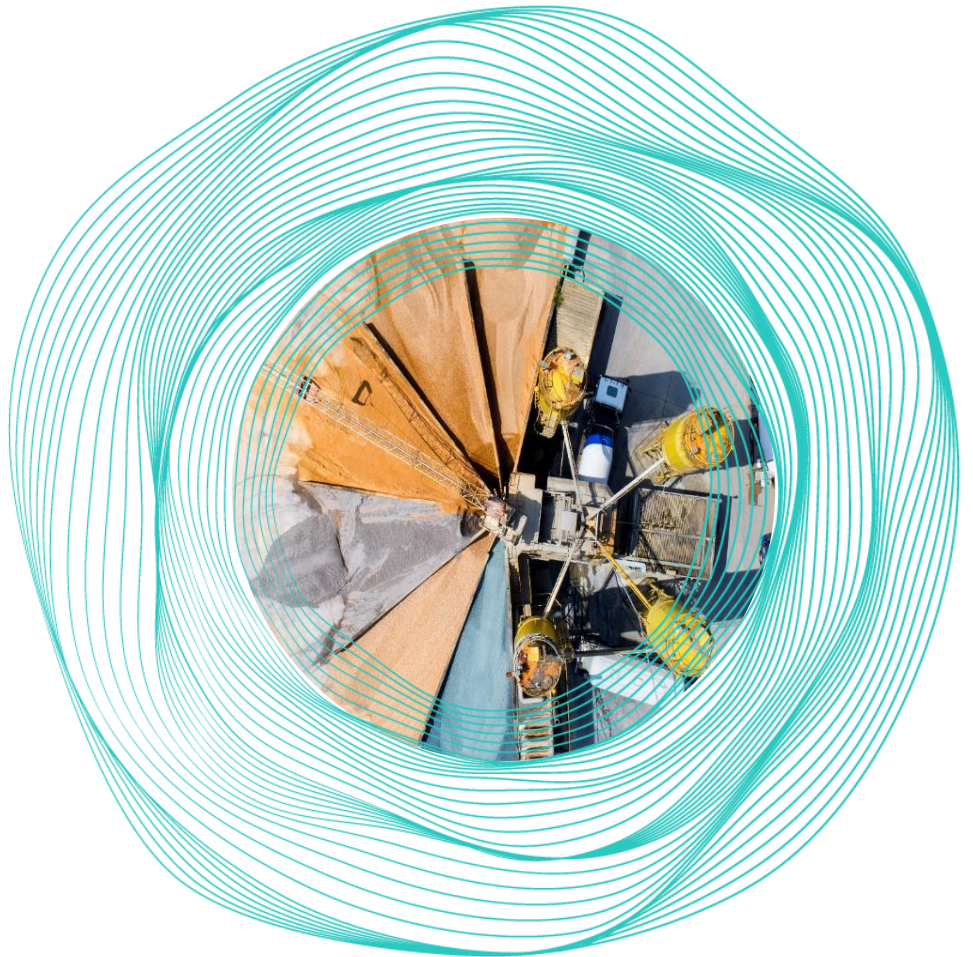


CADENT GAS LIMITED

Controlled Waters Detailed Quantitative Risk Assessment

Brick Kiln Street, Hinckley

Document no. Rev 0: 415001-00017_00402_DQRA



July 2025

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Table of Contents

Executive Summary	1
Acronyms and Abbreviations	3
1. Introduction	4
1.1 General	4
1.2 Background	4
1.3 Objectives	5
1.4 Report Format	5
1.5 Legislative Framework	6
1.6 Key Reference Documents	6
2. Site Description and Environmental Setting	9
2.1 Site Description	9
2.2 Environmental Setting	11
2.2.1 Geology	11
2.2.2 Hydrogeology	16
2.2.3 Hydrology	22
2.2.4 Hydrogeological Summary	24
2.3 Previous Site Works	25
2.3.1 Previous Site Investigation Works	25
2.3.2 Remediation Works	26
2.4 Current Evidence of Potential Pollutants	26
2.4.1 Visual and Olfactory Observations	26
2.4.2 Results of Preliminary/ Generic Risk Assessment	27
2.4.3 Metal Bioavailability Assessment Tool (M-BAT)	32
2.4.4 Non Aqueous Phase Liquid (NAPL)	34
3. Conceptual Site Model	38
3.1 Overview	38
3.2 Sources	38
3.2.1 Site Zoning	38
3.2.2 Source Zone A	38
3.2.3 Source Zone B	39
3.3 Pathways	40
3.4 Receptors	41
3.4.1 Aquifer(s)	41
3.4.2 Surface Water Receptors	42
3.4.3 Abstraction(s)	42
3.5 Potential Contaminant Linkages Selected for Detailed Assessment	43
4. Risk Assessment Methodology	45
4.1 Guidance	45
4.2 Model Selection	45
4.3 Risk Assessment Rationale	45
4.4 RTM Input Parameters	45
4.4.1 Site Area/ Zoning	45
4.4.2 Modelled Contaminants	46
4.4.3 Compliance Point	48
4.4.4 Target Concentrations	48

4.4.5	Retardation and Biodegradation.....	49
4.4.6	Physical Properties.....	50
4.4.7	Model Limitations and Assumptions.....	50
5.	Risk Assessment Results	51
5.1	Model Results	51
5.2	Discussion of Results	53
5.2.1	Resource Potential – Compliance Point 1.....	53
5.2.2	Surface Water Receptor – Compliance Point 2	54
6.	Sensitivity Analysis, Model Uncertainty and Climate Change	55
6.1	Model Sensitivity	55
6.1.1	Degradation Rates	55
6.1.2	Hydraulic Conductivity.....	57
6.1.3	Hydraulic Gradient.....	57
6.1.4	Saturated Aquifer Thickness.....	58
6.2	Uncertainty Analysis	58
6.3	Climate Change Considerations	60
7.	Summary and Recommendations.....	61
7.1	Summary	61
7.1.1	Resource Potential – Wolston Sand and Gravel	61
7.1.2	Surface Water – Sketchley Brook.....	61
7.2	Updated Conceptual Site Model	62
7.3	Recommendations	62
8.	References.....	63

List of tables in text

Table 2-1: Site Description	10
Table 2-2: Published Geology	12
Table 2-3: Aquifer Designations.....	16
Table 2-4: Estimated Hydraulic Gradients for Bosworth Clay Member and Wolston Sand and Gravels	20
Table 2-5: Contaminants of Potential Concern	31
Table 3-1: Summary of Soil and Groundwater Sources - Source Zone A	39
Table 3-2: Summary of Source Zones Identified at the Site	40
Table 3-3: Potential Contaminant Linkages	44
Table 4-1: Remedial Target Methodology Assessment Levels.....	45
Table 4-2: Summary of Source Areas	46
Table 4-3: Modelled Contaminants of Potential Concern.....	47
Table 4-4: Degradation Potential	49
Table 6-1: Sensitivity – Dual Phase.....	56
Table 6-2: Sensitivity – Half Life	56
Table 6-3: Sensitivity – Hydraulic Conductivity	57
Table 6-4: Sensitivity – Hydraulic Gradient	57
Table 6-5: Sensitivity – Hydraulic Gradient	58

List of figures in text

<i>Figure 2-1. Schematic Cross Section showing the relationships of the Quaternary Deposits.</i>	<i>12</i>
<i>Figure 2-2. Schematic Cross Section showing the General Relations of the Rock along the line of Section on the BGS Sheet 169: Coventry (Solid and Drift) (BGS, 1994).</i>	<i>13</i>
<i>Figure 2-3: Distribution of TPHCWG Fractions (% of total C5-C35) for MW25-23B product sample</i>	<i>34</i>

Appended figures

Figure 1:	Site Location Plan
Figure 2:	Site Plan with Site Investigation Locations and Historical Structures
Figure 3:	Schematic Geological Cross Sections A-A' and B-B'
Figure 4:	Interpreted Groundwater Flow
Figure 5:	Initial Conceptual Site Model
Figure 6:	Groundwater Source Zone Plan
Figure 7:	Revised Conceptual Site Model

Appendices

Appendix A. Supporting Information

Appendix B. Model Inputs

Appendix C. Model Outputs

Appendix D. Screened Analytical Results

Executive Summary

Introduction and Objectives	Worley Consulting was retained by Cadent to undertake a detailed quantitative controlled waters/ water environment risk assessment for the former gasworks site at Brick Kiln Street, Hinckley. The site has been subject to several phases of intrusive site investigation works. A number of on and off-site sources were identified that pose potential risks to the water environment at the site. These included made ground (inside and outside structures), shallow perched groundwater, residual groundwater contamination, DNAPL (in made ground, bedrock and inside structures) and the off-site former gasworks.
Preliminary Risk Assessment	In 2025, an update of the conceptual site model for controlled waters at the site was undertaken. Worley Consulting identified potential pollutant linkages (PPLs) relating to potential risks from site derived sources of contamination to the controlled waters receptors at the site, namely to the underlying superficial aquifer underlying the site and surface waters of the Sketchley Brook located down gradient of the site which required further assessment. The objectives of this quantitative risk assessment are to assess the significance of potentially unacceptable risks to the controlled waters and to assess whether remediation may be necessary.
Controlled Waters Risk Quantification	The risk to the controlled waters from site-derived contaminants was assessed using the Environment Agency's Remedial Target Methodology (Environment Agency, 2006). Two compliance points were defined in the Wolston Sands and Gravel aquifer; CP1 was located 50 m downgradient of the site (in accordance with Environment Agency guidance) and CP2 was located 300 m downgradient of the site to assess the potential for unacceptable risks to the Sketchley Brook (the mid-point to the down gradient surface water feature to the site). At CP1, cyanide, sulphate, benzene, toluene, ethylbenzene, xylene, ammonium as NH₄ and TPH aromatic C10-12 and C12-16 were identified to exceed the derived Site-Specific Assessment Criteria (SSAC) in both soils and groundwater at the site. Exceedances of toluene, ethylbenzene, xylene were also recorded in soils (only). At CP2, ammoniacal nitrogen as N and naphthalene were identified to exceed the derived SSAC in both soils and groundwater at the site. Exceedances of benzene, ethylbenzene and xylenes were also recorded in soils (only).
Conclusions	The identified sources of gasworks related contamination are considered to be made ground within and outside structures and discrete / diffuse sources of residual phase gasworks related hydrocarbon impact (DNAPL) and dissolved phase contaminants already present within groundwater. Exceedances of cyanide, sulphate, benzene, toluene, ethylbenzene, xylene, TPH aromatic C10-12 and C12-16, ammoniacal nitrogen as N, ammonium as NH₄ and naphthalene were recorded in concentrations at the site in excess of the derived SSAC for soils and groundwater at the site. In the majority of cases, the exceedances were identified in areas in which the saturated units were impacted with hydrocarbon contamination or evidence of DNAPL. Some exceedances (e.g. sulphate, cyanide and TPH aromatic C10-12 and C12-16) were also recorded in samples from the sites of former purifiers, holders and the refuse tip. Source areas defined by concentrations in excess of the SSAC are inferred to pose a potentially significant risk to the identified controlled waters receptors. Observations of DNAPL at the site are recorded within the superficial deposits and made ground (saturated and unsaturated and inside and outside structures). Measurable thicknesses of DNAPL have been recorded within the monitoring wells at multiple locations across the site (Worley Consulting, 2025). The findings of this report have not yet been discussed with the Planning

	Authority.
Recommendations	Risk mitigation measures will be required to manage the potentially unacceptable risks posed by these primary sources of contamination. It is recommended that evaluation of practical risk mitigation approaches and remediation options is undertaken, and an outline strategy developed for future works. Following shortlisting of viable options, an appraisal of the likely benefits of instigating remediation works should be undertaken to ensure the works are proportionate and sustainable. This sustainability assessment will need to be completed after specific remediation techniques have been confirmed as viable (e.g. after pilot trials, further assessment, etc.) and when the proposed development plan has been confirmed.

Acronyms and Abbreviations

Acronym/abbreviation	Definition
BGS	British Geological Society
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
CW	Controlled Waters
DNAPL	Dense Non-Aqueous Phase Liquid
DOC	Dissolved Organic Carbon
DQRA	Detailed Quantitative Risk Assessment
DWS	Drinking Water Standards
EA	Environment Agency
EPA	Environmental Protection Act
EQS	Environmental Quality Standards
FOC	Fraction of Organic Carbon
GQRA	Generic Quantitative Risk Assessment
m AOD	Meters Above Ordnance Datum
M-BAT	Metal Bioavailability Assessment Tool
MNA	Monitored Natural Attenuation
NAPL	Non-Aqueous Phase Liquid
NPPF	National Planning Policy Framework
PAH	Polycyclic aromatic hydrocarbons
PNEC	Predicted No Effect Concentration
ROA	Remediation Options Appraisal
RPVs	Resource Protection Values
RTM	Remedial Targets Methodology
SPR	Sources, pathways and receptors
SSAC	Site Specific Assessment Criteria
TPH	Total Petroleum Hydrocarbons
WQS	Water Quality Standard

1. Introduction

1.1 General

Worley Consulting has been commissioned by Cadent Gas Limited (Cadent) to undertake a controlled waters detailed quantitative risk assessment (DQRA) at Brick Kiln Street, Hinckley, LE10 0NA (the 'Site'), as shown on Figure 1. The assessment has been undertaken to support their Outline Planning (planning application: 24/00610/OUT) for the proposed erection of 195 dwellings (including affordable housing) with private gardens and areas of public open space.

The assessment includes:

- A source-pathway-receptor conceptualisation of the site;
- Parameterisation and running of selected risk models;
- Completion of risk-based modelling;
- Presentation of the updated conceptual model relating to risks to controlled waters; and
- Provision of recommendations for further work including remediation or mitigation measures, if required.

Assessment uncertainties, project risks and recommendations are collated into the Summary and Recommendations section for consideration by Cadent.

1.2 Background

Historically, the site was used by Cadent for commercial purposes (office blocks and associated parking). Prior to this, the site housed a former gasworks, comprising both gas production and gas storage infrastructure. The majority of above ground structures at the site have now been demolished and the site is currently secure and vacant.

Hinckley Gasworks was originally constructed in 1834, with multiple phases of expansion and development (Hinckleypastpresent, 2024). The gasworks was operational until the 1962 when gas production ceased and the majority of the buildings associated with the gasworks were demolished to make way for the former Cadent commercial offices. The offices were demolished around 2022.

The site comprises three separate land parcel areas as detailed below and shown on Figure 2:

- Area A (former car park in the north);
- Area B (former administrative buildings (demolished), operational land and roadways/parking - majority of the site to the south of Area A); and,
- Area C (smaller area of former car parking to the east).

The northern area (Area A) is at a lower elevation than the rest of the site (Area B and Area C). A 2-3 m high retaining wall with sloped embankment bisects the two areas. A second retaining wall is present in the north of Area B, orientated southwest to northeast between former office Block 4 and Block 3.

Several phases of site investigation, risk assessment and localized remediation have been undertaken onsite. A groundwater hydraulic containment unit was installed in 2009 along the southwestern boundary of Area B. At the time of writing, the containment system remains operational.

Previous site investigation work has identified a number of remaining potential contamination sources at the site, primarily located in Area B; the former gasworks process area. These include:

- Made ground (inside and outside of structures in non-remediated areas of the site);
- Perched/ contained waters within former below ground structures;
- Non-Aqueous Phase Liquids (NAPLs) in and around former structures towards the southwest of the site, primarily identified within the superficial deposits of the Wolston Sand and Gravel and overlying Oadby Member;
- Dissolved phase contamination in groundwater in the underlying aquifer.

1.3 Objectives

This DQRA report considers the findings of previous site investigation. The objectives of this assessment are to:

- quantify the risk to controlled waters posed by any impacted soils and groundwater; and,
- update the conceptual model for the site.

This report supports the close out of planning condition C174 (a) of the outline planning conditions (24/00610/OUT) and Point 1 of Condition 2 proposed by the Environment Agency for a proposed residential development. This assessment considers a future end use, with redevelopment of the site through the planning process for residential and public open spaces end uses. An illustrative master plan for the site is presented within Appendix A.

1.4 Report Format

The report is subdivided into the following sections.

Report Format	
Section 1	Introduction
Section 2	Site Description and Environmental Setting
Section 3	Conceptual Site Model
Section 4	Risk Assessment Methodology
Section 5	Risk Assessment Results
Section 6	Sensitivity Analysis, Model Uncertainty and Climate Change
Section 7	Summary and Recommendations
Section 8	References

Supporting information is included in Figures, Tables and Appendices following the main text of the report.

1.5 Legislative Framework

This report has been prepared in accordance with Part 2A of the Environmental Protection Act (1990), and the Groundwater Daughter Directive and Groundwater Regulations 2006/118/EEC Water Resources Act (1991) as amended by the Water Act (2003) (s.161) and the Anti-pollution Works Notices Regulations (1999).

The statutory definition of contaminated land is provided in Part 2A of the Environmental Protection Act (EPA) 1990 (Part 2A). This does not include land that is already regulated through other means, such as Waste Management Legislation or The Environmental Permitting Regulations 2010. The definition of contaminated land provided by Part 2A has also been used in the assessment of current site usage and includes the updated statutory guidance issued in April 2012. Land is defined as contaminated when:

- a) Significant harm is being caused to human health or there is a significant possibility of such harm being caused;
- b) Significant harm is being caused to non-human receptors (ecological systems and/or property as defined in Table 1 and Table 2 of the Statutory Guidance) or there is a significant possibility of such harm being caused; or
- c) Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused.

The assessments made in this report follow the "suitable for use" concept applicable to both current use (regulated through Part 2A) and future use (regulated through the Local Authority development and control system). Further details in relation to Part 2A may be found on the UK Government website, at the following link:

<https://www.gov.uk/government/publications/contaminated-land-statutory-guidance>.

Should the site be subject to redevelopment for a future use, the site would be assessed under the planning regime (regulated through the Local Authority development and control system). The key legislation applicable is the Town and Country Planning Act, 1990. Planning guidance relating to the development of land potentially affected by contamination is detailed in the National Planning Policy Framework (NPPF), which came into force in March 2012.

1.6 Key Reference Documents

Previous investigation reports were made available to Worley Consulting for review. Where relevant, findings from the previous site investigation (factual) have been used to inform the assessment. It should be noted that sections within a number of the reports have been redacted (by other parties) and some factual information (including intrusive logs) has not been provided. A full list of references is presented in Section 8:

- Celtic, March 1999, 'Transco Electrical Enhancement Works, Factual Environmental Assessment Report', R440/99/917A (Southern Area).
- Celtic, March 1999, 'Land for Adoption as A Cycle Route, Factual Environmental Assessment Report', R440/99/917B (Area A).
- Celtic, March 1999, 'Stockpile of Excavated Material, Factual Environmental Assessment Site Investigation Report', R440/99/917C (Northern Area).

- Celtic, June 2008, Phase 1 Design Assessment Report (Draft), R1191/08/3390.
- WorleyParsons, April 2013, 'Project Core: Human Health Environmental Assessment Works Factual Report', 305008-00018/51529-02.
- WorleyParsons, April 2013, 'Data Review Hinckley Operational Centre, Coventry Road, Hinckley', 305001-00024/51374-01 (Final-Rev 1). *The report includes summaries of factual investigation reports that were not provided to Worley Consulting.*
- WYG, 2015, 'Indoor Drinking Water and Air Monitoring Coventry Road, Hinckley (0326) – Combined Factual and Interpretive Letter Report'. A074754-101-1/jb/pm/FACINT/LR1.
- WYG, September 2016, 'Brick Kiln Street, Hinckley (0326), Factual Environmental Report – NGG Landholding'. *This report formed an amalgamation of various aforementioned reports.*
- Celtic Englobe (Celtic), Series of Groundwater Hydraulic Containment System Progress Reports.
 - Monthly Progress Report (July 2009): August 2009, R1329/09/3689
 - Monthly Progress Report (August 2009): September 2009, R1329/09/3699
 - Progress Report (February 2010): March 2010, R1329/10/3779
 - Progress Report (June 2010): July 2010, R1329/10/3897
 - Progress Report (September 2011): September 2011, R1329/11/4146
 - Progress Report (January 2012): January 2012, R1329/12/4249
 - Progress Report (May 2012): May 2012, R1329/12/4282
 - Progress Report (December 2012): March 2013, R1329/13/ 4370
 - Progress Report (Quarter 1 2016): August 2016, R1640/16/4685
 - Progress Report (Quarter 2 2016): October 2016, R1689/16/4717
 - Progress Report (Quarter 4 2016): February 2016, R1689/17/4766
 - Progress Report (Quarter 1 2017): June 2017, R1689/17/4807
 - Progress Report (Quarter 2 2018): July 2018, R1738/18/4903
 - Progress Report (Quarter 3 2018): October 2018, R1738/18/4925
 - Progress Report (Quarter 1 2019): May 2019, R1738/19/4954
 - Progress Report (Quarter 3 2019): January 2020, R1795/19/4972
 - Englobe, Quarter 2 2023 (November 2023): R1886/23/5350 draft 2
 - Englobe, Quarter 3 2023 (November 2023): R1886/23/5361 draft 1
 - Englobe, Quarter 4 2023 (June 2024): R1886/23/5382 draft 1
 - Biogenie, Quarter 1 2024 (September 2024): R1886/24/5414
 - Biogenie, Quarter 3 2024 (February 2025): R1886/25/5459
 - Biogenie, Quarter 4 2024 (February 2025): R1886/25/5460
- Wood, July 2020, 'Factual Site Investigation Report', 41727-WOD-XX-XX-RP-OC-0001_A_C01, Final (northern half of site).
- Wood, December 2020, 'Factual Land Condition Summary Report', 806504-WOOD-XX-XX-RP-OC-00002_A_C01, Final (northern half of site).
- Worley Consulting, June 2025, Phase 2 Factual Site Investigation Report, 415001-00017_00401_F, Final.

- Worley Consulting, July 2025, Preliminary Foundation Options Report, 415001-00017-SS-REP-00001.

One report was provided which relates to ground investigation works offsite to the southeast, detailed below.

- Wood, March 2019, 'Factual Site Investigation Report', 39959R012i2 Final (Lidl Land Parcel).

Additionally, various reports and supporting information have been downloaded from the Planning Portal in relation to the residential development to the west of the site (12/01119/OUT), including the following reports:

- WSP, November 2012, 'Revised Geoenvironmental Assessment', 33352-R01 (Former Jarvis Porter Facility).
- WSP, June 2013, 'Supplementary Ground Investigation Report', 39067-R01 (Former Jarvis Porter Facility).

2. Site Description and Environmental Setting

2.1 Site Description

The site is located off Coventry Road, Hinckley, Leicester, LE10 0NA and is accessed via a double palisade gate off Brick Kiln Street. The site location is shown in Figure 1 and current site layout in Figure 2. A brief overview of the site setting is provided in Table 2-1 below.

Site Description

Site Location	Address: Cadent Gas, Brick Kiln Street, Hinckley, LE10 0NA NGR: 442126, 293683 Site Area: 5.95 hectares (Ha)
Site Ownership and Use	The site is currently owned by Cadent Gas Ltd and is primarily disused, except the operation of a groundwater hydraulic containment unit in the southwest. The site can be accessed through double palisade gates off Brick Kiln Street in the east of Area B. There is also vehicular site access through locked double gates via Trinity Vicarage Road (within the northeast of Area B). A pedestrian entrance to Area A was also noted in the western corner of Area A, via the neighbouring Gymnastics Centre. The site boundary predominantly comprises 2m high metal palisade fencing in the south and west, and wooden fencing along the north and western boundaries. The boundary was assessed to be in good condition. The site is considered to be secure due to fencing and on-site security in the form of CCTV.
Site Setting	The site is located in a mixed residential and commercial setting. The site is not located within 500 m of statutory designated land (Local Nature Reserve (LNR), Ramsar Site, Site of Special Scientific Interest (SSSI), National Park, Special Area of Conservation (SAC) or a Special Protection Area (SPA)). The closest designated land is the Burbage Wood and Aston Firs (LNR and SSSI), located 2.7 km east of the site. The nearest surface water feature is the Battling Brook, which is located approximately 80 m northwest of the site and flows to the southwest towards the confluence with Harrow Brook (1.3 km southwest of the site). Sketchley Brook is located approximately 700 m south of the site and also flows to the southwest, joining the Harrow Brook approximately 3.7 km southwest of the site. Harrow Brook is a tributary of the River Anker (~ 5km southwest of the site). The two brooks flow beneath the elevated Ashby-de-la-Zouch Canal. At its closest point the canal is located approximately 1.25 km southwest of the site. A spring line is noted to be present in the north of the site. It is illustrated on historical mapping in the east of Area A, extending southward to the north of Area B.
Topography	There are two step changes in topography across the site from northwest to southeast. Area A is generally flat and sits at an elevation of ~103 m Above Ordnance Datum (m AOD). Area A is topographically lower than Area B. A 2-3 m high retaining wall and vegetated embankment separates Area A from Area B. The northern part of Area B, which abuts Area A sits at an elevation of around 106 m AOD. A second retaining wall is present in the north of Area B, between the former office blocks, Block 4 and Block 3 (Figure 2). The land to the south (Area B) of the second retaining wall sits at an elevation of approximately 110 m AOD. Area C is slightly higher in elevation than the adjacent Area B and sits at between approximately 111 m and 112 m AOD. Beyond the southwestern site boundary (Area B), there is a fall in elevation of approximately 3 m to the adjacent residential housing estate.

Adjacent and Surrounding Land Uses	Adjacent land uses in relation to the site comprise the following: • North and northeast: Residential properties and Park Play Area • Southeast: Lidl supermarket and associated car park, The Meeting Centre, and a vacant plot of land beyond. A radio mast is present between Area B and C. • South: Coventry Road, residential properties, and Granville Road Park. • West: Clarendon Park, residential properties and Hinckley Gymnastics Club.
Ground Cover (Current Site)	Area A Surfacing within Area A comprises mainly tarmacadam hardstanding with some gravel car parking and soft landscaping including mature trees around the perimeter. One temporary building remains on-site. Area B The majority of Area B comprises hardstanding (concrete foundations or tarmacadam) with some localised areas of gravel or rubble. Soft standing is present along the southern and western perimeters (including a wooded area in the south). Additionally, a water filled excavation is suspected to extend into the made ground. A High Voltage (HV) switch room and brick building in the south are the only permanent buildings remaining on-site. Area C Surfacing within Area C comprises primarily tarmacadam hardstanding, with an area of gravel and concrete foundations noted in the east. The gas governor is the only building remaining on-site. Overall site Estimated percentages of total ground cover are as follows: • Gravel/rubble – 15% • Hardstanding & buildings – 65 % • Soft standing – 20%
Proposed Use	The proposed development comprises the erection of 195 dwellings (including affordable housing) with private gardens and areas of public open space under outline planning application (24/00610/OUT).
Proposed ground cover	The illustrative master plan (Appendix A) indicates that the approximate cover at the site is: • Housing, driveways, pathways and associated roadways – 77% • Vegetated areas (public open space) and attenuation ponds – 23% It is noted that the proposed layout may be subject to change.
Site History	The site formed Hinckley Gas Works and is shown on historical mapping from the 1870s and remained operational up to the 1960s when gas production ceased at site. Gasworks infrastructure, including associated process features (retort houses, purifiers, scrubbers, condensers) and five gasholders (A, B, 1, 2 and 3), were generally located in Area B, with one above-ground gasholder (No. 4) within Area C. A 'refuse tip' is also recorded in the north of Area B. Area A remained largely undeveloped prior to the construction of the car park but may have been used as a former coke tip. Demolition of the gas works infrastructure began in the 1960s and the Cadent former office buildings and roadway infrastructure constructed by 1972. Localised remediation works have occurred on site and a groundwater hydraulic containment unit has been operating on-site along the southwestern boundary since 2009. The former Cadent offices were demolished around 2022. The layout of known historical structures is illustrated Figure 2.

Table 2-1: Site Description

2.2 Environmental Setting

2.2.1 Geology

2.2.1.1 Published Geology

The following summary of the site's geological setting is based on published information provided by the British Geological Survey (BGS, 2025) and geology mapping within the latest Envirocheck Report (Landmark, 2024). Published sources suggest the following geological stratigraphic sequence:

Stratigraphic Column (Published Geology)

Strata	Rock Name [Rock Type]	Description	Thickness (m)
Made Ground	Made ground	Artificial ground mapped across the southwest of the site (Landmark, 2024). The made ground covers much of Area B and extends southwest beyond the adjacent housing development.	n/a
Superficial Deposit – Parent Unit: Wolston Glaciogenic Formation (WOLS) (Wolston Glacial Succession)	Oadby Member (ODT) (formerly Oadby Till) [Diamicton]	Illustrated in the east of Area C. Unit is described " <i>Diamicton, grey, weathering brown, characterised by Cretaceous and Jurassic rock fragments; subordinate lenses of sand and gravel, clay and silt. Clay, brown to grey, and silty clay, with chalk and flint fragments</i> " (BGS, 2025). The Oadby Member extends offsite to the east and is also illustrated circa 300 m southwest of the site.	Up to 20m. Typically 1-7 m
	Wolston Sand & Gravel (WOSG) (also called Wigston Sand and Gravel Member (WIGS))[Sand and Gravel] (Glacial lake deposit)	Unit covers the southern and central area of Area B, and extends along the eastern boundary of Area A. The Wolston Sand Gravel (WOSG) is described as a "Sand gravel, locally with lenses of silt, clay or peat". WOSG is now obsolete, and WIGS lithological description is referred to in the BGS lexicon. Wigston Sand and Gravel Member described as " <i>Glaciofluvial sands and gravels with clasts generally dominated by lithologies such as Bunter pebbles and coal, suggesting derivation from the western ice that deposited the Thrussington Till Member (THT)</i> " (BGS, 2025).	n/a Up to 25 m (max)
	Bosworth Clay Member (BOSW) (formerly Wolston Clay Member) [Clay and Silt] (Glacial lake deposit)	Unit is mapped at surface in the northwest (Area A). The strata extends offsite to the north and northwest, extending beyond the Battling Brook. The unit is described as " <i>Lacustrine, commonly laminated clays and silts</i> " (BGS, 2025).	Over 25 m in Wolvey area.
	Thrussington Till (THT)	The Thrussington Till make up the basal unit of the Wolston Glacial Succession. The unit is not shown to outcrop at the site or in its vicinity of the site. The unit is described as " <i>Diamicton, brown to reddish-brown with stones and matrix derived primarily from Upper Carboniferous and Triassic rocks; subordinate sand, gravel and stoneless clay and silt. Red pebbly clay and silty clay with rock fragments</i> " (BGS, 2025).	Variable – up to 20 m, typically 1 – 7 m.
Bedrock	Merica Mudstone Group (MMG)	The bedrock underlies the whole of the site and extends across the region for at least 1 km from each of the site	Variable, ranging up to

Strata	Rock Name [Rock Type]	Description	Thickness (m)
		boundaries. Bedrock is described as “Dominantly red, less commonly green-grey, mudstones and subordinate siltstones with thick halite-bearing units in some basinal areas. Thin beds of gypsum/anhydrite are widespread; thin sandstones are also present. Mid Triassic (Anisian) to latest Triassic (Rhaetian)” (BGS, 2025). The MMG is underlain by the Sherwood Sandstone Group.	1,350 m in the Cheshire Basin.

Table 2-2: Published Geology

Excerpts from the BGS England and Wales Sheet 169: Coventry (Solid and Drift Geology, 1: 50, 000) illustrate two geological cross sections through the superficial and bedrock stratigraphic succession in the region of the site (Hinckley).

Figure 2-1 illustrates a schematic cross section showing the relationship of the quaternary deposits in the region. The closest outcrop of Dunsmore Gravel, which overlies the Oadby Till, is approximately 800 m northeast of the site, just beyond Hinckley Town Centre.

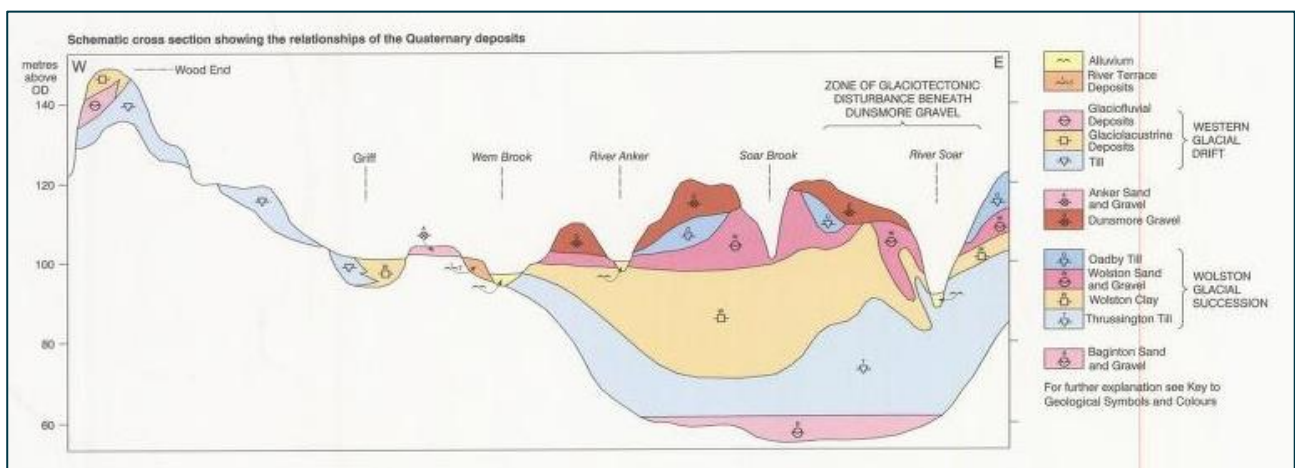


Figure 2-1. Schematic Cross Section showing the relationships of the Quaternary Deposits.

Figure 2-2 illustrates a geological cross section through the bedrock (drift deposits uncoloured or omitted) from New Arley and Nuneaton to the west, through Hinckley to Stoney Stanton in the east. The closest geological fault to the site is approximately 5.34 km southwest of the site. The fault is illustrated on Figure 2-2.

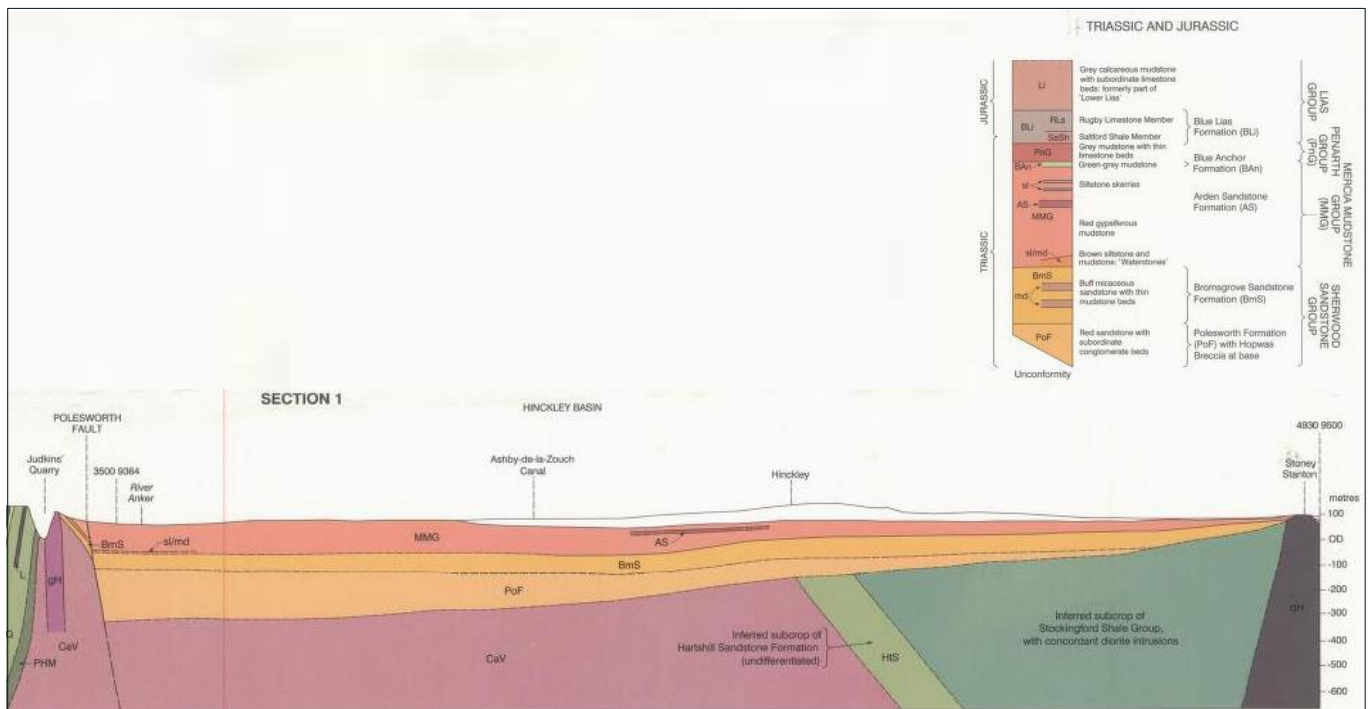


Figure 2-2. Schematic Cross Section showing the General Relations of the Rock along the line of Section on the BGS Sheet 169: Coventry (Solid and Drift) (BGS, 1994).

2.2.1.2 Site Geology

The site has undergone various stages of site investigation as referenced within Section 1.6. Geological cross sections for the site have been produced and presented in Figure 3. Additional sections are also presented within the Preliminary Foundation Options Report (Worley Consulting, July 2025).

An overview of the geology encountered at the site is presented below.

Made Ground

Made ground was encountered across the site. Made ground was deepest within Area B due to this area being primarily occupied by the former gasworks structures. It is suspected that areas of the site were made up resulting in the significant level changes towards the north of Area B. Made ground was typically shallower in Area A and Area C.

- Area A
 - Made ground was recorded across Area A. Typically encountered as 'sandy gravel' from surface to between 0.1 m and 1.6 m bgl / 101.68 to 106.80 m AOD.
 - No significant former below ground structures are shown to have been present on historical mapping within Area A, however the site was potentially used as a coke tip.
- Area B
 - Made ground to the north of the second retaining wall (between former office blocks, Block 4 and Block 3) was recorded to between 0.85 m and 3 m bgl / 103.61 m and 105.71 m AOD. To the south of the retaining wall, made ground was recorded to between 0.6 m and 4.2 m bgl / 106.22 and 111.91 m AOD outside of former structures.

- Various former features, including historical infilled gasholder tanks, were encountered across Area B resulting in significantly deeper areas of made ground (up to 9.45 m bgl / 100.88 m AOD) and various obstructions extending into the underlying superficial deposits.
- Area C. Within Area C, made ground comprised 'slightly silty slightly gravelly sand' and 'slightly silty slightly sandy gravel' to between 0.4 m and 2 m bgl / 112.91 to 114.67 m AOD.

Superficial Geology

The superficial deposits appear to be variable across the site, in part due to the significant level changes, but also due to the known variability exhibited by lowland glaciation deposits.

Oadby Member

The highest ground elevation within the site is to the east; Area C. Here, the Oadby Member was encountered below the made ground to between 3.7 m and 5 m bgl (encountered within MW25-28A and MW25-26, respectively), reflecting BGS records. The Oadby Member was encountered as 'slightly sandy slightly gravelly clay'.

Deposits of glacial Till and mixed lenses of sand, silt and clay were encountered in the centre of the site, extending laterally below the former Blocks 1 and 2 (MW25-15C and MW25-31A; up to 7.9 m bgl) from the east (Area C). The Till reduces in thickness in MW25-20 in the centre-south of the site and is not recorded to be present within MW25-19A to the east of Area B. Till is not recorded within historical boreholes along the southern site boundaries and shown to pinch out at the level change in the north of Area B towards Block 4 (approximate spring line). The absence of the Oadby Member at the level change in the north of Area B is illustrated on Figure 3, Section Line A-A'.

Whilst the published geological mapping from the BGS does not illustrate the presence of the Oadby Member within the west of Area B, it is possible that the Till deposits in the area represent the depositional transition between the two geological units.

Wolston Sand and Gravel (Wigston Sand and Gravel Member)

The deposit was encountered in Areas B and C as a yellow/red slightly gravelly sand and gravel with coal fragments. Running sands are reported in the northeast of the site at the geological interface with the underlying Bosworth Clay Member.

Wolston Sand and Gravel was encountered below the Oadby Member within Area C, with SHT5 recording a basal depth of 14.75 m bgl (100.97 m AOD) in the eastern corner of Area C. The formation extends across Area B, where it lies directly below the made ground in the centre of the site (e.g. MW25-19A and MW25-20) and in the south of the site (e.g. CBH124), before extending below Oadby Member (Till) in the east of Area B.

The Wolston Sand and Gravel is generally recorded directly below the made ground within the north of Area B (below former Block 4) which is likely due to the level change within this area, and it appears to be pinching out (reducing in thickness) with no sand recorded in MW25-08 at the boundary with Area A. This pinching out of the Oadby Member in the north of Area B is illustrated in Figure 3, Cross Section A-A'.

The Wolston Sand and Gravel was not encountered within Area A during the most recent phase of site investigation, due to its lower elevation, however previous investigations have encountered the formation marginally encroaching on the southwestern corner of Area A.

Neighbouring ground investigation completed by WSP in 2012 and 2013 to the west of the site confirmed that 'Boulder Clay' was encountered below the made ground within various locations in the south, north and central-east. The Wolston Sand and Gravel was also present and appeared to deeper towards the west and southwest.

