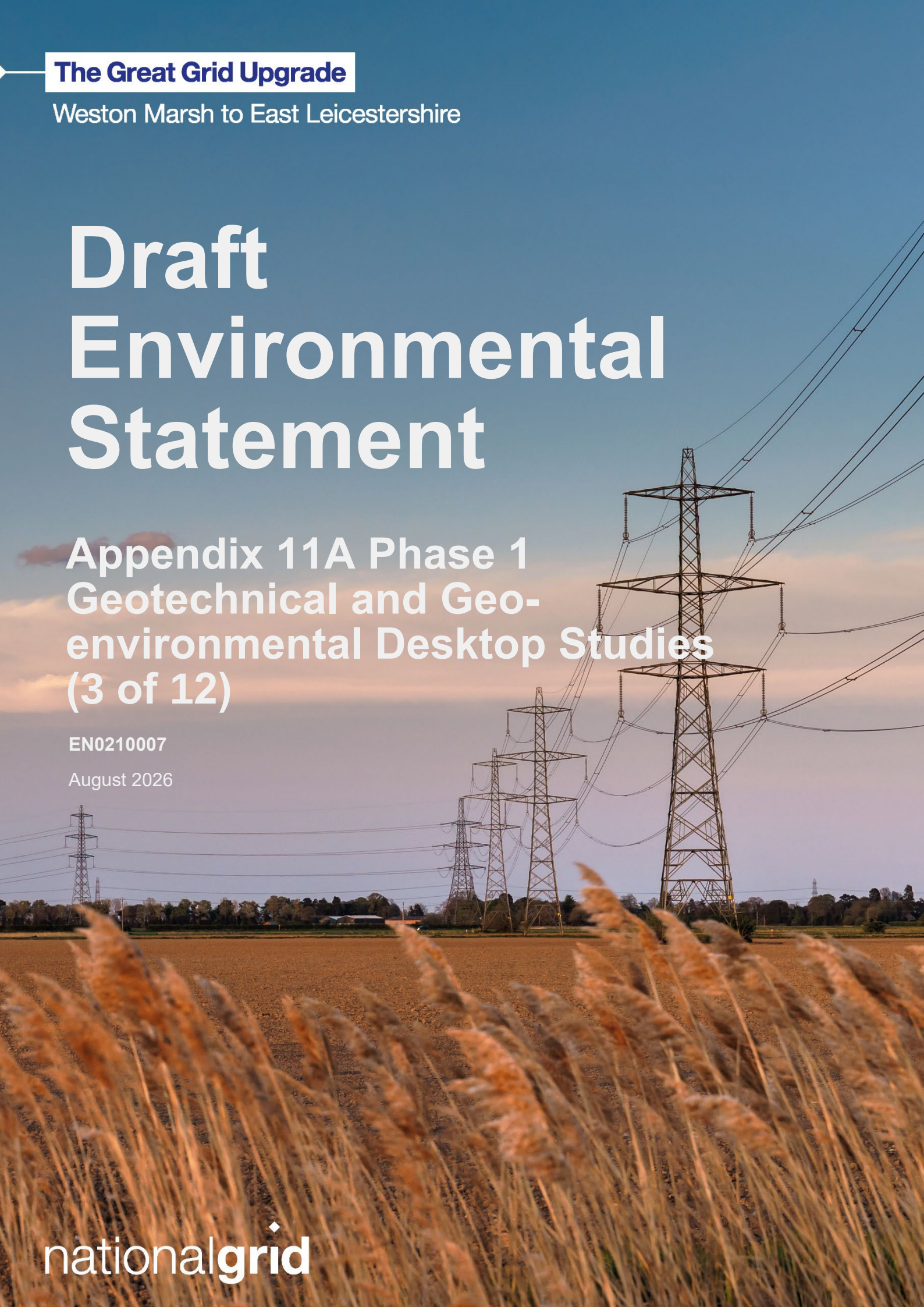




The Great Grid Upgrade

Weston Marsh to East Leicestershire

Draft Environmental Statement

Appendix 11A Phase 1 Geotechnical and Geo- environmental Desktop Studies (3 of 12)

EN0210007

August 2026

nationalgrid

11A. Phase 1

Geotechnical and Geo- environmental Desktop Studies



The Great Grid Upgrade

Weston Marsh to East Leicestershire

Phase 1 Geotechnical and Geo- Environmental Desktop Study Report

Weston Marsh to WMEL A Overhead Line

June 2026

nationalgrid

Appendix B

BGS exploratory hole records

Appendix B BGS exploratory hole records



NGRC
BOREHOLE RECORDS
ADJUSTMENT FORM

QUARTER SHEET TF 22 NE

BH REGISTRATION NUMBER 73

RECORDS ENTERED AND HELD BY WALLINGFORD

BH REGISTRATION NUMBER(S)



INLAND WATER SURVEY
RECORDS OF WELL-MEASUREMENTS

SCHOOL: Stalding Grammar School.

SIX-INCH FIELD-SLIP: Lucas 134 NE/W

No.	Location of Site and notes on character of water, etc.	Height of Surface above O.D.	Total Depth of Well	Depths to Water					
				Mar. 1937	Oct. 1937	Mar. 1938	Oct. 1938	Mar. 1939	Oct. 1939
S2	At Barn 750 yds. E.N.E. of Gurbine Farm, Stalding Marsh, Stalding	ca. 18'	10'		5'6"	1'10"			

NGR TF 22 NE 280 272.
TF 22/16

261812275917 31

TF22 NE 31

Contract Name		A16 TRUNK ROAD SPALING TO SUTTERTON		Trial Pit No. 15			
				Sheet 1 of 1			
Method of Excavation		Mechanical Excavator [JCB3C]		Ground Level 26144 27594 Start 15.3.85 Finish 15.3.85			
Water Levels	In-situ Tests	Samples	Depth (m)	Reduced Level (m.O.D.)	Thickness (m)	Description of Strata	Legend
			0.40		0.40	Made Ground [Brown clayey silty SAND and subrounded gravel with rail clinker]	
	V		1.10		1.10	Firm brown silty sandy CLAY grades to light grey very silty sandy CLAY from about 1.00 m	
			1.50			BOTTOM OF TRIAL PIT	
							2
							3
							4
							5
Notes Hand vane test @ 0.70 m - 70-80,68 kPa							
Terresearch Limited		Report No. S35/526		Appendix 1 Sheet 112			



British
Geological
Survey

HYDROGEOLOGY RESEARCH GROUP

TF22/23

Form WR-38 (BGS)

BOREHOLE RECORD

TF22 NW / 32

A SITE DETAILS	
Borehole drilled for	
Location	SURFLEET
NGR (8 fig.)	TF 2479 2708
Ground Level (if known)	4.26 MAOD
Drilling Company	
Date of Drilling	Commenced _____ Completed _____
B CONSTRUCTION DETAILS	
Borehole Datum (if not ground level)	above m below GL
(point from which all measurements of depth are taken e.g. flange, edge of chamber, etc.)	
Borehole drilled diameter	mm from _____ to _____ m/depth
	mm from _____ to _____ m/depth
	mm from _____ to _____ m/depth
Casing material diameter and type (e.g. if plain steel, plastic slotted)	mm from _____ to _____ m/depth
	diameter mm from _____ to _____ m/depth
	diameter mm from _____ to _____ m/depth
	diameter mm from _____ to _____ m/depth
Grouting details	
Water struck at	m (depth below datum — mbd)
	m (depth below datum — mbd)
Rest water level on completion	mbd
C TEST PUMPING SUMMARY (Please supply full details on Forms WR-39)	
Test Pumping Datum (if different from borehole datum)	m above below borehole datum (mbd)
Pump Suction depth	mbd
Water Level (Start of Test)	mbd
Water Level (End of Test)	mbd
Pumping rate	m ³ /d:l/s
for	days/hours
Recovery to (from end of pumping)	mbd in mins: hrs: days
Date(s) of measurements	
Please supply chemical Analysis if available.	



D STRATA LOG			
Geological Classification (BGS only)	Description of strata	Thickness	Depth
		m	m
(continue on separate page if necessary) Other comments (e.g. gas encountered, saline water intercepted, etc.) HISTORIC WATER LEVEL DATA AVAILABLE REF NO 31720			

FOR OFFICIAL USE ONLY		
FILE	CONSENT NO.	NGS REF NO.
LIC NO.	PURPOSE	NRA REF NO.
DATE REC:	COPY TO:	ENTERED BY:



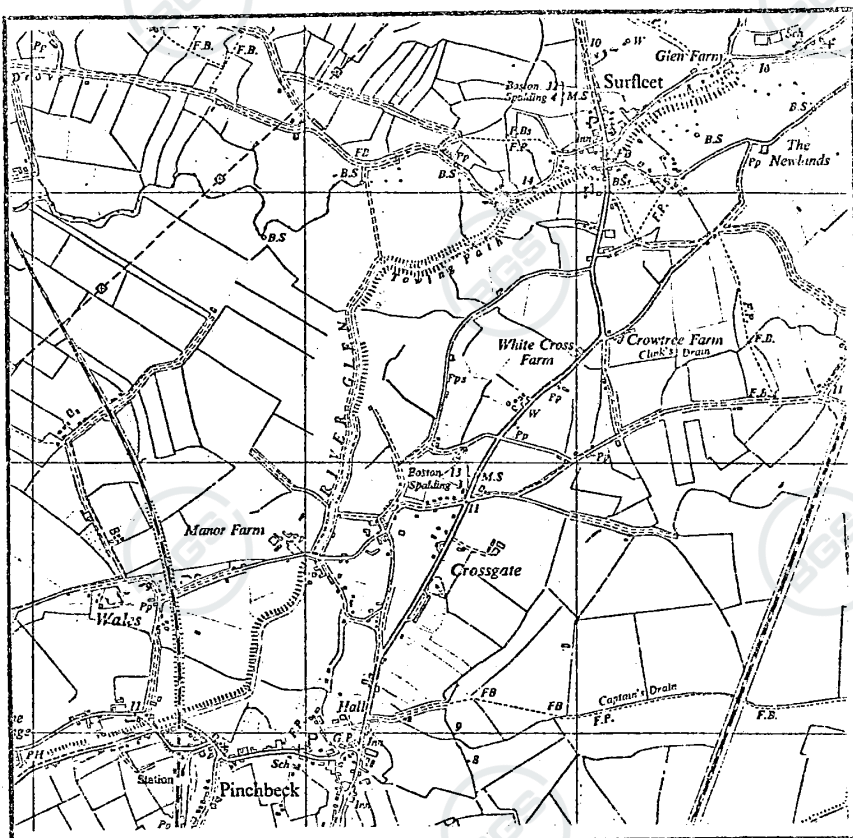
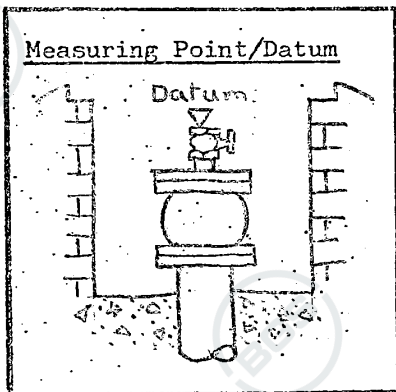
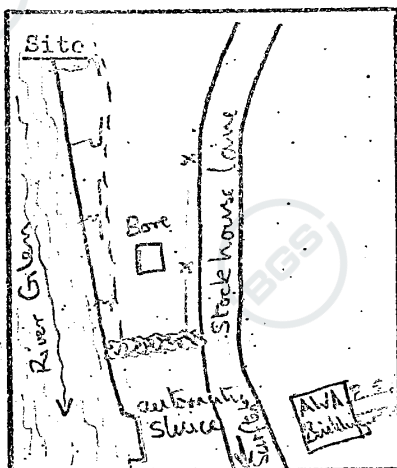


ANGLIAN WATER AUTHORITY
WELLAND AND NENE RIVER DIVISION
GROUNDWATER MONITORING BOREHOLE

031720
TF22/23

Name and Location	No 509 SURFLEET
-------------------	-----------------

Grid Reference	TF248 280 2479 2798
----------------	------------------------



HA 31

Aquifer	Lincoln Limestone ¹³
Depth	104.5 m.
Diameter	5"
Datum	Gate valve
Datum Level	4.267 m.aod.
Ground Level	
Solid lining to	93m from top.
Strata log	YES.

Licence No:	—
IGS No:	
Use	W & N Observation
Water level records	Jan 1979
Chemical records	

LINCOLNSHIRE LIMESTONE INVESTIGATION
OBSERVATION BOREHOLE WATER LEVEL RECORDS

TF22/23

Name SURFLEET

No. 509

N.G.R. TF 248 280

Measuring Point: 4.27m aod.

	1979	1980	1981	1982		
JANUARY	16.27	14.89	13.43	12.48		
FEBRUARY	17.27	17.83	13.65	—		
MARCH	18.77	18.98	16.90	13.57		
APRIL	18.87	17.61	15.99	14.19		
MAY	17.35	15.07	16.82	—		
JUNE	15.59	13.19	15.09	12.08		
JULY	13.48	12.05	13.46	13.46		
AUGUST	12.76	12.43	11.81	—		
SEPTEMBER	11.31	12.87	11.36	12.68		
OCTOBER	10.89	12.52	11.03	12.19		
NOVEMBER	10.67	13.48	10.69			
DECEMBER	11.51	14.01	—			

Levels recorded at the end of each month

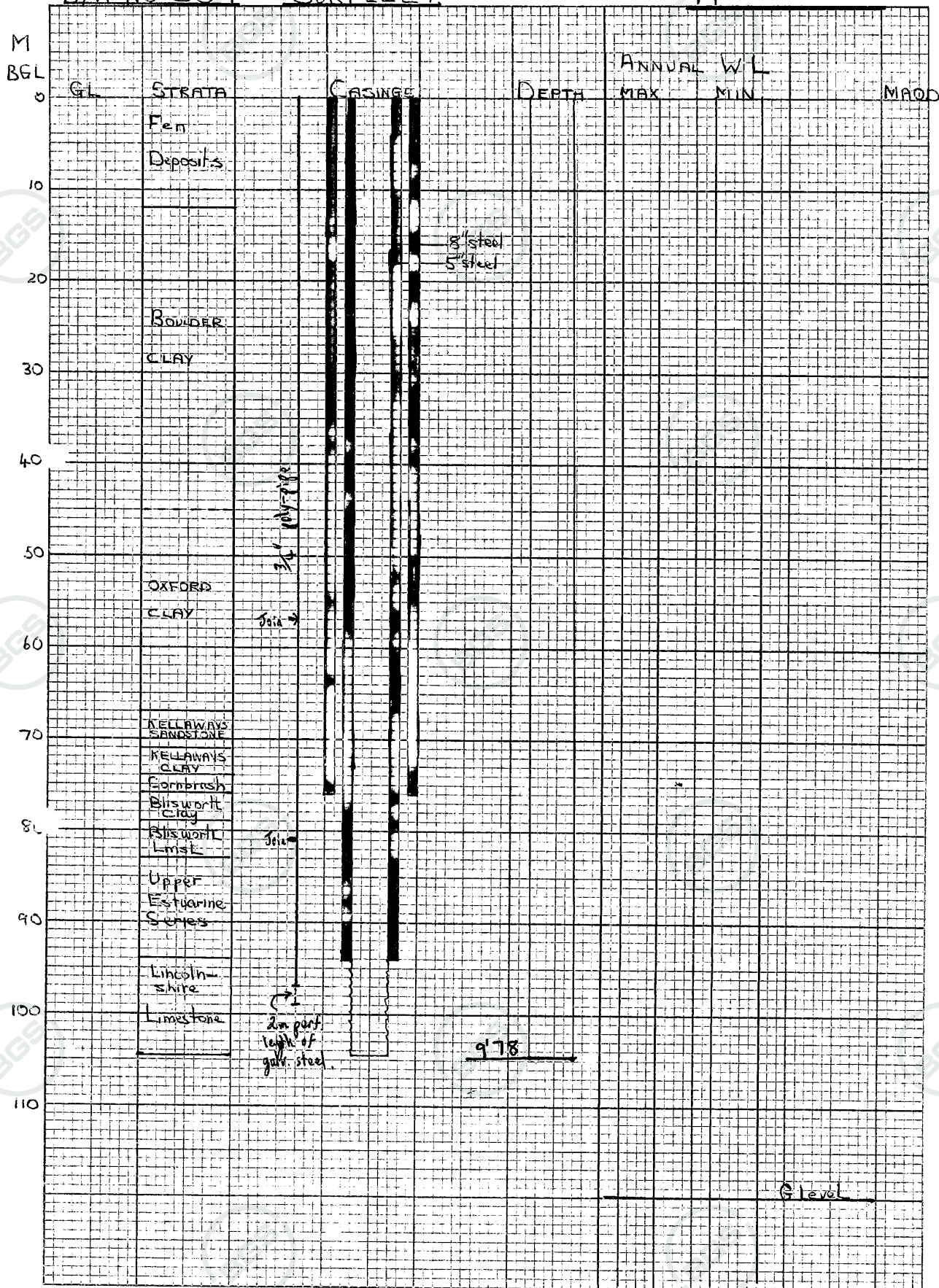


TF22/23

TF22 NW32

B/H No 509 SURFLEET

TF





TF 22/12

1" N.S. 144 131
1" O.S. 7

RECORD OF WELL (SHAFT OR BORE)
NOR TF 22 NW 2272 2844.

At Woking Drive Gatcham

Town or Village Gatcham County Lines. Six-inch quarter sheet 134 NW/W

Exact site Gatcham at NE side of road crossing Gatcham's Drive, 1 1/4 miles S by E of Gatcham

in parish of Gatcham

Level of ground surface above sea-level (O.D.) ca 11 ft. If well starts below ground surface, state depth of ca 11 ft.

Shaft ca 11 ft., diameter ca 11 ft. Bore ca 11 ft. Diameter of bore: at top 3 ins.; at bottom 2 ins.

Details of permanent lining tubes (internal diameters preferred) 94' x 3" from 1' down; 96' x 3" black brick; 50' x 2" galv. tubes; 50' x 2" perforated

Water struck at depths of (feet) ca 11

Rest-level of water below top of well 25 feet. Suction at ca 11 feet. Yield on ca 11 hours' test

ca 11 gallons per ca 11 (with pump of capacity ca 11 g.p.h.); depressing water level to ca 11 feet below top. Time of recovery ca 11 hrs. Amount normally pumped daily ca 11 g.p.h. for ca 11 hours.

Quality (attach copy of analysis if available) ca 11

Sunk by F. Smith & Son for Mr. L. A. N. E. R. G. Date of well Sept 1928

Information from Grimsby Mr. J. A. N. E. R. G. (Grimsby) Mr. C. B. T. G. (Grimsby) Mr. C. B. T. G. (Grimsby) Mr. C. B. T. G. (Grimsby)

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA (and any additional remarks).	THICKNESS		DEPTH	
		Feet.	Inches.	Feet.	Inches.
					<u>GR.</u>
	Red sand	2	6	2	6
	Blue "	19	-	21	6
	Sand & gravel	10	-	31	6
	Light coloured clay	108	-	139	6
	Dark clay	50	6	190	-
	Blue rock	2	-	192	-
Ketterings Rock	Dark silty clay	4	-	196	-
	Blue rock stone	1	-	197	-
	Dark clay	19	-	216	-
	Blue rock stone	19	-	230	-
	Dark clay	3	-	233	-
	Blue rock stone	12	-	245	-
Upper Estuarine	Green coloured clay	30	-	275	-
Series	Light coloured clay	10	-	285	-
Lower Estuarine	Blue rock stone	26	-	311	-

"Water supplied to 2 gatchams at the pressure for the include without pumping" [F. Smith & Son]

"Water from this bore also supplies Gatcham Drive Gatcham and Beach Bank Gatcham, which are 1/4 mile north"

"and respectively from Gatcham's Drive" [Mr. T. H. Marshall]

* Compare with
gatcham tubes with
level of 144/130

Overlain controlled O.D. B
Visited - sited on 6" Lines 134 NW/W
J. B. Gatcham
25.6.47.

2 COPY.

Office of the District Chemist
(Southern Area) L.A.E.
43 Bridge Terrace
Doncaster.

Ref : L28/70/738/-8.

31st March 1943.

REPORT ON A SAMPLE OF WATER FOR DOMESTIC PURPOSES.

Examined for. Estate Agent Peterborough.
Source of Sample. Gosberton No. 94 Crossing Watery Drive.
Date of sampling. 15.3.43.
Date received at laboratory. 17.3.43.

PHYSICAL EXAMINATION.

Appearance. Faint opalescence.
Odour. None
Parts per 100,000.
(To convert to G.P.G. Multiply by 0.7)

CHEMICAL EXAMINATION.

"Free Ammonia.	0.050
"Albuminoid" Ammonia,	0.0030
Chlorine,	-
Nitrogen as Nitrates,	-
Nitrogen as Nitrates,	-
Oxygen Absorbed in $\frac{1}{4}$ hour,	-
" " " 4 hours,	-
Poisonous Metals,	-
Total dissolved Solids,	-
Alkalinity,	34.2
Temporary Hardness, (Soap Test),	-
Permanent Hardness, do	-
Total Hardness, do.	10.8
pH Value,	-
Langelier Index,	-

MICROSCOPICAL EXAMINATION.

BACTERIOLOGICAL EXAMINATION.

Culture on Mc. Conkey's Bile Medium
for 72 hours at Blood Heat (37°C).

No. of Organisms producing colonies.
on 1 ml nil
on 10 mls 1
Typical B. Coli nil

REMARKS.

The results obtained on the sample taken from the above source are not entirely satisfactory. The figure for Free Ammonia is high but the Bacteriological Examination shows improvement upon previous samples taken from this district.

It cannot however be regarded as free from suspicion and looked upon as a safe source of supply for drinking purposes, in my opinion.

For T. Henry Turner,
(Signed) S. Watkinson.
DISTRICT CHEMIST.

Extract from Analysis by Muter & Hackman, 4.7.57.
Analytical Chemists, SE11.

SW/MEW

Fluorine, 1.36 p.p. million,
Chlorides as chlorine - 11.4 p.p. 100,000.
Carbonate of soda - 27.0 p.p. 100,000.

Received for Mr. C. T. Turner
Water Supply (Donkton Ave) LNER.
Collyer, Thos. Road, Peterborough.
2 April 1943 (Receipt note sent 1st)

Hardness temporary 7.9 p.p. 100,000
permanent none.



RECORD OF WELL

At Pinsbeck
Town or Village
Lincolnshire

For institute use only Licence 140.
N...N.....

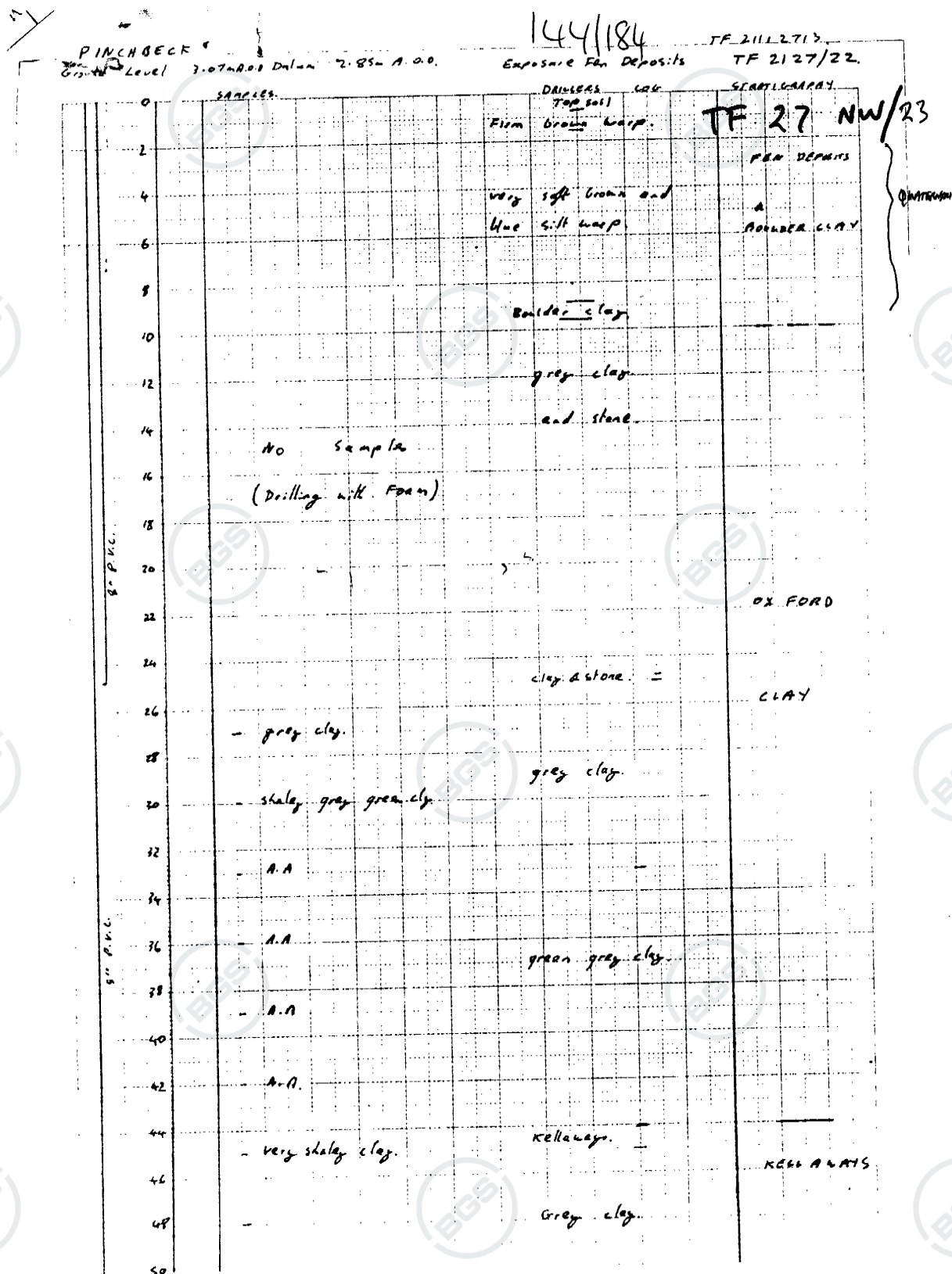
144/184
144/184

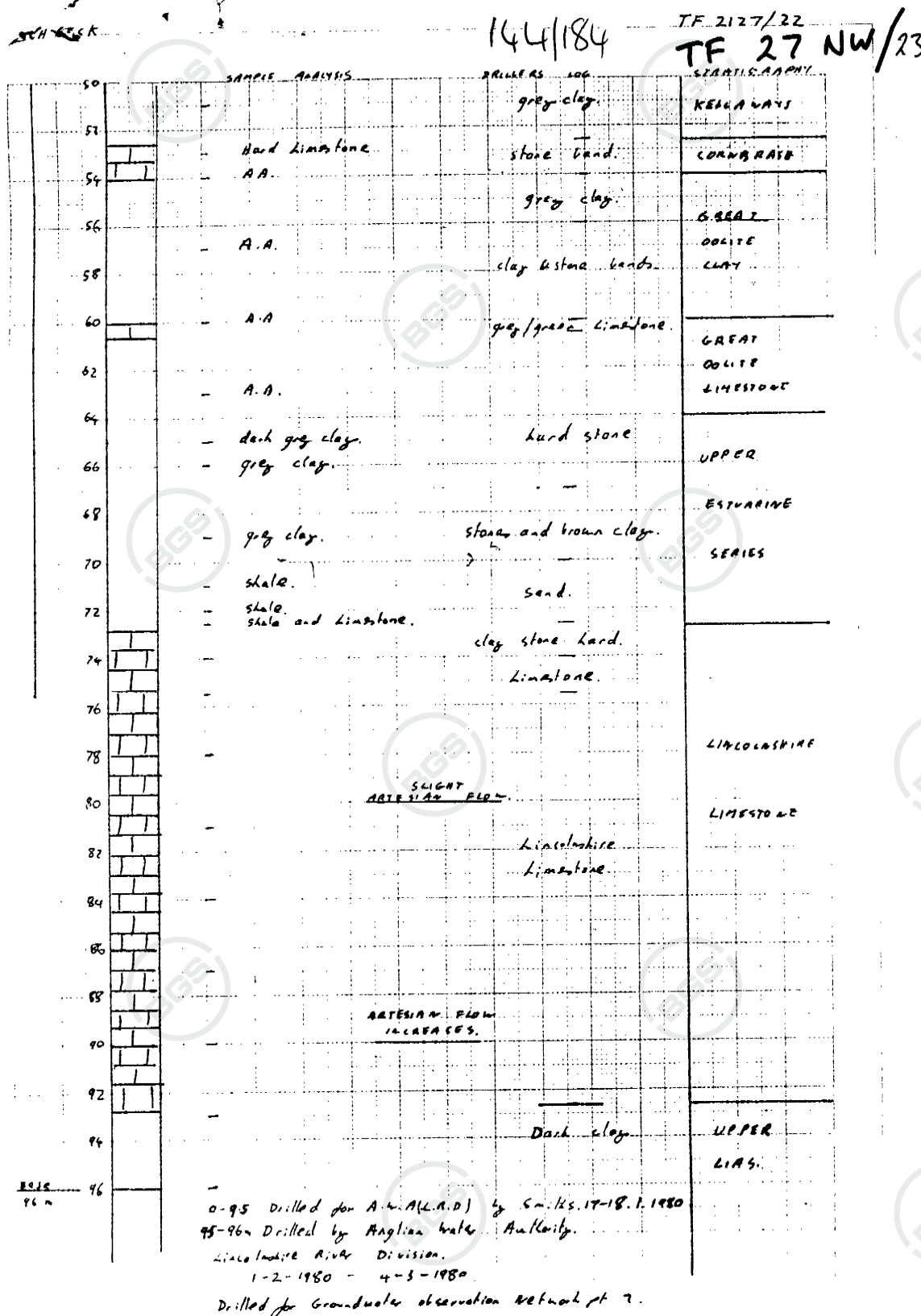
EXACT SITE
OF WELL
Six-inch National Grid sheet and reference TF 2111 2713 N.W.
A. A. Smith & Son (Gumby) Ltd
State whether owner, tenant, builder, contractor, consultant, etc.:
Address (if different from above)
Level of ground surface above sea level (O.D.) ft (..... m)
It well top is not at ground level state how far above* ft (..... m)
below:
AS SHAFT ft (..... m); diameter ft (..... m);
NECESSARY HEADINGS (please attach details—dimensions and directions)
BORE ft (..... m); diameter: at top in (..... mm);
at bottom in (..... mm)
Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):
Water struck at depths of ft (..... m) below well top
Rest level of water ft (..... m) above* well top. Suction at ft (..... m)
below
Yield on hours* test pumping at galls per (..... l/s) with
depression to ft (..... m) below well top. Recovery to rest level in mins*
hours
Capacity of pump g.p.h. (..... l/s)
Date of measurements.....
DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:
Make and/or type Motive power.....
Capacity galls (..... m³) per hour. Suction at ft (..... m)
below well top. Amount pumped galls (..... m³) per day. Estimated
consumption galls (..... m³) per week
Well made by F. Smith & Son (Gumby) Ltd Date of sinking 4.3.1980
ADDITIONAL NOTES ANALYSIS (please attach copy if available)
LOG OF
STRATA
OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

Received from A. W. A.
Lincolnshire River
Division
Date 27/11/80
Observation well.....
Recorder.....
ER log.....
Site marked on
1" map.....
6" map—Grid Sheet. Q
(use symbol)
Copy to.....
Date.....

BGS 2494 10 000 7 79





Geological Classification as given on RHS

11/13/3/21



RECORD OF WELL		For Institute use only Licence No.
EXACT SITE OF WELL	At <u>Pinchbeck</u>	N... <u>N</u>
	Town or Village	<u>TF22/19</u>
	County <u>Lincolnshire</u>	144/184
NECESSARY	Six-inch National Grid sheet and reference <u>TF 211 2713 NW</u>	<u>144/184</u>
	For <u>A.W.A. (Lincolnshire River Division)</u>	
	State whether owner, tenant, builder, contractor, consultant, etc.:	
	Address (if different from above)	
	Level of ground surface above sea level (O.D.) ft (.....m)	
	DELETE If well top is not at ground level state how far above ft (.....m)	
	AS SHAFT ft (.....m); diameter ft (.....m);	
	NECESSARY HEADINGS (please attach details—dimensions and directions)	
	BORE ft (<u>96</u>m); diameter: at top in (.....mm);	
	at bottom in (.....mm)	
TEST CONDITIONS	Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):	
	Water struck at depths of ft (.....m) below well top	
	Rest level of water ft (.....m) above* well top. Suction at ft (.....m)	
	Yield on hours* test pumping at galls per (..... l/s) with	
	depression to ft (.....m) below well top. Recovery to rest level in mins*	
	Capacity of pump g.p.h. (..... l/s)	
	Date of measurements	
	DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:	
	Make and/or type Motive power	
	NORMAL CONDITIONS	Capacity galls (.....m ³) per hour. Suction at ft (.....m)
below well top. Amount pumped galls (.....m ³) per day. Estimated		
consumption galls (.....m ³) per week		
Well made by <u>F. Smith & Son (Grimley) Ltd.</u> Date of sinking <u>4.3.1980</u>		
ADDITIONAL NOTES ANALYSIS (please attach copy if available)		
LOG OF STRATA OVERLEAF		

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

Received from A.W.A.
Lincolnshire River
Division
Date 27/11/80
Observation well.....
Recorder.....
ER log.....
Site marked on
1" map.....
6" map—Grid Sheet. Q
(use symbol)
Copy to EA & SE
Date.....



For Institute use only

GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

If measurements start below ground surface, state how far.

THICKNESS

DEPTH

Feet

Inches

Metres

Feet

Inches

Metres

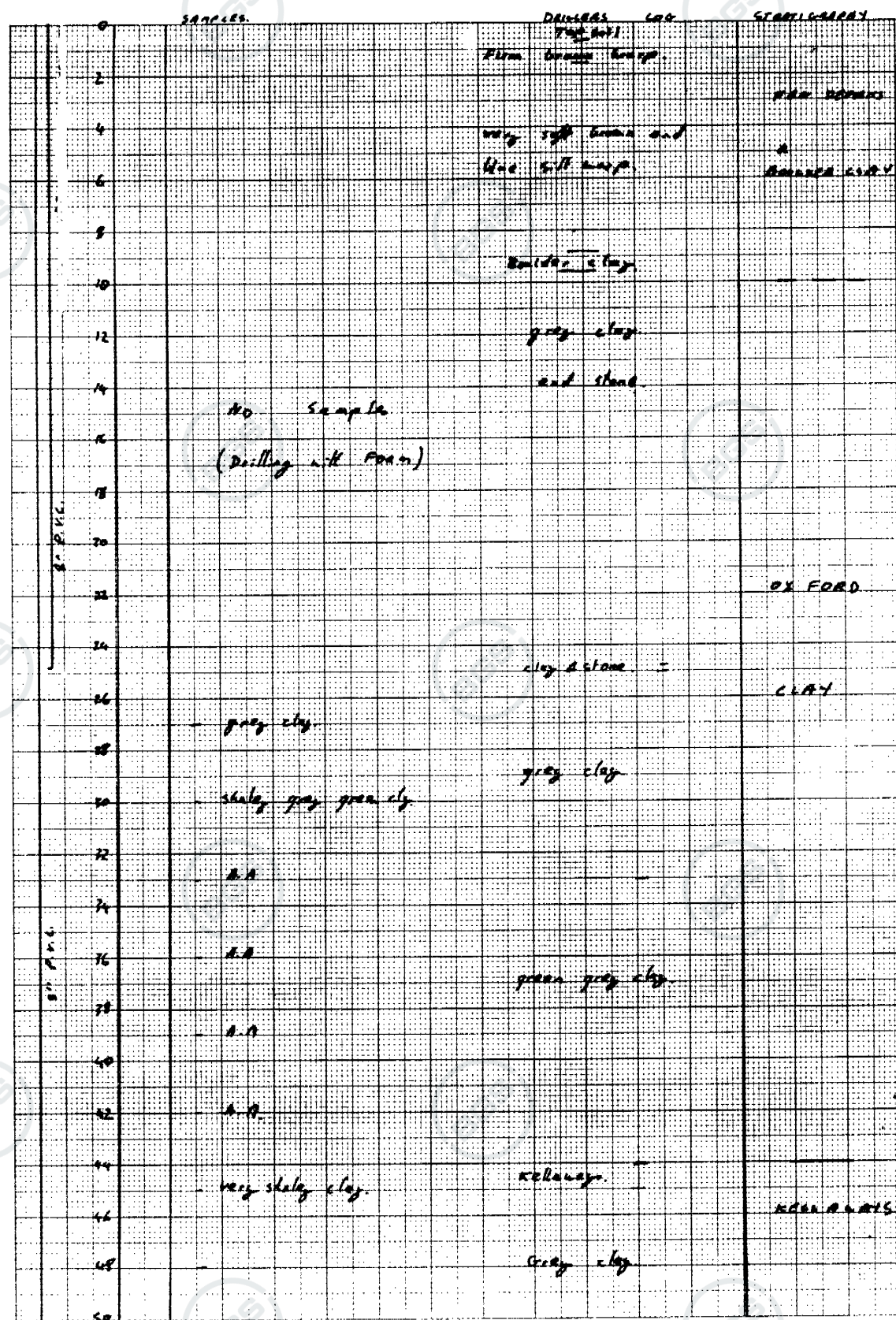
144/184 TF22/19

PINCHBECK

Ground Level 3.07m AOD on 2.85m A.O.D.

