



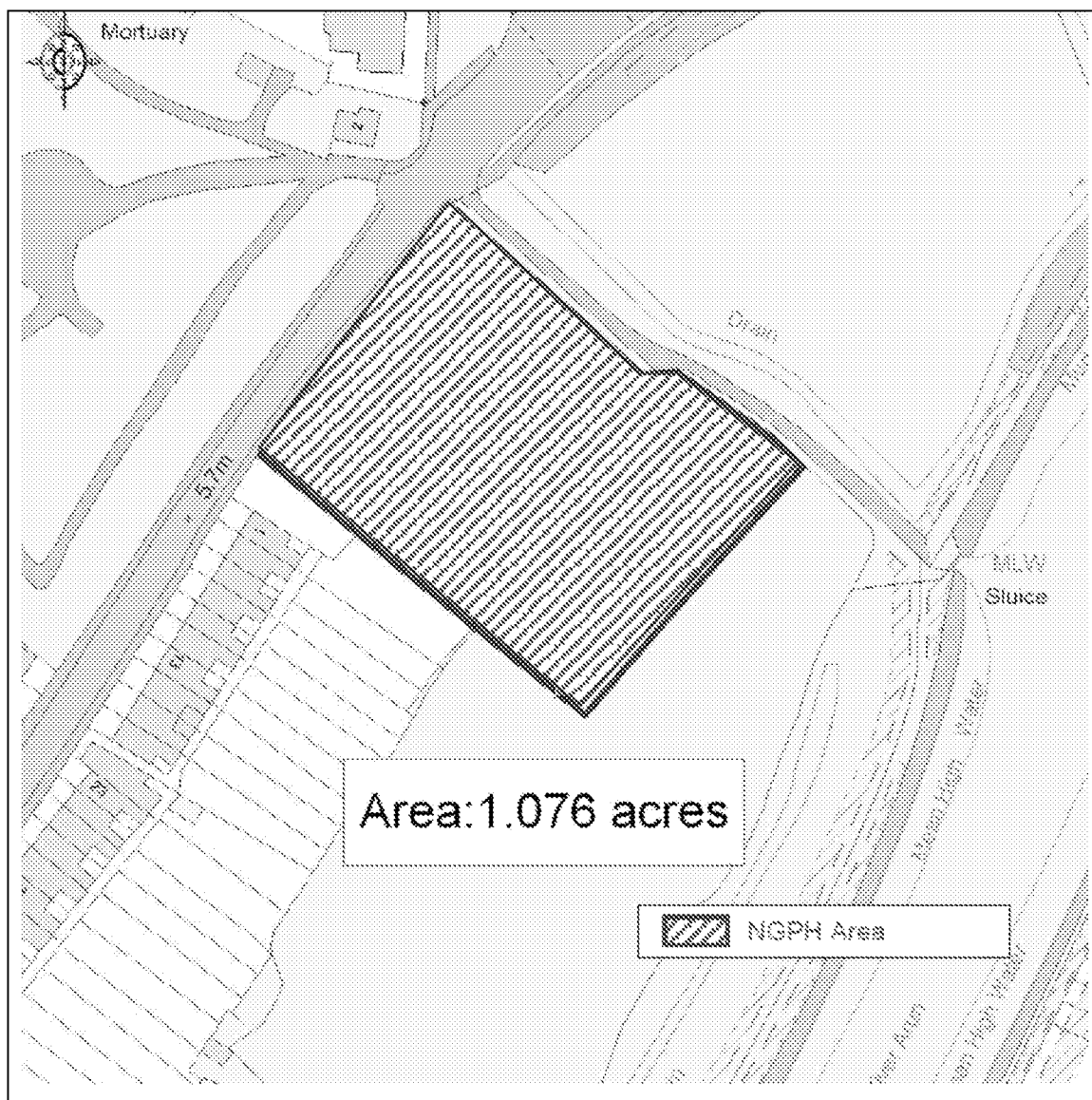
FORD ROAD, ARUNDEL
NATIONAL GRID PROPERTY
HOLDINGS

R1820/20/5043

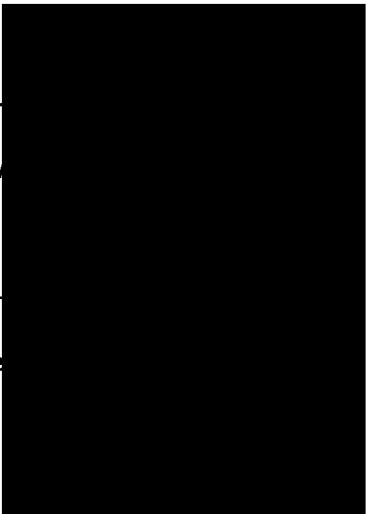
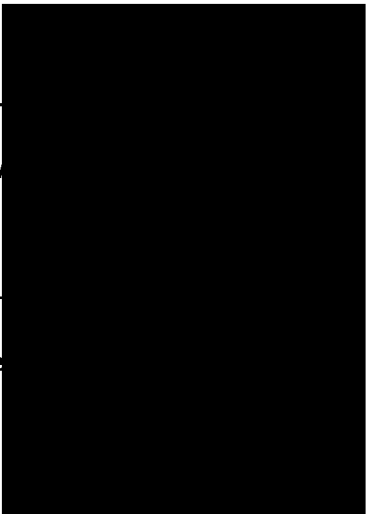
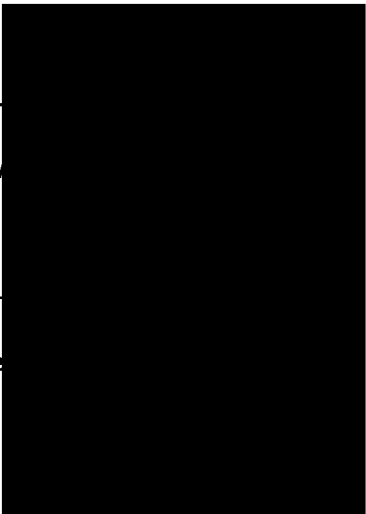
SUPPLEMENTARY SITE
INVESTIGATION FACTUAL
REPORT

FINAL REV 1

December 2020



Site Address:	Ford Road, Arundel, West Sussex BN18 9DX	NGP Document Tracking Code	
Report Title	Ford Road, Arundel – Supplementary Site Investigation Factual Report		
Report Type:	Contamination	Retention Period	
Site Code	2551	Author (Company)	Celtic Technologies
Report Date	December 2020	Factual/Interpretative	Factual
Draft / Final	Draft	H & S File?	No
Work Stage	SI		
Brief description of contents	Factual Site Investigation to provide further information for the design of remediation works proposed for the site.		
Access Permitted	NGP Land Regeneration Team	NGP Contact	Gareth Taylor eAOC Nicola Carver

Client:	National Grid Property Holdings Ltd
Report Number:	R1820/20/5043
Report Title:	Ford Road, Arundel – Supplementary Site Investigation Factual Report
Report Status:	Final
Author(s):	S. Gronow
(Signature & Date)	20.01.21 
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(Signature & Date)	20.01.21 
QA Approved:	M. Holme
(Signature & Date)	20.01.21 

Celtic is the trading name of Celtic Technologies Limited.

This report has been prepared for National Grid Property Holdings Ltd. and their advisors as part of the 2012-2015 Framework Agreement for the provision of Land Remediation Contracting Services (Design and Build) Soils South in accordance with the terms and conditions set out therein.

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1.0 INTRODUCTION

Celtic Technologies Limited (Celtic) has been commissioned by National Grid Property Holdings (NGPH) to provide a Factual Site Investigation Report on NGPH land at The Former Holder Station, Ford Road, Arundel, West Sussex BN18 9DX.

The objective of the Factual Site Investigation was to provide further information for the design of remediation works proposed for the site as part of the Stage 1 Pre-Remediation Risk Mitigation and Site Investigation Works. The investigation focussed on filling data gaps and collecting baseline monitoring data to inform the remediation design and implementation plan.

Contact points for the work are detailed in Table 1, below:

Table 1 – Contact Points

Organisation	Name	Role	Contact Details
NGPH	Gareth Taylor / eAOC Nicola Carver	Regeneration Manager / Advisor	National Grid House, Warwick Technology Park Gallows Hill Warwick CV34 6DA
Atkins (SNC-Lavalin Group)	Lucy Hay	Principal Designer	24 th Floor South, Euston Tower, 286 Euston Road, London NW1 3AT
Celtic Technologies (Celtic EnGlobe)	Steve Gronow	Principal Contractor	Columbus House, Greenmeadow Springs, Tongwynlais, Cardiff CF15 7NE
RSK	Simon Penney	CDM-Advisor	Spring Lodge, 172 Chester Road, Helsby, Cheshire WA6 0AR

2.0 SITE INFORMATION

2.1 Site Location

The site is situated approximately 40 m north west of the River Arun. The site is owned by NGPH, is currently unoccupied and comprises secure vacant land. The site has a postal address of Former Holder Station, Ford Road, Arundel BN18 9DX and is located at approximate National Grid Reference 501308E, 106749N.

2.2 Previous Investigation at the Site

Previous Investigations undertaken at the site include:

1. British Gas Environmental Liability Report, Report ref. E5347/LR860.NL/gp, Atkins April 1994;
2. Environmental Assessment Site Investigation, Final Factual Report, Report ref. A71430/GTG.20000078/R002rev1/December2000, Atkins December 2000;
3. Environmental Groundwater Monitoring Letter Report, Ford Road, Arundel, Mentor No. 015162, Report ref. A71430/GTG.2000078/Arundel/R004rev0/mg, Atkins July 2001; and
4. Ford Road, Arundel (Site No. 2551) Site Investigation Report, Report ref. 5104362/GTG.20100923/Arundel2011/R001v0, Atkins October 2011.

2.3 Site Description

The site entrance can be accessed from Ford Road off an access track which runs along the north-eastern site boundary. The site is then accessed from the east through a pair of metal access gates. The site is an approximately rectangular shaped area of land covering an area of approximately 0.44 hectares (Ha).

An electricity sub-station is located on the north-eastern site boundary adjacent to the site entrance and concrete slab foundations are in the northern and eastern corners of the site. No other above ground structures or buildings are present on the site.

The site surface comprises approximately 25% tarmac, with the remainder comprising of either gravel, wood chippings or bare earth. The site is generally level at an approximate elevation of 3 m above ordnance datum (aOD). The site is generally level with surrounding land, except for residential properties to the south/ south-west of the site which are raised above the site level by approximately 1 m.

Site location and surrounding areas are presented on drawing D1820/A1 within Appendix A of this report. A site hazard plan is provided as D1820/A2 and a traffic management plan as D1820/A3.

2.4 Site History

The site was operated as a gasworks from at least 1840, expanding in the west circa 1899, and in the south and south east in circa 1937. It is understood that the gasworks continued operation until the late 20th century.

The historical layout plan is provided on Drawing D1820/A4, Appendix A.

The historical gasworks structures comprised up to 4 No. gasholders, a Retort House, including chimney/ tank, a Boiler House, condensers, governor compound, liquor/ tar tanks, and associated offices and stores.

The gas work structures were widespread across the site, however, they are concentrated in the north eastern corner, where two of the four gasholders were located, along with the retort house, including chimney and the liquor/ tar tank.

2.5 Neighbouring Land

The site is surrounded by a combination of residential properties, grazing land and a cemetery as follows:

- South-west: Residential houses with gardens;
- South-east: Private grazing land with the River Arun behind;
- North-west: Ford Road, beyond which is a cemetery; and
- North-east: an access track leading off Ford Road, beyond which is a small surface water drain (which runs towards the River Arun via a sluice gate), and private grazing land.

3.0 INVESTIGATION METHODOLOGY

3.1 Enabling Works

Prior to the site investigation works, enabling works were carried out. This comprised the establishment of a welfare compound and parking area, a site boundary dilapidation survey was then undertaken followed by the clearance of vegetation across the site. Approximately half of the cleared vegetation was removed from site and the remaining half has been stockpiled, covered and weighted, so that it can be dealt with and removed from site during the enabling period of the remediation works.

A site boundary and dilapidation survey was undertaken and the type of fencing and gates, together with their condition and need for repairs were recorded. In general, the perimeter was found to be secure with no obvious evidence of recent trespass attempts.

Details of the fencing and access gates can be found on drawings 1120/Celtic/8244 and D1820/A4, a full description of the site boundary dilapidation survey is presented in Appendix B and photographs are presented within Appendix C.

3.2 Surveying of Existing Utilities and Exploratory Hole Positions

Prior to intrusive investigation, up-to-date utility plans were procured and a utilities surveyor employed to survey and mark up known and potential services on-site. Contact was made with plant protection departments of SGN and SSE to inform them of the investigation works and discuss any issues. SGN confirmed that they had no services on-site and that they had no concerns regarding the proposed investigation works. SSE requested a site meeting and duly attended site to discuss the works, in relation to their substation and live cables adjacent to the site, prior to works commencing. A drawing illustrating the findings of the survey works is provided as 1120/Celtic/8244 in Appendix A, together with the available up-to-date utility provider drawings.

The positions of all exploratory holes were set out on-site on the 10th November 2020 together with the surveying and mark up of utilities on-site to minimise risks of clashing with services. GPS survey equipment was used to OS National Grid datum.

3.3 Trial Pitting Works

A total of 15 trial pits were excavated using an 8T tracked excavator between the 11th and 13th of November 2020. The pits were excavated to depths between 1 m to 2.2 m and ground conditions were observed and recorded. Samples were retrieved and submitted to i2 Analytical laboratories and scheduled for chemical analysis. The trial pits were backfilled using excavated arisings in the approximate order of excavation.

The locations of all trial pits are shown on Drawing D1820/A4 in Appendix A. Engineers logs for the trial pits are presented in Appendix D.

3.4 Drilling Works

A total of 4 boreholes (BH201-204) were drilled using rotary drilling techniques between the 16th and 18th of November 2020. The boreholes were drilled and standpipes constructed by ADP Group. At each location, a hand dug trial pit was excavated to 1.2 m to check for services. The boreholes

were sunk to a maximum depth of 10.2 m. The locations of the boreholes are shown on Drawing D1820/A4 in Appendix A. Engineers logs for the boreholes are presented in Appendix D.

3.5 Waste Disposal

Two no. 20 yard 'roll-on roll-off' skips were used to dispose vegetation arising from the initial clearance works off-site under appropriate Duty of Care. A 4 yard skip was also used on-site to dispose of general construction waste comprising plastic off-cuts and packaging material resulting from the drilling works.

Soil cores generated during the drilling works were placed on 1000 gauge membrane and covered so as to minimise risk of human/animal contact and prevent rainwater ingress with associated risk of potential cross contamination from leachate run-off. These materials will be dealt with during the remediation phase of works.

All consignment notes for waste disposal during the works are included in Appendix E.

3.6 Environmental Monitoring

Prior to and during the site investigation works, environmental air monitoring was carried out. Total volatile organic compounds (VOCs) levels were monitored using a hand held photo ionisation detector (PID) meter. Noise levels were monitored using a hand held noise meter. Dust monitoring was undertaken on a visual basis given the low risk of dust generating activities and cold/damp time of year. The baseline monitoring was undertaken following vegetation clearance works but before the intrusive investigation. On-going monitoring during intrusive works was generally carried out once a day at locations around the site as shown on D1820/A4.

The environmental monitoring data is included in Appendix F and no significant vapour, noise or dust levels were measured during the works with all measured levels below appropriate safety legislation thresholds. No complaints were received during the works.

3.7 Well Dipping

The installed boreholes (BH201-BH204) and existing boreholes (BH101s, BH101d, BH102 & BH105) on the site were dipped on four occasions – 19th November, 1st December and twice on the 2nd December 2020. The wells were dipped using an oil/water interface meter and following these works, level loggers were installed with BH101d, BH102, BH105 and BH204 to record detailed fluctuations across site and tidal influence. The dipping records are included in Appendix G.

3.8 Sampling and Chemical Analysis

A total of 15 soil samples were retrieved during the trial pitting. Generally, one sample was retrieved and submitted for laboratory chemical analysis from each trial pit during the investigation. The exceptions to this were TP206 where two samples were retrieved and TP215 where no samples were retrieved. The deeper sample from TP206 was also scheduled for leachate analysis. The samples were typically retrieved from impacted Made Ground strata or shallow natural material.

Soil samples were also retrieved from cores produced during the drilling of the four boreholes. The samples were not submitted for laboratory analysis but were subject to on-site PID headspace analysis to assist with the decision making regarding the position of well response zones.

The newly installed wells were developed by the removal of at least ten well volumes of water from each borehole and were subsequently left for two weeks to stabilise. Samples were then recovered from all available wells on-site (BH101s, BH101d, BH102, BH105, BH201, BH202, BH203 & BH204) using a low flow peristaltic pump to purge the wells and water quality parameters measured and recorded with a YSI multi-parameter probe, until they stabilised. A duplicate sample was retrieved from BH102 in order to assess laboratory QA/QC.

All samples submitted for laboratory chemical analysis were scheduled for the following suites of analysis within Table 2.

Table 2 – Suites of Laboratory Chemical Analysis

Soils	Leachate	Groundwater
Moisture content	pH	pH
Asbestos screen	Electrical Conductivity	Electrical Conductivity
Asbestos quantification (if +ve screen)	Total, Complex and Free Cyanide,	Total, Complex and Free Cyanide,
pH	Total Sulphate as SO ₄	Total Sulphate as SO ₄
Electrical Conductivity	Sulphide	Sulphide
Total, Complex and Free Cyanide,	Total Chloride	Total Chloride
Total Sulphate as SO ₄	Ammonium as NH ₄	Ammonium as NH ₄
Sulphide	Total Organic Carbon (TOC)	Total Organic Carbon (TOC)
Total Chloride	Speciated and Total Phenols	Total Suspended Solids
Ammonium as NH ₄	Speciated and Total PAHs (EPA-16)	Speciated and Total Phenols
Total Organic Carbon (TOC)	Heavy Metals: As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn	Speciated and Total PAHs (EPA-16)
Speciated and Total Phenols	BTEX compounds	Heavy Metals: Fe, As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn
Speciated and Total PAHs (EPA-16)	TPH-CWG	BTEX compounds
Heavy Metals: As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn		TPH-CWG
BTEX compounds		
TPH-CWG		

The results of all soil, water, and leachate testing analysis is presented in Appendix H and summaries of soil and groundwater analysis are presented in Section 4.2.

3.9 Incidents and Near Misses

No accidents, incidents or near misses occurred during the works. A copy of the low level hazards reports issued during the project are included in Appendix I.

4.0 FINDINGS OF INVESTIGATION WORKS

4.1 Ground Conditions Encountered

The ground conditions encountered are summarised in Table 3, below. The information presented is based on the materials encountered within the exploratory holes.

Table 3 - Summary of Ground Conditions Encountered

<i>Geological Unit and Lithology</i>	<i>Depth and Thickness Encountered</i>
Made Ground Tarmac, concrete slabs, gravels of ash, clinker, bricks, concrete, timber and metal. Reworked natural material of alluvium, flint and chalk.	Encountered to depths between 0.3 – approx. 4.5 m bgl.
Alluvium Clay, clayey gravel and gravelly clay.	Encountered between 1.2 to 5.7 m bgl, not fully penetrated in some areas during investigation.
Spetisbury Chalk Member Clayey chalk with gravels and cobbles of flint and chalk.	> 2.7 m bgl.

Groundwater is present typically between 2 to 3 m bgl. Tidal fluctuations were apparent with shallower depths of groundwater at near surface level within BH105 (closest position to river Arun) during high tide events. Pockets of shallower perched water ingress were also apparent during trial pitting. The water quality data recorded from the borehole sampling event is presented within Table 4.

Table 4 – Groundwater quality data during sampling event

Borehole	Temp	DO%	SPC us/cm	pH	pH mv	ORP mv	Time 2/12/2020
105	12.2	36	1329	7.13	-7.9	51.6	08:43
	12.1	21.3	1442	7.04	-3.4	-109.4	08:48
	12.1	7.5	1516	7.02	-1.9	-124.7	08:53
	12	4.8	1503	7.02	-2	-128.4	08:58
	12	4	1456	7.03	-2.6	-132.4	09:03
	12	3.5	1443	7.03	-2.6	-134.7	09:08
102	11.3	10.7	1188	6.99	-0.2	-51.1	09:15
	12.2	25.2	879	7	-1	38.8	09:20
	12.2	34.2	821	7.01	-1.3	113.8	09:25
	12.2	36.3	820	7.01	-1.2	135.4	09:30
	12.2	36.7	821	7	-1.2	156.2	09:35
204	11.9	38.2	866	6.93	3.6	56.3	09:40
	12.6	19.3	932	6.87	6.5	5.2	09:45
	12.7	13.5	929	6.87	6.2	4.5	09:50
	12.7	13.4	926	6.87	6.7	3.1	09:55
203	12.2	13.1	1052	6.9	4.4	-14.8	10:00
	12.4	6.1	1083	6.92	3.6	-49.4	10:05
	12.4	4.9	1076	6.92	3.6	-54.8	10:10
	12.3	4.7	1070	6.92	3.6	-55.3	10:15
202	12.2	8.9	2463	6.76	12.8	-20.3	10:20
	12.6	4	2748	6.73	14.3	-10.7	10:25
	12.6	3.8	2739	6.73	14.3	-10.5	10:30
	12.6	3.7	2737	6.73	14.3	-9.9	10:35
201	12.4	7.6	2576	7.21	-12.9	-59.9	10:40
	12.4	3.2	2529	7.25	-14.8	-104.6	10:45
	12.4	2.8	2613	7.32	-19.7	-124.2	10:50
	12.4	2.6	2662	7.4	-23.6	-132.5	10:55
	12.4	2.6	2682	7.43	-25	-139.8	11:00
101s	12.6	6.4	3120	6.75	16.7	-49.1	11:08
	12.8	3.8	3210	6.58	23.2	213.8	11:13
	12.7	38.1	3172	6.62	21.1	233.8	11:18
101d	12.3	33.6	2893	7.91	-52.3	-113.7	11:23
	12.2	32.3	2789	8.43	-82.3	-167.7	11:28
	12.1	32	2635	8.4	-86	-184.2	11:33
	12.1	32	2552	8.53	-87.6	-188	11:38
	12.1	31	2476	8.55	-88.9	-186.4	11:43

4.2 Chemical Results

The following tables summarise the chemical analysis results from soil and groundwater samples taken from the site. Full copies of certificates of chemical analysis are included in Appendix H. A duplicate groundwater sample was retrieved from BH102 for laboratory quality assurance.