Bosworth Clay Member (Wolston Clay Member)

The Bosworth Clay Member was encountered as dark grey and brown stoneless clay and silt, laminated in part with sand bands and isolated lenses.

The Bosworth Clay Member is recorded extending across the entire site. Along the southern site boundary, it was encountered at ~104 m AOD (CBH124), dipping in the centre of the site to around 101.7 m AOD (MW25-15C) before extending northwards at around 103.3 m AOD below former Block 4 and within in Area A; within Area A the formation is encountered directly below the made ground. The Bosworth Clay Member was recorded at 100.97 m AOD within SHT5 in the east of Area C, suggesting it is dipping towards the east.

Thrussington Till

The Thrussington Till has not been encountered during previous site investigations at the site.

Bedrock geology

Bedrock has not been encountered during any intrusive investigation at the site.

BGS boreholes (SP49SW365 and SP49SW468) located approximately 400 m and 460 m northeast of the site, respectively, prove the bedrock. Within SP49SW365 the Upper Keuper Marls, Keuper Sandstone and Lower Keuper Marls (Mercia Mudstone Group) were encountered at approximately 48.8 m bgl (160 feet). The Mercia Mudstone is overlain by approximately 30.5 m (100 feet) of 'lower glacial' clay. This in turn is overlain by the Wolston Sand and Gravel described as 'Red sands, loams and clays' (50 feet, ~15.24 m thick) and the Oadby Member (Chalky boulder clay, 10 feet, ~3.0 m thick).

Within SP49SW468, the Mercia Mudstone is recorded at 41.2 m bgl. This is overlain by 2.2 m of Thrussington Till and 23.1 m of 'Clay', assumed to be the Bosworth Clay Member. In turn, this is overlain by the Wolston Sand and Gravel (logged as 'sand', 12.2 m thick) and the Oadby Till (logged as chalky Till, 3.7 m thick) (BGS, 2025).

2.2.2 Hydrogeology

2.2.2.1 Aquifer Designation

The following aquifer designations have been assigned:

Aquifer Designations

Strata	Name	Description [Definition ⁽¹⁾]	Thickness (m)
Superficial Deposits	Oadby Member	Secondary (Undifferentiated) Aquifer <i>[Aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.]</i>	Encountered in Area C, extending into Area B. Typical thickness Area C 1.95 – 3.8
	Wolston Sand & Gravel (Wigston Sand and Gravel)	Secondary A Aquifer <i>[Comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers.]</i>	Encountered in the east of Area A, central region of Area B and west of Area C. Typical thickness Area B 0.7 – 5.2 (Area B)
	Bosworth Clay Member	Unproductive Strata <i>[Largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them.]</i>	Encountered in Area A and north of Area B. Typical thickness (base not encountered) max thickness 13.9 (Area A)
	Thrussington Till	Secondary (Undifferentiated) Aquifer <i>[As above – see Oadby Till]</i>	Not encountered on site
Bedrock	Mercia Mudstone Formation	Secondary B Aquifer. <i>[Mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers.]</i>	Not encountered on site

(1) Environment Agency, Guidance: Protect groundwater prevent groundwater pollution, 2024.

Table 2-3: Aquifer Designations

Groundwater vulnerability maps provide an assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, hydrogeological and soil properties within a one-kilometer square grid. At the site, groundwater vulnerability is classified as low across Area A and northern part of Area B (associated with Bosworth Clay Member) and medium within Area C and the remainder of Area B (Oadby Member and Wolston Sand and Gravel) (Defra, 2025). Groundwater vulnerability is associated with the aquifer types at the site. The definitions are presented below:

- **Medium:** areas that offer some groundwater protection. Intermediate between high and low vulnerability. [High: areas that can easily transmit pollution to groundwater. They are characterised by high-leaching soils and the absence of low-permeability superficial deposits.]
- **Low:** areas that provide the greatest protection to groundwater from pollution. They are likely to be characterised by low-leaching soils and/or the presence of low-permeability superficial deposits.

2.2.2.2 Groundwater Abstractions

The site is not located within a Source Protection Zone (SPZ). The site is also not located within a Drinking Water Safeguard Zone (groundwater) (Defra, 2025). The closest SPZ is located 13.5 km southwest on the outskirts of Coventry.

The site is located within the Humber groundwater management catchment, within the Tame Anker Mease – Secondary Combined Operational Catchment (Environment Agency, 2025). The groundwater body has a good overall status, with good quantitative and chemical classifications (Environment Agency, 2025).

There is one groundwater abstraction within 1 km of the site, located 860 m south for general farming and domestic use. Celtic (2003) suggest this abstraction is 15 m bgl situated within the Wolston Sand and Gravels, abstracting 900 m³pa. The location of abstraction provided by Landmark (2024) correlates with a DPD depot, with BGS mapping suggesting Wolston Sand and Gravels are not present at this location.

2.2.2.3 Hydrogeological Regime

The groundwater regime at the site is considered complex and is influenced by the geology, topography and below-ground structures and services present at the site. An overview of the regime at the site is presented below.

Interpreted groundwater flow directions at the site are presented on Figure 4.

2.2.2.3.1 Hydraulic Connectivity

Groundwater has been encountered within the Wolston Sand and Gravel in Area B and C, and the Oadby Member in Area B. The dominant groundwater flow is expected to be within the more granular members of the superficial deposits at the site.

Perched waters have also been encountered, sitting at the base of the made ground on the underlying cohesive deposits of the Bosworth Clay Member in Area A.

In Area A, Celtic (2005) interpreted that perched water was flowing within the made ground overlying the Bosworth Clay Member, with no groundwater flow expected to occur within the cohesive unit due to its high-clay matrix. Monitoring of installations within the Bosworth Clay Member in Area A show the resting groundwater level is shallow, sitting at the interface between the made ground and underlying clay. The Bosworth Clay Member within Area A was variable, described as silts, sands and clay suggesting there may be some flow degree of flow within more granular layers.

BGS mapping indicates that the Wolston Sand and Gravels outcrop in the north of Area B and along the eastern boundary of Area A. A spring line has been identified at the geological boundary between the Wolston Sands and Gravel and the underlying Bosworth Clay Member. A spring line is a place where groundwater emerges at surface, typically at the boundary between permeable and lower permeability strata. The spring line crosses the site in the north of Area B where the permeable Wolston Sands and Gravels overlie the less permeable Bosworth Clay Member. The location of the spring line is reported to be associated with running sands (Celtic, 2003).

Historical maps (1:10,000, circa 1961 - 1968) (Landmark, 2024) illustrate a 'drain' within the former allotments in the north of the site (Area A), flowing northeast-southwest over land via drainage ditches. The marked drain may be associated with the spring line. A reservoir is also illustrated in Area A on the historical map.

Historical maps (1:2,500 circa 1961- 1971) (Landmark, 2024) are also annotated with the notation 'issues' which is approximately coincident with the geological boundary between the Bosworth Clay Member and the Wolston Sand and Gravel. There are two notations, one in the east of Area A and then other in the northwest of Area B. On historical maps, the term 'issues' written near a spring line indicates the location where water emerges from the ground and begins to flow. Drainage channels are also annotated across Area A. One drainage channel runs from the issue point in Area A, northwest before turning southwest and joining the drainage channel which runs northwest from the issue point in Area B. Once joined the drainage channel runs northwest, exiting the site on the northwest boundary of Area B.

Historical mapping (1987) does not make the 'issues' notation following the redevelopment of the site as commercial offices and carparking and associated terracing (construction of retaining walls and creation of level platforms) of the site. It is possible that these spring features were incorporated into the current foul/stormwater drainage infrastructure. Surface water run off at the site is primarily intercepted by the complex system of drains across the site, in particular within Area A.

Based on geological mapping, it is possible that the spring line continues through the site along the geological boundary, hence water emanations may be occurring between former building Blocks 3 and 4 from behind the retaining wall. The presence of the spring line causing running sands along the embankment in the north-east of the site (Area A) necessitated the need for drainage channels beneath the car park in the north, discharging directly to perched water in a north-westerly direction (Celtic, 2003). The car park hardstanding has been known to crack, suspected to be due to the pressure from upwelling waters. This may be from groundwater overtopping the flow divide on the southern boundary of Area A at a spring line (Wood, 2020).

Boreholes MW25-01, MW25-04A and MW25-36, located within the vicinity of former Block 4 (Area B), encountered up to 2 m Wolston Sand above the Bosworth Clay Member. Groundwater levels were high, generally sitting at the top of the sand/base of the made ground (105.11 m to 105.63 m AOD). In comparison, groundwater levels further south within Area B (also sitting at the top of the Bosworth Clay Member/base of the made ground), were recorded at a lower elevation (104.24 to 102.79 m AOD nearest to the retaining wall). This suggests the spring line is likely to be within the vicinity of the second retaining wall in the north of Area B. It is considered likely that groundwater contained within the Wolston Sand and Gravel in the north of Area B, beyond the second retaining wall, is being managed via foul/stormwater drainage system.

BGS mapping suggests the Wolston Sand and Gravel formation may only extend laterally for approximately 400 m to the south of the site, pinching out/ terminating before reaching the Sketchley Brook, as such, groundwater within this water bearing unit is unlikely to discharge directly into the Brook. No spring lines are recorded on historical mapping to the site to indicate the unit pinching out, however BGS boreholes to the south of the site suggest that the Wolston Sands and Gravels are not continuous towards the Sketchley Brook.

Towards the west, the residential development lies at a lower elevation (circa 4m: 106m AOD). Celtic (2018) suggests that the groundwater table within the adjacent site is shallower than on site due to the level change. The report notes that groundwater monitoring on the adjacent housing site (to the west) confirmed a locally westerly groundwater flow direction.

It should also be noted that pumping of the groundwater through the hydraulic containment system, along with the presence of various below ground features, may be influencing groundwater flow direction. Perched/contained water is also likely to be present within these features (e.g. as recorded within Gasholder 1).

2.2.2.3.2 Groundwater Elevations

Groundwater monitoring suggests that groundwater levels in the south of the site are relatively flat; levels of 105.7 to 105.76 m AOD were recorded on 5th June 2024 within boreholes installed in the Wolston Sand and Gravel southwards of MW25-29. Within Area C, groundwater within the Wolston Sand and Gravels, was recorded at 107 m AOD (7 m bgl).

Overall, inferred groundwater flow direction from monitoring installations within the Bosworth Clay Member in Area A show a west to northwesterly flow direction (270 to 340 degrees from north).

The inferred groundwater flow direction from monitoring installations within the Wolston Sand and Gravel in Area B show a southwesterly flow direction (220 to 230 degrees from north) in the south, becoming westerly / northwesterly towards the north of Area B (270 to 312 degrees from north). The change in the groundwater flow direction in the north of Area B is likely associated with the spring line.

To inform the hydraulic gradient, groundwater elevations within the Wolston Sand and Gravel monitored within boreholes outside of structures (MW25-05, MW25-07, MW25-19A, MW25-27, MW25-28A, MW25-34) were measured across multiple monitoring rounds. Groundwater levels within the Bosworth Clay Member within selected boreholes in Area A (MW25-02, MW25-06, WS03, WS11) were also measured across multiple monitoring rounds. Results are summarised in Table 2-4; an average gradient of 0.00865 has been adopted for the Wolston Sand and Gravels within Area B and Area C and an average gradient of 0.002659 has been adopted for the Bosworth Clay Member in Area A.

Hydraulic Gradients

Monitoring Wells	Groundwater Head (m AOD)		Gradient (i)
Area B (south) – Wolston Sand and Gravels (south of spring line)			
25-27/02/2025	MW25-05A	106.333	0.007516
	MW25-28A	107.142	
	MW25-19A	107.039	
	MW25-34	106.031	
	MW25-27	106.161	
	MW25-07	106.348	
30/05/2025	MW25-05A	106.138	0.008699
	MW25-28A	106.922	
	MW25-19A	106.779	

Monitoring Wells	Groundwater Head (m AOD)		Gradient (i)
	MW25-34	105.751	
	MW25-27	105.711	
	MW25-07	106.088	
02-05/06/2025	MW25-05A	106.118	0.008697
	MW25-28A	106.902	
	MW25-19A	106.759	
	MW25-34	105.649	
	MW25-27	105.731	
	MW25-07	106.078	
Most likely gradient = 0.0087			
Area B (north) – Wolston Sand and Gravels (north of spring line)			
24-28/02/2025	MW25-01	106.317	0.02967
	MW25-04A	105.725	
	MW25-36	104.873	
17/03/2025	MW25-01	105.497	0.01487
	MW25-04A	105.605	
	MW25-36	105.203	
30/05/2025	MW25-01	105.627	0.01557
	MW25-04A	105.575	
	MW25-36	105.113	
05/06/20205	MW25-01	105.847	0.01551
	MW25-04A	105.565	
	MW25-36	105.113	
Most likely gradient = 0.0155			
Area A – Bosworth Clay Member (north of spring line)			
30/05/2025	MW25-02	101.432	0.02699
	MW25-06	105.66	
	WS03	103.986	
	WS11	102.788	
05/06/2025	MW25-02	101.59	0.02619
	MW25-06	105.655	
	WS03	103.506	
	WS11	102.398	
Average gradient = 0.002659			

Table 2-4: Estimated Hydraulic Gradients for Bosworth Clay Member and Wolston Sand and Gravels

2.2.2.4 Aquifer Properties

Saturated thickness of the Wolston Sand and Gravels has been identified between circa 1.5 and 5 m (most commonly circa 4 m), based on groundwater monitoring data and the top of the Bosworth Clay Member.

In the south of the site, silt was encountered below the Wolston Sand and Gravel to around 12-14 m bgl, and likely in hydraulic conductivity with the overlying deposits. The saturated

thickness of material (sand and gravel and silt) within this area is considered to be thicker - up to around 9 m. It should be noted that in the neighbouring site to the west, the Wolston Sand and Gravels were recorded between 0.4 and 4.5 m in thickness, where proven, and over 7.6 m thick in the southwestern corner of the site. A saturated aquifer thickness of 4 m within the Wolston Sand and Gravel is considered representative of site conditions, although it is noted that the thickness is variable across the site and to the neighbouring site in the west; down hydraulic gradient.

Shallow/ perched groundwater was encountered in the Bosworth Clay Member in Area A which may exhibit a degree of hydraulic connectivity with the overlying Wolston Sand and Gravel where present. The Bosworth Clay Member predominantly comprise cohesive clays, however bands of sands and silts have been encountered varying in thickness. It has been assumed that groundwater may be contained within these more granular layers. Groundwater flow is likely to be significantly retarded within the unit and unlikely to reach the Battling Brook to the north.

To inform the hydraulic conductivity, a total of 21 rising and falling head tests have been undertaken on the site to determine the hydraulic conductivity of the made ground and Wolston Sand and Gravel at the site. The data is presented in Appendix A and summarised below:

- Made Ground (Area A): three slug tests were undertaken at MW25-3 in Area A and indicated a range of hydraulic conductivities between $6.2 \times 10^{-6} \text{ m.s}^{-1}$ and $9.48 \times 10^{-6} \text{ m.s}^{-1}$, with a geomean of $7.52 \times 10^{-6} \text{ m.s}^{-1}$ ($6.49 \times 10^{-1} \text{ m.day}^{-1}$); and
- Wolston Sand and Gravels (Area B): 18 slug tests were undertaken in three wells (MW25-05A, MW25-19A and MW25-28A) and indicated a range of hydraulic conductivities between $7.66 \times 10^{-7} \text{ m.s}^{-1}$ and $1.84 \times 10^{-4} \text{ m.s}^{-1}$, with a geomean of $1.61 \times 10^{-5} \text{ m.s}^{-1}$ (1.39 m.day^{-1}).

CPT data presented within the Preliminary Foundation Options Report (Worley, July 2025) recorded the unit weights within the Wolston Sand and Gravels and the Wolston Clay Member. CPT results for unit weight within the Wolston Sand and Gravels at CPT25-04, CP25-07, CPT25-08 and CPT25-15 are between 15 to 17 kN/m³ within the sands, resulting in a bulk density of between 1.53 to 1.73 g.cm⁻³ (using a conversion of 9.81). An average bulk density of 1.63 g.cm⁻³ is considered to be most representative.

Silts encountered within the south of the site generally showed lower values ($\sim 14 \text{ kN/m}^3$ / 1.43 g.cm^{-3}). CPT results for unit weight within the sand and silt bands of the Bosworth Clay Member at CPT25-01, CPT25-10 and CPT25-11 are generally 16 kN/m³ (1.63 g.cm^{-3}) within sands and between 18 and 19 kN/m³ (1.83 and 1.94 g.cm^{-3}) within silts. An average bulk density of 1.78 g.cm^{-3} is considered to be most representative.

Fraction of organic carbon (FOC) was analysed within ten environmental samples of the Wolston Sand and Gravels Formation, resulting in values of between <0.001 and 0.02; the most common value of 0.0019 is considered to be most representative. Seven samples were analysed from the Bosworth Clay Member with an FOC between 0.005 and 0.019; the most likely values were 0.016 or 0.0073.

2.2.3 Hydrology

2.2.3.1 Drainage and Infiltration

Annual average rainfall at the nearest Meteorological Office weather station ("Coventry, Coundon" weather station) is 698.3mm.yr⁻¹ based on Meteorological Office data from 1991 to 2020 (Met Office, 2025).

The proposed development (for all three areas) includes residential gardens and areas of communal soft standing; these areas are permeable and will allow infiltration of rainwater into the underlying soils. Additionally, it has been assumed that positive drainage will be used within areas of hardstanding.

The illustrative master plan (Appendix A) indicates that the approximate cover at the site is:

- Housing, driveways, pathways and associated roadways – 77%
- Vegetated areas (public open space) and attenuation ponds – 23%

It is noted that the proposed layout may be subject to change.

An infiltration factor of 0.3 has been adopted assuming ~70% hardstanding/buildings across the site. As such, actual infiltration is estimated to be 210 mm.yr⁻¹ (5.8×10^{-4} m.day⁻¹).

2.2.3.2 Surface Water Abstractions

The site is not located within a Drinking Water Protected Area (surface water) or Drinking Water Safeguard Zone (surface water) (Defra, 2025).

The closest surface water abstraction is located 650 m southeast of the site. The abstraction is from the Sketchley Brook for industrial use: commercial and public services. The license is registered to Johnson Textile Services for laundry use (Landmark, 2024).

There is one other surface water abstraction within 1 km of the site. The abstraction is from a tributary of Sketchley Brook and located 891 m southeast of the site (Landmark, 2024).

2.2.3.3 Surface Waters

The site is located within the 'Sence, Anker and Bourne Rivers and Lakes' operational catchment. There are 13 water bodies within the operational catchment. The site is located within the catchment for the 'Sketchley Brook from Source to River Anker' water body. The water body was classified with a moderate ecological status in 2022 (Environment Agency, 2025). The water body [ID:GB104028042470] is noted to be a heavily modified river, 4.719 km in length.

Within the vicinity of the site, there are several surface water features, these include:

- Battling Brook, 83 m northwest;
- Un-named drain at western edge of recreational ground, 440 m southwest;
- Sketchley Brook, 667 m south;
- Hinckley Water (Lake), Wharf Yard, 1.07 km southwest;
- Un-named Lakes, adjacent to Sketchley Brook, ~1.07 km south;

- Harrow Brook, 1.3 km southwest;
- Ashby de la Zouch Canal and associated marina, 1.2 km southwest; and
- River Anker, closest point 3.3 km southwest and confluence of Sketchley Brook 4.2 km southwest.

Surface water features within 1 km of the site have been reviewed in further detail below.

2.2.3.3.1 Battling Brook

The nearest surface water feature is the Battling Brook. Battling Brook is classified as a Statutory Main River by the Environment Agency (Environment Agency, 2025b). The Brook is located approximately 220 m northwest of the site and flows westward before turning southwest to its confluence with the Harrow Brook, approximately 1.3 km southwest of the site. Harrow Brook then passes beneath the elevated Ashby-de-la-Zouch Canal (1.4 km southwest of the site) and flows southwest to meet the Sketchley Brook, approximately 3.6 km southwest before continuing southwest to the River Anker, approximately 4.2 km southwest of the site.

The Battling Brook is located 83 m northwest (Landmark, 2024) of Area A, and circa 220 m northwest of Area B at its closest point, or 260 m based on a westerly / northwesterly groundwater flow direction.

There is no publicly available chemical data, ecological status, river level or flow data for the Battling Brook.

Various active discharge consent relating to sewerage and storm sewage outflow by Severn Trent Water Limited are recorded with the Battling Brook as the receiving water, the closest of which is 105 m northwest (Landmark, 2024).

The nearest pollution event is recorded on the western boundary of the site. Incident was classified as Category 3 (minor impact) and recorded in October 1997. The pollutant is listed as Chemicals – Other Organic. The receiving water is listed as a watercourse within the Trent Catchment: Upper Anker to Confluence with Sence. The notes identify the Harrow Brook, with contaminated drainage suspected. No adverse effects are also noted (Landmark, 2024).

There are various other pollution incidents to controlled waters listed in proximity of the site; a number of which record the Battling Brook to be the receiving water body; the closest and most recent was 104 m northwest with the report noting the Brook ran bright green in 1998. All incidents are classified as Category 3 (minor impact).

2.2.3.3.2 Un-named Drainage Channel, Clarendon Park

A small drainage channel is recorded (BGS, 2025) along the western edge of the Clarendon Park recreational ground. The drainage channel is approximately 440 m southwest (Landmark, 2024) of the site and orientated northwest-southeast. It is not known whether this channel connects directly to the Battling Brook.

2.2.3.3.3 Surface Water - Sketchley Brook

Sketchley Brook is located 667 m south of the site (Landmark, 2024) and flows to the southwest to the Harrow Brook (confluence ~3.6 km southwest) and subsequently the River Anker (~4.2 km southwest). There are a number of ponds connected to the Sketchley Brook, approximately 1.1 km south of the site. The Brook and associated ponds have been established as a protected green open space as part of a planning condition attached to a housing development (naturespot, 2025)

The Brook is largely culverted to the east of the site, appearing at surface adjacent to Brookside, nearby East Close before it runs culverted parallel to the railway line (Birmingham to Peterborough line) for approximately 490 m before flowing at surface again at Rugby Road (B4109), approximately 900 m south of the site.

Data from two sampling points along the Sketchley Brook (Us Hinckley Stw: MD-60587950 and A5 Road Bridge: MD-60587380) is available from the Environment Agency.

There is no publicly available river level or flow data for the Sketchley Brook.

Various active discharge consent relating to sewerage and storm sewage outflow by Severn Trent Water Limited are recorded with the Sketchley Brook as the receiving water, the closest of which is 658 m southeast (Landmark, 2024).

There are various pollution incidents to controlled waters listed, a number of which note the Sketchley Brook to be the receiving water body; the closest and most recent was 721 m south relating to gas oil pollutant recorded in the Brook in 1999. The majority of the incidents relating to impacts on the Sketchley Brook are classified as Category 3 (minor impact). Three Category 2 incidents are recorded on the Sketchley Brook within 1 km of the site, one 921 m (Ref: 2704208) and two 926 m (Ref: 2704211 and 2704209) south of the site. Incidents 2704208 and 2704211 relate to chemical paints / dyes entering the Sketchley Brook in February 1998, with a black and brick colour noted respectively. Incident 2704209 relates to a discharge of Sodium Hyperchlorode to the Brook, also in February 1998.

A Category 2 (significant incident) relating to an effluent tank overflowing and going into drains in 1997 is also recorded 426 m southeast of the site.

2.2.4 Hydrogeological Summary

Based on the site geology and groundwater levels recorded within wells during monitoring visits the following conclusions are currently drawn:

- Groundwater within Area A and northern area of Area B (proximal to the spring line) appears to flow towards the northwest. A degree of retarded flow is anticipated within the sand and silt layers of the Bosworth Clay Member, with some perched flow within the made ground anticipated. Drainage systems installed within Area A are likely to capture groundwater. Given the Bosworth Clay Member is designated as unproductive strata, and no groundwater or surface water abstractions are recorded to the north of the site, risks to human health via consumption of drinking water are considered to be low. The Battling Brook is located approximately 89 m down hydraulic gradient and could be considered to be a potential receptor of groundwater within Area A. However, given the likely retarded

flow and surface water drainage in the north of the site hydraulic connection with the brook is likely to be limited.

- Groundwater flow within Area B has been interpreted to be towards the west/ southwest. Groundwater flow is predominantly contained within the Wolston Sand and Gravels, though groundwater has been recorded within the variable Oadby Member (Till) overlying the Wolston Sand in the centre of the site. Flow within the Till is likely to be through more granular layers. Where the Oadby Member overlies the Wolston Sand and Gravel, some retardation of infiltration and vertical groundwater movement is likely, with the Till potentially confining the underlying sands and gravel to some degree where present.
- Along the western boundary, an active hydraulic containment system is operating to reduce flow of NAPL offsite and treat dissolved phase impact within the groundwater. The presence of the hydraulic containment system is likely to influence the groundwater regime locally. Whilst flow may be southwest towards the Sketchley Brook, the Wolston Sand and Gravels do not appear to be laterally continuous, with the unit thinning to the southwest and disappearing before reaching the Brook. This suggests that groundwater within the sands and gravels is unlikely to be in direct hydraulic continuity with the Brook; however, there is the potential for entry via drainage and streams that drain the unit. As the Wolston Sand and Gravels have been designated a Secondary A Aquifer, there is the potential for abstraction for drinking water purposes.
- Within Area C, the Oadby Member was encountered below the made ground in the east of the area. The Till is classified a Secondary Undifferentiated Aquifer, however due to its fine-grained cohesive nature, significant groundwater flow within the Till is unlikely expected to occur. As noted above, where present, the Till will likely act as a confining layer above the underlying sands and gravels. Groundwater was encountered within the underlying Wolston Sand and Gravels within Area C.

2.3 Previous Site Works

2.3.1 Previous Site Investigation Works

The site has undergone several phases of intrusive investigation works between 1999 and 2025. Previous site investigation locations are shown on Figure 2.

Intrusive investigations identified the presence of impacted soils and groundwater at the site, with the more significant impact recorded within Area B.

Made ground and underlying saturated natural materials towards the southwest of the site were noted to be most heavily impacted with NAPL and dissolved phase contaminants, predominantly associated with former gasworks structures and process areas. However, inorganic and lower levels of organic impact were noted in shallow made ground and groundwater across the site.

Investigations onsite suggested that the integrity of the gasholder tanks and former below ground features may have been compromised when placing the foundations of the former buildings onsite. Therefore, any contamination arising from these former features may not be fully contained.

Hydrocarbon contamination has been identified within made ground associated with various former features within the process area and within former Gasholders 1, 2 and A; hydrocarbon contamination within Gasholder 3 appeared to be lesser in comparison. Hydrocarbon contamination was not significantly encountered within the made ground in Gasholder B.

Additionally, hydrocarbon contamination has been identified within the Wolston Sand and Gravel and Oadby Member extending along the western boundary of the site. Free product (DNAPL) was observed along the southwestern boundary; it should be noted that a significant proportion (78.3%) of the total mass recovered by the hydraulic containment unit situated along the south-western boundary of the site is attributable to DNAPL, with mass still being recovered.

2.3.2 Remediation Works

Demolition of the former gas works plant was completed in the 1960s. Anecdotal evidence presented within Celtic (1993) indicates that waste material and tar was removed from former Gasholders A, B, 1 and 2 in 1993 by Walter Lawrence Ltd during Capital Project 241, prior to construction of Block 1. However, details on the remediation within Gasholder A are unclear and conflicting evidence has been provided. A total of 1,068 m³ of contaminated soils were removed and replaced with 'clean' sand and topsoil during these works. A supporting caisson was installed at southern boundary (believed to have been installed around BH15) and is reported as a 'permanent aerobic treatment system'. However, no further details of the installation or operation of this system are known.

A hydraulic containment unit was constructed by Celtic in 2009 to treat dissolved and free-phase contamination in groundwater at the southern boundary and to mitigate off-site migration.

A Groundwater Contamination Report by Balfour Maunsell in 1992 recorded that creosote and coal tar had been detected in soils and groundwater during excavation of a sewer trench in Rugby Road approximately 200 m south of the site. The sewer was replaced, and contamination removed as Special Waste (Celtic, 1998).

2.4 Current Evidence of Potential Pollutants

2.4.1 Visual and Olfactory Observations

Visual and olfactory observations of contamination at the site are detailed within various previous site investigation reports and are summarised below:

- Free phase NAPL was encountered within the made ground and Oadby Member and Wolston Sand and Gravel Formation along the western boundary and in the central area of the site.
- Hotspots of free phase product were recorded within made ground deposits to the west of former Blocks 1, 2, and 3. Hydrocarbon contamination has been identified within made ground associated with various former features within the process area and within former Gasholders 1, 2 and A; hydrocarbon contamination within Gasholder 3 appears to be lesser

in comparison. Hydrocarbon contamination has not been significantly encountered within the made ground in Gasholder B.

- Hydrocarbon contamination has been identified within the Wolston Sand and Gravel extending along the western boundary of the site. Free product (DNAPL) has been observed during monitoring within the Wolston Sand and Gravels at MW25-23B. It should be noted that a significant proportion (78.3%) of the total mass recovered by the hydraulic containment unit situated along the south-western boundary of the site is attributable to DNAPL, with mass still being recovered.
- Elevated concentrations of contaminants have been identified within leachate and groundwater samples primarily within former features.

The primary sources of contamination are located in Area B; the former gasworks process area. The main sources in this area are the former gas holder bases/tanks and surrounding soils which extend to depth into natural soils. Impacted soils and tar-related contamination are present in these areas. Tar-related contamination is also associated with other former structures, including the condensers, scrubbers, tanks, purifiers, etc.

The investigation suggests that the integrity of the gasholder tanks and former below ground features may have been compromised when placing the foundations of the former building blocks onsite, resulting in impact to surrounding soils.

Made ground across the broader site contains elevated concentrations of hydrocarbons, metals and other inorganic contaminants. Again, concentrations are highest in Area B, but hotspots and broader areas of impact are also noted in made ground in both Areas A and C.

Saturated soils containing NAPL and impacted shallow groundwater (NAPL and dissolved phase) across Area B are secondary sources of hydrocarbons. Free phase and high dissolved phase concentrations are currently being recovered from the hydraulic containment system along the southern-western boundary.

Dissolved phase concentrations recorded in water samples from wells installed in Area B are indicative of free phase being present in the surrounding soils. The ongoing recovery of NAPL from the containment system indicates the continued presence of a upgradient source of mobile free phase contamination.

2.4.2 Results of Preliminary/ Generic Risk Assessment

A generic quantitative risk assessment (GQRA) was undertaken as part of the preliminary risk assessment to determine contaminants of potential concern (COPC) (Table A1 to Table B3 Appendix D).

For samples recovered from Area B and C, given the permeable nature of the underlying Wolston Sand and Gravel and the potential for some limited connectivity with nearby surface waters, and considering the future resource potential of the underlying aquifer (Secondary A Aquifer), the following water quality standards were used in the assessment:

- Environmental Quality Standards (EQS) for freshwaters;
- Minimum Reporting Values (MRV) and,
- Drinking Water Standards (DWS).

Based on the conceptual model for the site, Area A has only been screened against the EQS. The underlying aquifer, Bosworth Clay Member, has been classified as unproductive and so is not considered to have a potable resource potential. Conservatively, limited connectivity with the nearby surface water has been assumed.

The GQRA identified multiple COPCs likely associated with the former industrial site use as a gas production site. These are summarised in Table 2-2.

Contaminants of Potential Concern

Determinand	Screening Criteria		Area A		Area B		Area C	
	EQS (mg.L ⁻¹)	DWS (mg.L ⁻¹)	Leachate	Groundwater	Leachate	Groundwater	Leachate	Groundwater
Cyanide (Total)		0.05	0 of 3	0 of 15	27 of 40	90 of 121	0 of 1	0 of 4
Easily liberatable cyanide	0.001		0 of 3	0 of 15	2 of 40	14 of 121	0 of 1	0 of 4
Sulphate	400	--	0 of 3	0 of 15	9 of 40	62 of 121	0 of 1	0 of 4
	--	250	0 of 3	--	12 of 40	84 of 121	0 of 1	0 of 4
Ammonium as NH ₄		0.5	0 of 3	--	22 of 40	92 of 121	1 of 1	0 of 4
Ammoniacal N (total) as N	1.1		1 of 3	0 of 15	17 of 40	102 of 121	0 of 1	0 of 4
Cresols (Total)	0.1		0 of 3	0 of 15	1 of 40	15 of 121	0 of 1	0 of 4
Phenol	0.0077		0 of 3	0 of 15	1 of 40	39 of 121	0 of 1	0 of 4
Naphthalene	0.002		0 of 3	0 of 15	13 of 40	55 of 121	0 of 1	0 of 4
Anthracene	0.0001		0 of 3	0 of 15	9 of 40	29 of 121	0 of 1	0 of 4
Fluoranthene	0.0000063		2 of 3	0 of 15	26 of 40	52 of 121	0 of 1	0 of 4
Benzo(b)fluoranthene	0.000017		0 of 3	0 of 15	2 of 40	17 of 121	0 of 1	0 of 4
Benzo(k)fluoranthene	0.000017		0 of 3	0 of 15	2 of 40	17 of 121	0 of 1	0 of 4
Benzo[a]pyrene	0.00000017	--	0 of 3	0 of 15	1 of 40	18 of 121	0 of 1	0 of 4
	--	0.00001		--	1 of 40	18 of 121	0 of 1	0 of 4
Benzo(ghi)perylene	0.000082		0 of 3	0 of 15	3 of 40	21 of 121	0 of 1	0 of 4
Sum of 4 PAH ⁽¹⁾		0.0001	--	--	4 of 40	16 of 121	0 of 1	0 of 4
Benzene	0.01		0 of 3	0 of 15	6 of 40	37 of 121	0 of 1	0 of 4
		0.001	--	--	9 of 40	38 of 121	0 of 1	0 of 4
Toluene	0.074		0 of 3	0 of 15	3 of 40	23 of 121	0 of 1	0 of 4
		0.7	--	--	0 of 40	9 of 121	0 of 1	0 of 4
Ethylbenzene	0.02		0 of 3	0 of 15	6 of 40	18 of 121	0 of 1	0 of 4
		0.3	--	--	0 of 40	2 of 121	0 of 1	0 of 4
Xylenes ⁽²⁾	0.03		0 of 3	0 of 15	6 of 40	34 of 121	0 of 1	0 of 4

Determinand	Screening Criteria		Area A		Area B		Area C	
	EQS (mg.L ⁻¹)	DWS (mg.L ⁻¹)	Leachate	Groundwater	Leachate	Groundwater	Leachate	Groundwater
		0.5	--	--	0 of 40	13 of 121	0 of 1	0 of 4
Aliphatic C10-C12		0.3	--	--	0 of 40	4 of 121	0 of 1	0 of 4
Aromatic C10 – C12		0.09	--	--	6 of 40	50 of 121	0 of 1	0 of 4
Aromatic C12 – C16		0.09	--	--	16 of 40	52 of 121	0 of 1	0 of 4
Aromatic C16 – C21		0.09	--	--	16 of 40	47 of 121	0 of 1	0 of 4
Aromatic C21 – C35			--	--	13 of 40	51 of 121	0 of 1	0 of 4
Styrene	0.05		0 of 3	0 of 15	n/a	6 of 121	n/a	0 of 4
		0.02	--	--	n/a	6 of 121	n/a	0 of 4
Iron	1		1 of 3	x	10 of 40	20 of 121	1 of 1	0 of 4
		0.2	--	--	26 of 40	65 of 121	1 of 1	0 of 4
Lead	0.0012		0 of 3	0 of 15	19 of 40	2 of 121	1 of 1	0 of 4
		0.01	--	--	2 of 40	0 of 121	1 of 1	0 of 4
Arsenic	0.05		0 of 3	0 of 15	1 of 40	6 of 121	0 of 1	0 of 4
		0.01	--	--	8 of 40	26 of 121	0 of 1	0 of 4
Cadmium	0.00025		0 of 3	0 of 15	1 of 40	9 of 121	0 of 1	0 of 4
		0.005	--	--	0 of 40	0 of 121	0 of 1	0 of 4
Chromium	0.0034		1 of 3	0 of 15	5 of 40	4 of 121	0 of 1	0 of 4
		0.05	--	--	0 of 40	0 of 121	0 of 1	0 of 4
Copper,	0.001		2 of 3	15 of 15	36 of 40	106 of 121	1 of 1	4 of 4
		2	--	--	0 of 40	0 of 121	0 of 1	0 of 4
Mercury (inorganic)	0.00007		0 of 3	0 of 15	1 of 40	9 of 121	0 of 1	0 of 4
		0.001	--	--	1 of 40	3 of 121	0 of 1	0 of 4
Nickel	0.004		1 of 3	1 of 15	11 of 40	69 of 121	0 of 1	1 of 4
		0.02	--	--	1 of 40	2 of 121	0 of 1	0 of 4
Selenium		0.01	0 of 3	0 of 15	0 of 40	2 of 121	0 of 1	0 of 4
Zinc	0.0123	--	x	1 of 15	7 of 40	15 of 121		

Determinand	Screening Criteria		Area A		Area B		Area C	
	EQS (mg.L ⁻¹)	DWS (mg.L ⁻¹)	Leachate	Groundwater	Leachate	Groundwater	Leachate	Groundwater
(1) Sum of 4 PAH = benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[ghi]perylene and ideno[1,2,3-cd]pyrene								
(2) Total of m and p, o-xylenes								

Table 2-5: Contaminants of Potential Concern

2.4.3 Metal Bioavailability Assessment Tool (M-BAT)

2.4.3.1 Overview

The GQRA identified that recorded dissolved phase concentrations of copper, zinc and nickel within the contained/perched water and groundwater exceed the generic EQS.

Toxicity of metals is dependent on a range of water quality parameters, these include water hardness, pH and dissolved organic carbon (DOC). These parameters influence the amount of metal that is actually bioavailable. This is the fraction of the metal which is responsible for toxic effects in flora and fauna. The bioavailability of a metal depends on several physico-chemical factors which govern both metal behaviour and the interactions of the toxic forms of the metals with a biological receptor.

The freshwater generic EQS developed for copper, nickel, lead and zinc have been derived as a bioavailable EQS. EQS for copper, nickel and zinc take into account consideration of pH, DOC and calcium, whilst the EQS for lead takes into account the influence of DOC on the toxicity of lead within the aquatic environment. Therefore, in order to assess whether the recorded concentrations at the site pose a risk to the surface water receptor a site-specific assessment has been undertaken.

2.4.3.2 Assessment

For copper, nickel and zinc, the UKTAG Metal Bioavailability Assessment Tool (M-BAT) has been used to derive a site specific EQS expressed as a dissolved metal, termed the Predicted No Effect Concentration (PNEC_{dissolved}). Algorithms within M-BAT derived the site specific PNEC using ecotoxicological data and site-specific water quality data.

Limited surface water quality data was available for pH, DOC and calcium from the surface water receptors, therefore groundwater data has been used as a proxy to evaluate the bioavailable fractions. The water quality parameters are considered to be reflective of the conditions along the fate and transport pathway to the surface water receptor. These have been entered into the M-BAT to derive the PNEC_{dissolved} for copper, zinc and nickel. DOC data has been used in the screening tool for lead to determine the site specific PNEC_{dissolved} for lead. The dissolved phase concentrations have then been compared with the site specific EQS in order to assess the potential risk posed by metals in the aquatic environment. Model output sheets are presented in Appendix A.

2.4.3.3 Results

Analytical groundwater data from the various site areas has been compared to the site specific EQS for copper, nickel, zinc and lead. Results of the screen are presented in the following tables.

Area A

Determinand	EQS	Max Concentration	No. of Exceedances	PNEC _{dissolved}	No. of Exceedances
Copper	0.001	0.0031	15 of 15	0.008	0 of 15
Nickel	0.004	0.0041	1 of 15	0.014	0 of 15
Zinc	0.00123	0.0294	1 of 15	0.021	1 of 15

Table 2-3: M-BAT – Area A

Recorded concentrations of copper and nickel within the perched waters across Area A do not exceed the site-specific PNEC. A single exceedance of the site specific PNEC was recorded at the site in the third monitoring round (only) at MW25-02. The recorded concentration in the duplicate sample was not in excess of the site specific PNEC. Therefore, these contaminants are not considered to pose a risk to the surface water receptor, the Battling Brook, located ~80 m down hydraulic gradient of Area A.

Area B

Determinand	EQS	Max Concentration	No. of Exceedances	PNEC _{dissolved}	No. of Exceedances
Copper	0.001	0.017	106 of 121	0.048	0 of 121
Nickel	0.004	0.023	69 of 121	0.036	0 of 121
Zinc	0.00123	0.0499	15 of 121	0.073	0 of 121
Lead	0.0012	0.0052	2 of 121	0.024	0 of 121

Table 2-4: M-BAT – Area B

Area C

Determinand	EQS	Max Concentration	No. of Exceedances	PNEC _{dissolved}	No. of Exceedances
Copper	0.001	0.0041	4 of 4	0.008	0 of 4
Nickel	0.004	0.0049	1 of 4	0.012	0 of 4
Zinc	0.00123	0.0027	0 of 4	0.020	0 of 4

Table 2-5: M-BAT – Area C

Recorded concentrations of copper, zinc and lead within the Wolston Sands and Gravel do not exceed the site-specific PNEC. Given the age of the historical impact, it is considered likely that the dissolved phase concentrations at the site are reflective of the contaminant loading in the shallow aquifer from the overlying made ground in addition to discrete sources (former structures). Therefore, these contaminants are not considered to pose a risk to the surface water receptor of the Sketchley Brook, located ~670 m down hydraulic gradient of the site and will not be considered further in this assessment.