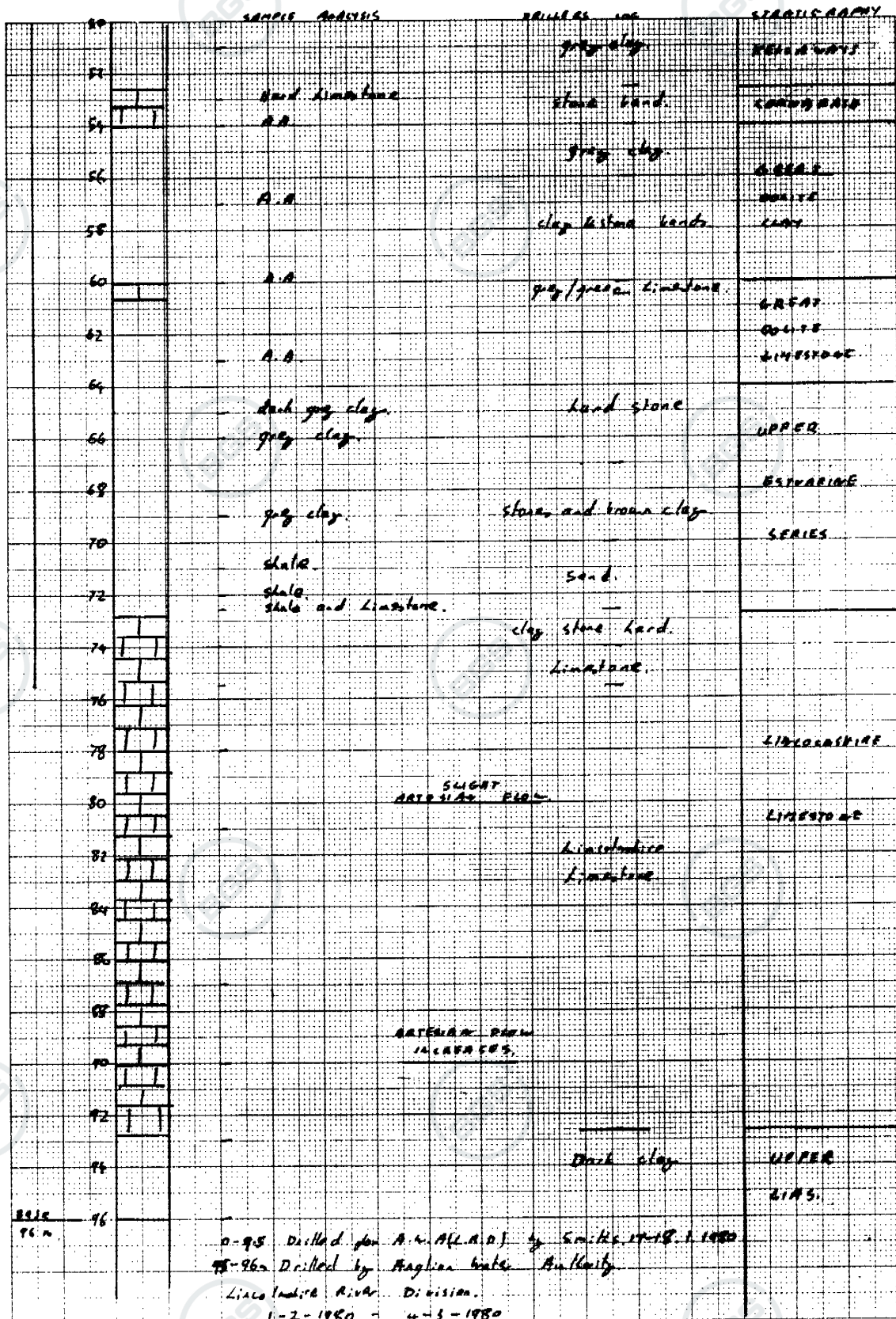
Exposure Fan Deposits

TF 2127/22



PIN CH BECK

144/184
TF 2127/22



0-95 Drilled for A.A. (L.A.D.) by Smith 19-12-1980
95-96 Drilled by Flagler Water Authority
Liaison River Division
1-2-1980 - 4-3-1980

Drilled for Groundwater observation network pt 7.

Geological Classification as given on RHS

P.A. RABAZZY 13/3/81

DATA ACQUISITION SHEET

147

MTD/D/2331

NRA region: Anglian/AWS

MTD 1/143

File Number:

SOUTHERN LS ANGLIAN EN.

TG22 NW

TG22/110

Pump Well Identification:

NRA id No:

BGS (WL) No: TG22/110

NGR: TG 2089 2756

6/3.

Elevation: c. 9m AOD

Measuring Point:

Site Name: Coldham Hall BH

Locality: Aylsham
Norfolk

Well details:

depth of pumping well: 80m

diameter: 610mm

casing details: 0-16.2m plain
16.2-80m slotted.

☐ observation boreholes

number of obs bhs:

obs bh details:

Aquifer Details:

confined / semi-confined / unconfined

confining layer:

Borehole Stratigraphy	from	to	thick	units
Drift	0	5	5	m
Chalk	5	80	75	m

Pumping Test Details:

date of test: 27 June 1990

length of test: 4 x 120 min

RWL:

PWL:

pumping rate: 17/31/45/63
l/s

date of test: 2 Jul, 1990

length of test: 14 days

RWL: n/k

PWL: n/k

64
l/s

CR Test
6 months into supply
(not continuous pumping)

13 Aug 1991
to
10 Mar 1992

2.55 mbd

5.15 mbd - on 17 Jan 1992

5529.6
m³/d.

Additional Well Information:

☐ Well Loss Data: $B: 1.4 \times 10^{-4}$ $C: 1.321 \times 10^{-3}$ Efficiency.....
☒ Well Acidified 10 tonnes at 51 nbsl.
☒ Flow Logs
☒ Other Geophysical Logs
☐ Fissure Information: major inflows from c. 30m ~~to~~
 at from c. 60m ~~to~~
 from.....to.....

Aquifer Parameters:

Analysis Type	Transmissivity	Storativity
no details given	$3800 \text{ m}^2/\text{d}$	5.0×10^{-3}

Confidence:

excellent

□ □ □ □ □

very poor

Notes:

Notes:

Proposed invert level 2.000 m below surface.

0.50 m Hard ground - Firm brown friable stony soil.

0.10 m Firm brown silty loam.

0.70 m Firm light-brown silt.

1.10 m Firm brown/red-brown/grey mottled silty clay.

0.10 m Firm red-brown/grey mottled silty clay.

0.50 m Soft ditto

0.30 m Soft blue-grey silty clay.

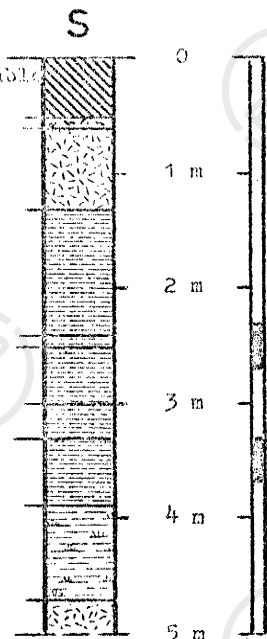
0.60 m Very soft ditto - black organic inclusions.

0.30 m Soft dark-brown peat.

0.30 m Soft grey silt.

Ground-water.

Seepage encountered at 3.400 m below surface.



COL 11. H 3.2 #10 10.
TF12 NE/21
1662.2651
1" 144.

* $c = 14 \text{ kN/m}^2$
 $\phi = \text{zero-degrees.}$
 $m = 96.3\%$
 $w = 1612 \text{ kg/m}^3$
 $d = 821 \text{ kg/m}^3$
* $c = 9 \text{ kN/m}^2$
 $\phi = \text{zero-degrees.}$
 $m = 117.2\%$
 $w = 1490 \text{ kg/m}^3$
 $d = 686 \text{ kg/m}^3$

pH/ SO_2 at 2.500 m below surface:
7.9/0.15-percent.

Trial boreholes,
Sourne to West Pinchbeck Trunk Main,
Lincolnshire.

Dwg. No. KM/12 Date. -11-1977



TF 12 NE/28

c1666 2654

GROUND EXPLORATIONS LIMITED BOREHOLE SECTION SHEET

Date..... August, 1964.....

CONTRACT NAME BLACK SLUICE PUMPING STATIONS.

ORDER No.

Bored for: Black Sluice Internal Drainage Board,
Address: 72 Carlton Road, Boston, Lincolnshire.

Address of Site: Pinchbeck Fen

District or Town: Pinchbeck

County Lincolnshire

Standing Water Level: 10'0" below surface

Dia. of Borehole: 6 Inches.

Water Struck (1) 25'0" (2) (3)

Boring Commenced: 5.8.64.

Boring Completed: 7.8.64.

Special Remarks:

SL C +2.4

Jar Samples: 8020 2'0"; 8022 7'0"; 8024 12'0"; 8026 17'0"; 8028 22'0";
8030 27'0"; 8032 32'0"; 8034 37'0"; 8036 Water

Core Samples: 8021 3'6"-5'0"; 8023 8'6"-10'0"; 8025 13'6"-15'0"; 8027 18'6"-20'0";
8029 23'6"-25'0"; 8031 28'6"-30'0"; 8033 33'6"-35'0";
8035 38'6"-40'0";

Large Disturbed Samples:

DESCRIPTION OF STRATA				Thickness		Depth below Surface	
				Feet	Inches	Feet	Inches
The descriptions are given in accordance with the British Standard Code of Practice CP2001 (1957) "Site Investigations." No responsibility is accepted for these descriptions and clients should examine the samples submitted.							
No.	1	Boring					
TB	Top soil			3	0	3	0
BD	Soft peaty clay	-1.0		8	0	11	0
?	Mottled clay	-3.7		9	0	20	0
?	Hard shaly clay	-9.8		20	0	40	0
TOTAL FROM SURFACE				40	0	40	0

Signed..... Date.....

PR18263



TF 12 NE/29

C 1666 2684

GROUND EXPLORATIONS LIMITED
BOREHOLE SECTION SHEET

Date.....August, 1964.....

CONTRACT NAME BLACK SLUICE PUMPING STATIONS

ORDER No.

Bored for: Black Sluice Internal Drainage Board,

Address: 72 Carlton Road, Boston, Lincolnshire.

Address of Site: Pinchbeck Fen

District or Town: Pinchbeck

County: Lincolnshire

Standing Water Level 10'0" below surface

Dia. of Borehole: 6 Inches.

Water Struck (1) 10'0" (2) (3)

Boring Commenced: 7.8.64.

Boring Completed: 8.8.64.

Special Remarks: SL C 2.4

Jar Samples: 8037 2'0"; 8039 7'0"; 8041 12'0"; 8043 17'0"; 8045 22'0";
8047 27'0"; 8049 Water

Core Samples: 8038 3'6"-5'0"; 8040 8'6"-10'0"; 8042 13'6"-15'0"; 8044 18'6"-20'0";
8046 23'6"-25'0"; 8048 28'6"-30'0";

Large Disturbed Samples:

DESCRIPTION OF STRATA			Thickness		Depth below Surface	
			Feet	Inches	Feet	Inches
The descriptions are given in accordance with the British Standard Code of Practice CP2001 (1957) "Site Investigations." No responsibility is accepted for these descriptions and clients should examine the samples submitted.						
No.	2	Boring				
TB	Top soil		2	6	2	6
BDB	Soft clay		1	6	4	0
	Soft peaty clay	- 1.0	7	0	11	0
?	Mottled clay	- 4.3	11	0	22	0
oxC	Hard shaly clay	- 6.7	8	0	30	0
TOTAL FROM SURFACE			30	0	30	0

Signed..... Date.....

PR18263



M. Kellaway London office

Map Ref. TF. 1650 2715

LINCOLNSHIRE RIVER BOARD

~~TF 12 NE 1~~
TF 12 NE 1

Borehole at DUNSBY P.S. (Black Sluice I.D.B.) 1650 2715

Borehole No. 5 (O.S. 192 Dunsby)

Date Aug. 1956 1" 144

Ground Level + 6.50 O.D. Liverpool

Job No. 118

Scale 5 ft. to 1 inch.

Dwg. No. B.141

Description	Thick	Depth	Bore	R. L.	Remarks
Brown Warp Clay	6'0"	0		+ 6.50	
		6'0"		0.00	O.D. Liverpool
Blue Warp Clay	5'6"				
Peat	2'0"	11'6" (3.51)	x x x	- 5.00	
		13'6" (4.11)	x x	- 7.00	Flandrian - 2.13
Blue Warp Clay	2'0"	15'6" (4.76)		- 9.00	
Wet Blue and Brown Silt	5'6"				Colluvium + Marine sand
		21'0" (6.40)		-14.50	
Brown Boulder Clay					
		31'0" (9.45)		-24.50	



At Middle Farm
Town or Village HACCONBY FEN
County LINCS. Six-inch quarter sheet 133 SW/W
For Mr. J. W. Atkinson

TP 12 NW 10

144

1303.2571

144

109

Exact site of well

{ Attach a tracing from
a map, or a sketch-
map, if possible.

Level of ground surface above sea-level (O.D.) 11 ^{3.35m} feet.

Is well-top at ground level? _____ If not, state how far ^{above} ; _____ feet.
_{below} ; _____ feet.

Shaft _____ ft., diameter _____ ft. Details of headings _____

Bore 117' 9" ; diameter of bore : at top _____ ins. ; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS { Rest-level of water _____ ft. ^{above} below well-top. Suction at _____ ft. Yield on _____ hours' days'
Month _____ pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.),
Year _____ with depression of _____ feet. Recovery to _____ in _____ mins. hours.

WORKING CONDITIONS { Rest-level of water in _____ (month), _____ (year), _____ ft. ^{above} below well-top.
Highest " in _____ (month), _____ (year), _____ ft. ^{above} below "
Lowest " in _____ (month), _____ (year), _____ ft. ^{above} below "
Suction at _____ ft. Rate of pumping _____ galls. per _____ for _____ hours per day.
with average depression of _____ ft. Recovery to _____ in _____ mins. hours

Quality of water (attach copy of analysis if available) _____

Well made by J. E. Noble, Thurlby Date of well 1914
Information from No. 201 of J. E. Noble, per HAT

ADDITIONAL NOTES.

Good supply - overflow

Rough-sited on sketch-map by Mr. Noble (see his no. 89) Farm still owned by Mr. J. W. Atkinson of Hacconby Hall. [H.D.T., May, 1941]

*1 in use & overflow
Visited & sited*

13.6.97

LOG OF STRATI OVERLAY

TF 12 NW/10

GEOLOGICAL CLASSIFICATION		If measurements start below ground surface, state how far... ..		Feet	Inches	Feet	Inches	
				4	0	4		
				3	0	7		
				8	0	15		
				4	0	19		
				10	0	29		
				7	6	36		
				16	0	52		
				5	9	58		
				9	0	67		
				2	6	69		
				2	0	71		
				15	6	87		
				1	0	88		
				2	6	90		
				11	6	102		
				15	6	117		



RECORD OF WELL (SHAFT OR BORE)

TF 12/46A

144

109A

At Middle Farm
Town or Village HACCONBY FEN
County LINCS. Six-inch quarter sheet 133 60/0
For Mr. J. W. Atkinson

Exact site of well (A) 1303 2570 (B) 1304 2569 (Attach a tracing from a map, or a sketch-map, if possible.)

Level of ground surface above sea-level (O.D.) 11 feet.

Is well-top at ground level? If not, state how far above ; feet.
below ; feet.

Shaft ft., diameter ft. Details of headings

Bore 117' 9" ; diameter of bore : at top ins. ; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

TEST DETAILS { Rest-level of water ft. above well-top. Suction at ft. Yield on hours' days'
Month pumping gallons per (max. capacity of pump g.p.h.),
Year with depression of feet. Recovery to in mins. hours.

WORKING CONDITIONS { Rest-level of water in (month), (year), ft. above well-top.
Highest in (month), (year), ft. above below "
Lowest in (month), (year), ft. above below "
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. hours

Quality of water (attach copy of analysis if available)

Well made by J. E. Noble, Thurlby Date of well 1914
Information from No. 201 of J. E. Noble, per HAT

ADDITIONAL NOTES.

Good supply - overflow

Rough-sited on sketch-map by Mr. Noble (see his no. 89) [144/3] Farm still owned by Mr. J. W. Atkinson of Hacconby Hall. [H.A.T., May, 1941]

*In use & overflows
Visited & sited*

13.6.47

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	
MAY 1941		144		○	○

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH	
		Feet	Inches	Feet	Inches
		...	...		
	Made ground	4	0	4	
	Silt	3	0	7	
	Yellow clay & sand	8	0	15	
AK	Sand & stone	4	0	19	
KIC	Clay	10	0	29	
CB	Rock	7	6	36	6
4-10	Dark Clay	16	0	52	6
	Light clay with green	5	9	58	3
90	Rock	9	0	67	3
	Clay	2	6	69	9
	Stone	2	0	71	9
	Clay	15	6	87	3
JK	Stone	1	0	88	3
	Clay	2	6	90	9
	mail	11	6	102	3
LL	Rock	15	6	117	9



NGRC
BOREHOLE RECORDS
ADJUSTMENT FORM

QUARTER SHEET TF 12 NW

BH REGISTRATION NUMBER 27 - 35

RECORDS ENTERED AND HELD BY WALLINGFORD

BH REGISTRATION NUMBER(S)



RECORD OF WELL

For Institute use only Licence No.

N. 14358

I44/I09 B
TF12/46B

EXACT SITE
OF WELL

At Middle Farm,
Haconby Fen,
Town or Village Bourne,
County Lincolnshire,
Six-inch County Sheet LnCS 133 SW/W.

Six-inch National Grid sheet and reference TF 12 NW

For Messrs. J. E. Atkinson & Son

State whether owner, tenant, builder, contractor, consultant, etc.:—

Address (if different from above)

Haconby Hall, Bourne, Lincolnshire.

Level of ground surface above sea level (O.D.) ft (..... m)

*DELETE
AS
NECESSARY

If well top is not at ground level, state how far above* ft (..... m)
below:

SHAFT ft (..... m); diameter ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE 190 ft (57.91 m); diameter: at top 15" in (381 mm); at
bottom in (..... cm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.)

110 feet - 15" diameter plain (33.52m X 381)

20 feet - 12" diameter plain (6.09m X 304)

Water struck at depths of ft (..... m) below well top

Rest level of water Artesian (22 P.S.I.) above* ft (..... m)
below

Yield on hours* test pumping at galls (..... m³) per with
days

TEST
CONDITIONS

depression to ft (..... m) below well top. Recovery to rest level in mins*
hours

Capacity of pump g.p.h. (..... m³/h)

Date of measurements March 1977

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power

NORMAL
CONDITIONS

Capacity galls (..... m³) per hour. Suction at ft (..... m)

below well top. Amount pumped galls (..... m³) per day. Estimated

consumption galls (..... m³) per week

Well made by DONCASTER WELL BORERS LIMITED Date of sinking DECEMBER 1976

30 Thorne Road, Edenthorpe, Doncaster.
ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF
STRATA
OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W.7.

C. L. S. m. i. d. h.

Received from Doncaster
Well Bore Ltd
Date 2.5.77
Observation well
Recorder
E.R. log
Site marked on Nat. Grid Sheet
1" map
6" map
(use symbol)
Copy to
Date



(For Institute use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA <i>144/109 B</i> If measurements start below ground surface, state how far.	THICKNESS			DEPTH		
		Feet	Inches	Metres	Feet	Inches	Metre
<i>Fen Deposits</i>	Top Soil	1	6	0.45	1	6	0.45
	Sandy Brown Clay	3	6	1.06	5	0	1.52
	Black Peat	2	0	0.60	7	0	2.13
<i>Fen clay or Kellaways clay</i>	Blue Clay	7	0	2.13	14	0	4.26
<i>Kellaways clay</i>	Grey Clay	3	0	0.91	17	0	5.18
<i>Bornbrash</i>	Grey Clay and stone	11	0	3.35	28	0	8.53
	Stone	7	6	2.28	35	6	10.81
<i>Blisworth clay</i>	Grey clay and stone	5	6	1.67	41	0	12.49
	Green and yellow clay	12	0	3.65	53	0	16.15
	Grey clay	5	6	1.67	58	6	17.82
<i>Blisworth limestone</i>	Grey clay and stone	9	0	2.74	67	6	20.57
<i>Upper Estuarine "Series"</i>	Grey clay	3	0	0.91	70	6	21.48
	Stone	1	0	0.30	71	6	21.79
	Grey clay	15	6	4.72	87	0	26.51
	Stone	1	0	0.30	88	0	26.82
	Grey clay	3	0	0.91	91	0	27.73
	Clay and stone	10	6	3.19	101	6	30.93
<i>Lincolnshire limestone</i>	Grey limestone	88	6	26.97	190	0	57.91
<i>Per. R. J. WYATT. 12/7/77.</i>							



1080.2544 TF/12NW/1
BOREHOLE RECORD

SURFACE LEVEL: 31.20 0.0 NOMINAL B.H. DIA.: 6" SHEET No.: 1
DATE STARTED: 14.12.61 DATE COMPLETED: 15.12.61 SCALE: 1/4" = 1 ft.
REMARKS: WATER LEVEL 9' 0" P.M. (14.12.61)
8' 6" P.M. (15.12.61)
CHISELLING THROUGH ROCK 9' 8" - 12' 0" - 2 1/2 HRS.
HOLE GASED TO 9' 0" LOCATION: HACEONBY P.S. (ROAD VERGE BY A),
FS 179-1

STRATA.	SAMPLE No.	SAMPLE DEPTH	B.H.	DEPTH	R.L.	REMARKS
TOPSOIL				2' 0"	29.20	
FIRM, BROWN, FRIABLE, SANDY CLAY WITH F.M. GRAVEL & SOME ORGANIC MATTER	1.	2' 6"				
	2.	4' 0"				
	3.	6' 0"				
LOOSE BROWN CLAYEY SILT WITH SOME F. GRAVEL	4.	8' 6"		7' 6" 23.70 2.21 9' 0" 22.20 2.75		WATER SAMPLE TAKEN AT 8' 6" +6.76m = 6.76
BLUE & BROWN ROCK (CORNBASH)	5.	11' 0"				
STIFF MOTTLED, BROWN & BLUE SILTY CLAY	6.	13' 0"		12' 0" 19.20 3.46 14' 0" 17.20		
VERY HARD BLUE FISSURED SHALY CLAY	7.	15' 0"				
	8.	17' 0"				
	9.	19' 0"				
	10.	21' 0"				
	11.	22' 6"				
	12.	24' 0"				
		24' 6"				
		26' 0"		26' 0" 5.20 7.93		+1.59 B.H. > +1.6 B.H. COMPLETED

Sited on gravel pit
a KIC
A Horb

UNDISTURBED SAMPLE	DISTURBED SAMPLE	WATER SAMPLE	BULK SAMPLE	STANDARD PENETRATION TEST
SOUTH KESTIVEN DRAINAGE CONTRACT 7.				B.H. No. / INVESTIGATION No. F2/1378

JOHN LAING AND SON LIMITED
RESEARCH AND DEVELOPMENT CENTRE
SOIL MECHANICS DEPARTMENT
BOREHAM WOOD, HERTS.



RECORD OF WELL (SHAFT OR BORE)

TF 12 NW/19

1034 2537
143/170

At Council House
Town or Village HACCONBY
County Lincoln Six-inch quarter sheet 132 SE (E)
For ME (Bourne) R.D.C. S. Kesteven R.D.C.

Exact site of well _____ { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) _____ feet.

Is well-top at ground level? _____ If not, state how far above ; _____ feet.
below ; _____

Shaft _____ ft., diameter _____ ft. Details of headings _____

Bore 10' 8" ; diameter of bore : at top _____ ins. ; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS { Rest-level of water _____ ft. above well-top. Suction at _____ ft. Yield on _____ hours' days'
Month _____ pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.),
Year _____ with depression of _____ feet. Recovery to _____ in _____ mins. hours.

WORKING CONDITIONS { Rest-level of water in _____ (month), _____ (year), _____ ft. above well-top.
Highest " in _____ (month), _____ (year), _____ ft. above "
Lowest " in _____ (month), _____ (year), _____ ft. above below "
Suction at _____ ft. Rate of pumping _____ galls. per _____ for _____ hours per day.
with average depression of _____ ft. Recovery to _____ in _____ mins. hours

Quality of water (attach copy of analysis if available) _____

Well made by J. M. Noble, Thurlby Date of well 1914

Information from No. 199 of J. M. Noble, per HAT

ADDITIONAL NOTES.

Good supply - overflow
Range - sited by Mr. Noble on sketch-map - with No. 329
a tap on road-side which used to supply Council Houses [H.A.T., May 1911]
Visited & sited on 6" Lines 132 SE/E by O
The bore is now disused and is covered by
an iron lid. Council houses it used to supply
are all on mains water supply.
O.D. 44' $\equiv$ B.M. sm. 22.6.51

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map.	on 6" Map.
14/3/1914		143		○	○



(For Survey use only)

GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

If measurements start below
ground surface, state how far... ..

TF12NW19

THICKNESS

Feet Inches

... ..

DEPTH

Feet Inches

... ..

Soil
yellow clay + gravel
Green Clay + sand
Rock
Dark clay
Rock
Light clay
Rock
Clay
Stone
Clay
sand + Stone
Clay
Mud
Rock

Stied on KIC

1	6	1	6	Drift + KIC
			0.5	
4	6	6	0	
			1.8	
4	6	10	63.2	+10.2
7	7	18	15.5	Q 3.3
5	0	23	1	
1	0	24	1	B/C 4.8
13	0	37	11.3	
9	10	46	11	B/L 3.0
			14.3	
4	0	50	11	
1	0	51	1	
5	0	57	1	OE 9.6+
5	0	61	11	
3	0	64	11	
13	6	78	52.9	-10.5
23	3	101	8	Lines Lst 7.1+
			31.0	



RECORD OF WELL (SHAFT OR BORE)

TF12/62
143
170

At Council House
Town or Village HACCONBY
County Lincoln Six-inch quarter sheet 132 SE (E)
For MZ (Bourne) L.D.C. S. Neelam R.D.C.

Exact site of well N 66° TF 12 NW 1034 2537 Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) feet.

Is well-top at ground level? If not, state how far above ; feet.
below ; feet.

Shaft ft., diameter ft. Details of headings

Bore 10 1/2" ; diameter of bore : at top ins. ; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

TEST DETAILS { Rest-level of water ft. above well-top. Suction at ft. Yield on hours' days' pumping gallons per (max. capacity of pump g.p.h.),
Month with depression of feet. Recovery to in mins. hours.

WORKING CONDITIONS { Rest-level of water in (month), (year), ft. above well-top.
Highest " in (month), (year), ft. above below "
Lowest " in (month), (year), ft. above below "
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. hours

Quality of water (attach copy of analysis if available)

Well made by J.E. Noble, Thurlby Date of well 1914
Information from No. 199 of J.E. Noble, per HAT

ADDITIONAL NOTES.

Good supply - overflow [143/172]
Rough-sited by Mr Noble on sketch-map as with his No. 329, was
a tap on road-side which used to supply Council House. [H.A.T. May 1911]
Visited & sited on 6" Lines 132 SE/E by O
The bore is now disused and is covered by
an iron lid. Council houses it used to supply
are all on mains water supply.
O.D. 44' J.M.H.
22.6.51

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	
MAY 1941		143		○	○



(For Survey use only) GEOLOGICAL CLASSIFICATION	2	NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH	
			Feet	Inches	Feet	Inches
			...	...		
		Soil	1	6	1	6
		Yellow clay ° gravel	4	6	6	0
		Green Clay ° sand	4	6	10	6
		Rock	7	7	18	1
		Dark clay	5	0	23	1
		Rock	1	0	24	1
		Light clay	13	0	37	1
		Rock	9	10	46	11
		Clay	4	0	50	11
		Stone	1	0	51	1
		Clay	5	0	56	1
		Sand ° Stone	5	0	61	11
		Clay	3	0	64	11
		Marl	13	6	78	5
		Rock	23	3	101	8



RECORD OF WELL (SHAFT OR BORE)

TF02 NE/28
143 0750 2535
171

At Haccomby Cross Roads
Town or Village H ACCOMBY
County Lines Six-inch quarter sheet 132 SE (W)
For Mr. Turner
Exact site of well See tracing with 143/171

(Attach a tracing from a map, or a sketch-map, if possible.)

Level of ground surface above sea-level (O.D.) 79 feet. 24.08 m

Is well-top at ground level? If not, state how far above ; feet.
below ; feet.

Shaft ft., diameter ft. Details of headings

Bore 13 1/4" 40.03 m ; diameter of bore : at top ins. ; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

TEST DETAILS { Rest-level of water 1 0.3 ft. above well-top. Suction at ft. Yield on hours' days'
Month pumping gallons per (max. capacity of pump g.p.h.),
Year with depression of 0 feet. Recovery to in mins. hours.

WORKING CONDITIONS { Rest-level of water in (month), (year), ft. above well-top.
Highest in (month), (year), ft. above "
Lowest in (month), (year), ft. above "
Suction at ft. Rate of pumping 200 galls. per hour for hours per day.
with average depression of nil ft. Recovery to in mins. hours

Quality of water (attach copy of analysis if available)

Well made by J. H. Noble, Thurlby Date of well 1931

Information from No. 912 of J. H. Noble, per HAT

ADDITIONAL NOTES.

*Rough-sited on sketch-map by
Mr. Noble. Bore got mud down
at Cross Roads NE corner.
[H.A.T., May, 1941.]*

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map.	on 6" Map.
MAY 1941		143		○	○



(For Survey use only)

GEOLOGICAL
CLASSIFICATION

2

NATURE OF STRATA

If measurements start below
ground surface, state how far... ..

THICKNESS **TP02NE/28**

Feet Inches Feet Inches

... ..

m

m

Soil

0.01

2

0

Sandy clay

5.49

18

0

Rock

2.44

8

0

Clay

0.38

1

3

Sandy Clay

6.1

20

0

Rock

2.42

9

7

Clay

2.59

8

6

Stone

0.3

1

0

Clay

2.59

8

6

-3.15

Mant

3.81

12

6

89

4

27.23

Rock

12.8

42

0

131

4

40.03



RECORD OF WELL (SHAFT OR BORE)

At Haccomby Cross Roads
Town or Village H ACCONBY
County Lincoln Six-inch quarter sheet 132 SE (W)
For Mr. Turner

TF02/14
143
171

Exact site of well See tracing with 143/171.
NMR TF 02 NE 0950 2535.

(Attach a tracing from
a map, or a sketch-
map, if possible.)

Level of ground surface above sea-level (O.D.) 79 feet.

Is well-top at ground level? _____ If not, state how far above ; _____ feet.
below ; _____ feet.

Shaft _____ ft., diameter _____ ft. Details of headings _____

Bore 131.4" ; diameter of bore : at top _____ ins. ; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS { Rest-level of water 1 ft. ^{above} well-top. Suction at _____ ft. Yield on _____ hours' days'
Month _____ pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.),
Year _____ with depression of 0 feet. Recovery to _____ in _____ mins.
hours.

WORKING CONDITIONS { Rest-level of water in _____ (month), _____ (year), _____ ft. above well-top.
Highest " in _____ (month), _____ (year), _____ ft. below "
Lowest " in _____ (month), _____ (year), _____ ft. above "
Suction at _____ ft. Rate of pumping 200 galls. per hour for _____ hours per day.
with average depression of nil ft. Recovery to _____ in _____ mins.
hours

Quality of water (attach copy of analysis if available) _____

Well made by J. E. Noble, Thurlby Date of well 1931
Information from No. 912 of J. E. Noble, per HAT

ADDITIONAL NOTES.

*Rough-sited on sketch-map by
Mr. Noble. Bore got near home
at Cross Roads NE corner.
[H.A.T., May, 1941]*

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map.	on 6" Map.
MAY 1941		143			

(For Survey use only) GEOLOGICAL CLASSIFICATION	2	NATURE OF STRATA If measurements start below ground surface, state how far	THICKNESS		DEPTH	
			Feet	Inches	Feet	Inches
		Soil	2	0		
		Sandy clay	18	0		
		Rock	8	0		
		Clay	1	3		
		Sandy Clay	20	0		
		Rock	9	7		
		Clay	8	6		
		Stone	1	0		
		Clay	8	6		
		Marl	12	6	89	4
		Rock	42	0	131	4

2
sillies appear : from 197/2 to base a gray fine-grained
sandstone with large masses of buff or pale brown silty
mudstone.

197'6" - 198'0"
m 80-2 80-35

Pale grey-brown silty clay with a large pale orange-brown
chert veined cementation. (Uli)



0900.2500

TF/02 NE/13

NW 140

51-05	51-23	
167'6" - 168'1"		Buff fine-grained well-cemented sst. with small shell mounds
51-23	51-06	
168'1" - 169'6"		Gray phacoiderite: abundant brown phacoiderites and small quartz grains in pale gray ? kaolinitic clay matrix: 167'11" - 168'11" ditto with fragments of dark gray-brown ferruginous mudstone.
51-06	53-57	
169'6" - 175'9"		Gray-brown even-grained oolitic sandstone: pale gray oolites (often represented by voids) in brown fine-grained matrix: shell mounds 173'3" - 173'6": below 173'6" fewer rather patchily distributed oolites in fine brown silty matrix: in basal 3" very few pale gray to white oolites in fine matrix
53-57	53-9	
175'9" - 176'10"		Brown fine-grained sst. with few scattered oolites: oolite rare in basal 4".
53-9	54-41	
176'10" - 178'6"		Gray fine-grained sst.: pale brown 177'2" - 177'9" and then gray-buff below: one small pebble at 178'5"
54-41	55-95	
178'6" - 182'3"		Pale gray-buff very fine-grained calcareous sst.: from 180'0" very occ. very small mudstone pebbles: 180'2" - 180'6" pebbles (1/2" - 1" diam.) of gray oolitic sandstone: from 180'6" pale buff with a few scattered gray oolites: patchily oxidized below 181'3"
55-95	55-7	
182'3" - 182'9"		Gray or gray-buff fine-grained sst. with few scattered gray oolites and large irregular buff-colored areas with some pale gray oolites: very disturbed bedding with pebbles of mudstone
55-7	55-83	
182'9" - 183'2"		Pale brown strong compact siltstone with few patches of green oolites
55-83	55-85	
183'2" - 183'3"		Fragments of very dark gray hard compact siltstone or silty mudstone with scattered brown oolites
55-85	55-93	
183'3" - 183'6"		Fragments of very sandy clay [Uki].

R.F.W.



RECORD OF WELL (SHAFT OR BORE)

TF 02 SE/43

0813, 2479

143/59

At Stainfield
Town or Village HACCONBY
County Lines Six-inch quarter sheet 132 SE (W)
For Mr. Brown R. D. C.

Exact site of well _____ { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) 98 feet. 29.87m

Is well-top at ground level? _____ If not, state how far above ; _____ feet.
below ; _____

Shaft 43 ft., diameter _____ ft. Details of headings _____

Bore 97 ft.; diameter of bore: at top _____ ins.; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS { Rest-level of water _____ ft. above well-top; Suction at _____ ft. Yield on _____ hours' days' pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.), with depression of _____ feet. Recovery to _____ in _____ mins. hours.

WORKING CONDITIONS { Rest-level of water in _____ (month), _____ (year), _____ ft. above well-top. Highest " in _____ (month), _____ (year), _____ ft. above " Lowest " in _____ (month), _____ (year), _____ ft. above " Suction at _____ ft. Rate of pumping _____ galls. per _____ for _____ hours per day. with average depression of _____ ft. Recovery to _____ in _____ mins. hours

Quality of water (attach copy of analysis if available) _____

Well made by J. H. Noble, Thurlby Date of well 1899
Information from No. 40. of J. H. Noble, per HAT

ADDITIONAL NOTES.

Bored in bottom of new well 43' deep.

Very good supply

Rough-sited on sketch map by Mr. Noble. Bore in middle of ploughed field. not used. [HAT, May, 1941]

W S Lines
P-165

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	
MAY 1947		143		○	○




(For Survey use only)
GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

If measurements start below
ground surface, state how far... ..

THICKNESS

Feet Inches

TF 02 SE 43

DEPTH

Feet Inches

m

m

Clay

1.37

4

6

Rock

0.46

1

6

Clay

1.22

4

0

Rock

0.61

2

0

Clay

6.71

22

0

Rock

23.87

78

4

Loose Sand

1.37

4

6

Rock.

4.91

13

2

130

0

39.62



TF02 SE43
143
59

HACCONBY
Stainfield. *

(1 in. Map 70, N.S., 143; 6 in. Map 132 S.E.).

Boring made by Mr. Noble, 1899.

Communicated by Mr. H. Preston.

Yield good supply, but the water did not reach surface.

		m	Thickness.	Depth.	m
			Ft. in.	Ft. in.	
Great Oolite	Clay	1.3.7	4 6	4 6	1.3.7
	Rock	0.66	1 6	6 0	1.8.7
Clay	Clay	1.2.2	4 0	10 0	3.0.5
	Rock	0.61	2 0	12 0	3.6.6
Great Oolite Limestone	Clay	6.7.1	22 0	34 0	10.3.6
	Rock	2.3.8.7	78 4	112 4	34.2.6
Upper Estuarine Series	Clay	1.3.7	4 6	116 10	35.6.1
	Rock	4.0.1	13 2	130 0	39.6.2
Lincolnshire Limestone	Clay				
	Rock				

Hacconby parish, under which it should be placed

Disused.

Used to provide water for stock & fields.

OD. 98.

Visited tested by O on Lucas 132 SE/W.

26.6.57. C.B.

covered by railway sleepers, well said to be filled with rubble
acc. Mrs. Measles the owner's wife.

Visited BMB 15-5-63.



RECORD OF WELL (SHAFT OR BORE)

NH. TF 02 SE 0813 2470

At Stainfield
Town or Village Stainfield
County Leeds Six-inch quarter sheet 132 SE (W)
For Brown R.D.C.

143/59

Exact site of well _____ { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) 98 feet.

Is well-top at ground level? _____ If not, state how far above ; _____ feet.
below ;

Shaft 43 ft., diameter _____ ft. Details of headings _____

Bore 130 ft.; diameter of bore: at top _____ ins.; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS { Rest-level of water _____ ft. above well-top. Suction at _____ ft. Yield _____ hours' days' pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.),
Month _____ with depression of _____ feet. Recovery to _____ in _____ mins. hours.

WORKING CONDITIONS { Rest-level of water in _____ (month), _____ (year), _____ ft. above below well-top.
Highest " in _____ (month), _____ (year), _____ ft. above below "
Lowest " in _____ (month), _____ (year), _____ ft. above below "
Suction at _____ ft. Rate of pumping _____ galls. per _____ for _____ hours per day.
with average depression of _____ ft. Recovery to _____ in _____ mins. hours

Quality of water (attach copy of analysis if available) _____

Well made by J.E. Noble, Thurlby Date of well 1899
Information from No. 40. of J.E. Noble, per HAT

ADDITIONAL NOTES.