Table 5 – Summay of Soil Analysis

<i>Determinand</i>	<i>No. of Samples Analysed</i>	<i>Concentration (mg/kg unless otherwise stated)</i>		
		<i>Min.</i>	<i>Max.</i>	<i>Average</i>
Cyanide, Total	15	<1	260	44
Cyanide, Free	15	<1	2	<2
Total Sulphate as SO ₄	15	260	11,000	2,921
Sulphide	15	<1	160	36
Total Chloride	15	71	360	194
Ammonium as NH ₄	15	<0.5	1,100	75
Total Organic Carbon (%)	15	0.2	5.2	2.1
Total Phenols	15	<1	69	5.6
Arsenic	15	13	69	24
Cadmium	15	<0.2	1.1	0.4
Chromium	15	15	35	22
Copper	15	11	67	36
Lead	15	17	510	205
Mercury	15	<0.3	1.5	0.6
Nickel	15	9.6	44	24.8
Zinc	15	40	670	209
Benzene	15	<0.01	2.3	0.156
Toluene	15	<0.01	2.5	0.178
Ethyl benzene	15	<0.01	0.11	0.009
p/m-Xylene	15	<0.01	2.7	0.2
o-Xylene	15	<0.01	1.2	0.113
Naphthalene	15	<0.05	1,100	120
Benzo(a)pyrene	15	<0.05	380	52
PAH, Total Detected USEPA 16	15	1.33	9,410	1,114
Total TPH Aliphatics & Aromatics C5-C44	15	<20	10,300	1,537

Table 6 – Summary of Groundwater Analysis

<i>Determinand</i>	<i>No. of Samples Analysed</i>	<i>Concentration (mg/l unless otherwise stated)</i>		
		<i>Min.</i>	<i>Max.</i>	<i>Average</i>
Cyanide, Total	8	<0.01	1.3	0.37
Cyanide, Free	8	<0.01	<0.01	<0.01
Sulphate as SO ₄	8	34.6	1,020	463
Sulphide	8	<0.005	<0.005	<0.005
Chloride	8	39	160	91.5
Ammonium as NH ₄	8	0.038	350	120
Total Organic Carbon	8	1.68	263	61
Total Phenols	8	<0.0035	300	44.4
Naphthalene	8	<0.00001	1.8	0.45
PAH, Total Detected USEPA 16	8	<0.00016	2.15	0.534
Iron	8	0.018	0.73	0.32
Arsenic	8	0.00034	0.049	0.01
Cadmium	8	<0.00002	0.00003	0.000025
Chromium	8	0.003	0.011	0.005
Copper	8	0.0015	0.0058	0.0035
Nickel	8	0.002	0.032	0.01
Zinc	8	0.003	0.033	0.01
Benzene	8	<0.001	12.9	1.94
Toluene	8	<0.001	4.95	0.74
Ethyl benzene	8	<0.001	0.077	0.019
p/m-Xylene	8	<0.001	0.695	0.158
o-Xylene	8	<0.001	0.328	0.074
Total TPH Aliphatics & Aromatics C5-C35	8	<0.02	27	8.374

4.3 Other Findings

The main findings of the investigation are shown on Drawing D1820/A3 and D1820/A4 within Appendix A and are detailed below.

- There remains a significant number of stumps and roots from vegetation growth at the site. The clearance works undertaken have removed the vast majority of above ground vegetation; however, the boundary fence remains heavily overgrown and a further phase of stump removal and vegetation clearance within the southern corner of site will be required during the preliminary phase of remediation works.
- Previous phases of investigation did not record the presence of asbestos fibres or products on-site. This investigation recorded the presence of asbestos within three of the 15 samples. Two of the samples (TP204 at 1m and TP206 at 1.2 m) recorded loose fibres of chrysotile, with one of those samples (TP204 at 1 m) also recording the presence of amosite fibres. The third sample (TP207 at 1.8 m) detected loose fibres of amosite and

crocidolite and fibrous debris of amosite and chrysotile. This area on-site is associated with the presence of a below ground brick structure, which also exhibited the highest concentrations of aromatic hydrocarbons on-site.

- Access into site is challenging for large vehicles, given the presence of the narrow access track, encroaching vegetation, potential presence of parked cars and public use of the track to access the river Arun tow path. The high and low voltage cables present within the verge of the access track also presents a substantial risk should vehicles veer into the verge. The presence of the electrical substation also inhibits the ability to alter or widen the access gate. Further discussion with SSE will be required to discuss the remediation works and potential risks involved.
- There is adequate tarmac hardstanding to accommodate a welfare compound within the eastern corner of site and the presence of tarmac, along the access track significantly reduces the risk of rutting and damage. Although detailed assessment; depending on delivery vehicles, plant and equipment requirements; will be required to assess additional mitigation measures and any temporary work requirements.
- The presence of the tarmac hardstand also improves the ability to protect the surface water drain which bisects the site. Due to the likely heavy nature of plant and equipment required for the remediation works, further assessment and protection measures are likely to be required to protect the access chambers and prevent any debris and especially contamination from entering the drain.
- The area accommodating the former gas governor (shown as Feature 19 on Drawing D1820/A4) is approximately 0.5 m (to the north) and 0.9 m (to the south) higher than the surrounding site level. There is also historic cast iron pipework (approx. 0.5 m diameter) together with brick and concrete obstructions that are likely to be higher than the surrounding levels should this area be required to be reduced in level.

5.0 REFERENCES

Redacted (to remove interpretative information) copies of previous investigation reports were made available to Celtic as follows:

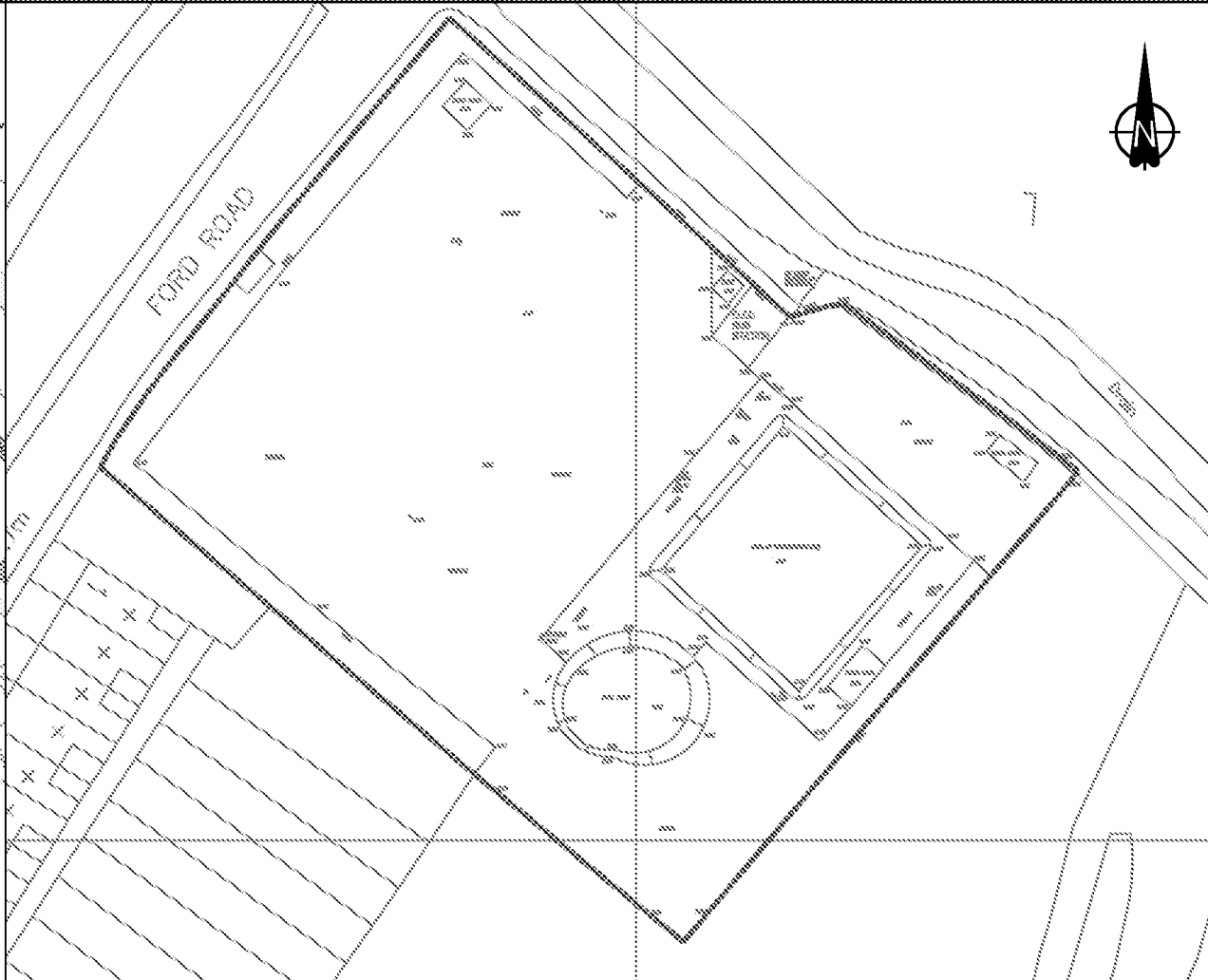
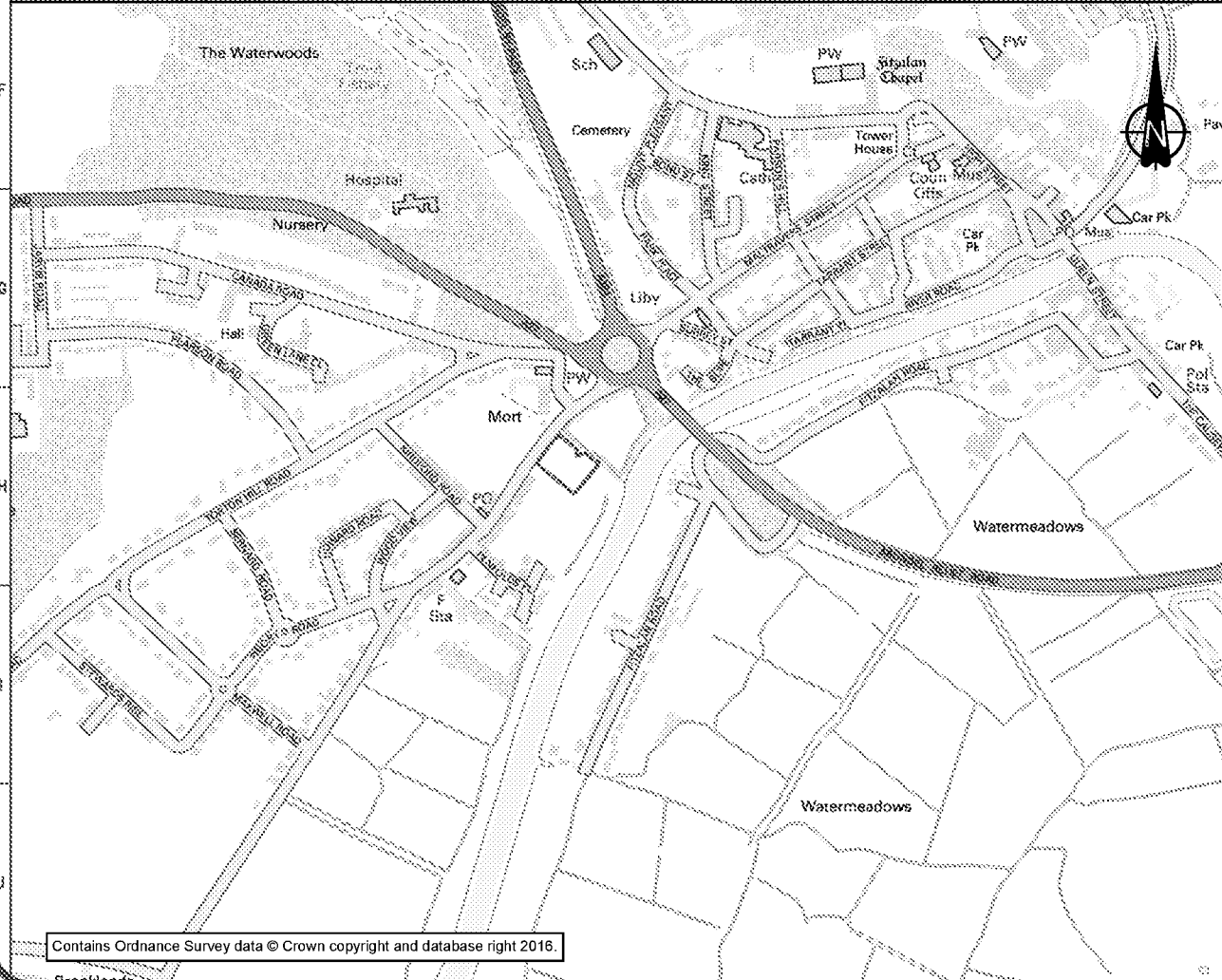
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2. Environmental Assessment Site Investigation, Final Factual Report, Report ref. A71430/GTG.20000078/R002rev1/December2000, Atkins December 2000;
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4. Ford Road, Arundel (Site No. 2551) Site Investigation Report, Report ref. 5104362/GTG.20100923/Arundel2011/R001v0, Atkins October 2011; and
5. Detailed Quantitative Risk Assessment Report, Ford Road, Arundel (Site No. 2551), Report ref. 5104362/GTG.20100923/Arundel DQRA 2012/R002v1, Atkins October 2012.

APPENDICES

APPENDIX A DRAWINGS



Google 2016



Legend
National Grid Property Holdings Ltd
Site Boundary

0 First Issue 28/10/20
REV COMMENT DATE

Celtic enGlobe
Columbus House
Village Way
Cardiff
CF15 7NE
019 2036 8635
Client

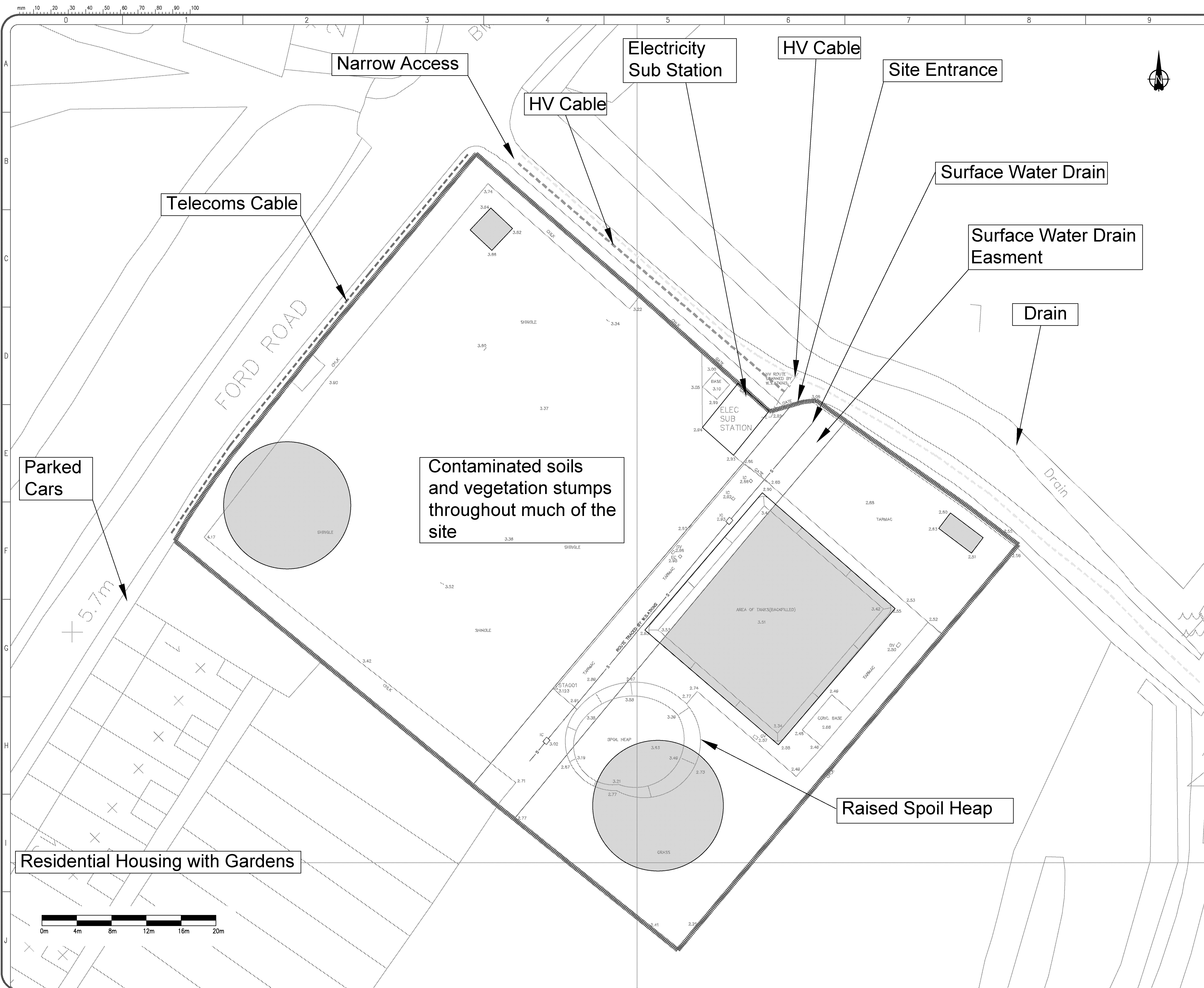
nationalgrid

Project
Arundel Gas Works
Ford Road, Arundel
Title
Site Location Plan

Drawn by **GEP** Checked Date **26/10/20** Authorised Date **26/10/20**
Original Scale Date **26/10/20** Rev **0** Paper **A3**
Drawing Number
D1820/A1

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CAD REF:--



Legend

- National Grid Property Holdings Site Boundary
- Public Right way

0	First Issue	26/10/20
REV	COMMENT	DATE



Columbus House
Village Way
Cardiff
CF15 7NE
029 2036 8636
Client

enquiries@celtic-ltd.com
www.celtic-ltd.com

nationalgrid

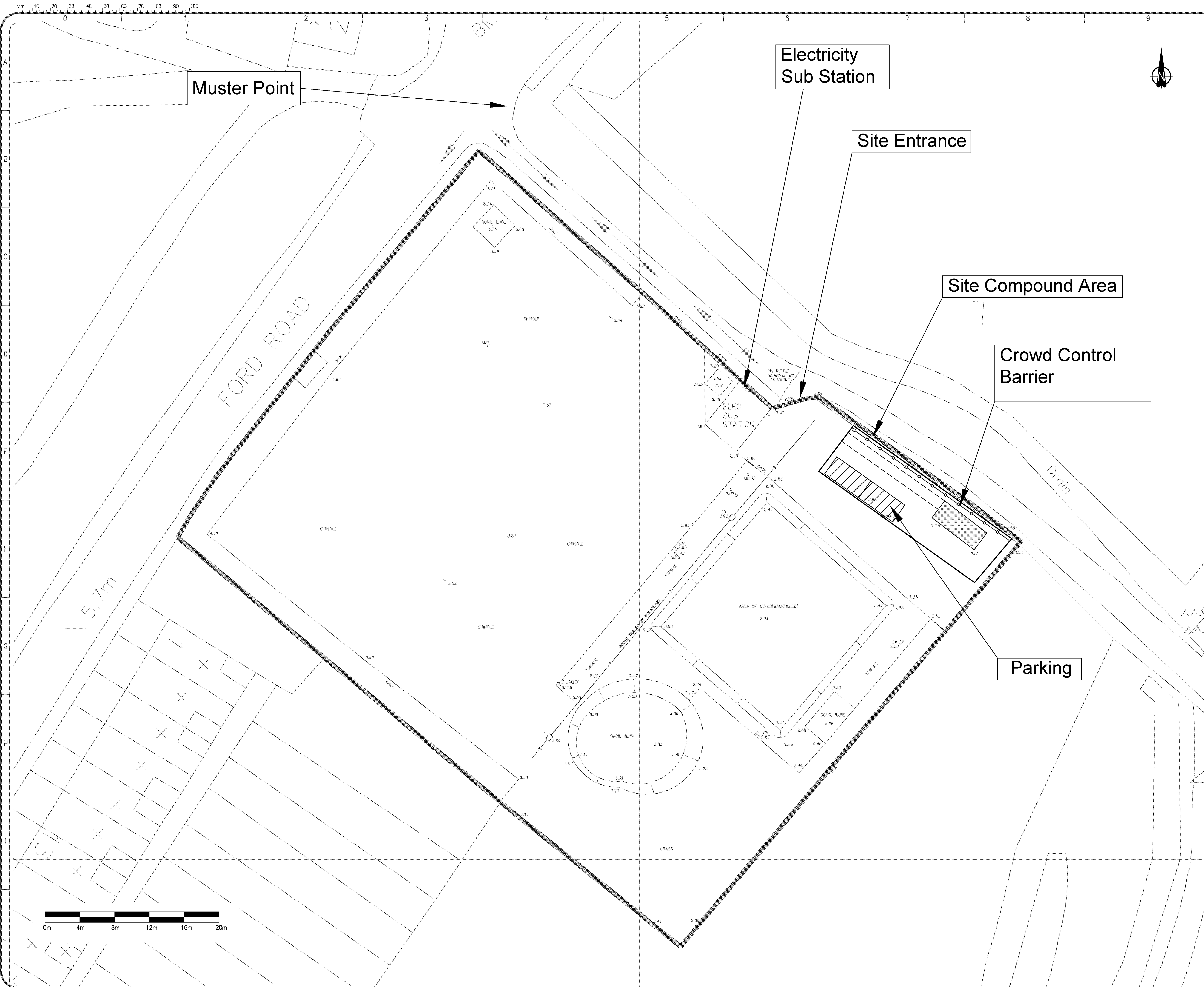
Project
Arundel Gas Works
Ford Road, Arundel