2.4.4 Non Aqueous Phase Liquid (NAPL)

2.4.4.1 Chemical Profile

NAPLs were identified as DNAPL at the site. DNAPLs are denser than water and have limited and varying solubilities in water (ITRC, 2020). When released into the subsurface, the DNAPL phase remains separate from other principal fluid phases, air and water. Their subsurface migration and physical behavior are governed by the physics of multiphase flow in porous or fractured media.

In order to characterize the DNAPL at the site, samples were collected from multiple locations across the site.

Figure 2-3 shows the distribution of TPH CWG fractions within a NAPL sample recovered from MW25-23B.

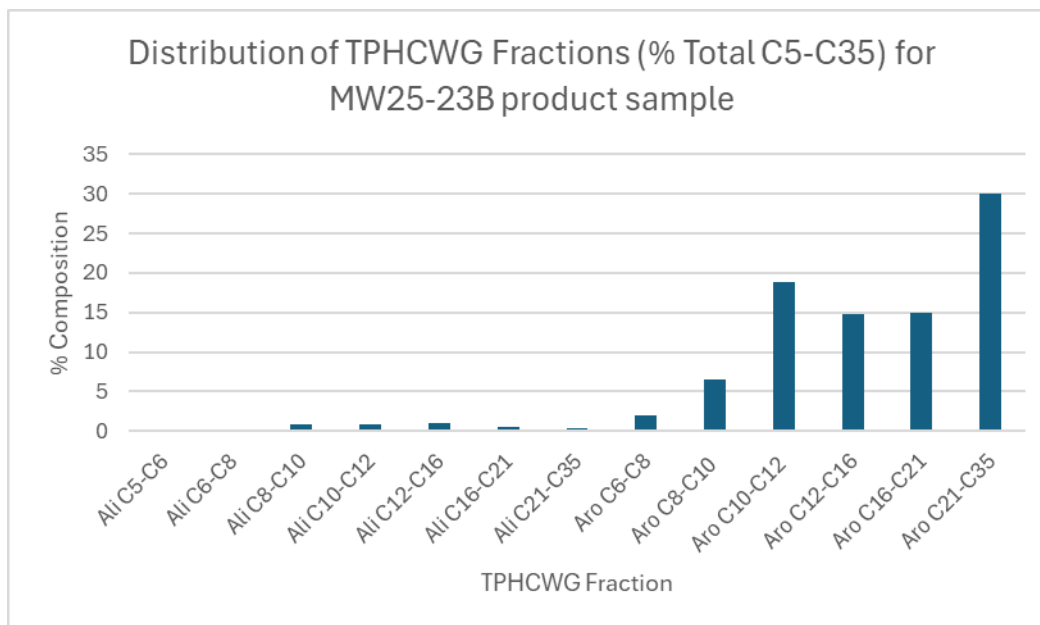


Figure 2-3: Distribution of TPHCWG Fractions (% of total C5-C35) for MW25-23B product sample

Analytical results of the sample obtained from MW25-023B indicates that the product mixture contains a high percentage of the moderately mobile fractions aromatic EC10-12 and EC12-16 and the lower mobility aromatic TPH fractions EC16-21 and EC21-35.

2.4.4.2 Physical Testing

Limited chemical/ physical data exist for coal tar because of the variability in feedstock and manufacturing processes (ATSDR, 2020).

Product density was found to be 1,0778 kg.cm³ (Worley Consulting, 2025). This is comparable with the range presented in the DNAPL Handbook (Environment Agency, 2003) for coal tars of 1,010 to 1,100 kg.m³ (1.01 – 1.10 g.ml⁻¹).

2.4.4.3 Effective Solubility

Aqueous solubility represents the maximum concentration of the DNAPL chemical constituents that can be dissolved in an aqueous solution (i.e. groundwater). Low-solubility DNAPLs such as coal tar are slow to dissolve and therefore are more persistent over time, although other factors such as biodegradability are interrelated and also control longevity.

Coal tar DNAPL mixtures generally display extremely low bulk solubility and may result in small to negligible dissolved plumes; however, these chemical mixtures often contain soluble constituents, such as naphthalene, that dissolve into groundwater creating plumes (ITRC, 2020).

DNAPL mixtures such as manufactured gas plant tars, which are characterized by high viscosity and low solubility, generally have a higher potential to migrate in the subsurface, and for longer periods, than other DNAPL types such as chlorinated solvents.

The relatively high viscosity of these DNAPL mixtures leads to longer-term continuity of the mobile DNAPL phase, sustaining mobility and contributing to mobility within small-scale geologic features. The relatively low solubility of many of the components of these DNAPL mixtures leads to less weathering of the DNAPL mixture in the environment, maintaining the mobile DNAPL phase longer than DNAPL types that contains higher solubility components.

Where NAPL is present, it represents a source of contamination. The concentration in soil, perched water or groundwater at the source in contact with the NAPL, which determines the risk, can be derived through direct analysis of hydrocarbon concentration in groundwater, soil or perched water adjacent to the source or by theoretical calculation of the NAPL-water equilibrium concentration using Raoult's Law or fugacity methods.

2.4.4.4 Raoult's Law

The aqueous solubility of the various substances within an ideal hydrocarbon mixture in contact with water depends on their proportion (molar fraction) within the mixture and their pure phase solubility.

Raoult's Law describes partitioning between gas and liquid phases and can be used to estimate the solubility of the hydrocarbon mixture by using:

$$C_d = S \times X$$

Where:

C_d = aqueous solubility concentration of substance in mixture at equilibrium (dissolved phase concentration in groundwater) (mg/l)

S = pure phase (liquid) solubility of organic compound (mg/l)

X = molar fraction of organic contaminant in free product or NAPL mixture

The molar fraction is defined as

$$X_i = MF_i \times (MW_o/MW_i)$$

Where:

MF_i = mass fraction of compound i in hydrocarbon mixture

MW_i = molecular weight of compound (g.mole⁻¹)

MW_o = approximated molecular weight of the hydrocarbon mixture (g.mole⁻¹)

The above equations have been used to estimate the aqueous concentrations in the presence of free product. The effective solubility has been calculated using SoBRA's effective solubility tool (SoBRA, 2023) for a NAPL sample taken from MW25-23B. The effective solubility will be reviewed against recorded concentrations in the dissolved phase source in the assessment.

Whole oil analysis indicates that the DNAPL sampled is characteristic of a coal tar (laboratory analytical report, Appendix A). The molecular mass typical of a coal tar ranges between 200 – 800 g.mole⁻¹. Calculation of the molecular weight of the DNAPL sampled using the TPHCWG analytical suite (from TPHCWG analysis) estimated that the site specific molecular weight of the NAPL was 158 g.mole⁻¹.

Using these site specific NAPL Molecular weight, the effective solubility has of the TPHCWG has been undertaken using Raoult's Law. The calculations are presented in Appendix A. The effective solubilities have been compared to the groundwater analytical results to evaluate the potential presence of NAPL across the site.

Screened analytical results are saved in Appendix D.

2.4.4.5 Selection of NAPL Potential Pollutants of Concern

Hydrocarbon mixtures generally comprise a large range of individual compounds and it is impossible to quantify all compounds through analysis and to undertake risk assessment of each. Therefore, in line with the CL:AIRE guidance (CL:AIRE, 2017) this assessment focusses on individual compounds, or groups of compounds that pose the greatest risk to controlled waters. In general, these compounds are relatively mobile and have a water quality assessment criterion.

The following methodology (CL:AIRE, 2017) has been followed in the selection of POPC for hydrocarbon contamination identified at the site:

Selection of NAPL COPCs

Phase/ Matrix	Hydrocarbon characterization/ condition	Approach to deriving remedial target concentrations
NAPL/ Soil / Groundwater	High proportion of individual compounds identified by detailed analysis (BTEX, naphthalene and other PAHS) for which there are water quality assessment criteria (WQT).	Assess risks for individual compounds only.
	Low proportion of individual compounds for which there are WQTs.	Assess risk for indicator compounds for the carbon band ranges that present the highest risk (based on their risk and relative abundance)
	No/ very low proportion of individual compounds	Assess risk for carbon band ranges that present the highest risk.

Table 2-6: Selection of COPC for Hydrocarbon Contamination

As part of this risk assessment, COPCs have been identified as individual substances from targeted detailed analysis. Given the nature of the contamination at the site, COPC have also been identified within TPH carbon bands and taken through to detailed assessment.

The number of COPC to be evaluated in this assessment have been reduced by eliminating those compounds which have very low solubility in water and/ or that are poorly mobile in the subsurface environment. Table 2- below identifies the TPH carbon bands with low to very low overall relative mobility in groundwater. These compounds have been excluded from detailed assessment on the basis that they are unlikely to pose a risk to groundwater in the dissolved phase.

Environmental Mobility of TPH Fractions

Contaminant	Recommended Petroleum Hydrocarbon CoPC indicator ⁽¹⁾	Overall Mobility in Groundwater	Mass Fraction	Effective Solubility (mg.L ⁻¹)	NAPL COPC
Aliphatics					
>C5-C6	n-hexane	High	0.001	7.02 x 10 ⁻²	No
>C6-C8	n-heptane	Moderate	0.002	1.67 x 10 ⁻²	No
>C8-C10	n-octane	Low	0.009	4.70 x 10 ⁻³	No
>C10-C12	n/a	Low	0.009	3.04 x 10 ⁻⁴	No
>C12-C16	n/a	Very low	0.01	6.00 x 10 ⁻⁶	No
>C16-C21	n/a	Very low	0.005	8.81 x 10 ⁻⁹	No
>C21-C35	n/a	n/a	n/a	n/a	No
Aromatics					
>C5-EC7	benzene	High	0.01	3.61 x 10 ¹	No
>EC7-EC8	toluene	High	0.01	1.01 x 10 ¹	No
>EC8-EC10	xylene	High	0.066	5.65	No
>EC10-EC12	naphthalene	Moderate	0.189	5.93	Yes
>EC12-EC16	acenaphthene	Moderate	0.148	9.35 x 10 ⁻¹	Yes
>EC16-EC21	anthracene	Low	0.15	9.17 x 10 ⁻²	No
>EC21-EC35	benzo(a)pyrene	Very low	0.301	1.31 x 10 ⁻³	No
¹ Recommended petroleum hydrocarbon CoPC indicator (CL:AIRE, 2017) Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies.					

Table 2-7: Mobility of TPH fractions

Recorded concentrations within groundwater of TPH Aromatic EC10-12 and EC12-16 were in excess of the effective solubilities in former below ground Gasholders No.1, No. 2, No. 3, Gasholders A and B, purifier catch box, scrubbers, CWG plant, retort house, exhaustor and an un-named former process structure on the western boundary (CBH126). These wells are predominantly screened within the made ground or Wolston Sand and Gravel, with exceedances of the effective solubilities indicating the potential for free phase NAPL.

3. Conceptual Site Model

3.1 Overview

This section of the report presents the conceptual understanding of the site. The conceptual model has been developed in the context of the current use of the site and is designed to identify potential contaminant sources, pathways and receptors (SPR) relating to controlled waters.

All confirmed linkages will be summarised in a tabular format of Potential Contaminant Linkages i.e. those considered to have the potential to pose an unacceptable risk to the controlled waters.

An initial schematic Conceptual Site Model is presented in Figure 5 and is discussed below.

3.2 Sources

3.2.1 Site Zoning

To accurately quantify the risk presented by the observed site conditions to the identified controlled waters receptors, the site has been divided into two separate source zones, Zone A and Zone B. Zone A has been defined as the area to the north of the spring line and Zone B the area to the south, as presented in Figure 6. The rationale for dividing the assessment in this manner is summarized below:

- **Flow Direction.** Variations in ground water flow direction observed during previous phases of site investigation; groundwater flow in the north of the site is towards the northwest, while flow in the south and east is towards the southwest.
- **Flow Mechanisms.** Dominant flow within the north of the site is limited to granular lenses within the Bosworth Clay Member and at the interface of the made ground and underlying cohesive unit. Dominant flow within the south and east of the site is within the more permeable Wolston Sand and Gravel.
- **The distribution of point sources on the Cadent landholding.** Historical records indicate five former Gasholder tanks and majority of the former gasworks processing plant were located in Area B, with a further a former Gasholder tank in Area C. Area A contained no processing plant associated with the former gasworks.

3.2.2 Source Zone A

Within Area A, the GQRA identified concentrations of ammoniacal nitrogen as N (total), fluoranthene, chromium, copper, iron, lead and nickel in excess of the EQS in the analytical soil leachate results from the most recent site investigation (Worley Consulting, 2025). Recorded concentrations of copper, nickel and zinc in were also recorded in excess of the EQS in groundwater (Worley Consulting, 2025). The subsequent M-BAT derived site specific PNEC_{dissolved} for copper, nickel and zinc. There were no exceedances of the site specific PNEC within Area A. The majority of the recorded exceedances within the soil leachate analytical results are noted to be only marginally in excess of the EQS, with no corresponding exceedance within the perched waters across the area.

Within the north of Area B, groundwater monitoring wells MW25-01, MW25-04A, MW25-08 and MW25-36 are located in the vicinity of the groundwater divide, with groundwater flow in the area towards the west/ northwest. The GQRA identified concentrations of cyanide, sulphate, ammonium as NH₄, copper and nickel exceed the nominated screening criteria within these wells, with occasional low level exceedance of PAH and TPH. The subsequent M-BAT derived site specific PNEC_{dissolved} for copper, nickel and zinc. There were no exceedances of the site specific PNEC within Area B.

As noted in Section 2, groundwater within Area A and northern area of Area B (proximal to the spring line) appears to flow towards the northwest. A degree of retarded flow is anticipated within the sand and silt layers of the Bosworth Clay Member, with some perched flow within the made ground anticipated. Drainage systems installed within Area A are likely to capture groundwater. Given the Bosworth Clay Member is designated as unproductive strata, and no groundwater or surface water abstractions are recorded to the north of the site, risks to human health via consumption of drinking water are considered to be low.

The Battling Brook is located approximately 89 m down hydraulic gradient or Source Zone A. However, given the likely retarded flow and surface water drainage in the north of the site, hydraulic connection with the brook is likely to be limited. Therefore, the pathway to the receptor is not considered credible.

On the basis of the above, Source Zone A has not been taken through as a primary source area within the assessment.

Soil and Groundwater Sources - Source Zone A

Source	Description	Potential Receptor(s)	Contaminants of Concern
Source Zone A Soil Sources (unsaturated)	Heterogeneous made ground associated with former coal store in Area A and north of Area B.	Unproductive Aquifer – Bosworth Clay Member	Not considered to pose a potentially significant risk to identified controlled waters receptors
Source Zone A Perched Groundwater source	Perched groundwater and hydraulically connected groundwater within superficial aquifer (Bosworth Clay Member). Dissolved concentrations of inorganic and organic contaminants.	Unproductive Aquifer – Bosworth Clay Member Battling Brook, 89 m down hydraulic gradient	

Table 3-1: Summary of Soil and Groundwater Sources - Source Zone A

3.2.3 Source Zone B

The majority of sources are located within Area B and Area C, to the south of the spring line (groundwater flow divide). The Source Zone is considered the primary source area within the risk assessment.

Multiple sources have been identified within Zone B and will be captured in the assessment as outlined in Table 3-2 below.

Soil and Groundwater Sources - Source Zone A

Source	Description	Potential Receptor(s)	Contaminants of Concern
Source Zone B Soil Sources (unsaturated)	Heterogeneous made ground associated with historical land use as a former gasworks. Includes the following identified sources: - Made ground (unsaturated, outside structures) - NAPL contamination in unsaturated made ground	Secondary Undifferentiated Aquifer – Oadby Formation Secondary A Aquifer – Wolston Sand and Gravel	PAHs: naphthalene, anthracene, fluoranthene, benzo(a)pyrene, sum of 4 PAH BTEX: benzene, toluene, ethylbenzene and xylenes
Source Zone B Groundwater source	Hydraulically connected groundwater within superficial aquifers. Dissolved concentrations of inorganic and organic contaminants. Includes the following identified sources: - Perched waters/ contained waters within below ground former gasworks structures - NAPL contamination below the water table in superficial and saturated made ground. - NAPL contamination below the water table in deeper superficial deposits. - Dissolved phase contamination in groundwater in the aquifer. Given the presence of free phase NAPL within the saturated units at the site, it is considered appropriate to use the theoretical effective solubility to evaluate the dissolved phase concentrations within the groundwater. The derived remedial target will be determined for groundwater in direct contact with the free product.	Secondary Undifferentiated Aquifer – Oadby Formation Secondary A Aquifer – Wolston Sand and Gravel Sketchley Brook – 660 m down hydraulic gradient	TPH: aromatic TPH fractions Phenols: phenol Inorganics: cyanide, sulphate, and ammonium as NH ₄ and ammoniacal nitrogen as N (total) Metals: arsenic and mercury

Table 3-2: Summary of Source Zones Identified at the Site

3.3 Pathways

Based on the site setting, the following pathways have been identified on site.

- Leaching/dissolution from contaminated soil/ NAPL and vertical migration to shallow groundwater within the underlying aquifer;
- Migration of NAPL to the underlying aquifer;
- Leakage of impacted perched/ contained water from below-ground former gasworks structures to the underlying aquifer;
- Leakage of NAPL from below-ground former gasworks structures to the underlying aquifer;
- Lateral and vertical migration of impacted groundwater within the underlying aquifer;

- Lateral migration of impacted groundwater within the underlying aquifer followed by dilution in the Sketchley Brook;
- Dissolution of NAPL in the saturated zone and migration via groundwater;
- Lateral and vertical migration of NAPL via fractures within the bedrock; and,
- Migration on site of impacted groundwater.

Whilst it is likely that the remnant below ground structures at the site retain water, for the purposes of the assessment it is assumed that some leakage is occurring or could occur from these structures in the future.

3.4 Receptors

3.4.1 Aquifer(s)

There are multiple aquifers at the site, the following section reviews the resource potential of each.

- **Secondary A Aquifer** associated with the Wolston Sands and Gravel: Resource potential (abstraction for drinking water purposes and supplying surface waters). Whilst the overlying Oadby Formation may provide some protection to contaminants within the made ground, this is noted to contain sandy bands and hydrocarbon impact has been observed. Towards the south, the Wolston Sand and Gravel formation appears to directly underly the made ground, forming a direct pathway for leaching of contaminants.

Discounted Aquifers

- **Secondary Undifferentiated Aquifer associated with Oadby Clay Member:** Within Area C, Oadby Till was encountered below the made ground in the east of the area. Due to its fine-grained nature no groundwater flow is expected to occur within the Till. Secondary Undifferentiated Aquifers are noted by the Environment Agency to have only a minor value. The Oadby Clay Member is likely to act as a confining layer to the underlying Wolston Sands and Gravel (saturated). As such, the Secondary Undifferentiated Aquifer is not considered a primary receptor at the site.
- **Unproductive Strata associate with the Bosworth Clay Member:** Unproductive strata are largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them. Therefore, the Bosworth Clay Member is not considered a primary controlled waters receptor at the site. Whilst the aquifer is not considered to be a receptor it could have the potential to act as a pathway for migration of shallow perched waters within Area A and B (north of the spring line) to migrate offsite.
- **Secondary Undifferentiated Aquifer associated with Thrussington Till:** The basal unit of the Wolston Glacial Succession was not encountered during previous site investigation at the site. BGS boreholes within the vicinity of the site indicated that the Till is overlain by in excess of 20 m of clay (Bosworth Clay Member). This thick cohesive clay is considered to limit the potential for hydraulic connection between the shallow impact at the site and the Secondary Undifferentiated Aquifer. Therefore, the Thrussington Till is not considered a primary receptor at the site.

- **Secondary B Aquifer associated with the bedrock of the Mercia Mudstone Formation** (sandstone, siltstone and mudstone). The bedrock was not encountered at the site. BGS boreholes within the vicinity of the site indicated that the bedrock is overlain by approximately 30 m of clay (Bosworth Clay Member and Thrussington Till). This thick deposit of cohesive clays is considered to limit the potential for hydraulic connection between the shallow impact at the site and the groundwater within the Mercia Mudstone. Therefore, the Secondary B Aquifer is not considered a primary receptor at the site.

3.4.2 Surface Water Receptors

The surface water receptors are identified as:

- **Sketchley Brook.** Although uncertain due to the currently active pumping system and local geology, groundwater flow in the south of the site may be towards the direction of the Sketchley Brook within the Wolston Sand and Gravels. The Wolston Sand and Gravels are not laterally continuous (the BGS mapping indicates that they disappear circa 400 m southwest of the site) and groundwater in the sands is unlikely to flow directly into the Brook; however, there is the potential for entry via drainage and streams that drain the unit.

Assessment of the potential risk to the Sketchley Brook is considered to be protective of the following receptors:

- Un-named drain at western edge of recreational ground, 440 m southwest;
- Hinckley Water (Lake), Wharf Yard, 1.07 km southwest;
- Un-named Lakes, adjacent to Sketchley Brook, ~1.07 km south;
- Harrow Brook, 1.3 km southwest; and
- River Anker, closest point 3.3 km southwest and confluence of Sketchley Brook 4.2 km southwest.

Discounted Surface Water Features

- **Battling Brook.** The Battling Brook is down hydraulic gradient of Source Zone A. However, groundwater flow in the north of the site is likely to be significantly retarded, with limited lateral extension of the perched waters. It is also noted that drainage systems are likely to intercept groundwater to some extent. Therefore, the Battling Brook is not considered to be the primary receptor at the site.
- **Ashby de la Zouch Canal** and associated marina, 1.2 km southwest. The canal is considered to be hydraulically isolated and not a primary receptor within the assessment.

3.4.3 Abstraction(s)

The site is not located within a Source Protection Zone or in a drinking water safeguard zone for either groundwater or surface water (Defra, 2025).

No potable groundwater abstractions were reported to exist within 500 m of the site (Landmark, 2024). Therefore, a current abstraction is not considered a potential receptor within the conceptual site model. Linkages associated with current groundwater abstraction are not included within the Potential Pollutant Linkages for the site.

There is one groundwater abstraction within 1 km of the site, located 860 m south for general farming and domestic use (Landmark, 2024). Celtic (2003) suggest this abstraction is 15 m bgl situated within the Wolston Sand and Gravels, abstracting 900 m³pa. The location of abstraction provided by Landmark (2024) correlates with a DPD depot, with BGS mapping suggesting Wolston Sand and Gravels are not present at this location. Despite this, permeable superficial deposits can sometimes be used for local groundwater abstraction, hence being classified as a Secondary A Aquifer, so should be treated as having the potential for use as a drinking water abstraction resource. Therefore, potential for future consumptive use of groundwater within the Wolston Sands and Gravels is considered to be a viable receptor for Area B and C.

Discounted Abstractions

The Bosworth Clay Member is designated as unproductive strata, and no groundwater or surface water abstractions are recorded to the north, therefore, as noted above (aquifers) the potential for future consumptive use of groundwater within the Bosworth Clay Member is not considered to be viable for Area A.

3.5 Potential Contaminant Linkages Selected for Detailed Assessment

The following contaminant linkages have been selected for detailed assessment.

An updated conceptual site model is presented in Section 7.

Potential Contaminant Linkages

Linkage	Source Contaminants	Pathway	Receptor
1	Made ground (unsaturated, outside structures, non-remediated areas)	Leaching/dissolution from contaminated soil/ NAPL and vertical migration to shallow groundwater within the underlying aquifer	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Lateral and vertical migration of impacted groundwater within the underlying aquifer	
		Lateral migration of impacted groundwater within the underlying aquifer followed by dilution in the Sketchley Brook	Sketchley Brook –surface water body located 650 m down hydraulic gradient
2	Made ground (unsaturated, inside structures, non-remediated areas)	Leaching/dissolution from contaminated soil/ NAPL and vertical migration to shallow groundwater within the underlying aquifer	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Lateral and vertical migration of impacted groundwater within the underlying aquifer	
		Lateral migration of impacted groundwater within the underlying aquifer followed by dilution in the Sketchley Brook	Sketchley Brook –surface water body located 650 m down hydraulic gradient
3	Perched waters/ contained waters within below ground former gasworks structures	Leakage of impacted perched/ contained water from below-ground former gasworks structures to the underlying aquifer	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Lateral and vertical migration of impacted groundwater within the underlying aquifer	
		Lateral migration of impacted groundwater within the underlying aquifer followed by dilution in the Sketchley Brook	Sketchley Brook –surface water body located 650 m down hydraulic gradient
4	NAPL contamination in unsaturated made ground	Leaching/dissolution from contaminated soil/ NAPL and vertical migration to shallow groundwater within the underlying aquifer	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Lateral and vertical migration of impacted groundwater within the underlying aquifer	
		Lateral migration of impacted groundwater within the underlying aquifer followed by dilution in the Sketchley Brook	Sketchley Brook –surface water body located 650 m down hydraulic gradient
		Migration of NAPL to the underlying aquifer	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Lateral and vertical migration of NAPL via fractures within the bedrock	
5	NAPL in and around former structures	Leaching/dissolution from contaminated soil/ NAPL and vertical migration to shallow groundwater within the underlying aquifer	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Leakage of NAPL from below-ground former gasworks structures to the underlying aquifer	
		Lateral and vertical migration of impacted groundwater within the underlying aquifer	
		Lateral migration of impacted groundwater within the underlying aquifer followed by dilution in the Sketchley Brook	Sketchley Brook –surface water body located 650 m down hydraulic gradient
		Migration of NAPL to the underlying aquifer	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Lateral and vertical migration of NAPL via fractures within the bedrock	
6	NAPL contamination below the water table in superficial deposits and saturated made ground	Dissolution of NAPL in the saturated zone and migration via groundwater	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Lateral and vertical migration of NAPL via fractures within the bedrock	
7	Dissolved phase contamination in groundwater in the aquifer	Lateral and vertical migration of impacted groundwater within the underlying aquifer	Wolston Sand and Gravel Groundwater Body – Future resource potential. Assessment point 50 m downgradient of the site.
		Lateral migration of impacted groundwater within the underlying aquifer followed by dilution in the Sketchley Brook	Sketchley Brook –surface water body located 650 m down hydraulic gradient

Table 3-3: Potential Contaminant Linkages

4. Risk Assessment Methodology

4.1 Guidance

The Environment Agency Remedial Targets Methodology (RTM) procedure has been adopted for the risk assessment of site conditions to protect controlled waters. This methodology is based on a phased approach, with each successive level providing a more complete model representation of the pathway from contaminant source to receptor as outlined in Table 4-1.

RTM Assessment Levels

Level	(Contamination source) Description of Remedial Targets methodology
L1	(Soil) Theoretical pore water concentration compared directly with applicable Water Quality Standard (WQS).
L2	(Soil) Attenuation of pollutants in unsaturated zone and dilution by groundwater flow. (Groundwater) Measured groundwater quality compared directly with applicable WQS.
L3	(Soil and Groundwater) Attenuation in the saturated zone down gradient of the site.
L4	Dilution in the receptor.

Table 4-1: Remedial Target Methodology Assessment Levels

4.2 Model Selection

In accordance with Environment Agency guidance, the Environment Agency Remedial Targets Worksheet v3.2 has been selected as the appropriate tool to derive both soil and groundwater remedial target concentrations at the site for the protection of controlled waters.

4.3 Risk Assessment Rationale

This DQRA advances to a "Level 3" soil and groundwater assessment to assess whether there is a theoretical risk to controlled waters from potential contaminants present within the made ground source and groundwater at the site.

Level 3 is considered appropriate as it will take account of migration in groundwater to the identified off-site receptors, including attenuation and dispersion.

4.4 RTM Input Parameters

4.4.1 Site Area/ Zoning

The CSM (Section 3.2) identified a number of sources at the site within Source Zone B, south of the groundwater divide (spring line). These include unsaturated made ground, perched waters/ contained waters within below ground former gasworks structures, NAPL contamination in unsaturated made ground, NAPL contamination below the water table in superficial deposits and saturated made ground and dissolved phase contamination in the aquifer(s).

Given the nature of the unsaturated soil sources, it was not considered practical or technically beneficial at this stage of the assessment to model each and every individual source area. Therefore, this assessment considers representative model source areas as outlined in Table 4-2 below. This approach is considered to be suitably conservative.

Modelled Soil and Groundwater Source Areas (Source Zone B)

Source	Description	Contaminants of Concern
Source Zone B Soil Sources (unsaturated)	Heterogeneous made ground associated with historical land use as a former gasworks. Includes the following identified sources: • Made ground (unsaturated, outside structures) • NAPL contamination in unsaturated made ground	PAHs: naphthalene, anthracene, fluoranthene, benzo(a)pyrene, sum of 4 PAH BTEX: benzene, toluene, ethylbenzene and xylenes TPH: aromatic TPH fractions Phenols: phenol Inorganics: cyanide and ammonium as NH ₄ and ammoniacal nitrogen as N Metals: arsenic and mercury.
Source Zone B Groundwater source	Hydraulically connected groundwater within superficial aquifers. Dissolved concentrations of inorganic and organic contaminants. Includes the following identified sources: • Perched waters/ contained waters within below ground former gasworks structures • NAPL contamination below the water table in superficial and saturated made ground. • NAPL contamination below the water table in deeper superficial deposits. • Dissolved phase contamination in groundwater in the aquifer. Given the presence of free phase NAPL within the saturated units at the site, it is considered appropriate to use the theoretical effective solubility to evaluate the dissolved phase concentrations within the groundwater. The derived remedial target will be determined for groundwater in direct contact with the free product.	

Table 4-2: Summary of Source Areas

In view of this conservative approach of assessing representative sources, the assessment is considered suitably protective of all source zones on site.

Full details of the soil source area and dissolved phase plume are outlined in Appendix B.

4.4.2 Modelled Contaminants

As outlined in Section 2.4.4, a selection of the COPC identified in the GQRA have been taken forward into the DQRA. The mBAT then refined the number of bio-available metals to be taken forward to DQRA. A composite list is presented below in Table 4-3.

The chemical input parameters are provided in Appendix B.

Modelled Contaminants of Potential Concern

COPC	Recommended Petroleum Hydrocarbon COPC indicator (21)	Determination (JAGDAG, 2017)	DWS (19) (20) (mg.L ⁻¹) CP1	EQS (18) (mg.L ⁻¹) CP2	Effective Solubility (mg.L ⁻¹) (NAPL)	Maximum Concentration		
						Soil (mg.kg ⁻¹)	Leachate (mg.L ⁻¹)	Groundwater (mg.L ⁻¹)
Cyanide (Total)	n/a	Non-hazardous pollutant	0.05	--	--	1200	50	8.6
Cyanide (free)	n/a	Non-hazardous pollutant	--	0.001	--	340	0.087	0.07
Sulphate	n/a	--	250	--	--	6900	1760	2220
Ammonium as NH4	n/a	--	0.5	--	--	430	40	680
Ammoniacal N (total) as N	n/a	Non-hazardous pollutant	--	1.1	--	335	31	528.9
Phenol	n/a	Non-hazardous pollutant	--	0.0077	--	2.4	0.29	56
Naphthalene	n/a	Non-hazardous pollutant	--	0.002	--	2400	2.15	6.8
Anthracene	n/a	Hazardous substance	--	0.0001	--	650	0.0069	0.36
Fluoranthene	n/a	Hazardous substance	--	0.0000063	--	1200	0.0052	0.81
Benzo(a)pyrene	n/a	Hazardous substance	0.00001	0.00000017	--	390	0.00061	0.27
Sum of 4 PAH	n/a	Hazardous substance	0.0001	--	--	890	0.00092	0.65
Arsenic	n/a	Hazardous substance	0.01	0.01	--	220	0.055	0.088
Mercury	n/a	Hazardous substance	--	0.00001	--	55	0.004	0.00199
Benzene	n/a	Hazardous substance	0.001	0.01	--	46	0.13	22
Toluene	n/a	Hazardous substance	0.7	0.074	--	42	0.29	14
Ethylbenzene	n/a	Hazardous substance	0.3	0.02	--	850	0.12	0.39
Xylenes	n/a	Hazardous substance	0.5	0.03	--	167	0.41	6.1
TPH Aromatic C10-C12	naphthalene	--	0.09	--	5.93	1800	0.55	156
TPH Aromatic C12-C16	acenaphthene	--	0.09	--	0.935	3500	10.1	33.7

Table 4-3: Modelled Contaminants of Potential Concern

4.4.3 Compliance Point

The underlying Secondary A aquifer and surface waters of the Sketchley Brook have been selected as the sensitive controlled waters receptors.

In accordance with Land Contamination Groundwater Compliance Points: Quantitative Risk Assessments (Environment Agency, 2017) and based on the identified receptors, assessment points have been nominated within the groundwater body in the direction of groundwater flow, as detailed below:

- **Groundwater Resource Potential**

A 50 m assessment point in the groundwater body in the direction of groundwater flow has been selected (CP1). This is the default compliance point for the assessment of all hazardous substances already groundwater and for non-hazardous substances in groundwater with strategic resource potential (Secondary A Aquifer). The assessment point has been selected to protect the quality of the water for human use both now and in the future, i.e. to protect the resource to allow for current and future exploitation.

- **Surface Waters**

Sketchley Brook: A 300 m compliance point in the groundwater body in the direction of groundwater flow has been selected (CP2). This is the approximate mid-point distance between the site and the surface waters of Sketchley Brook.

4.4.4 Target Concentrations

In line with the methodology adopted in the GQRA, the following target concentrations have been used:

- **Groundwater Resource Potential - Secondary A Aquifer**

Drinking Water Standards (DWS) (The Water Supply (Water Quality) Regulations 2016, Guidelines for Drinking Water Quality, WHO 2022 and Petroleum Products in Drinking Water, WHO 2008).

- **Surface Water Receptors**

Environmental Quality Standards (EQS) for fresh waters (The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015).

Groundwater and leachate samples collected from the made ground and superficial deposits will be screened against the above criteria, considered to be protective of the nearest surface water features to the site.

Reported ammonium (as NH₄) concentrations from laboratory analysis (soil leachate and groundwaters) have been converted to ammoniacal nitrogen as N (total) in this report to enable comparison to the applied EQS.

4.4.5 Retardation and Biodegradation

4.4.5.1 Degradation Potential

Geochemical data was recorded during groundwater monitoring rounds. The data has been used to evaluate whether conditions within the aquifer are suitable for supporting biodegradation of contaminants.

Degradation Potential (Source Zone B)

Parameter	Degradation Conditions	Field Data
Dissolved Oxygen	>1 mg.L ⁻¹ indicates that petroleum type hydrocarbons may oxidise aerobically ⁽¹⁾	Field measurements of dissolved oxygen ranged between 0.3 mg.L ⁻¹ and 5.0 mg.L ⁻¹ , with an average of 1.2 mg.L ⁻¹ in 2025. These concentrations are indicative of aerobic degradation to mildly reducing conditions.
Redox Potential	Aerobic degradation occurs under a redox potential of >150 mV. Mildly reducing conditions are considered to be 50 to -150 mV ⁽¹⁾ , with redox potential below this being indicative of anaerobic degradation ⁽²⁾ .	Site data indicates that conditions within the aquifer are indicative of aerobic degradation. Field measurements of Eh ranged between 134 mV and 495 mV with an average of 258 mV in 2025.
pH	Optimal pH range for degradation is between 6 and 8.5 pH ⁽²⁾ . pH between 5 and 9 is the tolerated range for the reductive pathway ⁽¹⁾ .	Analytical groundwater data indicates that the pH is within the optimal range for degradation. pH at the site ranged between 6.6 and 7.2
Temperature (affects solubility of chemicals involved in oxidation-reduction processes)	Biological and biochemical processes are accelerated at temperature in excess of 20°C and may be inhibited below 5°C ⁽²⁾ .	Data collected in the field (Appendix A) recorded groundwater temperatures of between 10 and 17°C (Worley Consulting, 2025). This suggests that conditions are within range for degradation processes to occur.
(1) Environment Agency's R&D Report P305 (Environment Agency, 1999) (2) Environment Agency's R&D Report P95 (Environment Agency, 2000)		

Table 4-4: Degradation Potential

In summary, pH, temperature, dissolved oxygen and redox recorded within groundwater at the site suggest that there is potential for microbial degradation. As such, an appropriate estimate of potential low rates of degradation will be included within the modelling. No site specific degradation rates are available, however appropriate literature values are considered suitable for use within the assessment where available.

4.4.5.2 Approach to Modelling Degradation Processes

Within the model there are two options available for the modelling of natural attenuation (as biodegradation). Biodegradation of contaminants in the dissolved phase only for which degradation rates calculated within laboratory-based experiments are typically used and combined 'dual' phase for which decay rates based upon field studies are preferred in accordance with Environment Agency guidance (Environment Agency, 2006).

In the absence of site specific degradation rates, the model was run as standard with the degradation settings set as degradation in dissolved phase only, in accordance with

Environment Agency guidance (Environment Agency, 2006). This is a conservative selection that would be revisited if additional groundwater data was available. A sensitivity analysis of the degradation setting on the model is provided in Section 6.

4.4.6 Physical Properties

Site specific input parameter values have been used to characterise the environmental conditions at the site and were used in the model where available. Conservative literature values have been utilised where site specific data is not available. Where a literature value has been used, it is with consideration of the applicability of the input to the known environmental conditions.

The physical and chemical input parameters are provided in Appendix B.

4.4.7 Model Limitations and Assumptions

In addition to the assumptions detailed above, the following model limitations and assumptions are applicable to the assessment:

- The model is based on a future residential end use, as per the illustrated master plan provided. Should the plan for the site change, the risk assessment will need to be updated accordingly;
- The model is used to assess the risk present to controlled waters by dissolved phase transport only. The model is not suitable assessing the risk presented by free phase hydrocarbons;
- The model is not suitable for assessing point discharges into the controlled waters from the site drainage;
- To date, limited liaison with the regulators (e.g. the Environment Agency or the Local Authority) has been undertaken by Worley Consulting regarding the assessment;
- The aquifer is intergranular, homogeneous and isotropic;
- Attenuation of contaminants in the hyporheic / riparian zone is not considered;
- The contaminant source can be represented as a constant term (does not decline with time);
- Steady state groundwater flow is assumed with no seasonal variations;
- Vertical dispersion simulated in one direction only (suitable for a source at or above the water table);
- The only processes that can affect the fate and transport of contaminants are dilution, sorption, degradation and dispersion;
- Sorption is linear, instantaneous, and reversible;
- Degradation can be described by an exponential function (first order decay);
- Degradation has been modelled in the aqueous phase only although degradation within both the sorbed and aqueous phase is likely to be occurring; and,
- Attenuation of contaminants in the unsaturated zone is negligible.

5. Risk Assessment Results

5.1 Model Results

The RTM calculations were used to derive Site Specific Assessment Criteria (SSAC) for soil/leachate (as mg.kg^{-1} and mg.L^{-1}) and groundwater (as mg.L^{-1}). Calculation sheets from the RTM model showing Level 3 remedial targets for each of the COPC with respect to each compliance point are provided in Appendix C.

The derived SSAC for soils/ soil leachate have been compared to individual soil and leachate sample results from the unsaturated zone only based on recorded water levels per site area. Due to the limited number of shallow soils within the former on-site structures and shallow water level across the site, saturated soils have been evaluated, however due consideration has been given in the evaluation of risk. Soil, leachate and groundwater results from the Worley Consulting site investigation have been used in the assessment (Worley Consulting, 2025).

The RTM model predicts a range of inorganics, heavy metals and PAH compounds will have a low mobility within the aquifer and will not cause significant impacts at the compliance point within a reasonable timeframe (1,000 years). Therefore, these compounds are not considered to represent unacceptable risks to controlled waters and will not be considered further in the assessment. The remaining COPCs may represent an unacceptable risk at the compliance point given their predicted travel time to the point of compliance is less than 1,000 years.

Exceedances of the derived target criteria at Level 3 for Assessment Point 1 (CP1) and Assessment Point 2 (CP2) are summarised in Table 5-1 and 5-2 below. The DQRA screening tables are presented in Appendix D. Discussion of the results is presented in Section 5.2.