Bored in bottom of new well 43' deep.

Very good supply

Rough-aided on sketch map by Mr. Noble. Bore in middle of ploughed field. Not made record. [HAT, May, 1941]

*IV S LINES
p. 165*

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.E. Map No.	1" O.S. Map No.	Site marked (see symbol) on 1" Map.	on 6" Map.
MAY 1941					

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH	
		Feet	Inches	Feet	Inches
2					
	Clay	4	6		
	Rock	1	6		
	Clay	4	0		
	Rock	2	0		
	Clay	22	0		
6.4	Rock	78	4		
	Grey Sand	4	6		
	Rock.	13	2	130	0

HACCONBY
Steinfeld. *

(1 in. Map 70, N.S., 143; 6 in. Map 132 S.E.).

Shelf Boring made by Mr. Noble, 1899.

Communicated by Mr. H. Preston.

Yield good supply, but the water did not reach surface.

		Thickness.	Depth.
		Ft. in.	Ft. in.
Great Oolite	Clay	4 6	4 6
	Rock	1 6	6 0
Clay	Clay	4 0	10 0
	Rock	2 0	12 0
Great Oolite Limestone	Clay	22 0	34 0
	Rock	78 4	112 4
Upper Estuarine Series	Grey sand	4 6	116 10
	Rock	13 2	130 0
Lincolnshire Limestone			

too high for top of L.L.

Hacconby parish, under which it should be placed

Disused.

Used to provide water for stock & fields.

OD. 98.

Visited & tested by O. on Lucas 132 SE/W.

26.6.57. C.B.

covered by railway sleepers, well said to be filled with rubble
see Mrs. Measius the owner's wife.

Visited 11.6.15-5-63

Published in
'Water Supply of
Lincolnshire.'
Page 165

177ft. 9in. - 178ft. 7in.
54.18 54.43

Pale buff fine-grained sandstone with rather few scattered large oolites and much white ? kaolinite in matrix : becoming grey and faintly greenish from 54.31
178ft. 2in. with few large generally oxidised oolites. sharp base.

178ft. 7in. - 182ft. 1in.
54.43 55.53

Grey fine even-grained oolite - light grey oolite in darker grey matrix. Between 180ft. 7in. - 181ft. 2in. rather broken - largely dark grey - brown, compact hard siltstone with rather fewer oolites. Even-grained oolite below.

182ft. 1in. - 183ft. 2in.
55.53 55.83

Grey-brown oolitic mudstone : fairly abundant oolites in compact, strong dark brown silty mudstone matrix : occasional shell moulds : towards base oolites becoming much fewer.

183ft. 2in. - 184ft. 6in.
55.83 56.24

Grey fine-grained sandstone with numerous scattered oolites ; many thin bands and wings brown in colour.

184ft. 6in. - 185ft. 10in.
56.24 56.64

Greenish-grey fine-grained sandstone with abundant oolites : in top 3in. rather soft green oolitic mudstone : becoming stronger and somewhat calcareous from 185ft. 4in. with fewer oolites.

185ft. 10in. - 192ft. 9in.
56.64 58.75

Grey very fine-grained sandstone, calcareous from 187ft. 10in. : rare small pebbles from 188ft. 7in. patches with oolite moulds 189ft. 3in. - 189ft. 9in. : below this very few oolites and many small mudstone pebbles - some shell fragments : occasional patches (? pebbles) of grey oolite : from 190ft. 3in. pale grey - buff fine-grained sandstone with many scattered oolites : very few oolites in band 3in. 9-98m

192ft. 9in. - 193ft. 9in.
58.75 59.06



GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

18

Name and Number given by owner:

NW 135

For whom made *United Steel Co. Ltd.*

Town or Village *Stamford* County *Leics.*

Exact site..... (Attach a tracing from a map, or a sketch-map, if possible.)

Purpose for which made *To prove iron ore (Northants. Sand)*

Ground Level at ^{shaft}bore relative to O.D. *106.4 ft.* If not ground level give O.D. of beginning of ^{shaft}bore

Made by *32-43m*

Date of sinking *24.3.59 - 8.4.59.*

Information from *examination of cores*

Date received *April 1959*

Examined by *R.J. Wignall (April 1959)*

(For Survey use only)

6-inch Map Registered No.

TF/02SE/18

Nat. Grid Reference

0807 2491

1" N.S. Map
No.

143

1" O.S. Map
No.

Confidential
or not

Yes

SPECIMEN NUMBERS AND ADDITIONAL NOTES

RJ 202 - RJ 215

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	IN.	FT	IN.
Kellaway Sand	Sandstone, weathered yellow-brown, soft and friable; bedding distorted (ditch creep).	1.83m		1.83m	
Kellaway Clay	Missing - driller records grey-blue clay	6	0	6	0
	Limestone, grey, fine-grained, compact and very strong with occasional shells: at 4.64m 14 ft. 7 in. a 1 in. ^{0.02} dark grey mud band: with much fragmentary shell material at 4.73 15 ft. 8 in. a 2 in. ^{0.02} very muddy dark grey limestone with much fragmentary shell material.	2.13m		3.96m	
Cornbrash	Limestone, fine-grained, grey, compact and strong with much finely comminuted shell fragment material: greenish muddy patches: at 16 ft. 3 in. large fragment of bryozoa: at 16 ft. 6 in. corals 5.93m [13 ft. 5 21 ft. 2 ft. missing] 8.61m	0.86		4.82	
	Clay, dark grey, becoming paler and finely laminated in bank 8 in. 0.2 m	2	10	15	10
	Clay, dark green mottled yellow brown, rather crumbly, occasional bitric surfaces	0.97		6.4	
	Clay, pale grey-green, hard silty clay with dark green rootlet infillings.	3	2	21	0
	Clay, dark grey-green	0.81			
	Sandstone, grey, fine-grained, clayey with plank streaks	2	8		
		0.3			
		1	0		
		0.5			
		1	0		
		0.1	4		
		0.08	3		

Name of Shaft or Bore given by Geological Survey:

NW135

6-inch Map
Registered
No.

TF/02 SE/18

2

0807.2491

GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	in.	FT	in.
Great Oolite Clay	Brought forward	5.4		21	0
	Clay, dark grey, shelly with abundant small well-preserved though friable paleo-pods	0.38		12.19	
	3.81m [12ft. 6in missing 2ft to 40ft]	1	3	40	0
	Limestone, grey, rather muddy, very shelly; fine grained and fairly compact; shaly nodules; becoming slightly greenish towards base	0.69			
Great Oolite Limestone		2	3		
	Limestone, grey, more compact, very strong, shelly, with greenish-grey muddy patches; at 43ft 4in. becoming pale grey with much fine shell fragment material - often rolled and resembling oolite.	1.14		14.63	
	0.61m [2ft missing 40ft - 48ft]	3	9	48	0
	Clay, faintly greenish-grey, silty, calcareous; very sandy in top 6in; many paleo-pods	0.61		15.24	
Upper Estuarine Series	Clay, deep green, sandy, calcareous (small) with much broken shell material	2	0	50	0
	Limestone, slightly greenish-grey, sandy and muddy with many dark green rootlets; at 19.86m. 52ft. becoming rather stronger, more shelly, without rootlets	0.3		15.54	
		1	0	51	0
	Clay, slightly greenish-grey sandy clay with some shells	0.61		16.15	
Rhythmic Beds 466		2	0	53	0
	Clay, brown, sandy, with dark grey laminae and lenses	0.3			
		1	0		
	Clay, deep green, sandy with many dark grey rootlets	0.2	8		
Upper Estuarine Limestone		0.38			
	Clay, dark grey, very sandy, with bands rich in paleo-pods	1	3		
	0.46m [1ft. 7in missing 53ft - 59ft]	0.46		17.98	
		1	6	59	0
Upper Estuarine Limestone	Limestone, dark greenish-grey, very muddy, fine-grained, shelly	0.23			
	Limestone, pale green-grey, compact, strong, fine-grained; many paleo-pods and many dark grey sub-vertical rootlets; becoming less strong 8in. from top, with no rootlets, but with many shells	0.23	9		
	0.61m [3in. missing 59ft - 62ft]	0.61		18.9	
	Limestone, grey, very muddy, very shelly, less strong	2	0	62	0
Freshwater Beds 121		0.13	5	62	5
	Clay, dark green, very sandy with carbonaceous plant fragments	0.2	8	63	1
	Limestone, grey, very muddy, shelly, soft	0.1	4	63	4
	Clay, green, with rootlets	1	4	64	4
Upper Estuarine Series	Clay, dark grey, laminated, with thin pale buff silty laminae	0.41			
		0.25	10		
	Clay, very dark green-grey with many lentic surfaces	0.2	8		
	Clay, grey, very finely laminated, hard silty clay; some pyritous patches and rootlets	1	2	0.36	

GEOLOGICAL CLASSIFICATION		DESCRIPTION OF STRATA	THICKNESS		DEPTH	
			FT	IN.	FT	IN.
Upper Estuarine Series	{	Brought forward	18.9	m	62	0
		Clay, pale buff-gray silty clay; top 1 ft = 0.3 m compact siltstone	3	0	0.91	m
		Clay, brown silty clay with occasional rootlets; becoming very ds sandy downwards: in basal 9 in. almost a clayey fine sandstone (probably ferruginous)	0.71	m	25.15	
		(9 ft. 9 in. missing 62 ft. - 82 1/2 ft.)	2	4	82	6
		2.97 m				



11. RECORD of WELL for BORING TF02/17

at (house or farm) West end of village

Town, Village, &c. Stainfield (Staincliffe parish) County Leics. Six-inch map 132 S.E. 105

Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on maps).

Surface level of ground 195.78 ft. above Ordnance Datum. Well or Bore commenced at 11.11 surface level of ground.

Sunk ft., diameter ft. Bored ft.; diameter of boring: at top 7 1/2 in., at bottom 4 7/8 in.

Details of lining tubes (internal diameters preferred) 5" tube to 116 ft.; the rest not lined.

Water struck at depths of (feet)

Rest-level of water above top of well or bore 96 ft. Pumping level 95 ft. Time of recovery 1/4 hour.

Suction at 140 ft. depth. Yield: (i) on test 360 galls. per hr., (ii) normal galls. per

Quality (attach copy of analysis if available) Good, fit for domestic use.

Made by J. E. Noble for Mr. S. Kesteven R.D.C. Date of boring 1934

Information from J. E. Noble, J. Hardy, W. Bourne, Leics.

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA. (and any additional remarks)	THICKNESS.		DEPTH.	
		Feet.	Inches.	Feet.	Inches.
C.H.D.	Another (1899) Stainfield bn w. 4 1/2' Manor p. 185				
	Soil	2	-	2	-
	Clay	16	-	18	-
? All G. clay } or sandstone clay? ? Red or greenish bl?	Clay stone	12	6	30	6
Killerings. Clay	Clay	16	-	46	6
Combelesh	Rock (small quantity of water)	6	6	53	-
Blisworth (or St. Od.) Clay	Clay	20	-	73	-
Gr. Oolite L. or G.	Rock	4	3	82	3
	Clay	2	-	84	3
	Rock	1	6	85	9
Up. Limestone	Clay	5	6	91	3
Strat.	Hard stone	5	10	97	1
32' 10"	Clay	4	-	101	1
	Marl	14	-	115	1
Lower. Lst.	Rock	77	6	192	7

Test yield. Pumping 5 days at 3,290 gpd.
R.W.L. +57 O.D.
P.W.L. +56 O.D. at above yield.
Recovery in 30 minutes.

Disused Pump house leased and used as chicken run. Related to Mr. Black
(at semi detached modern cottage on road W. out of Stainfield). Unable to
gain access.

Blb. 15.5.63.

January, 1964. South Leics Water Board sought to use
the boring as an observation well but found it to be
capped with concrete at the bottom of a 4 1/2 ft. per 21 ins.
square. As the concrete could not be removed without demolishing
the building, the operation was abandoned. By telephone from
South Leics Water Board 24.2.64. Kms.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

For Survey use only.

Date received.	G.S.M.	6" of H. notified.	Site marked on 1" map.
7.vi.34	6469		

(11.69B) Wt 10258/0175 2,500 9/32
H, J, R & L, Ltd Gp 616



RECORD OF WELL (SHAFT OR BORE)

143/74 TF02/17
143/74

At Stainfield
Town or Village HACCONBY
County Lines Six-inch quarter sheet 132 SE (W)
For Mr. _____

Exact site of well _____ { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) _____ feet.

Is well-top at ground level? _____ If not, state how far above ; _____ feet.
below ; _____ feet.

Shaft _____ ft., diameter _____ ft. Details of headings _____

Bore 192' 6" ft.; diameter of bore: at top _____ ins.; at bottom _____ ins.

Lengths, diameters, perforations, etc., of lining tubes _____

Water struck at depths, below well-top, of (feet) _____

TEST DETAILS { Rest-level of water _____ ft. above well-top. Suction at _____ ft. Yield on _____ hours' days'
pumping _____ gallons per _____ (max. capacity of pump _____ g.p.h.),
Year _____ with depression of _____ feet. Recovery to _____ in _____ mins. hours.

WORKING CONDITIONS { Rest-level of water in _____ (month), _____ (year), _____ ft. above well-top.
Highest " in _____ (month), _____ (year), _____ ft. above below "
Lowest " in _____ (month), _____ (year), _____ ft. above below "
Suction at _____ ft. Rate of pumping _____ galls. per _____ for _____ hours per day.
with average depression of _____ ft. Recovery to _____ in _____ mins. hours

Quality of water (attach copy of analysis if available) _____

Well made by J.E. Noble, Thurlby Date of well 1934
Information from No. 327 of J.E. Noble, per HAT

ADDITIONAL NOTES.

*Rough-sited by Mr. Noble on sketch-map with his M.H. Pump, for
Pavilion on road-side, just inside field. Good supply. [HAT, May, 1941]*

LOG OF STRATA-OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map.	on 6" Map.
MAY 1941		143			



(For Survey use only) GEOLOGICAL CLASSIFICATION	3 NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH	
		Feet	Inches	Feet	Inches
		...	...	...	...
	Soil	2	0	2	
	clay	16	0	18	
	clay & stone	12	6	30	6
	clay	16	0	46	6
chr	Rock	6	6	53	
goc	clay	20	0	73	
	Rock	9	2	82	2
goc	clay	2	0	84	2
	Rock	1	6	85	8
	clay	5	6	89	2
not	Hard stone	5	10	94	
	clay	4	0	98	
	marl	14	0	112	
	Rock	77	6	192	6

To be furnished in Triplicate.

143 TF02NE31
74

WELLS AND BOREHOLES.

Information to be supplied to the Ministry of Health.

Name of District South Kesteven Rural District.

If the District is a Rural District, name of
Contributory Place concerned. Stamfield, Hacconby.

A 6" to the mile Ordnance map showing (in red)
the precise situation of the well or borehole. This has been sent previously.

Level of surface of ground above O.D. 145.78

Depth of shaft or boring, or of each. 192 feet 7 inches.

Depth or depths at which water was found. 183 feet

Yield of water in gallons per diem, as ascertained by
continuous pumping during 5 days or
otherwise. 3, 290 galls.

Quality. (Copies of chemical and bacteriological analyses
should be annexed. Information as to the mineral
constituents of the water is desirable). enclosed.

Level of water (above O.D.) at commencement of pumping. 57 feet.

Level of water (above O.D.) at cessation of pumping. 56 feet.

Time taken for water to return to original rest level
after pumping ceased. 1/2 hour

A Statement giving the hours and dates and the quantity
of water pumped each day in a tabulated form, should
be annexed. If there should be any stoppage, the
reason and duration thereof should be stated. statement enclosed.

Distances of the well or borehole from any other known
wells or boreholes in the neighbourhood. see below.

The nearest well is 400 feet.
The farthest well is 1, 400 feet.
The nearest bore is 1, 900 feet.

K.20 (a)

S.R.P.W. 526.

F.T.O.

5

A description of the Strata pierced should be given as follows:-

	Thickness of each Stratum.		Total depths from the surface.	
	Feet	Inches	Feet	Inches.
Soil.....	2	0	18	0
Clay.....	16	0	30	6
Clay and Stone.....	12	6	46	6
Clay.....	16	0	53	0
Rock.....	6	6	73	0
Clay.....	20	0	82	3
Rock.....	9	3	84	3
Clay.....	2	0	85	9
Rock.....	1	6	91	3
Clay.....	5	6	97	1
Hard Stone.....	5	10	101	1
Clay.....	4	0	115	1
Marl.....	14	0	192	7
Rock.....	77	6		

A Section to scale showing the size of the well or boring, strata pierced, rest level of water, and other particulars, should also be forwarded to the Ministry.



-Copy-

TF02/17
143/74

TN 8

THE CLINICAL RESEARCH ASSOCIATION
LIMITED.

TO South Kesteven R.D.C.

Laboratory Report No. 18329

CHEMICAL WATER REPORT.

143/74

The sample of water marked Stainfield bore
collected on 18.6.45 10.45 a.m. and received here
on 18.6.45 has been examined, and with the following
results.

	GRAMS PER 100,000	GRAINS PER GALLON.
Total solids (dried at 120°C.)	56.0	89.8
Combined chlorine (as Cl)	3.0	2.1
equivalent to Sodium Chloride (NaCl)	5.0	3.5
Nitric nitrogen (Nitrates)	0.02	0.014
Nitrous nitrogen (Nitrites)	Nil	Nil
Ammoniacal nitrogen	Nil	Nil
Albuminoid nitrogen	0.0016	0.0011
Oxygen absorbed in 4 hours at 27°C	0.024	0.017
Lead or Copper	Nil	Nil
Temporary hardness {equivalent to CaCO ₃ }	27.0	18.9
Permanent hardness { " " " }	11.0	7.7
Total hardness { " " " }	38.0	26.6



THE CLINICAL RESEARCH ASSOCIATION
LIMITED.

TO South Kesteven R.D.C.

Laboratory Report No. 24218

CHEMICAL WATER REPORT.

-Copy- TF02/17
TF02/17
143/74
143/74
25.9.46

The sample of water marked Stainfield
collected on 17.9.46 11.30 a.m. and received here
on 19.9.46 has been examined, and with the following
results.

	POINTS PER 100,000	GRAINS PER GALLON.
Total solids (dried at 120°C.)	58.0	40.6
Combined chlorine (as Cl)	2.8	2.0
equivalent to Sodium Chloride (NaCl)	4.6	3.2
Nitric nitrogen (Nitrates)	0.02	0.014
Nitrous nitrogen (Nitrites)	faint trace present	
Ammoniacal nitrogen	0.0020	0.0014
Albuminoid nitrogen	0.0060	0.0042
Oxygen absorbed in 4 hours at 27°C	0.034	0.024
Lead or Copper	Nil	Nil
Temporary hardness (equivalent to CaCO ₃)	26.5	18.6
Permanent hardness { " " " }	12.0	8.4
Total hardness { " " " }	38.5	27.0



GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

19

Name and Number given by owner:

NW 203

For whom made *United Steel Co. Ltd.*

Town or Village *Stamford* County *Lincoln*

Exact site *(Attach a tracing from a map, or a sketch-map, if possible.)*

Purpose for which made *Ironstone*

Ground Level at shaft relative to O.D. *168.0 ft.* If not ground level give O.D. of beginning of shaft

Made by *51.21* Date of sinking *11.9.59 - 2.10.59*

Information from Date received

Examined by

(For Survey use only)

6-inch Map Registered No.

TF/02NE/19

Nat. Grid Reference

0700.2500

1" N.S. Map No. 1" O.S. Map No. Confidential or not

DECLASSIFIED

GEOLOGICAL LOG						DRILL LOG		
Depth From	Feet To	Thick. Ft.	Description	Geological Horizon		CROWNS USED		
0.0	23.0	23.0	Boulder Clay	Recent		Size	No.	Feet
23.0	30.5	7.5	Clay. Oxford Clay	Series		131	Cbd	83.0
30.5	38.5	8.0	Sand and sandstone with clay partings. Kellaways			116	Cbd	41.0
38.5	51.5	13.0	Clay	Beds		101	NOB	65.0
51.5	59.5	8.0	Limestone	Cornbrash	Cornbrash	101	K.3	10.0
59.5	78.0	18.5	Clay	Great Oolite Clay		40	Cbd	15.0
78.0	86.5	8.5	Limestone	Great Oolite Limestone		REAMERS USED		
86.5	90.0	3.5	Clay			Size	No.	Feet
90.0	94.5	4.5	Limestone			116	534199	41.0
94.5	98.0	3.5	Clay	Upper Estuarine Series				
98.0	101.5	3.5	Limestone					
101.5	121.0	19.5	Clay					
121.0	198.0	77.0	Oolitic Limestone	Inferior		CASING USED		
198.0	200.0	2.0	Clay	Oolite		Size	Set (Ft.)	Recovered (Ft.)
200.0	211.0	11.0	Limestone	Series		120	83.2	83.2
211.0	213.0	2.0	Clay			113	124.0	124.0
Crossi R. Cassini not recorded Hole not down.								
NO ANALYSIS						Water Used 40,000		
						Rise Water Level 115.0		
						LEVELS		
						Surface	168.0	
						Top 1st.	51.21	
						Bottom 1st.		
						Signed	R. J. M. DICK.	



GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

19

Name and Number given by owner:

NW 203

For whom made

United Steel Co. Ltd.

Town or Village

County Denes.

Exact site

Attach a tracing from
a map, or a sketch
map, if possible.

Purpose for which made

To prove iron ore (No. 1000. 1000)

Ground Level at shaft
bore relative to O.D.

If not ground level give D.D. of beginning of shaft
bore

Made by

Date of sinking

Information from

Date received

Examined by

R. J. Wynter (September 1959)

(For Survey use only)

6-inch Map Registered No.

TF/02 NE/19

Nat. Grid Reference

0700. 2500

1" N.S. Map
No.

1" O.S. Map
No.

Confidential
or not

DECLASSIFIED

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	IN.	FT	IN.
Boulder Clay	Clay - grey and sandy with abundant small chalk pebbles: weathered brown in top 2ft. 9in. of core: some flints in top 2ft. [17ft. 8in. missing from 0ft. to 23ft.]	1.62		7.01	
		5	4	23	0
Oxford Clay	Clay - grey, slightly sand and fissile: many ammonites [1ft. 6in. missing between 23ft. and 25ft.]	0.15		7.62	
			6	25	0
	Clay - ditto [3ft. 6in. missing between 25ft. and 30ft. 6in.]	0.61		9.3	
		2	0	30	6
Kellaways Sand	Sandstone - grey, fine-grained, calcareous: in top 1ft. thin dark grey clayey films and wips; rather disturbed bedding; occasional bellerophonites and very occasional fragments of pelecypods; one ammonite 1ft. 5in. from top.	0.76		9.91	
		2	6	32	6
	Clay - fragments of very sandy grey clay and some rather clayey sandstone; some pelecypods [1ft. 2in. missing between 30ft. 6in. and 35ft.]	0.29		10.67	
			10	35	0
	Sandstone - grey, fine-grained, calcareous irregularly bedded with darker grey wips; occasional pelecypods; rather clayey in base 2in.	0.91		13.41	
		1	8	44	0
Kellaways Clay	Clay - dark grey with many small shell fragments and occasionally complete small pelecypods; [9ft. 6in. missing between 35ft. and 44ft.]				

Name of Shaft or Bore given by Geological Survey:

NW 203

6-inch Map
Registered
No.

TF/02 NE/19

3

0700.2500

GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	in.	FT	in.
Kellaways Clay	Brought forward	0.91		13.41	
	scattered small pyrite nodules in basal 6 in.	3	0	4.4	0
	Marl - grey, very shelly and rather soft; many paleopods and some crinoid stems; grey-green very argillaceous patches; becoming stronger towards base.	0.1	4	18.6	6?
	Limestone - rather noddy with darker argillaceous patches; much vly small shell fragment material.	0.2	8		
Combach	Limestone - grey, fine-grained, compact and strong; much finely broken shell debris in matrix; scattered thin lenses and irregular bands of pale greenish-grey silty mudstone; soft and noddy in basal 1 in.	0.23	9		
	Limestone - rather pale grey, compact, strong and fine-grained with little shell debris; occasional thin argillaceous maps near top.	0.25	10	18.66	0
	[4 ft. 5 in. missing between 44 ft. and 54 ft.]				
	Limestone - ditto; fragments of large Ostrion marshalli, and corals at c. 8 ft. 5 in.	0.25	10		
	Marl - grey noddy limestone with many dark grey muddy maps and laminae.	0.91	3		
	Limestone - grey, fine-grained, compact and rather strong with much very finely broken shell debris; many irregular 'tubes' of dark grey muddy material; few complete shells except in basal 6 in.	0.59	11		
	Limestone - darker grey, softer and very muddy and shelly	0.18	7	18.14	
	Marl - dark grey, shelly marl	0.2	8	59	6
	Clay - dark greenish-grey, stiff and very sandy	0.23	9		
	Clay - dark grey with ochreous mottling and many slickensided surfaces; scattered bright red patches also in basal 4 in.	0.46	6	19.51	
	Clay - dark grey and sandy	0.15	6	64	0
	[3 ft. missing between 54 ft. and 64 ft.]				
	Clay - dark grey with occasional fine pale buff silty laminae; pale grey in basal 8 in.	0.36	2		
	Clay - deep green mottled brown with scattered small dark grey carbonaceous patches	0.23	9		
Great Oolite Clay	Clay - pale buff, compact and silty	0.05	2		
	Clay - dark grey-green with some brown mottling	0.13	5	22.86	0
	[8 ft. 6 in. missing between 64 ft. and 75 ft.]				
	Clay - dark greenish-grey with yellow-brown mottling and scattered small carbonaceous patches; often slickensided	0.33	1		
	Clay - very dark grey to black and rather sandy	0.25	10		
	Marl - dark grey and greenish-grey shelly marl	0.1	4		

Name of Shaft or Bore given by Geological Survey:

NW 203

6-inch Map
Registered
No.

TF/02NE/19

4.

0700.2500

GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	IN.	FT	IN.
Great Oolite Clay	Brought forward	22	86	7	75
	Clay - brown; very plastic	0.09	2		
	Clay - very dark gray to black and rather fine; many bedding planes crowded with pelecypods	0.56		23	27
	[9 in. missing between 75 ft. and 78 ft.]	1	10	78	0
Great Oolite Limestone	Limestone - dark gray, shelly and very muddy with abundant small pelecypods in top 3 in. and many oysters below; mostly compact and fairly strong; very dark gray muddy strips and lenses	0.53			
	Limestone - rather pale, slightly greenish-gray and rather muddy; fairly strong and compact; very shelly with abundant oysters	0.46			
	Limestone - gray, fine-grained, slightly crystalline with scattered greenish patches; very shelly	0.2	8	29	3
	[1 ft. 1 in. missing between 78 ft. and 83 ft.]			83	0
Upper Estuarine Series	Limestone - little; somewhat silty and with large pelecypods preserved in brown calcite; less shelly from c. 85 ft. 6 in.	1.07		26	37
	Clay - a few fragments of sandy clay only	3	6	86	6
	Limestone - pale greenish-gray, fine-grained and fairly strong; rather sandy texture; many pelecypods.	27	58	90	6
	Clay - greenish-gray, sandy and rather muddy	0.3		27	89
Upper Estuarine Limestone	[4 ft. missing between 91 ft. 6 in. and 93 ft.]	1	0	91	6
	Clay - bright green	0.15	6	93	0
	Clay - dark gray and somewhat fine; many pelecypods			28	35
	Clay - greenish-gray, sandy and rather muddy	0.1	4		
Upper Estuarine Series	Clay - dark gray and somewhat fine; many pelecypods	0.23	9		
	Clay - greenish-gray and sandy	0.08	3		
	Clay - dark gray, shelly and muddy with abundant poorly preserved pelecypods	0.25	10		
	Limestone - gray, shelly and rather muddy; shelly very poorly preserved	0.36			
Upper Estuarine Limestone	Limestone - greenish-gray, fine-grained and strong with a rather sandy texture; bright green patches and dark gray rosette occur; many pelecypods.	1	2		
	Limestone - gray, compact? sandy; rather less strong than above; many pelecypods; becoming very argillaceous in basal 5 in with many pelecypods ('comp. data')	0.2	8		
	[3 ft. missing between 93 ft. and 101 ft. 6 in. - almost wholly from clays.]	0.46		30	96
	Clay - gray, very sandy, plastic and shelly	1	6	101	6
Upper Estuarine Series	[1 ft. 10 in. missing between 101 ft. 6 in. & 104 ft.]			31	7
	Clay - deep green and sandy with brown rosettes	0.2	8	104	0
		0.1	4		

Name of Shaft or Bore given by Geological Survey:

NW 203

6-inch Map
Registered
No.

TF/02NE/19

5

0700.2500

GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	IN.	FT	IN.
Upper Estuarine Series	Brought forward			104	0
	Clay - dark grey and frequently laminated, with thin laminae of buff silty clay			31.7	
	Clay - very dark grey-brown to and friable with occasional shelly bedding planes	0.23	9		
	Clay - very dark grey and friable with occasional thin wings and laminae of buff silt	0.29	10		
	Clay - buff, very silty and sandy; laminated; many rootlets	0.15	6		
	Clay - brown, sandy and blocky; many rootlet traces; frequently shikaroided; quite hard.	0.28	11		
	Clay - pale brown, very silty, blocky and quite hard	0.13	5	36.44	0
	[5 ft. 3 in. missing between 104 ft. and 113 ft.]			113	
	Clay - brown, structureless blocky clay with dark grey mottling and rootlet traces	0.15	6		
	(still drilling in Upper Estuarine).				



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

20

Name and Number given by owner:

NW 144

For whom made

United Steel Co. Ltd.

Town or Village

Hanborough

County

Lincoln.

Exact site

(Attach a tracing from a map, or a sketch-map, if possible.)

Purpose for which made

To prove iron ore (Northants Land)

Ground Level at

shaft

bore

relative to O.D.

155.6 ft.

If not ground level give O.D. of beginning of shaft

bore

Made by

47.43 m

Date of sinking 16.5.59 - 6.5.59

Information from

United Steel Co. Ltd.

Date received

18.9.59

Examined by

(For Survey use only)

6-inch Map Registered No.

TF/02SE/20

Nat. Grid Reference

0700 2400

1" N.S. Map No.

143

1" O.S. Map No.

Confidential or not

Yes

GEOLOGICAL LOG

Depth Feet	Thick. Ft.	Description	Geological Horizon
From To			
0.0 15.0	15.0	Boulder Clay	Recent
15.0 20.0	5.0	Clay Oxford Clay	Ok. Cl. S.
20.0 35.0	15.0	Sand and Sandstone	Kellaways beds
35.0 40.0	5.0	Clay	
40.0 50.0	10.0	Limestone Cornbrash	Cornbrash
50.0 64.0	14.0	Great Oolite Clay	Great Oolite Series
64.0 83.0	19.0	Great Oolite Limestone	
83.0 88.0	5.0	Clays	
88.0 92.0	4.0	Limestone	
92.0 113.0	21.0	Clay + 12.99 m	
113.0 192.0	79.0	Oolitic Limestone	Inferior oolite Series
192.0 194.0	2.0	Clay	
194.0 206.0	12.0	Limestone	
206.0 211.0	5.0	Sands and silts	
211.0 226.0	15.0	Gray sandy Ironstone, Northampton ends red	
226.0 231.0	5.0	Blue Clay. Upper Blue Clay	Upper Blue

Details 211' - 226' 64.31 - 69.8

211'0"	211'1"	Gray-brown slightly oolitic fine ribbed sandstone
64.31	64.36	Gray-green oolitic sandstone, common thin irregular bands
211'1"	212'0"	
64.36	64.62	
212'0"	213'0"	Dark brown even-grained oolitic sandstone
64.62	64.92	
213'0"	219'0"	Mainly gray even-grained oolitic sandstone; sometimes gray-brown in colour; occasional thin irregular dark gray-brown hard silty sandstone bands; some nodules 216'3" - 216'9", below 216'0" more than 6'9" - 6'8" of non-oolitic silty sandstone.
64.92	66.75	
219'0"	221'6"	Gray-brown fine-grained sandstone with abundant pale gray or green oolites distributed in bands, lenses and thin masses in a pale brown matrix; oolites less abundant from c. 220'6" very few below 221'0"
66.75	67.51	

67.56 P.T.O.

DRILL LOG

CROWNS USED		
Size	No.	Feet
131	Old	111.0
116	583049	100.0
101	584025	20.0

REAMERS USED		
Size	No.	Feet
116	503850	100.0
101	503801	20.0

CASING USED		
Size	Set (Ft.)	Recovered (Ft.)
126	111	111
	33.23	33.83

Water Used	23,500
Rest Water Level	77.0 23.47

LEVELS	
Surface	55.65
Top 1st.	-55.65
Bottom 1st.	-75.64
	22.07

Signed R. G. W. P. M.

2.

221'6" - 222'0"
67.91 67.67
222'0" - 228'4"
67.67 69.99

gray fine-grained sandstone

Very fine-grained sandstone with scattered brown oxidized
oolites and occasional small pebbles of brown oxidized
oolitic ironstone; from 223'0" oolites represented by
moulds - shell fragments less common than above;
below 224'6" becomes a good oolitic ironstone with pale
gray oolites; many mudstone pebbles below 227'5"; 69.32
from 227'3" becoming a gray-luff or pale brown silty
mudstone with pebbles of green oolites and/or green clay
fragments. Ironstone pebbles above 228'0".

228'4" - 229'0"
69.99 69.8

gray silty clay fragments (Vhi)

69.69

R.J.W.



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

25

Name and Number given by owner:

NW 255

For whom made

United Steel Co. Ltd.

Town or Village

Stairfield

County

Lincoln

Exact site

Attach a tracing from
a map, or a sketch-
map, if possible.

Purpose for which made

Ironstone

Ground Level at shaft bore relative to O.D.

179.8 ft

If not ground level give O.D. of beginning of shaft bore

Made by

548 m

Date of sinking 14.12.59 - 31.12.59

Information from

Date received

Examined by

(For Survey use only)

6-inch Map Registered No.

TF/02SE/25

Nat. Grid Reference

0684.2484

1" N.S. Map
No.

143

1" O.S. Map
No.

Confidential
Yes not

Yes

GEOLOGICAL LOG

Depth Feet From	To	Thick- ft	Description	Geological Horizon
0.0	10.67	10.67	Brackish Clay	Recent
10.67	14.02	3.35	Clay. Oxford Clay	Oxford
14.02	16.92	2.9	Gray Sand and sandstone (Northampton Bed)	Clay
16.92	18.44	1.52	Gray clay	Series
18.44	20.88	2.44	Limestone. Cornbrash	Cornbrash
20.88	22.82	1.94	Clay. Great Oolite Clay	Great
22.82	24.81	1.99	Limestone. Great Oolite Limestone	Oolite
24.81	26.82	2.01	Clay	Series
26.82	28.82	2.0	Limestone. Upper Estuarine Series	
28.82	30.82	2.0	Clay	
30.82	32.82	2.0	Oolitic Limestone	Superior
32.82	34.82	2.0	Clay	Oolite
34.82	36.82	2.0	Limestone	Series
36.82	38.82	2.0	Gray silty clay. Lower Estuarine Series	
38.82	40.82	2.0	Gray sandy ironstone. Northampton Sands Bed	
40.82	42.82	2.0	Blue Clay. Upper Lias Clay	Upper

R. Crossi not recorded.

DRILL LOG

CROWNS USED

Size	No.	Feet
131	GED	25.82
116	GED	16.02
101	NOB	26.21
101	594545	30.0

REAMERS USED

Size	No.	Feet
101	594150	30.0

CASING USED

Size	Set (ft.)	Recorded (ft.)
128	84.5	25.76
118	132.7	132.7

Water Used 33,000

First Water Level
135.0 41.14

LEVELS

Surface	179.8
Top 1st.	54.8
Bottom 1st.	14.6
	18.5

Signed

R. J. M. DIXIE

2

0684. 2484

TF/02 SE/25

NW 255

227'9" - 229'0"	69.42m 69.8m	largely strong compact dark gray-brown silty mudstone (ferruginous) with scattered patchily distributed pale gray siltstone.	
229'0" - 231'6"	69.8m 70.56	gray-brown siltic ironstone - pale gray or green siltstone or voids in fine-grained brown sandy matrix.	
231'6" - 234'9"	70.56 71.55	pale brown fine-grained compact sandstone with very few scattered siltstone to c. 233'9" 71.25m; none below; slightly calcareous from 232'6" 70.87m	NSI (12'9")
234'9" - 237'9"	71.55 72.47	gray fine-grained calcareous sandstone	
237'9" - 240'6"	72.47 73.3	Ditto with some pitted siltstone or voids; from 240'0" 73.19m typical basement bed with gray mudstone pebbles and large ? pebbles of pale brown silty mudstone; much pyrite in basal 1 inch (nodular).	
		0.02m	

R. J. W.



Norwest Holst Soil Engineering Ltd.						Borehole No. 73	
BOREHOLE LOG							
Contract No. 4517		Location Hatton to Peterborough		Sheet 1 of 1			
Client British Gas		Method of Boring Percussion		Chainage TF02SE 117			
Diameter of Borehole 150mm				Ground Level m.A.O.D.		Date 30/5/80	

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth	Sampling and Coring	"N"/R.Q.D.%	Daily Progress
TOPSOIL		0.40					
Firm to stiff light brown silty fine sandy CLAY with occasional medium angular sandstone gravel and occasional roots. 2.10 to 2.60m boulder obstruction.				150mm to 2.60	0.70 1.70 2.80	(39) (38) (100)	
Stiff grey friable silty CLAY with mudstone lithorelics. ...4.90 to 5.30m boulder obstruction. ...below 7.50m becoming very weak grey laminated silty MUDSTONE with occasional shell fragments.		3.70 8.00			4.00 5.50 7.50	(90) (95) (99)	

Type of Sample S.P.T. Undisturbed C.P.T. Vane Jar Water Bulk Piezometer	Remarks (Observations of Ground Water etc.) () Blows required to drive undisturbed samples water strike 2.20m inflow moderate casing at 2.20m. Sealed at 2.60m final standing level. Chiselling 2.10m to 2.60m 3/4 hr and 4.90m to 5.30m 3/4 hr.
--	---

Water levels are subject to seasonal or tidal variations and should not be taken as constant



Norwest Holst Soil Engineering Ltd.						Borehole No. 74	
Contract No. F4517		BOREHOLE LOG		Sheet 1 of 1			
Location Hutton to Peterborough				Chainage			
Client British Gas		TF02SE 118		Ground Level		m.A.O.D.	
Method of Boring Percussion				Date 31/5/80			
Diameter of Borehole 150 mm							
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth	Sampling and Coring	"N"/R.Q.D. %	Daily Progress
TOPSOIL		0.35					
Firm brown silty CLAY.	X	1.15		150mm to 1.50	0.70		
Firm brown and grey mottled very sandy CLAY, becoming clayey sand in places.	X	2.85			1.50		
Firm grey poorly laminated silty CLAY with occasional fine sand.	X	4.10			2.85		
LIMESTONE.		4.30			3.50		
					4.30	60 for 50mm	

Type of Sample	Remarks (Observations of Ground Water etc.)
☒ S.P.T. ☒ Undisturbed ☒ C.P.T. ☒ Vane ☐ Jar ☐ Water ☐ Bulk ☐ Piezometer	Borehole dry during excavation. Chiselling 4.10 m to 4.30

Water levels are subject to seasonal or tidal variations and should not be taken as constant



For Institute use only Licence No.