Title
Site Hazard Plan

Drawn by	Checked	Date	Authorised	Date
GEP	SG	26/10/20	MH	30/11/20

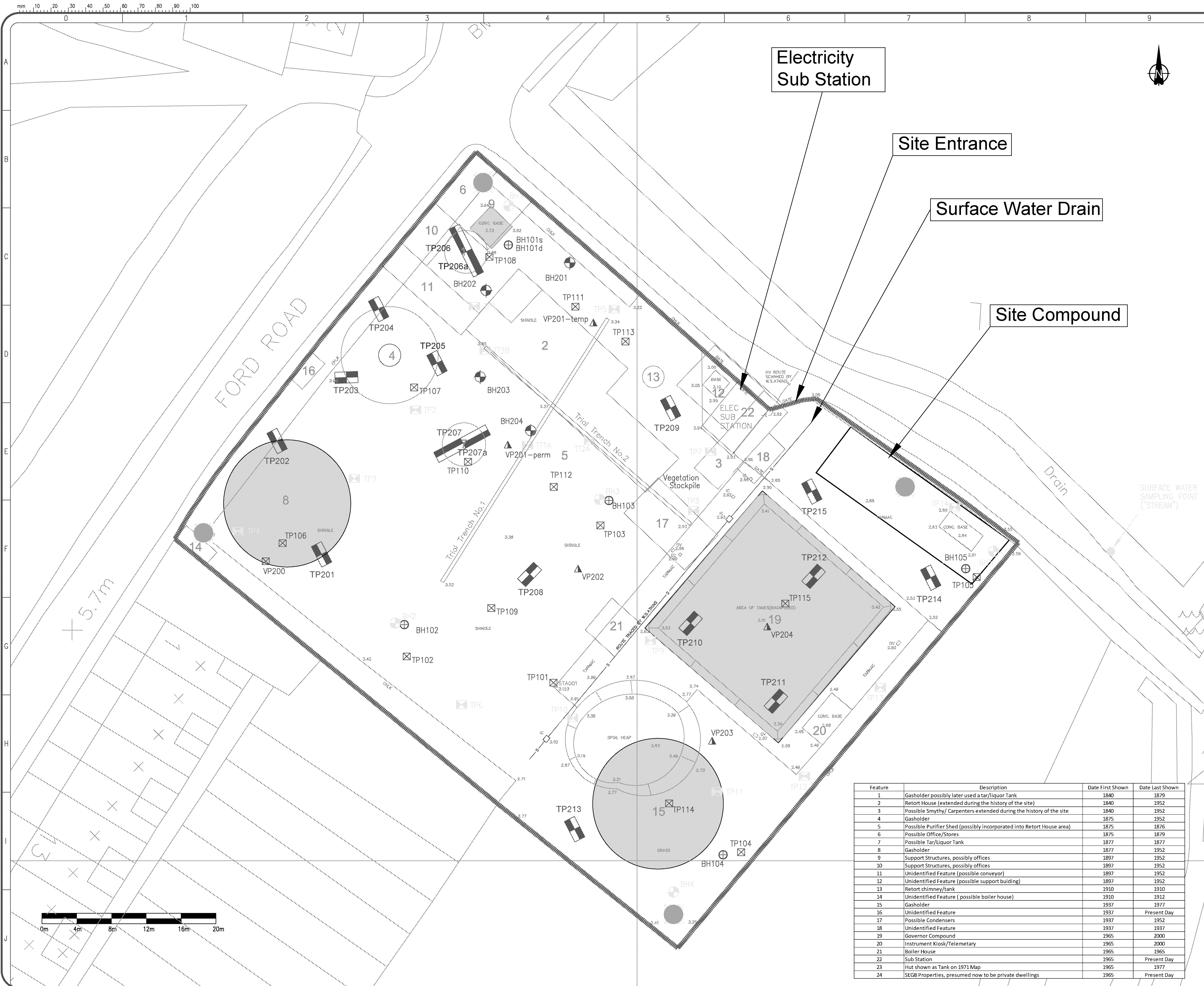
Original Scale	Date	Rev	Paper
1:200	26/10/20	0	A1

Drawing Number
D1820/A2



- Legend
- National Grid Property Holdings Site Boundary
 - Celtic Site Compound
 - Welfare Cabin
 - Pedestrian Routes
 - Crowd Control Barrier
 - Access on and off Site

0	First Issue	26/10/20
REV	COMMENT	DATE
Celtic enGlobe Columbus House Village Way Cardiff CF15 7NE 029 2036 8636 enquiries@celtic-ltd.com www.celtic-ltd.com		
Client nationalgrid		
Project Arundel Gas Works Ford Road, Arundel		
Title Traffic Management Plan		
Drawn by CEP	Checked SG	Date 26/10/20
Original Scale 1:200	Date 26/10/20	Rev 0
Drawing Number D1820/A3		
Authorised MH	Date 30/10/20	Paper A1



Legend

- National Grid Property Holdings Site Boundary
- Celtic Proposed Trial Pits
- Celtic Proposed Borehole Locations
- 2000 Atkins Borehole Location
- 2000 Atkins Trial Pit Location
- 2000 Trial Trench Location
- 2011 Atkins Borehole Location
- 2011 Atkins Trial Pit Location
- 2011 Vapour Well
- Historical Features
- Proposed Celtic Compound
- Current features on site which require on going protection
- Environmental Monitoring Point

1	Current features on site that need on going protection	02/12/20
0	First Issue	26/10/20
REV	COMMENT	DATE



Columbus House
Village Way
Cardiff
CF15 7NE
029 2036 8636

enquiries@celtic-ltd.com
www.celtic-ltd.com

Client
nationalgrid

Project
Arundel Gas Works
Ford Road, Arundel

Title
Additional Site Investigation
Locations

Drawn by	Checked	Date	Authorised	Date
GEP	SG	26/10/20	MH	30/10/20

Original Scale	Date	Rev	Paper
1:200	26/10/20	1	A1

Drawing Number

D1820/A4

Feature	Description	Date First Shown	Date Last Shown
1	Gasholder possibly later used as a tar/liquor Tank	1840	1879
2	Retort House (extended during the history of the site)	1840	1952
3	Possible Smyth/ Carpenters extended during the history of the site	1840	1952
4	Gasholder	1875	1952
5	Possible Purifier Shed (possibly incorporated into Retort House area)	1875	1876
6	Possible Office/Stores	1875	1879
7	Possible Tar/Liquor Tank	1877	1877
8	Gasholder	1877	1952
9	Support Structures, possibly offices	1897	1952
10	Support Structures, possibly offices	1897	1952
11	Unidentified Feature (possible conveyor)	1897	1952
12	Unidentified Feature (possible support building)	1897	1952
13	Retort chimney/tank	1910	1910
14	Unidentified Feature (possible boiler house)	1910	1912
15	Gasholder	1937	1977
16	Unidentified Feature	1937	Present Day
17	Possible Condensers	1937	1952
18	Unidentified Feature	1937	1937
19	Governor Compound	1965	2000
20	Instrument Kiosk/Telemetry	1965	2000
21	Boiler House	1965	1965
22	Sub Station	1965	Present Day
23	Hut shown as Tank on 1971 Map	1965	1977
24	SEGB Properties, presumed now to be private dwellings	1965	Present Day



LEGEND	
	Foul Drainage
	Surface Drainage
	Combined Drainage
	Electricity
	Electricity High Voltage
	Electricity Low Voltage
	Gas
	Ground Probing Radar
	Water
	Cable Television
	Close Circuit Television
	Communication
	British Telecom
	Compressed Air
	Offset Fill-Line
	Oil Pipe
	Pipe
	Ventilation
	Fuel Line
	Vapour Recovery
	Gauge Line
	Telemetry
	Fibre Optics
	Unknown
	Fence
	Edge of Canopy
	Gully Run
	End Of Trace
	Do Not Drill / Banded Pipes
	Borehole
	Trial Pit Location
	Excavated Area
	Window Sample
	Soil Vapour Sample
	TANK
	W=Water
	U=Unknown
	F=Foam
	P=Product
	C=Concrete

ABBREVIATIONS	
AR	Assumed Route
BO	Bollard
BOILL	Illuminated Bollard
BH	Borehole
BTB	British Telecom Box
BTIC	British Telecom Cover
C/BOX	Control Box
C/B FENCE	Closeboard Fence
CR	Cable Riser
CATV	Cable TV
CP	Catch Pit
Co	Concrete
CON	Conifer
CL	Cover Level
d	Depth (in metres)
D/CHAN	Drainage Channel
DP	Down Pipe
ER	Earth Rod
EIC	Electricity IC
EP	Electricity Pole
EOC	Edge of Canopy
EOT	End of Trace
FIBED	Flower Bed
FH	Fire Hydrant
FS	Fire Switch
GV	Gas Valve
G	Gully
GPR	Ground Probing Radar
G/RUN	Gully Run
HT	Height
H/CHESTNUT	Horse Chestnut
H/THORN	Hawthorn
IC	Inspection Cover
IL	Invert Level
INT	Interceptor
KO	Kerb Outlet
LP	Lamp Post
LC	Lighting Column
LH	Lamp Hole
MH	Manhole Cover
MW	Monitoring Well
NPV	No Pipes Visible
OH	Overhead Service
OSA	Off Survey Area
OSBM	Ordnance Survey Bench Mark
PR	Pipe Riser
P	Post
P&R FENCE	Post & Rail Fence
RET WALL	Retaining Wall
RWP	Rain Water Pipe
RS	Road Sign
RE	Rodding Eye
S/A	Soakaway
S/BIRCH	Silver Birch
SAP	Sapling
SEC FENCE	Security Fence
SL	Spot Light
SP	Soil Pipe
ST	Stop Tap
SV	Sluice Valve
SVP	Soil Vent Pipe
SVS	Soil Vapour Sample
TBM	Temporary Bench Mark
TFR	Taken From Records
TL	Traffic Light
TP	Telegraph Pole
TS	Traffic Sensor
UTL	Unable to Locate
UTR	Unable to Raise
UTS	Unable to Survey
UTT	Unable to Trace
VR	Vapour Recovery
VP	Vent Pipe
WM	Water Meter
WFC	Water Filled Chamber
WP	Waste Pipe
WR	Water Riser
WS	Window Sample
US	Underside
Ø	Pipe Diameter

General Notes:
Part of site overgrown at time of survey. UTS this area.
No Water or drainage guides available at time of survey.
Possible buried IC's on site.
Possibility of former infrastructure still underground.



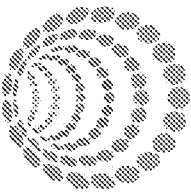
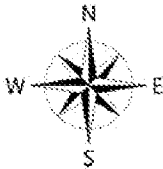
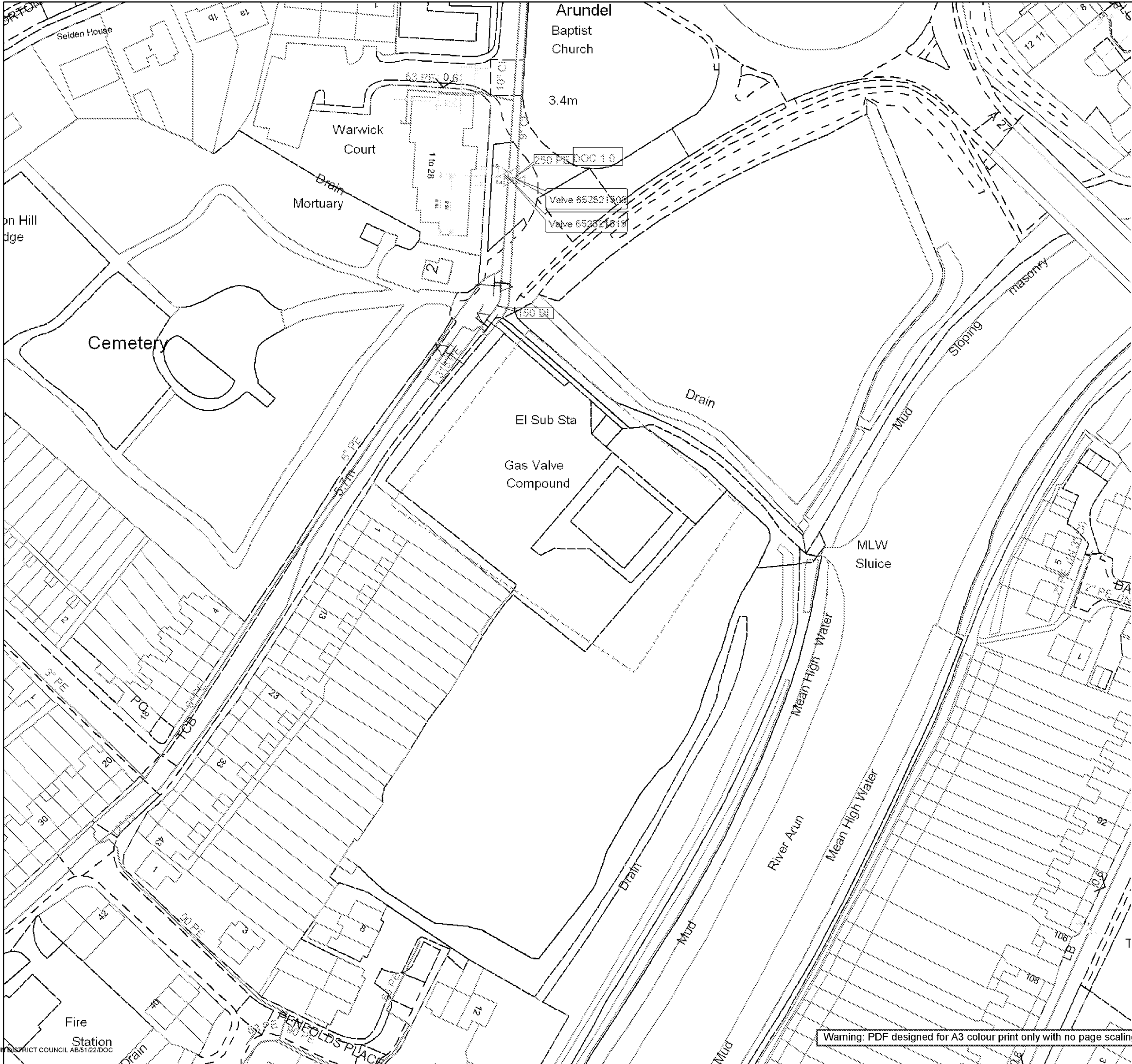
32 Doncaster Road, Burnley, South Yorkshire, S70 1TL.
Tel: 01282 292 377 Mobile: 07969 560297
E-Mail: scott@avoinsurveys.com & info@avoinsurveys.com
Website: www.avoinsurveys.com

Client
CELTIC

Site Location
**Gas Works
Ford Road
Arundel, BN18 9DX**

Surveyed by	AC	Drawn by	AC	Approved by	
Drawing No.	1120/Celtic/8244	Revision	-		
Scale	1:200@ A1	Date	10/11/2020	Sheet No.	1 of 1

DISCLAIMER: The location of under ground services shown on this drawing has been determined using electro-magnetic (and/or ground probing radar, where requested) techniques and visual observations. the limitations of this drawing should be realised and no guarantee can be given that all services have been identified. This drawing may not include the location of all public services that may cross the site and therefore the relevant service drawings should be obtained from the appropriate utility company and used in conjunction with this drawing. Additional services, structures or other below ground obstructions not indicated on this drawing may be present on site. reference should be made to historical plans and as built drawings. Excavations in the vicinity of services should be carried out with due diligence ref: HSG47 document "avoiding dangers from underground services". Location accuracy is determined by referring to manufacturers guidelines for the systems deployed. Reference should be made to the latest version of AMS Ltd site procedures document for utility location surveys Please note ground penetrating radar depths are approximate only.



SGN
Your gas. Our network.

Contact Us

Mapping Enquiries:
All areas

General Enquiries:
All areas

Date Requested: 26/10/2020
Job Reference: 20319776
Site Location: 501300 106732
Requested by:
Mr Steven Gronow
Your Scheme/Reference:
C1820
Exact Scales:
1:1000 Area or Circle dig site
1:1000 Line dig site

This plan shows the location of those pipes owned by Scotia Gas Networks (SGN) by virtue of being a licensed Gas Transporter (GT). Gas pipes owned by other GTs or third parties may also be present in this area but are not shown on this plan. Information with regard to such pipes should be obtained from the relevant owners. No warranties are given with regard to the accuracy of the information shown on this plan. Service pipes, valves, siphons, sub-connections etc. are not shown but their presence should be anticipated. You should be aware that a small percentage of our pipes/assets may be undergoing review and will temporarily be highlighted in yellow. If your proposed works are close to one of these pipes, you should contact the SGN Safety Admin Team on 0800 912 1722 for advice. No liability of any kind whatsoever is accepted by SGN or its agents, servants or sub-contractors for any error or omission contained herein. Safe digging practices, in accordance with HS (G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that plant location information is provided to all persons (whether direct labour or sub-contractors) working for you on or near gas apparatus. Information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Report damage immediately -- KEEP EVERYONE AWAY FROM THE AREA
0800 111 999

Low Pressure Mains

Medium Pressure Mains

Intermediate Pressure Mains

High Pressure Mains

LAs

GTs



SSSIs



Some Examples Of Plant Items

Valve



Syphon



Depth of Cover



Diameter Change



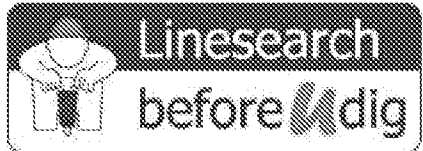
Material Change



Digsite:

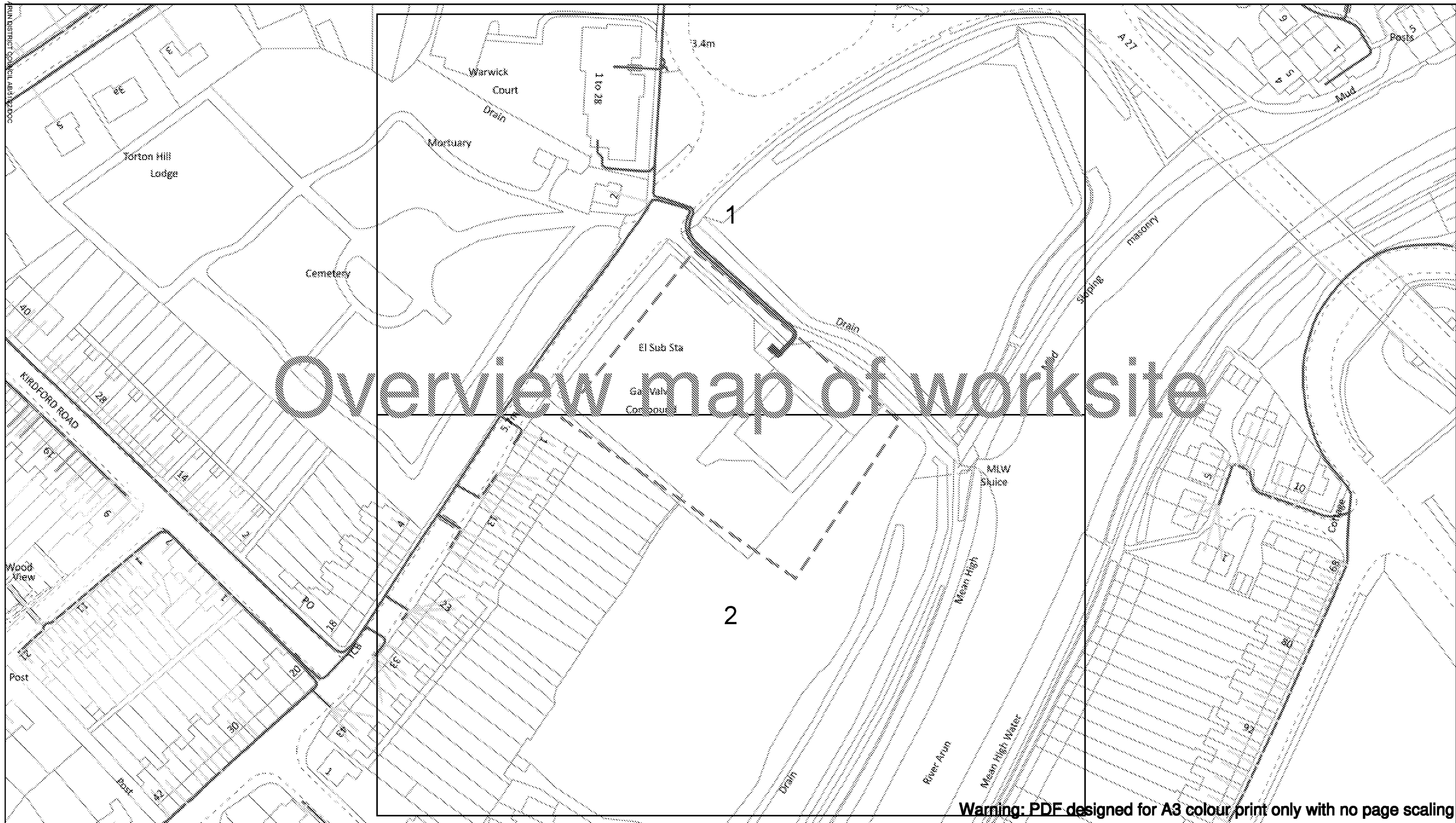
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Area:



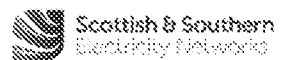
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Dig Sites Area: Line:



Date Requested: 26/10/2020
Job Reference: 20319776
Site Location: 501301 106731

Requested by:
Mr Steven Gronow
Your Scheme/Reference:
C1820

References

There may have been subsequent alteration to the surface levels. Trial holes must be undertaken to determine position and depths of cables. HS (G) 47 Booklet from the Health and Safety Executive – Avoiding Danger from Buried Cables – should be consulted before commencing excavation work.

WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTES G56 SHOULD BE CONSULTED (AVAILABLE FROM THE HSE WEBSITE)

Scale: 1:1025 (When plotted at A3)

Voltages (V)				
LV (Low Voltage) and Services	Up to 1,000V			
HV (High Voltage)	Over 1,000V to 11,000V			
EHV (Extra High Voltage)	22,000V to 132,000V			
Transmission	275,000V and 400,000V			
NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID				
	Services	LV	HV	EHV
Footpath/Unmade	0.45m	0.45m	0.6m	0.75m
Road Crossing	0.6m	0.6m	0.75m	0.9m
Agricultural	1m	1m	1m	1.2m

Legend	Distribution Structures (Element)
..... Service Station	 Joint, Existing Location
..... 1730066	 Pole Structure, Existing Location - Single
..... 2 - 3,200'	 Pole Structure, Existing Location - N
..... 6,500'	
..... 13,500'	 Over Route
..... 2,200'	 Over Section Route
..... 3,500'	
..... 6,600'	
..... 13,200'	
..... 25,500'	
..... 40,000'	
..... 130,000' (1000' Offset)	
..... 1000' Offset	

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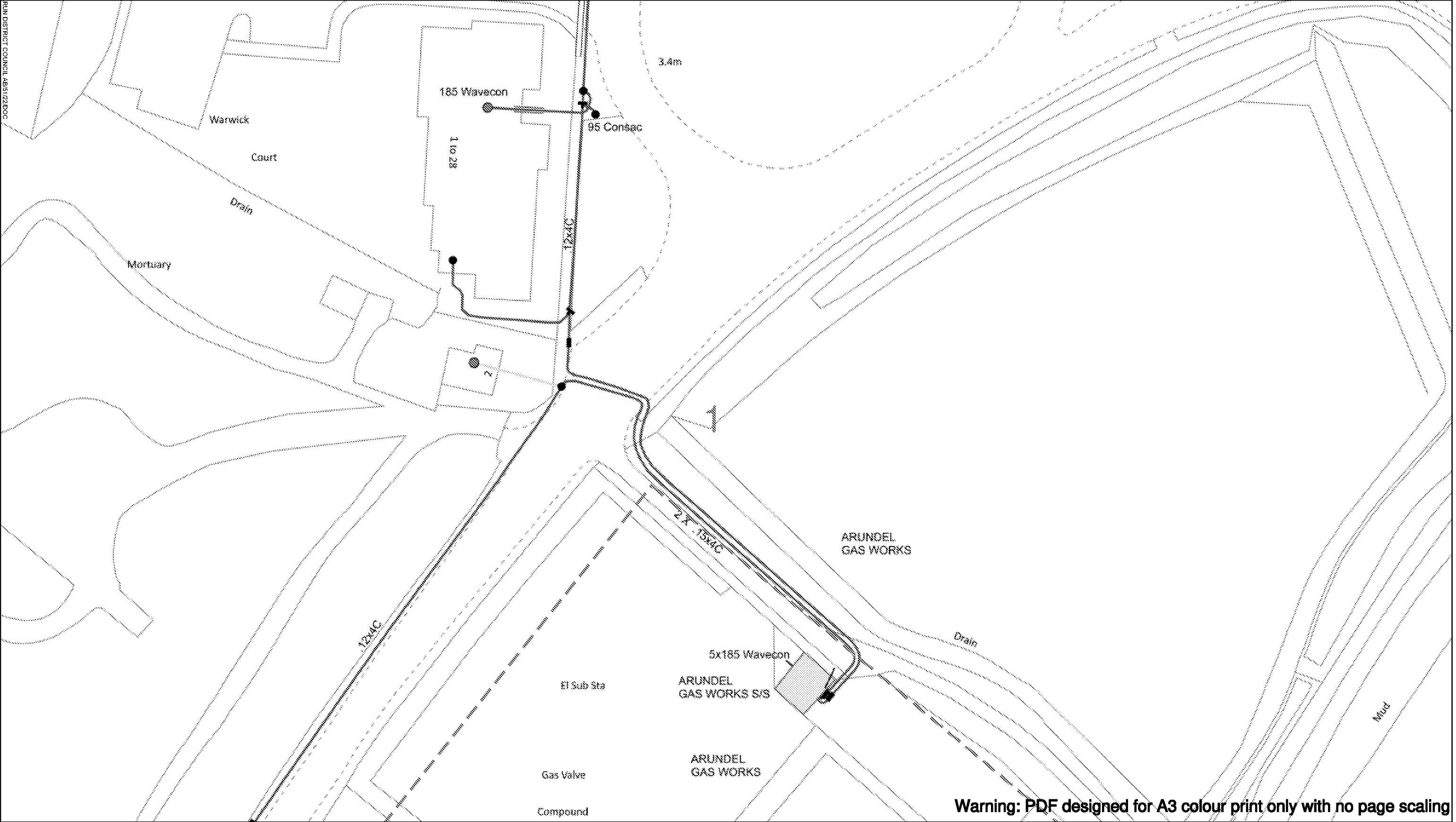
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General Enquiries: 0800 048 3516

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Dig Sites

Area:

Line:

Date Requested: 26/10/2020

Job Reference: 20319776

Site Location: 501301 106731

Requested by: Mr Steven Gronow

Your Scheme/Reference: C1820

WARNING

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WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTES GSS SHOULD BE CONSULTED (AVAILABLE FROM THE HSE WEBSITE)

Voltages (V)				
LV (Low Voltage) and Services	Up to 1,000V			
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EHV (Extra High Voltage)	22,000V to 132,000V			
Transmission	275,000V and 400,000V			

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID				
	Services	LV	HV	EHV
Footpath/Unmade	0.45m	0.45m	0.6m	0.8m
Road Crossing	0.6m	0.6m	0.75m	0.9m
Agricultural	1m	1m	1m	1.1m

Legend

Service Cable

15 kV cable

2-3.3kV

6.6kV

11kV

22kV

33kV

66kV

132kV

275kV

400kV

Stone Openc

Pole Cable

Distribution Structures (Electric)

Pole, Existing location

Pole Structure, Existing Location - Single

Pole Structure, Existing Location - N

Over Route

Cross Section Route

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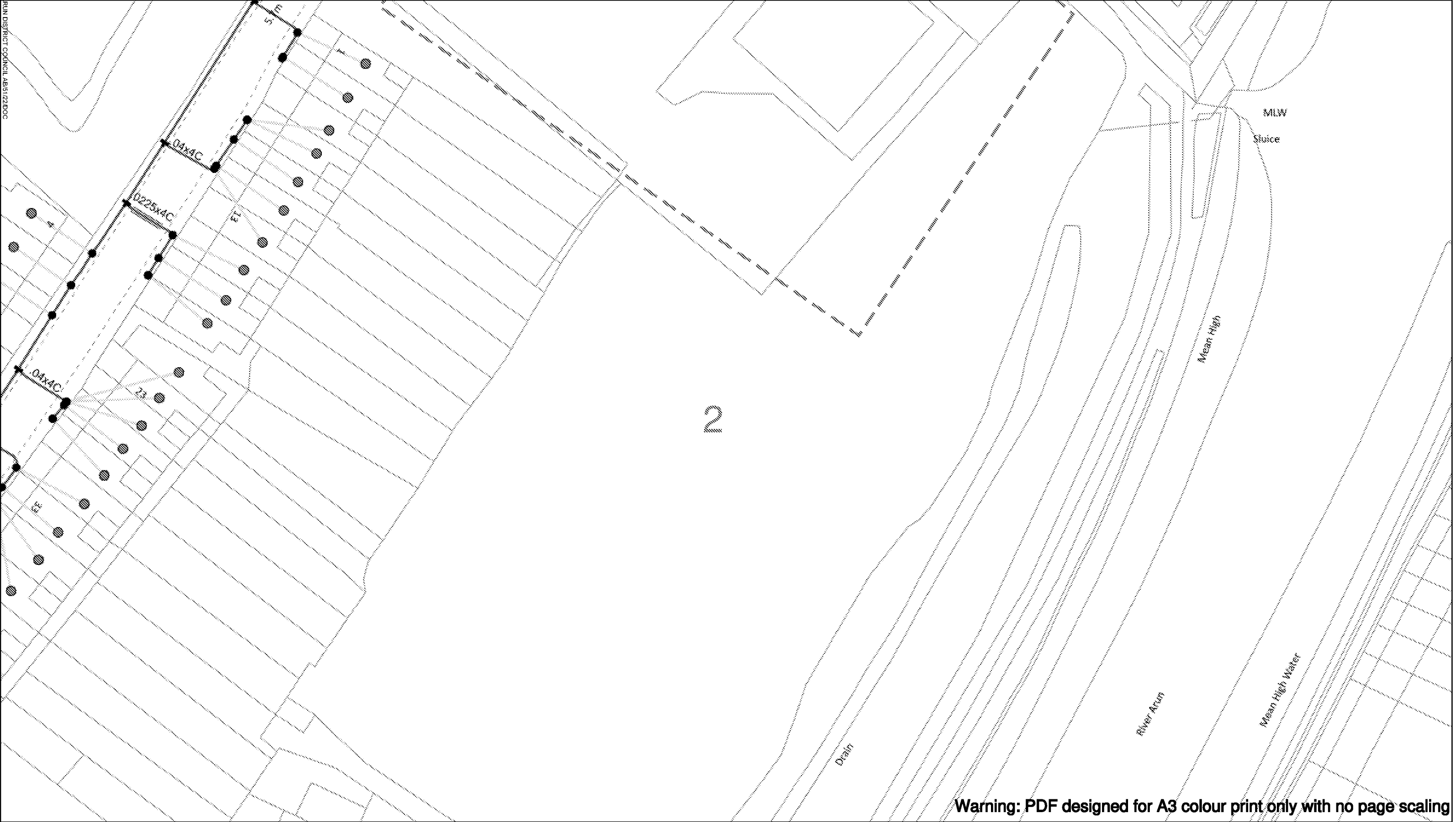
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Dig Sites

Area:

Line:

Date Requested: 26/10/2020

Job Reference: 20319776

Site Location: 501301 106731

Requested by: Mr Steven Gronow

Your Scheme/Reference: C1820

WARNING

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WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTES GSS SHOULD BE CONSULTED (AVAILABLE FROM THE HSE WEBSITE)

Voltages (V)

LV (Low Voltage) and ServicesUp to 1,000V

HV (High Voltage)Over 1,000V to 11,000V

EHV (Extra High Voltage)22,000V to 132,000V

Transmission275,000V and 400,000V

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID

	Services	LV	HV	EHV
Footpath/Unmade	0.45m	0.45m	0.6m	0.8m
Road Crossing	0.6m	0.6m	0.75m	0.9m
Agricultural	1m	1m	1m	1.1m

Legend

Service Cable

15 kV cable

2 – 3.3kV

6.6kV

11kV

22kV

33kV

66kV

132kV

275kV

400kV

Stone Openc

Pole Casts

Distribution Structures (Electric)

Stone, Existing location

Pole Structures, Existing Location - Single

Pole To Structure, Existing Location - N

Over Route

Cross Section Route

Scottish and Southern Energy Power Distribution Ltd.

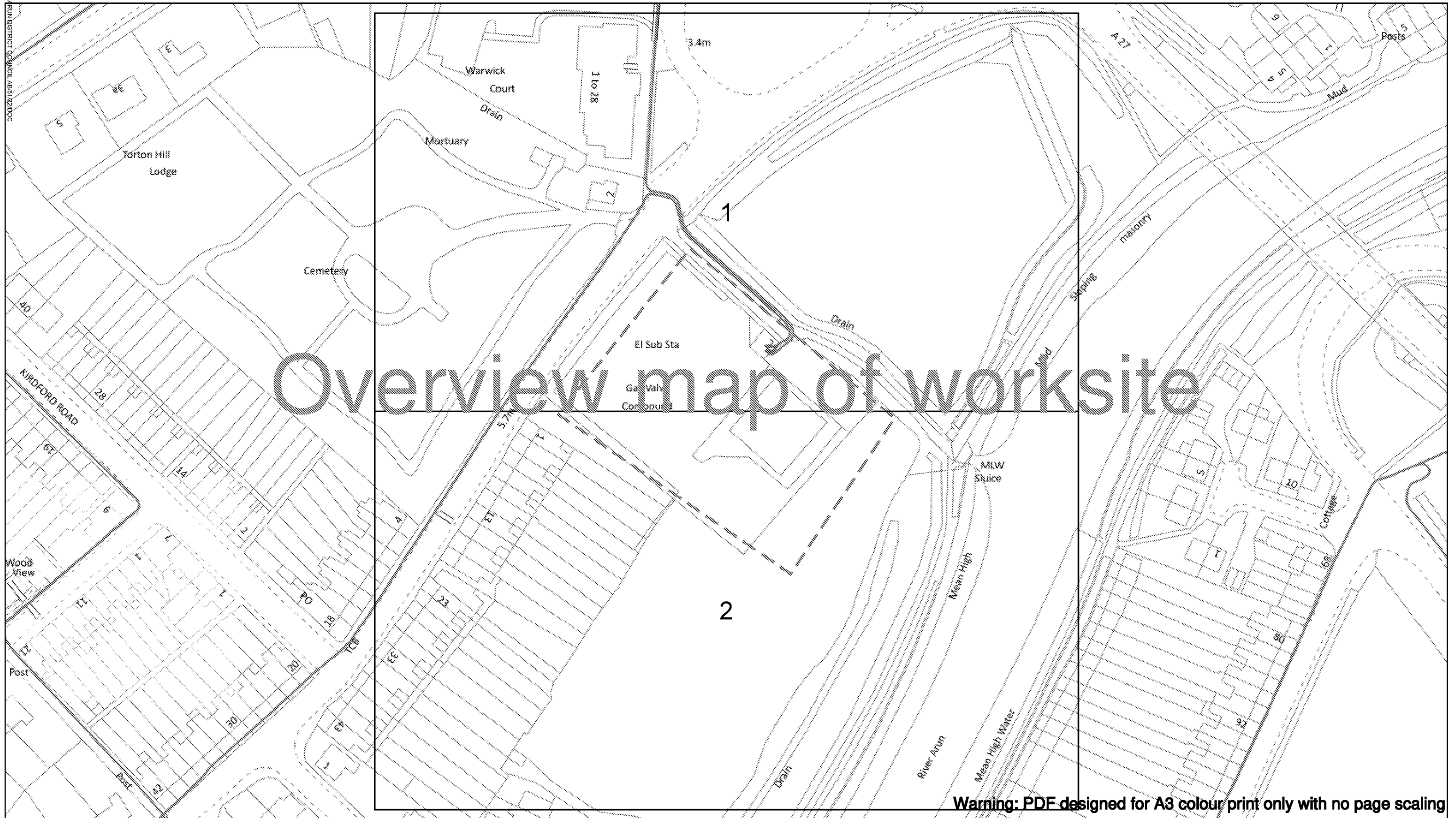
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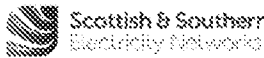
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Dig Sites Area: Line:



Date Requested: 26/10/2020
Job Reference: 20319776
Site Location: 501301 106731
Requested by:
Mr Steven Gronow
Your Scheme/Reference:
C1820

~~WARRING~~

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WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTES G56 SHOULD BE CONSULTED (AVAILABLE FROM THE HSE WEBSITE)

Voltages (V)			
LV (Low Voltage) and Services		Up to 1,000V	
HV (High Voltage)		Over 1,000V to 11,000V	
EHV (Extra High Voltage)		22,000V to 132,000V	
Transmission		275,000V and 400,000V	

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID			
	Services	LV	HV
Footpath/Unmade	0.45m	0.45m	0.6m
Road Crossing	0.6m	0.6m	0.75m
Agricultural	1m	1m	1m

[illegible]

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Registered In Scotland No.SC213459

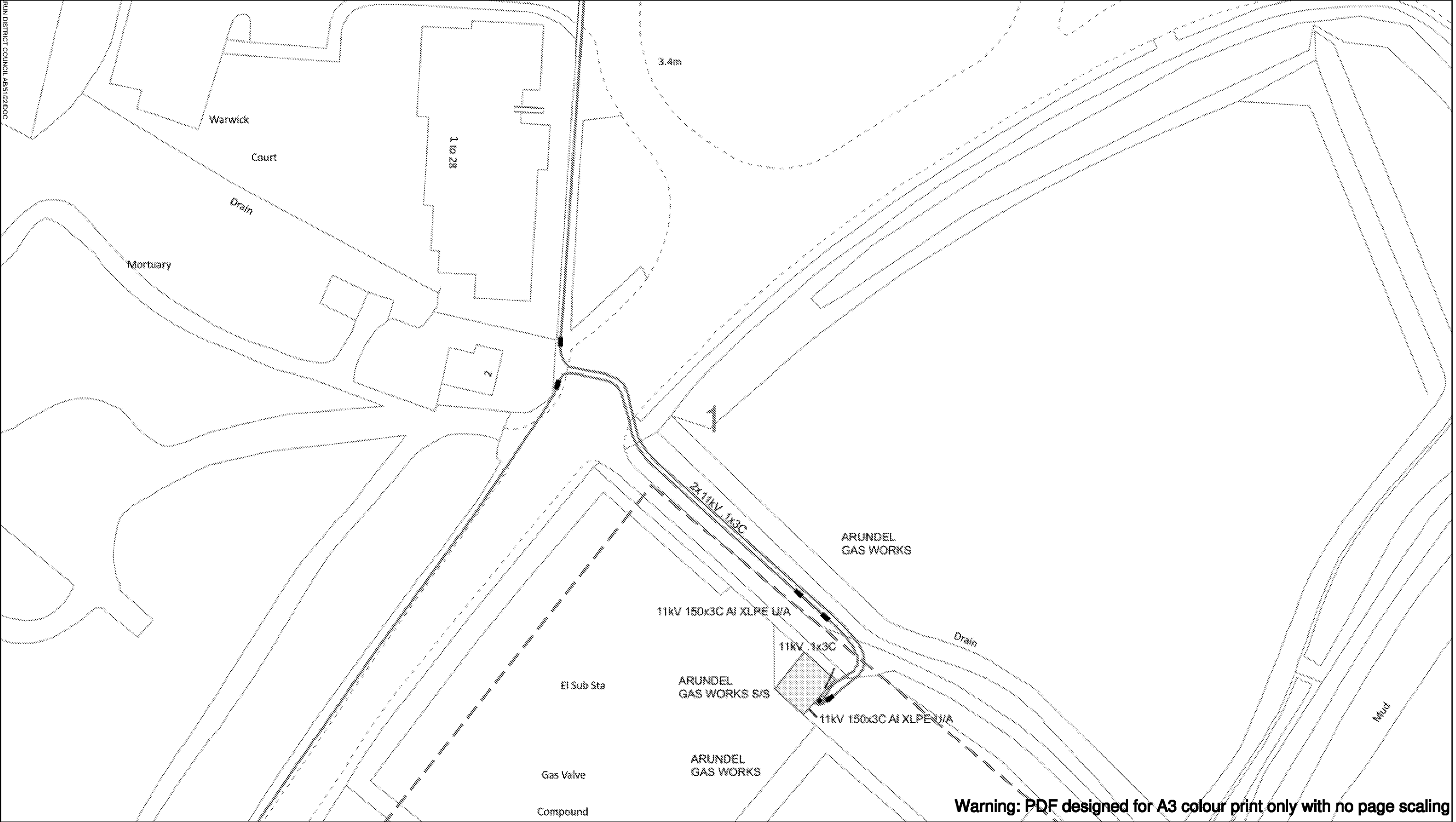
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Dig Sites

Area:

Line:

Date Requested: 26/10/2020

Job Reference: 20319776

Site Location: 501301 106731

Requested by: Mr Steven Gronow

Your Scheme/Reference: C1820

WARNING

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WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTES GSS SHOULD BE CONSULTED (AVAILABLE FROM THE HSE WEBSITE)

Voltages (V)				
LV (Low Voltage) and Services	Up to 1,000V			
HV (High Voltage)	Over 1,000V to 11,000V			
EHV (Extra High Voltage)	22,000V to 132,000V			
Transmission	275,000V and 400,000V			

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID				
	Services	LV	HV	EHV
Footpath/Unmade	0.45m	0.45m	0.6m	0.8m
Road Crossing	0.6m	0.6m	0.75m	0.9m
Agricultural	1m	1m	1m	1.1m

Legend

Service Cable

15 kV cable

2-3.3kV

6.6kV

11kV

22kV

33kV

66kV

132kV

275kV

400kV

Stone Openc

Pole Cable

Distribution Structures (Electric)

Pole, Existing location

Pole Structure, Existing Location - Single

Pole Structure, Existing Location - N

Over Route

Cross Section Route

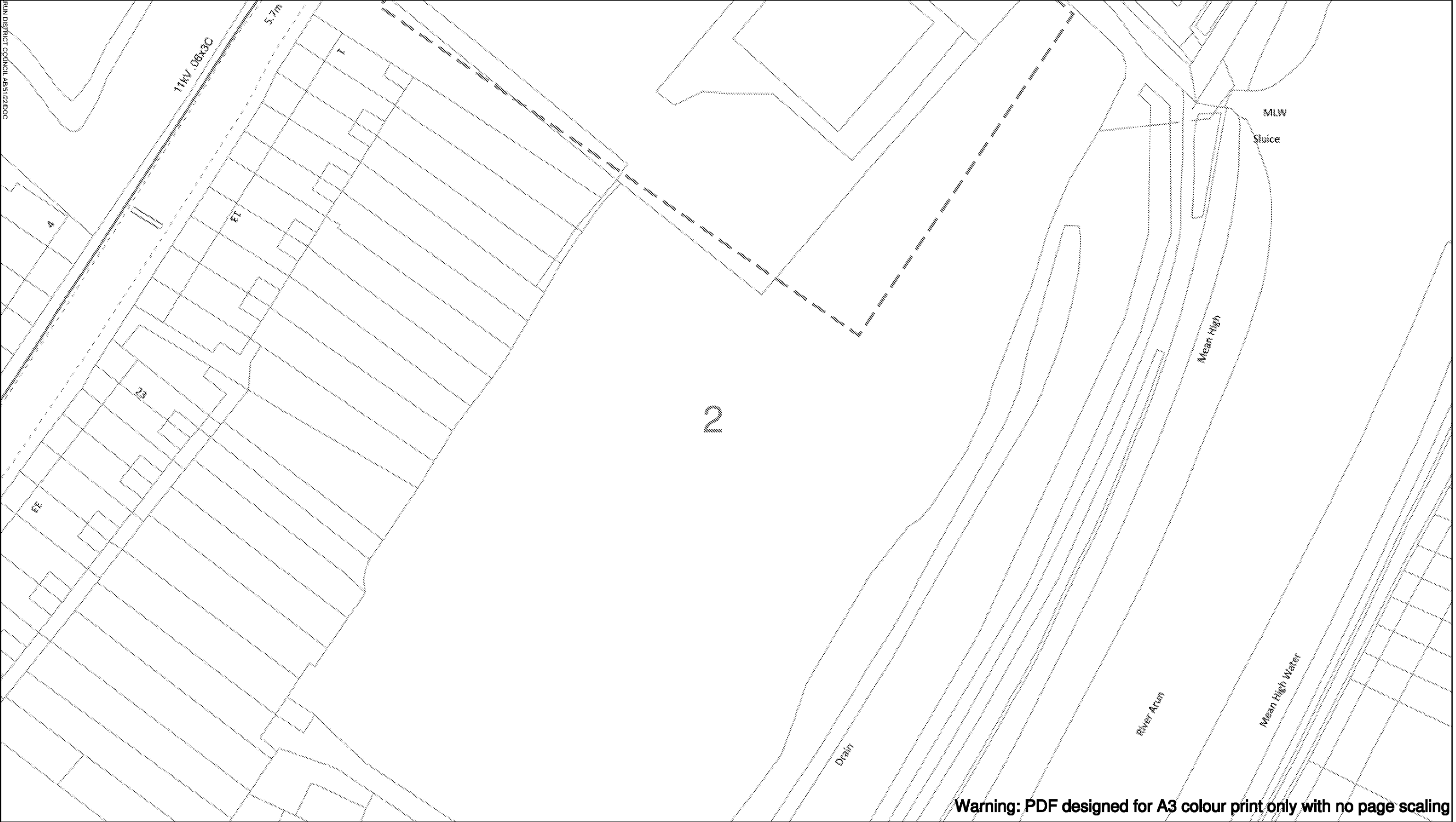
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Registered in Scotland No SC213459

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Dig Sites

Area:

Line:

Date Requested: 26/10/2020

Job Reference: 20319776

Site Location: 501301 106731

Requested by:
Mr Steven Gronow

Your Scheme/Reference: C1820

WARNING

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WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFETY GUIDANCE NOTES GSS SHOULD BE CONSULTED (AVAILABLE FROM THE HSE WEBSITE)

Scale: 1:500 (When plotted at A3)

Voltages (V)				
LV (Low Voltage) and Services	Up to 1,000V			
HV (High Voltage)	Over 1,000V to 11,000V			
EHV (Extra High Voltage)	22,000V to 132,000V			
Transmission	275,000V and 400,000V			

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID				
Services	LV	HV	EHV	
Footpath/Unmade	0.45m	0.45m	0.6m	0.8m
Road Crossing	0.6m	0.6m	0.75m	0.9m
Agricultural	1m	1m	1m	1.1m

Legend

Service Cable

15 kV cable

2-3.3kV

6.6kV

11kV

22kV

33kV

66kV

132kV

275kV

400kV

Stone Openc

Pole Cable

Distribution Structures (Electric)

Pole, Existing location

Pole Structure, Existing Location - Single

Pole Structure, Existing Location - N

Duct Route

Cross Section Route

Scottish and Southern Energy Power Distribution Ltd.

Registered Office: Inverlorn House,
200 Dunkeld Road, Perth, PH1 3AQ
Registered in Scotland No SC213459

If you're unsure & need to seek advice before commencing excavations please contact:
General Enquiries: 0800 048 3516

Subject to revision – Master held by SSEN Asset Data Team:
Asset.Data@ssen.com
01256 337 294

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APPENDIX B SITE BOUNDARY AND DILAPIDATION SURVEY

A site boundary and dilapidation survey was undertaken and the type of fencing and gates, together with their condition and need for repairs were recorded.

In general, the perimeter was found to be secure with no obvious evidence of recent trespass attempts.

The fencing surrounding the electrical sub-station was found to have been damaged and subsequently repaired with heras fence panels tied into the existing chain link fencing.