Resource Potential –Compliance Point 1

COPC	Screened Analytical Results						
	Soil SSAC (mg.kg ⁻¹)	No. Exceedances	Leachate SSAC (mg.L ⁻¹)	No. Exceedances	Groundwater SSAC (mg.L ⁻¹)	No. Exceedances	Estimated Travel Time to CP1 (years)
Cyanide (Total)	1.31	83 of 180	1.29 x 10 ⁻¹	16 of 36	4.16 x 10 ⁻¹	50 of 113	186
Sulphate	1.52 x 10 ²	139 of 196	3.50 x 10 ²	9 of 36	2.56 x 10 ²	75 of 113	8
Ammonium as NH4	1.64 x 10 ⁻¹	91 of 178	7.78 x 10 ⁻¹	16 of 36	7.52 x 10 ⁻¹	86 of 113	3
Benzo(a)pyrene	3.82 x 10 ⁻²	118 of 198	1.56 x 10 ⁻⁵	1 of 36	1.52 x 10 ⁻⁵	18 of 113	>1,000
Sum of 4 PAH⁽⁵⁾	2.51 x 10 ⁻¹	115 of 198	1.51 x 10 ⁻⁴	3 of 36	1.37 x 10 ⁻⁴	16 of 113	>1,000
Arsenic	7.00	148 of 196	1.4 x 10 ⁻²	4 of 36	1.02 x 10 ⁻²	26 of 113	>1,000
Benzene	4.48 x 10 ⁻³	61 of 162	2.94 x 10 ⁻³	9 of 36	1.24 x 10 ⁻²	37 of 113	6
Toluene	1.39 x 10 ¹	5 of 158	3.8	0 of 36	3.81 x 10 ¹	0 of 113	11
Ethylbenzene	5.77	12 of 174	6.6 x 10 ⁻¹	0 of 36	1.48	0 of 113	19
Xylenes	2.55	18 of 140	1.47	0 of 36	6.21	0 of 113	21
TPH Aromatic C10-C12	8.78	25 of 63	1.84 x 10 ⁻¹	5 of 20	3.48 x 10 ⁻¹	44 of 113	91
TPH Aromatic C12-C16	2.08 x 10 ¹	30 of 63	2.19 x 10 ⁻¹	13 of 20	6.12 x 10 ⁻¹	37 of 113	179

Table 5-1: Derived SSAC for Compliance Point 1 – Future Resource Potential

Surface Water Receptor – Compliance Point 2

COPC	Screened Analytical Results						
	Soil SSAC (mg.kg ⁻¹)	No. Exceedances	Leachate SSAC (mg.L ⁻¹)	No. Exceedances	Groundwater SSAC (mg.L ⁻¹)	No. Exceedances	Estimated Travel Time to CP1 (years)
Cyanide (free)	1.03	16 of 196	1.02 x 10 ⁻¹	0 of 36	1.49 x 10 ²	0 of 113	>1,000
Ammoniacal N (total) as N	1.32	80 of 198	6.26	3 of 36	2.32 x 10 ¹	34 of 113	20
Phenol	3.82 x 10 ¹	0 of 10	2.15 x 10 ¹	0 of 36	6.9 x 10 ⁶	0 of 113	38
Naphthalene	6.87 x 10 ⁻¹	71 of 198	5.51 x 10 ⁻²	8 of 36	6.62	1 of 113	156
Anthracene	3.59 x 10 ⁻¹	79 of 198	6.39 x 10 ⁻⁴	6 of 36	3.15 x 10 ⁻³	16 of 113	>1,000
Fluoranthene	1.44 x 10 ⁻²	145 of 198	4.17 x 10 ⁻⁵	23 of 36	2.23 x 10 ⁻⁴	43 of 113	>1,000
Benzo(a)pyrene	2.42 x 10 ⁻³	118 of 198	9.88 x 10 ⁻⁷	1 of 36	3.86 x 10 ⁻⁶	18 of 113	>1,000
Arsenic	7.6 x 10 ¹	2 of 196	1.52 x 10 ⁻¹	0 of 36	1.13 x 10 ⁻¹	0 of 113	>1,000
Mercury	4.81 x 10 ⁻¹	18 of 193	3.04 x 10 ⁻⁵	1 of 36	2.27 x 10 ⁻⁵	14 of 113	>1,000
Benzene	3.12	10 of 162	2.05	0 of 36	1.01 x 10 ⁴	0 of 113	35
Toluene	8.47 x 10 ²	0 of 158	2.06 x 10 ²	0 of 36	6.63 x 10 ⁷	0 of 113	63
Ethylbenzene	7.29	8 of 174	8.35 x 10 ⁻¹	0 of 20	2.28 x 10 ²	0 of 113	114
Xylenes	5.87 x 10 ¹	16 of 140	6.15	0 of 20	3.04 x 10 ⁴	0 of 113	124

Table 5-2: Derived SSAC for Compliance Point 2 – Surface Waters

5.2 Discussion of Results

5.2.1 Resource Potential – Compliance Point 1

The RTM predicts that the travel time of arsenic, benzo(a)pyrene and sum of 4 PAH is in excess of 1,000 years. As such, these COPCs are not considered to pose a potentially significant risk at CP1, due to the long travel time required to reach the hypothetical abstraction point 50 m down hydraulic gradient of the source.

At CP1, 50 m downgradient of the site, recorded concentrations within the soil leachate and groundwater exceed the derived SSAC for cyanide, sulphate, ammonium as NH₄, benzene, TPH aromatic C10-12 and TPH aromatic C12-16. The majority of the recorded exceedances are noted to be in the south and southwest of the site, proximal to NAPL-impacted soils. Each of the COPCs exceed the SSAC for soils.

Cyanide

- Exceedances of the soil and soil leachate SSAC were recorded in the footprint of the former refuse tip and within the former below ground gasholders and process plant in the south of the site. The highest recorded concentrations are located within the footprint of the former purifier in the centre of the site (MW25-14).
- The majority of groundwater exceedances are recorded within wells installed within the made ground either within or proximal to below ground former structures in the south of the site.

Sulphate

- Elevated concentrations of sulphate are recorded in the made ground soils within the footprint of the former refuse tip in the north of the site and within the below ground former gasholder structures in the south of the site. NAPL was identified within the footprint of the former refuse tip during drilling and within the below ground former gasholder structures.
- Recorded concentrations of sulphate are elevated above the groundwater SSAC in the majority of wells across the site. The highest recorded concentrations were recorded in MW25-17 within former Gasholder No. 3.

Ammonium

- Recorded concentrations of ammonium within soils are recorded in excess of the SSAC within and proximal to the former process plant. The highest recorded concentrations are recorded within the footprint of the scrubbers in the west of the Area B (MW25-16A).
- Concentrations of ammonium as NH₄ in groundwater were recorded in excess of the SSAC across the site, with the highest concentrations located in the south-west of the site within the vicinity of the former process structures.

Benzene

Exceedances of the groundwater SSAC for benzene are predominantly recorded within the below ground gasholder tanks in the south of the site and the vicinity of the former scrubbers, CWG plant, exhauster and retort house. The highest concentrations are recorded in MW25-23A within the former Gasholder A on the south-western boundary.

Aromatic C10-12 and Aromatic C12-16

- Concentrations of the TPH carbon bands are in excess of the SSAC in the footprint of the former refuse tip.
- A similar pattern of exceedances of the groundwater SSAC for the aromatic carbon bands is observed at the site, with elevated concentrations recorded the below ground gasholder tanks in the south of the site and the vicinity of the former scrubbers, CWG plant, exhauster and retort house. The highest recorded concentrations were recorded in the vicinity of the retort house in the far south of the site at MW25-27.

5.2.2 Surface Water Receptor – Compliance Point 2

The RTM predicts that the travel time of cyanide, arsenic, mercury, fluoranthene, anthracene and benzo(a)pyrene is in excess of 1,000 years. They are not considered to pose a potentially significant risk due to the long travel time required to reach CP2, considered protective of the nearest surface water receptor, the Sketchley Brook.

At CP2, 300 m down-hydraulic gradient from the site, recorded on site concentrations within the unsaturated soils and groundwater exceed the derived SSAC for ammoniacal nitrogen as N and naphthalene, with exceedances of benzene, ethylbenzene and xylenes in soils only.

Ammoniacal Nitrogen as N

- Exceedances of the soil SSAC were recorded across the site, with the highest concentrations noted in the centre of the site in the vicinity of the former scrubbers (MW25-16A).
- Exceedances of the soil leachate SSAC were recorded in the footprint of the former purifiers, scrubbers and retort house in the centre of the site. A similar pattern is recorded in the groundwaters, with additional exceedances within the former Gasholders A and B, CWG plant and benzole washer.

Naphthalene

- Exceedances of the soil and soil leachate SSAC were recorded within the footprint of the former gasholder structures and in the vicinity of the catch box and scrubbers in the centre of the site. The highest recorded concentrations were recorded within former Gasholder B in the south of the site and in the former purifier catch box in the centre of the site.
- A single exceedance of the SSAC for naphthalene was recorded in groundwater in MW25-23B (Round 3). The borehole is located within the former Gasholder A on the south-western boundary.

Benzene, Ethylbenzene and Xylenes

- Exceedances are recorded in former Gasholder A, Gasholder B, Gasholder 1, Gasholder 2, former retort house, former CWG plant and former tar well in the south of the site and Gasholder No 4 in the east of the site.
- There were no groundwater SSAC exceedances.

6. Sensitivity Analysis, Model Uncertainty and Climate Change

6.1 Model Sensitivity

A sensitivity analysis was undertaken to determine the sensitivity of the model to the various input parameters. The input parameters were varied within the realistic bounds which could be expected on site and varied by approximately 10%.

When considering degradation in only the aqueous phase, the most sensitive parameters (in order of impact) are biodegradation half-life, effective porosity, hydraulic conductivity, hydraulic gradient and infiltration. The parameters to which the model is most sensitive have been reviewed below.

6.1.1 Degradation Rates

Within the RTM there are two options available for the modelling of natural attenuation (as biodegradation), these being:

- biodegradation of contaminants in the dissolved phase only ('single-phase') for which degradation rates calculated within laboratory-based experiments are typically used; and,
- combined dissolved and sorbed phase ('dual phase') for which decay rates based upon field studies are preferred in the guidance (EA, 2006).

It is considered within this assessment that aerobic to slightly reducing conditions exist at the site. Reported measurements of dissolved oxygen concentrations were found to be higher in up- (MW25-21) than in boreholes located close to identified sources of contamination (MW25-12, MW25-20 and MW25-25).

The unconfined nature of the Sand and Gravel across the southern part of the site, where the Oadby Member is absent, indicates a likely oxidising environment, which then becomes slightly reducing as groundwater travels through DNAPL impacted made ground and superficial deposits in the direction of groundwater flow. Whilst it is considered possible that groundwater conditions are likely to reflect a condition closer to that represented by selecting the 'dual phase' degradation rate option, conservatively the 'single phase' degradation rate option has been used within this assessment.

In order to explore the potential impact of 'dual phase' degradation at the site, RTM worksheets have been run for two key risk drivers, ammonium as NH₄ and benzene for the closest assessment point, 50 m downgradient of the site.

Dual Phase

Variability of the modelled results for the Level 3 groundwater model for CP1 is shown below for key risk drivers at the site.

Sensitivity Assessment – Dual Phase

Determinand	Model Result (mg.L ⁻¹)	No. Exceedances	Dual Phase Result (mg.L ⁻¹)	No. Exceedances
Ammonium as NH ₄	7.52 x 10 ⁻¹	86 of 113	7.53 x 10 ⁻¹	86 of 113
Benzene	1.24 x 10 ⁻²	37 of 113	5.31 x 10 ⁻²	33 of 113

Table 6-1: Sensitivity – Dual Phase

Marginally fewer exceedances of the benzene groundwater SSAC were observed when degradation was considered in both the sorbed and dissolved phase. Whilst there was a slight increase in the SSAC, there was no change to the number of exceedances at the site under dual phase for ammonium as NH₄.

Degradation Rate

The mid-point of literature value ranges has been used within the risk assessment. The implication of using the lower end of the literature ranges is explored below. The values used are for shallow sand and gravel aquifers with aerobic degradation.

Variability of the modelled results for the Level 3 groundwater model is shown below for key risk drivers at the site.

Sensitivity Assessment – Half Life

Determinand	Half Life (days)	Model Result (mg.L ⁻¹)	No. Exceedances	Half Life (days)	Sensitivity Result (mg.L ⁻¹)	No. Exceedances
Ammonium as NH ₄	2,190	7.52 x 10 ⁻¹	86 of 113	365	4.16	67 of 113
Benzene	300	1.24 x 10 ⁻²	37 of 113	50	3.92 x 10 ⁻¹	0 of 113

Table 6-2: Sensitivity – Half Life

There are no exceedances of the benzene groundwater SSAC were observed when the lower end of the range of literature half lives is used.

There are also few exceedances recorded for ammonium as NH₄. The number of exceedances drops from 86 exceedances in a data set of 113 to just 67 exceedances. These exceedances are recorded in Gasholder No. 1, Gasholder No. 2, Gasholder No. 3, Gasholder A, Gasholder B, and other former process structures including former purifier catch box, oxide shed, scrubbers, GWG plant, retort house and benzole washer. Exceedances outside of structures are primarily located along the western site boundary.

Given the conditions recorded at the site, it is considered that the aquifer has a good capacity for degradation processes to occur. There is limited data available to enable the determination of site specific degradation rates or justify the use of dual phase within the model, however it is considered that dual phase degradation is likely occurring within the aquifer.

Conservatively, degradation in the dissolved phase only has been maintained within the model.

6.1.2 Hydraulic Conductivity

Hydraulic conductivity within the superficial aquifer of the Wolston Sand and Gravel (assessed at three locations) ranged between $7.66 \times 10^{-7} \text{ m.s}^{-1}$ and $1.84 \times 10^{-4} \text{ m.s}^{-1}$.

Within the assessment a geomean value of K testing undertaken in wells screened within the sands and gravels of $1.61 \times 10^{-5} \text{ m.s}^{-1}$ was used. Sensitivity analysis undertaken utilising the lower end and upper end of the rates determined through on-site permeability testing within both the superficial aquifer.

Variability of the modelled results for the Level 3 groundwater model is shown below for key risk drivers at the site.

Sensitivity Assessment – Hydraulic Conductivity

Determinand	Low K	Model Result (mg.L ⁻¹)	High K
K (m.day ⁻¹)	0.0662	1.39	15.9
Ammonium as NH ₄	2.18×10^2	7.52×10^{-1}	5.3×10^{-1}
Benzene	4.32×10^7	1.24×10^{-2}	1.31×10^{-3}

Table 6-3: Sensitivity – Hydraulic Conductivity

The range of hydraulic conductivity has a significant effect on the derived SSAC and predicted concentrations at the assessment point. Hydraulic conductivity measurements from on-site slug testing varied considerably between monitoring wells. This is presumably representative of the variable nature of the sand and gravel unit at the site. In order to accommodate the significant variability and remain conservative, the geometric mean value of 1.39 m.day^{-1} is considered to represent the wider aquifer.

6.1.3 Hydraulic Gradient

Hydraulic gradients within the superficial aquifer of the Wolston Sand and Gravel ranged between 0.0075 and 0.0087, with an average across the south of the site of 0.0083.

Within the assessment the typical hydraulic gradient within the sands and gravels of 0.0087 was used. Sensitivity analysis undertaken utilising the lower end and upper end of the range determined through interpolation of groundwater elevations within the superficial aquifer.

Variability of the modelled results for the Level 3 groundwater model is shown below for key risk drivers at the site.

Sensitivity Assessment – Hydraulic Gradient

Determinand	Low i	Model Result (mg.L ⁻¹)
i = hydraulic gradient	0.0075	0.0087
Ammonium as NH ₄	7.98×10^{-1}	7.52×10^{-1}
Benzene	1.76×10^{-2}	1.24×10^{-2}

Table 6-4: Sensitivity – Hydraulic Gradient

The range of hydraulic gradient has a minimal effect on the derived SSAC. Hydraulic gradient measurements from on-site varied across the site due to the presence of the spring line in the north of Area B and the influence of the hydraulic containment unit in the southwest. In order to accommodate the variability and remain conservative, the most commonly recorded value of 0.0087 is considered to be representative of the gradient in the centre-south of the site.

6.1.4 Saturated Aquifer Thickness

The saturated aquifer thickness has been estimated based on the monitoring well logs.

Saturated thickness of the Wolston Sand and Gravels has been identified between circa 1.5 and 5 m bgl (most commonly circa 4 m bgl), based on groundwater monitoring data and the top of the Wolston Clay Formation.

To the south of the site, silt was encountered below the Sand and Gravel formation to around 12-14 m bgl, which was visually impacted by hydrocarbons and likely in hydraulic conductivity with the overlying deposits. The saturated thickness of material (sand and gravel and silt) within this area is considered to be thicker - up to around 9 m.

Variability of the modelled results for the Level 3 groundwater model is shown below for key risk drivers at the site.

Sensitivity Assessment – Saturated Aquifer Thickness

Determinand	Model Result (mg.L ⁻¹)	Maximum thickness
Saturated aquifer thickness (m)	4	9
Ammonium as NH ₄	7.52 x 10 ⁻¹	7.34 x 10 ⁻¹
Benzene	1.24 x 10 ⁻²	1.12 x 10 ⁻²

Table 6-5: Sensitivity – Hydraulic Gradient

The change of the saturated aquifer thickness has a minimal effect on the derived SSAC. An average saturated aquifer thickness has been derived using observed site conditions. Therefore the average value used in the assessment is considered to be representative of the variability of on-site conditions.

6.2 Uncertainty Analysis

The uncertainty analysis is a qualitative evaluation of the inherent uncertainty associated with the risk results as a product of the information and assumptions used in their derivation (Environment Agency, 2006). Uncertainty is inherent in the risk assessment process with the main areas of uncertainty highlighted below.

The scope of this uncertainty analysis includes site data collection; exposure, site-specific and toxicological parameters; and the limitations of risk quantification models or conceptual model.

6.2.1.1 Site Data Collection

- The laboratory limit of detection for some groundwater contaminants e.g. benzo(a)pyrene is greater than the nominated guideline value (EQS). This signifies that there is some uncertainty about whether elevated concentrations of these COPC are actually present in groundwater below the site;
- Biodegradation half-lives used in the RTM are literature values and may not represent actual site conditions;
- The degradation processes in the aquifer are considered to comprise aqueous phase biodegradation only. However, in reality there is likely to be a proportion of biodegradation of the sorbed phase as well which will have significant impact on the fate and transport of more recalcitrant organic compounds (such as PAHs). This has not been considered in the assessment and the results of the assessment are likely to be conservative on this basis;
- It is noted that the majority of the data from the 2025 site investigation data is targeted within DNAPL impacted source areas. As such, the recorded conditions may not be reflective of the entirety of the site.
- The influence of the hydraulic containment system at the site has not been reviewed within this assessment. It is assumed that the dissolved phase plume and NAPL source are hydraulically connected to the wider aquifer.
- A declining source term has not been modelled within the assessment to represent the removal of DNAPL from the downgradient boundary and reduction in contaminant loading to the aquifer.

6.2.1.2 Definition of Parameter Values

- Site specific input parameter values have been used to characterise the environmental conditions at the site and were therefore used in the model where available. Where a literature value has been used, it is with consideration of the applicability of the input to the known environmental conditions.
- The main risk-driving chemicals of concern from gasworks sites have been considered for this risk assessment.

6.2.1.3 Limitations of the Conceptual Site Model

- From a review of the distribution of measured contaminants at the site, it has been not been possible/ practical to delineate specific source areas. As such, a default travel distance between the site boundary and chosen compliance point has been adopted.
- The conceptual model, and subsequent quantitative risk assessment, is intended to aid decision making for the requirements of Cadent in relation to the proposed future land use. Any future site purchaser/developer will need to reassess the site conditions based on their own site specific and detailed development proposals.

6.2.1.4 Model Limitation

The Environment Agency's RTW model for assessing risk to controlled waters requires a simplification of the real life environment which is inherently complex. Where possible, model input parameters have been selected conservatively.

6.3 Climate Change Considerations

UK Climate Projections were developed in 2009 (UKCP09) by DEFRA and updated in 2018 (UKCP18). The UKCP09 has subsequently been withdrawn. The projections are based on scientific methods provided by the Met Office, with input from over 30 contributing organisations. One of the purposes of the projections is to assist in the assessment of potential impacts based on projected future climates and the consideration of adaptation options to address those impacts.

The documents outline key projections for four different Representative Concentration Pathways (RCPs) (RCP 2.6, RCP 4.5, RCP 6.0 and RCP 8.5) and three time periods (2020, 2050, and 2080). Based on the data it is possible that future climate change projections for increased precipitation could increase the risks to controlled waters receptors via increased soil leaching effects to groundwater and increased risks of surface flooding. Similarly, the elevation of the water table could increase during winter months which may have implications relating to the hydraulic connection between the groundwater table and the surface waters of the Sketchley Brook. The conservative nature of the controlled waters risk assessment and that the Sketchley Brook are in continuity with the groundwater at the site is considered to be protective of these future variations resulting from climate change. An increased level of rainfall is also likely to result in an increased level of dilution within the aquifer.

7. Summary and Recommendations

7.1 Summary

Quantitative risk assessment has been used to assess whether pollution of controlled waters receptors is being caused, or is likely to be caused, by migration and discharge of groundwater beneath the site under a proposed future residential end use.

The qualitative risk assessment identified a number of potential contaminant linkages relating to site contamination and controlled waters receptors. A quantitative risk assessment was undertaken to further assess the potential contaminant linkages to ascertain the risk posed to the following potential receptors:

- Theoretical future groundwater abstractions from the Secondary A Aquifer; and,
- The Sketchley Brook, the nearest identified surface water body in the direction of groundwater flow.

Two theoretical compliance points were assessed; one in the Secondary A Aquifer located 50 m downgradient of the site and one located 300 m downgradient of the site considered to be protective of the nearest surface water receptor (Sketchley Brook).

7.1.1 Resource Potential – Wolston Sand and Gravel

Recorded on-site concentrations of cyanide (total), sulphate, ammonium as NH_4 , TPH aromatic C10-C12 and C12-C16 and benzene exceed the derived soil and groundwater SSAC for compliance point CP1 located 50 m from the site boundary (protective of future groundwater abstractions). Exceedances of the soil SSAC for toluene, ethylbenzene and xylenes were also recorded at the site. All other COPCs are not predicted to reach the compliance point within a reasonable timeframe (<1,000 years).

The observed exceedances for CP1 are located within localised source areas, predominantly in the vicinity of DNAPL impacted soils and former structures.

7.1.2 Surface Water – Sketchley Brook

For assessment point CP2, located 300 m from the site (protective of Sketchley Brook), recorded concentrations within the unsaturated soils and groundwater exceed the derived SSAC for ammoniacal nitrogen as N and naphthalene, with exceedances of benzene, ethylbenzene and xylenes in soils only. All other POPCs are either predicted to attenuate to concentrations below their respective criteria values or are not predicted to reach the compliance point within a reasonable timeframe (<1,000 years).

As with the observed exceedances for CP1, the majority of the exceedances of the soil and groundwater SSAC for are located within localised source areas predominantly in the vicinity of DNAPL impacted soils and former structures.

7.2 Updated Conceptual Site Model

The identified sources of gasworks related contamination are considered to be made ground within, and outside structures and discrete / diffuse sources of residual phase gasworks related hydrocarbon impact (DNAPL) and dissolved phase contaminants already present within groundwater.

Exceedances of cyanide, sulphate, benzene, toluene, ethylbenzene, xylene, TPH aromatic C10-12 and C12-16, ammoniacal nitrogen as N, ammonium as NH₄ and naphthalene were recorded in concentrations at the site in excess of the derived SSAC for soils and groundwater at the site. In the majority of cases, the exceedances were identified in areas in which the saturated units were impacted with hydrocarbon contamination or evidence of DNAPL. Some exceedances (e.g. sulphate, cyanide and TPH aromatic C10-12 and C12-16) were also recorded in samples from the sites of former purifiers, holders and the refuse tip.

Source areas defined by concentrations in excess of the SSAC are inferred to pose a potentially significant risk to the identified controlled waters receptors.

Observations of DNAPL at the site are recorded within the superficial deposits and made ground (saturated and unsaturated and inside and outside structures). Measurable thicknesses of DNAPL have been recorded within the monitoring wells at multiple locations across the site (Worley Consulting, 2025).

The findings of this report have not yet been discussed with the Planning Authority.

7.3 Recommendations

Risk mitigation measures will be required to manage the potentially unacceptable risks posed by these primary sources of contamination.

It is recommended that evaluation of practical risk mitigation approaches and remediation options is undertaken, and an outline strategy developed for future works.

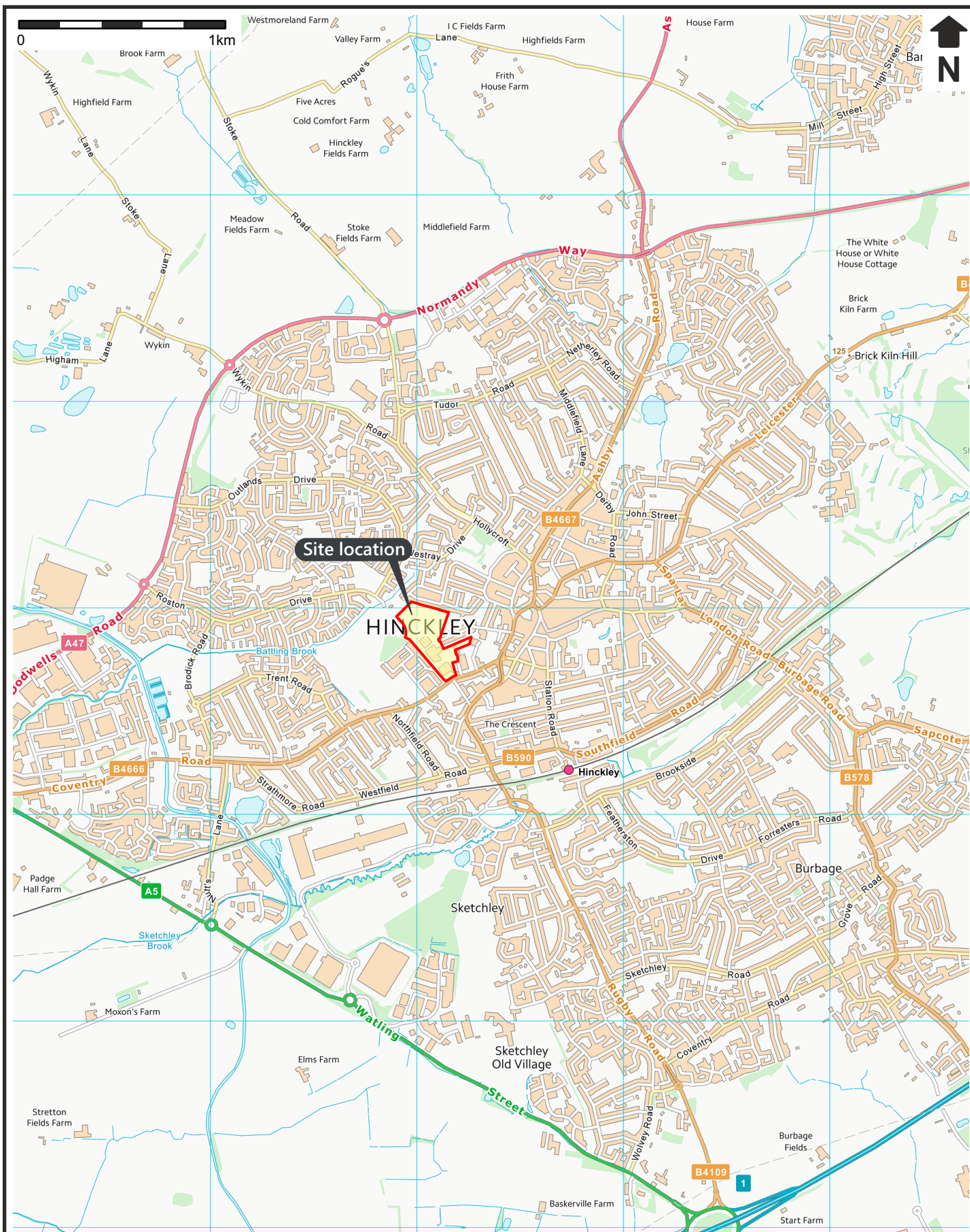
Following shortlisting of viable options, an appraisal of the likely benefits of instigating remediation works should be undertaken to ensure the works are proportionate and sustainable. This sustainability assessment will need to be completed after specific remediation techniques have been confirmed as viable (e.g. after pilot trials, further assessment, etc.) and when the proposed development plan has been confirmed.

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Wood	December 2020	'Factual Land Condition Summary Report', 806504-WOOD-XX-XX-RP-OC-00002_A_C01, Final
WorleyParsons	April 2013	'Project Core: Human Health Environmental Assessment Works Factual Report', 305008-00018/51529-02
WorleyParsons	April 2013	'Data Review Hinckley Operational Centre, Coventry Road, Hinckley', 305001-00024/51374-01 (Final-Rev 1)
Worley Consulting	June 2025	Phase 2 Factual Site Investigation Report, 415001-

Author	Date	Description
		00017_00401_F, Final
WSP	November 2012	'Revised Geoenvironmental Assessment', 33352-R01
WSP	June 2013	'Supplementary Ground Investigation Report', 39067-R01
WYG	2015	'Indoor Drinking Water and Air Monitoring Coventry Road, Hinckley (0326) – Combined Factual and Interpretive Letter Report'. A074754-101-1/jb/pm/FACINT/LR1
WYG	September 2016	'Brick Kiln Street, Hinckley (0326), Factual Environmental Report – NGG Landholding'

Figures



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PROJECT: 00402
BRICK KILN STREET, HINCKLEY

CADENT GAS LIMITED

SITE LOCATION PLAN

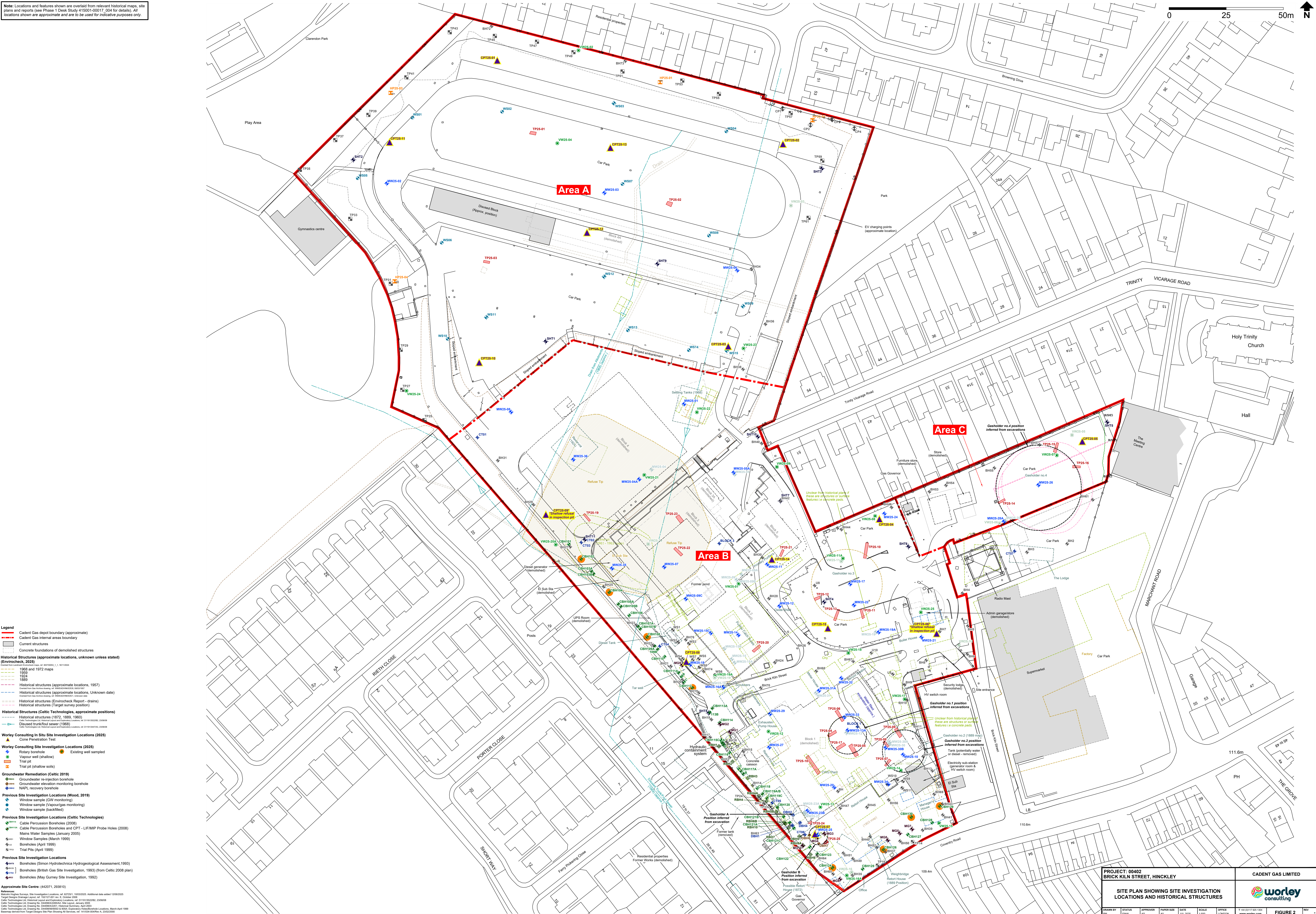


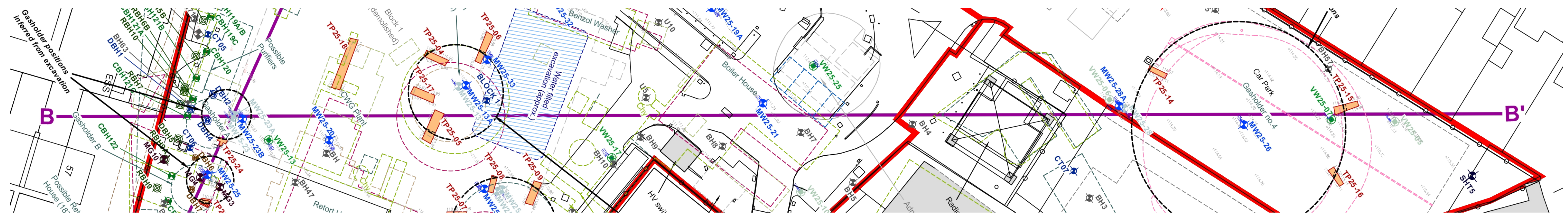
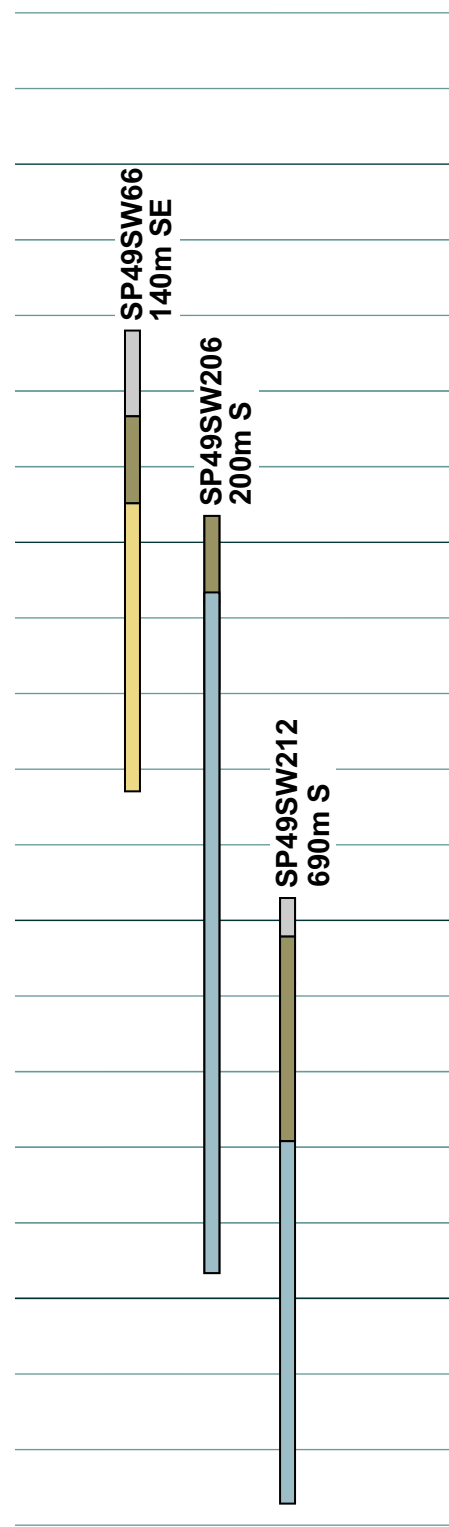
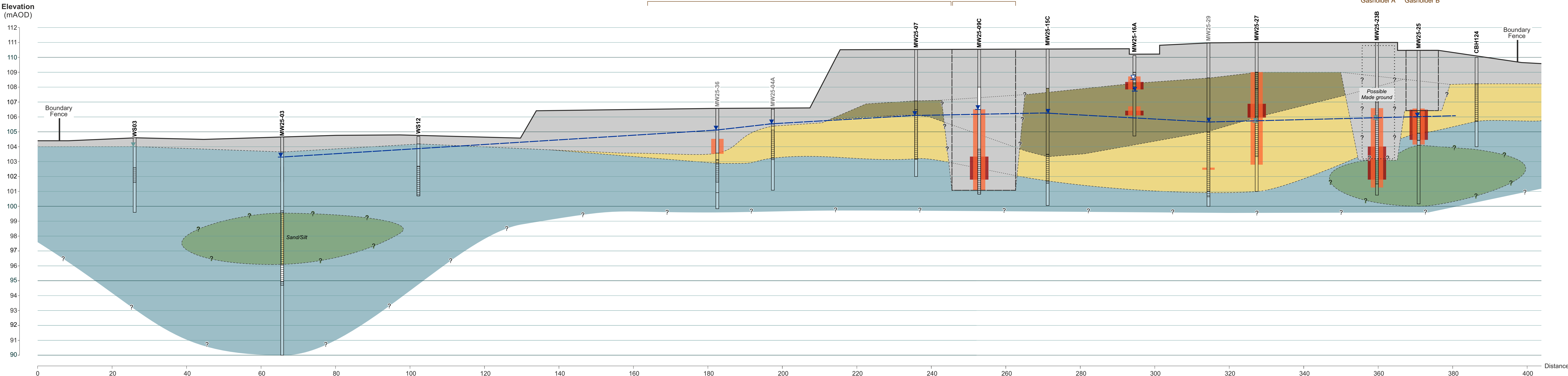
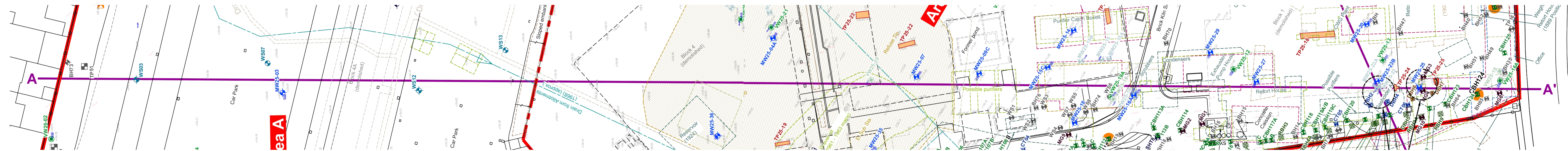
DRAWN BY PM	STATUS FINAL	APPROVER AS	PAPER SIZE A4	DATE JUL 2025	SCALE 1:25,000	OFFICE LONDON	T +44 (0)117 925 1304 www.worley.com	FIGURE 1	REV -
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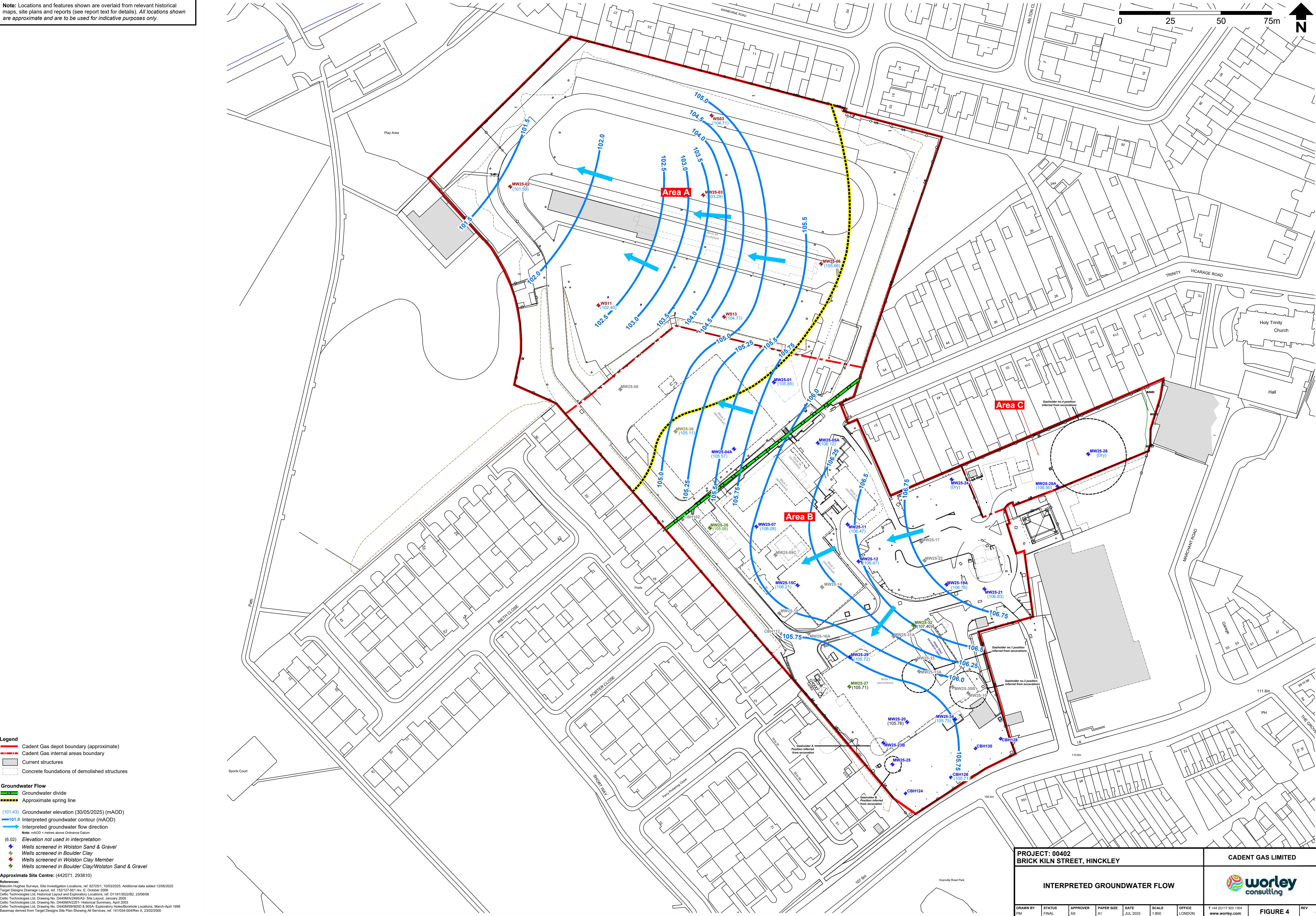
Q:\Hinckley Cadent\00402\00402

Note: Locations and features shown are overlaid from relevant historical maps, site plans and reports (see Phase 1 Desk Study 415001-00017_004 for details). All locations shown are approximate and are to be used for indicative purposes only.