NN.....

RECORD OF WELL

At ELSTHORPE 305.....

Town or Village ELSTHORPE.....

County LINCOLNSHIRE.....

I43 / 434

143/434

TF 02 SE 90

EXACT SITE
OF WELL

132 SW/E

Six-inch National Grid sheet and reference TF 0561 2478 TF 02 SE.....

For ANGLIAN WATER AUTHORITY (WELLAND & NENE).....

State whether owner, tenant, builder, contractor, consultant, etc.:.....

Address (if different from above)

Level of ground surface above sea level (O.D.)..... ft (39.859..... m)

*DELETE

If well top is not at ground level state how far ^{above*} below:..... ft (..... m)

AS

SHAFT..... ft (..... m); diameter..... ft (..... m);

NECESSARY

HEADINGS (please attach details--dimensions and directions)

BORE 145'..... ft (44.2..... m); diameter: at top..... in (..... mm);

at bottom..... in (..... mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

ABS PLASTIC..... PLAIN..... 8" DIA..... 15m DEEP.....

"..... "..... 6"..... 15.....

"..... PERFORATED..... 6"..... 30 (15).....

Water struck at depths of..... ft (..... m) below well top

Rest level of water..... ft (..... m) ^{above*} below well top. Suction at..... ft (..... m)

TEST

Yield on..... ^{hours*} _{days} test pumping at..... galls per..... (..... l/s) with

CONDITIONS

depression to..... ft (..... m) below well top. Recovery to rest level in..... mins*
hours

Capacity of pump..... g.p.h. (..... l/s)

Date of measurements.....

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type ROTARY..... Motive power.....

NORMAL

CONDITIONS

Capacity..... galls (..... m³) per hour. Suction at..... ft (..... m)

below well top. Amount pumped..... galls (..... m³) per day. Estimated

consumption..... galls (..... m³) per week

Well made by DRILLING & GEOSERVICES..... Date of sinking 1/11/75.....

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF

STRATA

OVERLEAF

Received from A.W.A......

Date.....

Observation well..... ☒

Recorder.....

ER log.....

Site marked on

1" map



TF 02 SE / 90

For Institute use only

GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

If measurements start below ground surface, state how far.

THICKNESS

DEPTH

Feet

Inches

Metres

Feet

Inches

Metres

no drift shown on
1" map. Blisworth Clay

DRIFT & GREAT OOLITE CLAY

4

4

Blisworth Limestone

GREAT OOLITE LIMESTONE

2

6

Upper Estuarine Series

UPPER ESTUARINE SERIES

7.2

13.2

Lincolnshire Lst.

LINCOLNSHIRE LIMESTONE

31

44.2

RAE

7-11-80



RECORD OF WELL

At ELSTHORPE 305
Town or Village ELSTHORPE
County LINCOLNSHIRE

For Institute use only Licence No.

143 / TF02/55
434

43/434

EXACT SITE
OF WELL

132 SW/E

Six-inch National Grid sheet and reference TF 0561 2478 TF 02 SE

For ANGLIAN WATER AUTHORITY (WELLAND & NENE)

State whether owner, tenant, builder, contractor, consultant, etc.:

Address (if different from above)

Level of ground surface above sea level (O.D.) 39.859 ft (.....m)

*DELETE

If well top is not at ground level state how far above*
below:ft (.....m)

AS

SHAFTft (.....m); diameterft (.....m);

NECESSARY

HEADINGS (please attach details—dimensions and directions)

BORE 145'ft (44.2m); diameter: at topin (.....mm);

at bottomin (.....mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

ABS. PLASTIC PLAIN 8" DIA 15m DEEP

" " 6' 15

" PERFORATED 6" 30 (15)

Water struck at depths offt (.....m) below well top

Rest level of waterft (.....m) above* well top. Suction atft (.....m)

Yield on hours*
days' test pumping atgalls per (..... l/s) with

depression toft (.....m) below well top. Recovery to rest level in mins*
hours

Capacity of pumpg.p.h. (.....l/s)

Date of measurements

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type ROTARY Motive power

Capacitygalls (.....m³) per hour. Suction atft (.....m)

below well top. Amount pumpedgalls (.....m³) per day. Estimated

consumptiongalls (.....m³) per week

Well made by DRILLING & GEOSERVICES Date of sinking 1/11/75

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF
STRATA
OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

Received from A.W.A.

Date

Observation well ☒

Recorder

ER log

Site marked on

1" map ①

6" map—Grid Sheet ②

(use symbol)

Copy to C&SM

Date



For Institute use only

GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

If measurements start below ground surface, state how far.

THICKNESS

DEPTH

Feet

Inches

Metres

Feet

Inches

Metres

No drift shown on Map

Blisworth Clay DRIFT & GREAT OOLITE CLAY

Blisworth Lst. GREAT OOLITE LIMESTONE

U. Estuarine Series UPPER ESTUARINE SERIES

Lincolnshire Lst. LINCOLNSHIRE LIMESTONE

PP.

RAE

7.11.80



ELSTHORPE 305

WELL DETAILS

TF02SE

TF02/55

61

78

DATE DRILLED 1/11/75

DRILLERS DRILLING + GEOSERVICES LTD

CASING DETAILS	MATERIAL	TYPE	DIAMETER	DEPTH
	ABS PLASTIC	PLAIN	5"	15
	"	PLAIN	6"	15
	"	PERFORATED	6"	30 - (15)

GEOLOGICAL DETAILS + AVAILABILITY OF SAMPLES

DRIFT + G.O.C. - 4m;

G.O.L. - 2m; U.E.S. - 7.2m;

L.L. - 31m.

WATER LEVEL ACTIVITY DURING DRILLING

VERTICALITY REMARKS

1:275

DEVIATION

- 3 1 8 2 8 2 10 2

DEPTH

9 18 18 27 27 36 36 43 43

DIRECTION

- N W N W N W N W

SERVICES IN THE VICINITY

OWNER OF SURROUNDING LAND

NEAREST BOREHOLE 67 (143/258) Edenham Elsthorpe Grange farm
2 yds NE of main buildings & 120 yds NE by N of Junction
- Elsthorpe Bulby & Slingsforth roads

REMARKS

O.D. - 39.859 m.a.s.l.



ANGLIAN WATER AUTHORITY

WELLAND AND NENE RIVER DIVISION

LINCOLNSHIRE LIMESTONE GROUNDWATER STUDY

SAMPLES TAKEN AT ELSTHORPE B/H 305

SAMPLE No.	BOREHOLE SITE		TEMPERATURE °C	pH	ELECTRICAL CONDUCTIVITY µS/cm	AMMONIA AS N mg/l	TOTAL OXIDISED NITROGEN AS N mg/l	ALKALINITY AS CaCO ₃ mg/l	TOTAL HARDNESS AS CaCO ₃ mg/l	CHLORIDE mg/l	SULPHATE AS SO ₄ mg/l	CALCIUM mg/l	MAGNESIUM mg/l	SODIUM mg/l	POTASSIUM mg/l	FLUORIDE mg/l
	No.	DATE														
		12th June 1979	9.53	7.65	680	0.05	8.70	220	372	26	122	131	11.0	14.6	-	0.13
		17th July 1979	12.1		670		5.75	230		22						
		15th Aug. 1979	9.63		610		0.28	240		19						
		12th Sept. 1979	9.68	7.30	740	0.05	9.87	250	417	36	125	156	6.58	12.8	2.53	0.11
		17th Oct. 1979	10.6	7.62	653		0.2	250		16						
		13th Nov. 1979	10.0	7.68	651		0.26	240		18						
		6th Dec. 1979	10.0	7.63	650	0.112	0.2	240	295	16	88.1	102	9.74	24.0	1.93	0.14
		16th Jan. 1980	10.3		660		0.2	240		19						
		13th Feb. 1980	9.27		715		6.60	215		22						
		13th March 1980	9.18	7.62	682	0.063	3.14	230	316	18	97.9	111	9.41	21.9	2.57	0.14
		15th April 1980	9.18		765		8.75	230		26						
		14th May 1980	9.12	7.53	781		8.83	220		28						

TF02/55

TF02/55

LINCOLNSHIRE LIMESTONE INVESTIGATION

OBSERVATION BOREHOLE WATER LEVEL RECORDS

Name... ELSTHORPE

No. 305

N.G.R. TF 054 249

Year. 1976

January	6	13	20	27		Date
	19.26	19.58	19.34	19.06		W.L.
February	3	10	17	24		Date
	18.93	18.97	19.09	18.96		W.L.
March	2	9	16	23	30	Date
	18.84	18.71	18.67	18.78	18.64	W.L.
April	6	13	21	27		Date
	18.57	18.28	18.23	17.73		W.L.
May	4	11	18	26		Date
	17.25	16.89	16.37	16.04		W.L.
June	3	8	15	22	29	Date
	16.09	15.93	15.74	15.65	15.51	W.L.
July	6	13	20	27		Date
	15.39	15.20	15.20	15.14		W.L.
August	3	10	18	26		Date
	15.06	14.98	14.86	14.92		W.L.
September	2	9	16	22	29	Date
	15.07	15.04	15.06	15.05	15.45	W.L.
October	6	13	20	26		Date
	16.75	17.61	18.58	18.80		W.L.
November	1	9	17	24	30	Date
	19.16	19.22	19.18	19.27	19.26	W.L.
December	8	15	22	30		Date
	19.37	19.46	19.64	19.86		W.L.

TF02/55

LINCOLNSHIRE LIMESTONE INVESTIGATION

OBSERVATION BOREHOLE WATER LEVEL RECORDS

Name... ELSTHORPE

No. 305

N.G.R. TF...054...249

Year. 1977

January	5	12	19	26		Date
	20.07	20.67	21.13	21.71		W.L.
February	2	9	16	23		Date
	22.54	23.60	25.09	26.66		W.L.
March	2	7	16	23	30	Date
	28.79	27.61	29.92	29.78	29.56	W.L.
April	4	13	20	27		Date
	29.35	29.03	28.48	27.96		W.L.
May	4	10	18	25	31	Date
	27.45	27.12	26.52	26.05	25.45	W.L.
June	9	14	24			Date
	24.62	24.16	23.33			W.L.
July	6	11	19	26		Date
	22.08	21.45	20.52	19.72		W.L.
August	1	8	17	23	31	Date
	19.30	19.13	18.81	18.74	18.61	W.L.
September	6	13	21	28		Date
	18.49	18.33	18.18	18.11		W.L.
October	5	12	19	25		Date
	18.05	17.98	17.82	17.74		W.L.
November	2	8	15	23		Date
	17.57	17.70	17.59	17.39		W.L.
December	2	8	15	22		Date
	17.29	17.38	19.00	19.16		W.L.

TF02/55

LINCOLNSHIRE LIMESTONE INVESTIGATION
OBSERVATION BOREHOLE WATER LEVEL RECORDS

Name.....ELSTWORTH.....

No.395.....

N.G.R.TF 054 249.....

Year. 1978

January	4	10	18	25		Date
	18.76	18.55	19.31	19.55		W.L.
February	1	7	14	22		Date
	19.79	19.96	20.82	21.43		W.L.
March	1	6	14	21	29	Date
	20.98	22.37	22.99	23.09	23.34	W.L.
April	5	11	18	25		Date
	23.18	23.03	22.72	22.35		W.L.
May	4	8	16	23	31	Date
	21.81	21.88	22.69	22.99	22.87	W.L.
June	7	13	21	27		Date
	22.54	22.11	21.63	21.15		W.L.
July	5	10	18	25		Date
	20.81	20.77	20.32	19.74		W.L.
August	2	7	15	22	30	Date
	19.38	19.54	19.61	19.30	19.15	W.L.
September	7	13	21	28		Date
	18.89	18.73	18.55	18.38		W.L.
October	5	11	19	25		Date
	18.32	18.16	18.12	18.07		W.L.
November	2	8	16	23	30	Date
	17.95	17.86	17.76	17.78	17.71	W.L.
December	6	14	21			Date
	17.67	19.18	19.52			W.L.

TF02/55

LINCOLNSHIRE LIMESTONE INVESTIGATION

OBSERVATION BOREHOLE WATER LEVEL RECORDS

Name... ELSTHORPE

No. 305

N.G.R. .. TF...054...249

Year. 1979

January	3	12	18	26		Date
	20.44	21.74	22.45	23.05		W.L.
February	2	8	21			Date
	23.73	24.59	26.06			W.L.
March	6	19	21	28		Date
	27.47	28.14	28.41	28.95		W.L.
April	6	12	18	25		Date
	29.55	29.97	30.16	30.19		W.L.
May	4	11	16	23	29	Date
	29.75	29.39	29.21	28.73	28.57	W.L.
June	7	13	21	28		Date
	28.25	27.86	27.20	26.56		W.L.
July	6	13	18	25		Date
	25.92	25.29	24.86	24.21		W.L.
August	3	9	15	23	30	Date
	23.43	22.92	22.47	22.49	21.27	W.L.
September	6	12	17	25		Date
	20.72	20.25	19.84	19.41		W.L.
October	5	11	17	24		Date
	19.27	19.20	19.13	18.95		W.L.
November	2	9	14	22	30	Date
	18.88	18.94	18.99	19.20	19.13	W.L.
December	6	10	17	28		Date
	18.93	18.95	19.72	20.55		W.L.





DRILLING & GEOSERVICES LIMITED

**FOUNDATION and GEOTECHNICAL ENGINEERS
WATERWELL BORING CONTRACTORS**

BERMUDA ROAD INDUSTRIAL ESTATE,
BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

DAILY BOREHOLE RECORD

CLIENT Wolland & Nene BIG TYPE Hands & Feet

CONTRACT

BOREHOLE No.

O.D. LEVEL

DATE 31. 10. 75

[illegible]



DRILLING & GEOSERVICES LIMITED
FOUNDATION and GEOTECHNICAL ENGINEERS
AND CONTRACTORS

FOUNDATION and GEOTECHNICAL ENGINEERS
WATERWELL BORING CONTRACTORS

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TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390
FAX: 0682 68328
FACSIMILE RECORD

DAILY BOREHOLE RECORD

TELEPHONE: NUNEATON 68328/9 or 68329
DAILY BOREHOLE RECORD
CLIENT Welland + Nene RIG TYPE Hands England
BOREHOLE No. 11

O.D. LEVER

O.D. LEVEL _____
DATE 1.11.75

CONTRACT

BOREHOLE No.

DRILL CREW

DRILL CREW
✓ H. TIMMONS.
B. Mackin.



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DAILY BOREHOLE RECORD

CLIENT Art + View

RIG TYPE Handwritten O.D. LEVEL

CONTRACT

BOREHOLE No.

DATE 8-11-73



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DAILY BOREHOLE RECORD

CLIENT Welland, N.Y. RIG TYPE Land D. LEVEL 21
CONTRACT BOREHOLE No. 11 DATE 4.11.75

CONTRACT _____ BOREHOLE No. 2011 DATE 4.11.75



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DAILY BOREHOLE RECORD

CLIENT Welland & New RIG TYPE Trans. England O.D. LEVEL

CONTRACT _____ BOREHOLE No. 11 DATE 5-11-75



DRILLING & GEOSERVICES LIMITED

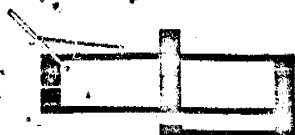
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DAILY BOREHOLE RECORD.

CLIENT William L. Wiers RIG TYPE Harold's Dayland O.D. LEVEL _____
CONTRACT _____ BOREHOLE No. W 11 DATE 6-11-75



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TF02/55

DAILY BOREHOLE RECORD

CLIENT W. A. WATER RIG TYPE H-2 O.D. LEVEL _____
CONTRACT STIMPORD BOREHOLE No. 5 DATE 10-11-78

227 227.

ANGLIAN WATER AUTHORITY
WELLAND & NENE
19 NOV 1975
RIVER DIVISION
HEAD OFFICE



BGS ID: 468159 : BGS Reference: TF02SE90
British National Grid (27700) : 505610,324780

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BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

TF02/55

CLIENT W. M. WATER RIG TYPE H. E O.D. LEVEL _____
CONTRACT STAMPED BOREHOLE No. NO 5 DATE 11-11-75

nn nn nn nn.



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BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

DAILY BOREHOLE RECORD

CLIENT W.A. NORTON

RIG TYPE 17 L

O.D. LEVEL 21 May

CONTRACT 57441-040

BOREHOLE No. 1405

DATE 13-11-75

Method of Drilling	Size	From	To	Distance	Recovery	Core Run No.	Depth	Legend	Geological Description
									<u>DRILLING COMPLETED</u>
REMARKS									
PULLED OUT									
DUG COLLAR & CEMENTED									
BOTTOM.									
WAITING FOR 5 1/2" PERF. CASING.									
DRILL CREW									
S. L. GILBERTSON									
B. MACHINE.									



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BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

TF02/55

DAILY BOREHOLE RECORD

CLIENT W & M. WATER RIG TYPE H E WATER
O.D. LEVEL 21 meter.

CONTRACT STAMPED BOREHOLE No. NOS DATE 12-11-75

CO
101

Digitized
dike/water and chemistry
entered.



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

2

Name and Number given by owner:

NW 27

For whom made

United Steel Co. Ltd.

Town or Village

Elthorpe

County

Leeds

Exact site

966 yds

N 27° E

f Elthorpe

Grange

(Attach a tracing from
a map, or a sketch-
map, if possible.)

Purpose for which made

To prove iron ore

Ground Level at shaft
bore

relative to O.D.

127 ft 38.71 m

If not ground level give O.D. of beginning of shaft
bore

Made by

Date of sinking

16.6.58 - 25.6.58

Information from

United Steel Co. Ltd.

Date received

20.8.58

Examined by

(For Survey use only)

6-inch Map Registered No.

TF/02 NE/2

Nat. Grid Reference

0516 2500

1° N.S. Map
No.

1° O.S. Map
No.

Confidential
or not

DECLASSIFIED

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	m	FT	m
Alluvium	Clay - brownish washings	8.5	2.59	8.5	2.59
	Clay - grey-brown washings	1.5	0.46	10	3.0
	Gravel	5.0	1.52	15	4.57
Upper Eocene series	Sandy yellow clay	1.0	0.30	16	4.88
	Grey clay	1.0	0.30	17	5.18
	Upper Eocene limestone	3.0	0.91	20	6.10
Upper Eocene series	Upper Eocene limestone	19.4	6.06	39	11.89
	limestone	39.8	12.16	78	23.77
	Crassi Bed	2.0	0.61	80	24.38
Lower Eocene limestone	limestone	40.0	12.19	120	36.58
	Clay parting	6.0	1.83	126	38.40
	Rugstone	9.6	2.89	135.5	41.3
Lower Eocene series	Grey, hard sandy clay	3.0	0.91	138.5	42.21
	Ironstone	14.5	4.42	153	46.63
Northampton shales	Clay	3.0	0.91	156	47.54
Water level at 39 ft 11.89					
Water level at 31 ft 9.45					
41.91 → 42.14	137 ft 6 in - 138 ft 3 in	brown fine-grained sandstone			
42.14 → 43.13	138 ft 3 in - 141 ft 6 in	pale brown siltstone with generally white siltstone frequent irregular beds and patches of dark brown silty mudstone without siltstone			
43.13 → 43.66	141 ft 6 in - 143 ft 3 in	brown or yellow-brown, fine-grained sandstone			

~~467980~~
3

143ft. 3in. - 148ft. 3in.
43.06 - 45.19 m

148ft. 3in. - 149ft. 9in.
45.19 - 45.64 m
149ft. 9in. - 151ft. 3in.
45.64 - 46.101 m

151ft. 3in. - 153ft. 0in.
46.101 - 46.63 m

153ft. 0in. - 153ft. 6in.
46.63 - 46.8 m

153ft. 6in. - 154ft. 6in.
46.8 - 47.09

with few scattered oolites

buff-grey, fine-grained, irregularly-bedded sandstone with
very few scattered oolites; becoming grey and very
compact below 146ft. 3in.; occasional small mudstone
pebbles below 147ft. 2in.

green-grey oolitic sandstone

dark green, patchily oolitic sandstone with irregular patches
of poorly oolitic mudstone; yellow-brown oxidised patches.

pale grey, fine-grained sandstone with occasional oolites; in
band 6in very nodular and argillaceous

grey muddy sandstone with frequent pebbles of grey or buff calcareous
sandstone and chert-intruded pyrite.

grey clay



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

18

Name and Number given by owner:

NW 63

For whom made

United Steel Co. Ltd.

Town or Village

County. *Leics.*

Exact site

166 yds. N 22 1/2° E of the bridge,

Bulby

(Attach a tracing from
a map, or a sketch-
map, if possible.)

Purpose for which made

To prove iron ore (Northants. Sand)

Ground Level at

shaft
bore

relative to O.D. *222.0 ft.*

If not ground level give O.D. of beginning of shaft
bore

Made by

Date of sinking

18.9.58 - 1.10.58

Information from

United Steel Co. Ltd.

Date received

11.12.58

Examined by

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	IN.	FT	IN.
<i>Kellaways Beds</i>	<i>Boulder clay</i>	<i>6.0</i>		<i>6.0</i>	
	<i>Sand</i>	<i>13.0</i>		<i>19.0</i>	
	<i>Clay</i>	<i>7.0</i>		<i>26.0</i>	
<i>Corbrash</i>	<i>limestone</i>	<i>8.0</i>		<i>34.0</i>	
<i>great Oolitic clay</i>	<i>gray clay</i>	<i>15.0</i>		<i>49.0</i>	
<i>great Oolitic Lst.</i>	<i>limestone</i>	<i>17.5</i>		<i>66.5</i>	
<i>Upper E. Triassic Series</i>	<i>gray and green clay</i>	<i>9.0</i>		<i>75.5</i>	
	<i>limestone</i>	<i>4.0</i>		<i>79.5</i>	
	<i>gray and green clay</i>	<i>20.5</i>		<i>100.0</i>	
<i>Upper Lincs. Lst.</i>	<i>Oolitic limestone</i>	<i>33.0</i>		<i>133.0</i>	
	<i>limestone with A. crassi</i>	<i>5.0</i>		<i>138.0</i>	
	<i>Oolitic limestone</i>	<i>36.0</i>		<i>174.0</i>	
<i>Lower Lincs. Lst.</i>	<i>limestone</i>	<i>5.0</i>		<i>179.0</i>	
	<i>Clay parting</i>	<i>4.0</i>		<i>183.0</i>	
	<i>Roystone</i>	<i>12.5</i>		<i>195.5</i>	
<i>Lower E. Triassic Series</i>	<i>Siltstone</i>	<i>0.5</i>		<i>196.0</i>	
<i>Northampton Sands</i>	<i>Sandy limestone</i>	<i>17.7</i>		<i>213.7</i>	
<i>Upper Lincs</i>	<i>Blue clay</i>	<i>1.3</i>		<i>215.0</i>	
	<i>R.W.L. 85.0 ft.</i>				
	<i>Northampton Sands :-</i>				
	<i>195 ft. 0 in - 195 ft. 6 in</i>				
	<i>195 ft. 6 in - 196 ft. 6 in</i>				
	<i>gray fine grained sandy limestone (L. Lincs. Lst.)</i>				
	<i>Pale buff siltstone (Lower E. Triassic Series)</i>				

196 ft. 6 in. - 198 ft. 9 in.

Pale green soft oolitic limestone : occasional oolitic nodules
brown down to 198 ft. 0 in.

198 ft. 9 in. - 199 ft. 4 in.

Large dark brown mudstone with scattered oolites

199 ft. 4 in. - 205 ft. 0 in.

Buff fine-grained sandstone with scattered oolites : becoming
softer and a little pebbly below for 8 in. at 202 ft. 2 in.

205 ft. 0 in. - 209 ft. 6 in.

Buff fine-grained sandstone ; becoming grey at c. 206 ft. 3 in. -
also calcareous.

209 ft. 6 in. - 212 ft. 6 in.

Grey fine-grained sandstone with few oolites ; more abundant
patchily distributed oolites below c. 210 ft. 6 in.

212 ft. 6 in. - 213 ft. 9 in.

Grey fine-grained calcareous slightly micaceous sandstone.



NGRC
BOREHOLE RECORDS
ADJUSTMENT FORM

QUARTER SHEET TF 12 NW

BH REGISTRATION NUMBER 27 - 35

RECORDS ENTERED AND HELD BY WALLINGFORD

BH REGISTRATION NUMBER(S)

TF12/44

NGR TF 12 NW 1357 2668.

Kesteven R.D.C. 69.

DUNSBY FEN.

J.H. Donnipons Farm, Fen Road

Bore - 3 inches

Depth 60 ft.

Information from Kesteven R.D.C.

visited and sited on LINES 133 ^NW/W
O.D. e.g.

Bore overflows - and overflows controlled
Still in use

2. 26.6.47.

144/149

144

149



GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

Name and Number given by owner:

NW 28

For whom made *United Steel Co Ltd.*

Town or Village *Grimthorpe* County *Leics.*

Exact site *Attach a tracing from a map, or a sketch-map, if possible.*

Purpose for which made *contour exploration*

Ground Level at shaft bore relative to O.D. *219.4 ft.* If not ground level give O.D. of beginning of shaft bore *1953*

Made by *U. S. Co. Ltd.* Date received *1953*

Information from *U. S. Co. Ltd.*

Examined by

(For Survey use only)

6-inch Map Registered No.

TF/02SW/6

Nat. Grid Reference

0400. 2408

1" N.S. Map No. 1" O.S. Map No. Confidential or not

DECLASSIFIED

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		Ft	in.	Ft	in.
BCL + OxC	Boulder Clay	68		68	
KLS	Purple sandstone	3 1/2		71 1/2	
KIC	Gray and blue clay	7 1/2		79	
Cb	Limestone with clay bands	7 1/2		86 1/2	
SoC	Blue and green clay	20		106	
SoL	Limestone	7		113	
UE	Gray and green clays	37		150	
	Oolitic limestone	36		186	
LL	Limestone with A. crossi	2		188	
	Oolitic limestone and argillaceous	42		240	
LE	Sandy clay	10		250	
NS	Sandy limestone	24 1/2		274 1/2	
Uki	Clay	2 1/2		277	
	R.W.L. 30'				

NW 28

0400. 2408

TF/02SW/6

- 250'0" - 250'9" Pale yellowish-brown fine-grained sandstone with some dark carbonaceous patches
- 250'9" - 251'6" Pale grey coarsely oolitic sandstone with many oxidised oolites
- 251'6" - 252'0" Grey oolitic ironstone; many oolites oxidised
- 252'0" - 252'3" Grey-green fine-grained sandstone
- 252'3" - 255'0" Pale brown oolitic ironstone with pale grey oolites; many shell moulds
- 255'0" - 257'6" Greenish-grey oolitic ironstone; 1-in sideritic mudstone band at 255'11"; otherwise irregular mudstone bands 256'5" - 257'2"
- 257'6" - 260'8" Grey, fine-grained sandstone with patchily developed oolites
- 260'8" - 261'3" Brown, fine-grained, friable sandstone with many fragments of dark green and blue-coloured mudstone
- 261'3" - 261'11" Pale greenish-grey fine-grained sandstone
- 261'11" - 264'0" Dark grey oolitic ironstone; becoming greenish-grey at 262'5" with oolites patchily developed
- 264'0" - 265'2" Greenish-grey, fine-grained, calcareous sandstone with scattered oolites
- 265'2" - 267'0" Grey, fine-grained, calcareous sandstone; scattered oolites below 266'8"
- 267'0" - 272'8" Dark grey-green oolitic ironstone; patchily developed oolites in top 1' and again below 270'0"
- 272'8" - 274'1" Grey, fine-grained calcareous sandstone
- 274'1" - 274'6" Pale brown calcareous oolite with scattered green oolites and mud pyrite
- 274'6" - 276'0" Dark grey clay with irregular nodules of pyrite in top 2" [U4c]



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

4

Name and Number given by owner:

NW24

For whom made *United Steel Cos. Ltd.*

Town or Village *Grimsby* County *Lincoln.*

Exact site *1933 yds N 311° E of Grimsby* Attach a tracing from
Cath a map, or a sketch
map, if possible.

Purpose for which made *To prove iron ore (Northampton Sands)*

Ground Level at ^{shaft}bore relative to O.D. *183.88 ft.* If not ground level give O.D. of beginning of ^{shaft}bore.

Made by *United Steel Cos. Ltd.* Date of sinking *16.58. - 17.6.58.*

Information from *United Steel Cos. Ltd.* Date received *20.8.58.*

Examined by

(For Survey use only)

6-inch Map Registered No.

TF/02 SW/4

Nat. Grid Reference

0308 2394

1" N.S. Map
No.

1" O.S. Map
No.

Confidential
or not

DECLASSIFIED

Yes

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	in.	FT	in.
<i>Concretions</i>	<i>limestone</i>	6	0	6	0
<i>Great Oolite Clay</i>	<i>Green, blue, red clay</i>	21	6	27	6
<i>Great Oolite Lst.</i>	<i>Gray and blue limestone</i>	8	0	35	6
	<i>Green, gray and black clay</i>	12	6	48	0
<i>Upper Estuarine Series</i>	<i>Gray limestone</i>	3	6	51	6
	<i>Gray, blue, black and red clay</i>	18	6	70	0
<i>Upper Lincs. Lst.</i>	<i>Oolitic limestone</i>	41	0	111	0
	<i>Limestone with A. crassi.</i>	3	0	114	0
	<i>Oolitic limestone</i>	44	6	158	6
<i>Lower Lincs. Lst.</i>	<i>Clay parting</i>	3	0	161	6
	<i>Regulation</i>	6	6	168	0
<i>Lower Estuarine Series</i>	<i>Estuarine</i>	5	0	173	0
<i>Northampton Sands</i>	<i>Sandstone</i>	18	9	191	9
<i>Upper Lincs</i>	<i>Blue clay</i>	1	3	193	0
	<i>? R.W.L. 94.0 ft.</i>				
	<i>Northampton Sands:-</i>				
	<i>173 ft. 0 in. - 174 ft. 0 in.</i>	<i>Soft friable, off-white silt with irregular masses of black carbonaceous material; becoming steeper and coarser (fine sandstone) and buff-grey below 173 ft. 9 in. (LE)</i>			
	<i>174 ft. 0 in. - 175 ft. 5 in.</i>	<i>Buff-grey oolitic medium-grained sandstone with irregular dark carbonaceous patches at top.</i>			
	<i>175 ft. 5 in. - 183 ft. 0 in.</i>	<i>Pale brown oolitic sandstone (oolite frequently white)</i>			

with occasional shell moulds : becoming buff-grey below 177ft. 0in.
1in. of dark brown, hard ferruginous mudstone at 178ft. 6in. ; from
179ft. 6in. to 180ft. 0in. very disturbed bedding with bands and
streaks of dark brown mudstone ; again disturbed with mudstone bands
from 180ft. 8in. and 181ft. 3in.

183ft. 0in. - 183ft. 10in.	grey-buff fine-grained sandstone with scattered oolites
183ft. 10in. - 186ft. 9in.	grey-buff fine-grained sandstone with patchily developed oolites
186ft. 9in. - 190ft. 8in.	greenish-grey fine-grained calcareous sandstone with scattered oolites in basal 4in.
190ft. 8in. - 191ft. 9in.	greenish-grey oolitic sandstone with patchily developed oolites.



RECORD OF WELL

For Institute use only Licence No.

NN.....

143 / 433

TF 02 SW 138

143/433

At ... GRIMSTHORPE 307

Town or Village GRIMSTHORPE

County ... LINCOLNSHIRE

EXACT SITE
OF WELL

132 SW/W

Six-inch National Grid sheet and reference ... TF 0301 2375 ... TF 02 SW

For ... A.W.A. (WELLAND & NENE)

State whether owner, tenant, builder, contractor, consultant, etc.:

Address (if different from above)

Level of ground surface above sea level (O.D.) ft (54.804) m

*DELETE

If well top is not at ground level state how far above* ft m
below:

AS

SHAFT ft m; diameter ft m;

NECESSARY

HEADINGS (please attach details—dimensions and directions)

BORE ... 142 $\frac{1}{2}$... ft (43.50) m; diameter: at top in mm;
at bottom in mm

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

ABS. PLASTIC PLAIN 8" DIA 16.5m DEPTH

" " 6" 27m

" PERFORATED 6" 4.2m (15m)

Water struck at depths of ft m) below well top

Rest level of water ft m) above* well top. Suction at ft m
below

TEST

Yield on hours* test pumping at galls per (l/s) with
days

CONDITIONS

depression to ft m) below well top. Recovery to rest level in mins*
hours

Capacity of pump g.p.h. (l/s)

Date of measurements

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power

NORMAL

Capacity galls (m³) per hour. Suction at ft m)

CONDITIONS

below well top. Amount pumped galls (m³) per day. Estimated

consumption galls (m³) per week

Well made by ... DRILLING & GEOSERVICES ... Date of sinking 19/11/75

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF

STRATA

OVERLEAF

Received from A.W.A.

Date

Observation well ☒

Recorder

ER log



TF 02 SW 38

For Institute use only

GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

If measurements start below ground surface, state how far.

THICKNESS

DEPTH

Feet

Inches

Metres

Feet

Inches

Metres

no drift shown on
1" map
Blisworth Clay

DRIET

GREAT OOLITE CLAY

2.8

2.8

Blisworth Limestone

GREAT OOLITE LIMESTONE

2.7

5.5

UPPER ESTUARINE SERIES

10.5

16.0

LINCOLNSHIRE LIMESTONE

2.7

43.0

LOWER ESTUARINE SERIES

0.5

43.5

RAE

7-11-80



RECORD OF WELL

For Institute use only Licence No.

143 / **433** ^{NN} **TF02/56**

143/433

At GRIMSTHORPE 307

Town or Village GRIMSTHORPE

County LINCOLNSHIRE

EXACT SITE
OF WELL

132 SW/W
Six-inch National Grid sheet and reference TF 0301 2375 TF 02 SW

For A.W.A. (WELLAND & NENE)

State whether owner, tenant, builder, contractor, consultant, etc.:

Address (if different from above)

Level of ground surface above sea level (O.D.) 54.804 ft (.....m)

*DELETE If well top is not at ground level state how far above: ft (.....m)

AS SHAFT.....ft (.....m); diameter.....ft (.....m);

NECESSARY HEADINGS (please attach details—dimensions and directions)

BORE 142 1/2 ft (43.50 m); diameter: at top.....in (.....mm);

at bottom.....in (.....mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

ABS PLASTIC PLAIN 8" DIA 16.5m DEPTH

" " 6" 27m

" PERFORATED 6" 4.2m (15m)

Water struck at depths offt (.....m) below well top

Rest level of water.....ft (.....m) above* well top. Suction at.....ft (.....m)

Yield on.....hours* test pumping at.....galls per (.....l/s) with

depression to.....ft (.....m) below well top. Recovery to rest level in.....mins*

Capacity of pump.....g.p.h. (.....l/s)

Date of measurements.....

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power.....

Capacity.....galls (.....m³) per hour. Suction at.....ft (.....m)

below well top. Amount pumped.....galls (.....m³) per day. Estimated

consumption.....galls (.....m³) per week

Well made by DRILLING & GEOSERVICES Date of sinking 19/11/75

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF
STRATA
OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

Received from A.W.A.

Date.....

Observation well.....✓

Recorder.....

ER log.....

Site marked on

1" map.....①

6" map—Grid Sheet.....②

(use symbol)

Copy to C.B.S.M.

Date.....



For Institute use only

GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

If measurements start below ground surface, state how far.

THICKNESS

DEPTH

Feet Inches Metres

Feet Inches Metres

No drift shown on
1" Map.

DRIFT

Blisworth clay

GREAT OOLITE CLAY

Blisworth limestone

GREAT OOLITE LIMESTONE

UPPER ESTUARINE SERIES

LINCOLNSHIRE LIMESTONE

LOWER ESTUARINE SERIES

PR 2AE

7.11.80



GRIMSTHORPE 307

(N57)

TF02/56

WELL DETAILS

TF02SW
NSR TF 030 238

DATE DRILLED 19/11/75

DRILLERS DRILLING + GEOSERVICES LTD

CASING DETAILS	MATERIAL	TYPE	DIAMETER	DEPTH
	ABS PLASTIC	PLAIN	8"	16.5
	" "	PLAIN	6"	27
		PERFORATED	6"	42 (15)

GEOLOGICAL DETAILS + AVAILABILITY OF SAMPLES

DRIFT & G.O.C. - 2.8m;

G.O.L. - 2.7m; U.E.S. - 10.5m;

L.L. - 27m; L.E.S. - 0.5m.

WATER LEVEL ACTIVITY DURING DRILLING

VERTICALITY REMARKS	DEVIATION	3	5	7	8	10
1:280	DEPTH	9	18	27	36	42
	DIRECTION	E	E	E	E	E

SERVICES IN THE VICINITY

OWNER OF SURROUNDING LAND

NEAREST BOREHOLE 63 (143/269) Swinstead The Hall 270 yds
E by S of Church also 349 but no log

REMARKS O.D. - 54.804m.