Chainlink to 2.1 m high topped with up to 3 lines of barb wire and concrete crankposts form the site boundary, although barb wire is missing in certain areas and secondary fencing is present as described below.

A pair of metal gates with chainlink fencing serves as the only current vehicular access point to site and is secured with an IDACS coded lock and chain. Three lines of barbed wire top the gate to approx. 2.5 m high and the gate functions adequately to secure the site. An internal swing gate secured with concrete blocks form a secondary security measure just inside of the main gate. A padlocked pedestrian gate forms a secondary route of access just to the north west of the main gate, although this gate has not been used or maintained for a long time.

The north east boundary is heavily overgrown with a couple of leaning posts. A dwarf brick wall approximately 0.5m high is also present further north toward the junction with Ford Road. The dwarf brick wall continues along the north western boundary along the footpath of Ford Road. Directly behind the brick wall is a 1.5 m high (from the level of Ford Road) chainlink fence with concrete crank posts. Approximately 3.5 m into site is a further chainlink fence, 2.1 m high (from site level) and concrete crank posts. Trees and vegetation are present between these fencelines more so towards the northern site corner. This double fencing arrangement continues along the south western boundary, due to the differences in levels between site and adjacent property (the adjacent property being approx. 1 m higher than site level). The double fencing stops at the position of the surface water drain and turns 90 degrees to step back into the outer (site boundary) fenceline. This south western boundary and the area between the fencelines is considerably overgrown with brambles and scrub vegetation. The remaining single line of chainlink fence along the south west boundary and along the south east boundary is heavily overgrown and particularly at the concrete crankposts where ivy is completely smothering the posts. A couple of repairs are evident along these boundaries and the fence serves as an adequate boundary to the adjacent grazing land.

Photographic plates 1 to 14 provide images of the boundaries, substation and access gate.

APPENDIX C PHOTOGRAPHS

Plate 1 View of Site Access Track from Ford Road Junction



Plate 2 View of Double Gate Vehicle Access Gate



Plate 3 View of SSE Electrical Substation



Plate 4 View of Site Boundary Surrounding the Substation



Plate 5 View of Access Track along Heavily Overgrown North Eastern Boundary leading to River Arun



Plate 6 View of Site Boundary along North Eastern Boundary towards Ford Road



Plate 7 View of Site Boundary along North Western Boundary from Ford Road



Plate 8 View of South Western Boundary (at Western Corner) Adjacent to Neighbouring Residential Property



Plate 9 View of Ford Road and North Western Boundary Outer Fenceline



Plate 10 View of Site Gates from Welfare Compound Area



Plate 11 View of South Western Boundary on Line of Drain Looking West as Fence Returns to Single Line at Outer Boundary Fence



Plate 12 View of the South Corner of Site



Plate 13 View of South Eastern Boundary Showing Heavily Overgrown Fenceline



Plate 14 View of Eastern Corner of Site Showing Heavily Overgrown Fenceline



Plate 15 View of Welfare compound Area from Site Gate



Plate 16 View of Tarmac Access Road that Bisects Site and the Line of the Surface Water Drain Prior to Vegetation Clearance Works



Plate17 View of northern part of site following vegetation clearance



Plate 18 View of southern part of site following vegetation clearance



Plate 19 Views of marked up electrical services during utilities surveying



Plate 20 Views of other utilities marked up during survey



Plate 21 Views of other utilities marked up during survey

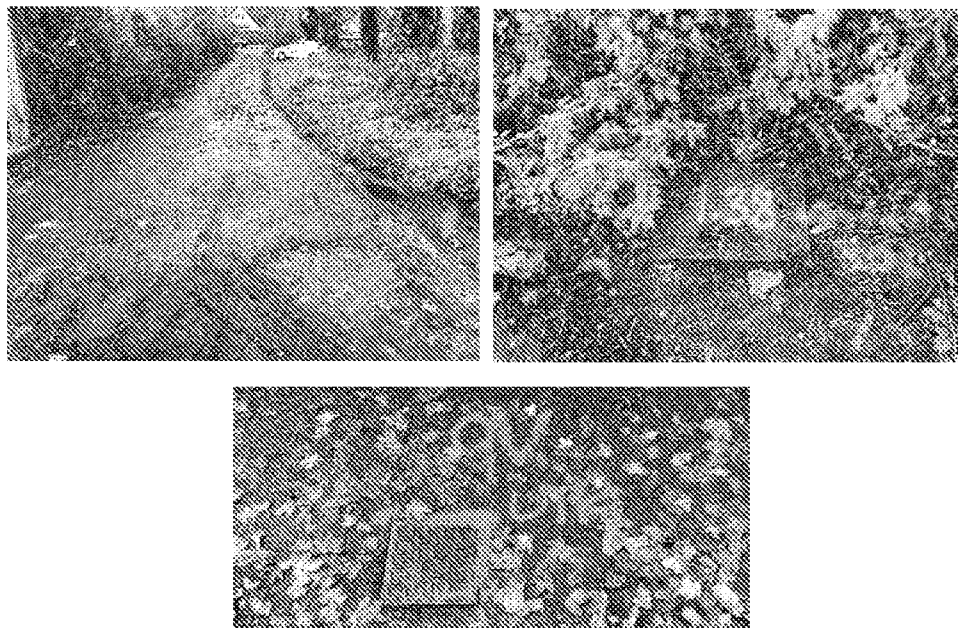


Plate 22 View of tarmac road along line of surface water drain following vegetation clearance



Plate 23 Trial Pit TP201



Plate 24 Trial Pit TP201 Arisings



Plate 25 Trial Pit TP202

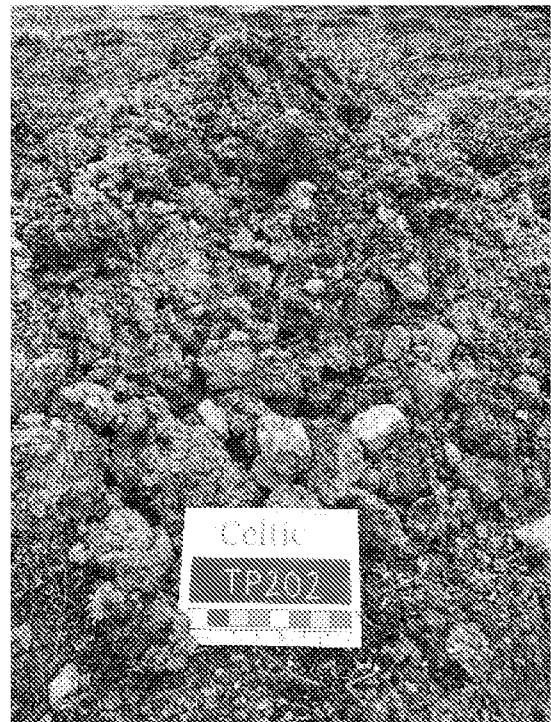
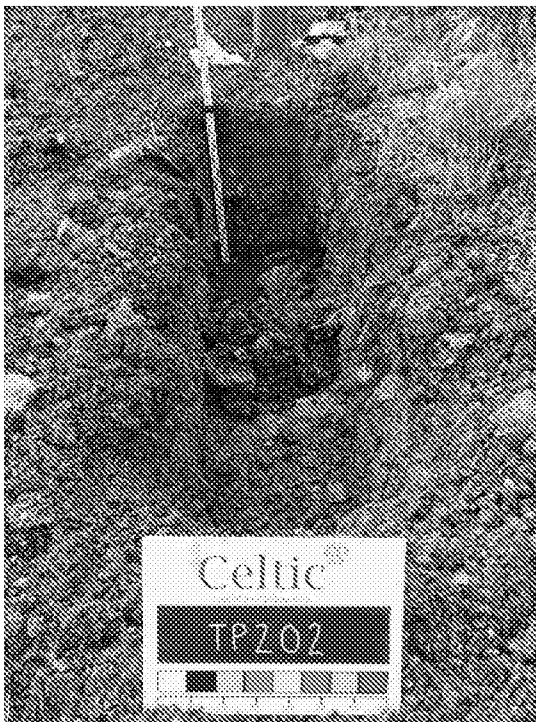


Plate 26 Trial Pit TP203



Plate 27 Trial Pit TP204



Plate 28 Trial Pit TP205



Plate 29 Trial Pit TP206

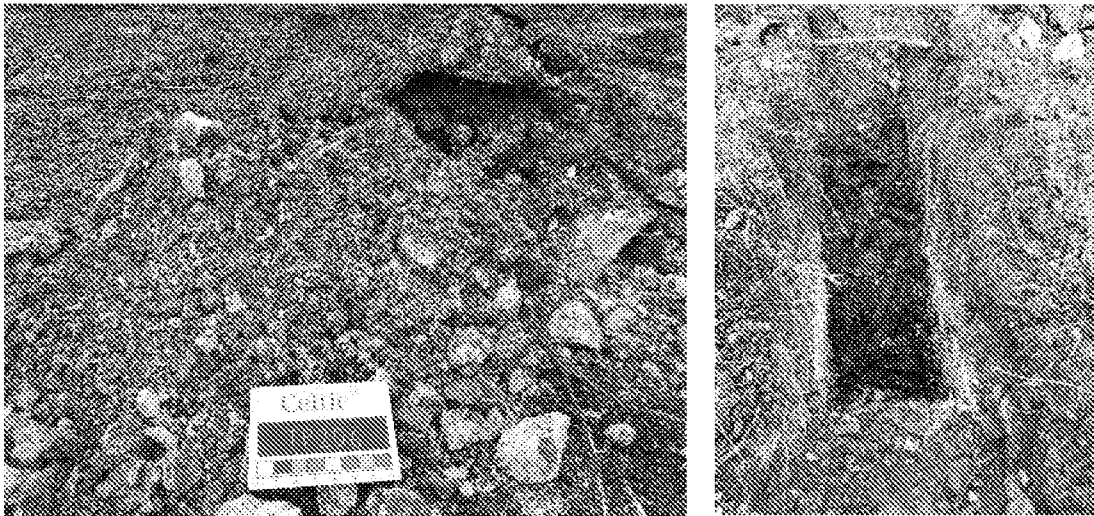


Plate 30 Trial Pit TP206a

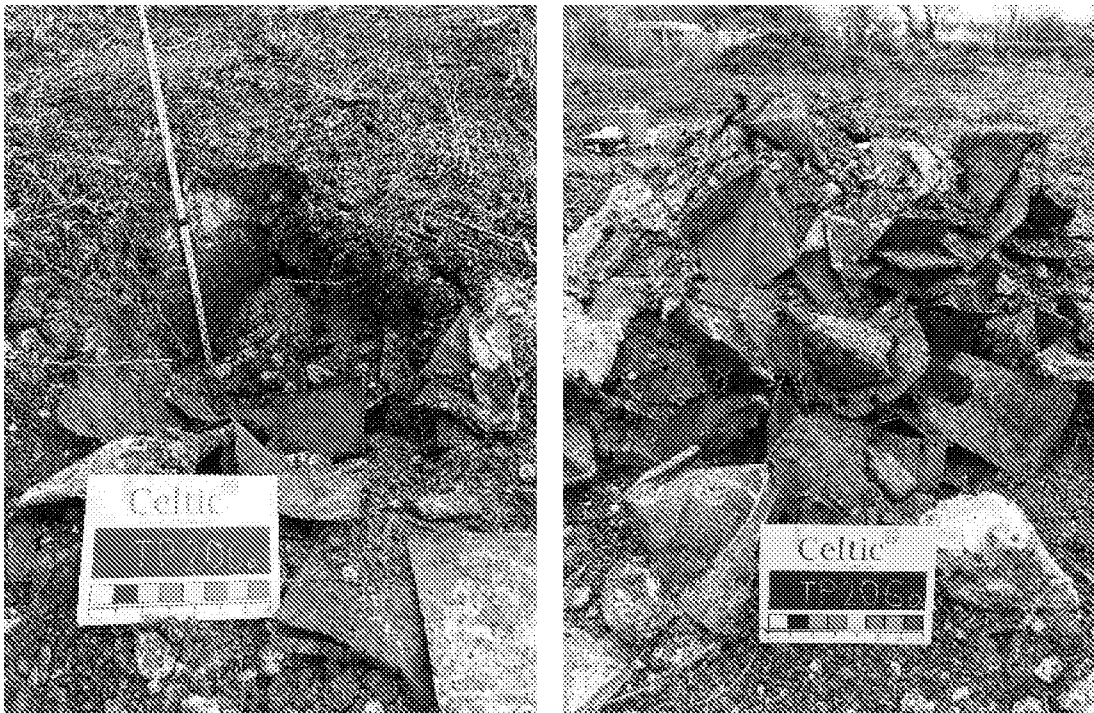


Plate 31 Trial Pit TP207



Plate 32 Trial Pit TP207

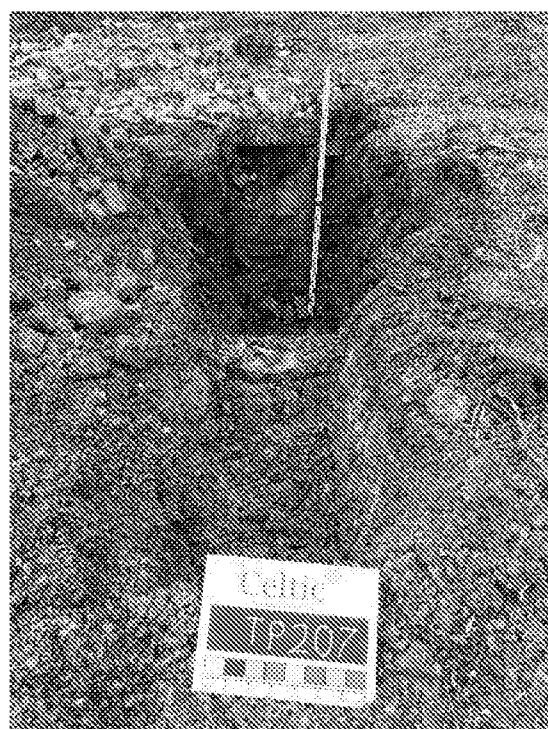


Plate 33 Trial Pit TP207

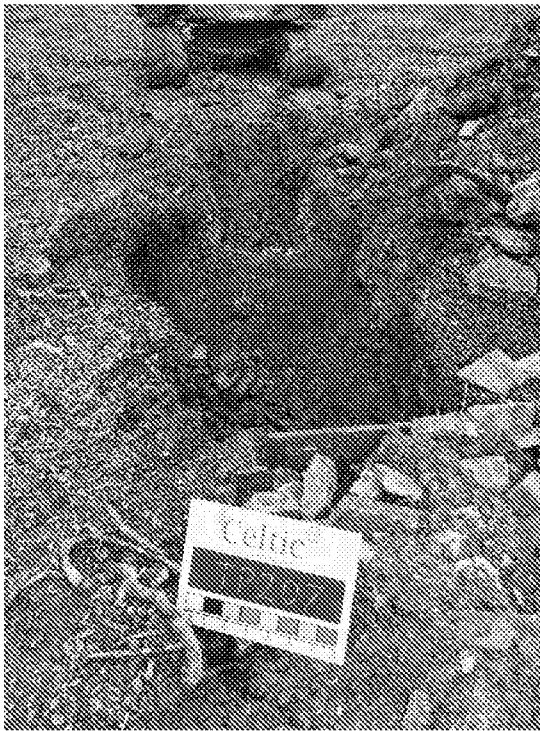


Plate 34 trial Pit TP207a

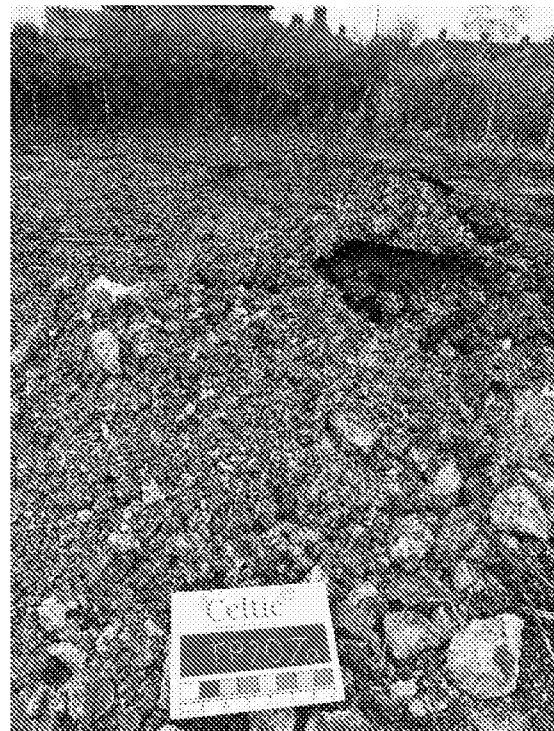


Plate 35 Trial Pit TP208

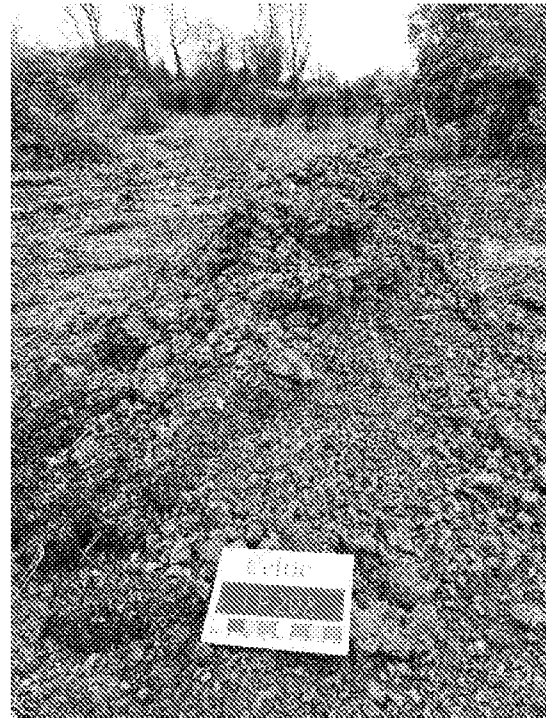
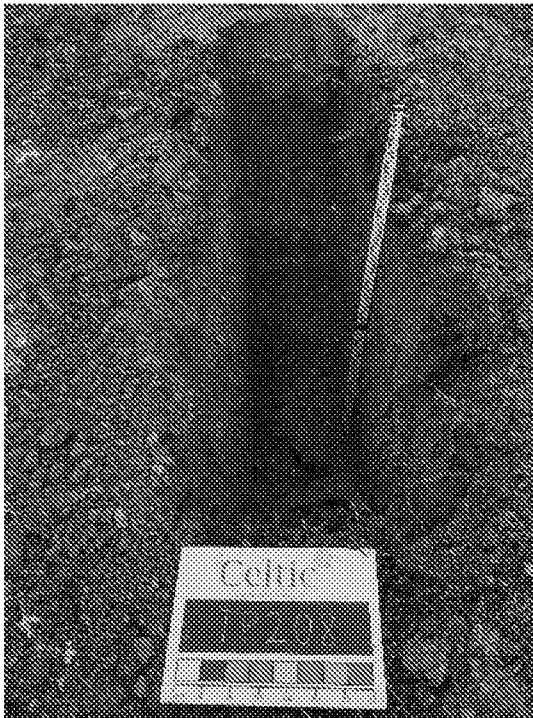


Plate 36 Trial Pit TP209

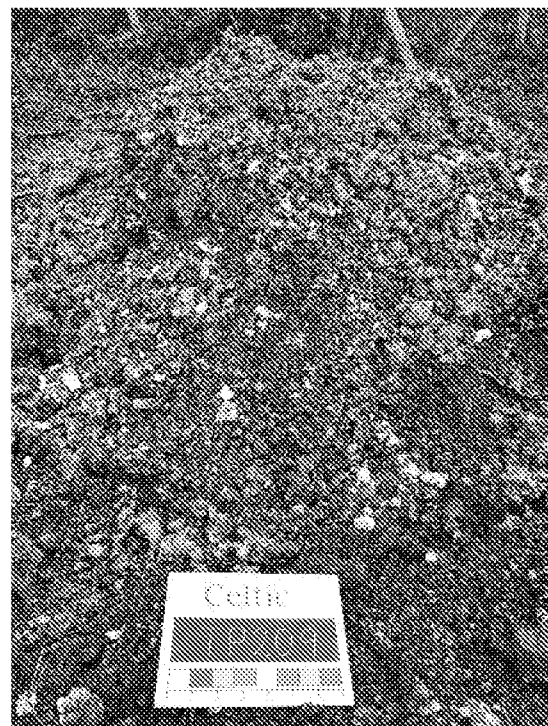


Plate 37 Trial Pit TP210

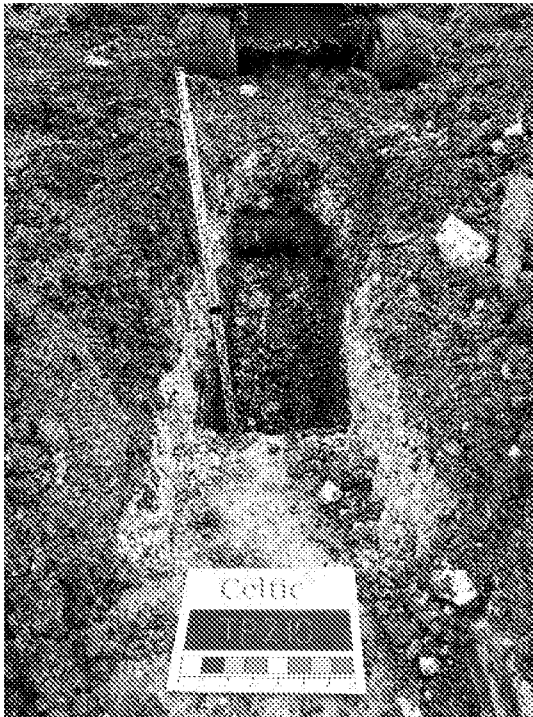


Plate 38 Trial Pit TP211

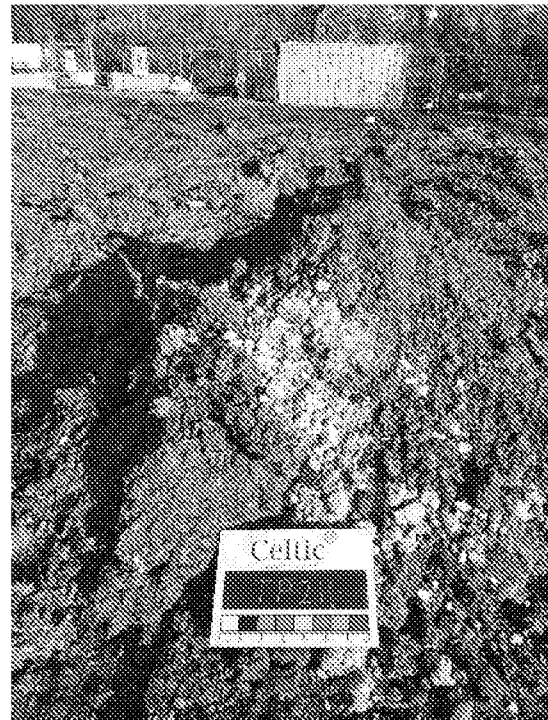
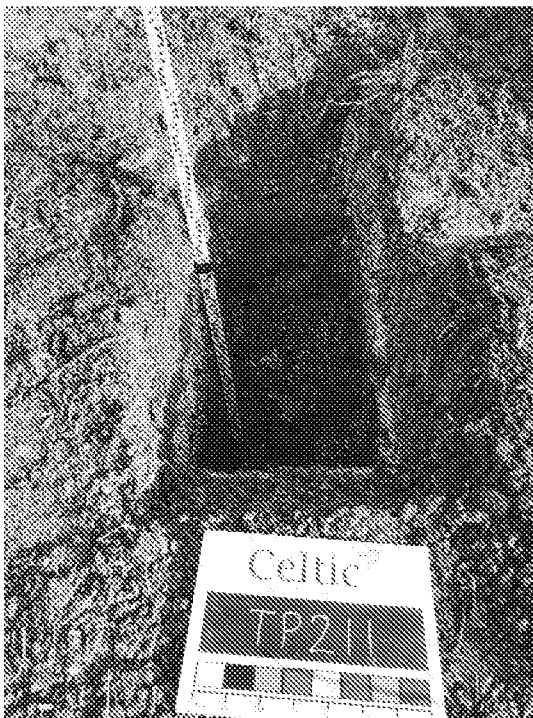