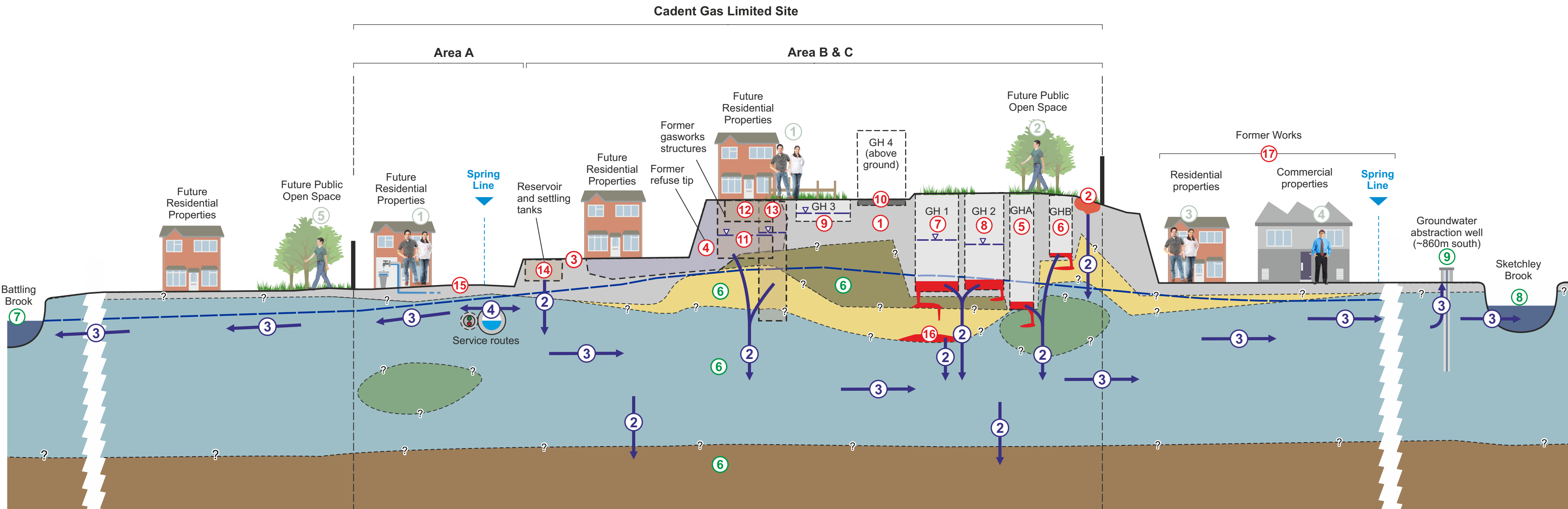


Note: Locations and features shown are overlaid from relevant historical maps, site plans and reports (see report text for details). All locations shown are approximate and are to be used for indicative purposes only.



North

South



Legend

- Made ground
- Oadby Member
- Wolston Sand and Gravel
- Bosworth Clay Member (Clay)
- Bosworth Clay Member (Silt)
- Mercia Mudstone Formation
- Perched water level
- Inferred groundwater level (June 2025)
- Free product noted in the form of globules or pockets of tar
- Contaminant pathways

Sources

- General Made Ground in Area B (not including hotspots of free product), including areas of former predominantly above ground features
- Hotspots of free-phase product within made ground west of former Blocks 1,2 & 3 (including vicinity of cast iron square tar tank)
- Asbestos in soils
- Former refuse tip, and infilled gravel pit
- Infilled Gasholder A - sub-surface structure
- Infilled Gasholder B - sub-surface structure
- Infilled Gasholder 1 - sub-surface structure, including perched waters
- Infilled Gasholder 2 - sub-surface structure, including perched waters
- Infilled Gasholder 3 - sub-surface structure, including perched waters
- Made Ground within Area C (including Gasholder 4 - above ground structure)
- Purifiers in Area B
- Scrubbers and Condensers in Area B
- Former brick structures with timber base in Area B
- Reservoir and settling tanks in Area B
- Made Ground within Area A (former coke tip)
- NAPL and contaminated groundwater (dissolved phase) in Sand and Gravels
- Offsite sources (Former Dye Works/ Hosiery Factory, Printing & Packaging Works)

Pathways (Migration)

- Migration of vapour/gas
- Leaching/dissolution from impacted soil/NAPL
- Migration in groundwater
- Migration via service routes (site drainage/sewers)
- Diffusion through drinking water pipes

Pathways (Exposure)

- Direct contact (dermal, ingestion, vapour/gas inhalation)
- Inhalation/direct contact via offsite migration (groundwater, wind-blown)

Receptors

- Future site users – residential with private gardens (allowing for ingestion of vegetables)
- Future site users – public open space (attenuation ponds and landscaped areas)
- Off-site residential properties (surrounding the site)
- Off-site commercial workers (primarily to the southeast)
- Off-site public open space (park) users (Clarendon Park in the northeast and Granville Road Park in the south)
- Groundwater (principally the Secondary A Aquifer associated with the Wolston Sand & Gravel Member, and the Secondary B Aquifer associated with the Oadby Member and Mercia Mudstone Formation)
- Surface Water: Battling Brook
- Surface Water: Sketchley Brook
- Groundwater extraction well - located approximately 860 m south of site for general farming and domestic use

Note: Only significant contaminant linkage pathways for controlled waters are shown. Human health pathways are not shown.

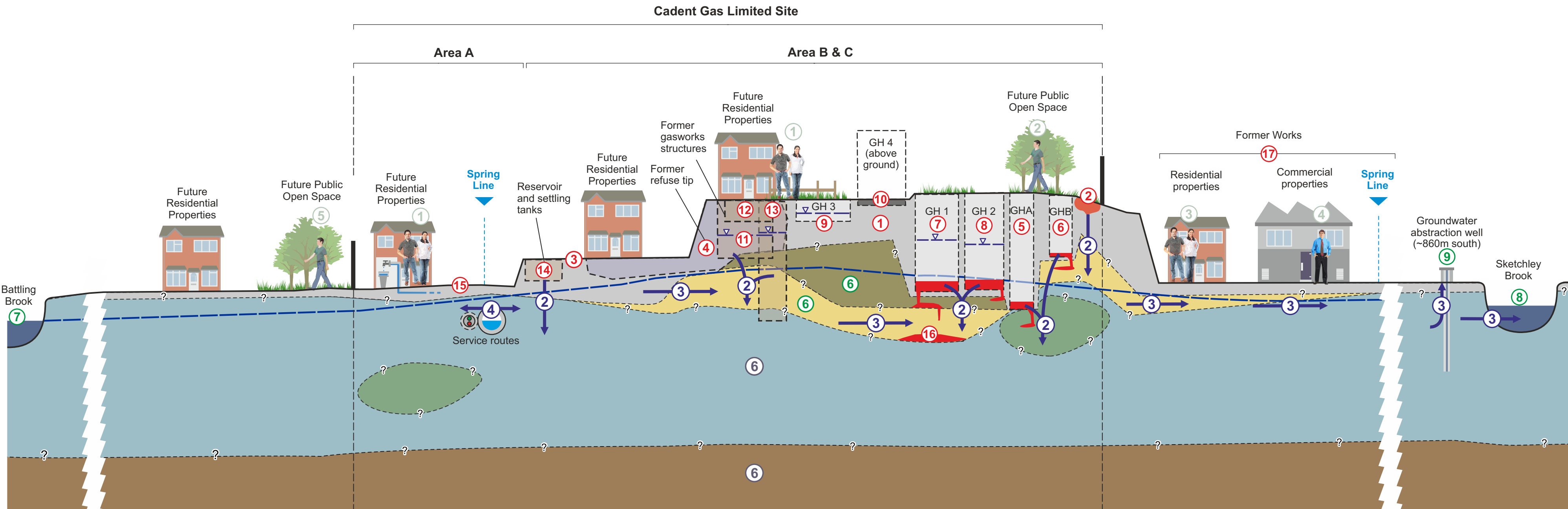
PROJECT: 00402 BRICK KILN STREET, HINCKLEY								CADENT GAS LIMITED		
INITIAL CONCEPTUAL SITE MODEL								worley consulting		
DRAWN BY PM	STATUS FINAL	APPROVER AS	PAPER SIZE A2	DATE JUL 2025	SCALE N/A	OFFICE LONDON	T +44 (0)117 925 1304 www.worley.com	FIGURE 5	REV -	

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Figure 6: Groundwater Source Zone Plan. This map illustrates the layout of a site, divided into three main areas: Area A (pink), Area B (yellow), and Area C (orange). The map includes numerous monitoring points (TP, MW, V, CPT, SH, BH, CP, CT, MG, RB, DB, CBH, R, G, EV) and infrastructure like roads (Trinity Vicarage Road, MARCHANT ROAD, RIETH CLOSE, PORTER CLOSE, SHORT WAY, FERRY PARKING CLOSE, BRICK KILN STREET, COVENTRY ROAD), buildings (Gymnastics centre, Holy Trinity Church, Hall, The Meeting Centre, Supermarket, Admins garage/store, Security lodge, Site entrance, B Sub Sta, HV switch room, Gas holder no. 1 position, Gas holder no. 2 position, Gas holder no. 3 position, Gas holder no. 4 position), and other features like a Play Area, Car Park, and a Diesel generator. A scale bar at the top right indicates 0, 25, and 50m. A north arrow is also present.

North

South



Legend

- Made ground
- Oadby Member
- Wolston Sand and Gravel
- Bosworth Clay Member (Clay)
- Bosworth Clay Member (Silt)
- Mercia Mudstone Formation
- Perched water level
- Inferred groundwater level (June 2025)
- Free product noted in the form of globules or pockets of tar
- Contaminant pathways

Sources

- General Made Ground in Area B (not including hotspots of free product), including areas of former predominantly above ground features
- Hotspots of free-phase product within made ground west of former Blocks 1,2 & 3 (including vicinity of cast iron square tar tank)
- Asbestos in soils
- Former refuse tip, and infilled gravel pit
- Infilled Gasholder A - sub-surface structure
- Infilled Gasholder B - sub-surface structure
- Infilled Gasholder 1 - sub-surface structure, including perched waters
- Infilled Gasholder 2 - sub-surface structure, including perched waters
- Infilled Gasholder 3 - sub-surface structure, including perched waters
- Made Ground within Area C (including Gasholder 4 - above ground structure)
- Purifiers in Area B
- Scrubbers and Condensers in Area B
- Former brick structures with timber base in Area B
- Reservoir and settling tanks in Area B
- Made Ground within Area A (former coke tip)
- NAPL and contaminated groundwater (dissolved phase) in Sand and Gravels
- Offsite sources (Former Dye Works/ Hosiery Factory, Printing & Packaging Works)

Pathways (Migration)

- Migration of vapour/gas
- Leaching/dissolution from impacted soil/NAPL
- Migration in groundwater
- Migration via service routes (site drainage/sewers)
- Diffusion through drinking water pipes

Pathways (Exposure)

- Direct contact (dermal, ingestion, vapour/gas inhalation)
- Inhalation/direct contact via offsite migration (groundwater, wind-blown)

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- Future site users – residential with private gardens (allowing for ingestion of vegetables)
- Future site users – public open space (attenuation ponds and landscaped areas)
- Off-site residential properties (surrounding the site)
- Off-site commercial workers (primarily to the southeast)
- Off-site public open space (park) users (Clarendon Park in the northeast and Granville Road Park in the south)
- Groundwater (principally the Secondary A Aquifer associated with the Wolston Sand & Gravel Member, and the Secondary B Aquifer associated with the Oadby Member and Mercia Mudstone Formation). The Bosworth Clay Member designated unproductive strata.
- Surface Water: Battling Brook
- Surface Water: Sketchley Brook
- Groundwater extraction well - located approximately 860 m south of site for general farming and domestic use

Note: Only significant contaminant linkage pathways for controlled waters are shown. Human health pathways are not shown.

PROJECT: 00402 BRICK KILN STREET, HINCKLEY								CADENT GAS LIMITED			
UPDATED CONCEPTUAL SITE MODEL								worley consulting			
DRAWN BY PM	STATUS FINAL	APPROVER AS	PAPER SIZE A2	DATE JUL 2025	SCALE N/A	OFFICE LONDON	T +44 (0)117 925 1304 www.worley.com	FIGURE 7	REV -		

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Appendix A. Supporting Information

Land Off Brick Kiln St, Hinckley

ILLUSTRATIVE MASTERPLAN



0 | 10 | 20 | 30 | 40 | 50m

LEGEND

Site Allocation Boundary

Primary Movement Routes

Secondary Movement Routes

Shared/Private Drives

Proposed Attenuation

Indicative position of new tree planting

Proposed POS

Potential Site Access off Brick Kiln St

Potential Highway Emergency Link

Easement

Existing Mast

Proposed Development Structure

Existing Trees

Potential footpath connections

LEGEND

Site Allocation Boundary

Primary Movement Routes

Secondary Movement Routes

Shared/Private Drives

Proposed Attenuation

Proposed Pedestrian/Cycle Routes

Indicative position of new tree planting

Proposed Development Structure

Existing Trees

Proposed POS

Potential Highway Emergency Link

Easement

Existing Mast

PORTER CLOSE

TRINITY VICARAGE RD

COVENTRY RD

DGL Associates Limited
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Southfield
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A2

Client	CADENT
Project	LAND OFF BRICK KILN ST, HINCKLEY
Drawing Title	ILLUSTRATIVE MASTERPLAN
Drawing No.	DGL_230929_5830.001



SOCIETY OF BROWNFIELD RISK ASSESSMENT

Non-Aqueous Phase Liquid – Guidance Notes for their Assessment in Contaminated Land Scenarios in the UK

2. Effective Solubility Tool

This series of reports and tools is published by the Society of Brownfield Risk Assessment (SoBRA). It presents work undertaken by the SoBRA non-aqueous phase liquid (NAPL) sub-group composed of volunteers listed in the acknowledgments below. This publication is part of a series of work packages designed to address various issues in data collection and evaluating risks associated with non-aqueous phase liquid (NAPL) as indicated in the accompanying figure.

Use of the solubility tool will provide the user with a robust and defensible approach to the use of effective solubility in the assessment of fuel contamination. It is imperative that users have read and understand the basis for the outputs of the tool and its limitations. Outputs are dependant on the chosen literature fuel type or chosen site specific values.

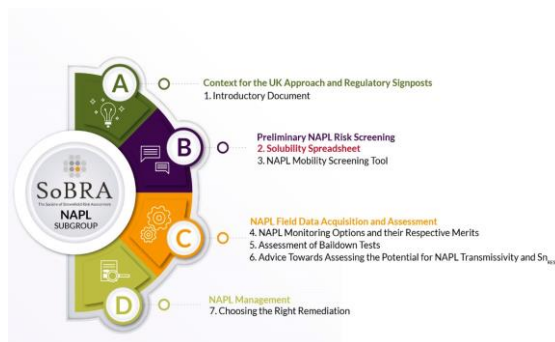
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Feedback on this workbook is welcomed and should be submitted to SoBRA at info@sobra.org.uk

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Non-Aqueous Phase Liquid – Guidance Notes for their Assessment in Contaminated Land Scenarios in the UK 2.
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ACKNOWLEDGMENTS

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Melinda Evans	Soilfix Ltd
Alexander Lee	HKA Ltd
Anil Waduge	RSK RAW
Conor Armstrong	Avada Environmental

Library of physical properties

Capability to add additional user defined compounds at the bottom of the list

User defined values

Compound/ Fractions (I)	Molecular Weight		Single Component Solubility		
	g.mol-1	Reference []	mg/L-1	°C	Reference []
VOCs					
Chloromethane	50.488	[EC, CLARE Report [4]	5350	25	[EC, CLARE Report [4]
Vinyl chloride (chloroethene)	62.5	[SC050021,0/87 [3]	2760	25	[SC050021,0/87 [3]
Chloroethane	64.51	[EC, CLARE Report [4]	5742	10	[EC, CLARE Report [4]
1,1-Dichloroethene	96.94	[EC, CLARE Report [4]	3100	5	[EC, CLARE Report [4]
Carbon disulphide	76.14	[SC050021,0/87 [3]	2100	20	[SC050021,0/87 [3]
Dichloromethane	84.93	[EC, CLARE Report [4]	20080	10	[EC, CLARE Report [4]
Methyl tertiary butyl ether (MTBE)	88.15	[EC, CLARE Report [4]	48000	20	[EC, CLARE Report [4]
trans-1,2-Dichloroethene	96.94	[EC, CLARE Report [4]	5250	10	[EC, CLARE Report [4]
1,1-Dichloroethane	96.96	[EC, CLARE Report [4]	3466	10	[EC, CLARE Report [4]
cis-1,2-Dichloroethene	96.94	[EC, CLARE Report [4]	7550	10	[EC, CLARE Report [4]
1,1,1-Trichloroethane	133.4	[SC050021,0/87 [3]	1300	10	[SC050021,0/87 [3]
1,2-Dichloroethane	98.98	[SC050021,0/87 [3]	8680	10	[SC050021,0/87 [3]
Benzene	78.11	[SC050021,0/87 [3]	1780	10	[SC050021,0/87 [3]
Trichloroethene	131.39	[SC050021,0/87 [3]	1370	10	[SC050021,0/87 [3]
1,2-Dichloropropane	112.99	[EC, CLARE Report [4]	2050	10	[EC, CLARE Report [4]
Bromodichloromethane	163.83	[EC, CLARE Report [4]	3000	30	[EC, CLARE Report [4]
Toluene	92.14	[SC050021,0/87 [3]	590	10	[SC050021,0/87 [3]
1,1,2-Trichloroethane	133.4	[EC, CLARE Report [4]	4491	10	[EC, CLARE Report [4]
Tetrachloroethene	166.83	[SC050021,0/87 [3]	225	10	[SC050021,0/87 [3]
Chlorobenzene	112.56	[SC050021,0/87 [3]	387	10	[SC050021,0/87 [3]
1,1,1,2-Tetrachloroethane	167.85	[SC050021,0/87 [3]	1110	10	[SC050021,0/87 [3]
Ethylbenzene	106.17	[SC050021,0/87 [3]	180	10	[SC050021,0/87 [3]
m-Xylene	106.17	[SC050021,0/87 [3]	200	10	[SC050021,0/87 [3]
o-Xylene	106.17	[SC050021,0/87 [3]	173	25	[SC050021,0/87 [3]
p-Xylene	106.17	[SC050021,0/87 [3]	200	10	[SC050021,0/87 [3]
Styrene	104.15	[EC, CLARE Report [4]	290	10	[EC, CLARE Report [4]
Bromoforn	252.73	[EC, CLARE Report [4]	3000	25	[EC, CLARE Report [4]
Isopropylbenzene	120.19	[EC, CLARE Report [4]	56	25	[EC, CLARE Report [4]
1,1,2,2-Tetrachloroethane	167.85	[SC050021,0/87 [3]	2930	10	[SC050021,0/87 [3]
Bromobenzene	157.01	[EC, CLARE Report [4]	388.04	10	[EC, CLARE Report [4]
Propylbenzene	120.19	[EC, CLARE Report [4]	54.1	10	[EC, CLARE Report [4]
2-Chlorotoluene	126.58	[SC050021,0/87 [3]	117	25	[SC050021,0/87 [3]
1,3,5-Trimethylbenzene	120.191	[EC, CLARE Report [4]	50	-	[EC, CLARE Report [4]
tert-Butylbenzene	134.22	[EC, CLARE Report [4]	27.3	25	[EC, CLARE Report [4]
1,2,4-Trimethylbenzene	120.19	[EC, CLARE Report [4]	59	25	[EC, CLARE Report [4]
sec-Butylbenzene	134.22	[EC, CLARE Report [4]	14	25	[EC, CLARE Report [4]
1,3-Dichlorobenzene	147	[SC050021,0/87 [3]	103	10	[SC050021,0/87 [3]
1,4-Dichlorobenzene	147	[SC050021,0/87 [3]	51.2	10	[SC050021,0/87 [3]
n-Butylbenzene	134.22	[EC, CLARE Report [4]	20.4	25	[EC, CLARE Report [4]
1,2-Dichlorobenzene	147	[SC050021,0/87 [3]	133	10	[SC050021,0/87 [3]
1,2,4-Trichlorobenzene	181.45	[SC050021,0/87 [3]	41.4	25	[SC050021,0/87 [3]
Naphthalene	128.17	[SC050021,0/87 [3]	19	10	[SC050021,0/87 [3]
1,2,3-Trichlorobenzene	181.45	[SC050021,0/87 [3]	21	25	[SC050021,0/87 [3]
1,3,5-Trichlorobenzene	181.45	[SC050021,0/87 [3]	6	25	[SC050021,0/87 [3]
Phenols					
Phenol	94.11	[SC050021,0/87 [3]	84100	25	[SC050021,0/87 [3]
2,4-Dimethylphenol	122.16	[EC, CLARE Report [4]	8106	25	[EC, CLARE Report [4]
2-Methylphenol	108.138	[EC, CLARE Report [4]	12383	25	[EC, CLARE Report [4]
3-Methylphenol	108.138	[EC, CLARE Report [4]	27503	25	[EC, CLARE Report [4]
4-Methylphenol	108.138	[EC, CLARE Report [4]	23392	25	[EC, CLARE Report [4]
BTEX					
Benzene	78.11	[SC050021,0/87 [3]	1780	10	[SC050021,0/87 [3]
Toluene	92.14	[SC050021,0/87 [3]	590	10	[SC050021,0/87 [3]
Ethylbenzene	106.17	[SC050021,0/87 [3]	180	10	[SC050021,0/87 [3]
m,p-Xylene	106.17	[SC050021,0/87 [3]	200	10	[SC050021,0/87 [3]
o-Xylene	106.17	[SC050021,0/87 [3]	173	25	[SC050021,0/87 [3]
Speciated TPH					
Aliphatics <C5-C6	81	TPH CWG Volume 3 [2]	36	-	TPH CWG Volume 3 [2]
Aliphatics <C6-C8	102	TPH CWG Volume 3 [2]	5.4	-	TPH CWG Volume 3 [2]
Aliphatics <C8-C10	130	TPH CWG Volume 3 [2]	0.43	-	TPH CWG Volume 3 [2]
Aliphatics <C10-C12	159	TPH CWG Volume 3 [2]	0.034	-	TPH CWG Volume 3 [2]
Aliphatics <C12-C16 (aq)	200	TPH CWG Volume 3 [2]	0.00076	-	TPH CWG Volume 3 [2]
Aliphatics <C16-C21 (aq)	269	TPH CWG Volume 3 [2]	0.000003	-	TPH CWG Volume 3 [2]
Aromatics <EC5-EC7	78	TPH CWG Volume 3 [2]	1780	-	TPH CWG Volume 3 [2]
Aromatics <EC7-EC8	92	TPH CWG Volume 3 [2]	590	-	TPH CWG Volume 3 [2]
Aromatics <EC8-EC10	120	TPH CWG Volume 3 [2]	65	-	TPH CWG Volume 3 [2]
Aromatics <EC10-EC12	126	TPH CWG Volume 3 [2]	25	-	TPH CWG Volume 3 [2]
Aromatics <EC12-EC16 (aq)	145	TPH CWG Volume 3 [2]	5.8	-	TPH CWG Volume 3 [2]
Aromatics <EC16-EC21 (aq)	168	TPH CWG Volume 3 [2]	0.65	-	TPH CWG Volume 3 [2]
Aromatics <EC21-EC35 (aq)	239	TPH CWG Volume 3 [2]	0.0066	-	TPH CWG Volume 3 [2]
PCBs					
PCB congener 118	326.43	[SC050021,Technical Review Documents [6]	0.0227	-	[SC050021,Technical Review Documents [6]
PCB congener 77	291.99	[SC050021,Technical Review Documents [6]	0.0643	-	[SC050021,Technical Review Documents [6]
PCB congener 81	291.99	[SC050021,Technical Review Documents [6]	0.0663	-	[SC050021,Technical Review Documents [6]
PCB congener 105	326.43	[SC050021,Technical Review Documents [6]	0.0227	-	[SC050021,Technical Review Documents [6]
PCB congener 114	326.43	[SC050021,Technical Review Documents [6]	0.0227	-	[SC050021,Technical Review Documents [6]
PCB congener 123	326.43	[SC050021,Technical Review Documents [6]	0.0218	-	[SC050021,Technical Review Documents [6]
PCB congener 126	326.43	[SC050021,Technical Review Documents [6]	0.0218	-	[SC050021,Technical Review Documents [6]
PCB congener 156	360.88	[SC050021,Technical Review Documents [6]	0.00741	-	[SC050021,Technical Review Documents [6]
PCB congener 157	360.88	[SC050021,Technical Review Documents [6]	0.00741	-	[SC050021,Technical Review Documents [6]
PCB congener 167	360.88	[SC050021,Technical Review Documents [6]	0.00741	-	[SC050021,Technical Review Documents [6]
PCB congener 169	360.88	[SC050021,Technical Review Documents [6]	0.00741	-	[SC050021,Technical Review Documents [6]
PCB congener 189	395.32	[SC050021,Technical Review Documents [6]	0.00249	-	[SC050021,Technical Review Documents [6]
PAHs					
Naphthalene (aq)	128.17	[SC050021,0/87 [3]	19	10	[SC050021,0/87 [3]
Acenaphthene (aq)	154.21	TPH CWG Volume 3 [2]	16.1	-	TPH CWG Volume 3 [2]
Acenaphthylene (aq)	152.2	TPH CWG Volume 3 [2]	16.1	-	TPH CWG Volume 3 [2]
Fluoranthene (aq)	202.25	[SC050021,0/87 [3]	0.23	25	[SC050021,0/87 [3]
Anthracene (aq)	178.2	TPH CWG Volume 3 [2]	0.045	-	TPH CWG Volume 3 [2]
Phenanthrene (aq)	178.2	TPH CWG Volume 3 [2]	1.1	-	TPH CWG Volume 3 [2]
Fluorene (aq)	166.2	TPH CWG Volume 3 [2]	1.9	-	TPH CWG Volume 3 [2]
Chrysene (aq)	228.29	[SC050021,0/87 [3]	0.002	25	[SC050021,0/87 [3]
Pyrene (aq)	202.25	[SC050021,0/87 [3]	0.13	-	[SC050021,0/87 [3]
Benzo(a)anthracene (aq)	228.29	[SC050021,0/87 [3]	0.0038	10	[SC050021,0/87 [3]
Benzo(b)fluoranthene (aq)	252.31	[SC050021,0/87 [3]	0.002	20	[SC050021,0/87 [3]
Benzo(k)fluoranthene (aq)	252.31	[SC050021,0/87 [3]	0.0008	25	[SC050021,0/87 [3]
Benzo(a)pyrene (aq)	252.31	[SC050021,0/87 [3]	0.0038	25	[SC050021,0/87 [3]
Dibenzo(a,h)anthracene (aq)	278.35	[SC050021,0/87 [3]	0.0006	25	[SC050021,0/87 [3]
Benzo(a,h,i)perylene (aq)	276.33	[SC050021,0/87 [3]	0.00026	25	[SC050021,0/87 [3]
Indeno(1,2,3-cd)pyrene (aq)	276.33	[SC050021,0/87 [3]	0.0002	25	[SC050021,0/87 [3]
Others					
2,4-Dinitrotoluene	182.13	[EC, CLARE Report [4]	129	12.4	[EC, CLARE Report [4]
2,6-Dinitrotoluene	182.13	[EC, CLARE Report [4]	232	25	[EC, CLARE Report [4]
1-Methylnaphthalene	142.2	[EC, CLARE Report [4]	20.5	10	[EC, CLARE Report [4]
2-Chloronaphthalene	162.62	[EC, CLARE Report [4]	11.7	25	[EC, CLARE Report [4]
2-Methylnaphthalene	142.2	[EC, CLARE Report [4]	25	25	[EC, CLARE Report [4]
Bisphenol	154.21	[EC, CLARE Report [4]	4.06	10	[EC, CLARE Report [4]
Bis (2-ethylhexyl) phthalate	390.56	[EC, CLARE Report [4]	0.17	20.3	[EC, CLARE Report [4]
Butyl benzyl phthalate	312	[EC, CLARE Report [4]	2.32	25	[EC, CLARE Report [4]
Carbazole	167.21	[EC, CLARE Report [4]	1364	25	[EC, CLARE Report [4]
Diethyl Phthalate	222.237	[EC, CLARE Report [4]	1200	25	[EC, CLARE Report [4]
Dimethyl phthalate	134.18	[EC, CLARE Report [4]	4000	25	[EC, CLARE Report [4]
Di-n-butyl phthalate	278.34	[EC, CLARE Report [4]	13.3	10	[EC, CLARE Report [4]
Di-n-octyl phthalate	390.56	[EC, CLARE Report [4]	0.0738-30764	25	[EC, CLARE Report [4]
Hexachloroethane	236.74	[EC, CLARE Report [4]	49.9	10	[EC, CLARE Report [4]
Isopropyltoluene	134.22	[EC, CLARE Report [4]	51	25	[EC, CLARE Report [4]

References

- 1 Total Petroleum Hydrocarbon Criteria Working Group Series, 1997. Volume 3. Selection of Representative TPH Fractions Based on Fate and Transport Considerations
- 2 CLARE, 2014. An Illustrated Handbook of LNAPL Transport and Fate in the Subsurface
- 3 Alaska Statement of Cooperation Working Group, 2006. Hydrocarbon Characterization for Use in the Hydrocarbon Risk Calculator and Example Characterizations of Selected Alaskan
- 4 CLARE, 2010. Soil Generic Assessment Criteria for Human Health Risk Assessment
- 5 Science Report SC050021,0/87 Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values
- 6 Science Report SC050021 / Diatoms SOV. Soil Guideline Values for dioxins, furans and dioxin-like PCBs in soil

Mass fraction library

= User defined values

Mass fraction library																
Compound/ Fractions (f)	Site Specific		Unleaded	Diesel	Kerosene	Mixture of Weathered Petrol and Diesel	Red Diesel (c. 7 years old)	Degraded Diesel 1	Degraded Diesel 2	Degraded Diesel 3	Degraded Diesel 4	Degraded Diesel 5	Weathered Petrol		Weathered Diesel	Weathered Petrol
	Molecular Weight of NAPL (g.mole ⁻¹):		105	230	165	173	217	219	225	219	214	218	117	113	218	115
Molecular Weight Reference:		[7]	[2]	[2]	[2]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]	[7]
Mass fraction reference:			[3]	[3]	[3]	Site Specific (SoBRA NAPL sample database)	Site Specific (SoBRA NAPL sample database)	Site Specific (SoBRA NAPL sample database)	Site Specific (SoBRA NAPL sample database)	Site Specific (SoBRA NAPL sample database)	Site Specific (SoBRA NAPL sample database)	Site Specific (SoBRA NAPL sample database)	Site Specific (SoBRA NAPL sample database)	Site Specific (SoBRA NAPL sample database)		
Aromatics																
EC5-EC6 Benzene	0.01		0.0325	0.0002	0.0047											
EC7-EC8 Toluene	0.01		0.1233	0.0013	0.0122	0.0260	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.1600	0.1600	0.0001	0.1600
EC8-EC10 (ethylbenzene, xylenes + others)	0.066		0.2286	0.0004	0.0033	0.1900	0.0012	0.0004	0.0001	0.0001	0.0017	0.0035	0.3500	0.4000	0.0012	0.3750
EC10-EC12 (includes naphthalene)	0.189		0.0486	0.0102	0.0146	0.0140	0.0099	0.0088	0.0049	0.0140	0.0170	0.0110	0.0570	0.0390	0.0111	0.0480
EC12-EC16	0.148		0.0026	0.0325	0.0410	0.0380	0.0480	0.1000	0.0610	0.0950	0.1100	0.0600	0.0071	0.0068	0.0790	0.0070
EC16-EC21	0.15		0.0002	0.0859	0.0163	0.0240	0.0470	0.1300	0.1400	0.1500	0.1600	0.0270	0.0081	0.0045	0.1090	0.0063
EC21-EC35	0.301		0.0001	0.0119	0.0002	0.0065	0.0082	0.0510	0.0660	0.0700	0.0660	0.0360	0.0009	0.0012	0.0495	0.0011
Aliphatics																
EC5-EC6	0.001		0.2320	0.0004	0.0575	0.0530	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.1700	0.0180	0.0001	0.0940
EC6-EC8	0.002		0.0435	0.0036	0.2327	0.1100	0.0020	0.0001	0.0001	0.0001	0.0008	0.0017	0.1700	0.2900	0.0008	0.2300
EC8-EC10	0.009		0.2018	0.0373	0.3598	0.0063	0.0340	0.0092	0.0055	0.0069	0.0140	0.0370	0.0110	0.0350	0.0178	0.0230
EC10-EC12	0.009		0.0819	0.1303	0.0604	0.0930	0.1100	0.0390	0.0300	0.0340	0.0400	0.1000	0.0028	0.0360	0.0588	0.0194
EC12-EC16	0.01		0.0044	0.2776	0.1543	0.2000	0.3200	0.2300	0.2100	0.1700	0.2000	0.3000	0.0270	0.0089	0.2383	0.0180
EC16-EC35	0.005		0.0006	0.4032	0.0251	0.2430	0.4200	0.4300	0.4800	0.4500	0.3900	0.4200	0.0440	0.0014	0.4317	0.0227
MTBE	0		0.0000	0.0000	0.0000									0.0005		
Mass fraction totals:		0.9100	1.0001	0.9948	0.9820	0.9938	1.0005	0.9997	0.9978	0.9903	0.9997	0.9964	1.0079	1.0013	0.9974	1.0044

References

- 1 Total Petroleum Hydrocarbon Criteria Working Group Series, 1997. Volume 3. Selection of Representative TPH Fractions Based on Fate and Transport Considerations
- 2 CL:AIRE, 2014. An Illustrated Handbook of LNAPL Transport and Fate in the Subsurface
- 3 Alaska Statement of Cooperation Working Group, 2006. Hydrocarbon Characterization for Use in the Hydrocarbon Risk Calculator and Example Characterizations of Selected Alaskan Fuels
- 4 CL:AIRE, 2010. Soil Generic Assessment Criteria for Human Health Risk Assessment
- 5 Science Report SC050021/SR7 Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values
- 6 Science Report SC050021 / Diatoms SCV. Soil Guideline Values for diatoms, furans and dioxin-like PCBs in soil
- 7 User defined molecular weight. See Molecular Weight Calculation Tab

Calculation sheet for NAPL Molecular Weight

Based on methodology set out in ANSR, 2015. Calculating Mole Fractions from LNAPL and Soil Samples. Applied NAPL Science Review. Volume 5, Issue 1.

A site specific NAPL molecular weight is the sum of the product of each component's mass fractions by molecular weight

$$MW_o = \sum (MF_i \times MW_i)$$

= Calculation outputs
 = User defined value

User defined list.