ANGLIAN WATER AUTHORITY

WELLAND AND NENE RIVER DIVISION

LINCOLNSHIRE LIMESTONE GROUNDWATER STUDY

SAMPLES TAKEN AT GRISTHORPE B/H 307.

[illegible]

* Particulate matter in sample; results suspect.

TF02/56

LINCOLNSHIRE LIMESTONE INVESTIGATION

OBSERVATION BOREHOLE WATER LEVEL RECORDS

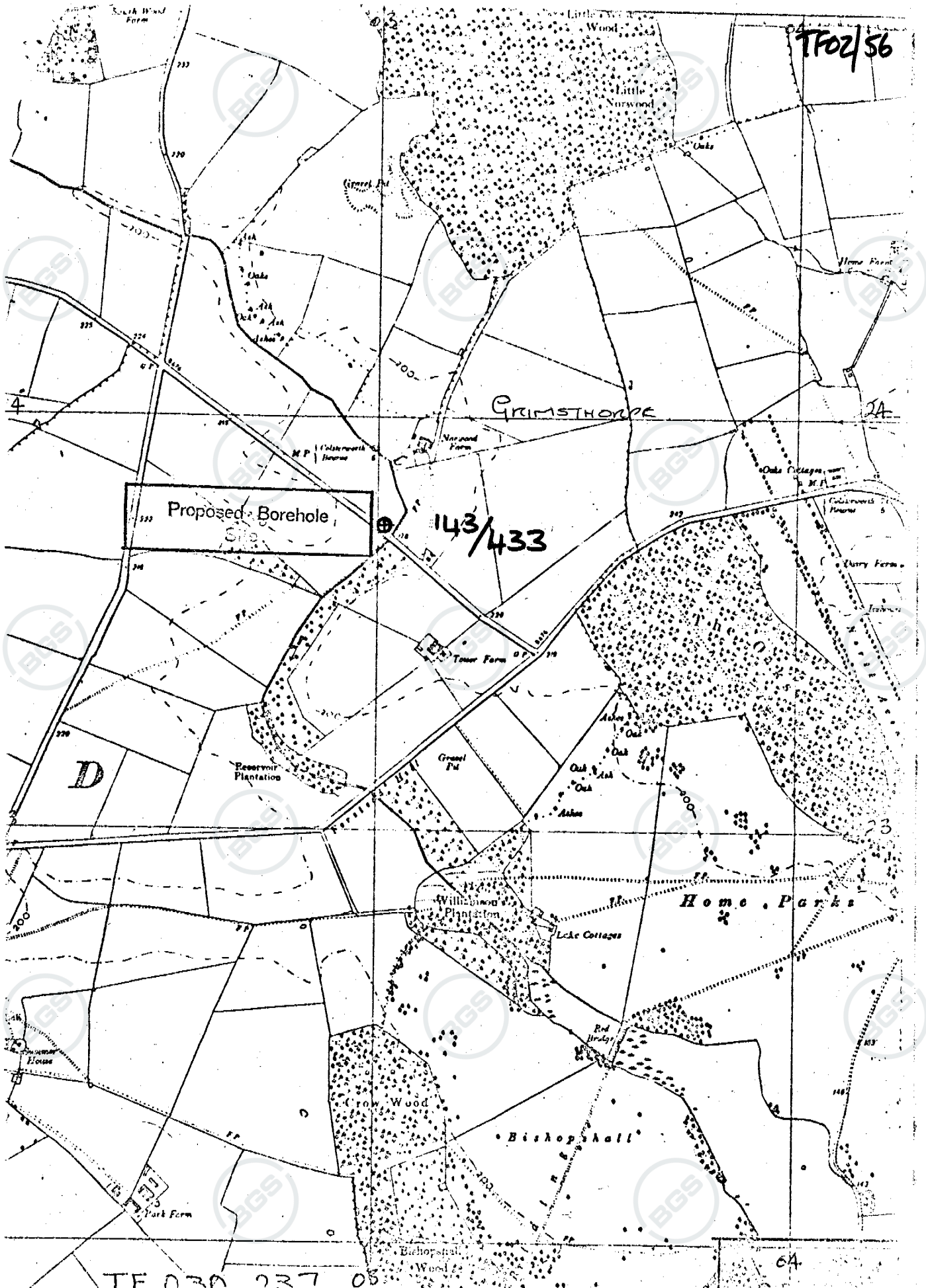
Name... CRUMPTON.....

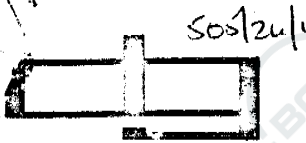
No. 307.....

N.G.R. .. TF...030...237.....

Year. 1979

January	4	12	18	26		Date
	22.67	25.19	26.51	27.63		W.L.
February	2	8	21			Date
	27.14	29.05	29.95			W.L.
March	6	19	21	27		Date
	31.09	31.41	31.74	32.02		W.L.
April	6	12	17	25		Date
	32.42	32.29	32.80	32.73		W.L.
May	4	11	16	23	30	Date
	32.38	32.01	31.81	31.66	31.59	W.L.
June	7	13	21	28		Date
	31.35	30.87	30.42	29.92		W.L.
July	6	12	18	27		Date
	29.13	28.18	27.63	26.18		W.L.
August	3	9	15	23	30	Date
	24.89	23.97	23.23	22.49	21.86	W.L.
September	6	12	20	25		Date
	21.28	20.89	20.29	20.08		W.L.
October	5	11	17	25		Date
	19.57	19.23	18.98	18.60		W.L.
November	2	9	14	22	30	Date
	18.39	18.33	18.36	18.42	18.36	W.L.
December	6	13	19	28		Date
	18.23	18.58	20.55	21.60		W.L.





DRILLING & GEOSERVICES LIMITED

FOUNDATION and GEOTECHNICAL ENGINEERS
WATERWELL BORING CONTRACTORS

BERMUDA ROAD INDUSTRIAL ESTATE,
BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

DAILY BOREHOLE RECORD

CLIENT Welland & Nene RIG TYPE H-England O.D. LEVEL
CONTRACT BOREHOLE No. 7 DATE 24/11/75

Method of Drilling	Size	From	To	Distance	Recovery	Core Run No.	Depth	Legend	Geological Description
Open hole	5 1/2"	17.0	28.5				18		Yellow/brown soft limestone
Difficulty starting hammer, and clearing borehole.							19		
							20	20.00	
							21		
							22		Soft grey limestone with occasional yellow bands, and dark grey limestone bands.
							23		
							24		
							25		
							26		
							27		
							28		
							29		
							30		
							31	31.50	
							32		
							33		
							34		Hard grey limestone, occ yellow bands.
							35		
							36		
							37		
							38		
							39		
							40	40.00	
							41		Damp soft dark grey limestone.
							42	41.00	
							43		Dark grey clay & limestone mixture.
							44		
							45		
							46		
							47		
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							50	43.50	
							51		
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							100		

Depth	N	S	E	W
9m	-	-	3.1m	-
18m	-	-	5.1m	-
27m	-	-	7.1m	-
36m	-	-	8.1m	-
42m	-	-	10.1m	-

REMARKS

Making Water @ 40.00

DRILL CREW

B. B. B. B.

C. B. B. B.



DRILLING & GEOSERVICES LIMITED

FOUNDATION and GEOTECHNICAL ENGINEERS
WATERWELL BORING CONTRACTORS

TF02/56

BERMUDA ROAD INDUSTRIAL ESTATE,
BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

DAILY BOREHOLE RECORD

CLIENT Welland + Nene RIG TYPE Hans England O.D. LEVEL _____
CONTRACT _____ BOREHOLE No. 7 DATE 19, 20/11/75

Method of Drilling	Size	From	To	Distance	Recovery	Core Run No.	Depth	Legend	Geological Description
19/11/75									Surface
Moved Rig & equipment to B.H. 4							1	1.50	Stiff brown clay.
Completed Man hole on B.H. 5.							2		
Open hole 5 1/2" on 12.5							3	3.00	Very soft brown clay.
20/11/75.							4		
Open hole 5 1/2" 12.5 12.00							5	5.50	Hard grey Limestone, occ small clay bands.
Travelled to last site for banner and re-fillect.							6		
Open hole 9 5/8" on 6.5							7		Stiff grey/blue clay.
Very slow progress through 3m of Limestone.							8		occ light grey bands.
							9	9.50	
							10	10.50	Hard grey limestone.
							11		
							12		Dark grey stiff clay.
							13	13.60	damp.
							14		Very dry light grey clay
							15	15.50	
							16	16.00	Black dry powdery clay
							17	17.00	Med/hard grey limestone.

REMARKS

DRILL CREW

B. M. Brooke.
Bob.



GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

19

Name and Number given by owner:

NW 60

For whom made

United Steel Co. Ltd.

Town or Village

Burnstead

County

Lines

Exact site

1750 yds. N.E. of Burnstead Church

Attach a tracing from a map, or a sketch-map, if possible.

Purpose for which made

To prove win ore (Northampton Sands)

Ground Level at shaft bore

relative to O.D. 240.7 ft.

If not ground level give O.D. of beginning of shaft bore

Made by

Date of sinking 15.9.58 - 26.9.58.

Information from

United Steel Co. Ltd.

Date received

11.12.58

Examined by

(For Survey use only)

6-inch Map Registered No.

TF/02 SW/19

Nat. Grid Reference

0188 2408

1" N.S. Map

1" O.S. Map

Confidential

No.

No.

or not

DECLASSIFIED
143

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	in.	FT	in.
Combrach	Brown flaggy brach	4.0		4.0	
great Oolite Clay	gray clay	18.0		22.0	
great Oolite det.	limestone	6.0		28.0	
	gray clay	15.0		43.0	
Upper Estuarine Series	limestone	3.0		46.0	
	gray and green clay	18.0		64.0	
Upper Lincs. det.	Oolitic limestone	43.0		107.0	
	limestone with A. crossi	3.0		110.0	
	Oolitic limestone	45.0		155.0	
Lower Lincs. det.	limestone with clay bands	4.0		159.0	
	limestone	6.0		165.0	
Lower Estuarine Series	Clay (NG. on assay base taken at 173.4')	3.5		168.5	
Northampton Sands	Sandy sandstone	24.4		192.9	
Upper Lincs	Blue clay	2.1		195.0	
	R.W.L. 72.0 ft.				
	Northampton Sands:-				
	168 ft. 0 in. - 168 ft. 6 in. Pale gray, fine-grained quartzose sandstone, black rootlets and carbonaceous layers towards base.				
	168 ft. 6 in. - 168 ft. 9 in. Dark gray micaceous compact siltstone				
	168 ft. 9 in. - 170 ft. 9 in. Very pale gray soft friable siltstone				

170 ft. 9 in. - 171 ft. 5 in.

Pale grey fine-grained sandstone - very broken - darker grey patches.

171 ft. 5 in. - c. 173 ft. 4 in.

Pale grey fine-grained sandstone with ~~scattered oolite~~ in top 6 in. : becoming darker grey and laminated at 173 ft. 0 in. [LE]

c. 173 ft. 4 in. - 175 ft. 6 in.

Buff-grey finely oolitic sandstone : largely dark brown mudstone for 6 in. at 174 ft. 10 in. : grey oolitic sandstone below.

175 ft. 6 in. - 176 ft. 0 in.

Dark brown, strong ferruginous mudstone.

176 ft. 0 in. - 176 ft. 10 in.

Ditto with siltstone also - very compact and strong with scattered pale grey oolites : becoming soft fine-grained sandstone at 176 ft. 5 in. with scattered oolite moulds

176 ft. 10 in. - 180 ft. 7 in.

Grey fine-grained calcareous sandstone with occasional small mudstone pebbles below 180 ft. 2 in.

180 ft. 7 in. - 182 ft. 11 in.

Green-grey fine-grained sandstone with scattered oolite (largely moulds)

182 ft. 11 in. - 186 ft. 5 in.

Buff oolitic sandstone : 2 in. dark brown mudstone at 186 ft. 0 in.

186 ft. 5 in. - 191 ft. 10 in.

Buff-grey fine-grained sandstone with scattered oolite (largely moulds) : becoming non-oolitic below 187 ft. 5 in. : at c. 188 ft. 8 in. becoming stronger and more massive calcareous sandstone (slightly greenish-grey to 189 ft. 6 in. - with shaly bedding) - grey below : very occasional small mudstone pebbles : large pale buff areas in basal 2 in.-3 in. with much pyrite.

191 ft. 10 in. - 192 ft. 10 in.

Largely pale buff siltstone with scattered green oolites : some lentic surfaces : in basal 3 1/2 in. much nodular pyrite and derived fossil fragments (e.g. rolled balaenite).



(For Sites use only)

GEOLOGICAL
CLASSIFICATION

LL
1LE + V.L.

NATURE OF STRATA

If measurements start below
ground surface, state how far...

Soil
Rock
Blue shale

THICKNESS

Feet Inches

2
98
55

DEPTH

Feet Inches

2
100
155 o.

TF 02 32/35
0109. 2385

franklin from main Water & ...
in letter of 21/3/60.

Visited. Disused for c. 5 years since on mains water.
Windpump not in working order. Impossible to sample.
OD + c. 255. 20.11.65 ASR.



RECORD OF WELL (SHAFT OR BORE)

TF02/46
143
236

At Woodlands Farm.

Town or Village Grby

County Lincoln Six-inch quarter sheet 131 S.E.C.

For Mr. NMR TF 02 JW 0118 2385.

Exact site of well 1620 yds. S.E. of Church 20 yds. E.S.W. from
House. (See tracing on back of 143/239)

(Attach a tracing from
a map, or a sketch-
map, if possible.)

Level of ground surface above sea-level (O.D.) 25.250 feet.

Is well-top at ground level? If not, state how far above ; feet.
below ; feet.

Shaft ft., diameter ft. Details of headings

Bore 110 ft.; diameter of bore: at top 6 ins.; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

TEST DETAILS { Rest-level of water ft. above well-top. Suction at ft. Yield on hours' days'
Month pumping gallons per (max. capacity of pump g.p.h.),
Year with depression of feet. Recovery to in mins. hours.

WORKING CONDITIONS { Rest-level of water in (month), (year), ft. above well-top.
Highest in (month), (year), ft. above below "
Lowest in (month), (year), ft. above below "
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. hours

Quality of water (attach copy of analysis if available)

Well made by Barnes Date of well 1919

Information from E.B. Birms (Colston Agent) per G.A. Kellaway (17.1.42)

ADDITIONAL NOTES. See (143/239).

"fair supply".
Only water supply.
water supposed to be condemned but is drunk
by occupants.
has never dried up.
windpump only.
D.O. 248.
Further information from Guinsthorpe Estate Agent.
Information from Mrs C.A. Recard.
D.O. 248.

P.T.O.

Visited site checked by
20.6.57. C.B.
GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

LOG OF STRATA OVERLEAF.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map.	on 6" Map.
				⊙	⊙

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH	
		Feet ...	Inches ...	Feet ...	Inches ...
2					
Soil		2		2	
Rock		98		100	
Blue shale		55		155	0.
Information from mess^r Waters & Lamb in letter of 21/3/60. Visited. Disused for c. 5 years since on main water Windpump not in working order. Impossible to sample SD + c. 255. 20.11.65 AGR.					



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

(For Survey use only)

6-inch Map Registered No.

TF/02 SW/1

Name and Number given by owner:

Ancaster Estate

N.W. 12

Nat. Grid Reference

0096 2394

For whom made

United Steel Co. Ltd.

Town or Village

Colby

County

Lincoln

Exact site

1466 yds N 143° E of St. John's Church

Attach a tracing from a map, or a sketch-map, if possible.

1" N.S. Map No.

1" O.S. Map No.

Confidential or not

DECLASSIFIED

Purpose for which made

To prove iron ore

Ground Level at shaft bore relative to O.D.

260.2 ft

If not ground level give O.D. of beginning of shaft bore

Made by

79.31 m

Date of sinking

21.4.58 - 28.4.58

Information from

United Steel Co. Ltd.

Date received

10.6.58

Examined by

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	m	FT	m
UE	Gray clay	7.0	2.13	7.0	2.13
Hyper Lincs. Limestone	Oolitic limestone	44.0	13.41	51.0	15.54
	Limestone with A. crossi	3.0	0.91	54.0	16.46
	Oolitic limestone	45.5	13.87	99.5	30.33
Lower Lincs. Limestone	Clay parting	2.0	0.61	101.5	30.94
	Regestone	12.0	3.66	113.5	34.59
Northampton Sands	Northampton Sands	20.0	6.1	133.5	40.69
Hyper Lincs	Clay	1.0	0.3	134.5	41.0
	R.W.L. 86.0 ft. 26.21 m				
	Note: Lower Etrurian series and Northampton sands cannot be penetrated.				
	Northampton Sands :- [L.W.]				
	Top NSI is probably at c. 115 ft. 35.09 m				
	35.09 - 37.19 m				
	115 ft. - 122 ft.				
	37.19 - 39.30 m				
	122 ft. - 129 ft. 6 in.				
	39.30 - 39.67 m				
	129 ft. 6 in. - 130 ft. 9 in.				
	39.67 - 40.06 m				
	130 ft. 9 in. - 132 ft. 9 in.				
	40.06 - 40.89 m				
	132 ft. 9 in. - 133 ft. 6 in.				
	40.89 - 41.0 m				
	Light brown oolite with white oolite and calcareous grains				
	Gray calcareous oolite				
	Oolite with oolite				
	Oolite, no oolite				
	Buff oolite				

(For supervisory use only)
GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

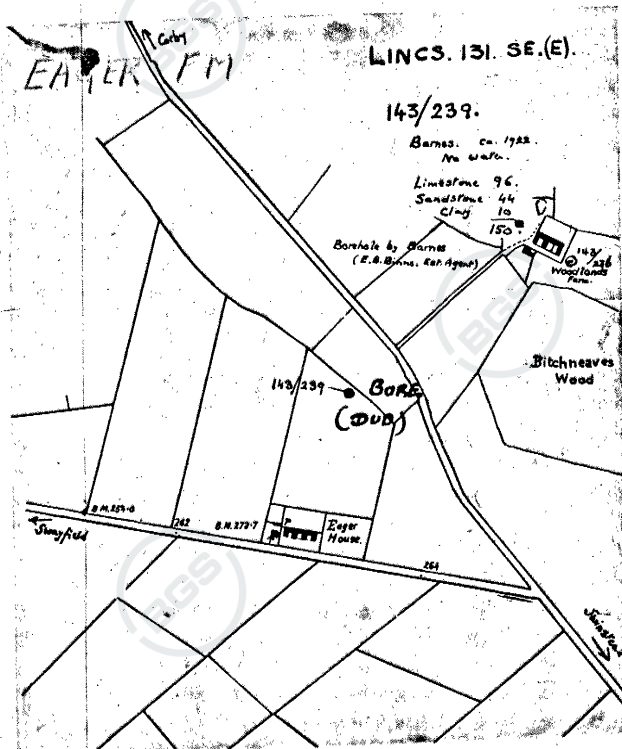
If measurements start below
ground surface, state how far...

Limestone
Sandstone
Clay

THICKNESS
Feet Inches

TF 02 SW/36
DEPTH
Feet Inches 0066.2361

THICKNESS	Feet	Inches
96	96	-
44	140	-
10	150	-





RECORD OF WELL (SHAFT OR BORE)

At EAGER *
Town or Village Swinstead.
County Lincs. Six-inch quarter sheet 131. SE (E)
For Mr. Earl of Ancaster

Exact site of well (see tracing) 300yds N by E of a
1 m. N.W. of Swinstead Church

Level of ground surface above sea-level (O.D.) 270 feet. NGM TF02SW 0065

Is well-top at ground level? If not, state how far above : feet. 2359
below : feet.

Shaft ft., diameter ft. Details of headings

Bore 150 ^{45-72m} ft.; diameter of bore : at top ins.; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

TEST DETAILS Rest-level of water ft. above well-top. Suction at ft. Yield on hours' days'
Month pumping gallons per (max. capacity of pump g.p.h.),
Year with depression of feet. Recovery to in mins. hours.

WORKING CONDITIONS Rest-level of water in (month), (year), ft. above well-top.
Highest in (month), (year), ft. above below
Lowest in (month), (year), ft. above below
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. hours

Quality of water (attach copy of analysis if available)

Well made by J.T. BARNES & son, Date of well 1942
Information from SLEAFORD-

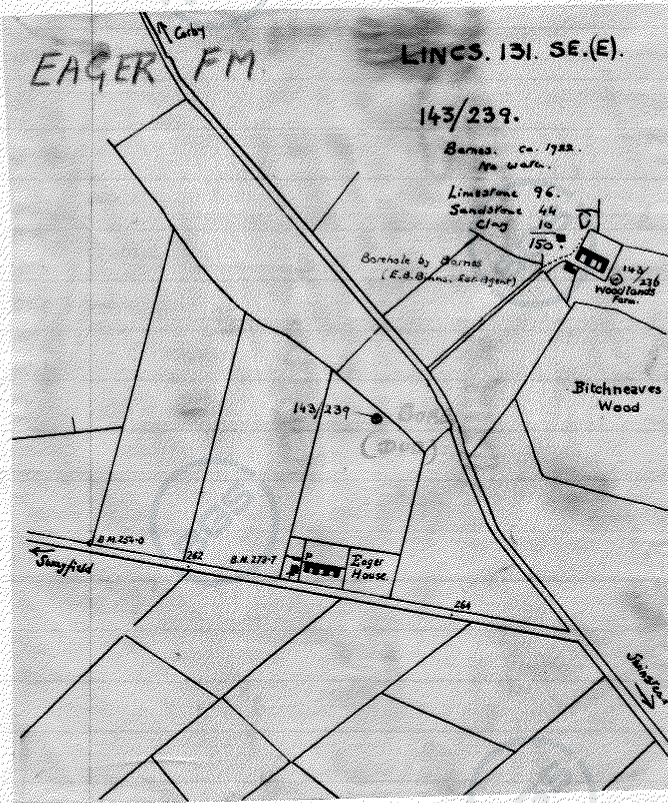
ADDITIONAL NOTES.

Failure
* Site given to G.A. Kellaway (17.1.42) by E.B. Binns. (Estate Agent).
Mr. Binns also sited a well at Woodlands Farm § (see tracing overleaf), made by
Barnes. "A fair supply" from Woodlands BH. = 1242/236.
§ Is this Corby Lodge Farm. 143/244? which Barnes stated was near Colstretworth?
The second would open. 17.1.42 No! 143/244 is unknown to be nearly 3 miles away to W.
Nothing known of bore or position or history.
Bore supplied by rain
Information from Mrs. Kellaway.
Visited 20.6.57. CS.

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map.	on 6" Map.
		143	70	⊙	⊙

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH	
		Feet	Inches	Feet	Inches
		...	...		
2	Limestone Sandstone Clay	96		46	-
		44		140	-
		10		150	-
					
47					

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

26

(For Survey use only)

6-inch Map Registered No.

TF/02 SW/26

Name and Number given by owner:

Ex. 7

Nat. Grid Reference	
-----------------------------------	--

0062.2451

For whom made

Mineral Steel Co. Ltd.

Town or Village..

Corby

County

Lewis.

Exact site.

Attach a tracing from a map, or a sketch-map, if possible.

1" N.S. Map
No.

1" O.S. Map
No.

Confidential
or not

143

Purpose for which made.

Ironstone

Ground Level at ~~shaft~~
bore relative to O.D..

255-22

If not ground level give O.D. of beginning of shaft bore

Made by

Date of sinking 19/7/45 - 20/7/45

Information from

U.S.G. M.L.

Date received...

1960

Examined by.

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

2

Name and Number given by owner:

Arcaster Estate

NW 14A

For whom made

United Steel Co. Ltd.

Town or Village

Corby

County

Northants

Exact site

1066 yds. N 136° E of St John's Church, Corby

Attach a tracing from a map, or a sketch-map, if possible.

Purpose for which made

To prove iron ore

Ground Level at shaft bore

relative to O.D. 241.9 ft.

If not ground level give O.D. of beginning of shaft bore

Made by

Date of sinking 6.5.58 - 7.5.58

Information from

United Steel Co. Ltd.

Date received 10.6.58

Examined by

(For Survey use only)

6-inch Map Registered No.

TF/02/SW/2

Nat. Grid Reference

0002.2404

1" N.S. Map No.

1" O.S. Map No.

Confidential or not

DECLASSIFIED

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		Ft	in.	Ft	in.
Lower Lias Limestone	Oolitic Limestone	53.0		53.0	
	Clay Parting	1.0		54.0	
	Regestone	9.5		63.5	
Lower Etrurian Lias Clay	Clay	7.0		70.5	
	Northampton Sands	19.5		90.0	
Upper Lias Clay	Clay	1.0		91.0	
	R.W.L. 73.5 ft.				
	Northampton Sands (detail):-				
	70 ft. 6 in. - 72 ft. 1 in. light grey or buff calcareous sandstone with scattered oolitic				
	72 ft. 1 in. - 72 ft. 6 in. strongly oxidised, deep purple-brown calcareous sandstone				
	72 ft. 6 in. - 74 ft. 1 in. light buff grey oolitic sandstone (white patchily developed)				
	74 ft. 1 in. - 75 ft. 4 in. pale grey-brown oolitic sandstone				
	75 ft. 4 in. - 75 ft. 9 in. rust-brown, oxidised oolitic sandstone				
	75 ft. 9 in. - 76 ft. 5 in. buff oolitic sandstone (white? kaolin oolitic) with shell marbles				
	76 ft. 5 in. - 76 ft. 7 in. rust-brown oolitic sandstone				
	76 ft. 7 in. - 77 ft. 4 in. green-grey oolitic sandstone with occasional shell marbles				
	77 ft. 4 in. - 77 ft. 6 in. rust-brown oxidised oolitic sandstone				
	77 ft. 6 in. - 77 ft. 11 in. green-grey oolitic sandstone				
	77 ft. 11 in. - 79 ft. 7 in. deep rust-brown oolitic sandstone				
	79 ft. 7 in. - 80 ft. 0 in. grey-green oolitic sandstone				
	80 ft. 0 in. - 80 ft. 5 in. deep rust-brown sandstone				
	80 ft. 5 in. - 81 ft. 3 in. light grey-green, fine-grained sandstone				
	81 ft. 3 in. - 84 ft. 0 in. deep rust-brown oolitic sandstone with occasional patches				

of green-grey unoxidised ironstone.

84ft. 0in. - 85ft. 5in. light grey, fine-grained calcareous sandstone
85ft. 5in. - 88ft. 8in. green-grey oolitic ironstone.
88ft. 8in. - 89ft. 10in. brown, very fine-grained sandstone
89ft. 10in. - 90ft. 0in. dark grey clay.

2



RECORD OF WELL

For Institute use only Licence No.

NM.....

At **SWAYFIELD 306**

Town or Village **SWAYFIELD**

County **LINCOLNSHIRE**

143 / **442**
SK 92 SE / 92

143/442

EXACT SITE
OF WELL

Six-inch National Grid sheet and reference **SK 9982 2338 SK 92 SE**

For **AWA (Lincs Div.)**

State whether owner, tenant, builder, contractor, consultant, etc.:

Address (if different from above)

Level of ground surface above sea level (O.D.) **177.69** ft (**54.158** m)

*DELETE

If well top is not at ground level state how far above* below: ft (.....m)

AS

SHAFT.....ft (.....m); diameter.....ft (.....m);

NECESSARY

HEADINGS (please attach details—dimensions and directions)

BORE **49 1/4** ft (**15** m); diameter: at top **8** in (.....mm);

at bottom **6** in (.....mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

ABS PLASTIC PLAIN 8" DIA 3m DEPTH

6" 3m

PERFORATED 6" 15m

Water struck at depths offt (.....m) below well top

Rest level of water.....ft (.....m) above* below well top. Suction at.....ft (.....m)

TEST

Yield on.....hours* test pumping at.....galls per (.....l/s) with

CONDITIONS

depression to.....ft (.....m) below well top. Recovery to rest level in.....mins* hours

Capacity of pump.....g.p.h. (.....l/s)

Date of measurements.....

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

NORMAL

Make and/or type Motive power.....

CONDITIONS

Capacity.....galls (.....m³) per hour. Suction at.....ft (.....m)

below well top. Amount pumped.....galls (.....m³) per day. Estimated

consumption.....galls (.....m³) per week

Well made by **DRILLING & GEOSERVICES** Date of sinking **22/10/1975**

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF

STRATA

OVERLEAF

for information only.

Received from **AWA (Lincs Div.)**

Date.....

Observation well.....

Recorder.....

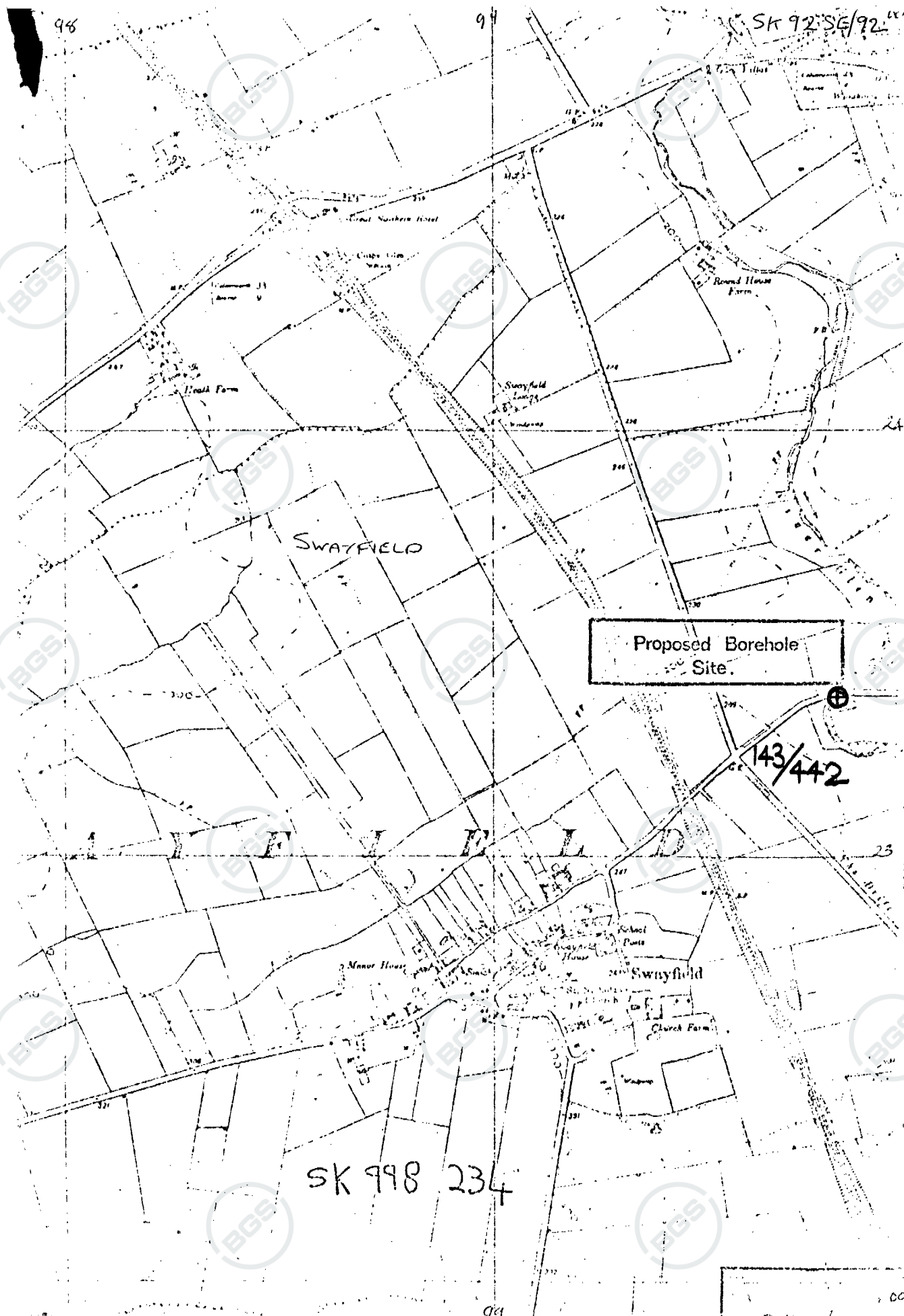
ER log.....

Site marked on.....

Institute use only

SK 92 SE 92

[illegible]





B&L	STRATA	CASINGS	DEPTH	ANNUAL W.L.		ST
				Max	Min	
0	Top Soil					54
2		Solid				52
4				Dec 76		50
6	Limestone					48
8		Perf			Aug 76	46
10	Lincolnshire					44
12						42
14	Northampton Sand		July 77			40
	Upper Lias Clay		Oct 75			
16						38

SWAYFIELD

SK 998 236

SK 115 SE

SK92SE/93



RECORD OF WELL

For Institute use only Licence No.

NM.....

At SWAYFIELD 306

I43 SK92/34
442

Town or Village SWAYFIELD

County LINCOLNSHIRE

143/442

EXACT SITE

OF WELL

Six-inch National Grid sheet and reference SK 9982 2338 SK92SE

For AWA (LINGS DIV.)

State whether owner, tenant, builder, contractor, consultant, etc.:

Address (if different from above)

Level of ground surface above sea level (O.D.) 177.69 ft (54.158 m)

*DELETE

If well top is not at ground level state how far above* below:

AS

SHAFT.....ft (.....m); diameter.....ft (.....m);

NECESSARY

HEADINGS (please attach details—dimensions and directions)

BORE 49 1/4 ft (15 m); diameter at top 8 in (.....mm);

at bottom 6 in (.....mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

ABS PLASTIC PLAIN 8" DIA 3m DEPTH

" " " 6" " 3m "

" " PERFORATED 6" " 15m "

Water struck at depths offt (.....m) below well top

Rest level of water.....ft (.....m) above* below well top. Suction at.....ft (.....m)

Yield on.....hours* test pumping at.....galls per (.....l/s) with

depression to.....ft (.....m) below well top. Recovery to rest level in mins*

Capacity of pump.....g.p.h. (.....l/s)

Date of measurements.....

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power.....

Capacity.....galls (.....m³) per hour. Suction at.....ft (.....m)

below well top. Amount pumped.....galls (.....m³) per day. Estimated

consumptiongalls (.....m³) per week

Well made by DRILLING & GEOSERVICES Date of sinking 22/10/1975

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF

STRATA

OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

Digitized
water and chemistry entered

Received from AWA (LINGS DIV.)

Date.....

Observation well.....

Recorder.....

ER log.....

Site marked on

1" map.....8

6" map—Grid Sheet.....8

(use symbol)

Copy to C. & S. MIDS

Date.....

For Institute use only

[illegible]



SWATFIELD 306

SK92SE

SK92/34

WELL DETAILS

NCR: SK 998 234

DATE DRILLED 22/10/75

DRILLERS DRILLING + GEOSERVICES LTD

CASING DETAILS	MATERIAL	TYPE	DIAMETER	DEPTH
	ABS PLASTIC	PLAIN	8"	3m
	" "	PLAIN	6"	3m
	" "	PERFORATED	6"	15 (12)

GEOLOGICAL DETAILS + AVAILABILITY OF SAMPLES

DRIFT - 0.5m;

L.L. - 12.2m;

N.S. - 0.8m; U.Lias - 1.5m

WATER LEVEL ACTIVITY DURING DRILLING

VERTICALITY REMARKS	DEVIATION	
1:706	DEPTH	3 6 9 9 12 12 15 15 m
	DIRECTION	- N E N E N E N

SERVICES IN THE VICINITY

OWNER OF SURROUNDING LAND

NEAREST BOREHOLE 59 (143/239) Swinstead Eger house farm
300 yds N by E of farm & 1 ml N.W. of Church
(Abandoned) No 394 NGR 493 226 No log
REMARKS Also No 236 (60 in log book) (143/236) Cooby woodlands
farm 1620 yds SE of Church & 30 yds ESE of House
O.D. 54.158 m a.o.d.

ANGLIAN WATER AUTHORITY

WELLAND AND NENE RIVER DIVISION

LINCOLNSHIRE LIMESTONE GROUNDWATER STUDY

SAMPLES TAKEN AT SWAYFIELD B/H 306

[illegible]

SK-92/34

SK92/34

LINCOLNSHIRE LIMESTONE INVESTIGATION

OBSERVATION BOREHOLE WATER LEVEL RECORDS

Name... SWAFFIELD.....

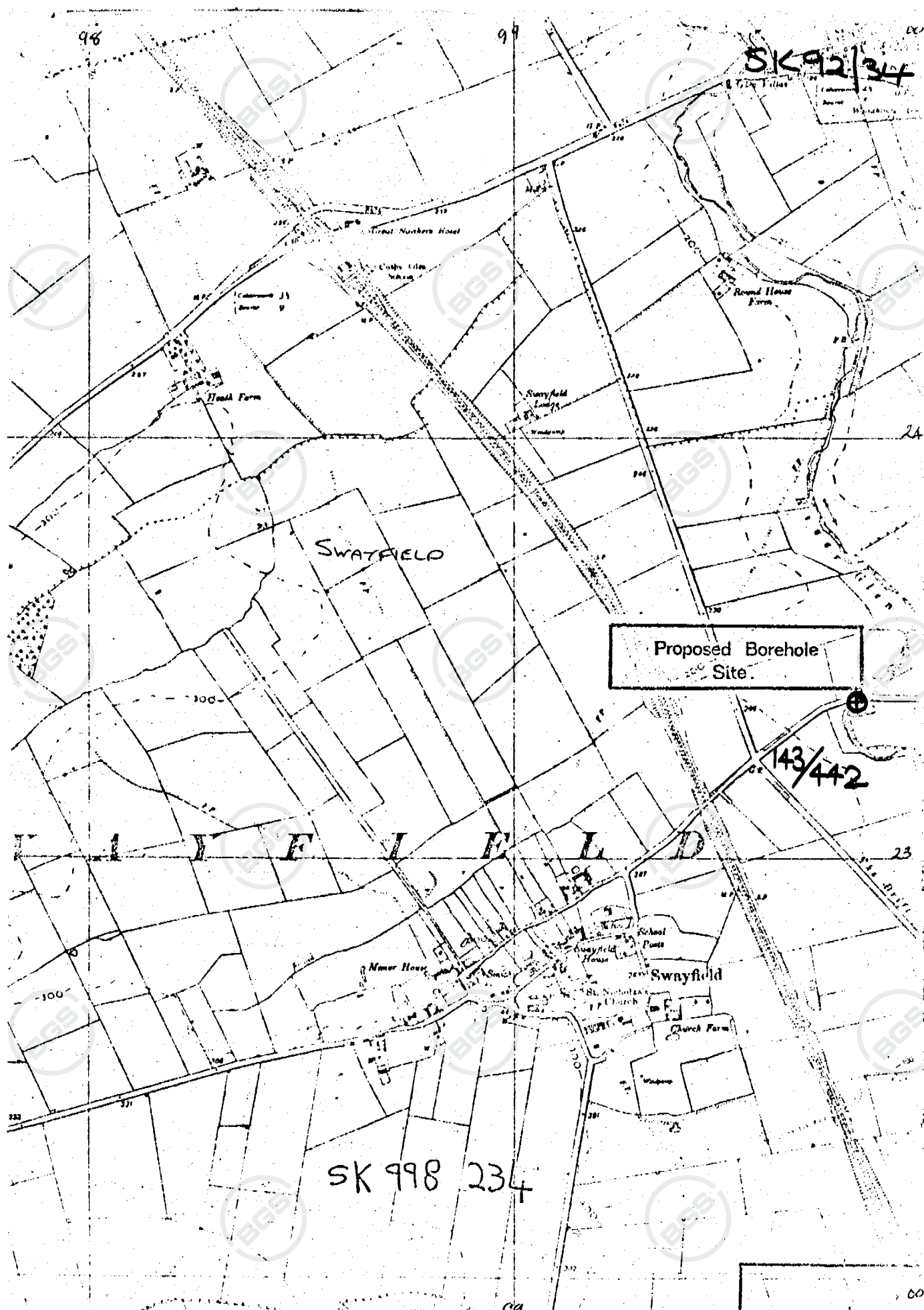
No. 306.....