Plate 39 Trial Pit TP212

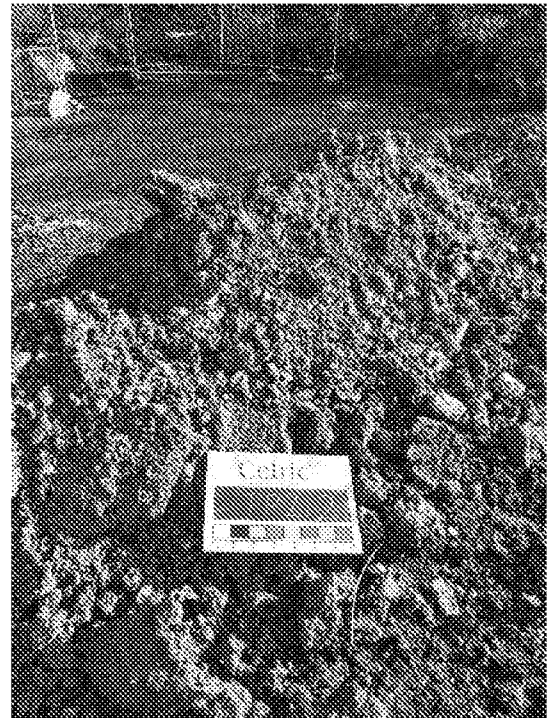


Plate 40 Trial Pit 213

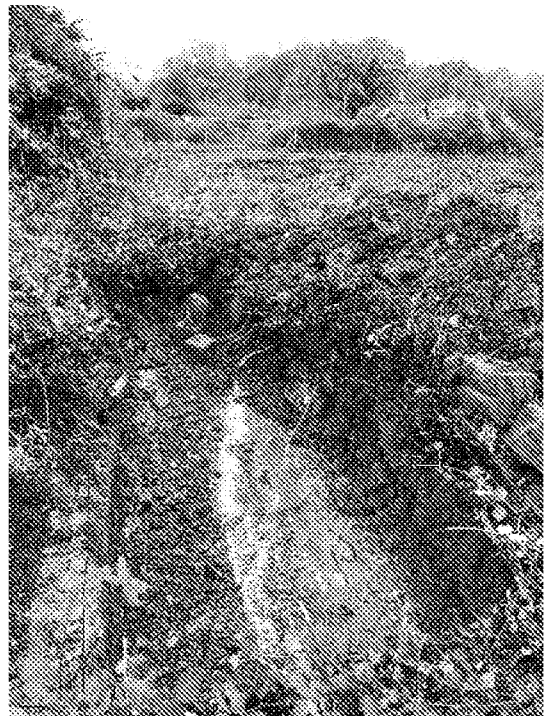
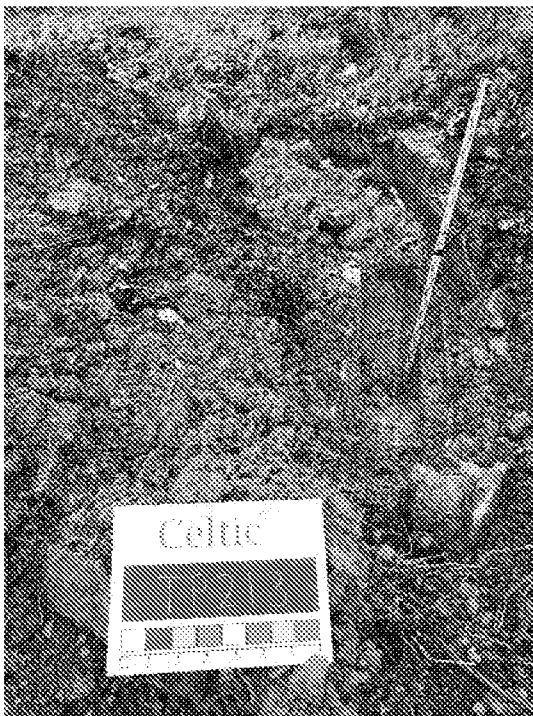


Plate 41 Trial Pit TP213



Plate 42 Trial Pit 214

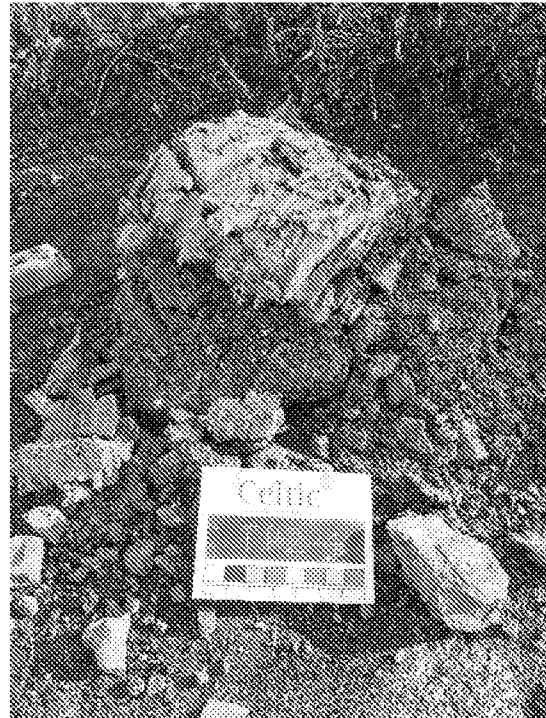
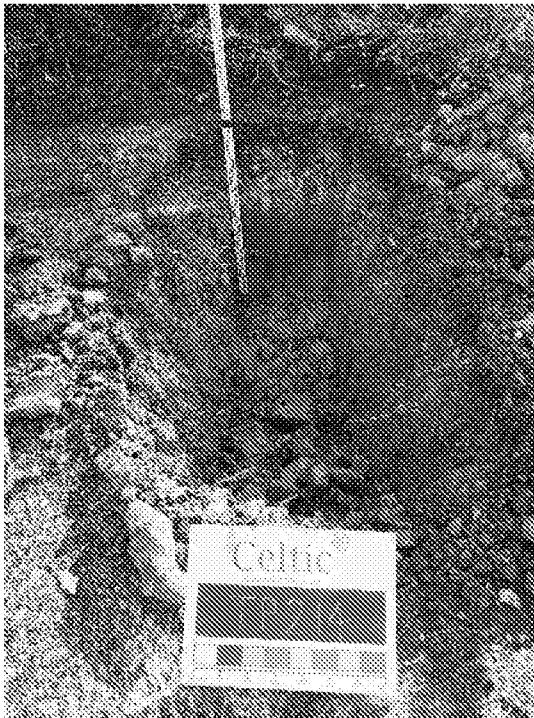


Plate 43 Trial Pit 215



Plate 44 Borehole BH201 during drilling



Plate 45 Borehole BH202 during drilling



Plate 46 Borehole BH202 Cored material exhibiting NAPL staining within chalk

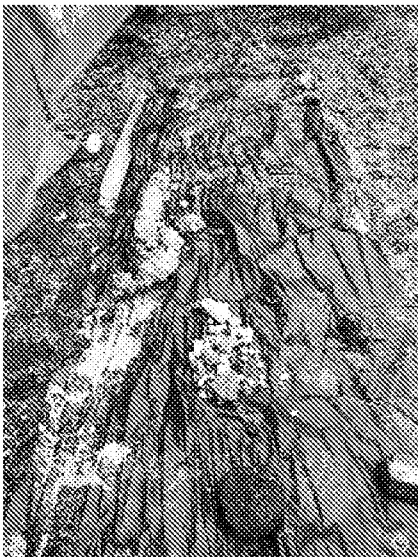


Plate 47 Borehole BH203 during drilling



Plate 48 Borehole BH203 corings



Plate 49 Borehole BH204 during drilling works



Plate 50 Completed Borehole Headworks

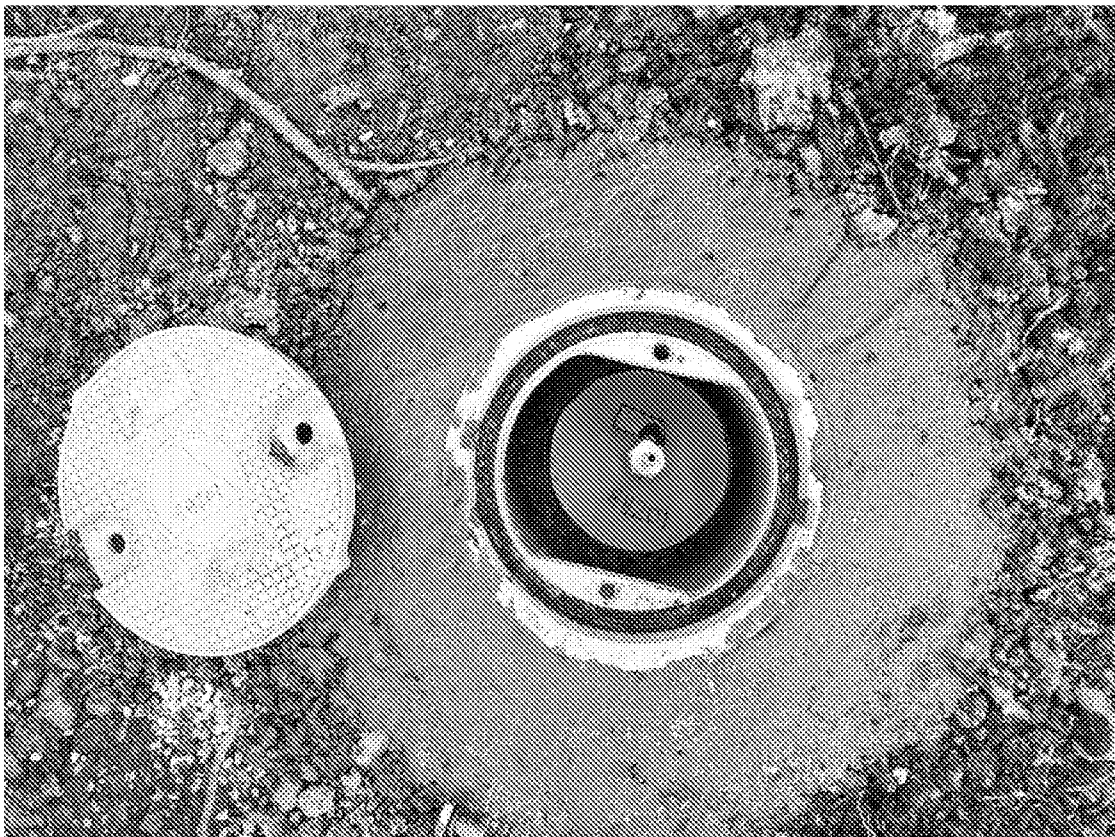


Plate 51 Northern area of site following borehole installation works



Plate 52 Stockpile of vegetation remaining on-site



APPENDIX D TRIAL PIT AND BOREHOLE LOGS



Celtic Technologies

Trialpit No

TP201

Sheet 1 of 1

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501280E - 106770N

Level:

-

Date

18/11/2020

Location:

Ford Road, Arundel BN18 9DX

Dimensions:

-

Scale

1:25

Client:

National Grid Property Holdings

Depth

1.20m

Logged By

SG

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.50	ES		0.30		Gravel of medium shingle and topsoil with much rootlets. Made Ground. (MG)		
					Dark brown silt, sand, gravel with some metal scrap fragments and thick (25mm) rebar. Made Ground. (MG)		
					Light brown silt, sand, gravel. Made Ground. (MG)	1	
					White weathered reworked chalk with coarse gravel of flint. Concrete slab of former gasholder base found at 0.6m depth (0.3m thick). Made Ground. Stable sides, no water, no visual/olfactory contamination (MG)		
			1.20		Trialpit Complete at 1.20 m		
							2
							3
							4

Remarks:

Groundwater:





Celtic Technologies

Trialpit No
TP202

Sheet 1 of 1

Project Name
NGPH Arundel

Project No.
C1820

Co-ords: 501270E - 106763N
Level: -

Date
18/11/2020

Location: Ford Road, Arundel BN18 9DX

Dimensions: -

Depth
1.10m

Scale
1:25

Logged By
SG

Client: National Grid Property Holdings

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.80	ES		0.40 0.90 1.10			Brown subsoil of gravelly sandy silt with much rootlets. Made Ground. (MG)	
						Brown sand, gravel and silt with some whole and half bricks and occasional black ash, coal and clinker. Made Ground (MG)	
						Sandy, gravelly, clay, gravels are subrounded shingle. Brick wall present to west, with visual and olfactory evidence of tar contamination and concrete slab at 1.1m. Made Ground. No water, sides were collapsing (MG)	1
		Trialpit Complete at 1.10 m					
							2
							3
							4

Remarks:

Groundwater:



Celtic enGlobe Celtic Technologies					Trialpit No TP203 Sheet 1 of 1			
Project Name NGPH Arundel			Project No. C1820		Co-ords: 501277E - 106757N Level: -		Date -	
Location: Ford Road, Arundel BN18 9DX					Dimensions: -		Scale 1:25	
Client: National Grid Property Holdings					Depth 2.00m		Logged By SG	
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
Depth (m)	Type	Results						
1.00	ES		0.40			Dark brown silt, sand, gravel with much rootlets. Made Ground (MG)		
		Red/rown gravelly (shingle) CLAY in west side of pit (appears natural). East side of pit has brown silt, sand, gravel and some metal fragments and thick reinforcing steel. Made Ground. (MG)						
		Light brown mottled CLAY with occasional subrounded medium to coarse gravel in west side of pit (appears natural). Brown and white weathered chalk with occasional black staining and some metal sheeting. Made Ground. Brick (MG)						
		Wall 0.4 m thick at 1 m depth (MG)						
		Grey silt, sand and gravel, water ingress at 2 m. Slight organic odour. Stable sides (SG)						
			2.00			Trialpit Complete at 2.00 m		
Remarks:								
Groundwater:								



Celtic Technologies

Trialpit No
TP204

Sheet 1 of 1

Project Name
NGPH Arundel

Project No.
C1820

Co-ords: 501267E - 106756N
Level: -

Date
18/11/2020

Location: Ford Road, Arundel BN18 9DX

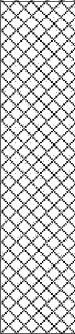
Dimensions: -

Client: National Grid Property Holdings

Depth
1.40m

Scale
1:25

Logged By
SG

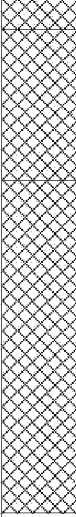
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
1.00	ES		0.30			Dark brown silt, sand, gravel and much rootlets. Made Ground. (MG)	1
						White gravels, cobbles and boulders of reworked chalk with occasional pocket of blue spent oxide, some bricks and much metal sheeting. Made Ground. Terminated at 1.4 m due to presence of much metal sheeting obstructions. (MG)	
			1.40			Trialpit Complete at 1.40 m	2
							3
							4

Remarks:

Groundwater:



Public Use 3.1 (Bul 428-03) Standard Trialpit Log 22 dated 27th Nov 03

			Celtic Technologies			Trialpit No TP205 Sheet 1 of 1	
Project Name NGPH Arundel			Project No. C1820		Co-ords: 501280E - 106748N Level: -		Date 18/11/2020
Location: Ford Road, Arundel BN18 9DX					Dimensions: -		Scale 1:25
Client: National Grid Property Holdings					Depth 1.70m		Logged By SG
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
1.50	ES		0.10			Dark brown sub-soil with much rootlets. Made Ground. (MG)	
				White reworked chalk with some brick and brick fragments, metal sheets. Chalk is coarse gravel, cobbles and boulders. Made Ground. (MG)			
				Reworked chalk (coarse gravel, cobbles and boulders). Made Ground. Brick wall present at 0.7 m depth, approx. 0.6 m wide. No water, no odour, stable sides. (MG)			
			0.60				
			1.70			Trialpit Complete at 1.70 m	
1 2 3 4							
Remarks:							
Groundwater:							

Public Use 3.1 (Bul 428-03) Standard Trialpit Log 22 (revised 27th Nov 03)



Celtic Technologies

Trialpit No

TP206

Sheet 1 of 1

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501259E - 106748N

Date

18/11/2020

Location:

Ford Road, Arundel BN18 9DX

Dimensions:

-

Scale

1:25

Client:

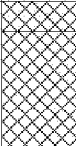
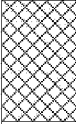
National Grid Property Holdings

Depth

2.20m

Logged By

SG

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
1.20	ES		0.10			Dark brown sub-soil with much rootlets. Made Ground. (MG)	
			0.50			Weathered reworked chalk with some brick fragments in brown silty matrix. Made Ground. (MG)	
2.00	ES		1.80			Brown/white sandy gravelly silt with some timber and brick. Made Ground. (MG)	1
			2.20			Grey/black sandy, gravelly clay with some free tar staining. Made Ground. Water ingress at 2.1 m, tar odour, collapsing sides (MG)	2
						Trialpit Complete at 2.20 m	3
							4

Remarks:

Groundwater:





Celtic Technologies

Trialpit No

TP207

Sheet 1 of 1

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501264E - 106735N

Date

18/11/2020

Location:

Ford Road, Arundel BN18 9DX

Dimensions:

-

Scale

1:25

Client:

National Grid Property Holdings

Depth

1.90m

Logged By

SG

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.60	ES		0.10		Dark brown sub-soil with much rootlets. Made Ground. (MG) Whole bricks, laid but no mortar. Steel beam and columns present in centre of circular footprint. Bricks extend north beyond circular footprint. To the south of the steel beams dark brown silt, sand, gravel with much loose whole bricks and cobbles/boulders of concrete with some metal fragments, sections of steel rebar. Made Ground. Water ingress at 1.9 m and tar contamination present. 0.3 m wide brick wall on southern line of circle with natural red/brown sandy (MG)	1	
			1.90			Trialpit Complete at 1.90 m	2
							3
							4

Remarks:

Groundwater:



					Celtic Technologies					Trialpit No TP208 Sheet 1 of 1	
Project Name NGPH Arundel				Project No. C1820		Co-ords: 501288E - 106733N Level: -				Date 18/11/2020	
Location: Ford Road, Arundel BN18 9DX						Dimensions: -				Scale 1:25	
Client: National Grid Property Holdings						Depth 2.00m				Logged By SG	

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
Depth (m)	Type	Results						
1.50	ES		0.30			Brown silt, sand, fine to medium gravel (of shingle). Made ground. (MG)		
						Red/brown silty, sandy GRAVEL (of shingle), gravels becoming cobbles with depth (SG)		
						Brown gravelly CLAY. Stable sides, no water, no odour or contamination. (LC)		
			1.80					
			2.00					
						Trialpit Complete at 2.00 m		
								1
								2
								3
								4

Remarks:		
Groundwater:		

Project Name
NGPH Arundel

Project No.
C1820

Co-ords: 501293E - 106704N
Level: -

Date
18/11/2020

Location: Ford Road, Arundel BN18 9DX

Dimensions: _____

Scale
1:25

Client: National Grid Property Holdings

Depth
2.10m

Logged By
SG

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.60	ES		0.10			Brown sub-soil with much rootlets. Made Ground. (MG)	
			0.30			Dark brown silt, sand, gravel. Made Ground. (MG)	
			0.50			Brown sand, gravel and clay. Made Ground. (MG)	
						White/brown weathered reworked chalk and clay/gravel (of flint). Made Ground. (MG)	
			0.80			Red/brown sandy, gravelly CLAY (gravel of shingle). Stable, no water, no contamination or odour. (LC)	
			2.10			Red/brown sandy, gravelly CLAY (gravel of shingle). Stable, no water, no contamination or odour. (LC)	1
							2
							3
							4
Trialpit Complete at 2.10 m							

Remarks:

Groundwater:



Project Name
NGPH Arundel

Project No.
C1820

Co-ords: 501316E - 106718N
Level: -

Date
18/11/2020

Location: Ford Road, Arundel BN18 9DX

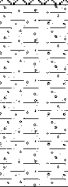
Dimensions: _____

Scale
1:25

Client: National Grid Property Holdings

Depth
1.80m

Logged By
Sg

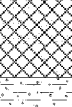
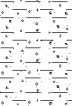
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
1.00	ES		0.40			Brown subsoil and shingle. Made Ground. (MG)	1
						Weathered reworked chalk with large boulder size concrete at 0.6 m depth. Made Ground. (MG)	
						Dark brown clay, gravel and brick. Concrete walls present and 0.5 m dia case iron pipe running N-S. Made Ground. (MG)	
						Red/brown sandy, gravelly CLAY. Stable, no contamination, odour or water. (LC)	
			1.80			Trialpit Complete at 1.80 m	2
							3
							4

Remarks:

Groundwater:



					Celtic Technologies		Trialpit No TP211 Sheet 1 of 1	
Project Name NGPH Arundel			Project No. C1820		Co-ords: 501306E - 106727N Level: -		Date 18/11/2020	
Location: Ford Road, Arundel BN18 9DX					Dimensions: -		Scale 1:25	
Client: National Grid Property Holdings					Depth 1.50m		Logged By SG	

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
Depth (m)	Type	Results						
0.80	ES		0.30			Light brown sandy, gravelly clay. Made Ground. Yellow 25 mm dia. gas pipe running N-S at 0.25 m depth at western end of pit (2.5m from edge of Governor compound). Cast iron 0.5 m dia. pipe running N-S at 0.5 m depth (top of (MG)		
			0.60			White reworked fine to coarse sub-angular to subrounded chalk gravels and cobbles. Made Ground. (MG)		
			1.00			Brown silt, sand, gravel with occasional ash and brick fragments. Made Ground. (MG)		
			1.50			Brown gravelly CLAY. Stable sides, no water, no odour or contamination. (LC)	1	
						Trialpit Complete at 1.50 m		
								2
								3
								4

Remarks:		
Groundwater:		



Celtic Technologies

Trialpit No

TP212

Sheet 1 of 1

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501320E - 106733N

Level:

-

Date

18/11/2020

Location:

Ford Road, Arundel BN18 9DX

Dimensions:

-

Scale

1:25

Client:

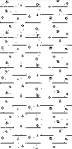
National Grid Property Holdings

Depth

2.00m

Logged By

SG

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.50	ES		0.40			Light brown silt, sand and gravel with much ash and brick fragements. Made Ground. (MG)	
			0.80			White/brown weathered reworked chalk and brown clay/gravel (of flint). Made Ground. (MG)	
			1.10			Brown silt, sand, gravel with occasional brick and concrete fragments. Made Ground. 300 mm dia. Clay pipe running N-S at 1.1 m depth. (MG)	1
			1.50			Brown gravelly clay with some ash and brick. Made Ground. (MG)	
			2.00			Mottled brown gravelly CLAY (gravels are subrounded coarse shingle). Stable sides, no water, no contamination. (LC)	
						Trialpit Complete at 2.00 m	2
							3
							4

Remarks:

Groundwater:



POLIBASE 3.1 (Bul 428-03) Standard Trialpit Log 22 dated 27th Nov 03

ARUN DISTRICT COUNCIL AB/51/22/DOC



Celtic Technologies

Trialpit No

TP213

Sheet 1 of 1

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501334E - 106733N

Date

18/11/2020

Location:

Ford Road, Arundel BN18 9DX

Dimensions:

-

Scale

1:25

Client:

National Grid Property Holdings

Depth

1.70m

Logged By

SG

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
Depth (m)	Type	Results						
1.00	ES		0.10			Brown subsoil and rootlets. Made Ground. (MG)		
			0.60			Brown silty, sand and gravel with much cobbles/boulders of brick and occasional cobble size chrystaline tar. Made Ground. Concrete gasholder base present at the west of the pit at 0.6 m depth. Also to the west of the pit is an access chamber and old water pipe with two valves. Gasholder base is 0.3 m thick concrete, a brick wall 0.2 m wide is present surrounding the base at 0.5 m depth with a 100 mm dia. clay pipe surrounding the gasholder. (MG)		
			0.90			Concrete (MG)		
			1.30			Brown silt, sand and gravel (SG)	1	
			1.70			Sandy, clayey GRAVEL (shingle). Slight seepage of water at 1.7m (SG)		
						Trialpit Complete at 1.70 m		
								2
								3
								4

Remarks:

Groundwater:





Celtic Technologies

Trialpit No

TP214

Sheet 1 of 1

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501320E - 106743N

Date

18/11/2020

Location:

Ford Road, Arundel BN18 9DX

Dimensions:

-

Scale

1:25

Client:

National Grid Property Holdings

Depth

1.20m

Logged By

SG

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.40	ES		0.08			Tarmacadam (MG)	
			0.30			Whole and half bricks and shingle within sandy clay matrix. Made Ground. (MG)	
			0.60			Brown gravelly clay with some brick fragments. Made Ground. (MG)	
			1.00			Brown/black mottled CLAY. (LC)	
			1.20			Mottled brown gravelly CLAY (gravels are subrounded coarse shingle). Stable sides, no contamination, slight seepage of water at 1.2 m. (SG)	1
						Trialpit Complete at 1.20 m	
							2
							3
							4

Remarks:

Groundwater:



POL-BASE 3.1 (B01 428 03) Standard Trialpit Log 2 (dated 27th Nov 03)

ARUN DISTRICT COUNCIL AB/51/22/DOC





Celtic Technologies

Borehole No

BH201

Sheet 1 of 1

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501291E - 106768N

Hole Type

Rotary

Location:

Ford Road, Arundel BN18 9DX

Level:

3.42 m AOD

Scale

1:75

Client:

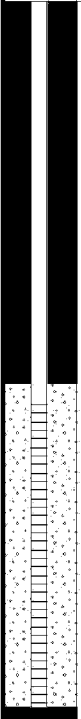
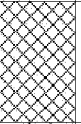
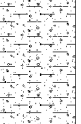
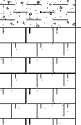
National Grid Property Holdings

Dates:

16/11/2020

Logged By

SG

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		5.00	PID1	0.2	1.20	2.22		Hand pitted: Made Ground. Light brown sand and gravel with much brick fragments (MADE GROUND)	1
								Orange brown stiff CLAY with flint gravel (Gravelly CLAY)	2
					2.70	0.72		Grey / black weathered CHALK (CHALK - Natural)	3
					4.20	-0.78		Grey / black weathered CHALK (CHALK - Natural)	4
					5.70	-2.28		Light orange clay and CHALK (CHALK - Natural)	5
					7.20	-3.78		End of Borehole at 7.20 m	6
									7
									8
									9
									10
									11
									12
									13
									14

Remarks:

Casing used throughout. The installation pipe is 100mm and the gravel pack is 2mm-4mm washed





Project Name

NGPH Arundel

Celtic Technologies

Project No.

C1820

Co-ords: 501282E - 106765N

Borehole No

BH202

Sheet 1 of 1

Hole Type

Rotary

Location: Ford Road, Arundel BN18 9DX

Level: 3.59 m AOD

Scale 1:75

Client: National Grid Property Holdings

Dates: 17/11/2020

Logged By SG

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					1.20	2.39		Hand pitted: Made Ground. Reworked chalk and red bricks (MADE GROUND)	1	
									No return. (MADE GROUND)	2
					2.70	0.89			Concrete slab (100 mm thick) at 3 m. Limited core recovery. Reworked chalk, possibly becoming natural by 4.5 m. Black tar staining from 6.5m. (MADE GROUND)	3
										4
										5
										6
										7
					7.20	-3.61		White clay and CHALK with flint bands. Tar staining between 7.2 m to 9 m. (CHALK - Natural)	8	
		7.50	PID1	176.0						
		7.70	PID2	26.7						
		7.90	PID3	164.0						
		8.90	PID4	4.4						
		9.50	PID5	75.7						
					9.90	PID6	59.0			10
			10.20	-6.61		End of Borehole at 10.20 m	11			
							12			
							13			
							14			

Remarks: Casing used throughout. The installation pipe is 100mm and the gravel pack is 2mm-4mm washed





Celtic Technologies

Borehole No

BH203

Sheet 1 of 1

Hole Type

Rotary

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501283E - 106755N

Location:

Ford Road, Arundel BN18 9DX

Level:

3.37 m AOD

Scale

1:75

Client:

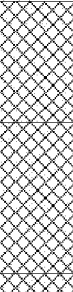
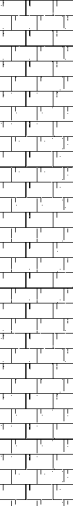
National Grid Property Holdings

Dates:

17/11/2020

Logged By

SG

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					1.20	2.17		Hand pitted: Made Ground. Red bricks in sand and gravel (MADE GROUND)	1
								No return. (MADE GROUND)	2
					2.70	0.67		Made Ground. Brick, ash, clinker (MADE GROUND)	3
	3.50	PID1	1.2	3.00	0.37	Grey / black gravelly SAND with flint and chalk (Gravelly SAND)			
	4.00	PID2	0.9					4	
	5.00	PID3	1.4	5.00	-1.64		White / grey clayey CHALK with flint, occasional black sandy lenses and tar staining. (CHALK - Natural)	5	
	5.70	PID4	20.9						6
	6.00	PID5	0.9						
	7.00	PID6	22.8						7
	7.50	PID7	14.6						8
	8.50	PID8	0.8						9
	9.00	PID9	1.0						
	10.00	PID10	0.8	10.20	-6.84				10
								End of Borehole at 10.20 m	11
								12	
							13		
							14		

Remarks:

Casing used throughout. The installation pipe is 100mm and the gravel pack is 2mm-4mm washed



ARUN DISTRICT COUNCIL AB/51/22/DOC



Celtic Technologies

Borehole No

BH204

Sheet 1 of 1

Project Name

NGPH Arundel

Project No.

C1820

Co-ords:

501286E - 106749N

Hole Type

Rotary

Location:

Ford Road, Arundel BN18 9DX

Level:

3.34 m AOD

Scale

1:75

Client:

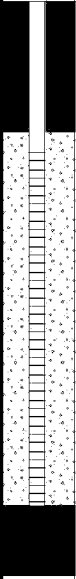
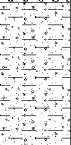
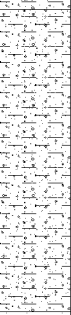
National Grid Property Holdings

Dates:

18/11/2020

Logged By

SG

Well	Water Strikes	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					1.20	2.14		Hand pitted: Made Ground. Red bricks in sand and gravel (MADE GROUND)	1
		1.50	PID1	0.6				Brown sandy, gravelly CLAY (Gravelly CLAY)	2
		2.00	PID2	0.1					
		2.50	PID3	0.3					
		3.00	PID4	8.3	2.70	0.64			
		3.50	PID5	3.5					
		4.00	PID6	1.3				Grey sandy GRAVELLY CLAY with gravels of chalk, black clayey sand between 4.2 m - 5.5 m. (GRAVELLY CLAY)	3
		4.50	PID7	2.4					
		5.00	PID8	0.4					
		5.50	PID9	0.1					
				5.70	-2.36		End of Borehole at 5.70 m		6
									7
									8
									9
									10
									11
									12
									13
									14

Remarks:

Casing used throughout. The installation pipe is 100mm and the gravel pack is 2mm-4mm washed



ARUN DISTRICT COUNCIL AB/51/22/DOC

APPENDIX E WASTE DISPOSAL DOCUMENTATION

Conveyance & Waste Transfer Note

Unit 9, Hangar 3
Rudford Industrial Estate
Ford, Arundel, West Sussex. BN18 0BS

Tel: [REDACTED]
Waste Carrier Registration CBDU59437



Ticket No [REDACTED]

Customer	[REDACTED]	Location	[REDACTED]	DATE
Contact	[REDACTED]	Address	[REDACTED]	
Order No	[REDACTED]		[REDACTED]	

Producer's Certificate

Container	[REDACTED]	Brief	[REDACTED]
Quantity	[REDACTED]	Description	[REDACTED]
Service	[REDACTED]	of waste	[REDACTED]
Extra	[REDACTED]	Signature	[REDACTED]
SIC Code	[REDACTED]	PRINT NAME	[REDACTED]
Info	[REDACTED]	Date	[REDACTED]
Sec 62 No	[REDACTED]	Time	[REDACTED]

Disposal Certificate

Vehicle Reg No	[REDACTED]	Ticket No	[REDACTED]
Driver's	[REDACTED]		
Signature	[REDACTED]		
PRINT NAME	[REDACTED]		
Disposal Site	EAWML/10146	Date	[REDACTED]
		Time	[REDACTED]

NO ASBESTOS, RUBBER TRACKS, GAS CYLINDERS, TYRES, TREE ROOTS, BATTERIES, MATTRESSES, FRIDGES, FREEZERS, PAINTS, LIQUIDS OR CHEMICALS WITHOUT PRIOR ARRANGEMENT.

Overloaded bins will be refused collection.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011

Net price £
Total £
VAT £

VAT No. 819 1570 23

Conveyance & Waste Transfer Note

Unit 9, Hangar 3
Rudford Industrial Estate
Ford, Arundel, West Sussex. BN18 0BS

Tel: [REDACTED]
Waste Carrier Registration CBDU59437



Ticket No [REDACTED]

Customer	[REDACTED]	Location	[REDACTED]	DATE
Contact	[REDACTED]	Address	[REDACTED]	
Order No	[REDACTED]		[REDACTED]	

Producer's Certificate

Container	[REDACTED]	Brief	[REDACTED]
Quantity	[REDACTED]	Description	[REDACTED]
Service	[REDACTED]	of waste	[REDACTED]
Extra	[REDACTED]	Signature	[REDACTED]
SIC Code	[REDACTED]	PRINT NAME	[REDACTED]
Info	[REDACTED]	Date	[REDACTED]
Sec 62 No	[REDACTED]	Time	[REDACTED]

Disposal Certificate

Vehicle Reg	[REDACTED]	Ticket No	[REDACTED]
Driver's	[REDACTED]	Disposer's	[REDACTED]
Signature	[REDACTED]	Signature	[REDACTED]
PRINT NAME	[REDACTED]	PRINT NAME	[REDACTED]
Disposal Site	EAWML/10146	Date	[REDACTED]
		Time	[REDACTED]

NO ASBESTOS, RUBBER TRACKS, GAS CYLINDERS, TYRES, TREE ROOTS, BATTERIES, MATTRESSES,

Overloaded bins will be refused collection

Net price £
Total £



Customer	ADAM WASTE MANAGEMENT LTD	Location	U/D CELLING TECHNOLOGY	DATE
Contact	ADAM	Address	FORD FORD	
Order No	123456789			

Producer's Certificate

Container	2.0m x 1.2m	Brief	WASTE
Quantity	1	Description	WASTE
Service		of waste	
Extra		Signature	[REDACTED]
SIC Code	1211	PRINT NAME	
Info		Date	
Sec 62 No			

Disposal Certificate

Vehicle Reg No	[REDACTED]	Ticket No	[REDACTED]
Driver's		Disposer's	
Signature		Signature	
PRINT NAME		PRINT NAME	
Disposal Site	EAWML/10136	Date	
		Time	

**NO ASBESTOS, RUBBER TRACKS,
GAS CYLINDERS, TYRES, TREE
ROOTS, BATTERIES, MATTRESSES,
FRIDGES, FREEZERS, PAINTS,
LIQUIDS OR CHEMICALS WITHOUT
PRIOR ARRANGEMENT.**

**Overloaded bins will
be refused collection.**

I confirm that I have fulfilled my duty to apply the
waste hierarchy as required by Regulation 12 of the
Waste (England and Wales) Regulations 2011

Net price	£
Total	£
VAT	£

VAT No. 819 1570 23

APPENDIX F ENVIRONMENTAL MONITORING

Baseline Monitoring undertaken prior to start of works
Noise - using portable 3M SD-200 Noise Meter (CELT 220)

Monitoring during drilling BH201

Monitoring during drilling BH202

Monitoring during drilling BH203

Location	Time /			L _{EQ}	Max	Min	Time /			L _{EQ}	Max	Min	Time / Dur			L _{EQ}	Max	Min	Time / Dur			L _{EQ}	Max	Min
	Date	Duration					Date	Duration					Date						Date					
E	16/11/2020	09:48 - 10:03		56.3	78.7	47.6	16/11/2020	15 mins		61.8	78.2	46.4	17/11/2020	15 mins		58.2	74.7	46.5	17/11/2020	15 mins		60.7	79.4	45.3
N	16/11/2020	11:46 - 12:33		60.2	76.2	48	16/11/2020	15 mins		80.3	93.4	49	17/11/2020	15 mins		70	80.1	45.5	17/11/2020	107 mins		66.5	79.9	47.2
W	16/11/2020	10:30 - 11:23		66.1	81.9	43.5	16/11/2020	15 mins		65.3	80.7	45.1	17/11/2020	55 mins		61.7	77.6	43	17/11/2020	25 mins		58.7	73.5	47.5
S	16/11/2020	10:05 - 10:28		52.1	74.1	43.5	16/11/2020	15 mins		54.5	76.1	44	17/11/2020	15 mins		51.9	68.4	43.6	17/11/2020	15 mins		53.8	69.6	43.2

Vapour Pho Check Tiger PID Serial No. T-109955 (CELT 254)

Location	Date	Time	Max ppm (total VOCs)	Date	Time	Max ppm (total VOCs)	Date	Time	Max ppm (total VOCs)	Date	Time	Max ppm (total VOCs)
E	16/11/2020	09:50	0	16/11/2020	13:38	0	17/11/2020	09:00	0	17/11/2020	13:00	0
N	16/11/2020	11:47	0	16/11/2020	14:05	0	17/11/2020	09:30	0	17/11/2020	13:20	0
W	16/11/2020	10:30	0	16/11/2020	14:25	0	17/11/2020	10:00	0	17/11/2020	15:20	0
S	16/11/2020	10:05	0	16/11/2020	14:45	0	17/11/2020	11:00	0	17/11/2020	16:00	0

APPENDIX G DIPPING RECORDS

Borehole	East	North	mAOD	Dip to base	Base mAOD	Response zone	Dip to water	Water level mAOD	Time	Date	Dip to water	Water level mAOD	Time	Date	Dip to water	Water level mAOD	Time	Date	Dip to water	Water level mAOD	Time	Date
BH105	501334.1	106736.5	2.48	7.62	-5.14	6-10m	1.81	0.67	09:56	19/11/2020	0.83	1.65	14:54	01/12/2020	2.23	0.25	08:10	02/12/2020	0.45	2.03	14:06	02/12/2020
BH102	501274.2	106731.1	3.267	8.86	-5.593	6-10m	2.12	1.147	09:59	19/11/2020	1.59	1.677	15:07	01/12/2020	2.5	0.767	08:21	02/12/2020	1.37	1.897	14:09	02/12/2020
BH101s	501285.2	106770.2	3.654	4.27	-0.616	2-4.5m	1.95	1.704	10:14	19/11/2020	2.08	1.574	15:03	01/12/2020	2.45	1.204	08:24	02/12/2020	2.23	1.424	14:13	02/12/2020
BH101d	501285.2	106770.3	3.659	9.47	-5.811	6-10m	2.66	0.999	10:17	19/11/2020	2.03	1.629	15:03	01/12/2020	3.13	0.529	08:25	02/12/2020	1.81	1.849	14:13	02/12/2020
BH201	501291.1	106768.3	3.418	7.14	-3.722	4-7m	2.46	0.958	10:05	19/11/2020	1.8	1.618	15:02	01/12/2020	2.9	0.518	08:25	02/12/2020	1.59	1.828	14:14	02/12/2020
BH202	501282.1	106765	3.593	9.78	-6.187	6-10m	1.77	1.823	10:09	19/11/2020	1.99	1.603	15:04	01/12/2020	2.63	0.963	08:24	02/12/2020	1.92	1.673	14:12	02/12/2020
BH203	501282.7	106754.9	3.365	9.47	-6.105	6-10m	2.3	1.065	10:03	19/11/2020	1.77	1.595	15:05	01/12/2020	2.63	0.735	08:23	02/12/2020	1.55	1.815	14:11	02/12/2020
BH204	501285.8	106749.3	3.341	4.94	-1.599	1.5-5m	2.28	1.061	10:01	19/11/2020	1.65	1.691	15:06	01/12/2020	2.64	0.701	08:22	02/12/2020	1.48	1.861	14:10	02/12/2020

APPENDIX H CHEMICAL ANALYSIS CERTIFICATES

Steve Gronow
Celtic EnGlobe
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
CF15 7NE

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

Analytical Report Number : 20-41212

Project / Site name:	Arundel	Samples received on:	12/11/2020
Your job number:	C1820	Samples instructed on/ Analysis started on:	12/11/2020
Your order number:	81231	Analysis completed by:	20/11/2020
Report Issue Number:	1	Report issued on:	20/11/2020
Samples Analysed:	1 leachate sample - 15 soil samples		

Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number	1682757	1682758	1682759	1682760
Sample Reference	TP201	TP202	TP203	TP204
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.80	1.00	1.00
Date Sampled	11/11/2020	11/11/2020	11/11/2020	11/11/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection on	Accreditation Status	Accreditation
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	13
Total mass of sample received	kg	0.001	NONE	1.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile, Amosite Loose Fibres
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	8.3	8	8
Electrical Conductivity	µS/cm	10	ISO 17025	320	120	350	87
Total Cyanide	mg/kg	1	MCERTS	6	3	< 1	7
Complex Cyanide	mg/kg	1	MCERTS	6	1	< 1	7
Free Cyanide	mg/kg	1	MCERTS	< 1	2	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	830	1200	960	810
Sulphide	mg/kg	1	MCERTS	3.1	92	140	3.3
Total Chloride	mg/kg	5	NONE	250	180	140	210
Ammonium as NH ₄	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.2	2.4	2	2.1

Phenols by GC-MS

Phenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
2-Chlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloro-3-methylphenol	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2

Total Phenols

Total Phenols (GC-MS)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number	1682757	1682758	1682759	1682760
Sample Reference	TP201	TP202	TP203	TP204
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.80	1.00	1.00
Date Sampled	11/11/2020	11/11/2020	11/11/2020	11/11/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of Detection	Accreditation Status	Accreditation

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.9	2.1	1.7	0.97
Acenaphthylene	mg/kg	0.05	MCERTS	4.5	4	2.9	2.4
Acenaphthene	mg/kg	0.05	MCERTS	0.67	0.66	0.92	0.23
Fluorene	mg/kg	0.05	MCERTS	3.2	3.2	2.3	0.89
Phenanthrene	mg/kg	0.05	MCERTS	33	30	20	7.7
Anthracene	mg/kg	0.05	MCERTS	12	9.5	7.3	3.7
Fluoranthene	mg/kg	0.05	MCERTS	78	62	32	23
Pyrene	mg/kg	0.05	MCERTS	66	52	28	21
Benzo(a)anthracene	mg/kg	0.05	MCERTS	51	40	21	18
Chrysene	mg/kg	0.05	MCERTS	32	26	14	12
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	42	35	22	17
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	30	21	9.5	9.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	46	34	21	16
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	21	18	11	7.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	6.2	4.9	2.8	2.3
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	23	18	12	8.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	449	361	210	150
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	47	21	17	18
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.9	2.9	9.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.8	1
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	31	21	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	66	31	43	67
Lead (aqua regia extractable)	mg/kg	1	MCERTS	510	390	220	210
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.1	< 0.3	< 0.3	0.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	25	32	44
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	290	410	270	670

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number	1682757	1682758	1682759	1682760
Sample Reference	TP201	TP202	TP203	TP204
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50	0.80	1.00	1.00
Date Sampled	11/11/2020	11/11/2020	11/11/2020	11/11/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of Detection	Action Status	Ascribed

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	3.8	9.9	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	13	33	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	17	75	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	11	100	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	44	220	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	8.7	18	7.9	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	46	46	24	15
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	210	620	210	78
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	260	400	240	110
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	520	1100	480	200

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number	1682761	1682762	1682763	1682764
Sample Reference	TP205	TP206	TP206	TP207
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1,50	1,20	2,00	1,80
Date Sampled	11/11/2020	11/11/2020	11/11/2020	11/11/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection on	Asbestos status	Asbestos
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	13
Total mass of sample received	kg	0.001	NONE	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile- Loose Fibres	-	Amosite, Crocidolite- Loose Fibres; Amosite, Chrysotile- Loose Fibrous Debris
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	8.1	8.1	8
Electrical Conductivity	µS/cm	10	ISO 17025	100	100	78	170
Total Cyanide	mg/kg	1	MCERTS	2	9	34	26
Complex Cyanide	mg/kg	1	MCERTS	2	9	34	26
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1
Total Sulphate as SO4	mg/kg	50	MCERTS	880	1200	1300	1900
Sulphide	mg/kg	1	MCERTS	18	7	160	57
Total Chloride	mg/kg	5	NONE	140	280	360	280
Ammonium as NH4	mg/kg	0.5	MCERTS	< 0.5	< 0.5	1100	13
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.4	3.1	-	5.2

Phenols by GC-MS

Phenol	mg/kg	0.2	NONE	< 0.2	0.6	< 0.2	< 0.2
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	NONE	< 0.3	0.4	69	< 0.3
2-Chlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	0.3	< 0.3	< 0.3
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloro-3-methylphenol	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	0.8	< 0.2	< 0.2