Determinand	Mass fraction	Molecular weight	Component Mass fraction x molecular weight
i	g.g-1 MF _i	g.mole-1 MW _i	g.mole-1 MF _i x MW _i
Aliphatics >C5-C6	0.001	81	0.081
Aliphatics >C6-C8	0.002	102	0.204
Aliphatics >C8-C10	0.009	130	1.17
Aliphatics >C10-C12	0.009	159	1.431
Aliphatics >C12-C16 (aq)	0.01	200	2
Aliphatics >C16-C21 (aq)	0.005	269	1.345

Aromatics >EC5-EC7	0.01	78	0.78
Aromatics >EC7-EC8	0.01	92	0.92
Aromatics >EC8-EC10	0.066	120	7.92
Aromatics >EC10-EC12	0.189	126	23.814
Aromatics >EC12-EC16 (aq)	0.148	145	21.46
Aromatics >EC16-EC21 (aq)	0.15	168	25.2
Aromatics >EC21-EC35 (aq)	0.301	239	71.939

Calculated NAPL molecular weight (MW _o):			158
Mass fraction total:			0.91
			g.mole-1

Calculation sheet for effective solubility of standard fuel types

Based on Raoult's Law and methodology set out in CL:AIRE, 2017. Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies. CL:AIRE, London. ISBN 978-1-905046-31-7
©SoBRA, 2022

NAPL Type **Site Specific**

Determinand	Mass fraction	Pure phase solubility mg.L-1	Molecular weight g.mole-1	NAPL Molecular weight g.mole-1	Mole Fraction	Effective Solubility mg.L-1
i	MF _i	C _i ⁰	MW _i	MW ₀	x _i	C _i
Aromatics						
EC5-EC6 Benzene	0.01	1780	78	158	2.03E-02	3.61E+01
EC7-EC8 Toluene	0.01	590	92	158	1.72E-02	1.01E+01
EC8-EC10 (ethylbenzene, xylenes + others)	0.066	65	120	158	8.69E-02	5.65E+00
EC10-EC12 (includes naphthalene)	0.189	25	126	158	2.37E-01	5.93E+00
EC12-EC16	0.148	5.8	145	158	1.61E-01	9.35E-01
EC16-EC21	0.15	0.65	168	158	1.41E-01	9.17E-02
EC21-EC35	0.301	0.0066	239	158	1.99E-01	1.31E-03
Aliphatics						
EC5-EC6	0.001	36	81	158	1.95E-03	7.02E-02
EC6-EC8	0.002	5.4	102	158	3.10E-03	1.67E-02
EC8-EC10	0.009	0.43	130	158	1.09E-02	4.70E-03
EC10-EC12	0.009	0.034	159	158	8.94E-03	3.04E-04
EC12-EC16	0.01	0.00076	200	158	7.90E-03	6.00E-06
EC16-EC35	0.005	0.000003	269	158	2.94E-03	8.81E-09
MTBE		43000	88	158		
Mass fraction total:	0.91					

Raoult's Law

$$C_i = x_i C_i^0$$

Where:

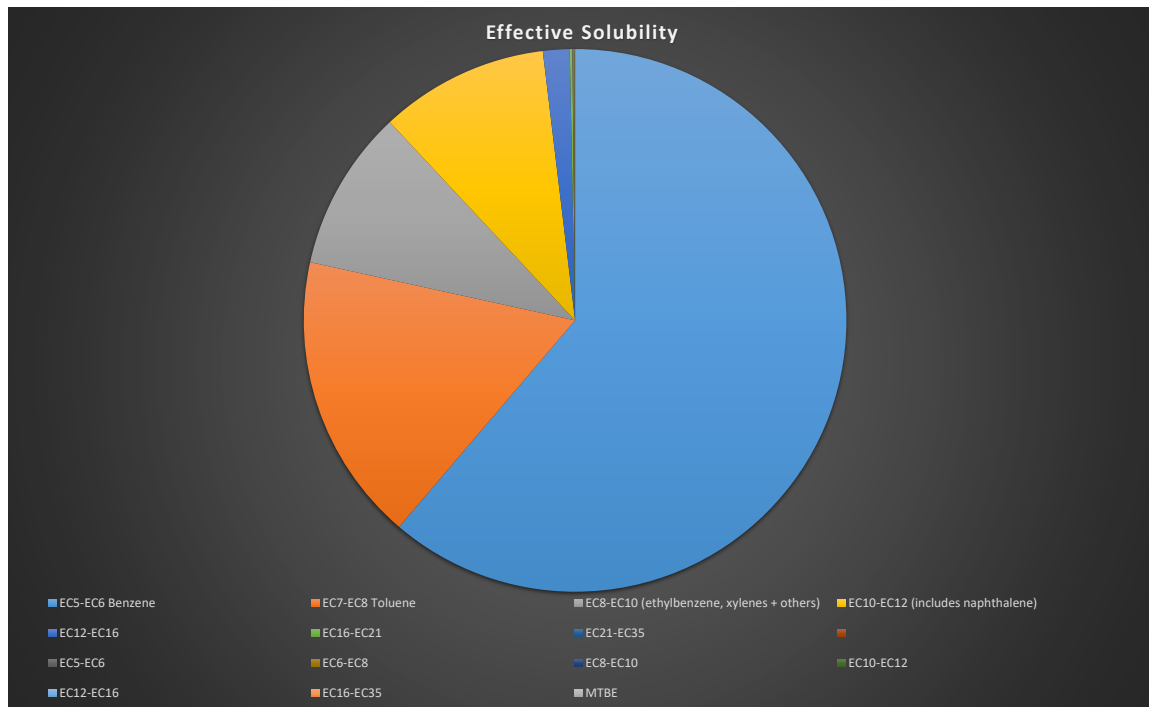
C_i = Effective solubility of a compound *i* (in a mixture) at equilibrium (mg.L-1)
x_i = mole fraction of *i* in the mixture
C_i⁰ = aqueous solubility concentration of the pure compound (mg.L-1)

The mole fraction, x_i, is defined as:

$$x_i = MF_i \times (MW_0 / MW_i)$$

Where:

MF_i = mass fraction compound *i* in hydrocarbon mixture
MW_i = molecular weight of compound *i* (g.mole-1)
MW₀ = approximated molecular weight of the hydrocarbon mixture (g.mole-1)



Worley Parsons
2nd Floor
Bull Wharf
Redcliff Street
Bristol
United Kingdom
BS1 6QR



4225



Attention : Brooke Davison
Date : 1st April, 2025
Your reference : 415001-00017_00401
Our reference : Test Report 25/4497 Batch 1 Schedule A
Location : Brick Kiln Street, Hinckley
Date samples received : 21st March, 2025
Status : Final Report
Issue : 202504011146

One sample was received for analysis on 21st March, 2025 and was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 0.217 kg of CO2

Scope 1&2&3 emissions - 0.513 kg of CO2

Authorised By:



Simon Gomery BSc

Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Worley Parsons
Reference: 415001-00017_00401
Location: Brick Kiln Street, Hinckley
Contact: Brooke Davison
EMT Job No: 25/4497

Report : Product

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-2										Please see attached notes for all abbreviations and acronyms		
Sample ID	MW2S-23B												
Depth													
COC No / misc													
Containers	V												
Sample Date	19/03/2025												
Sample Type	Product												
Batch Number	1												
Date of Receipt	21/03/2025										LOD/LOR	Units	Method No.
Whole Oil Trace #	See Attached											None	TM1/PM0
Density @20°C	1.0778										<0.0000	g/cm3	TM11/PM0
TPH CWG													
Aliphatics													
>C5-C6 (EH_CU_1D_AL) #	<0.1 ⁺										<0.1	%	TM1/PM0
>C6-C8 (EH_CU_1D_AL) #	0.2 ⁺										<0.1	%	TM1/PM0
>C8-C10 (EH_CU_1D_AL) #	0.9 ⁺										<0.1	%	TM1/PM0
>C10-C12 (EH_CU_1D_AL) #	0.9 ⁺										<0.1	%	TM1/PM0
>C12-C16 (EH_CU_1D_AL) #	1.0 ⁺										<0.1	%	TM1/PM0
>C16-C21 (EH_CU_1D_AL) #	0.5 ⁺										<0.1	%	TM1/PM0
>C21-C35 (EH_CU_1D_AL) #	0.4 ⁺										<0.1	%	TM1/PM0
Aromatics													
>EC6-EC8 (EH_CU_1D_AR) #	2.0 ⁺										<0.1	%	TM1/PM0
>EC8-EC10 (EH_CU_1D_AR) #	6.6 ⁺										<0.1	%	TM1/PM0
>EC10-EC12 (EH_CU_1D_AR) #	18.9 ⁺										<0.1	%	TM1/PM0
>EC12-EC16 (EH_CU_1D_AR) #	14.8 ⁺										<0.1	%	TM1/PM0
>EC16-EC21 (EH_CU_1D_AR) #	15.0 ⁺										<0.1	%	TM1/PM0
>EC21-EC35 (EH_CU_1D_AR) #	30.1 ⁺										<0.1	%	TM1/PM0

Client Name: Worley Parsons
Reference: 415001-00017_00401
Location: Brick Kiln Street, Hinckley
Contact: Brooke Davison

EMT Job No.: 25/4497
EMT Sample No.: 1
Sample Identity: MW2S-23B
Depth:

Description: Dark brown coloured oil
Carbon Range: 6-40+
Boiling Point Range (°C): 69-525+

% Diesel: -
% Petrol: -
Estimated % Weathering of Petrol: -

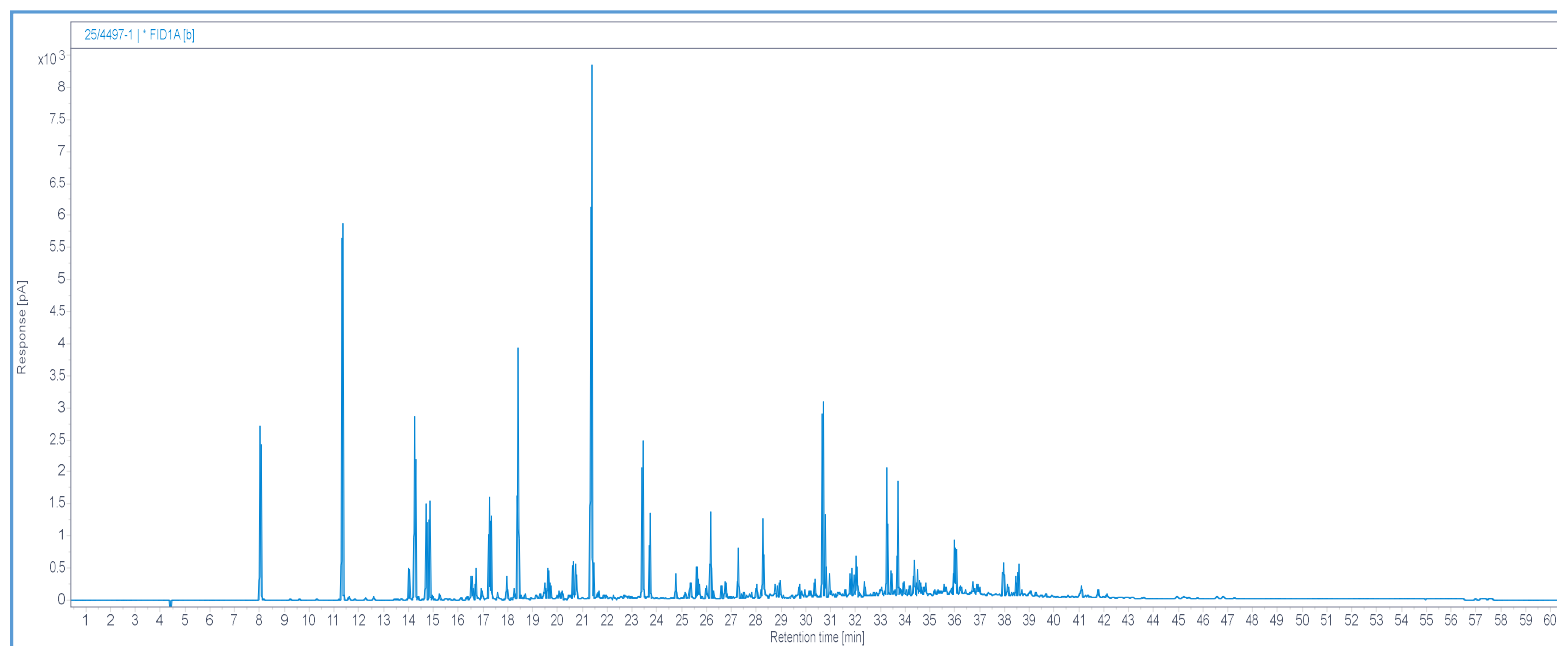
Pristane/Phytane Ratio: n/a
nC₁₇/Pristane Ratio: n/a

Toluene/nC₈ ratio of Petrol: -
Age of Petrol (years) (schmidt et al 2002): -

Age of Diesel (+/- 2 years)*: Not possible as relevant markers are either not present or values are above the permitted range

Interpretation: Coal tar

Chromatogram:



*The age of release estimated in this report is based on the nC₁₇/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996). Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory is not aware.

Client Name:	Worley Parsons
Reference:	415001-00017_00401
Location:	Brick Kiln Street, Hinckley
Contact:	Brooke Davison

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/4497

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).

Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitatively, with a matrix specific limit of detection.

Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 25/4497

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM1	Modified USEPA 8015B v2:1996 method for the determination of carbon banding in oil and product samples by GC-FID.	PM0	No preparation is required.			AR	
TM1	Modified USEPA 8015B v2:1996 method for the determination of carbon banding in oil and product samples by GC-FID.	PM0	No preparation is required.	Yes		AR	
TM11	Determination of density by a meter.	PM0	No preparation is required.			AR	

Appendix B. Model Inputs

B.1 Contaminant Properties

COPC	Recommended Petroleum Hydrocarbon COPC indicator (21)	COPC for Contaminant Source	Determination (JAGDAG, 2017)	DWS ⁽¹⁹⁾ ⁽²⁰⁾ (mg.L ⁻¹) CP1	EQS ⁽¹⁸⁾ (mg.L ⁻¹) CP2	Maximum Concentration			Henrys Law Constant (dimensionless)	Half Life for Degradation (days)	Organic Partition Coefficient (Literature) Koc (L.kg ⁻¹)	Distribution Coefficient (Literature) Kd (L.kg ⁻¹)
						Soil (mg.kg ⁻¹)	Leachate (mg.L ⁻¹)	Groundwater (mg.L ⁻¹)				
Cyanide (Total)	n/a	S1 – S4	Non-hazardous pollutant	0.05	--	1200	50	8.6	0 ⁽¹³⁾	365 ⁽¹²⁾	--	9.9 ⁽¹⁵⁾
Cyanide (free)	n/a	S1 – S4	Non-hazardous pollutant	--	0.001	340	0.087	0.07	0 ⁽¹³⁾	365 ⁽¹⁰⁾	--	9.9 ⁽¹⁵⁾
Sulphate	n/a	S1 – S4	--	250	--	6900	1760	2220	0 ⁽¹³⁾	1 x 10 ³⁰ ⁽⁹⁾	--	0.23 ⁽¹⁶⁾
Ammonium as NH4	n/a	S1 – S4	--	0.5	--	430	40	680	0 ⁽¹³⁾	2,190 ⁽⁶⁾	0.4 ⁽⁶⁾	--
Ammoniacal N (total) as N	n/a	S1 – S4	Non-hazardous pollutant	--	1.1	335	31	528.9	0 ⁽¹³⁾	2,190 ⁽⁶⁾	0.4 ⁽⁶⁾	--
Phenol	n/a	S1 – S4	Non-hazardous pollutant	--	0.0077	2.4	0.29	56	8.35 x 10 ⁻⁶ ⁽¹⁾	175 ⁽²⁾	83 ⁽¹⁾	--
Naphthalene	n/a	S1 – S4	Non-hazardous pollutant	--	0.002	2400	2.15	6.8	0.00662 ⁽¹⁾	600 ⁽²⁾	646 ⁽¹⁾	--
Anthracene	n/a	S1 – S4	Hazardous substance	--	0.0001	650	0.0069	0.36	0.0016 ⁽¹⁾	1,840 ⁽³⁾	29,512 ⁽⁴⁾	--
Fluoranthene	n/a	S1 – S4	Hazardous substance	--	0.0000063	1200	0.0052	0.81	6.29 x 10 ⁻⁵ ⁽¹⁾	1,759 ⁽³⁾	18,197 ⁽¹⁾	--
Benzo(a)pyrene	n/a	S1 – S4	Hazardous substance	0.00001	0.00000017	390	0.00061	0.27	1.76 x 10 ⁻⁶ ⁽¹⁾	2,117 ⁽³⁾	128,825 ⁽¹⁾	--
Sum of 4 PAH ⁽⁵⁾	n/a	S1 – S4	Hazardous substance	0.0001	--	890	0.00092	0.65	2.05 x 10 ⁻⁶ ⁽¹⁾	2,920 ⁽³⁾	87,096 ⁽¹⁾	--
Arsenic	n/a	S1 – S4	Hazardous substance	0.01	0.01	220	0.055	0.088	0 ⁽¹³⁾	1 x 10 ³⁰ ⁽⁹⁾	--	500 ⁽⁷⁾
Mercury	n/a	S1 – S4	Hazardous substance	--	0.00001	55	0.004	0.00199	0 ⁽¹³⁾	1 x 10 ³⁰ ⁽⁹⁾	--	15849
Benzene	n/a	S1 – S4	Hazardous substance	0.001	0.01	46	0.13	22	0.116 ⁽¹⁾	300 ⁽²⁾	68 ⁽¹⁾	--
Toluene	n/a	S1 – S4	Hazardous substance	0.7	0.074	42	0.29	14	0.115 ⁽¹⁾	175 ⁽²⁾	204 ⁽¹⁾	--
Ethylbenzene	n/a	S1 – S4	Hazardous substance	0.3	0.02	850	0.12	0.39	0.139 ⁽¹⁾	500 ⁽²⁾	447 ⁽¹⁾	--
Xylenes	n/a	S1 – S4	Hazardous substance	0.5	0.03	167	0.41	6.1	0.112 ⁽¹⁾⁽⁸⁾	300 ⁽²⁾	490 ⁽¹⁾⁽⁸⁾	--
TPH Aromatic C10-C12	naphthalene	S1 – S4	--	0.09	--	1800	0.55	156	0.00662 ⁽¹⁾	600 ⁽²⁾	2,500 ⁽¹⁷⁾	--
TPH Aromatic C12-C16	acenaphthene	S1 – S4	--	0.09	--	3500	10.1	33.7	0.00492 ⁽⁴⁾	408 ⁽³⁾	5,000 ⁽¹⁷⁾	--

- EA (2008) Compilation of Data for Priority Organic Pollutants for Derivation of Soil Guideline Values (SR7).
- The Effects of Contaminant Concentration on the Potential for Natural Attenuation. R&D Technical Report P2-228/TR. Environment Agency (2002). Shallow sand/gravel aquifer. Mid-point of range provided.
- Howard (1991) Handbook of Environmental Degradation Rates. (Aqueous half-life, high end of range provided - anaerobic)
- Environment Agency (2003). Review of the Fate and Transport of Selected Contaminants in the Soil Environment. Draft Technical Report P5-079/TR1.
- Parameter values taken from references for Indeno(123-cd)pyrene.
- EA (2003) Review of ammonium attenuation in soil and groundwater, lower end of values presented for sand and gravel, clayey. Aerobic conditions est. 1 – 6 years. Upper end of value range for to reflect mildly reducing conditions (NGWCLC report NC/02/49).
- EA (2009) Supplementary Information For The Derivation Of SGV For Arsenic. Science report SC050021 for sand, loam and clay soil.
- Parameter values taken from references for m-xylene.
- Contaminant not considered readily biodegradable.
- The value adopted for cyanide degradation has been derived by Advisian from a number of reference sources to provide a suitably conservative modelling parameter considered to be representative of the microbial degradation conditions that would prevail at a gasworks site. This takes into account the potential inhibitory effect on degradation that is considered likely due to multiple contaminants present. The principal reference sources used are a) Chemistry and Treatment of Cyanidation Wastes.

Adrian Smith and Terry Mudder. Mining Journal Books Limited, London, p293, b) Proposed EQS for WFD Annex VIII Substances: Cyanide (free) [for consultation]. Environment Agency [2012]) and c) The Fate of Cyanide in Groundwater at Gasworks sites in South Eastern Australia. Meehan. September 2000, PhD University of Melbourne.

11. Nathanail et al., 2009. *The LQM/ CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Ed).* Land Quality Press, Nottingham

12. Total cyanide conservatively modelled using fate and transport for free cyanide.

13. For non-volatile contaminants and inorganics, Henry's Law Coefficient is assumed to be zero.

14. Partition Coefficients for Metals in Surface Water, Soil and Waste. Allison et al., 2005. Soil/ Water, median value.

15. Soil screening Guidance. Superfund Technical Background Document. USEPA 1996.

16. EA (2005) Development of the partition coefficient (Kd) test method for use in environmental risk assessments

17. Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies, CL:AIRE, 2017.

18. EQS: The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 – Fresh Water Bodies

19. WHO, 2008 Guidelines for Drinking Water

20. DWS: The Water Supply (Water Quality) Regulations 2016

21. Recommended petroleum hydrocarbon CoPC indicator (CL:AIRE, 2017) Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies.

B.2 Contaminant Properties

Soil Source Characteristics (Area B and C)

Property	Value	Justification/ Rationale
Bulk density (made ground)	1.18 (g.cm ⁻³)	General description of made ground at site is described as gravel with varying quantities of clay and sand. As such a bulk density value for sand is considered reflective of the site conditions. (EA, SR3)
Water filled porosity (made ground)	0.24	General description of made ground at site is described as gravel with varying quantities of clay and sand. As such a bulk density value for sand is considered reflective of the site conditions. (EA, SR3)
Air filled porosity (made ground)	0.3	General description of made ground at site is described as gravel with varying quantities of clay and sand. As such a bulk density value for sand is considered reflective of the site conditions. (EA, SR3)
Infiltration	0.00058 (m.d ⁻¹)	Annual average rainfall at the nearest Meteorological Office weather station ("Coventry, Coundon" weather station) is 698.3mm.yr⁻¹ based on Meteorological Office data from 1991 to 2020 (Met Office, 2025). The illustrative master plan (Appendix A) indicates that the approximate cover at the site is: - Housing, driveways, pathways and associated roadways – 77% - Vegetated areas (public open space) and attenuation ponds – 23% It is noted that the proposed layout may be subject to change. An infiltration factor of 0.3 has been adopted assuming ~70% hardstanding/buildings across the site. As such, actual infiltration is estimated to be 210 mm.yr⁻¹ (5.8 x 10⁻⁴ m.day⁻¹).
Area of contaminant source	SZ2: Area south of spring line (Area B and Area C): 42,750 (m ²)	Source length and width of 225m x 190m used to calculate approximate area of source.
Length of source in direction of groundwater flow	S2: Area south of spring line (Area B and Area C): 225 (m)	Measured in the direction of groundwater flow taken from monitoring data at the site; northeast to southwest across the site. Includes Area B and Area C, maximum extent.
Fraction of organic carbon (made ground)	S2: Area south of spring line (Area B and Area C): 0.019	FOC analysed within three samples of Made Ground within Area B; 0.017, 0.0037 and 0.021.

Aquifer Characteristics (Wolston Sand and Gravel Unit)

Dominant transport mechanism for dissolved phase plume at the site considered to be intergranular flow within the basal sands and gravel unit of the Wolston Sand and Gravel, with some connectivity at the interface with the Oadby Member (granular lenses within Till). Aquifer properties adopted within this assessment are reflective of the transport pathway.

Property	Value	Justification/ Rationale
Effective porosity aquifer (Wolston Sands and Gravel)	0.3	Average effective porosity value for gravelly sand from Alvarez, P.J.J and Illman, W.AI, Bioremediation and natural attenuation, John Wiley & Sons 2006.
Hydraulic conductivity aquifer (Wolston Sands and Gravel)	1.39 (m.d ⁻¹) [Sensitivity = 6.62 x 10 ⁻² m.d ⁻¹ to 1.59 m.d ⁻¹]	Average (geomean) value from multiple slug tests (rising and falling) completed at three locations (MW25-05A, MW25-19A and MW25-28A within the Wolston Sand and Gravel. Values ranged between 6.62 x 10 ⁻² m.day ⁻¹ to 1.59 m.day ⁻¹ , with a geomean of 1.39 m.day ⁻¹ .
Hydraulic gradient aquifer (Wolston Sands and Gravel)	0.0087	Average gradient calculated from groundwater contours within the Wolston Sand and Gravel across the site. Groundwater levels within the Wolston Sand and Gravel monitored within boreholes outside of structures in the south/centre of the site (MW25-05, MW25-07, MW25-19A, MW25-27, MW25-28A, MW25-34) were measured on various monitoring rounds; a most likely gradient of 0.0087 has been adopted.
Saturated aquifer thickness (Wolston Sands and Gravel)	4 (m) [Sensitivity = 9 m]	Estimated thickness across site based on monitoring well logs. Saturated thickness of the Wolston Sand and Gravels has been identified between circa 1.5 and 5 m bgl (most commonly circa 4 m bgl), based on groundwater monitoring data and the top of the Wolston Clay Formation. To the south of the site, silt was encountered below the Sand and Gravel formation to around 12-14 m bgl, which was visually impacted by hydrocarbons and likely in hydraulic conductivity with the overlying deposits. The saturated thickness of material (sand and gravel and silt) within this area is considered to be thicker - up to around 9 m.
Bulk density (Wolston Sands and Gravel)	1.63 (g.cm ⁻³)	The Wolston Sand and Gravels predominantly comprise sands. Therefore, bulk density for a fine sand (1.6 g.cm ⁻³) could be considered representative of the superficial aquifer (Alvarez & Illman, 2006). CPT results for unit weight within CPT25-04, CP25-07, CPT25-08 and CPT25-15 are between 15 to 17 kN/m ³ within the sands, divided by 9.81 = 1.53 to 1.73 g.cm ⁻³ . Average of 1.63 g.cm ⁻³ adopted. Noting that silts generally showed lower values (~14 kN/m ³ / 1.43 g.cm ⁻³).
Fraction of organic carbon (Wolston Sands and Gravel)	0.0019	Ten environmental samples recovered from the Wolston Sand and Gravels Formation with an FOC between <0.001 and 0.02. Most common value used. No significant visual or olfactory contamination recorded in sample locations.
Plume width at source	190 (m)	Measured perpendicular to the direction of groundwater flow taken from monitoring data at the site; northwest to southeast across the site.
Plume thickness at source	4 (m)	Assumed to be 100% of saturated Wolston Sand and Gravel thickness.
Mixing zone thickness	--	Thickness calculated in the Remedial Target model.

Property	Value	Justification/ Rationale
Distance to Compliance Point	CP1 = 50 (m)	Distance along groundwater flow path to default groundwater resource compliance point (for comparison to DWS). Considered protective of superficial Secondary A Aquifer, Wolston Sand and Gravel.
	CP2 = 300 (m)	Distance along groundwater flow path to default groundwater resource compliance point (for comparison to EQS). Midpoint between the site and surface water adopted. Surface water receptor approximately 670 m down hydraulic gradient. Considered protective of the Sketchely Brook (fresh water body)

Appendix C. Model Outputs

Appendix D. Screened Analytical Results



Table C1: M-BAT Screened Groundwater Data – Area A

Brick Kiln Street, Hinckley

NUMBER OF SAMPLES: 15						Sample Location				MW25-02	MW25-02	MW25-02	MW25-02-DUP	MW25-02-DUP	MW25-03	MW25-03	MW25-03	MW25-03-DUP	MW25-03-DUP	MW25-06	MW25-06	MW25-06	MW25-06-DUP	MW25-06-DUP
						Monitoring Round No.				1	2	3	2	3	1	2	3	1	3	1	2	3	2	3
						Date Sampled				17/03/2025	07/04/2025	28/04/2025	07/04/2025	28/04/2025	17/03/2025	07/04/2025	28/04/2025	17/03/2025	28/04/2025	17/03/2025	07/04/2025	28/04/2025	07/04/2025	28/04/2025
CRITERIA 1						CRITERIA 1					Wolston Clay Member				Wolston Clay Member				Wolston Clay Member					
Analytical Parameter	Units	Limit of detection	M-BAT	No. Analyses	Exceedances	Min	Mean	Max	Max ID															
Copper	mg.L ⁻¹	0.0005	0.008	15	0	0.0011	0.0019	0.0031	MW25-03	0.0015	0.0015	0.0026	0.0012	0.0023	0.0031	0.0011	0.0013	0.0030	0.0013	0.0027	0.0015	0.0019	0.0012	0.0020
Nickel	mg.L ⁻¹	0.0005	0.014	15	0	0.0012	0.0025	0.0041	MW25-03	0.0014	0.0014	0.0013	0.0013	0.0012	0.0041	0.0027	0.0027	0.0039	0.0024	0.0031	0.0028	0.0029	0.0029	0.0031
Zinc	mg.L ⁻¹	0.0005	0.021	15	1	0.001	0.0048	0.0294	MW25-02	0.0016	0.0010	0.029	0.0014	0.0039	0.0064	0.0013	0.0020	0.0070	0.0038	0.0034	0.0013	0.0035	0.0015	0.0046

Table C2: M-BAT Screened Groundwater Analytical Data - Area B

										Settling tanks	Settling tanks	Settling tanks	Settling tanks	Settling tanks	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Reservoir	Reservoir	Reservoir	Reservoir	GH1	GH1	GH1	GH1	GH1	GH1	GH1	GH2												
NUMBER OF SAMPLES:		121		Sample Location						MW25-01	MW25-01	MW25-01	MW25-01-DUP	MW25-01-DUP	MW25-04A	MW25-04A	MW25-04A	MW25-07	MW25-07	MW25-07	MW25-35	MW25-35	MW25-35	MW25-36	MW25-36	MW25-36	MW25-36-DUP	MW25-13A	MW25-13A	MW25-13A	MW25-33	MW25-33	MW25-33	MW25-10																
										Monitoring Round No.		1	2	3	1	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1												
										Date Sampled		17/03/2025	07/04/2025	28/04/2025	07/04/2025	28/04/2025	17/03/2025	07/04/2025	28/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	07/04/2025	28/04/2025	17/03/2025	07/04/2025	28/04/2025	17/03/2025	19/03/2025	09/04/2025	30/04/2025	18/03/2025	09/04/2025	30/04/2025	19/03/2025														
										CRITERIA 1		CRITERIA 1		Stratum		Wolston Sand & Gravel					Wolston Sand & Gravel					Boulder Clay/Wolston Sand & Gravel					Boulder Clay/Wolston Sand & Gravel					Wolston Sand & Gravel/Wolston Clay					Made Ground					Made Ground				
Analytical Parameter	Units	Limit of detection	M-BAT	No. Analyses	Exceedances	Min	Mean	Max	Max ID																																									
Copper	mg.L ⁻¹	0.0005	0.048	121	0	<0.0005	<0.0033	0.017	CBH108-DUP	0.0051	0.0020	0.0012	0.0023	0.0020	0.0033	0.0024	0.0029	0.0044	0.0048	0.0094	0.0033	0.0042	0.0020	0.0023	0.0029	0.0040	0.0028	0.0016	0.0016	0.0021	0.0015	0.0017	0.0022	0.0061																
Lead	mg.L ⁻¹	0.0002	0.024	121	0	<0.0002	<0.0003	0.0052	CBH104	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	0.00020	0.0012																
Nickel	mg.L ⁻¹	0.0005	0.036	121	0	0.0006	0.0056	0.023	MW25-17	0.0054	0.0050	0.0052	0.0049	0.0061	0.0055	0.0053	0.0052	0.013	0.014	0.017	0.0031	0.0030	0.0042	0.0058	0.0051	0.0051	0.0055	0.0017	0.0012	0.0016	0.0022	0.0017	0.0018	0.015																
Zinc	mg.L ⁻¹	0.0005	0.073	121	0	0.0006	0.006	0.0499	CBH104	0.0027	0.00090	0.0095	0.0010	0.020	0.0048	0.0034	0.0048	0.0071	0.0055	0.032	0.0080	0.0070	0.0073	0.0049	0.0038	0.0046	0.0031	0.0024	0.00080	0.0022	0.0015	0.0015	0.0026	0.0019																

										GH2	GH2	GH2	GH2	GH2	GH3	GH3	GH3	GH3	GH3	GH3	GHA	GHA	GHA	GH8	GH8	GH8	Primary Purifiers	Primary Purifiers	Primary Purifiers	Purifier Catch box	Purifier Catch box	Purifier Catch box	Brick structure	Brick structure																																																	
NUMBER OF SAMPLES: 121										Sample Location		MW25-10	MW25-10	MW25-30B	MW25-30B	MW25-30B	MW25-17	MW25-17	MW25-17	MW25-22	MW25-22	MW25-22	MW25-23B	MW25-23B	MW25-23B	MW25-25	MW25-25	MW25-25	MW25-11	MW25-11	MW25-11	MW25-14	MW25-14	MW25-14	MW25-09C	MW25-09C																																															
										Monitoring Round No.		2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2																																																		
										Date Sampled		09/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	17/03/2025	07/04/2025	28/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	10/04/2025	07/05/2025	19/03/2025	09/04/2025	30/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025																																															
										CRITERIA 1		CRITERIA 1		Stratum										Made Ground										Made Ground/Wolston Sand & Gravel										Wolston Sand & Gravel										Wolston Sand & Gravel										Made Ground										Made Ground									
Analytical Parameter	Units	Limit of detection	M-BAT	No. Analyses	Exceedances	Min	Mean	Max	Max ID																																																																										
Copper	mg.L ⁻¹	0.0005	0.048	121	0	<0.0005	<0.0033	0.017	CBH108-DUP	0.0045	0.0029	0.0016	0.0017	0.0011	0.00080	<0.0005	<0.0005	0.0013	0.00090	0.00060	0.00090	0.0019	0.0040	0.0040	0.0043	0.0031	0.0059	0.0029	0.0095	0.0021	0.0012	0.0030	0.0030	0.0013	0.0027																																																
Lead	mg.L ⁻¹	0.0002	0.024	121	0	<0.0002	<0.0003	0.0052	CBH104	0.0021	0.00040	<0.0002	<0.0002	<0.0002	<0.0002	0.00060	<0.0002	0.00020	0.00040	<0.0002	<0.0002	0.00040	<0.0002	<0.0002	0.00030	0.00040	<0.0002	<0.0002	<0.0002	<0.0002	0.00070	<0.0002	<0.0002	<0.0002	<0.0002																																																
Nickel	mg.L ⁻¹	0.0005	0.036	121	0	0.0006	0.0056	0.023	MW25-17	0.012	0.012	0.0033	0.0048	0.0061	0.023	0.018	0.013	0.016	0.018	0.013	0.0044	0.0024	0.0024	0.0030	0.0056	0.0038	0.0049	0.0058	0.0076	0.014	0.022	0.018	0.00090	0.00080																																																	
Zinc	mg.L ⁻¹	0.0005	0.073	121	0	0.0006	0.006	0.0499	CBH104	0.00070	0.0013	0.00060	0.0011	0.0011	0.0016	0.0014	0.0015	0.00090	0.00080	0.0015	0.0022	0.0015	0.0068	0.0030	0.0023	0.0023	0.0047	0.0020	0.020	0.0050	0.0028	0.0062	0.0038	0.0021																																																	

										Brick structure	Oxide shed	Oxide shed	Oxide shed	Scrubbers	Scrubbers	Scrubbers	Scrubbers	Scrubbers	Scrubbers	Tar well	Tar well	Tar well	CWG plant	CWG plant	CWG plant	Boiler house	Boiler house	Boiler house	Retort house	Retort house	Retort house	Exhauster	Exhauster	Exhauster			
NUMBER OF SAMPLES:		121								Sample Location	MW25-09C	MW25-12	MW25-12	MW25-12	MW25-16A-D 1	MW25-16A-D 2	MW25-16A-D 3	MW25-16A-S 1	MW25-16A-S 2	MW25-16A-S 3	MW25-18 1	MW25-18 2	MW25-18 3	MW25-20 1	MW25-20 2	MW25-20 3	MW25-21 1	MW25-21 2	MW25-21 3	MW25-27 1	MW25-27 2	MW25-27 3	MW25-29 1	MW25-29 2	MW25-29 3		
										Monitoring Round No.	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3		
										Date Sampled	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	19/03/2025	09/04/2025	30/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	09/04/2025	30/04/2025	18/03/2025	09/04/2025	30/04/2025		
										Stratum	Wolston Sand & Gravel			Wolston Sand & Gravel			Made Ground			Wolston Sand & Gravel			Wolston Sand & Gravel			Boulder Clay			Wolston Sand & Gravel			Boulder Clay			Wolston Sand & Gravel		
CRITERIA 1		CRITERIA 1																																			
Analytical Parameter	Units	Limit of detection	M-SAT	No. Analyses	Exceedances	Min	Mean	Max	Max ID																												
Copper	mg.L ⁻¹	0.0005	0.048	121	0	<0.0005	<0.0033	0.017	CBH108-DUP	0.011	0.0019	0.0013	0.0017	0.0011	0.00050	0.0015	0.00080	0.00070	0.0012	0.0083	0.0083	0.0086	0.0016	0.0049	0.0016	0.0031	0.0030	0.0033	0.0050	0.0025	0.0012	0.0010	0.0029	0.00090			
Lead	mg.L ⁻¹	0.0002	0.024	121	0	<0.0002	<0.0003	0.0052	CBH104	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00040	0.00020	<0.0002	<0.0002	<0.0002	<0.0002	0.00080	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00030	0.00030	<0.0002	<0.0002	<0.0002				
Nickel	mg.L ⁻¹	0.0005	0.036	121	0	0.0006	0.0056	0.023	MW25-17	0.0022	0.0042	0.0023	0.0037	0.0041	0.0030	0.0032	0.0068	0.0088	0.011	0.0060	0.0064	0.0060	0.0064	0.0032	0.0026	0.0012	0.0014	0.0014	0.0037	0.0041	0.0020	0.0011	0.00060				
Zinc	mg.L ⁻¹	0.0005	0.073	121	0	0.0006	0.006	0.0499	CBH104	0.046	0.0059	0.0025	0.0030	0.0017	0.0012	0.0015	0.0046	0.0023	0.0031	0.0052	0.0037	0.0057	0.0031	0.0022	0.0027	0.0063	0.0020	0.0030	0.0019	0.00080	0.0013	0.0026	0.0024	0.00018			

Table C2: M-BAT Screened Groundwater Analytical Data - Area B

										Meter house	Meter house	Meter house	Benzol washer	Benzol washer	Benzol washer	Tank	Tank	Tank	Managers House	Managers House	Managers House	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	-	-	-	-								
NUMBER OF SAMPLES:		121								Sample Location						MW25-31A	MW25-31A	MW25-31A	MW25-32	MW25-32	MW25-32	MW25-34	MW25-34	MW25-34	CBH129	CBH129	CBH129	CBH124	CBH124	CBH124	CBH126	CBH126	CBH126	MW25-15C	MW25-15C	MW25-15C	CBH102	CBH102	CBH104	CBH104		
				Monitoring Round No.						1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
				Date Sampled						18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	18/03/2025	08/04/2025	29/04/2025	17/03/2025	08/04/2025	17/03/2025	08/04/2025					
				Stratum						Boulder Clay/Wolston Sand & Gravel			Boulder Clay/Wolston Sand & Gravel			Wolston Sand & Gravel			Wolston Sand & Gravel			Wolston Sand & Gravel			Wolston Sand & Gravel			Boulder Clay/Wolston Sand & Gravel			Wolston Sand and Gravel			Made Ground								
		CRITERIA 1		CRITERIA 1																																						
Analytical Parameter	Units	Limit of detection	M-BAT	No. Analyses	Exceedances	Min	Mean	Max	Max ID																																	
Copper	mg.L ⁻¹	0.0005	0.048	121	0	<0.0005	<0.0033	0.017	CBH108-DUP	0.0013	0.0027	0.0031	0.0025	0.0029	0.0028	<0.0005	0.0022	0.0024	0.0027	0.0031	0.0015	0.0029	0.0050	0.0033	0.00050	0.0016	0.0013	0.0035	0.0032	0.0030	0.0030	0.0046	0.0060	0.0060	0.0060	0.0060	0.0060					
Lead	mg.L ⁻¹	0.0002	0.024	121	0	<0.0002	<0.0003	0.0052	CBH104	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00020	0.00030	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.00040	<0.0002	<0.0002	<0.0002	0.00070	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002					
Nickel	mg.L ⁻¹	0.0005	0.036	121	0	0.0006	0.0056	0.023	MW25-17	0.0019	0.0017	0.0013	0.0014	0.0019	0.0011	0.0027	0.0015	0.0037	0.0056	0.0071	0.0071	0.0057	0.0050	0.0058	0.0027	0.0027	0.0028	0.0034	0.0027	0.0024	0.0027	0.0047	0.0068	0.0068	0.0068	0.0068	0.0068					
Zinc	mg.L ⁻¹	0.0005	0.073	121	0	0.0006	0.006	0.0499	CBH104	0.0031	0.0025	0.0025	0.0011	0.0021	0.0011	0.0030	0.00080	0.0012	0.0028	0.0023	0.0023	0.024	0.025	0.014	0.0012	0.0019	0.0020	0.0080	0.0031	0.0029	0.018	0.017	0.050	0.045	0.045	0.045						

NUMBER OF SAMPLES: 4						Sample Location				MW25-28A	MW25-28A	MW25-28A	MW25-28A-DUP
						Monitoring Round No.				1	2	3	1
						Date Sampled				17/03/2025	07/04/2025	28/04/2025	17/03/2025
						Stratum					Wolston Sand and Gravel		
Analytical Parameter	Units	Limit of detection	M-BAT	No. Analyses	Exceedances	Min	Mean	Max	Max ID				
Copper	mg.L ⁻¹	0.0005	0.008	4	0	0.0013	0.0024	0.0041	MW25-28A	0.0022	0.0013	0.0041	0.0021
Lead	mg.L ⁻¹	0.0002	0.0012	4	0	<0.0002	<0.0002	<0.0002	n/a	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	mg.L ⁻¹	0.0005	0.012	4	0	0.0036	0.004	0.0049	MW25-28A	0.0040	0.0049	0.0036	0.0036
Zinc	mg.L ⁻¹	0.0005	0.02	4	0	0.0016	0.0023	0.0027	MW25-28A	0.0022	0.0016	0.0027	0.0026

Table D: Effective Solubility Screened Groundwater Analytical Data

										Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	GH1	GH1	GH1	GH1	GH1	GH1	GH2	GH2	GH2	GH2	GH2	GH2	GH3	GH3	GH3	GH3	GH3					
NUMBER OF SAMPLES: 113					Sample Location						MW25-07	MW25-07	MW25-07	MW25-35	MW25-35	MW25-35	MW25-13A	MW25-13A	MW25-13A	MW25-33	MW25-33	MW25-33	MW25-10	MW25-10	MW25-10	MW25-30B	MW25-30B	MW25-30B	MW25-17	MW25-17	MW25-17	MW25-22	MW25-22				
					Monitoring Round No.						1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2				
					Date Sampled						18/03/2025	08/04/2025	29/04/2025	18/03/2025	07/04/2025	28/04/2025	19/03/2025	09/04/2025	30/04/2025	18/03/2025	09/04/2025	30/04/2025	19/03/2025	09/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	17/03/2025	07/04/2025	28/04/2025	18/03/2025	08/04/2025				
					Stratum						Boulder Clay/Wolston Sand & Gravel		Boulder Clay/Wolston Sand & Gravel		Made Ground		Made Ground		Made Ground		Made Ground		Made Ground		Made Ground		Made Ground		Made Ground		Made Ground						
Analytical Parameter	Units	Limit of detection	CRITERIA 1		No. Analyses	Exceedances	Min	Mean	Max	Max ID																											
			Effective solubility																																		
Aliphatic C5 - C6	mg.L ⁻¹	0.001	0.0702		109	0	<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Aliphatic C6 - C8	mg.L ⁻¹	0.001	0.0167		109	1	<0.001	<0.002	0.061	MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Aliphatic C8 – C10	mg.L ⁻¹	0.001	0.0047		113	1	<0.001	<0.001	0.03	MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Aliphatic C10 – C12	mg.L ⁻¹	0.01	0.000304		113	6	<0.001	<0.07	3.11	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Aliphatic C12 – C16	mg.L ⁻¹	0.01	0.000006		113	9	<0.001	<0.03	0.62	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Aliphatic C16 - C21	mg.L ⁻¹	0.01	0.0000000088		113	8	<0.01	<0.02	0.32	CBH129	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Aliphatic C21 - C35	mg.L ⁻¹	0.01			113		<0.01	<0.02	0.7	CBH129	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Total Aliphatic C10 - C35	mg.L ⁻¹	0.01			99		<0.01	<0.13	3.92	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Total Aliphatic C5 - C35	mg.L ⁻¹	0.01			113		<0.01	<0.12	3.92	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Aromatic C5 - C7	mg.L ⁻¹	0.001	36.06		113	0	<0.001	<0.906	22	MW25-23B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0026	<0.001	<0.001	<0.001	0.14	0.17	<0.001	0.44	0.85	1.90	0.44	0.38	2.10	0.040	<0.001	0.029	0.023	<0.001			
Aromatic C7 - C8	mg.L ⁻¹	0.001	10.13		109	3	<0.001	<0.457	14	MW25-23B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.076	0.028	<0.001	0.26	0.60	1.50	0.29	0.18	0.99	0.013	<0.001	<0.001	0.0043	<0.001			
Aromatic C8 – C10	mg.L ⁻¹	0.001	5.65		113	1	<0.001	<0.285	6.6	MW25-23B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0068	0.0064	<0.001	0.22	0.24	<0.001	0.18	0.54	1.90	0.38	0.19	1.10	0.070	<0.001	0.053	0.023	<0.001				
Aromatic C10 – C12	mg.L ⁻¹	0.01	5.93		113	18	<0.001	<6.44	156	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.26	0.45	0.20	1.65	2.49	0.26	3.10	3.45	4.23	2.02	5.46	4.13	1.60	1.65	0.67	1.03	0.85				
Aromatic C12 – C16	mg.L ⁻¹	0.01	0.935		113	31	<0.001	<2.02	33.7	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.46	0.62	0.38	2.31	4.08	0.58	1.16	1.14	1.11	0.93	1.48	1.0	0.78	0.78	0.34	0.55	0.43				
Aromatic C16 – C21	mg.L ⁻¹	0.01	0.0917		113	47	<0.01	<0.44	9.17	MW25-23B	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.21	0.18	0.20	0.45	2.37	0.36	0.30	0.32	0.33	0.18	0.38	0.21	0.69	0.64	0.29	0.39	0.33				
Aromatic C21 – C35	mg.L ⁻¹	0.01	0.00131		113	51	<0.01	<0.41	8	MW25-16A-S	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.36	0.25	0.34	0.66	2.77	0.54	0.60	0.29	0.49	0.22	0.71	0.34	1.15	0.91	0.27	0.40	0.28				
Total Aromatic C10 - C35	mg.L ⁻¹	0.01			99		<0.01	<7.5	192	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.29	1.49	1.13		11.70	1.74	5.17	5.19	6.15		8.03	5.68	4.23	3.98	1.57		1.88				
Total Aromatic C5 - C35	mg.L ⁻¹	0.01			113		<0.01	<10.91	199	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.30	1.50	1.13		5.51	12.20	1.74	6.05	7.19	11.40		4.45	8.78	9.83	4.35	3.98	1.65		2.42		1.88