N.G.R. ... SK... 99.8... 234.....

Year. 1979

January	2	11	19	25		Date
	51.01	51.12	51.11	51.11		W.L.
February	1	7	23			Date
	51.13	50.93	51.57			W.L.
March	6	14	23	27		Date
	51.63	51.52	51.69	51.69		W.L.
April	5	11	19	25		Date
	51.63	51.79	51.58	51.57		W.L.
May	3	9	17	23	29	Date
	51.36	51.25	51.12	51.11	51.00	W.L.
June	6	11	18	25		Date
	50.78	50.61	50.40	50.13		W.L.
July	5	11	19	25		Date
	49.79	49.61	49.41	49.29		W.L.
August	2	9	16	23	29	Date
	49.10	48.98	48.99	48.77	48.68	W.L.
September	5	14	17	24		Date
	48.56	48.36	48.29	48.15		W.L.
October	4	11	18	24	30	Date
	47.94	47.85	47.75	47.67	47.67	W.L.
November	8	16	21	28		Date
	47.83	47.95	47.85	47.59		W.L.
December	5	10	17	28		Date
	47.60	47.84	49.45	50.04		W.L.

Flowing



SK 92/34



DRILLING & GEOSERVICES LIMITED

**FOUNDATION and GEOTECHNICAL ENGINEERS
WATERWELL BORING CONTRACTORS**

BERMUDA ROAD INDUSTRIAL ESTATE,
BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

DAILY BOREHOLE RECORD

CLIENT Welland & Nene RIG TYPE Leads Drift and O.D. LEVEL 2.9 m
CONTRACT _____ BOREHOLE No. 846. DATE 21.10.15

[illegible]



DRILLING & GEOSERVICES LIMITED

**FOUNDATION and GEOTECHNICAL ENGINEERS
WATERWELL BORING CONTRACTORS**

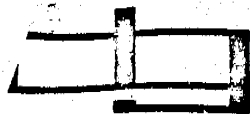
BERMUDA ROAD INDUSTRIAL ESTATE,
BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

DAILY BOREHOLE RECORD

CLIENT Willard + Neri RIG TYPE Handi Dripal O.D. LEVEL _____
CONTRACT _____ BOREHOLE No. 6 DATE 22 10 75

[illegible]



DRILLING & GEOSERVICES LIMITED

**FOUNDATION and GEOTECHNICAL ENGINEERS
WATERWELL BORING CONTRACTORS**

**BERMUDA ROAD INDUSTRIAL ESTATE,
BERMUDA ROAD, NUNEATON, WARWICKSHIRE.**

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

DAILY, BOREHOLE RECORD

CLIENT Welland + New RIG TYPE Arms England O.D. LEVEL 9 m.
CONTRACT _____ BOREHOLE No. 6 DATE 23-10-75

CONTRACT _____ BOKEHOLE No. 61 DATE 25/10/53

[illegible]



DRILLING & GEOSERVICES LIMITED

**FOUNDATION and GEOTECHNICAL ENGINEERS
WATERWELL BORING CONTRACTORS**

BERMUDA ROAD INDUSTRIAL ESTATE,
BERMUDA ROAD, NUNEATON, WARWICKSHIRE.

TELEPHONE: NUNEATON 68328/9 or 69458/9 (STD. Code 0682) TELEX: 31390

DAILY BOREHOLE RECORD

CLIENT William & Nene RIG TYPE Hands Inland O.D. LEVEL _____
CONTRACT _____ BOREHOLE No. 6-12 DATE 24-10-15

CONTRACT _____ BOREHOLE No. G-17 DATE 10-13

[illegible]



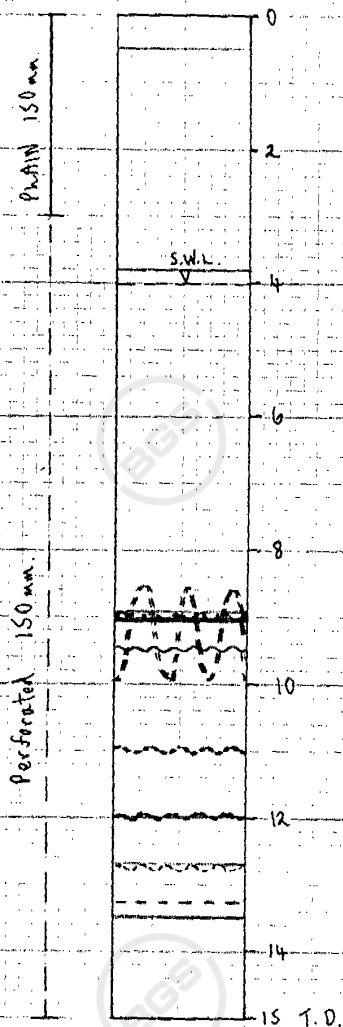
WATER RESOURCES BOARD WELL RECORD		W.R.B. REF. No. SK 92/34
SHEET 1		R.A. LICENCE No.
1. WELL IDENTITY		NATIONAL GRID REFERENCE SK 9982 2388
Well at SWAYFIELD		I.G.S. REF. No. 143/442
Town.....		RIVER AUTHORITY.....
County.....		HYDROMETRIC AREA.....
Owner of well.....		SUB-CATCHMENT.....
Well made by.....		Date of sinking.....
Information from W.D.U.		Date received.....
2. WELL DESCRIPTION		
Level of ground surface..... m. If well top is not at above*..... m. above sea level (O.D.)..... ft. ground level how far below..... ft.		
Shaft..... m. deep; Diameter at top..... mm; at bottom..... mm. ft. in. in.		
Bore..... m. deep; Diameter at top..... mm; at bottom..... mm. ft. in. in.		
Details of headings.....		
DETAILS OF PERMANENT LINING TUBES		
Length..... m; Diam..... mm; Length..... m; Diam..... mm; Top..... m above* surface Plain..... ft. in. ft. in. ft. below surface		
Length..... m; Diam..... mm; Length..... m; Diam..... mm; Top..... m above* surface Plain..... ft. in. ft. in. ft. below surface		
Length..... m; Diam..... mm; Length..... m; Diam..... mm; Top..... m above* surface Plain..... ft. in. ft. in. ft. below surface		
Details of well screen.....		
DETAILS OF REST WATER LEVELS DURING CONSTRUCTION		
Water struck at depths of..... below well top		
Rest level of water..... m above* O.D.* m deep. Date ft. below well top when bore ft.		
Rest level of water..... m above* O.D.* m deep. Date ft. below well top when bore ft.		
Rest level of water on completion of bore..... m above* O.D.* m deep. Date ft. below well top when bore ft.		
Method of drilling.....		
Brief details of well development e.g. acid treatment etc.....		

* delete as applicable

(18127/1)



SK92SE/93



9m - 10m.

LINCS. LMST. BOREHOLE

NO. 106

RESUME OF LITHOLOGICAL VARIATIONS

DEPTH	ROCK TYPE	COLOUR	TEXTURE	CEMENTATION	WATER ENCOUNTER'D	WATER. HORIZON.
MOD 0.1	Drift	BROWN	-	-	-	-
1.6	LMST	BUFF / CREAM	Oolitic / pisolitic (fractured well weathered 0.5 to 3m)	very well cemented	-	-
2.	LMST	BUFF / CREAM	Oolitic / pisolitic (fractured well weathered 0.5 to 3m)	very well cemented	-	-
3.	LMST	BUFF / CREAM	Oolitic / pisolitic (fractured well weathered 0.5 to 3m)	very well cemented	-	-
4.	LMST & CLAYS	LIGHT BROWN (clays) BUFF (Lmst)	Pisolitic Skeletal Debris	very well cemented	-	-
5.	CLAY	BROWN	Pisolitic	v. well cem.	-	-
6.	LMST	BROWN (C) CREAM (L)	Pisolitic	" " "	-	-
7.	CLAY	BROWN	Pisolitic	" " "	-	-
8.	CLAY	BROWN	Pisolitic	" " "	-	-
9.	CLAY	BROWN	Pisolitic	" " "	-	-
10.	CLAY	BROWN	Pisolitic	" " "	-	-
11.	CLAY & LMST	BROWN (C) CREAM (L)	Pisolitic	well cem.	-	-
12.	LMST	BROWN (C) CREAM (L)	Pisolitic	well cem.	-	-
13.	LMST & CLAY	L. BROWN / BUFF (L) L. BROWN (CLAY)	Fine / medium Grained Oolitic	well cemented	-	-
14.	CLAY	PALE BROWN	Fine / med oolitic	v. well cemented	-	-
15.	LMST	OFF WHITE	Fine / med oolitic	v. well cemented	-	-
16.	CLAY some (Lmst)	Med BROWN (clay) Light BROWN (Lmst)	Fine / med Oolitic	fairly well cemented	Returns Moist Water encountered @ 9.0m	-
17.	Very few returns Lmsts Predom?	-	-	-	-	-
18.	CLAY	BROWN	Oolitic & massive	f. w. cem.	-	-
19.	LMST	BUFF BROWN	Ferruginous s. r. Fine grained	w. cem.	-	-
20.	LMST	BROWN	Fine grained	very well cemented.	water very brown slightly more water	-
21.	SDST	BROWN	Fine grained	very well cemented.	-	-
22.	CLAY	BLUE / GREY	-	-	-	-
23.	-	-	-	-	-	-
24.	-	-	-	-	-	-
25.	-	-	-	-	-	-
26.	-	-	-	-	-	-
27.	-	-	-	-	-	-
28.	-	-	-	-	-	-
29.	-	-	-	-	-	-
30.	-	-	-	-	-	-
31.	-	-	-	-	-	-
32.	-	-	-	-	-	-
33.	-	-	-	-	-	-
34.	-	-	-	-	-	-
35.	-	-	-	-	-	-
36.	-	-	-	-	-	-
37.	-	-	-	-	-	-
38.	-	-	-	-	-	-
39.	-	-	-	-	-	-
40.	-	-	-	-	-	-
41.	-	-	-	-	-	-
42.	-	-	-	-	-	-
43.	-	-	-	-	-	-
44.	-	-	-	-	-	-
45.	-	-	-	-	-	-
46.	-	-	-	-	-	-
47.	-	-	-	-	-	-
48.	-	-	-	-	-	-
49.	-	-	-	-	-	-
50.	-	-	-	-	-	-

SK92 SE/93



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

10

Name and Number given by owner:

MCTH 4

For whom made

A.F.S. Co.

Town or Village

Corby

County

Leics.

Exact site

Attach a tracing from
a map, or a sketch-
map, if possible.

Purpose for which made

Ironstone

Ground Level at shaft
bore relative to O.D.

188.05 ft.

If not ground level give O.D. of beginning of shaft
bore

Made by

Date of sinking

26.5.41 - 29.5.41

Information from

Date received

Examined by

(For Survey use only)

6-inch Map Registered No.

DECLASSIFIED

SK/92 SE/10

Nat. Grid Reference

9970.2419

1" N.S. Map
No.

145

1" O.S. Map
No.

Confidential
or not

Yes

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA		THICKNESS		DEPTH	
			FT	in.	FT	in.
	Soil	West 1'6" East 1'				
	Gravel	1'6" 1'			2	6
	Ironstone		19	0	21	6
	Uhi					
	Water at 14'6"					
	Analysis:-					
	Depth	Fe (dried at 100°) 2			Gravel 2	
	2					
	3	31.4			34.7	
	4	32.4			30.0	
	5	44.0			17.3	
	6	41.0			20.5	17.4
	7	36.7			54.0	21.5
	8	26.4			58.0	54.0
	9	28.0			47.7	50.0
	10	27.6			75.2	47.7
	11	22.8			42.2	75.2
	12	28.4			42.2	42.2
	13	18.2			48.6	
	14	18.4			55.2	
	20 1/2	21.5			45.2	
	Average:					
		Fe (dry)	Insol.		Depth	
	Total depth	26.2	42.6		2 - 20'6"	
	Workable stone	37.3	24.1		2 - 7	

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

DECLASSIFIED
5X/92 SE/11

Name and Number given by owner:

MCTH 5

(For Survey use only)

6-inch Map Registered No.

Nat. Grid Reference

9968. 2405

For whom made

A.F.S. Co

Town or Village.

Corby

County

Luvio

Exact site.

Attach a tracing from
a ~~map~~ or a sketch
map, if possible.

1" N.S. Map
No.

1" O.S. Map
No.

Confidential
or not

143

Purpose for which made.

From above

Ground Level at ~~shaft~~
bore relative to O.D. 186.57 ft

If not ground level give O.D. of beginning of shaft bore

Made by

Date of sinking 20-5-41- 3.6.41

Information from

Date received

Examined by.

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

(For Survey use only)

6-inch Map Registered No.

Name of Shaft or Bore given by Geological Survey:

DECLASSIFIED SK/92 SE/9

Name and Number given by owner:

МСТН 3

Nat. Grid Reference

9966.2419

For whom made A. F. S. C.

A. F. S. C.

Town or Village Corby County Lenis

Corby

County Lincoln

Exact site	Attach a tracing from a map, or a sketch-map, if possible.
------------	--

Attach a tracing from a map, or a sketch-map, if possible.

1" N.S. Map
No.

(4.3)

1" O.S. Map
No.

Confidential
or not

He

Purpose for which made Iron tone

Ironstone

Ground Level at ~~shaft~~ ^{base} relative to O.D. 197.03 ft. If not ground level give O.D. of beginning of ~~shaft~~ ^{base}

197-03 *fl.*

If not ground level give O.D. of beginning of shaft bore

Made by _____ Date of sinking 5.5.74 - 45.41

Date of sinking 5.5.41 - 45.41

Information from _____ Date received _____

Date received.....

Examined by _____

본 연구는 한국연구재단의 지원을 받아 수행된 기초연구사업임(과제번호: K2016-00079-A0100001).

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]



LINCS. T31 SE

SK/92SE/8

CONFIDENTIAL

SURVEY No. 28

AFSCo. No. MCH 2.

Date. 25.4.41 - 4.6.41.

a.d. 190.46.

Remitter

Soil	3-6	3	6
fat rubble	1-6	5	0
Estuarine clay	2 0	7	0
Ironstone. Soft brown	3 0	10	0
hard brown blue	1 0	11	0
v. " " "	1 0	12	0
" " blue cones	2 0	14	0
Tubed (inferior)	4 6	18	6

Spring from wear at 13 ft. : estimated 1000 g.p.h.

Dip 5° E.

Analysis

Depth.	Iron (wet)	Moisture	Iron (Dry)	Insol.
7	33.9 %		39.3 %	19.5 %
8	33.8 %		29.4	42.1
9	31.0 %		36.0	25.5
10	31.9		37.0	25.4
11	29.6		34.6	35.1
12	31.3		36.3	32.3
13	29.6		34.3	33.3
14	16.8		19.5	54.5
17	19.0		22.0	61.3
18'6"				

Averages

	Iron (wet)	Iron (dry)	Insol.	Depth
Total depth	32.9 27.2	30.8	42.6	7' - 18'6"
Workable stone.	30.6 35.2	35.2	30.4	7' - 14'



DECLASSIFIED (For Survey use only)
GEOLOGICAL SURVEY OF GREAT BRITAIN
RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

8

6-inch Map Registered No.

5X/92 SE/8

Name and Number given by owner:

MCTH 2

Nat. Grid Reference

9947.2442

For whom made

A.F.S. Co

Town or Village

Corby

County

Leics

Exact site

Attach a tracing from a map, or a sketch-map, if possible.

1" N.S. Map No.

14J

1" O.S. Map No.

Confidential or not

Yes

Purpose for which made

Ironstone

Ground Level at shaft bore relative to O.D.

190.46 ft

If not ground level give O.D. of beginning of shaft bore

Made by

Date of sinking

25.4.41 - 4.6.41

Information from

Date received

Examined by

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only) GEOLOGICAL CLASSIFICATION	DESCRIPTION OF STRATA	THICKNESS		DEPTH	
		FT	in.	FT	in.
	Soil	3	6	3	6
	Lat. rubble	1	6	5	0
	Estuarine clay	2	0	7	0
	Ironstone, soft brown	3	0	10	0
	" , hard brown blue	1	0	11	0
	" , v. " " "	1	0	12	0
	" , v. hard blue cores	2	0	14	0
	" , Tubed (inferior)	4	6	18	6
	Spring from well at 13 ft : estimated 1000 g.p.h. Dip 5° E				
	Analysis:-				
	Depth	Fe (wet) %	Fe (dry) %	Insol. %	
	8	33.9	37.3	19.5	
	9	33.8	29.4	42.1	
	10	31.9	36.0	25.5	
	11	31.9	37.0	25.4	
	12	29.6	34.6	35.1	
	13	31.7	36.3	22.3	
	14	29.6	34.3	33.3	
	17	16.8	19.5	54.5	
	18 1/2	19.0	22.0	61.3	
	Averages:-				
		Fe (wet) %	Fe (dry) %	Insol. %	Depth
	Total Depth	27.2	30.8	42.6	7' - 18 1/2"
	Workable stone	35.2	35.2	30.4	7' - 18'



LINCS. 131 SE.

SK/92SE/7

DECLASSIFIED

N.G.R. 9939.2452

CONFIDENTIAL
SURVEY No. 7

Date. 25.4.41 — 20.5.41.

A.F.S.Co. No. MCTH. 1.

O.D. 196.81.

	2	0	2	0
Gravel	2	6	4	6
Sandy gravel	1	6	6	0
Thin bedded irony rag [blue centred v. hard]	3	0	9	0
Estuarine clay sand	7	6	16	6
Flintstone, v. hard brown.	1	0	17	6
(Water at 21'6") " " " blue	2	0	19	6
Hard brown	2	0	21	6
[Tubed] Brown	3	0	24	6
" " blue	3	0	27	6

Analysis.

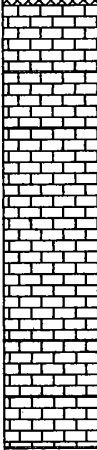
Depth.	Iron as recd.	Moisture	Iron @ 100°	Insol.
16 6	31.0 %	% of 16% assumed		
17 6	30.2		36.0	22.7
18 6	30.2		35.0	23.7
19 6	32.7		35.0	25.7
20 6	30.4		38.0	31.1
21 6			35.3	35.2
24 6	30.3		35.2	26.8
27 6	28.4		33.0	27.7

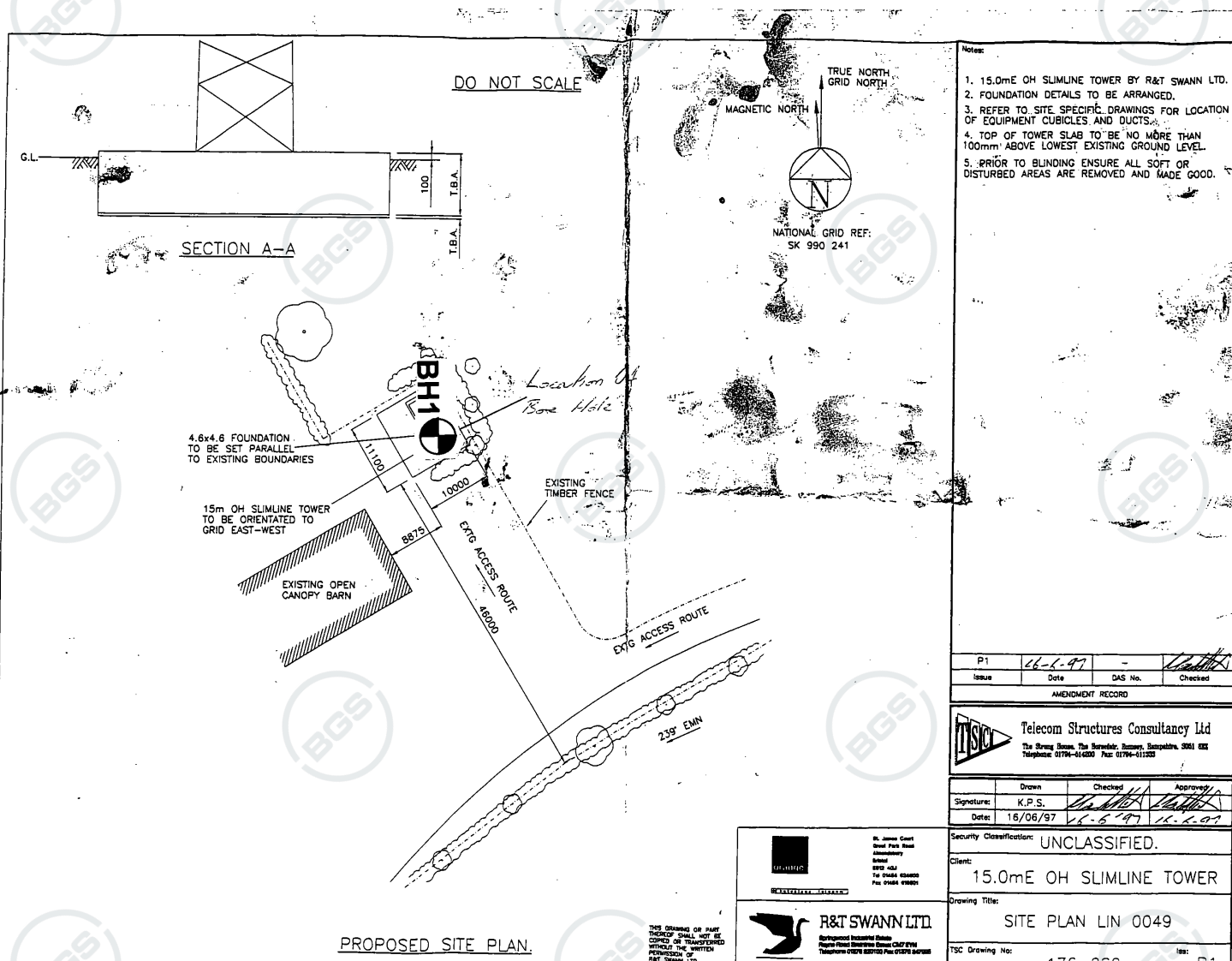
Averages

	Fe. (moist)	Fe. (dry)	Insol.	Depth.
Total depth sampled	30.0 %	34.9	27.4	16'6" — 27'6"
Total workable.	30.6	35.6	27.3	16'6" — 24'6"

[OVER]



CLIENT T.S.C.		JOB NO C9058	LOCATION LIN 0049, SWAYFIELD FRAM LODGE		BOREHOLE NO BH1		
DATE JUNE 1997		SCALE 1 to 50	BORING METHOD CABLE PERCUSSIVE			Sheet: 1	
Drilling & Casing Progress	SAMPLE/TEST		SPT N - value or COHESION	DESCRIPTION	O D LEVEL	LEGEND	DEPTH
	Type & No.	Depth(M)					
30TH				MADE GROUND—Compact stone & fragmented brick fill materials.			0.0
				initially weathered weak yellow/buff LIMESTONE becoming denser, harder and less weathered with depth. Weak to moderately weak towards base.			0.65
	S 1	1.20	14				
	B 2	1.40					
	S 3	2.10	50				
	B 4	2.70					
	S 5	3.00 - 3.25	75				
30TH							4.00
DUNELM DRILLING CO 0191 626 2634 FAX 0191 617 0086				BOREHOLE LOGSHEET			
Water Observations, Remarks, Etc Borehole dry. Chiselling limestone for up to 2hrs - 2.75m-4.00m							





(For Survey use only)

GEOLOGICAL
CLASSIFICATION

FOR ALL USES

Up. L. Clay

L. L. Clay

N. L. Sand.
(L. L. + F. L.)

NATURE OF STRATA

If measurements start below
ground surface, state how far

Glaug
Limestone
Sandstone

THICKNESS

Feet Inches

8

92

30

DEPTH

Feet Inches

8

100

130

SK 92 SE/87
9903 2402

143



RECORD OF WELL (SHAFT OR BORE)

NW 92 SE 9902 2402.

At E. Swayfield

Town or Village

County Lincoln Six-inch quarter sheet 131 SE/w

For Mr. Bloodworth

Exact site of well (Tracing)

(Attach a tracing from a map, or a sketch-map, if possible.)

Level of ground surface above sea-level (O.D.) 266 feet.

Is well-top at ground level? above ; below ; feet.

Shaft ft., diameter ft. Details of headings

Bore ft. ; diameter of bore : at top ins. ; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes 10' x 5"

Water struck at depths, below well-top, of (feet)

TEST DETAILS Rest-level of water 100 ft. above well-top. Suction at ft. Yield on hours'
Month 1927 pumping gallons per (max. capacity of pump) g.p.h.,
Year 1927 with depression of feet. Recovery to in mins.
hours.

WORKING CONDITIONS Rest-level of water in (month), (year), ft. above well-top.
Highest in (month), (year), ft. below "
Lowest in (month), (year), ft. above "
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins.
hours.

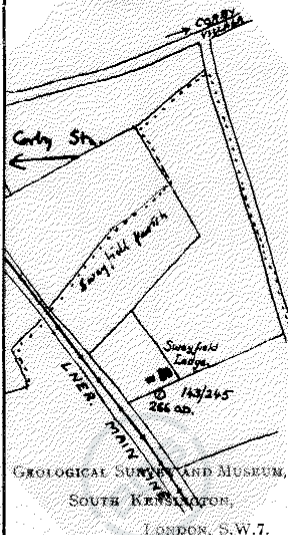
Quality of water (attach copy of analysis if available)

J.T. BARNES & son,

Well made by SLEAFORD Date of well 1927

Information from do

ADDITIONAL NOTES.



Disused. Dismantled wind pump well bore which is inaccessible for measurements. B.M. 16-5-63.

LOG OF STRATA OVERLEAF.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked on 1" Map.	(use symbol) on 6" Map.
		143		○	○



(For Survey use only)

GEOLOGICAL
CLASSIFICATION

FOOT WALL (K.P.) x 44

Up. Gr. Clay

Lime. Lr

N. & S. Sandst.
(Lr Gr. + I. & M.)

NATURE OF STRATA

If measurements start below
ground surface, state how far... ..

THICKNESS

Feet

Inches

DEPTH

Feet

Inches

2

Glauc
Limestone
Sandstone

8

92

30

8

100

130

—

—

—

✓

Contact BGS: ngdc@bgs.ac.uk



①

For Institute use only Licence No.

N. N

143 SK 92/3
420

RECORD OF WELL

At No 3 BOREHOLE (OBS)
NOM SK 9896 2513.

Town or Village BURTON COSSGARS

County LINCOLNSHIRE

Six-inch County Sheet LINCS 131 SE/W

Six-inch National Grid sheet and reference SK 92 NE

For WELLS 947 v NANNIE RIVER AUTHORITY

State whether owner, tenant, builder, contractor, consultant, etc.:—

Address (if different from above) Oscar 412 Peterborough

Level of ground surface above sea level (O.D.) ft (..... m)

If well top is not at ground level, state how far above* ft (..... m)
below: ft (..... m)

SHAFT ft (..... m); diameter ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE 102 ft (31 m); diameter: at top in (152 mm); at
bottom in (152 mm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.)
5.50 m x 152 mm plain casing

Water struck at depths of ft (..... m) below well top

Rest level of water ft (..... m) above* well top. Suction at ft (..... m)
below

Yield on hours* test pumping at galls (..... m³) per with
days

depression to ft (..... m) below well top. Recovery to rest level in mins*
hours

Capacity of pump g.p.h. (..... m³/h)

Date of measurements 16 Dec

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power

Capacity galls (..... m³) per hour. Suction at ft (..... m)
below well top. Amount pumped galls (..... m³) per day. Estimated
consumption galls (..... m³) per week

Well made by FARRODS LTD Date of sinking Oct 1971

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Received from FARRODS LTD

Date 21.8.1971

Observation well

Recorder

E.R. log

Site marked on
1" map
6" map
(use symbol)

Copy to D.G. e.x.s.m.d.s

Date

LOG OF STRATA OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W.7.

[illegible]

ADDITIONAL INFORMATION SHEET

Date of completion
of well catalogue

Date of publication

Licence No.

143/420 SK92|3

Additional Sheet No.....

DATE	*	ADDITIONAL INFORMATION	INIT.		
14.8.78		100MM X 31.8M STEEL REPLACED BY ABS 125MM X 5.8M (PL), 20.4m (PERF), 2.8m (PL), 0.3m (BASAL PLUG). REAMING OUT & RELINING BY W.F. PETTIFER LTD.			
FILMED	* INSERT WELL REFERENCE LETTER, IF MORE THAN ONE WELL AT SITE		P.T.O.		
Section 6	Pumping test	Observ. well	Recorder	E.R. log	GEOLOGICAL SURVEY, WATER DEPARTMENT SOUTH KENSINGTON, LONDON, S.W.7.

Additional Information Sheet No. _____ Commenced _____





Sk 92/3





DAILY SITE BORING RECORD

SK92/3

BOREHOLE No. 3.

DATE 4 11 71

SITE BURTON COSSLES

CLIENT DEAF - WELAND RIVER AUTHORITY

DEPTH	THICK	STRATA	SAMPLE Depth	TYPE	No. BLOWS REMARKS
0.30	0.30	Brown Top Soil with Limestone cobbles			
28.35	28.05	Oolitic Limestone Buff coloured in upper part - grey coloured in lower part. Hard and soft bands and thin clays encountered			
29.55	1.20	Very hard grey Limestone			
31.00		CLAY.			

SHOW SAMPLE THUS

☒ UNDISTURBED

☐ DISTURBED

☐ S.P.T.

☐ WATER

WATER OBSERVATIONS

WATER LEVEL

STRUCK 23.75 METERS - DAMP

SEALED 28.95 METERS CELESTIAL

STRUCK 29.00 METERS LOST CIRCULATION

SEALED

STRUCK

SEALED

CLIENT'S SIGNATURE

CASING IN 5.50 m of 150 mm.

CASING REMOVED

REMARKS OR DETAILS OF DELAYS

200 mm boring to 5.50 m.
150 mm boring to 31.00 m.

BORING CLEAN

SK 92/3

Burton Coggles Borehole.

SK 990 251

Depth ? , diameter 150 mm, lined to 5.0 m.

TV log by M. Fleet, 15.2.73.

Mud was observed on the walls in patches down to about 8 m.

Small horizontal fissures observed at 9.3 m, 10.0 m, and 10.3 m depth.
A large fissure was seen at 11.3 m.

At 12.2 m, much broken rock was observed, apparently around a large horizontal fissure.

Mud was present on the walls at about 13 m depth.

Some broken rock was seen at 13.8 m depth.

At 14.5 m, a large fissure with much shattered and broken rock was observed. ~~Most~~ Many of the rock fragments were apparently balanced ready to slip into the borehole, so it was decided to lower the camera no further.

The large fissure at 11.3 m was examined with the radial lens, but little could be seen due to inadequate lighting. Technical difficulties prevented further use of this lens.



WATER RESOURCES BOARD WELL RECORD		W.R.B. REF. No. <u>SK 92/3</u>
SHEET 1		R.A. LICENCE No.
1. WELL IDENTITY		
NATIONAL GRID REFERENCE <u>SK 990 251</u>		
Well at <u>Burton Coggles</u>	I.G.S. REF. No.	
	RIVER AUTHORITY <u>Welland & Nene</u>	
Town	HYDROMETRIC AREA <u>31</u>	
County	SUB-CATCHMENT	
Owner of well <u>Welland & Nene R.A.</u>		
Well made by	Date of sinking <u>4-11-71</u>	
Information from <u>Welland & Nene R.A.</u>	Date received <u>28-2-73</u>	
2. WELL DESCRIPTION		
Level of ground surface <u>71.537</u> m. If well top is not at above* m.		
above sea level (O.D.) ft. ground level how far below ft.		
Shaft m. deep; Diameter at top mm; at bottom mm.		
ft. deep; Diameter at top in; at bottom in.		
Bore <u>31</u> m. deep; Diameter at top <u>200</u> mm; at bottom <u>150</u> mm.		
ft. deep; Diameter at top in; at bottom in.		
Details of headings		
DETAILS OF PERMANENT LINING TUBES		
Length <u>5.50</u> m.; Diam. <u>150</u> mm; Length Slotted m.; Diam. mm; Top <u>0.00</u> m. above* surface		
Plain ft.; in; ft.; in; ft. below surface		
Length m.; Diam. mm; Length Slotted m.; Diam. mm; Top m. above* surface		
Plain ft.; in; ft.; in; ft. below surface		
Length m.; Diam. mm; Length Slotted m.; Diam. mm; Top m. above* surface		
Plain ft.; in; ft.; in; ft. below surface		
Details of well screen		
DETAILS OF REST WATER LEVELS DURING CONSTRUCTION		
Water struck at depths of <u>23-75, 28-95 m.</u> below well top		
Rest level of water m. above* O.D.* m. deep. Date		
ft. below well top when bore ft.		
Rest level of water m. above* O.D.* m. deep. Date		
ft. below well top when bore ft.		
Rest level of water on completion of bore m. above* O.D.* m. deep. Date		
ft. below well top when bore ft.		
Method of drilling <u>2 airflush</u>		
Brief details of well development e.g. acid treatment etc.		

* delete as applicable

(18127/1)



WATER RESOURCES BOARD WELL RECORD		W. R. B. REF No. <i>SK 92/3</i>
SHEET 2		R. A. LICENCE No.
4. HYDROGEOLOGY		
Topography AT WELL SITE		
Local depression ☐ , Flat surface ☐ , Hill top ☐ , Hillside ☐ , Valley bottom ☐ , Terrace ☐		
MAJOR AQUIFER <i>Lincolnshire Limestone</i>		Lithology <i>limestone and clay bands</i>
Depth to top of aquifer <i>0-30</i> m. ft.		Thickness penetrated <i>30-70</i> m. ft.
Top of aquifer m. <i>AOD*</i> ft. <i>BOD</i>		Total thickness of aquifer <i>30-70</i> m. ft.
Coefficient of storage		Transmissivity $\frac{\text{m}^2/\text{day}^*}{\text{galls/day/ft.}}$
MINOR AQUIFER		Lithology
Depth to top of aquifer m. ft.		Thickness penetrated m. ft.
Top of aquifer m. <i>AOD*</i> ft. <i>BOD</i>		Total thickness of aquifer m. ft.
Coefficient of storage		Transmissivity $\frac{\text{m}^2/\text{day}^*}{\text{galls/day/ft.}}$
ADDITIONAL NOTES: <i>Observation borehole, Welland & Nene R.A. Television run by M. Fleet, 15.2.73 :</i>		

* delete as applicable

[illegible]



NGRC
BOREHOLE RECORDS
ADJUSTMENT FORM

QUARTER SHEET SK92 SE

BH REGISTRATION NUMBER 95 - 101

~~NUMBER NOT USED~~ / ~~! LOG MISSING !~~
(Delete as appropriate)

Records entered and held in Wallingford

BH REGISTRATION NUMBER(S)



RECORD OF WELL (SHAFT OR BORE)		For Survey use only	
(attach copy of analysis if available)		N. <u>143</u> SK92/36	
At <u>Corby Glen Railway Station</u>		<u>407</u>	
EXACT SITE OF WELL	Town or Village <u>Corby</u>		
	County <u>Lincs</u>	Six-inch quarter sheet <u>131 SE W.</u>	
	For <u>British Transport Commission</u> State whether owner, tenant, builder, contractor, consultant, etc. :- <u>Region</u>		
	Address (if different from above) <u>c 240/150?</u>		
	Level of ground surface above sea-level (O.D.) <u>200</u> ft.	If well-top is not at ground (above ; level, state how far <u>below</u> <u>3.9</u> ft.	
	SHAFT <u>94</u> ft. ; diameter <u>4</u> ft. ;	Details of headings	
	BORE <u>110</u> ft. ; diameter of bore : at top <u> </u> ins. ; at bottom <u> </u> ins.		
	Details of permanent lining tubes		
	Water struck at depths of <u> </u> ft. below well-top.		
TEST CONDITIONS	Rest-level of water <u>85.9</u> ft. <u>above</u> well-top. Suction at <u> </u> ft. Yield on <u>one</u> hours' test pumping at <u>334.8</u> galls. per <u>hour</u> with depression to <u>86.9</u> ft. below well-top.		
	Recovery to rest-level in <u>30</u> mins. Capacity of pump <u>300</u> g.p.h. Date of measurements <u>21.8.54</u>		
NORMAL CONDITIONS	Description of permanent pumping equipment :		
	Make and/or type <u>Submersible Pump</u>	Motive power <u>Electricity</u>	
	Capacity <u>300</u> gallons per hour.	Suction at <u>110</u> ft.	
	Amount pumped <u>66</u> galls. per day.	Estimated consumption <u>400</u> galls. per week.	
	Well made by <u> </u>	Date of well <u> </u>	
	Information from <u>Brit. Transport Commission - Eastern - N.E. Region</u>		
	ADDITIONAL NOTES		
	<u>36 Return 1962.</u>		
	<u>Pumping plant abandoned and well filled in on 14 January 1962.</u>		
	<u>W6/GW7 Cdr</u>		
	<u>date 2/11/54</u>		
	<u>20257/63</u>		
LOG OF STRATA OVERLEAF.			
GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.		Date Received <u>3/11/54</u>	1" O.S. Map No. Site marked (use symbol) on 1" Map on 6" Map

Contact BGS: ngdc@bgs.ac.uk



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

(For Survey use only)

6-inch Map Registered No.