Total Phenols

Total Phenols (GC-MS)	mg/kg	1	NONE	< 1.0	2	69	< 1.0
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Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number				1682761	1682762	1682763	1682764
Sample Reference				TP205	TP206	TP206	TP207
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1,50	1,20	2,00	1,80
Date Sampled				11/11/2020	11/11/2020	11/11/2020	11/11/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	1.3	5.6	1100	680
Acenaphthylene	mg/kg	0.05	MCERTS	2.7	9.9	310	610
Acenaphthene	mg/kg	0.05	MCERTS	0.22	0.7	48	95
Fluorene	mg/kg	0.05	MCERTS	0.76	2.5	260	530
Phenanthrene	mg/kg	0.05	MCERTS	3.8	22	830	1900
Anthracene	mg/kg	0.05	MCERTS	2.4	14	270	760
Fluoranthene	mg/kg	0.05	MCERTS	11	67	600	1300
Pyrene	mg/kg	0.05	MCERTS	11	59	470	1000
Benzo(a)anthracene	mg/kg	0.05	MCERTS	9.8	50	270	600
Chrysene	mg/kg	0.05	MCERTS	6.5	41	150	400
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	12	65	190	440
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	3.5	17	72	290
Benzo(a)pyrene	mg/kg	0.05	MCERTS	11	52	160	380
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	5.8	28	66	160
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.5	8.4	16	48
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	6.6	29	75	170

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	90.6	471	4920	9410
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	21	24	79
Boron (water soluble)	mg/kg	0.2	MCERTS	1.1	1.3	3.4	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	< 0.2	1.1	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	16	21	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	40	28	55
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	430	300	250
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	0.9	1.5	1.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	18	19	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	160	150	230	430

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	2300	27
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	2500	160
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	110	18
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	2700	310
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	1200	480
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number					1682761	1682762	1682763	1682764
Sample Reference					TP205	TP206	TP206	TP207
Sample Number					None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)					1,50	1,20	2,00	1,80
Date Sampled					11/11/2020	11/11/2020	11/11/2020	11/11/2020
Time Taken					None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of Detection	MCERTS Status	Accreditation Status				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS		11	16	27	21
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS		47	61	64	68
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS		65	83	78	89
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS		91	190	130	120
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS		210	350	300	300
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS		< 0.001	< 0.001	2.3	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS		< 0.001	< 0.001	2.5	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS		< 0.001	< 0.001	5.1	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS		5.5	25	1100	1700
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS		20	77	880	1700
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS		150	850	1700	2800
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS		220	1100	1500	3800
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS		400	2000	5200	10000

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number	1682765	1682766	1682767	1682768
Sample Reference	TP208	TP209	TP210	TP211
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1,50	0,60	1,00	0,80
Date Sampled	11/11/2020	11/11/2020	11/11/2020	12/11/2020
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection on	Accreditation Status	Accreditation
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	11
Total mass of sample received	kg	0.001	NONE	1.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	8.1	7.3	7
Electrical Conductivity	µS/cm	10	ISO 17025	390	210	110	70
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	260	74
Complex Cyanide	mg/kg	1	MCERTS	< 1	< 1	260	72
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	2
Total Sulphate as SO ₄	mg/kg	50	MCERTS	260	670	11000	17000
Sulphide	mg/kg	1	MCERTS	1.8	1.1	2.1	4.7
Total Chloride	mg/kg	5	NONE	110	210	250	180
Ammonium as NH ₄	mg/kg	0.5	MCERTS	< 0.5	< 0.5	0.9	< 0.5
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.3	0.9	1.9	3.1

Phenols by GC-MS

Phenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
2-Chlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloro-3-methylphenol	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2

Total Phenols

Total Phenols (GC-MS)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number				1682765	1682766	1682767	1682768
Sample Reference				TP208	TP209	TP210	TP211
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1,50	0,60	1,00	0,80
Date Sampled				11/11/2020	11/11/2020	11/11/2020	12/11/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.42	0.98	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.83	6.5	0.76
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.41	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.37	1.3	0.34
Phenanthrene	mg/kg	0.05	MCERTS	0.27	2.3	11	5.5
Anthracene	mg/kg	0.05	MCERTS	< 0.05	4.3	4.8	1.5
Fluoranthene	mg/kg	0.05	MCERTS	0.42	29	29	12
Pyrene	mg/kg	0.05	MCERTS	0.46	27	39	11
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.28	24	25	7.6
Chrysene	mg/kg	0.05	MCERTS	0.21	17	22	5.9
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	22	32	7.9
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	8.3	8.4	4.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	19	20	6.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	7.9	14	4.1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	2.9	4	1.1
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	7.5	15	4.5

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	1.64	173	234	74
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	19	21	17
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	0.8	0.6	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35	20	17	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	17	35	38
Lead (aqua regia extractable)	mg/kg	1	MCERTS	19	63	190	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.6	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	41	27	9.6	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	53	40	110

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

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Lab Sample Number				1682765	1682766	1682767	1682768
Sample Reference				TP208	TP209	TP210	TP211
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1,50	0,60	1,00	0,80
Date Sampled				11/11/2020	11/11/2020	11/11/2020	12/11/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of Detection	Accreditation Status				
Petroleum Hydrocarbons							
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	3.8
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	7.5
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	24
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	79
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	110
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	0.025	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	0.15	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	1.2	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	18	16
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	24	23	15
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	160	86	68
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	200	130	210
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	380	250	310

U/S = Unsuitable Sample I/S = Insufficient Sample

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Project / Site name: Arundel

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Lab Sample Number				1682769	1682770	1682771
Sample Reference				TP212	TP213	TP214
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0,50	1,00	0,40
Date Sampled				12/11/2020	11/11/2020	12/11/2020
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Asbestos Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	16	22
Total mass of sample received	kg	0.001	NONE	1.5	1.5	1.5

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7	7.9	7.4
Electrical Conductivity	µS/cm	10	ISO 17025	130	74	39
Total Cyanide	mg/kg	1	MCERTS	4	< 1	59
Complex Cyanide	mg/kg	1	MCERTS	4	< 1	57
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	2
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1400	300	4100
Sulphide	mg/kg	1	MCERTS	2	< 1.0	6.9
Total Chloride	mg/kg	5	NONE	110	140	71
Ammonium as NH ₄	mg/kg	0.5	MCERTS	< 0.5	< 0.5	0.6
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.9	0.2	1.4

Phenols by GC-MS

Phenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3
2-Chlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3
4-Chloro-3-methylphenol	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	< 0.1
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2

Total Phenols

Total Phenols (GC-MS)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 20-41212

Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number				1682769	1682770	1682771
Sample Reference				TP212	TP213	TP214
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0,50	1,00	0,40
Date Sampled				12/11/2020	11/11/2020	12/11/2020
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	0.61	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	1.6	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.32	< 0.05	0.19
Fluorene	mg/kg	0.05	MCERTS	1.3	< 0.05	0.33
Phenanthrene	mg/kg	0.05	MCERTS	15	0.17	3.6
Anthracene	mg/kg	0.05	MCERTS	1.9	< 0.05	0.92
Fluoranthene	mg/kg	0.05	MCERTS	21	0.35	6.5
Pyrene	mg/kg	0.05	MCERTS	17	0.38	5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	12	0.25	3.2
Chrysene	mg/kg	0.05	MCERTS	8.6	0.18	2.8
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	12	< 0.05	3.5
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	7.3	< 0.05	1.6
Benzo(a)pyrene	mg/kg	0.05	MCERTS	11	< 0.05	2.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	6.9	< 0.05	1.7
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.7	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	7.6	< 0.05	1.8

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	126	1.33	33.7
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	13	16
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	0.8	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	29	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	42	11	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	180	17	37
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	19	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	67	57

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

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Your Order No: 81231

Lab Sample Number					1682769	1682770	1682771
Sample Reference					TP212	TP213	TP214
Sample Number					None Supplied	None Supplied	None Supplied
Depth (m)					0,50	1,00	0,40
Date Sampled					12/11/2020	11/11/2020	12/11/2020
Time Taken					None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of Detection	MCERTS Status	Ascertained			
Petroleum Hydrocarbons							
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS		6.6	1.7	2.5
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS		16	< 2.0	3.1
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS		47	11	14
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS		91	24	28
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS		160	38	48
Aromatic Hydrocarbons							
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS		< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS		< 1.0	< 1.0	4.9
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS		6	< 2.0	11
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS		67	< 10	36
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS		170	< 10	74
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS		240	< 10	130

U/S = Unsuitable Sample I/S = Insufficient Sample



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Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number				1684278
Sample Reference				TP206
Sample Number				None Supplied
Depth (m)				2.00
Date Sampled				11/11/2020
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection on	Ascrip- tion Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	7.5
Electrical Conductivity	µS/cm	10	ISO 17025	620
Total Cyanide	µg/l	10	ISO 17025	100
Complex Cyanide	µg/l	10	ISO 17025	100
Free Cyanide	µg/l	10	ISO 17025	< 10
Sulphate as SO4	µg/l	100	ISO 17025	40100
Sulphide	µg/l	5	NONE	< 5.0
Chloride	mg/l	0.15	ISO 17025	7.9
Ammonium as NH4	µg/l	15	NONE	67000
Total Organic Carbon (TOC)	mg/l	0.1	NONE	55.1

Phenols by HPLC

Catechol	µg/l	0.5	NONE	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	3800
Cresols	µg/l	0.5	NONE	1600
Naphthols	µg/l	0.5	NONE	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5
Phenol	µg/l	0.5	NONE	3700
Trimethylphenol	µg/l	0.5	NONE	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	9100
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	2100
Acenaphthylene	µg/l	0.01	ISO 17025	170
Acenaphthene	µg/l	0.01	ISO 17025	9.4
Fluorene	µg/l	0.01	ISO 17025	23
Phenanthrene	µg/l	0.01	ISO 17025	27
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	3.8
Pyrene	µg/l	0.01	ISO 17025	2.3
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	2300
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Project / Site name: Arundel

Your Order No: 81231

Lab Sample Number					1684278
Sample Reference					TP206
Sample Number					None Supplied
Depth (m)					2.00
Date Sampled					11/11/2020
Time Taken					None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of Detection	Accredi- tation Status	Accredi- tation Status	

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.7
Copper (dissolved)	µg/l	0.7	ISO 17025	12
Iron (dissolved)	mg/l	0.004	ISO 17025	0.24
Lead (dissolved)	µg/l	1	ISO 17025	5.4
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	6.2
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Zinc (dissolved)	µg/l	0.4	ISO 17025	11

Monocaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	61
Toluene	µg/l	1	ISO 17025	96
Ethylbenzene	µg/l	1	ISO 17025	3.4
p & m-xylene	µg/l	1	ISO 17025	51
o-xylene	µg/l	1	ISO 17025	33
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	61
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	96
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	87
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	2100
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	200
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	34
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	2500

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 20-41212

Project / Site name: Arundel

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1682757	TP201	None Supplied	0,5	Brown loam and clay with gravel and vegetation.
1682758	TP202	None Supplied	0,80	Brown loam and clay with gravel and vegetation.
1682759	TP203	None Supplied	1,00	Brown loam and clay with gravel and vegetation.
1682760	TP204	None Supplied	1,00	Brown loam and clay with gravel and vegetation.
1682761	TP205	None Supplied	1,50	Brown loam and clay with gravel and vegetation.
1682762	TP206	None Supplied	1,20	Brown loam and clay with gravel and vegetation.
1682763	TP206	None Supplied	2,00	Brown loam and clay with gravel and vegetation.
1682764	TP207	None Supplied	1,80	Brown loam and clay with gravel and vegetation.
1682765	TP208	None Supplied	1,50	Brown clay with gravel and vegetation.
1682766	TP209	None Supplied	0,60	Brown clay and loam with gravel and vegetation.
1682767	TP210	None Supplied	1,00	Brown clay and loam with gravel and vegetation.
1682768	TP211	None Supplied	0,80	Brown loam and clay with gravel and vegetation.
1682769	TP212	None Supplied	0,50	Brown loam and clay with gravel and vegetation.
1682770	TP213	None Supplied	1,00	Brown clay with gravel.
1682771	TP214	None Supplied	0,40	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 20-41212

Project / Site name: Arundel

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Phenols, speciated, in soil, by GCMS	Determination of speciated phenols in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Phenols, speciated, in leachate, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	NONE
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Complex cyanide in leachate	Determination of complex cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L040-PL	W	ISO 17025
Complex Cyanide in soil	Determination of complex cyanide by calculation.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Chloride in soil	Determination of acid soluble chloride in soil by extraction with nitric acid, addition of silver nitrate followed by titration against thiocyanate.	In-house method	L075-PL	D	NONE
Electrical conductivity at 20oC of leachate	Determination of electrical conductivity in leachate by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031-PL	W	ISO 17025
Electrical conductivity of soil	Determination of electrical conductivity in soil by electrometric measurement.	In-house method	L031-PL	D	ISO 17025
Free cyanide in leachate	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE

Analytical Report Number : 20-41212

Project / Site name: Arundel

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In house method.	L005-PL	W	ISO 17025
Sulphide in leachate	Determination of sulphide in leachate by ion selective electrode.	In-house method	L010-PL	W	NONE
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon in leachate	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE

Analytical Report Number : 20-41212

Project / Site name: Arundel

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.



Steve Gronow
Celtic EnGlobe
Columbus House
Greenmeadow Springs
Tongwynlais
Cardiff
CF15 7NE

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

Analytical Report Number : 20-44712

Project / Site name:	Arundel	Samples received on:	02/12/2020
Your job number:	C1820	Samples instructed on/ Analysis started on:	02/12/2020
Your order number:	81275	Analysis completed by:	09/12/2020
Report Issue Number:	1	Report issued on:	09/12/2020
Samples Analysed:	9 water samples		

Signed:

Will Fardon
Technical Reviewer (CS Team)
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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



Environmental Science

Analytical Report Number: 20-44712

Project / Site name: Arundel

Your Order No: 81275

Lab Sample Number				1702559	1702560	1702561	1702562
Sample Reference				BH101s	BH101d	BH102	BH102a
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				02/12/2020	02/12/2020	02/12/2020	02/12/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	6.8	8.5	7.1	7.2
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	2300	2200	670	680
Total Cyanide	µg/l	10	ISO 17025	1300	430	< 10	< 10
Complex Cyanide	µg/l	10	ISO 17025	1300	430	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Sulphate as SO ₄	µg/l	45	ISO 17025	933000	502000	34700	37100
Sulphate as SO ₄	mg/l	0.045	ISO 17025	933	502	34.7	37.1
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025	39	160	66	67
Ammonium as NH ₄	µg/l	15	ISO 17025	130000	370000	38	33
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	47.9	263	1.68	3.23
Total Suspended Solids	mg/l	2	ISO 17025	60	21	12	7

Phenols by HPLC

Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	87000	< 0.5	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5	200000	< 0.5	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	µg/l	0.5	NONE	710	11000	< 0.5	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	710	300000	< 3.5	< 3.5
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	15.4	1810	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	45.8	237	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	24.6	15.9	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	72.8	41	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	54.8	34.4	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	40.3	4.15	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	75.6	2.15	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	58.5	1.29	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	19.3	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	13.4	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	10.7	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	4.98	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	7.92	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	2.82	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	0.79	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	2.83	< 0.01	< 0.01	< 0.01



Environmental Science

Analytical Report Number: 20-44712

Project / Site name: Arundel

Your Order No: 81275

Lab Sample Number				1702559	1702560	1702561	1702562
Sample Reference				BH101s	BH101d	BH102	BH102a
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				02/12/2020	02/12/2020	02/12/2020	02/12/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	450	2150	< 0.16	< 0.16
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Heavy Metals / Metalloids

Iron (dissolved)	mg/l	0.004	ISO 17025	0.73	0.3	0.018	0.027
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Arsenic (dissolved)	µg/l	0.15	ISO 17025	2.89	49	0.34	0.28
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	< 0.02	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	6	11	3.2	3.3
Copper (dissolved)	µg/l	0.5	ISO 17025	5.7	3	4.8	4.2
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	6.9	8.5	2	1.9
Selenium (dissolved)	µg/l	0.6	ISO 17025	5.6	8.3	1.7	1.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	8.4	2.9	7.9	9.3

Monoaromatics & Oxygenates

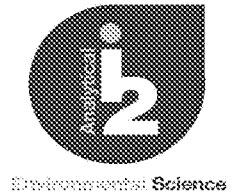
Benzene	µg/l	1	ISO 17025	184	12900	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	56.6	4950	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	77.2	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	695	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	16.3	328	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	180	13000	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	57	5000	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	16	1200	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	330	2000	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	1000	4000	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	1000	1900	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	400	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	3000	27000	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-44712
Project / Site name: Arundel

Your Order No: 81275

Lab Sample Number				1702563	1702564	1702565	1702566
Sample Reference				BH105	BH201	BH202	BH203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				02/12/2020	02/12/2020	02/12/2020	02/12/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	7.1	7.5	6.8	7
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	1200	2300	1900	860
Total Cyanide	µg/l	10	ISO 17025	290	310	510	59
Complex Cyanide	µg/l	10	ISO 17025	290	310	510	59
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10
Sulphate as SO4	µg/l	45	ISO 17025	422000	647000	1020000	111000
Sulphate as SO4	mg/l	0.045	ISO 17025	422	647	1020	111
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0
Chloride	mg/l	0.15	ISO 17025	69	130	140	63
Ammonium as NH4	µg/l	15	ISO 17025	65000	350000	41000	4000
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	8.69	89.8	53.7	16.3
Total Suspended Solids	mg/l	2	ISO 17025	550	21	23	17

Phenols by HPLC

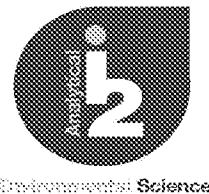
Catechol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5	1200	3500	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5	17000	670	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5	30000	2500	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5	< 0.5	< 0.5	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5	48000	6600	< 3.5
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	4.54	786	523	6.25
Acenaphthylene	µg/l	0.01	ISO 17025	0.31	83.7	50.4	2.07
Acenaphthene	µg/l	0.01	ISO 17025	3.07	21.1	8.61	26.6
Fluorene	µg/l	0.01	ISO 17025	< 0.01	47.8	14.1	13.2
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	33.3	10.6	0.51
Anthracene	µg/l	0.01	ISO 17025	< 0.01	5.71	2.13	1.5
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	3	2.74	2.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	1.64	2.09	1
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01



Analytical Report Number: 20-44712
Project / Site name: Arundel

Your Order No: 81275

Lab Sample Number				1702563	1702564	1702565	1702566
Sample Reference				BH105	BH201	BH202	BH203
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				02/12/2020	02/12/2020	02/12/2020	02/12/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status				

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	7.92	982	614	53.2
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Heavy Metals / Metalloids

Iron (dissolved)	mg/l	0.004	ISO 17025	0.59	0.41	0.38	0.083
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Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.74	22.1	2.91	1.81
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.03	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	3	5.8	6.4	4
Copper (dissolved)	µg/l	0.5	ISO 17025	1.8	1.5	5.8	3.1
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	8.9	9.7	32	4.9
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.9	4.5	7	1.8
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.6	7.3	33	11

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	1620	810	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	808	77	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	26.8	2.2	6
p & m-xylene	µg/l	1	ISO 17025	< 1.0	337	150	11.9
o-xylene	µg/l	1	ISO 17025	< 1.0	119	66.9	11.2
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	1600	810	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	810	77	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	550	240	56
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	3200	1500	270
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	4000	1500	800
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	900	1300	500
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	11000	5400	1600

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 20-44712
Project / Site name: Arundel

Your Order No: 81275

Lab Sample Number				1702567
Sample Reference				BH204
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				02/12/2020
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

General Inorganics

pH	pH Units	N/A	ISO 17025	7
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	760
Total Cyanide	µg/l	10	ISO 17025	50
Complex Cyanide	µg/l	10	ISO 17025	50
Free Cyanide	µg/l	10	ISO 17025	< 10
Sulphate as SO4	µg/l	45	ISO 17025	34600
Sulphate as SO4	mg/l	0.045	ISO 17025	34.6
Sulphide	µg/l	5	NONE	< 5.0
Chloride	mg/l	0.15	ISO 17025	65
Ammonium as NH4	µg/l	15	ISO 17025	3200
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	7.6
Total Suspended Solids	mg/l	2	ISO 17025	30

Phenols by HPLC

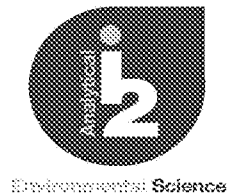
Catechol	µg/l	0.5	NONE	< 0.5
Resorcinol	µg/l	0.5	NONE	< 0.5
Ethylphenol & Dimethylphenol	µg/l	0.5	NONE	< 0.5
Cresols	µg/l	0.5	NONE	< 0.5
Naphthols	µg/l	0.5	NONE	< 0.5
Isopropylphenol	µg/l	0.5	NONE	< 0.5
Phenol	µg/l	0.5	NONE	< 0.5
Trimethylphenol	µg/l	0.5	NONE	< 0.5

Total Phenols

Total Phenols (HPLC)	µg/l	3.5	NONE	< 3.5
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	7.18
Acenaphthylene	µg/l	0.01	ISO 17025	0.6
Acenaphthene	µg/l	0.01	ISO 17025	1.65
Fluorene	µg/l	0.01	ISO 17025	3.53
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	2.16
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01



Analytical Report Number: 20-44712
Project / Site name: Arundel

Your Order No: 81275

Lab Sample Number				1702567
Sample Reference				BH204
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				02/12/2020
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status	

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	15.1
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Heavy Metals / Metalloids

Iron (dissolved)	mg/l	0.004	ISO 17025	0.037
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Arsenic (dissolved)	µg/l	0.15	ISO 17025	4.51
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	3.6
Copper (dissolved)	µg/l	0.5	ISO 17025	2.2
Lead (dissolved)	µg/l	0.2	ISO 17025	0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	8.4
Selenium (dissolved)	µg/l	0.6	ISO 17025	1.5
Zinc (dissolved)	µg/l	0.5	ISO 17025	11

Monaromatics & Oxygenates

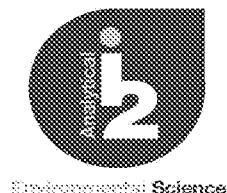
Benzene	µg/l	1	ISO 17025	35.4
Toluene	µg/l	1	ISO 17025	6.3
Ethylbenzene	µg/l	1	ISO 17025	38.6
p & m-xylene	µg/l	1	ISO 17025	65.8
o-xylene	µg/l	1	ISO 17025	50.5
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	3100
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	7800
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	3200
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	14000

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	35
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	6.3
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	210
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	200
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	1000
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	2500
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	1000
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	4900

U/S = Unsuitable Sample I/S = Insufficient Sample

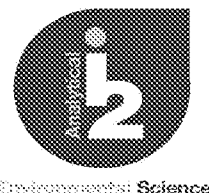


Analytical Report Number : 20-44712

Project / Site name: Arundel

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Phenols, speciated, in water, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	NONE
Complex cyanide in water	Determination of complex cyanide by calculation. Accredited matrices SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025



Analytical Report Number : 20-44712

Project / Site name: Arundel

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX I HAZARD REPORTS

Safety	Simplify
Health	Enable
Sustainability	Deliver

[illegible]