Table D: Effective Solubility Screened Groundwater Analytical Data

										GH3	GHA	GHA	GHA	GHB	GHB	GHB	Primary Purifiers	Primary Purifiers	Primary Purifiers	Purifier Catch box	Purifier Catch box	Purifier Catch box	Brick structure	Brick structure	Brick structure	Oxide shed	Oxide shed	Oxide shed	Scrubbers	Scrubbers	Scrubbers	Scrubbers			
NUMBER OF SAMPLES: 113		Sample Location								MW25-22	MW25-23B	MW25-23B	MW25-23B	MW25-25	MW25-25	MW25-25	MW25-11	MW25-11	MW25-11	MW25-14	MW25-14	MW25-14	MW25-09C	MW25-09C	MW25-09C	MW25-12	MW25-12	MW25-12	MW25-16A-D 1	MW25-16A-D 2	MW25-16A-D 3	MW25-16A-S 1			
		Monitoring Round No.								3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025
		Date Sampled								29/04/2025	18/03/2025	10/04/2025	07/05/2025	19/03/2025	09/04/2025	30/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025			
		Stratum								Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel	Made Ground/Wolston Sand & Gravel				
Analytical Parameter	Units	Limit of detection	CRITERIA 1		No. Analyses	CRITERIA 1				Exceedances	Min	Mean	Max	Max ID																					
			Effective solubility																																
Aliphatic C5 - C6	mg.L ⁻¹	0.001	0.0702		109	0	<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aliphatic C6 - C8	mg.L ⁻¹	0.001	0.0167		109	1	<0.001	<0.002	0.061	MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Aliphatic C8 – C10	mg.L ⁻¹	0.001	0.0047		113	1	<0.001	<0.001	0.03	MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Aliphatic C10 – C12	mg.L ⁻¹	0.01	0.000304		113	6	<0.001	<0.07	3.11	MW25-27	<0.01	<<0.20 &	<<0.10 &	1.32	<<0.10 &	<<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
Aliphatic C12 – C16	mg.L ⁻¹	0.01	0.000006		113	9	<0.001	<0.03	0.62	MW25-27	<0.01	<<0.20 &	<<0.10 &	0.44	<<0.10 &	<<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
Aliphatic C16 - C21	mg.L ⁻¹	0.01	0.0000000088		113	8	<0.01	<0.02	0.32	CBH129	<0.01	<<0.20 &	<<0.10 &	0.17	<<0.10 &	<<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
Aliphatic C21 - C35	mg.L ⁻¹	0.01			113		<0.01	<0.02	0.7	CBH129	<0.01	<<0.20 &	<<0.10 &	0.21	<<0.10 &	<<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
Total Aliphatic C10 - C35	mg.L ⁻¹	0.01			99		<0.01	<0.13	3.92	MW25-27	<0.01	<<0.20 &	<<0.10 &	2.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
Total Aliphatic C5 - C35	mg.L ⁻¹	0.01			113		<0.01	<0.12	3.92	MW25-27	<0.01	<0.01	<0.01	2.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
Aromatic C5 - C7	mg.L ⁻¹	0.001	36.06		113	0	<0.001	<0.906	22	MW25-23B	0.028	22.00	19.00	19.00	0.13	0.64	0.82	<0.001	<0.001	<0.001	<0.001	0.040	<0.001	0.010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Aromatic C7 - C8	mg.L ⁻¹	0.001	10.13		109	3	<0.001	<0.457	14	MW25-23B	0.0052	14.00	11.00	13.00	0.027	0.14	0.067	<0.001	<0.001	<0.001	<0.001	0.019	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Aromatic C8 – C10	mg.L ⁻¹	0.001	5.65		113	1	<0.001	<0.285	6.6	MW25-23B	0.032	4.50	2.60	6.60	0.014	0.042	0.067	<0.001	<0.001	<0.001	<0.001	0.075	0.25	0.082	0.0078	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
Aromatic C10 – C12	mg.L ⁻¹	0.01	5.93		113	18	<0.001	<6.44	156	MW25-27	0.71	22.20	28.40	55.50	1.88	6.76	2.93	<0.01	<0.01	<0.01	<0.01	0.64	3.63	1.21	0.29	0.14	0.75	<0.01	<0.01	<0.01	<0.01	<0.01			
Aromatic C12 – C16	mg.L ⁻¹	0.01	0.935		113	31	<0.001	<2.02	33.7	MW25-27	0.35	12.80	13.00	23.50	1.63	3.08	1.65	<0.01	<0.01	<0.01	<0.01	0.43	2.77	0.89	0.34	0.21	0.74	<0.01	<0.01	<0.01	<0.01	<0.01			
Aromatic C16 – C21	mg.L ⁻¹	0.01	0.0917		113	47	<0.01	<0.44	9.17	MW25-23B	0.26	3.52	3.57	9.17	0.74	2.25	0.76	<0.01	<0.01	<0.01	<0.01	0.18	1.08	0.40	0.21	0.15	0.33	<0.01	<0.01	<0.01	<0.01	<0.01			
Aromatic C21 – C35	mg.L ⁻¹	0.01	0.00131		113	51	<0.01	<0.41	8	MW25-16A-S	0.25	1.09	0.82	5.19	0.83	2.16	0.29	<0.01	<0.01	<0.01	<0.01	0.29	0.99	0.36	0.24	0.23	1.03	<0.01	<0.01	<0.01	<0.01	<0.01			
Total Aromatic C10 - C35	mg.L ⁻¹	0.01			99		<0.01	<7.5	192	MW25-27	1.57		45.70	93.30	5.08	14.30	5.64	<0.01	<0.01	<0.01	<0.01	1.54	8.47	2.86		0.73	2.86	<0.01	<0.01	<0.01	<0.01	<0.01			
Total Aromatic C5 - C35	mg.L ⁻¹	0.01			113		<0.01	<10.91	199	MW25-27	1.64	79.80	78.00	132.00	5.25	15.10	6.59	<0.01	<0.01	<0.01	<0.01	1.61	8.78	2.94	1.10	0.73	2.86	<0.01	<0.01	<0.01	<0.01	<0.01			

Analytical Parameter	Units	Limit of detection	CRITERIA 1		CRITERIA 1		Stratum				Made Ground		Boulder Clay				Wolston Sand & Gravel			Wolston Sand & Gravel			Boulder Clay/Wolston Sand & Gravel			Wolston Sand & Gravel			Boulder Clay/Wolston Sand & Gravel			Boulder Clay/Wolston Sand & Gravel		
			Effective solubility	No. Analyses	Exceedances	Min	Mean	Max	Max ID																									
Aliphatic C5 - C6	mg.L ⁻¹	0.001	0.0702	109	0	<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aliphatic C6 - C8	mg.L ⁻¹	0.001	0.0167	109	1	<0.001	<0.002	0.061	MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aliphatic C8 – C10	mg.L ⁻¹	0.001	0.0047	113	1	<0.001	<0.001	0.03	MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aliphatic C10 – C12	mg.L ⁻¹	0.01	0.000304	113	6	<0.001	<0.07	3.11	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10 &	<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.40 &	2.08	3.11	<0.10 &	<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01		
Aliphatic C12 – C16	mg.L ⁻¹	0.01	0.000006	113	9	<0.001	<0.03	0.62	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10 &	<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.40 &	0.54	0.62	<0.10 &	<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01		
Aliphatic C16 - C21	mg.L ⁻¹	0.01	0.0000000088	113	8	<0.01	<0.02	0.32	CBH129	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10 &	<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.40 &	<0.2	0.070	<0.10 &	<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01		
Aliphatic C21 - C35	mg.L ⁻¹	0.01		113		<0.01	<0.02	0.7	CBH129	<0.01	<0.01	<0.01	<0.01	<0.01	<0.10 &	<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.40 &	0.13	0.13	<0.1	<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01		
Total Aliphatic C10 - C35	mg.L ⁻¹	0.01		99		<0.01	<0.13	3.92	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Total Aliphatic C5 - C35	mg.L ⁻¹	0.01		113		<0.01	<0.12	3.92	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Aromatic C5 - C7	mg.L ⁻¹	0.001	36.06	113	0	<0.001	<0.906	22	MW25-238	0.55	1.80	<0.001	<0.001	<0.001	0.73	0.90	2.90	<0.001	<0.001	<0.001	<0.001	3.40	1.40	3.70	1.80	0.44	1.20	<0.001	<0.001	<0.001	<0.001	<0.001		
Aromatic C7 - C8	mg.L ⁻¹	0.001	10.13	109	3	<0.001	<0.457	14	MW25-238	0.10	0.33	<0.001	<0.001	<0.001	0.23	0.22	0.89	<0.001	<0.001	<0.001	<0.001	1.50	0.62	1.80	0.037	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aromatic C8 – C10	mg.L ⁻¹	0.001	5.65	113	1	<0.001	<0.285	6.6	MW25-238	0.57	1.70	<0.001	<0.001	<0.001	0.29	0.30	1.10	<0.001	<0.001	<0.001	<0.001	1.40	0.55	2.00	0.11	0.024	0.061	<0.001	<0.001	<0.001	<0.001	<0.001		
Aromatic C10 – C12	mg.L ⁻¹	0.01	5.93	113	18	<0.001	<6.44	156	MW25-27	16.40	<0.01	<0.01	<0.01	<0.01	8.12	13.00	16.70	<0.01	<0.01	<0.01	<0.01	139.00	110.00	156.00	4.94	4.13	2.85	<0.01	<0.01	<0.01	<0.01	<0.01		
Aromatic C12 – C16	mg.L ⁻¹	0.01	0.935	113	31	<0.001	<2.02	33.7	MW25-27	5.46	<0.01	<0.01	<0.01	<0.01	3.89	5.77	9.26	<0.01	<0.01	<0.01	<0.01	23.90	22.80	33.70	4.78	3.71	2.63	<0.01	<0.01	<0.01	<0.01	<0.01		
Aromatic C16 – C21	mg.L ⁻¹	0.01	0.0917	113	47	<0.01	<0.44	9.17	MW25-238	1.19	<0.01	<0.01	<0.01	<0.01	0.47	1.01	1.26	<0.01	<0.01	<0.01	<0.01	0.74	0.85	1.25	0.19	0.21		<0.01	<0.01	<0.01	<0.01	<0.01		
Aromatic C21 – C35	mg.L ⁻¹	0.01	0.00131	113	51	<0.01	<0.41	8	MW25-16A-S	0.70	<0.01	<0.01	<0.01	<0.01	0.61	0.50	0.43	<0.01	<0.01	<0.01	<0.01	2.36	1.35	1.33	0.54	0.62		<0.01	<0.01	<0.01	<0.01	<0.01		
Total Aromatic C10 - C35	mg.L ⁻¹	0.01		99		<0.01	<7.5	192	MW25-27	23.80	<0.01	<0.01	<0.01	<0.01	13.10	20.30	27.70	<0.01	<0.01	<0.01	<0.01		135.00	192.00		8.67	5.48	<0.01	<0.01	<0.01	<0.01	<0.01		
Total Aromatic C5 - C35	mg.L ⁻¹	0.01		113		<0.01	<10.91	199	MW25-27	25.00	3.09	<0.01	<0.01	<0.01	14.30	21.70	32.60	<0.01	<0.01	<0.01	<0.01	172.00	137.00	199.00	12.40	9.13	6.79	<0.01	<0.01	<0.01	<0.01	<0.01		

Table D: Effective Solubility Screened Groundwater Analytical Data

										Tank		Tank	Tank	Managers House	Managers House	Managers House	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	Former feature	-	-	-	-	-	-	-
NUMBER OF SAMPLES: 113				Sample Location							MW25-34	MW25-34	MW25-34	CBH129	CBH129	CBH129	CBH124	CBH124	CBH124	CBH126	CBH126	CBH126	MW25-15C	MW25-15C	MW25-15C	CBH102	CBH102	CBH104	CBH104	CBH104	CBH108	CBH108	CBH108	
				Monitoring Round No.							1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	1	2	3	1	2	3	
				Date Sampled							19/03/2025	10/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	19/03/2025	10/04/2025	30/04/2025	18/03/2025	08/04/2025	29/04/2025	17/03/2025	08/04/2025	17/03/2025	08/04/2025	28/04/2025	17/03/2025	08/04/2025	28/04/2025	
				Stratum							Wolston Sand & Gravel			Wolston Sand & Gravel			Wolston Sand & Gravel			Wolston Sand & Gravel			Boulder Clay/Wolston Sand & Gravel			Wolston Sand and Gravel		Made Ground		Made Ground / Wolston Sar				
Analytical Parameter	Units	Limit of detection	CRITERIA 1		No. Analyses	CRITERIA 1		Exceedances	Min	Mean	Max	Max ID																						
			Effective solubility																															
Aliphatic C5 - C6	mg.L ⁻¹	0.001	0.0702		109	0	<0.001	<0.001	<0.001		n/a	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aliphatic C6 - C8	mg.L ⁻¹	0.001	0.0167		109	1	<0.001	<0.002	0.061		MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aliphatic C8 – C10	mg.L ⁻¹	0.001	0.0047		113	1	<0.001	<0.001	0.03		MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aliphatic C10 – C12	mg.L ⁻¹	0.01	0.000304		113	6	<0.001	<0.07	3.11		MW25-27	<0.01	<0.01	<0.01	<0.01		0.039	0.020	<0.01	<0.01	<0.01	0.070	<<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Aliphatic C12 – C16	mg.L ⁻¹	0.01	0.000006		113	9	<0.001	<0.03	0.62		MW25-27	<0.01	<0.01	<0.01	<0.01		0.20	0.020	<0.01	<0.01	<0.01	0.050	<<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Aliphatic C16 - C21	mg.L ⁻¹	0.01	0.0000000088		113	8	<0.01	<0.02	0.32		CBH129	<0.01	<0.01	<0.01	<0.01		0.32	0.030	<0.01	<0.01	<0.01	0.020	<<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Aliphatic C21 - C35	mg.L ⁻¹	0.01			113		<0.01	<0.02	0.7		CBH129	<0.01	<0.01	<0.01	<0.01		0.70	0.050	<0.01	<0.01	<0.01	0.020	<<0.10 &	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Total Aliphatic C10 - C35	mg.L ⁻¹	0.01			99		<0.01	<0.13	3.92		MW25-27	<0.01	<0.01	<0.01	<0.01		1.30	0.10	<0.01	<0.01	<0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Total Aliphatic C5 - C35	mg.L ⁻¹	0.01			113		<0.01	<0.12	3.92		MW25-27	<0.01	<0.01	<0.01	<0.01		1.30	0.10	<0.01	<0.01	<0.01	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Aromatic C5 - C7	mg.L ⁻¹	0.001	36.06		113	0	<0.001	<0.906	22		MW25-23B	0.11	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	1.90	1.10	1.50	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aromatic C7 - C8	mg.L ⁻¹	0.001	10.13		109	3	<0.001	<0.457	14		MW25-23B	0.097	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.025	0.023	0.027	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aromatic C8 – C10	mg.L ⁻¹	0.001	5.65		113	1	<0.001	<0.285	6.6		MW25-23B	0.034	0.0024	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.16	0.24	0.53	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Aromatic C10 – C12	mg.L ⁻¹	0.01	5.93		113	18	<0.001	<6.44	156		MW25-27	1.41	0.38	0.10	<0.01	0.015	0.010	0.050	0.030	<0.01		9.63	11.50	6.54	<0.01	<0.01	<0.01	0.050	<0.01	<0.01	<0.01	0.030	<0.01	
Aromatic C12 – C16	mg.L ⁻¹	0.01	0.935		113	31	<0.001	<2.02	33.7		MW25-27	0.38	0.25	0.14	<0.01	0.12	0.050	0.040	0.020	<0.01		3.59	2.77	1.55	<0.01	<0.01	<0.01	0.050	<0.01	<0.01	<0.01	0.040	<0.01	
Aromatic C16 – C21	mg.L ⁻¹	0.01	0.0917		113	47	<0.01	<0.44	9.17		MW25-23B	0.010	0.050	0.030	<0.01	0.16	0.040	<0.01	<0.01	<0.01		0.61	0.52	0.29	<0.01	<0.01	<0.01	0.070	<0.01	<0.01	<0.01	0.050	<0.01	
Aromatic C21 – C35	mg.L ⁻¹	0.01	0.00131		113	51	<0.01	<0.41	8		MW25-16A-S	<0.01	<0.01	<0.01	<0.01		0.44	0.43	<0.01	<0.01	<0.01		0.37	0.41	0.38	<0.01	<0.01	<0.01	0.26	<0.01	<0.01	0.20	<0.01	
Total Aromatic C10 - C35	mg.L ⁻¹	0.01			99		<0.01	<7.5	192		MW25-27	1.81	0.69	0.27	<0.01	0.73	0.53	0.10	0.060	<0.01		14.20	15.20	8.77	<0.01	<0.01	<0.01	0.43	<0.01	<0.01	<0.01	0.31	<0.01	
Total Aromatic C5 - C35	mg.L ⁻¹	0.01			113		<0.01	<10.91	199		MW25-27	2.05	0.69	0.27	<0.01	0.73	0.53	0.10	0.060	<0.01		16.30	16.60	10.90	<0.01	<0.01	<0.01	0.43	<0.01	<0.01	<0.01	0.31	<0.01	

										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Area C							
NUMBER OF SAMPLES: 113					Sample Location					CBH108-DUP	CBH108-DUP	CBH112	CBH112	CBH112	CBH113	CBH130	CBH130	MW25-05A	MW25-05A	MW25-05A	MW25-08	MW25-08	MW25-08	MW25-19A	MW25-19A	MW25-19A	MW25-28A	MW25-28A	MW25-28A	MW25-28A-DUP 1				
					Monitoring Round No.					1	2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1				
					Date Sampled					17/03/2025	08/04/2025	17/03/2025	08/04/2025	28/04/2025	19/03/2025	10/04/2025	30/04/2025	18/03/2025	08/04/2025	29/04/2025	17/03/2025	07/04/2025	28/04/2025	18/03/2025	08/04/2025	29/04/2025	17/03/2025	07/04/2025	28/04/2025	17/03/2025				
					Stratum					d and Gravel		Volston Sand & Gravel/Volston Clay Member			Volston Sand & Gravel/Volston Clay Member			Volston Sand & Gravel			Made Ground			Volston Sand & Gravel			Volston Sand and Gravel							
CRITERIA 1					CRITERIA 1																													
Analytical Parameter	Units	Limit of detection	Effective solubility	No. Analyses	Exceedances	Min	Mean	Max	Max ID																									
Aliphatic C5 - C6	mg.L ⁻¹	0.001	0.0702	109	0	<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001					
Aliphatic C6 - C8	mg.L ⁻¹	0.001	0.0167	109	1	<0.001	<0.002	0.061	MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001					
Aliphatic C8 – C10	mg.L ⁻¹	0.001	0.0047	113	1	<0.001	<0.001	0.03	MW25-33	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001					
Aliphatic C10 – C12	mg.L ⁻¹	0.01	0.000304	113	6	<0.001	<0.07	3.11	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Aliphatic C12 – C16	mg.L ⁻¹	0.01	0.000006	113	9	<0.001	<0.03	0.62	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Aliphatic C16 - C21	mg.L ⁻¹	0.01	0.000000008	113	8	<0.01	<0.02	0.32	CBH129	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Aliphatic C21 - C35	mg.L ⁻¹	0.01		113		<0.01	<0.02	0.7	CBH129	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Total Aliphatic C10 - C35	mg.L ⁻¹	0.01		99		<0.01	<0.13	3.92	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Total Aliphatic C5 - C35	mg.L ⁻¹	0.01		113		<0.01	<0.12	3.92	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01					
Aromatic C5 - C7	mg.L ⁻¹	0.001	36.06	113	0	<0.001	<0.906	22	MW25-23B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001						
Aromatic C7 - C8	mg.L ⁻¹	0.001	10.13	109	3	<0.001	<0.457	14	MW25-23B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001						
Aromatic C8 – C10	mg.L ⁻¹	0.001	5.65	113	1	<0.001	<0.285	6.6	MW25-23B	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001						
Aromatic C10 – C12	mg.L ⁻¹	0.01	5.93	113	18	<0.001	<6.44	156	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	0.050	<0.01	<0.01	<0.01	<0.01	<0.01	0.040	0.070	0.020	<0.01	<0.01	<0.001	<0.001	<0.001						
Aromatic C12 – C16	mg.L ⁻¹	0.01	0.935	113	31	<0.001	<2.02	33.7	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	0.040	<0.01	<0.01	<0.01	<0.01	<0.01	0.080	0.12	0.090	<0.01	<0.01	<0.001	<0.001	<0.001						
Aromatic C16 – C21	mg.L ⁻¹	0.01	0.0917	113	47	<0.001	<0.44	9.17	MW25-23B	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.050	0.090	0.060	<0.01	<0.01	<0.01	<0.01	<0.01						
Aromatic C21 – C35	mg.L ⁻¹	0.01	0.00131	113	51	<0.01	<0.41	8	MW25-16A-S	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						
Total Aromatic C10 - C35	mg.L ⁻¹	0.01		99		<0.01	<7.5	192	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.090	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						
Total Aromatic C5 - C35	mg.L ⁻¹	0.01		113		<0.01	<10.91	199	MW25-27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.090	<0.01	<0.01	<0.01	<0.01	<0.01	0.56	0.28	0.17	<0.01	<0.01	<0.01	<0.01						

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										Alsea 8	Alsea 9	Alsea 10	Alsea 11	Alsea 12	Alsea 13	Alsea 14	Alsea 15	Alsea 16	Alsea 17	Alsea 18	Alsea 19	Alsea 20	Alsea 21	Alsea 22	Alsea 23	Alsea 24	Alsea 25	Alsea 26	Alsea 27	Alsea 28	Alsea 29	Alsea 30	Alsea 31	Alsea 32	Alsea 33	Alsea 34	Alsea 35	Alsea 36	Alsea 37	Alsea 38	Alsea 39	Alsea 40	Alsea 41	Alsea 42	Alsea 43	Alsea 44	Alsea 45	Alsea 46	Alsea 47	Alsea 48	Alsea 49	Alsea 50	Alsea 51	Alsea 52	Alsea 53	Alsea 54	Alsea 55	Alsea 56	Alsea 57	Alsea 58	Alsea 59	Alsea 60	Alsea 61	Alsea 62	Alsea 63	Alsea 64	Alsea 65	Alsea 66	Alsea 67	Alsea 68	Alsea 69	Alsea 70	Alsea 71	Alsea 72	Alsea 73	Alsea 74	Alsea 75	Alsea 76	Alsea 77	Alsea 78	Alsea 79	Alsea 80	Alsea 81	Alsea 82	Alsea 83	Alsea 84	Alsea 85	Alsea 86	Alsea 87	Alsea 88	Alsea 89	Alsea 90	Alsea 91	Alsea 92	Alsea 93	Alsea 94	Alsea 95	Alsea 96	Alsea 97	Alsea 98	Alsea 99	Alsea 100	Alsea 101	Alsea 102	Alsea 103	Alsea 104	Alsea 105	Alsea 106	Alsea 107	Alsea 108	Alsea 109	Alsea 110	Alsea 111	Alsea 112	Alsea 113	Alsea 114	Alsea 115	Alsea 116	Alsea 117	Alsea 118	Alsea 119	Alsea 120	Alsea 121	Alsea 122	Alsea 123	Alsea 124	Alsea 125	Alsea 126	Alsea 127	Alsea 128	Alsea 129	Alsea 130	Alsea 131	Alsea 132	Alsea 133	Alsea 134	Alsea 135	Alsea 136	Alsea 137	Alsea 138	Alsea 139	Alsea 140	Alsea 141	Alsea 142	Alsea 143	Alsea 144	Alsea 145	Alsea 146	Alsea 147	Alsea 148	Alsea 149	Alsea 150	Alsea 151	Alsea 152	Alsea 153	Alsea 154	Alsea 155	Alsea 156	Alsea 157	Alsea 158	Alsea 159	Alsea 160	Alsea 161	Alsea 162	Alsea 163	Alsea 164	Alsea 165	Alsea 166	Alsea 167	Alsea 168	Alsea 169	Alsea 170	Alsea 171	Alsea 172	Alsea 173	Alsea 174	Alsea 175	Alsea 176	Alsea 177	Alsea 178	Alsea 179	Alsea 180	Alsea 181	Alsea 182	Alsea 183	Alsea 184	Alsea 185	Alsea 186	Alsea 187	Alsea 188	Alsea 189	Alsea 190	Alsea 191	Alsea 192	Alsea 193	Alsea 194	Alsea 195	Alsea 196	Alsea 197	Alsea 198	Alsea 199	Alsea 200	Alsea 201	Alsea 202	Alsea 203	Alsea 204	Alsea 205	Alsea 206	Alsea 207	Alsea 208	Alsea 209	Alsea 210	Alsea 211	Alsea 212	Alsea 213	Alsea 214	Alsea 215	Alsea 216	Alsea 217	Alsea 218	Alsea 219	Alsea 220	Alsea 221	Alsea 222	Alsea 223	Alsea 224	Alsea 225	Alsea 226	Alsea 227	Alsea 228	Alsea 229	Alsea 230	Alsea 231	Alsea 232	Alsea 233	Alsea 234	Alsea 235	Alsea 236	Alsea 237	Alsea 238	Alsea 239	Alsea 240	Alsea 241	Alsea 242	Alsea 243	Alsea 244	Alsea 245	Alsea 246	Alsea 247	Alsea 248	Alsea 249	Alsea 250	Alsea 251	Alsea 252	Alsea 253	Alsea 254	Alsea 255	Alsea 256	Alsea 257	Alsea 258	Alsea 259	Alsea 260	Alsea 261	Alsea 262	Alsea 263	Alsea 264	Alsea 265	Alsea 266	Alsea 267	Alsea 268	Alsea 269	Alsea 270	Alsea 271	Alsea 272	Alsea 273	Alsea 274	Alsea 275	Alsea 276	Alsea 277	Alsea 278	Alsea 279	Alsea 280	Alsea 281	Alsea 282	Alsea 283	Alsea 284	Alsea 285	Alsea 286	Alsea 287	Alsea 288	Alsea 289	Alsea 290	Alsea 291	Alsea 292	Alsea 293	Alsea 294	Alsea 295	Alsea 296	Alsea 297	Alsea 298	Alsea 299	Alsea 300	Alsea 301	Alsea 302	Alsea 303	Alsea 304	Alsea 305	Alsea 306	Alsea 307	Alsea 308	Alsea 309	Alsea 310	Alsea 311	Alsea 312	Alsea 313	Alsea 314	Alsea 315	Alsea 316	Alsea 317	Alsea 318	Alsea 319	Alsea 320	Alsea 321	Alsea 322	Alsea 323	Alsea 324	Alsea 325	Alsea 326	Alsea 327	Alsea 328	Alsea 329	Alsea 330	Alsea 331	Alsea 332	Alsea 333	Alsea 334	Alsea 335	Alsea 336	Alsea 337	Alsea 338	Alsea 339	Alsea 340	Alsea 341	Alsea 342	Alsea 343	Alsea 344	Alsea 345	Alsea 346	Alsea 347	Alsea 348	Alsea 349	Alsea 350	Alsea 351	Alsea 352	Alsea 353	Alsea 354	Alsea 355	Alsea 356	Alsea 357	Alsea 358	Alsea 359	Alsea 360	Alsea 361	Alsea 362	Alsea 363	Alsea 364	Alsea 365	Alsea 366	Alsea 367	Alsea 368	Alsea 369	Alsea 370	Alsea 371	Alsea 372	Alsea 373	Alsea 374	Alsea 375	Alsea 376	Alsea 377	Alsea 378	Alsea 379	Alsea 380	Alsea 381	Alsea 382	Alsea 383	Alsea 384	Alsea 385	Alsea 386	Alsea 387	Alsea 388	Alsea 389	Alsea 390	Alsea 391	Alsea 392	Alsea 393	Alsea 394	Alsea 395	Alsea 396	Alsea 397	Alsea 398	Alsea 399	Alsea 400	Alsea 401	Alsea 402	Alsea 403	Alsea 404	Alsea 405	Alsea 406	Alsea 407	Alsea 408	Alsea 409	Alsea 410	Alsea 411	Alsea 412	Alsea 413	Alsea 414	Alsea 415	Alsea 416	Alsea 417	Alsea 418	Alsea 419	Alsea 420	Alsea 421	Alsea 422	Alsea 423	Alsea 424	Alsea 425	Alsea 426	Alsea 427	Alsea 428	Alsea 429	Alsea 430	Alsea 431	Alsea 432	Alsea 433	Alsea 434	Alsea 435	Alsea 436	Alsea 437	Alsea 438	Alsea 439	Alsea 440	Alsea 441	Alsea 442	Alsea 443	Alsea 444	Alsea 445	Alsea 446	Alsea 447	Alsea 448	Alsea 449	Alsea 450	Alsea 451	Alsea 452	Alsea 453	Alsea 454	Alsea 455	Alsea 456	Alsea 457	Alsea 458	Alsea 459	Alsea 460	Alsea 461	Alsea 462	Alsea 463	Alsea 464	Alsea 465	Alsea 466	Alsea 467	Alsea 468	Alsea 469	Alsea 470	Alsea 471	Alsea 472	Alsea 473	Alsea 474	Alsea 475	Alsea 476	Alsea 477	Alsea 478	Alsea 479	Alsea 480	Alsea 481	Alsea 482	Alsea 483	Alsea 484	Alsea 485	Alsea 486	Alsea 487	Alsea 488	Alsea 489	Alsea 490	Alsea 491	Alsea 492	Alsea 493	Alsea 494	Alsea 495	Alsea 496	Alsea 497	Alsea 498	Alsea 499	Alsea 500	Alsea 501	Alsea 502	Alsea 503	Alsea 504	Alsea 505	Alsea 506	Alsea 507	Alsea 508	Alsea 509	Alsea 510	Alsea 511	Alsea 512	Alsea 513	Alsea 514	Alsea 515	Alsea 516	Alsea 517	Alsea 518	Alsea 519	Alsea 520	Alsea 521	Alsea 522	Alsea 523	Alsea 524	Alsea 525	Alsea 526	Alsea 527	Alsea 528	Alsea 529	Alsea 530	Alsea 531	Alsea 532	Alsea 533	Alsea 534	Alsea 535	Alsea 536	Alsea 537	Alsea 538	Alsea 539	Alsea 540	Alsea 541	Alsea 542	Alsea 543	Alsea 544	Alsea 545	Alsea 546	Alsea 547	Alsea 548	Alsea 549	Alsea 550	Alsea 551	Alsea 552	Alsea 553	Alsea 554	Alsea 555	Alsea 556	Alsea 557	Alsea 558	Alsea 559	Alsea 560	Alsea 561	Alsea 562	Alsea 563	Alsea 564	Alsea 565	Alsea 566	Alsea 567	Alsea 568	Alsea 569	Alsea 570	Alsea 571	Alsea 572	Alsea 573	Alsea 574	Alsea 575	Alsea 576	Alsea 577	Alsea 578	Alsea 579	Alsea 580	Alsea 581	Alsea 582	Alsea 583	Alsea 584	Alsea 585	Alsea 586	Alsea 587	Alsea 588	Alsea 589	Alsea 590	Alsea 591	Alsea 592	Alsea 593	Alsea 594	Alsea 595	Alsea 596	Alsea 597	Alsea 598	Alsea 599	Alsea 600	Alsea 601	Alsea 602	Alsea 603	Alsea 604	Alsea 605	Alsea 606	Alsea 607	Alsea 608	Alsea 609	Alsea 610	Alsea 611	Alsea 612	Alsea 613	Alsea 614	Alsea 615	Alsea 616	Alsea 617	Alsea 618	Alsea 619	Alsea 620	Alsea 621	Alsea 622	Alsea 623	Alsea 624	Alsea 625	Alsea 626	Alsea 627	Alsea 628	Alsea 629	Alsea 630	Alsea 631	Alsea 632	Alsea 633	Alsea 634	Alsea 635	Alsea 636	Alsea 637	Alsea 638	Alsea 639	Alsea 640	Alsea 641	Alsea 642	Alsea 643	Alsea 644	Alsea 645	Alsea 646	Alsea 647	Alsea 648	Alsea 649	Alsea 650	Alsea 651	Alsea 652	Alsea 653	Alsea 654	Alsea 655	Alsea 656	Alsea 657	Alsea 658	Alsea 659	Alsea 660	Alsea 661	Alsea 662	Alsea 663	Alsea 664	Alsea 665	Alsea 666	Alsea 667	Alsea 668	Alsea 669	Alsea 670	Alsea 671	Alsea 672	Alsea 673	Alsea 674	Alsea 675	Alsea 676	Alsea 677	Alsea 678	Alsea 679	Alsea 680	Alsea 681	Alsea 682	Alsea 683	Alsea 684	Alsea 685	Alsea 686	Alsea 687	Alsea 688	Alsea 689	Alsea 690	Alsea 691	Alsea 692	Alsea 693	Alsea 694	Alsea 695	Alsea 696	Alsea 697	Alsea 698	Alsea 699	Alsea 700	Alsea 701	Alsea 702	Alsea 703	Alsea 704	Alsea 705	Alsea 706	Alsea 707	Alsea 708	Alsea 709	Alsea 710	Alsea 711	Alsea 712	Alsea 713	Alsea 714	Alsea 715	Alsea 716	Alsea 717	Alsea 718	Alsea 719	Alsea 720	Alsea 721	Alsea 722	Alsea 723	Alsea 724	Alsea 725	Alsea 726	Alsea 727	Alsea 728	Alsea 729	Alsea 730	Alsea 731	Alsea 732	Alsea 733	Alsea 734	Alsea 735	Alsea 736	Alsea 737	Alsea 738	Alsea 739	Alsea 740	Alsea 741	Alsea 742	Alsea 743	Alsea 744	Alsea 745	Alsea 746	Alsea 747	Alsea 748	Alsea 749	Alsea 750	Alsea 751	Alsea 752	Alsea 753	Alsea 754	Alsea 755	Alsea 756	Alsea 757	Alsea 758	Alsea 759	Alsea 760	Alsea 761	Alsea 762	Alsea 763	Alsea 764	Alsea 765	Alsea 766	Alsea 767	Alsea 768	Alsea 769	Alsea 770	Alsea 771	Alsea 772	Alsea 773	Alsea 774	Alsea 775	Alsea 776	Alsea 777	Alsea 778	Alsea 779	Alsea 780	Alsea 781	Alsea 782	Alsea 783	Alsea 784	Alsea 785	Alsea 786	Alsea 787	Alsea 788	Alsea 789	Alsea 790	Alsea 791	Alsea 792	Alsea 793	Alsea 794	Alsea 795	Alsea 796	Alsea 797	Alsea 798	Alsea 799	Alsea 800	Alsea 801	Alsea 802	Alsea 803	Alsea 804	Alsea 805	Alsea 806	Alsea 807	Alsea 808	Alsea 809	Alsea 810	Alsea 811	Alsea 812	Alsea 813	Alsea 814	Alsea 815	Alsea 816	Alsea 817	Alsea 818	Alsea 819	Alsea 820	Alsea 821	Alsea 822	Alsea 823	Alsea 824	Alsea 825	Alsea 826	Alsea 827	Alsea 828	Alsea 829	Alsea 830	Alsea 831	Alsea 832	Alsea 833	Alsea 834	Alsea 835	Alsea 836	Alsea 837	Alsea 838	Alsea 839	Alsea 840	Alsea 841	Alsea 842	Alsea 843	Alsea 844	Alsea 845	Alsea 846	Alsea 847	Alsea 848	Alsea 849	Alsea 850	Alsea 851	Alsea 852	Alsea 853	Alsea 854	Alsea 855	Alsea 856	Alsea 857	Alsea 858	Alsea 859	Alsea 860	Alsea 861	Alsea 862	Alsea 863	Alsea 864	Alsea 865	Alsea 866	Alsea 867	Alsea 868	Alsea 869	Alsea 870	Alsea 871	Alsea 872	Alsea 873	Alsea 874	Alsea 875	Alsea 876	Alsea 877	Alsea 878	Alsea 879	Alsea 880	Alsea 881	Alsea 882	Alsea 883	Alsea 884	Alsea 885	Alsea 886	Alsea 887	Alsea 888	Alsea 889	Alsea 890	Alsea 891	Alsea 892	Alsea 893	Alsea 894	Alsea 895	Alsea 896	Alsea 897	Alsea 898	Alsea 899	Alsea 900	Alsea 901	Alsea 902	Alsea 903	Alsea 904	Alsea 905	Alsea 906	Alsea 907	Alsea 908	Alsea 909	Alsea 910	Alsea 911	Alsea 912	Alsea 913	Alsea 914	Alsea 915	Alsea 916	Alsea 917	Alsea 918	Alsea 919	Alsea 920	Alsea 921	Alsea 922	Alsea 923	Alsea 924	Alsea 925	Alsea 926	Alsea 927	Alsea 928	Alsea 929	Alsea 930	Alsea 931	Alsea 932	Alsea 933	Alsea 934	Alsea 935	Alsea 936	Alsea 937	Alsea 938	Alsea 939	Alsea 940	Alsea 941	Alsea 942	Alsea 943	Alsea 944	Alsea 945	Alsea 946	Alsea 947	Alsea 948	Alsea 949	Alsea 950	Alsea 951	Alsea 952	Alsea 953	Alsea 954	Alsea 955	Alsea 956	Alsea 957	Alsea 958	Alsea 959	Alsea 960	Alsea 961	Alsea 962	Alsea 963	Alsea 964	Alsea 965	Alsea 966	Alsea 967	Alsea 968	Alsea 969	Alsea 970	Alsea 971	Alsea 972	Alsea 973	Alsea 974	Alsea 975	Alsea 976	Alsea 977	Alsea 978	Alsea 979	Alsea 980	Alsea 981	Alsea 982	Alsea 983	Alsea 984	Alsea 985	Alsea 986	Alsea 987	Alsea 988	Alsea 989	Alsea 990	Alsea 991	Alsea 992	Alsea 993	Alsea 994	Alsea 995	Alsea 996	Alsea 997	Alsea 998	Alsea 999	Alsea 1000
										Alsea 8	Alsea 9	Alsea 10	Alsea 11	Alsea 12	Alsea 13	Alsea 14	Alsea 15	Alsea 16	Alsea 17	Alsea 18	Alsea 19	Alsea 20	Alsea 21	Alsea 22	Alsea 23	Alsea 24	Alsea 25	Alsea 26	Alsea 27	Alsea 28	Alsea 29	Alsea 30	Alsea 31	Alsea 32	Alsea 33	Alsea 34	Alsea 35	Alsea 36	Alsea 37	Alsea 38	Alsea 39	Alsea 40	Alsea 41	Alsea 42	Alsea 43	Alsea 44	Alsea 45	Alsea 46	Alsea 47	Alsea 48	Alsea 49	Alsea 50	Alsea 51	Alsea 52	Alsea 53	Alsea 54	Alsea 55	Alsea 56	Alsea 57	Alsea 58	Alsea 59	Alsea 60	Alsea 61	Alsea 62	Alsea 63	Alsea 64	Alsea 65	Alsea 66	Alsea 67	Alsea 68	Alsea 69	Alsea 70	Alsea 71	Alsea 72	Alsea 73	Alsea 74	Alsea 75	Alsea 76	Alsea 77	Alsea 78	Alsea 79	Alsea 80	Alsea 81	Alsea 82	Alsea 83	Alsea 84	Alsea 85	Alsea 86	Alsea 87	Alsea 88	Alsea 89	Alsea 90	Alsea 91	Alsea 92	Alsea 93	Alsea 94	Alsea 95	Alsea 96	Alsea 97	Alsea 98	Alsea 99	Alsea 100	Alsea 101	Alsea 102	Alsea 103	Alsea 104	Alsea 105	Alsea 106	Alsea 107	Alsea 108	Alsea 109	Alsea 110	Alsea 111	Alsea 112	Alsea 113	Alsea 114	Alsea 115	Alsea 116	Alsea 117	Alsea 118	Alsea 119	Alsea 120	Alsea 121	Alsea 122	Alsea 123	Alsea 124	Alsea 125	Alsea 126	Alsea 127	Alsea 128	Alsea 129	Alsea 130	Alsea 131	Alsea 132	Alsea 133	Alsea 134	Alsea 135	Alsea 136	Alsea 137	Alsea 138	Alsea 139	Alsea 140	Alsea 141	Alsea 142	Alsea 143	Alsea 144	Alsea 145	Alsea 146	Alsea 147	Alsea 148	Alsea 149	Alsea 150	Alsea 151	Alsea 152	Alsea 153	Alsea 154	Alsea 15																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

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MGR = Made Ground
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[illegible]

[illegible]