Name of Shaft or Bore given by Geological Survey:

17

SK/92SE/17

Name and Number given by owner:

NW 248

Nat. Grid Reference

9853.2401

For whom made

United Steel Co. Ltd.

Town or Village

Sunnyfield

County

Lincoln

Exact site

(Attach a tracing from
a map, or a sketch-
map, if possible.)

1" N.S. Map
No.

143

1" O.S. Map
No.

Confidential
or not

Yes

Purpose for which made

Ironstone

Ground Level at shaft
bore relative to O.D. 284.9 ft.

If not ground level give O.D. of beginning of shaft
bore

Made by

Date of sinking 22.11.59

Information from

Date received

Examined by

GEOLOGICAL LOG

DRILL LOG

Depth From	Feet To	Thick. Ft.	Description	Geological Horizon	CROWNS USED		
0.0	8.0	8.0	Grey and green clay. Upper Estuarine Series	St. Oolite Series	Size	No.	Feet
8.0	56.0	48.0	Oolitic Limestone	Upper Lincs. Limestone	131	Cbd	20.0
56.0	60.0	4.0	Limestone with R. Crossi		Inferior	116	NOB
60.0	104.0	44.0	Oolitic Limestone	Lower Lincs. Limestone	116	584255 583687	53.0
104.0	105.0	1.0	Clay		Oolite	101	594744 573171
105.0	108.0	3.0	Limestone	Series	REAMERS USED		
108.0	109.0	1.0	Grey clay Lower Estuarine Series		Size	No.	Feet
109.0	110.0	1.0	Lilac clayey sandstone. Transitional	Lower Estuarine Series/Northampton Sands Bed	116	584223	53.0
					101	584766 573330	26.0
110.0	112.0	2.0	Green and grey sandy ironstone	Northampton Sands Bed			
112.0	112.5	0.5	Dark green clayey sand				
112.5	128.2	15.7	Green and grey sandy ironstone				
128.2	135.0	6.8	Blue clay. Upper Lias Clay	Upper Lias	CASING USED		
				Size	Set (Ft.)	Recovered (Ft.)	
				128	20.0	20.0	
				113	109.0	109.0	
				Water Used 16,000			
				Rest Water Level 105.0			
				LEVELS			
				Surface	284.9		
				Top 1st.	175.9		
				Bottom 1st.	156.7		
				Signed R.J.M.DIXIE.			



NW 248

SK/92SE/17

- 109'0" - 110'2" Pale lilac sandy clay [LE]
- 110'2" - 111'3" Grey strong oolitic sandy ironstone - pallid
oolitic in silty & sandy mudstone matrix;
- 111'3" - 111'7" grey-brown even-grained oolite
(largely voids) : 111'7" - 112'4" dark brown semi-
oxidised oolitic ironstone; becoming dark bluish-
grey and unoxidised at 112'1"
- 112'4" - 112'5" Very dark grey-green clay
- 112'5" - 112'7" Dark green medium-grained quartzose pebbly
sandstone (with dark grey ? reddish trace)
- 112'7" - 118'6" Greenish-grey even-grained oolitic ironstone; ^{with brownish} ^{matrix}
much orange-brown ^{oxidised} matrix (?); some
shell moulds; distinctly green below 115'4";
below 116'4" fragments of green oolitic ironstone;
from 117'0" oolites become few in grey-green
sandy ironstone; no oolite below 117'6"; 1 in. at
base oxidised.
- 118'6" - 122'0" Grey fine-grained compact calcareous sandstone
- 122'0" - 127'10" Slightly darker grey sandstone with scattered pallid
oolites - most of original oolites represented
by voids; very few oolites and voids below 125'6";
all calcareous.
- 127'10" - 128'3" Very argillaceous pebbly soft sandstone with
irregular fragments of pale grey silty mudstone
in top 1 inch.
- 128'3" - 129'0" Grey silty clay [ULi]

NSI
(18'1")

R.T.W.

DECLASSIFIED



SK 92 SE/82
9841 2456

143/27

(For Survey use only)
GEOLOGICAL
CLASSIFICATION
1:50,000 scale

NATURE OF STRATA
If measurements start below
ground surface, state how far...

	THICKNESS		DEPTH	
	feet	inches	feet	inches
Head	11		11	-
Lower Lst.	50		61	-
Lower Lst.	35		96	-
Upper Lst.	9		105	-

Soil & Clay
Limestone
Sandstone
Clay

143

X



166
RECORD OF WELL (SHAFT OR BORE)

At Cosby Heath

Town or Village

County Lincoln Six-inch quarter sheet 13/SE(W)

For Mr. Paravicini 9842 2456
9839 2455

Exact site of well (Tracing on 143/27D) SK 92SE (9842 2456)

29 d.
143/27D
Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) 213 feet.

Is well-top at ground level? Yes If not, state how far above; 213 feet.
below;

Shaft ft., diameter ft. Details of headings

Bore ft.; diameter of bore: at top ins.; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes 15 x 5"

Water struck at depths, below well-top, of (feet)

TEST DETAILS Rest-level of water 47 ft. above well-top. Suction at ft. Yield on hours' days'
Month Nov pumping 600 gallons per hour (max. capacity of pump g.p.h.),
Year 1925 with depression of feet. Recovery to in mins. hours.

WORKING CONDITIONS Rest-level of water in (month), (year), ft. above well-top.
Highest " in (month), (year), ft. above below "
Lowest " in (month), (year), ft. above below "
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. hours

Quality of water (attach copy of analysis if available)

Well made by J. T. BARNES & son, Date of well Nov 1925

Information from SLEAFORD.

do
ADDITIONAL NOTES.

Test pump down 72 ft.
Water struck in sandstone near bottom.
No 2 Bore.

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map. on 6" Map.	
		<u>143</u>	<u>70</u>	<u>○</u>	<u>○</u>



(For Survey use only) GEOLOGICAL CLASSIFICATION F.S.A. with x.44	NATURE OF STRATA If measurements start below ground surface, state how far... ..	THICKNESS		DEPTH		
		Feet	Inches	Feet	Inches	
		...	...	...	...	
Head	Soil & Clay	11		11	—	
Lim. Lst	Limestone	50		61	—	
Lr. Limestone	Sandstone	35		96	—	
Upp. Lms	Clay	9		105	—	x



GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

Name of Shaft or Bore given by Geological Survey:

30

(For Survey use only)

6-inch Map Registered No.

DECLASSIFIED

Name and Number given by owner:

Pi 5

Nat. Grid Reference

9829. 2463

For whom made

United Steel Co. Ltd.

Town or Village

Hayfield

County

Northants.

Exact site

(Attach a tracing from a map, or a sketch-map, if possible.

1" N.S. Map No.

143

1" O.S. Map No.

Confidential or not

Purpose for which made

Ironstone

Ground Level at shaft bore relative to O.D.

247.4 ft

If not ground level give O.D. of beginning of shaft bore

Made by

Date of sinking 1/5/43 - 5/5/43

Information from

U.S.G. Ltd.

Date received

1960

Examined by

SPECIMEN NUMBERS AND ADDITIONAL NOTES

(For Survey use only)
GEOLOGICAL
CLASSIFICATION

DESCRIPTION OF STRATA

THICKNESS

Ft

in.

DEPTH

Ft

in.

Limestone

80

0

80

0

Regstone

14

0

94

0

L. & Ironstone

4

0

98

0

Ironstone

18

0

116

0

Uli

1

0

117

0

GEOLOGICAL SURVEY OF GREAT BRITAIN

RECORD OF SHAFT OR BORE FOR MINERALS

(For Survey use only)

6-inch Map Registered No.

Name of Shaft or Bore given by Geological Survey:

31

DECLASSIFIED

Name and Number given by owner:

SL 18

Nat. Grid Reference

9828. 2353

For whom made United Steel Co.

United Steel Co.

Town or Village.....*Hayfield*

Hayfield

County Lincoln

Lumia

Exact site

Attach a tracing from a map, or a sketch-map, if possible.

1st N.S. Map
No.

1" O.S. Map
No.

Confidential
or not

Purpose for which made.

Inmate

Ground Level at shaft
bore relative to O.D. 309.38 ft.

309.38 ft

If not ground level give O.D. of beginning of shaft bore.

Made by

Date of sinking 19.6.43. - 24.6.43

Information from

U.S.C. 152

Date received

196.

Examined by.

SPECIMEN NUMBERS AND ADDITIONAL NOTES

[illegible]

Appendix C

Historical development

Appendix C Historical development

Date(s) of Mapping	On-site Features	Off-site Features
Region 1		
1886 – 1889	- Site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. - Wykeham Drain present on-site south of the overhead line alignment flowing from the south towards the north east off-site – all south of the overhead line alignment. - Welland Bank River on-site of Region 1a, crossing beneath the overhead line at 527371 327364, flowing towards the north east. - Vernatt's Drain on-site of Region 1a, crossing beneath the overhead line at 527271 327417, flowing parallel to Welland Bank Drain towards the north east. - Pond onsite centrally of Region 1a, north of the overhead line (526812 327704). - Pond onsite of Region 1b (526283 327891). - Blue Gowt Drain on-site of Region 1b, crossing the overhead line at 526491 32737, flowing towards the north east. - Lincolnshire Loop railway line on-site of Region 1b, crossing the overhead line at 526098 327463. - Clink's Drain on-site of Region 1b to 1d – south of the overhead line alignment (1b), crossing the overhead line at 524680 327588 and again at 524067 327593 (1c), then meandering north of the overhead line before crossing the overhead line at 522377 327629 (1d), flowing from the south then in an easternly direction. - Pond on-site of Region 1b, south of the overhead line alignment (525699 327444). - River Glen on-site of Region 1c, crossing the overhead line at 524196 327589, flowing towards the north east. - Great Northern and Great Eastern railway line on-site of Region 1d, crossing the overhead line at 523053 327615. 2 No. ponds on-site of Region 1e to the far east, north of the overhead line alignment (522171 327685). - New Drain extends on-site of Region 1e and 1f south of the overhead line alignment, before crossing the overhead line at the boundary between 1e and 1f at 521082 327662 and again at 520288 327677. - South Forty-Foot Drain on-site of Region 1h, crossing the overhead line at 516570 326747. - Hammond Beck on-site of Region 1f/g, crossing the overhead line at 520288 327677. - Hacconby Lode on-site of Region 1j, crossing the overhead line at 512909 326163.	- The surrounding land of site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. - Small area of buildings including a farm 120m south of Region 1a (527297 32713). - Wykeham Drain extends from site, flowing off-site towards the north east. 2 No. ponds offsite of Region 1a 125m and 230m south of the site (527602 327077 and 527553 327005, respectively). - Area of buildings associated with a farm estate off-site Region 1b (526304 327567). - Pond noted 183 m north of Region 1b (526273 327915). - Farm 55 m north of Region 1b (526296 327574). - Farms 16 m and 48 m south of Region 1c at 525154 327468 and 525036 327423, respectively. - Pond noted 211 m north of Region 1c (524984 327894). - Large pond or reservoir noted 51 m south of Region 1d (523340 327173). - New Drain 237 m south of Region 1d. - Farm noted 37 m north of Region 1e (522171 327828). - Well present 7 m north of Region 1f (520363 327762). 3 No. ponds noted 74 m (520075 327814), 62 m (519326 327870) and 182 m (519553 327967) north of Region 1f. - Farm 74 m south (519322 327548) and named house adjacent east of the access road (519284 327882) of Region 1f. - Pond 184 m south of Region 1g at 518697 327472. - Draining pump recorded 230 m north of Region 1h (516513 327097). - Hacconby Lode 190 m south of Region 1i. - Star Lode 124 m south of Region 1h.
1903 – 1906	No significant changes.	- Pond within 250 m of Region 1a at 527096 327616 appears infilled. - Pond 100 m south west of Region 1b at 526515 326856. - Pump with associated buildings 140 m south of Region 1b at 526347 326889. - Pump 120 m south of Region 1c at 524534 327391. - Well 72 m north of Region 1d at 522157 327785. Well is associated with Farm. - Pond 86 m south of Region 1g at 518691 327458.

Date(s) of Mapping	On-site Features	Off-site Features
		• Second draining pump recorded 250 m north of Region 1h (516587 327119). • Pond 32m south of Region 1j at 512747 325952.
1907 – 1928	• No mapping available.	• No mapping available.
1929 – 1938	• Historical mapping included, however no coverage across the site or within 250 m of it.	• Historical mapping included, however no coverage across the site or within 250 m of it.
1939 – 1949	• No mapping available.	• No mapping available.
1950 – 1959	• ‘Romano-British remains found’ labelled partially onsite (access road) of Region 1h (516262 326261).	• Pump south of Region 1b at 526347 326889 no longer labelled by 1956. The buildings remain. • Pump south of Region 1c at 524534 327391 no longer labelled by 1950. The building remains. • Pond 30 m north west of Region 1c at 524681 327892. • Pond south of Region 1j at 512747 325952 appears infilled.
1960 – 1967	• No mapping available.	• No mapping available.
1968 – 1981	• Ponds on-site of Region 1a at 527553 327005 and 527602 327077 appear infilled by 1969. • Pond onsite of Region 1b (526283 327891) appears to be infilled. • Old Sea Drain labelled on-site of Region 1b and 1c predominantly south of the overhead line alignment. In Region 1b the drain branches off to the north crossing the overhead line at 525948 327509. In Region 1c is passes beneath the overhead line at 524703 327588. • Farm with a piggery noted on-site of Region 1c north of the overhead line alignment at 524672 327634. • The River Glen appears to have been widened • Overhead line and associated pylon towers on-site, with the overhead line crossing at 523209 327612.	• Pond within 250 m of Region 1b at 526515 326856 appear to be infilled. • Tank (1973) labelled 243 m south west of Region 1b at 525619 327224. • A large estate with unlabelled buildings present 175 m south of Region 1c at 524994 327318. • Pond north of Region 1c at 524681 327892 appears infilled. • Large reservoir/pond at 523340 327173 appears to be infilled. • Farms present 152 m south (523145 327166) and 184 m north (522956 328081) of Region 1d. • Well at farm (522157 327785) north of Region 1e no longer labelled. • Ponds north of Region 1f at 520075 327814, 519553 327967 and 519326 327870 appears infilled. • Pond south of Region 1g at 518691 327458 appears infilled. • Pumping Station 112 m south of Region 1h at 516620 326546. • Ponds 165 m and 200 m north of Region 1j at 512569 326267 and 512562 326301, respectively.
1982 - 1995	• Tanks noted on-site of Region 1b south of the overhead line alignment at 526030 327417. • Piggery in Region 1c no longer labelled, but building still present.	• Pond south of Region 1b at 525699 327444 appears infilled by 1985. • Electricity substation 167 m north of Region 1c at 525204 327835. • Tank 113 m south of Region 1c at 524554 327399.
2000 – 2025 <i>Google Earth</i>	• Pond onsite of Region 1e at 522171 327685 appears infilled by 1999.	• Pond north of Region 1c at 525005 327886 appears to be infilled by 2021. • Pond south of Region 1d at 523340 327173 appears to be infilled by 2016. • Farm no longer present. • Intensive animal husbandry (poultry?) in Region 1e at 521787 327314 on the boundary of the 250m buffer, south of the corridor.
Region 2		
1886 – 1889	• Site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. Additionally, where very small water bodies have been noted along drainage channels, these have not been noted as standalone ponds.	• The surrounding land of site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. Additionally, where very small water bodies have been noted along drainage channels, these have not been noted as standalone ponds.

Date(s) of Mapping	On-site Features	Off-site Features
	- Pond on-site of Region 2a south of the overhead line alignment at 511938 325981. - Haconby Lode on-site of Region 2a, crossing the overhead line at 512390 326080 and 512349 326074. - Scotten Dike on-site of Region 2a, crossing the overhead line at 512044 326027. - Car Dyke on-site of Region 2a, crossing the overhead line at 511667 325966. - Pond on-site of Region 2c north of the overhead line alignment at 509657 325831. - Pump onsite of Region 2c at 508839 325107. - Pond on-site of Region 2d south of the overhead line alignment at and 508523 325173.	3 No. of ponds off-site of Region 2a located 79 m south (511609 325802), 200 m south (511220 325652) and 162 m south (511814 325748). - Village of Haconby from 125 m south of the site. - A quarry noted 120 m south of Region 2b at 510383 325603. 6 No. ponds within 250 m of Region 2b located 40 m north (511031 326016), 114 m south (510558 325594), 237 m north east (510349 326205), 66 m west (510513 325467), 240 m south east (510234 325282) and 247 m east (510261 325351). - Pond noted 55 m east of Region 2c at 509751 325427. - Well 12 m south of Region 2c at 509255 325291. 7 No. ponds within 250 m of Region 2d located 15 m northwest (507980 324860), 30m south (507706 324591), 41 m south (507777 324455), 103 m west (507888 324835), 130 m north (507771 324780), 153 m north (507850 324908) and 105 m north west (508114 325038) - Smithy located 160 m north of Region 2d at 508046 324956. - Well 55 m north (508050 324987).
1903 – 1906	- Pond on-site of Region 2a at 511938 325981 appears infilled. - Pond on-site of Region 2c north of the overhead line alignment at 509698 325717.	- Pond on-site of Region 2a at 511938 325981 appears infilled. - Quarry south of Region 2b at 510383 325603 appears infilled. - Pumps labelled 18 m north east and 35 m north of Region 2b at 509766 325971 and 510245 325907, respectively, with associated buildings. - Pond 20 m south of Region 2c at 509486 325339. - Pump 40 m south west of Region 2c at 509211 325257. - Well south of Region 2c at 509255 325291 no longer present. - Smithy north of Region 2d at 508046 324956 no longer labelled.
1907 – 1928	No mapping available.	No mapping available.
1929 – 1938	Historical mapping included, however no coverage across the site or within 250 m of it.	Historical mapping included, however no coverage across the site or within 250 m of it.
1939 – 1949	No mapping available.	No mapping available.
1950 – 1959	Pond on-site of Region 2c north of the overhead line alignment at 509045 325546.	- Ponds south of Region 2b at 510558 325594 and 510513 325467 appear infilled. - Well 20 m west of Region 2b at 510556 325484. - Pump north east of Region 2b at 509766 325971 no longer labelled. The buildings remain present. - Pump south of Region 2d at 508839 325107 no longer labelled. - Ponds north of Region 2d at 508114 325038 and 507706 324827 appear infilled.
1960 – 1967	No mapping available.	No mapping available.
1968 – 1981	- Ponds on-site of Region 2c north of the overhead line alignment at 509657 325831, 509698 325717, 509122 325696 and 509045 325546, appear to be infilled. - Pumping Station on-site of Region 2d south of the overhead line alignment at 508146 324588. - Pond on-site of 2d at 508523 325173 appear infilled.	- Ponds south of Region 2a at 511814 325748 and 511609 325802 appear to be infilled by 1977. - Pond north of Region 2b at 511031 326016 appears infilled by 1976. - Well west of Region 2b at 510556 325484 no longer labelled. - Pump east of Region 2b at 510245 325907 no longer labelled. - Ponds south of Region 2b at 510261 325351 and 510234 325282 appear infilled.

Date(s) of Mapping	On-site Features	Off-site Features
		• Farm present from adjacent (north east) of Region 2b. • Pond south of Region 2c at 509486 325339 appears infilled. • 6 No. ponds from 50 m to 150 m east of Region 2d located in a cluster centred on 508515 324641. • Well north of Region 2d at 508050 324987 is no longer labelled. • Pond 223 m north of Region 2d at 507923 324973. • Pond north of Region 2d at 507771 324780 appear infilled.
1982 – 1995	• No significant changes.	• No significant changes.
2000 – 2025 <i>Google Earth</i>	• No significant changes.	• Pond south of Region 2a at 511220 325652 appears infilled by 1999. • Pond north of Region 2b at 510349 326205 appears infilled by 2016. • Pond north of Region 2d at 507850 324908 appears infilled by 1999. • Pond north of Region 2d at 507923 324973 appears infilled by 1999. • Agricultural compound north of Region 2 at 507793 325072.
Region 3		
1886 – 1889	• Site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. • 4 No. ponds on-site of Region 3 located south of the overhead line alignment at 507177 324618, 507244 324391 and 507265 324394, and north of the overhead line alignment at 506095 324570.	• The surrounding land of site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. • 10 No. ponds located 10 m east (506550 324746), 26 m south of access road (506970 324842), 32 m south (506708 324447), 36 m south (507501 324536), 45 m south (506473 324452), 15 m north (506505 324806), 120 m north (507573 324755), 120 m east (507459 325023), 144 m north east (506664 324835) and 176m northeast (506075 324842). • Pumps located 14 m east and 230 m north at 506313 324762 and 506069 324895, respectively. • Pond 6 m south at 506197 324655. • East Glen River 234 m south of Region 3, extending onto site in Region 4.
1903 – 1906	• No significant changes.	• Pond 190 m north at 507706 324827 and 146 m south at 507301 324174.
1907 – 1928	• <i>No mapping available.</i>	• <i>No mapping available.</i>
1929 – 1938	• <i>Historical mapping included, however no coverage across the site or within 250 m of it.</i>	• <i>Historical mapping included, however no coverage across the site or within 250 m of it.</i>
1939 – 1949	• <i>No mapping available.</i>	• <i>No mapping available.</i>
1950 – 1959	• Pylon overhead line and associated towers on-site of Region 3, crossing the overhead line alignment at 507244 324642.	• ‘Romano-British Settlement’ labelled from 50 m north of Region 3 (507432 324824). • Pond south of Region 3 at 506970 324842 appears infilled.
1960 – 1967	• <i>No mapping available.</i>	• <i>No mapping available.</i>
1968 – 1981	• Pond on-site south of the overhead line alignment at 507214 324464. • Ponds on-site north of the overhead line alignment at 506095 324570 and south at 507265 324394 and 507244 324391 appear infilled by 1981.	• Ponds east of Region 3 at 507459 325023 appear infilled. • Pond north of Region 3 at 507177 324618 to be part of the drain running towards the east. • Pond to the south of Region 3 at 507301 324174 appears to be infilled by 1981. • Pond 170 m south west of Region 3 at 506997 324287.

Date(s) of Mapping	On-site Features	Off-site Features
		5 No. ponds within 250 m of Region 3 at 506473 324452, 506111 324921, 506664 324835, 506550 324746 and 506505 324806 appear infilled by 1981. - Pumps north of Region 3 at 506313 324762 and 506069 324895 no longer labelled.
1982 – 1995	No significant changes.	No significant changes.
2000 – 2025 <i>Google Earth</i>	No significant changes.	- Pond 18 m north at 507573 324755 appears infilled by 1999. - Agricultural complex north of Region 3 at 506106 324955.
Region 4		
1886 – 1889	- Site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. - East Glen River on-site of Region 4 crossing the overhead line at 505527 324710. - Ponds on-site of Region 4 south of the overhead line alignment at 505659 324612, 504840 324956 and 505553 324385.	- The surrounding land of site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. - Pond 110 m south (504848 324544).
1903 – 1906	No significant changes.	No significant changes.
1907 – 1928	<i>No mapping available.</i>	<i>No mapping available.</i>
1929 – 1938	<i>Historical mapping included, however no coverage across the site or within 250 m of it.</i>	<i>Historical mapping included, however no coverage across the site or within 250 m of it.</i>
1939 – 1949	<i>No mapping available.</i>	<i>No mapping available.</i>
1950 – 1959	Pylon overhead line and associated towers on-site of Region 3, crossing the overhead line alignment at 504840 324793.	No significant changes.
1960 – 1967	<i>No mapping available.</i>	<i>No mapping available.</i>
1968 – 1981	Area of archaeological remains/earthworks encroaching onto Region 4 (505514 324673) to the south – noted as ‘site of Medieval Village Elsthorpe’.	Ponds at 504840 324956 and 504848 324544 appear to be infilled by 1981.
1982 – 1995	No significant changes.	No significant changes.
2000 – 2025 <i>Google Earth</i>	No significant changes.	No significant changes.
Region 5		
1886 – 1889	- Site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. - Ponds on-site of Region 5 north of the overhead line alignment at 504015 324755, 503732 324642 and 503734 324386. - Breeche’s Wood encroaching on-site from the south.	- The surrounding land of site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. - Pond 54 m south east (503600 324084). - Little Norwood (forest/woodland) from 50 m north east of Region 5.
1903 – 1906	No significant changes.	No significant changes.
1907 – 1928	<i>No mapping available.</i>	<i>No mapping available.</i>

Date(s) of Mapping	On-site Features	Off-site Features
1929 – 1938	Historical mapping included, however no coverage across the site or within 250 m of it.	Historical mapping included, however no coverage across the site or within 250 m of it.
1939 – 1949	No mapping available.	No mapping available.
1950 – 1959	No significant changes.	No significant changes.
1960 – 1967	No mapping available.	No mapping available.
1968 – 1981	- Breeches Wood appears to have decreased in size. - Ponds on-site north of the alignment at 504015 324755, 503732 324642 and 503734 324386 appear infilled by 1981.	- Pond 80 m north of Region 5 at 503904 324961. - Pond to the south at 503600 324084 appears to be infilled by 1981.
1982 – 1995	No significant changes.	No significant changes.
2000 – 2025 <i>Google Earth</i>	No significant changes.	- No significant changes. - Livestock farming complex centred to the south of site boundary (504260 E, 324400 N), outbuildings within site boundary.
Region 6		
1886 – 1889	- Site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. - Pond on-site of Region 6 south of the overhead line alignment at 503191 324158. - Little Norwood (forest/woodland) encroaches onto Region 6 to the north east.	- The surrounding land of site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. 2 No. gravel pits 7 m south and 280 m north of Region 6 at 503002 324578 and 502927 324091, respectively. - Marl pit 185 m south at 503053 323538. - Farm from 146 m south of Region 6, adjacent west of access road. 4 No. ponds within 250 m of Region 6 located 5 m west (503131 323994), 62 m south (502143 324046), 250 m north (502970 3245530) and 72 m west of access road (503049 323892). - Corby Pasture Wood from 140 m north east of Region 6.
1903 – 1906	No significant changes.	- Pump noted 180 m south of Region 6 associated with the farm estate at 503105 323928. - Buildings associated with the gravel pits to the north of Region 6 no longer present. One gravel pit now present/labelled. - Gravel pit south of Region 6 at 502927 324091 appears infilled. - Pond 108 m north at 501869 324346. - Hydraulic Ram and Windpump labelled in the vicinity of 501445 325184 from 180 m north east of Region 6.
1907 – 1928	No mapping available.	No mapping available.
1929 – 1938	Historical mapping included, however no coverage across the site or within 250 m of it.	Historical mapping included, however no coverage across the site or within 250 m of it.
1939 – 1949	No mapping available.	No mapping available.
1950 – 1959	No significant changes	Pump south of Region 6 associated with the farm estate at 503105 323928 no longer labelled.
1960 – 1967	No mapping available.	No mapping available.

Date(s) of Mapping	On-site Features	Off-site Features
1968 – 1981	Pond on-site of Region 6 south of the overhead line alignment at 501319 324889.	- Gravel pit to the north of Region 6 at 503002 324578 labelled as disused. Pond in the vicinity at 502970 324553 appears infilled, replaced by two ponds at 503033 324553 and 502924 324544. 2 No. ponds 12m east of access road and 16 m west of Region 6 at 503143 323909 and 502120 324266, respectively. - In the vicinity of the Hydraulic Ram, a Pump House is now also labelled.
1982 – 1995	No significant changes.	- Pond south of Region 6 at 502143 324046 appears infilled by 1983. - Builders Yard labelled from 248 m south east of Region 6 at 499732 325435.
2000 – 2025 <i>Google Earth</i>	No significant changes.	- Pond south of Region 6 at 501054 324859 appears infilled by 1999. - Pond south of Region 6 at 499920 325650) appears infilled by 1999. - Ponds north of Region 6 at 502924 324544 and 503033 324553 appear infilled by 2018 - Agricultural complex (farmyard) north of the site (500268 325783).
Region 7		
1886 – 1889	- Site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. - West Glen River on-site of Region 7a, crossing the overhead line at 499089 325461. - Railway line on-site of Region 7b, crossing the overhead line at 498127 324962. Railway line is orientated north west-south east.	- The surrounding land of site predominantly occupied by undeveloped agricultural fields with a number of minor roadways/drainage channels present and occasional farms. Where drainage channels are not labelled, they have not been listed individually below. 3 No. Old Stone Pits within 250 m of Region 7b located 58 m north west (498650 325391), 20 m north west (498738 325498) and 70 m north (498144 325366). Pit 150 m north has associated buildings north of the pit. - Lodge 170 m north of Region 7b at 498988 324055. - Farm adjacent north of Region 7b arm at 498245 324158. - Station adjacent south of Region 7b at 498580 324460. - Smithy 165 m northeast of Region 7b at 498132 325530. - Pond 126 m south of Region 7b at 498695 325153. - Pump 77 m south west of Region 7b at 498253 324675. - Well 185 m south east of Region 7b at 498798 325008.
1903 – 1906	No significant changes.	Old Stone Pits (Region 7b) at 498650 325391 and 498144 325366 are no longer labelled but appear visually still present.
1907 – 1928	<i>No mapping available.</i>	<i>No mapping available.</i>
1929 – 1938	<i>Historical mapping included, however no coverage across the site or within 250 m of it.</i>	<i>Historical mapping included, however no coverage across the site or within 250 m of it.</i>
1939 – 1949	<i>No mapping available.</i>	<i>No mapping available.</i>
1950 – 1959	No significant changes.	No significant changes.
1960 – 1967	<i>No mapping available.</i>	<i>No mapping available.</i>
1968 – 1981	No significant changes.	- Old Stone pit to the north of Region 7b at 498738 325498 appears infilled. - Old Stone Pits north of Region 7b at 498650 325391 and 498144 325366 labelled as disused pit/quarry although the outlines are still present. - Pump south west of Region 7b at 498253 324675 now labelled as a pond and a well.

Date(s) of Mapping	On-site Features	Off-site Features
		- Well south of Region 7b at 498798 325008 no longer labelled. - Pond 162 m south east of Region 7b at 497908 324840.
1982 – 1995	No significant changes.	No significant changes.

Appendix D

Preliminary

Geotechnical

Risk Register

Appendix D Preliminary Geotechnical Risk Register

A Preliminary Geotechnical Risk Register has been compiled to show the degree of risk attached to various ground related aspects of the proposed scheme. The purpose of the register is to produce an assessment of the risk to the project posed by site-specific ground related problems and identify suitable mitigation measures to control the risk to an acceptable level. The risk register should be developed and refined as the geotechnical design and assessment progresses such that the register will allow management of the geotechnical risks.

The degree of risk (R) is determined by combining an assessment of the likelihood (L) of the hazard with an assessment of the severity (S) of the hazard. The scale against which the likelihood and severity are measured, and the resulting degree of risk determined is presented below. Table D.4 presents the risk register for the proposed scheme.

Table D.1. Classification of probability and impact

Likelihood (L)		Severity (S)	
Very Likely	5	Very High	5
Likely	4	High	4
Probable	3	Medium	3
Unlikely	2	Low	2
Negligible	1	Very Low	1

Table D.2. Risk matrix

Likelihood	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
		Severity				

Table D.3. Classification of risk rating

Risk rating	Response
Intolerable	Unacceptable
Substantial	Early Attention
Tolerable	Regular Attention
Trivial	Monitor

Table D.4. Preliminary Geotechnical Risk Register

Identified geotechnical hazard/constraint	Associated ground condition/feature	Cause	Risk before control/mitigation			Consequence	Control/mitigation measures	Risk after control/mitigation		
			L	S	R (LxS)			L	S	R (LxS)
Unknown/unexpected ground conditions (including groundwater)	Site wide	Absence of ground investigation information across the site. Site is linear alignment which crosses numerous mapped changes in superficial and bedrock geology. The mapping may not be a true reflection of the ground conditions. Local features/geological conditions increasing likelihood of local unexpected ground conditions, such as karst, mining, slope instabilities, faulting, and buried channels.	4	4	16	Damage to and possible failure of proposed development due to incorrect ground model, design parameters. Increased cost and delay to account for unexpected ground conditions.	Ground investigations and associated in-situ and laboratory testing to identify underlying ground conditions (including groundwater) and assess risk, targeted across the site depending on nature of the proposed development and anticipated ground hazards. Appropriate design ground model (including groundwater conditions) and parameters to be incorporated, considering changes in ground conditions and nature of associated hazards. Consideration of inspection by a suitably qualified geotechnical engineer and inclusion of validation testing during construction to confirm design assumptions.	2	2	4
Karstic terrains and associated subsidence features	Cornbrash Limestone Formation, Blisworth Limestone Formation, Lincolnshire Limestone Formation (specifically the upper boundary with the Rutland Formation)	Limestone is prone to solution features, forming karstic terrains which are prone to subsidence. Presence of recorded karstic terrains and associated subsidence features and likely additional unrecorded/associated features, including swallet/sink/shake holes and stream sinks. Increased likelihood of features in proximity to faulting through the Lincolnshire Limestone Formation, and potentially at boundaries of superficial extents.	5	4	20	Subsidence/settlement at surface causing damage and possibly failure of proposed developments. Potential for increased cost and delays during site works to investigate and remediate features. Possible risk to life/injury and damage to plant due to ground collapse. Requirement for more significant scale investigations to inform risk, although such would not be able to fully de-risk the site due to nature of karst terrains.	Site reconnaissance by suitably qualified geotechnical engineer/engineering geologist, including inspection of existing and suspected features to further profile risk. Ground Investigation to identify underlying ground conditions and assess risk, including geophysical survey and targeted investigation of identified features. Investigation and construction work to consider the potential for void spaces/solution features on the site, such as inspections, drilling platforms, validation testing. Account for risk through remediation of features/in designs, such as through extending foundations into deeper intact rock not prone to dissolution, ignoring base resistance in pile design, and design shallow foundations to span voids. Consideration of locating developments outside of higher risk areas. Avoid use of infiltration drainage where possible. If used, ensure suitable offset from foundations and infrastructure. Incorporate appropriate ground model and engineering parameters into designs. Consideration given to monitoring/maintenance regimes post construction, depending on level of risk and final mitigation.	4	3	12
Lateral and vertical variabilities in ground conditions and associated engineering properties, including	Site wide	Variations in stratigraphy and engineering properties across the site, leading to changes in ground conditions and potentially design/construction/maintenance requirements. Variability in the lateral extents and vertical thickness of	4	3	12	Damage to and possible failure of proposed development due to incorrect ground model, design parameters if varied approach of design/construction/maintenance is not taken,	Ground investigations and associated in-situ and laboratory testing to identify underlying ground conditions (including groundwater) and assess risk, targeted across the site depending on nature of proposed development and variations in ground condition. Changes in ground conditions and engineering properties of the ground taken into account subject to the location of the proposed development on site in design, construction and maintenance.	2	2	4

Identified geotechnical hazard/ constraint	Associated ground condition/ feature	Cause	Risk before control/ mitigation			Consequence	Control/mitigation measures	Risk after control/ mitigation		
			L	S	R (LxS)			L	S	R (LxS)
potential for sudden changes		composition of superficial deposits and composition of in-situ bedrock, including geological boundaries, faulting, buried channels, boulders and variations in extents of alluvial channels. Historical/present day developments/land uses, including realignment of rivers, infilling ponds.				considering variations in ground conditions. Differential settlement due to variable ground conditions at similar depths, resulting in damage to proposed infrastructure. Changes in ground conditions resulting in construction difficulties and delays.	Designs to account for variations, such as through increasing construction depths to account for variations in ground conditions, breaking out local boulders, and incorporating reinforcement in foundation. Incorporate appropriate ground model and engineering parameters into designs. Consideration of locating infrastructure outside of areas anticipated to have more significantly variable ground conditions. Selecting suitable excavation methodologies/equipment/plant during construction, consideration of potential for changes in ground/groundwater conditions and impact of such.			
Aggressive Ground Chemistry	Site wide, but anticipated to be more notably elevated in: Oxford Clay Formation, Rutland Formation, and possible also Tills, Tidal Flat Deposits and Alluvium.	Sulphide/sulphate bearing stratum, posing risk of aggressive ground conditions, anticipated to be most prevalent mudstones/soils derived from such. Potential for other stratum and groundwater to also contain sulphate/sulphides generally, including Artificial ground and Alluvium.	4	3	12	Deleterious effects on buried construction materials, causing damage and potential failure of proposed development. Potential to preclude some forms of ground improvement including lime stabilisation.	Ground investigations to identify underlying ground conditions, including BRE Special Digest 1 (SD1) suite testing, and assess risk. Design concrete mix and the additional protective measures incorporated based on BRE SD1 test results into designs. Designs to account for aggressive ground conditions generally if present, including consideration of construction depths being adjusted to not interface with ground conditions of elevated aggressivity to buried construction materials. Consideration of aggressivity of site won materials, including oxidisation of sulphides, in material re-use/earthworks design.	4	1	4
Presence of natural highly compressible deposits	Tidal Flat Deposits, glaciolacustrine deposits, Alluvium, and associated soils generally around natural surface water courses	Unconsolidated low strength coastal/marine clay, silt and sand soils prone to compression and subsequent significant settlements under load. Potential for greater extents of Alluvium than recorded on mapping due to re-alignment of rivers.	5	3	15	Unacceptable degrees of settlement, including differential settlement resulting in damage to proposed developments.	Ground investigations to identify underlying ground conditions and assess risk, including targeted investigations around riverbanks to confirm extent of deposits. Designs to account for settlement, such as through: - deepening foundations to competent underlying stratum; - laying new utilities with increased falls and flexible service connections; and, - ground improvement. Consideration of locating proposed developments outside of areas anticipated to be prone to settlement. Incorporate appropriate ground model and engineering parameters into designs. Consider ongoing monitoring post construction and maintenance plan, as appropriate.	3	3	9
Potential for slope instabilities, including	Existing slopes where potential slope	Potential for slope instability issues, including relict shear surfaces and soils at residual strengths, and possible signs of	3	4	12	Slope failure resulting in damage to and potentially failure of proposed	Site reconnaissance by suitably qualified geotechnical engineer/engineering geologist, including inspection of existing and suspected features to further profile risk.	3	2	6