										Scrubbers	Scrubbers	Tar well	Tar well	Tar well	CWG plant	CWG plant	CWG plant	Boiler house	Boiler house	Boiler house	Retort house	Retort house	Retort house	Exhauster	Exhauster	Exhauster	Meter house	Meter house	Meter house	Benzol washer	Benzol washer	Benzol washer										
NUMBER OF SAMPLES: 113										Sample Location			MW25-16A-S 2	MW25-16A-S 3	MW25-18 1	MW25-18 2	MW25-18 3	MW25-20 1	MW25-20 2	MW25-20 3	MW25-21 1	MW25-21 2	MW25-21 3	MW25-27 1	MW25-27 2	MW25-27 3	MW25-29 1	MW25-29 2	MW25-29 3	MW25-31A 1	MW25-31A 2	MW25-31A 3	MW25-32 1	MW25-32 2	MW25-32 3							
										Monitoring Round No.			Date Sampled			Stratum			08/04/2025			29/04/2025			18/03/2025			08/04/2025			29/04/2025			18/03/2025			08/04/2025			30/04/2025		
										CRITERIA 1			CRITERIA 2			CRITERIA 1																										
Analytical Parameter										Min	Mean	Max	Max ID																													
Cyanide (Total) (as CN)	mg.L ⁻¹	0.01	4.16E-01		113	50		0	<0.01	<0.82	8.6	MW25-10	0.75	0.58	0.46	0.76	0.93	0.070	0.080	0.090	<0.01	<0.01	<0.01	0.24	0.23	0.26	0.17	0.19	0.20	0.040	0.040	0.050	0.050	0.050	0.060							
Easily liberatable cyanide	mg.L ⁻¹	0.01			113	75		0	<0.01	<0.01	0.07	MW25-14	<0.01	0.010	<0.01	<0.01	0.020	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01								
Sulphate	mg.L ⁻¹	0.045	256		113	50		0	29.9	558.045	2220	MW25-17	298.00	272.00	473.00	458.00	473.00	322.00	193.00	101.00	83.40	74.60	92.10	713.00	601.00	580.00	306.00	380.00	328.00	207.00	219.00	204.00	1560.00	1870.00	1240.00							
Sulphur (Elemental)	mg.L ⁻¹	0.02			75	50		0	<0.02	<0.02	0.04	CBH102	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02							
Ammonium as NH4	mg.L ⁻¹	0.015	7.52E-01		113	86		0	<0.015	<57.494	680	MW25-27	84.00	57.00	0.96	0.58	1.20	44.00	46.00	42.00	<0.015	<0.015	<0.015	640.00	680.00	630.00	76.00	68.00	68.00	0.94	1.20	1.60	240.00	360.00	260.00							
Ammoniacal N (total) as N	mg.L ⁻¹	0.011667			113	34		0	<0.011667	<4.7187	528.904	MW25-27	65.34	44.33	0.75	0.45	0.93	34.22	35.78	32.67	<0.011667	<0.011667	<0.011667	497.79	528.90	490.01	59.11	52.89	52.89	0.73	0.93	1.24	186.67	280.01	202.23							
Phenol	mg.L ⁻¹	0.0005			113	0		0	<0.0005	<1.0133	56	MW25-27	0.85	1.70	<0.0005	<0.0005	<0.0005	0.56	0.91	1.20	<0.0005	<0.0005	<0.0005	9.50	56.00	14.00	0.31	<0.0005	<0.0005	<0.0005	0.011	<0.0005	<0.0005	<0.0005								
Naphthalene	mg.L ⁻¹	0.00001			113	1		0	<0.00001	<0.49601	6.8	MW25-23B	4.80	0.00011	<0.00001	<0.00001	<0.00001	0.57	2.40	1.10	0.00032	<0.00001	<0.00001	4.10	2.70	3.60	0.060	0.20	0.23	<0.00001	<0.00001	0.0030	0.00028	<0.00001	0.00022							
Anthracene	mg.L ⁻¹	0.00001			113	16		0	<0.00001	<0.00795	0.36	MW25-16A-S	0.022	<0.00001	<0.00001	<0.00001	<0.00001	<<0.00010 &	<<0.00010 &	0.0010	<0.00001	<0.00001	<0.00001	0.0012	0.0021	<0.00001	<<0.00010 &	<<0.00010 &	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001							
Fluoranthene	mg.L ⁻¹	0.00001			113	43		0	<0.00001	<0.01431	0.81	MW25-16A-S	0.035	<0.00001	<0.00001	<0.00001	<0.00001	0.0013	0.0041	0.0011	<0.00001	<0.00001	<0.00001	0.0018	0.0043	<0.00001	<<0.00010 &	<<0.00010 &	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001							
Benzo[a]pyrene	mg.L ⁻¹	0.00001			113	18	18	0	<0.00001	<0.00364	0.27	MW25-16A-S	0.0066	<0.00001	<0.00001	<0.00001	<0.00001	<<0.00010 &	0.0011	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<<0.00040 &	0.00085	<0.00001	<<0.00010 &	<<0.00010 &	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001						
Sum of benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[ghi]perylene and ideno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00004			113	16		0	<0.00004	<0.00857	0.65	n/a	0.015	<0.00004	<0.00004	<0.00004	<0.00004	0.00264	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	0.00221	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004							
Arsenic	mg.L ⁻¹	0.00015			113	26	0	0.00035	0.00933	0.088	MW25-10	0.042	0.064	0.0028	0.0033	0.0029	0.0047	0.0057	0.0065	0.00071	0.00062	0.00067	0.012	0.0084	0.0089	0.0012	0.00992	0.0012	0.00078	0.00073	0.00044	0.0013	0.0021	0.0013								
Mercury (inorganic)	mg.L ⁻¹	0.00005			113	14		0	<0.00005	<0.00001	0.00199	MW25-17	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.000060	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005								
Benzene	mg.L ⁻¹	0.001			113	37	0	0	<0.001	<0.916	22	MW25-23B	0.55	1.80	<0.001	<0.001	<0.001	0.74	0.90	3.00	<0.001	<0.001	<0.001	3.40	1.40	3.70	1.80	0.44	1.20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001							
Toluene	mg.L ⁻¹	0.001			113	0	0	0	<0.001	<0.441	14	MW25-23B	0.099	0.33	<0.001	<0.001	<0.001	0.23	0.22	0.88	<0.001	<0.001	<0.001	1.50	0.63	1.80	0.036	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001							
Ethylbenzene	mg.L ⁻¹	0.001			113	0	0	0	<0.001	<0.024	0.39	MW25-10	0.065	0.12	<0.001	<0.001	<0.001	0.027	<0.001	<0.001	<0.001	<0.001	<0.001	0.15	0.064	0.23	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001							
Xylenes (Total of m and p, o-xylenes)	mg.L ⁻¹	0.002			113	0	0	0	<0.002	<0.254	6.1	n/a	0.48	1.5	<0.002	<0.002	<0.002	0.25	0.29	1.11	<0.002	<0.002	<0.002	1.25	0.48	1.65	0.111	<0.019	<0.009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002							
Aromatic C10 – C12	mg.L ⁻¹	0.01			113	44		0	<0.001	<6.44	156	MW25-27	16.40	<0.01	<0.01	<0.01	<0.01	8.12	13.00	16.70	<0.01	<0.01	<0.01	139.00	110.00	156.00	4.94	4.13	2.85	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						
Aromatic C12 – C16	mg.L ⁻¹	0.01			113	37		0	<0.001	<2.02	33.7	MW25-27	5.46	<0.01	<0.01	<0.01	<0.01	3.89	5.77	9.26	<0.01	<0.01	<0.01	23.90	22.80	33.70	4.78	3.71	2.63	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						

[illegible]

[illegible]

NUMBER OF SAMPLES: 3					Sample Location					MW25-02	MW25-03	MW25-06
					Depth (m bgl)					0.50	0.30	0.20
					Date Sampled					03/02/2025	03/02/2025	05/02/2025
					Stratum					MGR	MGR	MGR
Analytical Parameter	Units	Limit of detection	CRITERIA 1		CRITERIA 1	Min	Mean	Max	Max ID			
			Environmental Quality Standards for freshwater surface waters	No. Analyses	Exceedances							
pH	pH Units	N/A	6-9	3	0	7.9	8.2	8.5	MW25-06	7.90	8.20	8.50
Sulphate as SO ₄	mg.L ⁻¹	0.045		3		5.1	10.98	18.7	MW25-03	9.14	18.70	5.10
Total Suspended Solids	mg.L ⁻¹	2		3		<2	<2.2	2.7	MW25-06	<2	<2	2.70
Conductivity	µS.cm ⁻¹	10		3		67	119	160	MW25-03	130.00	160.00	67.00
Cyanide (Total) (as CN)	mg.L ⁻¹	0.01		3		<0.01	<0.01	<0.01	n/a	<0.01	<0.01	<0.01
Complexed cyanide	mg.L ⁻¹	0.01		3		<0.01	<0.01	<0.01	n/a	<0.01	<0.01	<0.01
Easily liberatable cyanide	mg.L ⁻¹	0.01	0.001	3	0	<0.01	<0.01	<0.01	n/a	<0.01	<0.01	<0.01
Thiocyanate	mg.L ⁻¹	0.2		3		<0.2	<0.2	<0.2	n/a	<0.2	<0.2	<0.2
Sulphur (Elemental)	mg.L ⁻¹	20		3		<20	<20	<20	n/a	<20	<20	<20
Sulphide	mg.L ⁻¹	0.005		3		<0.005	<0.005	<0.005	n/a	<0.005	<0.005	<0.005
Chloride	mg.L ⁻¹	0.15	250	3	0	1.6	5.27	9	MW25-02	9.00	5.20	1.60
Ammoniacal Nitrogen as NH ₄ ⁺ / Ammonium as NH ₄	mg.L ⁻¹	0.015		3		0.019	1	2.8	MW25-02	2.80	0.18	0.019
Ammoniacal N (total) as N	mg.L ⁻¹	0.011667	1.1	3	1	0.0147782	0.777541	2.17784	MW25-02	2.18	0.14	0.015
Un-ionised ammonia as nitrogen (NH ₃ as N)	mg.L ⁻¹	0.011667		3		0.0147782	0.777541	2.17784	MW25-02	2.18	0.14	0.015
Dissolved Organic Carbon (DOC)	mg.L ⁻¹	0.1		3		3.9	14	27	MW25-02	27.00	11.00	3.90
Catechol	mg.L ⁻¹	0.0005		3		<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Resorcinol	mg.L ⁻¹	0.0005		3		<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Ethylphenol & Dimethylphenol	mg.L ⁻¹	0.0005		3		<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Cresols (Total)	mg.L ⁻¹	0.0005	0.1	3	0	<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
2-Isopropylphenol	mg.L ⁻¹	0.0005		3		<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Trimethylphenol (2,3,5-)	mg.L ⁻¹	0.0005		3		<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Naphthols	mg.L ⁻¹	0.0005		3		<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Phenol	mg.L ⁻¹	0.0005	0.0077	3	0	<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Trimethylphenol	mg.L ⁻¹											
Phenols (Total)	mg.L ⁻¹	0.0035		3		<0.0035	<0.0035	<0.0035	n/a	<0.0035	<0.0035	<0.0035
Naphthalene	mg.L ⁻¹	0.00001	0.002	3	0	<0.00001	<0.00011	0.00021	MW25-03	<0.00001	0.00021	0.00011
Acenaphthylene	mg.L ⁻¹	0.00001		3		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Acenaphthene	mg.L ⁻¹	0.00001		3		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Fluorene	mg.L ⁻¹	0.00001		3		0.00001	0.00003	0.00004	MW25-02	0.000040	0.000030	0.000010
Phenanthrene	mg.L ⁻¹	0.00001		3		0.00004	0.00011	0.00018	MW25-02	0.00018	0.00011	0.000040
Anthracene	mg.L ⁻¹	0.00001	0.0001	3	0	<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Fluoranthene	mg.L ⁻¹	0.00001	0.0000063	3	2	<0.00001	<0.00005	0.00009	MW25-02	0.000090	0.000040	<0.00001
Pyrene	mg.L ⁻¹	0.00001		3		<0.00001	<0.00003	0.00006	MW25-02	0.000060	0.000030	<0.00001
Benzo[a]anthracene	mg.L ⁻¹	0.00001		3		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Chrysene	mg.L ⁻¹	0.00001		3		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Benzo[b]fluoranthene	mg.L ⁻¹	0.00001	0.000017	3	0	<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Benzo[k]fluoranthene	mg.L ⁻¹	0.00001	0.000017	3	0	<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Benzo[a]pyrene	mg.L ⁻¹	0.00001	0.00000017	3	0	<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Indeno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00001		3		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Dibenz(a,h)anthracene	mg.L ⁻¹	0.00001		3		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Benzo[ghi]perylene	mg.L ⁻¹	0.00001	0.0000082	3	0	<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001
Sum of benzo[b]fluoranthene & benzo[k]fluoranthene	mg.L ⁻¹	0.00002		3		<0.00002	<0.00002	<0.00002	n/a	<0.00002	<0.00002	<0.00002
Sum of benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[ghi]perylene and ideno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00004		3		<0.00004	<0.00004	<0.00004	n/a	<0.00004	<0.00004	<0.00004
Sum of benzo[ghi]perylene and indeno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00002		3		<0.00002	<0.00002	<0.00002	n/a	<0.00002	<0.00002	<0.00002
PAH 16 Total	mg.L ⁻¹	0.00016		3		<0.00016	<0.00032	0.00041	MW25-03	0.00038	0.00041	<0.00016
Arsenic	mg.L ⁻¹	0.001	0.05	3	0	0.001	0.003	0.005	MW25-02	0.0050	0.0010	0.0020
Cadmium	mg.L ⁻¹	0.00008	<0.00008	3	0	<0.00008	<0.00008	<0.00008	n/a	<0.00008	<0.00008	<0.00008
Chromium (VI)	mg.L ⁻¹	0.005	0.0034	3	0	<0.005	<0.005	<0.005	n/a	<0.005	<0.005	<0.005
Chromium (Total)	mg.L ⁻¹	0.0004	0.0034	3	1	<0.0004	<0.0019	0.0048	MW25-02	0.0048	<0.0004	<0.0004
Copper	mg.L ⁻¹	0.0007	0.001	3	2	0.0009	0.0022	0.0047	MW25-02	0.0047	0.00090	0.0011
Iron	mg.L ⁻¹	0.004	1	3	1	0.089	1.63	4.2	MW25-02	4.2000	0.08900	0.60000
Lead	mg.L ⁻¹	0.001	0.0012	3	1	<0.001	<0.002	0.004	MW25-02	0.0040	<0.001	<0.001
Mercury (inorganic)	mg.L ⁻¹	0.0005	0.00007	3	0	<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005
Nickel	mg.L ⁻¹	0.0003	0.004	3	1	<0.0003	<0.0019	0.005	MW25-02	0.0050	0.00050	<0.0003
Selenium	mg.L ⁻¹	0.004		3		<0.004	<0.004	<0.004	n/a	<0.004	<0.004	<0.004
Zinc	mg.L ⁻¹	0.0004	0.0123	3	0	0.0019	0.0049	0.0095	MW25-02	0.0095	0.0019	0.0032
Benzene	mg.L ⁻¹	0.001	0.01	3	0	<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001
Toluene	mg.L ⁻¹	0.001	0.074	3	0	<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001
Ethylbenzene	mg.L ⁻¹	0.001	0.02	3	0	<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001
Xylene (p & m-Xylene)	mg.L ⁻¹	0.001		3		<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001
Xylene (o-Xylene)	mg.L ⁻¹	0.001		3		<0.001	<0.001	<0.001	n/a	<0.001	<0.001	<0.001
Xylenes (Total of m and p, o-xylenes)	mg.L ⁻¹	0.002	0.03	3	0	<0.002	<0.002	<0.002	n/a	<0.002	<0.002	<0.002
TPH (C10 - C40)	mg.L ⁻¹	0.01		3		<0.01	<0.06	0.1	MW25-03	0.060	0.10	<0.01

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NUMBER OF SAMPLES: 1												Sample Location	MW25-28A
												Depth (m bgl)	0.60
												Date Sampled	20/02/2025
												Stratum	MGR
Analytical Parameter	Units	Limit of detection	CRITERIA 1 Environmental Quality Standards for freshwater surface waters	CRITERIA 2 Combined Drinking Water Screening values	No. Analyses	CRITERIA 1	CRITERIA 2	Min	Mean	Max	Max ID		
						Exceedances	Exceedances						
pH	pH Units	N/A			1			8.4	8.4	8.4	MW25-28A	8.40	
Sulphate as SO ₄	mg.L ⁻¹	0.045			1			21.8	21.8	21.8	MW25-28A	21.80	
Total Suspended Solids	mg.L ⁻¹	2			1			11.2	11.2	11.2	MW25-28A	11.20	
Conductivity	µS.cm ⁻¹	10		2500	1		0	360	360	360	MW25-28A	360.00	
Cyanide (Total) (as CN)	mg.L ⁻¹	0.01		0.05	1		0	0.021	0.02	0.021	MW25-28A	0.021	
Complexed cyanide	mg.L ⁻¹	0.01			1			0.0215	0.02	0.0215	MW25-28A	0.022	
Easily liberatable cyanide	mg.L ⁻¹	0.01	0.001	0.05	1	0	0	<0.01	<0.01	<0.01	n/a	<0.01	
Thiocyanate	mg.L ⁻¹	0.2			1			<0.2	<0.2	<0.2	n/a	<0.2	
Sulphur (Elemental)	mg.L ⁻¹	20			1			<20	<20	<20	n/a	<20	
Sulphide	mg.L ⁻¹	0.005			1			<0.005	<0.005	<0.005	n/a	<0.005	
Chloride	mg.L ⁻¹	0.15	250	250	1	0	0	36	36	36	MW25-28A	36.00	
Ammoniacal Nitrogen as NH ₄ ⁺ / Ammonium as NH ₄	mg.L ⁻¹	0.015		0.5	1		1	0.54	0.54	0.54	MW25-28A	0.54	
Ammoniacal N (total) as N	mg.L ⁻¹	0.011667	1.1		1	0		0.420012	0.420012	<0.420012	n/a	0.42	
Un-ionised ammonia as nitrogen (NH ₃ as N)	mg.L ⁻¹	0.011667			1			0.420012	0.420012	<0.420012	n/a	0.42	
Dissolved Organic Carbon (DOC)	mg.L ⁻¹	0.1			1			37	37	37	MW25-28A	37.00	
Catechol	mg.L ⁻¹	0.0005			1			<0.0005	<0.0005	<0.0005	n/a	<0.0005	
Resorcinol	mg.L ⁻¹	0.0005			1			<0.0005	<0.0005	<0.0005	n/a	<0.0005	
Ethylphenol & Dimethylphenol	mg.L ⁻¹	0.0005			1			<0.0005	<0.0005	<0.0005	n/a	<0.0005	
Cresols (Total)	mg.L ⁻¹	0.0005	0.1		1	0		<0.0005	<0.0005	<0.0005	n/a	<0.0005	
2-Isopropylphenol	mg.L ⁻¹	0.0005			1			<0.0005	<0.0005	<0.0005	n/a	<0.0005	
Trimethylphenol (2,3,5-)	mg.L ⁻¹	0.0005			1			<0.0005	<0.0005	<0.0005	n/a	<0.0005	
Naphthols	mg.L ⁻¹	0.0005			1			<0.0005	<0.0005	<0.0005	n/a	<0.0005	
Phenol	mg.L ⁻¹	0.0005	0.0077		1	0		<0.0005	<0.0005	<0.0005	n/a	<0.0005	
Phenols (Total)	mg.L ⁻¹	0.0035			1			<0.0035	<0.0035	<0.0035	n/a	<0.0035	
Naphthalene	mg.L ⁻¹	0.00001	0.002		1	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Acenaphthylene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Acenaphthene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Fluorene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Phenanthrene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Anthracene	mg.L ⁻¹	0.00001	0.0001		1	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Fluoranthene	mg.L ⁻¹	0.00001	0.0000063		1	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Pyrene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Benzo[a]anthracene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Chrysene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Benzo[b]fluoranthene	mg.L ⁻¹	0.00001	0.000017		1	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Benzo[k]fluoranthene	mg.L ⁻¹	0.00001	0.000017		1	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Benzo[a]pyrene	mg.L ⁻¹	0.00001	0.00000017	0.00001	1	0	0	<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Indeno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Dibenz[a,h]anthracene	mg.L ⁻¹	0.00001			1			<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Benzo[ghi]perylene	mg.L ⁻¹	0.00001	0.0000082		1	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	
Sum of benzo[b]fluoranthene & benzo[k]fluoranthene	mg.L ⁻¹	0.00002			1			<0.00002	<0.00002	<0.00002	n/a	<0.00002	
Sum of benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[ghi]perylene and ideno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00004		0.0001	1		0	<0.00004	<0.00004	<0.00004	n/a	<0.00004	
Sum of benzo[ghi]perylene and indeno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00002			1			<0.00002	<0.00002	<0.00002	n/a	<0.00002	
PAH 16 Total	mg.L ⁻¹	0.00016			1			<0.00016	<0.00016	<0.00016	n/a	<0.00016	
Arsenic	mg.L ⁻¹	0.001	0.05	0.01	1	0	0	<0.001	<0.001	<0.001	n/a	<0.001	
Cadmium	mg.L ⁻¹	0.00008	<0.00008	0.005	1	0	0	<0.00008	<0.00008	<0.00008	n/a	<0.00008	
Chromium (VI)	mg.L ⁻¹	0.005	0.0034		1	0		<0.005	<0.005	<0.005	n/a	<0.005	
Chromium (Total)	mg.L ⁻¹	0.0004	0.0034	0.05	1	0	0	0.0013	0.0013	0.0013	MW25-28A	0.0013	
Copper	mg.L ⁻¹	0.0007	0.001	2	1	1	0	0.011	0.011	0.011	MW25-28A	0.011	
Iron	mg.L ⁻¹	0.004	1	0.2	1	1	1	1.4	1.4	1.4	MW25-28A	1.40	
Lead	mg.L ⁻¹	0.001	0.0012	0.01	1	1	1	0.015	0.015	0.015	MW25-28A	0.015	
Mercury (inorganic)	mg.L ⁻¹	0.0005	0.00007	0.001	1	0	0	<0.0005	<0.0005	<0.0005	n/a	<0.0005	
Nickel	mg.L ⁻¹	0.0003	0.004	0.02	1	0	0	0.004	0.004	0.004	MW25-28A	0.0040	
Selenium	mg.L ⁻¹	0.004		0.01	1		0	<0.004	<0.004	<0.004	n/a	<0.004	
Zinc	mg.L ⁻¹	0.0004	0.0123		1	0		0.0031	0.0031	0.0031	MW25-28A	0.0031	
Benzene	mg.L ⁻¹	0.001	0.01	0.001	1	0	0	<0.001	<0.001	<0.001	n/a	<0.001	
Toluene	mg.L ⁻¹	0.001	0.074	0.7	1	0	0	<0.001	<0.001	<0.001	n/a	<0.001	
Ethylbenzene	mg.L ⁻¹	0.001	0.02	0.3	1	0	0	<0.001	<0.001	<0.001	n/a	<0.001	
Xylene (p & m-Xylene)	mg.L ⁻¹	0.001			1			<0.001	<0.001	<0.001	n/a	<0.001	
Xylene (o-Xylene)	mg.L ⁻¹	0.001			1			<0.001	<0.001	<0.001	n/a	<0.001	
Xylenes (Total of m and p, o-xylenes)	mg.L ⁻¹	0.002	0.03	0.5	1	0	0	<0.002	<0.002	<0.002	n/a	<0.002	
Methyl tert-butyl ether	mg.L ⁻¹	0.003			1			<0.003	<0.003	<0.003	n/a	<0.003	
Aliphatic C5 - C6	mg.L ⁻¹	0.001		15	1		0	<0.01	<0.01	<0.01	n/a	<0.01	
Aliphatic C6 - C8	mg.L ⁻¹	0.001		15	1		0	<0.001	<0.001	<0.001	n/a	<0.001	
Aliphatic C8 - C10	mg.L ⁻¹	0.001		0.3	1		0	<0.001	<0.001	<0.001	n/a	<0.001	
Aliphatic C10 – C12	mg.L ⁻¹	0.01		0.3	1		0	<0.001	<0	<0.001	n/a	<0.001	
Aliphatic C12 – C16	mg.L ⁻¹	0.01			1			<0.01	<0.01	<0.01	n/a	<0.01	
Aliphatic C16 – C21	mg.L ⁻¹	0.01			1			<0.01	<0.01	<0.01	n/a	<0.01	
Aliphatic C21 – C35	mg.L ⁻¹	0.01			1			<0.01	<0.01	<0.01	n/a	<0.01	
Total TPH Aliphatic >EC10 - EC35	mg.L ⁻¹	0.01			1			<0.01	<0.01	<0.01	n/a	<0.01	
Aromatic C5 - C7	mg.L ⁻¹	0.001			1			<0.01	<0.01	<0.01	n/a	<0.01	
Aromatic C7 - C8	mg.L ⁻¹	0.001			1			<0.001	<0.001	<0.001	n/a	<0.001	
Aromatic C8 – C10	mg.L ⁻¹	0.001			1			<0.001	<0.001	<0.001	n/a	<0.001	
Aromatic C10 – C12	mg.L ⁻¹	0.01		0.09	1		0	<0.001	<0	<0.001	n/a	<0.001	
Aromatic C12 – C16	mg.L ⁻¹	0.01		0.09	1		0	<0.01	<0.01	<0.01	n/a	<0.01	
Aromatic C16 – C21	mg.L ⁻¹	0.01		0.09	1		0	<0.01	<0.01	<0.01	n/a	<0.01	
Aromatic C21 – C35	mg.L ⁻¹	0.01		0.09	1		0	<0.01	<0.01	<0.01	n/a	<0.01	
Total TPH Aromatic >EC10 - EC35	mg.L ⁻¹	0.01			1			<0.01	<0.01	<0.01	n/a	<0.01	

MGR = Made Ground

												Setting tanks	Setting tanks	Setting tanks	Setting tanks	Setting tanks	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Refuse tip	Reservoir	Reservoir	Reservoir	Reservoir	GH1	GH1	GH1	GH1	GH1	GH1	GH2									
NUMBER OF SAMPLES: 121												Sample Location					MW25-01	MW25-01	MW25-01	MW25-01-DUP	MW25-01-DUP	MW25-04A	MW25-04A	MW25-04A	MW25-07	MW25-07	MW25-07	MW25-35	MW25-35	MW25-35	MW25-36	MW25-36	MW25-36	MW25-36-DUP	MW25-13A	MW25-13A	MW25-13A	MW25-33	MW25-33	MW25-33	MW25-10					
												Monitoring Round No.					1	2	3	1	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	3					
												Date Sampled Stratum					17/03/2025	07/04/2025	28/04/2025	07/04/2025	28/04/2025	17/03/2025	07/04/2025	28/04/2025	18/03/2025	08/04/2025	29/04/2025	18/03/2025	07/04/2025	28/04/2025	17/03/2025	17/03/2025	07/04/2025	28/04/2025	17/03/2025	19/03/2025	09/04/2025	30/04/2025	18/03/2025	09/04/2025	30/04/2025	19/03/2025				
												CRITERIA 1 CRITERIA 2 CRITERIA 1					Wolston Sand & Gravel					Boulder Clay/Wolston Sand & Gravel					Boulder Clay/Wolston Sand & Gravel					Wolston Sand & Gravel/Wolston Clay					Made Ground					Made Ground				
Analytical Parameter	Units	Limit of detection	Environmental Quality Standards for freshwater surface waters	Combined Drinking Water Screening values	No. Analyses	Exceedances	Exceedances	Min	Mean	Max	Max ID																																			
pH	pH Units	N/A	6-9	6.5<-9.5	121	12	12	6.8	7.6	11.500	MW25-22	7.50	7.50	7.30	7.50	7.40	7.30	7.20	7.10	7.20	7.20	6.90	7.30	7.30	7.10	7.10	7.20	7.10	7.10	7.10	7.90	7.90	7.90	7.60	7.30	7.50	9.90									
Conductivity	µS.cm ⁻¹	10		2500	121		36	640	2513.6	7200	MW25-17	1600.00	1600.00	1600.00	1500.00	1600.00	2000.00	1900.00	2100.00	2100.00	2100.00	2400.00	2300.00	2500.00	1800.00	1700.00	1700.00	1700.00	1700.00	1400.00	1400.00	1400.00	1000.00	1100.00	1200.00	2000.00										
Cyanide (Total) (as CN)	mg.L ⁻¹	0.01		0.05	121		90	<0.01	<0.77	8.6	MW25-10	0.030	0.020	0.030	0.020	0.030	0.040	0.040	0.050	0.57	0.53	0.51	0.17	0.29	0.34	0.34	0.29	0.17	0.41	0.36	0.44	0.37	0.66	0.79	0.48	7.90										
Complexed cyanide	mg.L ⁻¹	0.01			121			<0.01	<0.77	8.5	MW25-10	0.030	0.020	0.030	0.020	0.030	0.040	0.040	0.050	0.57	0.53	0.51	0.17	0.29	0.34	0.34	0.29	0.17	0.41	0.36	0.44	0.37	0.66	0.79	0.48	7.90										
Easily liberatable cyanide	mg.L ⁻¹	0.01	0.001		121	14	1	<0.01	<0.01	0.07	MW25-14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.030									
Thiocyanate	mg.L ⁻¹	0.2			121			<0.2	<0.8	12	MW25-14	<0.2	0.30	<0.2	<0.2	0.20	<0.2	0.20	0.20	<0.2	0.30	0.30	0.30	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.20	0.20	0.30	0.30	0.20	0.40	6.20										
Sulphate	mg.L ⁻¹	0.045	400	250	121	62	84	29.9	545.662	2220	MW25-17	262.00	252.00	216.00	246.00	229.00	338.00	326.00	310.00	913.00	637.00	833.00	383.00	367.00	377.00	364.00	343.00	301.00	282.00	446.00	474.00	478.00	378.00	480.00	433.00	568.00										
Sulphur (Elemental)	mg.L ⁻¹	0.02			80			<0.02	<0.02	0.04	CBH102	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02									
Sulphide	mg.L ⁻¹	0.005			121			<0.005	<0.176	5.9	MW25-17	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.060									
Chloride	mg.L ⁻¹	0.15	250	250	121	63	63	27	446.72	190	MW25-17	210.00	210.00	210.00	210.00	210.00	360.00	350.00	380.00	180.00	210.00	130.00	610.00	490.00	490.00	240.00	240.00	240.00	240.00	82.00	81.00	84.00	27.00	35.00	40.00	350.00										
Ammonium as NH4	mg.L ⁻¹	0.015		0.5	121		102	<0.015	<54.093	680	MW25-27	2.40	4.00	3.80	3.80	3.90	7.10	5.70	4.60	2.70	2.90	2.50	2.70	2.40	2.40	3.40	3.40	3.00	3.40	4.70	4.40	4.70	0.33	0.30	0.058	26.00										
Ammoniacal N (total) as N	mg.L ⁻¹	0.011667	1.1		121	92		<0.011667	<42.0734	528.904	MW25-27	1.87	3.11	2.96	2.96	3.03	5.52	4.43	3.58	2.10	2.26	1.94	2.10	1.87	1.87	2.64	2.64	2.33	2.64	3.66	3.42	3.66	0.26	0.23	0.045	20.22										
Un-ionised ammonia as nitrogen (NH3 as N)	mg.L ⁻¹	0.011667			121			<0.011667	<42.0734	528.904	MW25-27	1.87	3.11	2.96	2.96	3.03	5.52	4.43	3.58	2.10	2.26	1.94	2.10	1.87	1.87	2.64	2.64	2.33	2.64	3.66	3.42	3.66	0.26	0.23	0.045	20.22										
Total Organic Carbon (TOC)	mg.L ⁻¹	0.1			121			2.46	23.7	264	MW25-27	640	9.19	8.57	9.40	8.38	5.86	4.47	3.33	5.25	3.98	5.01	2.88	2.73	3.60	2.83	3.01	3.45	12.10	9.87	11.00	9.65	11.20	7.23	100.00											
Alkalinity as CaCO3	mg.L ⁻¹	3			121			50	379.4	1200	MW25-27	370.00	370.00	390.00	330.00	380.00	340.00	300.00	300.00	370.00	340.00	340.00	320.00	250.00	270.00	360.00	360.00	380.00	400.00	280.00	300.00	320.00	180.00	200.00	210.00	120.00										
Dissolved Organic Carbon (DOC)	mg.L ⁻¹	0.1			121			2.44	21.3	235	MW25-27	630	8.31	8.15	9.29	8.20	5.59	4.31	3.09	4.74	3.82	4.88	2.85	2.55	2.53	3.37	2.74	2.69	3.35	11.50	9.75	10.80	9.61	10.50	7.12	98.60										
Total Suspended Solids	mg.L ⁻¹	2			121			<2	<1193.9	110000	CBH129	180.00	110.00	120.00	91.00	180.00	56.00	110.00	240.00	110.00	75.00	700.00	120.00	95.00	22.00	56.00	38.00	32.00	71.00	250.00	450.00	110.00	220.00	720.00	73.00	250.00										
Hardness - Total	mgCaCO ₃ .L ⁻¹	1			121			201	694.2	2520	MW25-08	428.00	444.00	490.00	397.00	509.00	550.00	567.00	564.00	1110.00	818.00	1200.00	619.00	550.00	631.00	653.00	603.00	654.00	486.00	573.00	602.00	563.00	408.00	520.00	486.00	615.00										
Catechol	mg.L ⁻¹	0.0005			121			<0.0005	<0.2783	14	MW25-27	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005									
Resorcinol	mg.L ⁻¹	0.0005			121			<0.0005	<0.0179	0.48	MW25-23B	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005									
Ethylphenol & Dimethylphenol	mg.L ⁻¹				121			<0.0005	<0.0558	2.2	MW25-23B	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005								
Cresols (Total)	mg.L ⁻¹	0.0005	0.1		121	15		<0.0005	<1.3943	50	MW25-27	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005								
Naphthols	mg.L ⁻¹	0.0005			121			<0.0005	<0.0558	2.2	MW25-23B	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005								
Isopropylphenol	mg.L ⁻¹	0.0005			121			<0.0005	<0.1477	10	MW25-27	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005								
Phenol	mg.L ⁻¹	0.0005	0.0077		121	39		<0.0005	<0.9463	16	MW25-27	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005								
Trimethylphenol	mg.L ⁻¹	0.0005			121			<0.0005	<0.5489	56	MW25-23B	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005								
Phenols (Total)	mg.L ⁻¹	0.0035			121			<0.0035	<5.9229	190	MW25-27	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	0.058	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035	<0.0035								
Total Xylenols & Ethylphenols	mg.L ⁻¹	0.0005			121			<0.0005	<2.4998	66	MW25-27	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	&lt																		

Table B2: GQRA Screened Groundwater Analytical Data - Area B

NUMBER OF SAMPLES: 121										Sample Location										Monitoring Round No.										Date Sampled										Stratum										GH2										GH3										GHA										Primary Purifiers										Purifier Catch box										Brick structure																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															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NUMBER OF SAMPLES: 121											Sample Location										CBH104	CBH108	CBH108	CBH108	CBH108-DUP	CBH108-DUP	CBH112	CBH112	CBH112	CBH130	CBH130	CBH130	MW25-05A	MW25-05A	MW25-05A	MW25-08	MW25-08	MW25-08	MW25-19A	MW25-19A	MW25-19A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													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Analytical Parameter	Units	Limit of detection	CRITERIA 1	CRITERIA 2	No. Analyses	CRITERIA 1	CRITERIA 2	Min	Mean	Max	Max ID						
			Environmental Quality Standards for freshwater surface waters	Combined Drinking Water Screening values		Exceedances	Exceedances										
pH	pH Units	N/A	6-9	6.5<9.5	4	0	0	7.4	7.5	7.600	MW25-28A	7.50	7.60	7.40	7.40		
Conductivity	µS.cm ⁻¹	10		2500	4		0	950	975	1000	MW25-28A	960.00	990.00	1000.00	950.00		
Cyanide (Total) (as CN)	mg.L ⁻¹	0.01		0.05	4		0	<0.01	<0.01	<0.01	n/a	<0.01	<0.01	<0.01	<0.01		
Complexed cyanide	mg.L ⁻¹	0.01			4			<0.01	<0.01	<0.01	n/a	<0.01	<0.01	<0.01	<0.01		
Easily liberatable cyanide	mg.L ⁻¹	0.01	0.001	0.05	4	0	0	<0.01	<0.01	<0.01	n/a	<0.01	<0.01	<0.01	<0.01		
Thiocyanate	mg.L ⁻¹	0.2			4			<0.2	<0.2	<0.2	n/a	<0.2	<0.2	<0.2	<0.2		
Sulphate	mg.L ⁻¹	0.045	400	250	4	0	0	118	125.75	133	MW25-28A	124.00	128.00	133.00	118.00		
Sulphur (Elemental)	mg.L ⁻¹	0.02			3			<0.02	<0.02	<0.02	n/a	<0.02		<0.02	<0.02		
Sulphide	mg.L ⁻¹	0.005			4			<0.005	<0.005	<0.005	n/a	<0.005	<0.005	<0.005	<0.005		
Chloride	mg.L ⁻¹	0.15	250	250	4	0	0	88	96.5	110	MW25-28A	88.00	110.00	100.00	88.00		
Ammonium as NH4	mg.L ⁻¹	0.015			4			<0.015	<0.015	0.015	MW25-28A	<0.015	0.015	<0.015	<0.015		
Ammoniacal N (total) as N	mg.L ⁻¹	0.011667	1.1		4	0		<0.011667	<0.011667	0.011667	MW25-28A	<0.011667	0.012	<0.011667	<0.011667		
Un-ionised ammonia as nitrogen (NH3 as N)	mg.L ⁻¹	0.011667			4			<0.011667	<0.011667	0.011667	MW25-28A	<0.011667	0.012	<0.011667	<0.011667		
Total Organic Carbon (TOC)	mg.L ⁻¹	0.1			4			1.78	2.1	2.48	MW25-28A	1.78	2.48	2.03	1.92		
Alkalinity as CaCO3	mg.L ⁻¹	3			4			260	282.5	300	MW25-28A	300.00	260.00	280.00	290.00		
Dissolved Organic Carbon (DOC)	mg.L ⁻¹	0.1			4			1.71	2	2.19	MW25-28A	1.71	2.19	2.03	1.88		
Total Suspended Solids	mg.L ⁻¹	2			4			270	4120	15000	MW25-28A	270.00	15000.00	460.00	750.00		
Hardness - Total	mgCaCO.L ⁻¹	1			4			414	446.5	497	MW25-28A	434.00	441.00	497.00	414.00		
Catechol	mg.L ⁻¹	0.0005			4			<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005	<0.0005		
Resorcinol	mg.L ⁻¹	0.0005			4			<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005	<0.0005		
Ethylphenol & Dimethylphenol	mg.L ⁻¹																
Cresols (Total)	mg.L ⁻¹	0.0005	0.1		4	0		<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005	<0.0005		
Naphthols	mg.L ⁻¹	0.0005			4			<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005	<0.0005		
Isopropylphenol	mg.L ⁻¹	0.0005			4			<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005	<0.0005		
Phenol	mg.L ⁻¹	0.0005	0.0077		4	0		<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005	<0.0005		
Trimethylphenol	mg.L ⁻¹	0.0005			4			<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005	<0.0005		
Phenols (Total)	mg.L ⁻¹	0.0035			4			<0.0035	<0.0035	<0.0035	n/a	<0.0035	<0.0035	<0.0035	<0.0035		
Total Xylenols & Ethylphenols	mg.L ⁻¹	0.0005			4			<0.0005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	<0.0005	<0.0005		
Naphthalene	mg.L ⁻¹	0.00001	0.002		4	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Acenaphthylene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Acenaphthene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Fluorene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Phenanthrene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Anthracene	mg.L ⁻¹	0.00001	0.0001		4	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Fluoranthene	mg.L ⁻¹	0.00001	0.0000063		4	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Pyrene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Benzo[a]anthracene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Chrysene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Benzo[b]fluoranthene	mg.L ⁻¹	0.00001	0.000017		4	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Benzo[k]fluoranthene	mg.L ⁻¹	0.00001	0.000017		4	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Benzo[a]pyrene	mg.L ⁻¹	0.00001	0.00000017	0.00001	4	0	0	<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Indeno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Dibenz(a,h)anthracene	mg.L ⁻¹	0.00001			4			<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Benzo[ghi]perylene	mg.L ⁻¹	0.00001	0.0000082		4	0		<0.00001	<0.00001	<0.00001	n/a	<0.00001	<0.00001	<0.00001	<0.00001		
Sum of benzo[b]fluoranthene & benzo[k]fluoranthene	mg.L ⁻¹	0.00002			4			<0.00002	<0.00002	<0.00002	n/a	<0.00002	<0.00002	<0.00002	<0.00002		
Sum of benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[ghi]perylene and indeno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00004		0.0001	4		0	<0.00004	<0.00004	<0.00004	n/a	<0.00004	<0.00004	<0.00004	<0.00004		
Sum of benzo[ghi]perylene and indeno[1,2,3-cd]pyrene	mg.L ⁻¹	0.00002			4			<0.00002	<0.00002	<0.00002	n/a	<0.00002	<0.00002	<0.00002	<0.00002		
PAH 16 Total	mg.L ⁻¹	0.00016			4			<0.00016	<0.00016	<0.00016	n/a	<0.00016	<0.00016	<0.00016	<0.00016		
Calcium	mg.L ⁻¹	0.012			4			130	140	160	MW25-28A	140.00	130.00	160.00	130.00		
Iron	mg.L ⁻¹	0.004	1	0.2	4	0	0	0.008	0.03	0.087	MW25-28A	0.016	0.087</				