Identified geotechnical hazard/ constraint	Associated ground condition/ feature	Cause	Risk before control/ mitigation			Consequence	Control/mitigation measures	Risk after control/ mitigation		
			L	S	R (LxS)			L	S	R (LxS)
potential for scour	instabilities identified	local slope instabilities in existing sloping topographies. Existing gully features and cutting slopes potentially formed of low strength superficial deposits, possibly also susceptible to scour. Potential for scour on slopes forming riverbanks.				developments and adjacent infrastructure. Possible risk to life/injury and damage/loss of plant due to landslip. Requirement for more significant scale site wide investigations to inform risk. Some potential for voids, with potential for collapse settlement/subsidence resulting in damage and potential failure of proposed development. Delays/increased costs to remediate features.	Topographical surveys to confirm the topography of any slopes along the site. Ground investigations, including geophysical surveying (to inform location of exploratory holes in cambering terrains) and in-situ and laboratory testing, to identify underlying ground and assess risk, considering proposed developments. Designs to account for slope instability as necessary including: - avoiding unsuitably loading slopes or locating loads a sufficient distance from the crest of slopes; - ensuring slopes are not undermined in a way that would preclude stability; - incorporation of mitigation measures if required, such as slope stabilization; - avoiding developments in higher risk areas; - piled foundations extending to competent strata at depth; - foundations designs to span voids/accommodate differential settlement; - remediation of cavities/slope instabilities; and, - ensuring no vegetation is removed from slopes, which could be providing stabilising effects. Consider risk of slope stability during any ground investigation and construction works, such as avoid loading slopes/ incorporate exclusions zones at crests, avoid discharging water over slopes. Avoid locating infiltration devices at top of slopes in a way that could induce/increase risk of instabilities. Appropriate design ground models and parameters to be incorporated into designs, alongside slope stability assessments. Consideration of inspections by a suitably qualified engineering geologist/ geotechnical engineer during construction. Consider ongoing monitoring post construction and maintenance plan, as appropriate, based on residual risk due to ongoing natural subsidence risk.			
Local head deposits with potential for poor load bearing characteristics.	Head deposits/ potential for generally on sloping topographies.	Head deposits likely to be variable with potential for low strength soils associated with historical mass soil movements on slopes.	3	3	9	Unacceptable degrees of settlement, including differential settlement resulting in damage and possibly failure of proposed developments.	Ground investigations to identify underlying ground conditions and assess risk, including targeted investigations around sloping topographies. Avoid locating proposed developments in areas of Head deposits. Consider in designs, such as through deepening foundations to underlying competent stratum. Appropriate design ground models and parameters to be incorporated into designs. Consideration of inspections by a suitably qualified engineering geologist/ geotechnical engineer during construction.	2	3	6

Identified geotechnical hazard/ constraint	Associated ground condition/ feature	Cause	Risk before control/ mitigation			Consequence	Control/mitigation measures	Risk after control/ mitigation		
			L	S	R (LxS)			L	S	R (LxS)
Sloping topographies on the site requiring earthworks/retaining structures to form enabling works	Sloping topographies	Sloping topographies requiring earthworks/retaining walls to manage level changes as part of enabling works i.e. to form level construction compound and laydown areas and haul roads to enable access to proposed towers.	3	3	9	Delays during construction if not suitably accounted for. Increased costs/program generally to complete enabling works, and ensure feasible access including for long-term maintenance.	Ground investigations and topographical survey to identify underlying ground and groundwater conditions and confirm level changes, to inform earthworks design. Design earthworks to manage levels as efficiently as possible, and where necessary, incorporate slopes or retaining structures to manage level changes. Where possible, avoid the need for developments/working areas through sloping ground. Where possible, re-use site won fill to minimise importing of fill materials.	2	2	4
Potential for shallow groundwater and artesian waters/confined aquifers, including springs	Rivers including the East and West Glen Rivers and other natural and manmade surface water features/associated lower lying topographies. Alluvium/associated soils generally around natural surface water courses. Confined groundwater potential within Sandstone and Limestone units underlying mudstone geologies. Springs generally associated with stream sink features.	The likely presence of shallow groundwater associated with existing rivers/surface water features and lower lying topographies in such areas, in continuity with surrounding ground. Variation in permeability characteristics of stratum, resulting in formation of confined aquifers and artesian water pressures underground and springs forming on site at ground level.	4	4	16	Worsening of issues with excavation instabilities (including scour and running sands) and if present, issues with slope instabilities, posing risk to life, alongside damage and potential failure of proposed developments. Uplift/buoyancy effect on infrastructure. Reducing bearing capacity and degrading/reducing strength of ground.	Ground investigations to identify underlying ground conditions, including for groundwater monitoring, and assess risk. Consider groundwater regime during construction and investigations and need for mitigation measures such as dewatering as part of temporary works design. Consideration of locating infrastructure outside of areas where significant shallow groundwater is anticipated. Suitably account for groundwater in designs including flotation checks as necessary. Measures may be required to reduce buoyancy of ducting and chambers during construction, such as dewatering Redirection of existing watercourses away from critical site areas. Consider suitable groundwater level in design ground model. Design and construction depths to avoid interfacing with artesian groundwater. Consideration of inspections by a suitably qualified engineering geologist/geotechnical engineer during construction.	2	4	8
Potential for excavation/cutting instabilities	Site wide	Potential for shallow superficial/weathered bedrock soils prone to instabilities in excavations, more likely in Alluvium, Head, Artificial deposits and granular soils weathered	3	4	12	Unstable temporary or permanent excavations/cuttings, prone to instability, posing risk to life and difficulties/delays during	Ground investigations to be undertaken to identify underlying ground and groundwater conditions and assess risk. Instabilities to be considered during investigations, design and constructions, such as through:	2	2	4

Identified geotechnical hazard/ constraint	Associated ground condition/ feature	Cause	Risk before control/ mitigation			Consequence	Control/mitigation measures	Risk after control/ mitigation		
			L	S	R (LxS)			L	S	R (LxS)
		from sandstones such as the Northampton Sand Formation. Potential for discontinuities in rock with characteristics that would make faces in such unstable, such as evidence of smooth/discontinuities in historical borehole records. Potential heavily faulted rock unstable in excavations. Potential for shallow groundwater/springs/artesian groundwater exasperating stability issues.				construction, with potential for increasing construction and maintenance costs and causing delays if not suitably accounted for in designs.	- battering back excavation faces to suitable safe angles; - excavation support; - selecting suitable excavation methodologies/equipment/plant; and, - for any permanent cuttings, engineering solution to mitigate instabilities, such as retaining wall, soil nails, rock bolts, and netting/mesh systems. Consideration of limiting any cut works, especially any permanent cuttings, in areas likely prone to excavation instabilities. Appropriate design ground models and parameters to be incorporated into designs, including stability analysis. Consider ongoing monitoring post construction and maintenance plan, as appropriate, for any permanent cuttings.			
Potential for shallow bedrock, boulders and localised anthropogenic materials acting as obstructions during excavation	Till Bedrock with no superficial cover Local existing/historical structures	Potential for shallow bedrock/natural obstructions, including boulders in tills, and potentially locally anthropogenic obstructions associated with historical/present day developments.	3	3	9	Early refusals, difficult excavation and potential for overbreak. Potential for delays or design changes if not suitably accounted for.	Ground investigations and associated in-situ and laboratory testing to identify underlying ground conditions and assess risk, targeted across the site depending on nature of ground/local potential anthropogenic obstructions and likely cut magnitudes. Select suitable plant/methodologies to undertake investigation and construction works. Where possible, limit cut magnitudes on the site as part of designs due to risk of costly and potentially difficult excavation in bedrock.	2	2	4
Existing utilities, including culverts and overhead lines	Site wide	Utilities present locally including overhead lines, buried gas mains, and local culverts indicated by gaps on field boundaries with surface water features. Utility records not held and therefore, potential for currently unknown utilities crossing/adjacent to the site. Relatively rural site, therefore, presence of site wide utilities is considered unlikely, although could be present.	4	5	20	Damage to utilities/infrastructure. Increased cost and delay to divert or lower utilities. Potential for delays to suitably account for presence of utilities, such as relocations, protection, and surveys. H&S impact during any excavations during Ground Investigation or construction, including potential for injury/loss of life due to utility strike. Relocation of ground investigation or site area to avoid overhead lines. Scheme design alterations to avoid	Ensure up to date utility plans and records are obtained, including PAS128 Type D, C, B and A compliant utility surveys and drainage surveys as required. Early liaisons with asset owners to confirm constraints/requirements and continue such throughout works. Undertake safe digging procedures in accordance with HSE HSG47 and PAS128. Undertake works in accordance with HSE GS6, where relevant. Undertake GPR surveys and mark out utilities prior to any investigations/breaking ground. Plan ground investigation works, including access onto and through the site, to avoid utilities. Design proposed scheme to minimise impact on existing utilities. Where/if necessary, incorporate additional mitigation measures into designs such as bridging structures to protect existing utilities.	2	2	4

Identified geotechnical hazard/ constraint	Associated ground condition/ feature	Cause	Risk before control/ mitigation			Consequence	Control/mitigation measures	Risk after control/ mitigation		
			L	S	R (LxS)			L	S	R (LxS)
						overhead/underground utilities.				
Existing developments/ infrastructure/ land uses constraining development and that could be impacted by the proposed developments, including access constraints.	Site wide	Presence of developments, infrastructure and land uses, such as overhead line towers, rivers, drains, agricultural fields and boundaries, roads, railways, paths, and towers. Potential for damage to existing features/developments/infrastructure if not suitably considered, including existing tower foundations. Access constraints caused generally by rural/agricultural setting with numerous field boundaries, surface water features and associated culverts, alongside existing road and rail infrastructure.	4	3	12	Failure/subsidence of/damage to existing features resulting from interaction with proposed developments. Difficulties/constraints during investigations, construction, resulting in delays.	Site reconnaissance to confirm site layout/features and access constraints. Liaisons with asset owners and appropriate bodies to establish nature of existing features and any requirements/restrictions relating to ground investigation and development works, such as the Environment Agency and Local Authorities. Undertaking appropriate assessments as required to confirm the nature/stability/condition of the specific features and assess associated risks/constraints to the proposed development. Ground investigations to identify underlying ground conditions in the vicinity of specific features and assess risk as required. Investigation and construction work to take into account risk of damage/failure, such as through safe working distances and selecting suitable plant/equipment and working/construction methodologies.	2	2	4
Historical surface mineral extraction (including infilled ponds)	Identified and suspected local features.	Surface mineral extraction, including worked ground and local recorded/suspected pits, and suspected infilled ponds; associated buried high walls and likely un-engineered infill prone to settlement when loads.	3	3	9	Differential settlement from fill and potential for collapse settlement, resulting in significant subsidence at surface, causing damage to or failure of proposed developments. Potential for increased cost and delays during site works to investigate and remediate features.	Ground investigations based on location specific development proposals to identify underlying ground conditions and assess risk, including confirmation of extent/nature of any fill materials. Avoid infilled ground/buried high walls when designing layout of proposed developments. If encountered, designs to suitably remediate/mitigate the risk, such as through deep foundations extending through fill, excavation and replacement of fill with engineered fill, and ground improvement.	2	2	4
Potential for historical underground ironstone mining	Potential for underground ironstone mining.	Suspected underground mining features, including mineral permissions encroaching associated with old ironstone mines encroaching locally, with features potentially associated with underground mining and susceptible to subsidence.	3	4	12	Damage to and possible failure of proposed development due to subsidence associated with historical mining, including risk of collapse settlement.	Liaison with landowners to confirm any further known information of possible features and site reconnaissance by suitably qualified geotechnical engineer/engineering geologist, including inspection of existing and suspected features to further profile risk. Subject to inspections, obtaining mining catalogues/plans to confirm extent of workings, and subject to findings, undertaking Mining Risk Assessment. Avoid high risk areas with the design of proposed development layouts. Geophysics survey ahead of intrusive works to survey voids associated with mining activity to target ground investigation. Investigate identified desk-based features as part of ground investigation, considering results of geophysical survey.	2	4	8

Identified geotechnical hazard/ constraint	Associated ground condition/ feature	Cause	Risk before control/ mitigation			Consequence	Control/mitigation measures	Risk after control/ mitigation		
			L	S	R (LxS)			L	S	R (LxS)
							If idequantified, remediation of identified features/mitigation through design measures and, subject to residual risk, subsequent maintenance plans. Management of mining subsidence risk during investigation and construction, such as drilling platforms, inspections of formation for signs of mining related features.			
Possibility for constraints associated with mineral resources	Lincolnshire Limestone Formation Historical Mineral Planning Permissions associated with Ironstone extraction	Mineral resources recorded on site, mainly safeguarded limestone minerals. Historical mineral planning permissions locally encroaching on site, possibly posing constraint on development, although future obstruction is indicated to be highly unlikely.	4	2	8	Delays/increased costs to suitably consider mineral planning matters.	Liaise with MPA to confirm requirements around mineral resources, planning permissions and safeguarding. If/where required, undertake minerals assessment to inform risk assessment. Consider re-use of site won mineral resources in developments.	2	1	2
Shrink swell of clay soils	Tidal Flat Deposits, Oxford Clay, Kellaways Clay Member, Blisworth Clay Formation, Till	Clay rich areas of the Tidal Flat Deposits in the east, where shallow groundwater conditions are present. Shallow ground conditions generally mapped as Till, anticipated to be clay dominated; high plasticity clays also anticipated associated with upper weathering profile of mudstone bedrock strata. The presence of clay soils with potential for shrinking and swelling on changes in moisture content, exacerbated by the presence of trees and possibly dense vegetation.	4	3	12	Damage to proposed developments and increased maintenance costs if not suitably designed against.	Ground investigations, alongside laboratory testing to confirm plasticity of soils, to identify underlying ground conditions and assess risk. Arboricultural survey to determine the type of vegetation in the vicinity to allow for a more refined assessment of foundation depth requirements to avoid the influence of shrink/swell induced by trees/vegetation drawing water from the ground. Designs to account for risks associated with shrink/swell of clays as required, such as through: - accounting for the plasticity index/volume change potential of clays, with consideration of trees/vegetation (existing, proposed and removed); - deepening of foundations and incorporation of heave protection; - deepening pavement thicknesses, including excavation and replacement of desiccated soils; - laying infrastructure with increased falls and flexible connections; - forming pavement surfaces using flexible materials; - consideration of re-bound in significant cuttings in clays; and, - root barriers.	2	2	4
Potential for frost susceptible soils	Site Wide	Potential for shallow weathered soils to be susceptible to frost heave.	3	3	9	Damage to proposed haul road/shallow infrastructure developments and increased maintenance costs if not suitably designed against.	Ground investigations to identify underlying ground conditions and assess risk. Designs to account for frost heave, such as through deepening infrastructure, pavement thicknesses.	2	2	4

Identified geotechnical hazard/ constraint	Associated ground condition/ feature	Cause	Risk before control/ mitigation			Consequence	Control/mitigation measures	Risk after control/ mitigation		
			L	S	R (LxS)			L	S	R (LxS)
Potential for ground conditions unsuitable for use of infiltration drainage	Site Wide	Ground conditions across much of the site anticipated to be dominated by clay/silt soils, likely with low permeability, which are more likely to preclude use of infiltration drainage. Ground conditions across much of the site anticipated to be dominated by clay/silt soils, likely with low permeability, or karstic terrains which are more likely to preclude use of infiltration drainage.	4	3	9	In the event that ground conditions preclude use of infiltration, drainage will likely require connecting into existing network. Potential for introduction of point discharge of waters resulting in solution of limestone and/or increasing risk of instabilities/subsidence generally associated with slope instabilities.	Ground investigations and associated in-situ testing to assess the suitability for infiltration drainage and develop drainage strategy and designs considering this, including undertaking in-situ testing in line with BRE 365. If feasible, design and construct any infiltration drainage to avoid creating an unacceptable risk of subsidence.	2	2	4
Potential for Unexploded Ordnance (UXO)	Site wide	Preliminary UXO Risk Assessment with identification of potential for encountering UXO on Site. Subsequent Detailed UXO Risk Assessment awaited. Generally greenfield site, reducing likelihood for UXO to have been uncovered in past and increasing likelihood of unrecorded UXO.	3	5	15	Potential for loss of life if struck. Delays/increased costs if encountered.	Obtain Detailed UXO Risk Assessment to further inform risk and mitigation measures. Mitigation measures implemented based on UXO assessments prior to any breaking ground works. If further assessment is not undertaken prior to ground investigation works, full UXO supervision/mitigation measures to be incorporated throughout works.	2	4	8

Appendix E

Approach to geo-environmental reporting

Appendix E Approach to geo-environmental reporting

Legislative context and guidance

Where this report relates to existing or proposed planning application, it considers the contents of the Town and Country Planning Act 1990 (as amended) (Ref 13.58), the National Planning Policy Framework (2012, updated in December 2024) and considers the potential implications of Part 2A of the Environmental Protection Act 1990 (Part 2A) (Ref 13.58) and the associated Contaminated Land (England) Regulations 2006 (Ref 13.61) and Contaminated Land Statutory Guidance (2012) (Ref 13.30).

This report has been prepared in general accordance with the technical guidance and procedures described in the UK Government guidance Land Contamination: Risk Management (2025) (Ref 13.34) and its predecessor, Model Procedures for the Management of Land Contamination, Contaminated Land Report (CLR) 11 (2004) (Ref 13.29), British Standard (BS) 5930:2015 (as amended) Code of Practice for Ground Investigations (Ref 13.21), BS:EN 1997 Eurocode 7 – Geotechnical Design (Ref 13.22) and BS 10175:2026 (as amended) Investigation of Potentially Contaminated Sites – Code of Practice (Ref 13.23).

Historical map review

AAJV notes that only indicative map scales are provided. Where dates are stated, these refer to the dates of maps on which the features are present, have changed use or are no longer annotated, and do not necessarily refer to the exact dates of existence of a particular feature. Development that may have occurred between map editions is recorded as occurring on the latter published map, hence there are some limitations to the accuracy to the date of development unless supplementary evidence is available.

Conceptual Site Model derivation

The CSM is aimed at identifying possible risks, if any, arising from substances used or deposited on site, or from other sources of land contamination. Both past and current potentially contaminative land uses have been considered. It is based on the proposed site redevelopment described in Report Section 1.

Assessment framework

The site, in terms of potential land contamination, will be regulated by the Local Authority under the Town and Country Planning Act 1990 (as amended) (Ref 13.58), taking account of the National Planning Policy Framework (2012, updated in December 2024) (Ref 13.51), with the Environment Agency, Natural England and English Heritage acting as potential statutory consultees.

Environmental liabilities can arise through provisions contained within statutory legislation including Part 2A of the EPA 1990, the Environmental Damage (Prevention and Remediation) Regulations 2009 (Ref 13.62), the Water Resources Act 1991 (Ref 13.59), the Groundwater Regulations 2009 (Ref 13.63) and the Water Act 2003 (Ref 13.60).

Current best practice recommends that the determination of health hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Statutory Guidance to Part 2A (2012) (Ref 13.30) and Land Contamination: Risk Management (LCRM) (Ref 13.34).

The “suitable for use” approach is adopted (as outlined in the Contaminated Land Statutory Guidance) for the assessment of contaminated land where remedial measures are undertaken where unacceptable risks to human health or the environment are realised taking into account the use (or proposed use) of the land in question and the environmental setting.

The risk assessment process for environmental contaminants is based on a source-pathway-receptor analysis. These terms can be defined as follows:

- **Source:** hazardous substance that has the potential to cause adverse impacts.
- **Pathway:** route whereby a hazardous substance may come into contact with the receptor: examples include ingestion of contaminated soil and leaching of contaminants from soil into watercourses.
- **Receptor:** target that may be affected by contamination: examples include human occupants/ users of site, water resources (surface waters or groundwater), or structures.

For a risk to be present, there must be a relevant/viable contaminant linkage; i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway.

AAJV have determined the potential sources, pathways and receptors to assess potential risks/liabilities and constraints associated with the site in its current condition prior to any proposed redevelopment. Risks associated with the proposed redevelopment have also been assessed based on the future land use scenario specified, including any potential sources of contamination, potential receptors and potential contaminant pathways identified during this desk-based assessment.

Approach to risk assessment

Current best practice recommends that the determination of hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Environment Agency guidance on LCRM.

For a risk to be present, there must be a viable contaminant linkage; i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway.

Assessments of risks associated with each of these contaminant linkages are discussed in the following sections.

Using criteria broadly based on those presented in the CIRIA C552 (Ref 13.55), the magnitude of the risk associated with potential contamination at the site has been assessed. To do this an estimate is made of:

- the magnitude of the potential consequence (i.e. severity);
- the magnitude of probability (i.e. likelihood); and,
- the severity of the risk is classified according to the criteria in Table E..

Table E.1. Description of severity of risk

Severity	Definition	Examples (as defined by C552)
Severe	Short-term (acute) risk to human health likely to result in "significant harm" as defined by Environmental Protection Act 1990, Part IIA. Short-term risk of pollution	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water.

	(note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings \ property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note: the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health ("significant harm" as defined in DETR 2000). Pollution of sensitive water resources (note: Water Resources Act contains no for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem. (note: the definitions of ecological systems within Draft Circular on Contaminated Land, DETR, 2000).	Concentrations of a contaminant from site exceed the generic, or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ("significant harm" as defined in the Draft Circular on Contaminated Land, DETR, 2000). Damage to sensitive buildings/structures/ services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (such as foundation damage resulting in instability).
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing and equipment). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

The probability of the risk occurring is classified according to the criteria in Table E.2.

Table E.2. Likelihood of risk occurrence

Likelihood	Definition	Example
High	There is a pollutant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.	The contaminant linkage exists or is very likely to exist in the short term, and/or may also be linked to visual/olfactory evidence of that linkage being present and active in some cases. The conditions are such that there is no foreseeable reason to suggest that a source-

		pathway-receptor linkage is not occurring and required mediums for a contamination source to pass through/within to reach a receptor are all present.
Likely	There is pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.	The conditions are such that there are very few foreseeable reasons to suggest that a source-pathway-receptor linkage is not occurring, and that all or most of the required mediums for a contamination source to pass through/within to each a receptor are present.
Low	There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.	The source, pathway and receptor linkage may exist and it is possible that contamination could reach a receptor in certain circumstances. The site conditions indicate that there are limiting factors in the pathway mediums/generation potential of the source/or presence of the receptor.
Unlikely	There is pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.	The source, pathway and receptor may exist in certain circumstances, but the contaminant linkage is improbable in the short term and in the long term.

An overall evaluation of the level of risk is gained from a comparison of the severity and probability, as shown in Table E.3.

Table E.3. Risk based on comparison of likelihood and severity

		Severity			
		SEVERE	MEDIUM	MILD	MINOR
Likelihood	HIGH	Very High	High	Moderate	Moderate/Low
	LIKELY	High	Moderate	Moderate/Low	Low
	LOW	Moderate	Moderate/Low	Low	Very Low
	UNLIKELY	Moderate/Low	Low	Very Low	Very Low

Further description of the classified risks as defined by CIRIA C552 is provided below.

Very high risk

There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to

a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short term.

High risk

Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short term and are likely over the longer term.

Moderate risk

It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

Low risk

It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

Very low risk

It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

Discussion of acute risk to construction workers

AAJV understands that the proposed development works will be undertaken in compliance with Construction Design and Management (CDM) 2015 regulations.

Prior to work commencing, a health and safety risk assessment should be carried out by the appointed Principal Contractor/developed in accordance with current health and safety regulations. This assessment should cover potential risks to construction staff, permanent site staff and the local population. Based on the findings of this risk assessment, appropriate mitigation measures should be implemented during the construction period.

The greatest potential for generation of dust will be during the site works and therefore dust generation should be kept to a minimum in accordance with general best practice, as outlined in, for example, 'Environmental Good Practice on Site', CIRIA Publication C692 to reduce this risk.

The risk to construction workers during the excavation and construction phases in terms of potential exposure to high concentrations of contaminants is considered to be low given the historic and current land uses identified at the site. Should gross contamination be identified during the construction phase, then this may pose a potential acute risk to construction works. It is likely to be able to be effectively managed through good health and safety practices and protocols. Adoption of appropriate dust suppression techniques would also mitigate the degree of potential particulate migration off site.

Appendix F

Initial Conceptual Site Model and Risk Assessment

Appendix F Initial Conceptual Site Model and Risk Register

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
On-site Sources: Agricultural Land, Made Ground, Infilled Land, Railway Land/buildings, Tanks, Water Pumping Station, Sludge Storage sites, and unrecorded shallow and deep ironstone workings and associated spoil heaps.	Human Health – On-site Trespassers, general public and site users post development/during construction i.e., owners of land or public passing through rights of way	Agricultural Land, Made Ground, Infilled Land, Railway Land/buildings and Tanks			Low Risk	The sources on-site with respect to trespassers, general public and site users has been divided between sources considered to be of a lower-level contamination (agricultural land, Made Ground and infilled land) and those of a higher-level contamination (railway land/buildings, tanks and the water pumping station). Agricultural Land, Made Ground and Infilled Land – All Regions On-site sources and their associated contaminants are listed in Table 9-1. The land is used predominantly for agricultural purposes along the entire extent of the site, with the use of herbicides/pesticides the predominant CoPC. The use of these extensively across the sites means the presence of them in the soils and groundwater is likely. However, a Low risk remains here where diffusive application may be present (majority of the site) due to the unlikely contact of soils from the receptors walking above ground. Where point sources associated with agricultural land use are noted the risk may be increased, such as the presence of a farm tank. At this stage, no on-site farms noted the presence of tanks which would pose a significant risk. The walkover is designed to visit farms on-site and note the potential presence of these. Made Ground is also anticipated to be present in some areas due to the presence of various roads, railways, buildings and canalised
		Inhalation of contaminants in soil-derived dust and asbestos fibres	Unlikely	Medium		
		Water Pumping Stations – Regions 1a and 1d			Moderate/Low Risk	
		Inhalation of contaminants in soil-derived dust and asbestos fibres	Low	Medium		
All on-site sources – Agricultural Land, Made Ground, Infilled Land, Railway Land/buildings, Sludge Storage Sites and Tanks, ironstone workings/spoil heaps - All Regions						

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
		Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Unlikely	Medium	Low Risk	watercourses in the vicinity of the transmission towers and overhead lines, which are unlikely to present a substantial source of contamination. Similarly, former ponds, quarries and/or pits that have since been infilled are also present along the extent of the site, with these for the same reason unlikely to present a substantial source of contamination. It is unlikely for the receptors to come into direct contact with the soils, with crop coverage limiting the likelihood of soil disturbance and particulates becoming airborne. No volatile vapours are noted in association with any of the above sources. For Made Ground and infilled land, in accordance with BS 8576 the potential for gas generation is classified as ‘very low to low’ as outlined in Table 9-2, therefore due to the limited gas generation potential of the source, and the dissipation of gases into the open air, the risk in line with CIRIA C522 is considered to be Low.
		Inhalation of vapours - outdoors	Unlikely	Medium	Low Risk	Railway Land/buildings, Tanks, Sludge Storage Sites and Water Pumping Stations – Regions 1, 2 and 7 Present-day and historical railway land and buildings are located on-site of Regions 1b, 1d and 7b. Based on the CoPC, the risk to the receptors is considered to remain Low considering that re-fuelling activities would not have taken place on sections of the running line limiting the risk with respect to both volatile compounds and presence of contaminants in the underlying soils. It is unlikely that the receptors would encounter any contamination present due to the presence of restrictions surrounding the railway lines such as dense vegetation. Additionally, with respect to the railway building on-site, this is noted as historical – with it likely that CoPC associated with this to have minimal effect due to dissipation of contaminants over time.
		Agricultural Land, Made Ground, Infilled Land, Railway Land/buildings and Tanks - All Regions				Low Risk
		Gas inhalation	Unlikely	Medium ¹		
		Sludge Storage Sites – Region 1h, 1i and 7b				Moderate/Low Risk
		Gas inhalation	Unlikely	Severe		

¹ Source severity has been downgraded to ‘Medium’ as ground gas sources identified have a ‘Very Low or ‘Low’ ground gas generation potential and vapour sources are considered to be limited in potential concentration and extent. Therefore, ground gas sources are unlikely to generate significant concentrations capable of meeting the ‘Severe’ severity rating as defined in CIRIA C552.

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						Direct contact with contaminants associated with the above sources in the form of dermal contact, ingestion or inhalation of particulates (for the most part) is also considered a Low risk, similarly due to the short-term exposure, but also due to the unlikely contact with said soils due to site restrictions. The water pumping stations on-site (Region 1a and 2d) are associated with the possible presence of asbestos, particularly due to their construction noted as pre-2000 before the ban of such material. Based on this, an elevated risk of Moderate/Low has been adopted with respect to inhalation of fibres which may come loose on windy days. Based on Table 9-2, there is considered a ground gas generation potential up to ‘moderate’ in accordance with BS 8576 due to the presence of sludge storage sites on-site of Regions 1h, 1i and 7b. However, due to the nature of the receptors on-site and likely dissipation of gases into the open air, the risk is considered to be Low Unrecorded surface ironstone workings and spoil heaps (Region 7b) have a Moderate rating as although their presence is unconfirmed, potential contaminants derived therefrom are likely to contribute to higher risk levels, include creation of acidic groundwater, and flammable hydrogen sulphide gas. Further investigation into the presence of ironstone workings is required.
Construction/Ground Investigation	Agricultural Land, Made Ground and Infilled Land – All Regions					As above, the sources on site have been split between those considered of a higher-level contaminative source and those lower. Note, that where a higher than Low risk is noted, the risk is only considered within a 250 m buffer of the source. Beyond this, the risk is considered Low.
	Inhalation of contaminants in soil-derived dust and asbestos fibres.	Unlikely	Medium	Low Risk		
	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Unlikely	Medium	Low Risk		
	Railway Land, Tanks, Water Pumping Station, unrecorded ironstone workings/spoil heaps – Regions 1a, 1b, 1d, 2d, 7a, and 7b					For a detailed account of the risk from agricultural land, infilled land and Made Ground on-site see the row above. For construction workers the risk is typically slightly increased as it is anticipated that soils will be disturbed during the GI and construction phases, as well as the potential for workers to enter confined spaces (such as excavations). However, due to the nature of these two sources which are unlikely to present a substantial source of contamination, the risk is considered to be Low for inhalation of contaminants, dermal contact and ingestion. At this stage no agricultural land use ‘point sources’ such
	Inhalation of contaminants in soil-derived dust and asbestos fibres.	Low	Medium	Moderate/Low Risk		
	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Low	Medium	Moderate/Low Risk		

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
		Agricultural Land, Made Ground, Infilled Land, Railway Land, Tanks and Water Pumping Station – All Regions				as sheep dips/tanks on farms have been noted on-site. The use of diffuse application (crop spraying) across the extent of the site is not considered to be of risk to construction workers disturbing the soils. Risks during construction are expected to be managed through appropriate work methods and Personal Protective Equipment (PPE).
		Intrusion and inhalation of vapours.	Unlikely	Medium	Low Risk	No volatile vapours are noted in association with any of the above sources. While contraction workers may enter confined spaces the likelihood for gases to accumulate to harmful levels is unlikely – for Made Ground, in accordance with BS 8576 the potential for gas generation is classified as ‘very low to low’, and gases are expected to dissipate in the open air. Therefore, due to the limited gas generation potential of the source, the risk in line with CIRIA C522 is considered to be Low.
		Gas ingress – inhalation.	Unlikely	Medium ¹	Low Risk	Railway Land/buildings, Tanks, Sludge Storage Sites, historical landfill, Water Pumping Stations, and unrecorded ironstone workings/spoil heaps – Regions 1, 2 and 7
		Sludge Storage Sites and Landfill – Regions 1d, 1h, 1i and 7b				As detailed above the railway land/buildings, tanks and water pumping station are noted on-site. It is considered that due to the CoPC associated with these sources and the fact that GI and construction phases are anticipated to lead to the disturbance of soils the risk associated with dust inhalation, dermal contact and ingestion is slightly increased compared to other on-site receptors and has been assessed as Moderate/Low. No transmission towers are noted to directly intersect these features although soils within 250 m of them will be disturbed. The potential presence of asbestos associated with the water pumping stations (Regions 1a and 2d) remains as a Moderate/Low risk here as it is deemed unlikely that the stations will be demolished. Based on this, the same risk is given due to windy days causing airborne particles to be inhaled. Should demolition of the structures occur, this risk will need to be raised. Ironstone workings were historically permitted on Region 7, but it is unconfirmed whether these actually took place, at both shallow and deep level. Considering the potential contaminants derived from workings exposure to water, the potential consequence thereof, and the unconfirmed status of work, a moderate risk is considered appropriate.
		Gas ingress – inhalation.	Low	Severe	Moderate Risk	Volatile compounds which could produce organic vapours are most likely to be associated with refuelling activities for trains. However, as mentioned above re-fuelling activities would not have taken place on sections of the running line

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						limits the risk with respect to volatile compounds. Therefore, the risk from vapours remains Low. Ground gas is not identified as a CoPC with regard to railway land, tanks or the pumping station. However, for the sludge storage sites and the historical landfill associated with the sewage settling beds onsite, there is a 'moderate' ground gas generation in accordance with BS 8576. Where construction workers may be likely to enter confined spaces the risk from ground gas inhalation increases. Here, due to a severe consequence, the risk is considered to be Moderate within 250 m of those sites identified on Regions 1e, 1h, 1i and 7b.
	Maintenance Workers	All On-site Sources – All Regions				A Low risk is considered with respect to maintenance workers operating on the transmission towers and/or overhead lines on-site. It is unlikely that maintenance workers will operate at ground level and therefore the risk from direct contact, ingestion or inhalation of dust/soil/groundwater potentially containing contaminants is Low.
		Inhalation of contaminants in soil-derived dust and asbestos fibres.	Unlikely	Medium	Low Risk	
		Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Unlikely	Medium	Low Risk	The gas/vapour risk has been deemed as negligible for maintenance workers as no structures are present on-site and has therefore not been discussed here.
Human Health – Off-site	Adjacent Site Users	All On-site Sources – All Regions				The same risk rating is considered with respect to adjacent site users as those identified for on-site trespassers/general public/site users. The lack of disturbance of the soils is considered to limit the risk of inhalation of vapours/dust particulates and direct contact. During GI and construction phases the possibility of dust becoming airborne and travelling off-site (particularly on windy days) is more possible, however it is anticipated that mitigation of this through barriers and use of dust suppressants will be in place where/when necessary. Whilst some buildings are noted 250 m of the site, resulting in enclosed spaces for ground gas to accumulate, the on-site gas sources present are Made Ground and infilled ground – both classed as non-credible sources of ground gas unlikely to cause harm.
		Inhalation of contaminants in soil, soil-derived dust and volatile vapours. Inhalation of asbestos fibres.	Unlikely	Medium	Low Risk	
		Inhalation of vapours/ground gas	Unlikely	Medium	Low Risk	
Controlled Waters	<u>Superficial Aquifers:</u> Unproductive, Secondary Undifferentiated and Secondary A <u>Bedrock Aquifers:</u>	Unproductive and Secondary B Aquifers - All Sources – All Regions				The risks to controlled waters with respect to groundwater depends on the proximity to the sources and the type of aquifer present in that area and the geology, as well the presence of any SPZs or abstraction points, and the depth to groundwater. Based on this, the risk to groundwater has been split by aquifer type. Report Section 3.11 outlines
		Leaching of contaminants in the unsaturated zone to groundwater in underlying aquifers	Low	Mild	Low Risk	

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
	Unproductive, Secondary B, Secondary A and Principal.	Lateral and vertical migration of groundwater	Low	Mild	Low Risk	the superficial and bedrock geologies associated with each aquifer classifications across the site.
		Secondary Undifferentiated Aquifers – Made Ground, Infilled Land and Agricultural Land – All Regions				Unproductive and Secondary B Aquifers
		Leaching of contaminants in the unsaturated zone to groundwater in underlying aquifers	Unlikely	Medium	Low Risk	The on-site sources of agricultural land, Made Ground, infilled land, railway land in Regions 1b and 1d and the tanks and the pumping station in Region 1a are all located within areas of unproductive superficial and bedrock aquifers. These aquifers typically have a limited water resource value and are unlikely to transmit potential contamination quickly or widely due to their low permeability. Where Oxford Clay Formation, Kellaways Clay Member and Blisworth Clay Formation are noted, these act as confining aquifers, preventing both lateral and vertical migration of contaminants. The likelihood of these linkages has therefore been assessed as low, with a mild consequence and an overall risk of Low.
		Lateral and vertical migration of groundwater	Unlikely	Medium	Low Risk	Secondary Undifferentiated
		Principal and Secondary A Aquifers - Made Ground, Agricultural Land and Infilled Land – All Regions				The only sources located within areas of secondary undifferentiated aquifers are Made Ground, infilled land and agricultural land. These sources are considered unlikely to present a substantial source of contamination. Undifferentiated aquifers have variable characteristics and the potential to have the properties of either Secondary A or B aquifers. However, due to the lack of significant high-level contaminative source, the risk is deemed as Low.
		Leaching of contaminants in the unsaturated zone to groundwater in underlying aquifers	Low	Medium	Moderate/Low Risk	Principal and Secondary A Aquifers
		Lateral and vertical migration of groundwater	Low	Medium	Moderate/Low Risk	These aquifers are typically more permeable and productive, supporting water supply or baseflow to rivers and are therefore generally more vulnerable to pollution. Where agricultural land, Made Ground and infilled land is located along the extent of the site the geology where these aquifers sit within or are below varies, with Alluvium, till, tidal flat deposits or no superficial deposits noted. A lack of cohesive barrier allows for the downwards migration of contaminants into these more vulnerable aquifers. Based on this, a risk of Moderate/Low has been given with respect to these lower-level contaminative sources across the majority of site where principal/secondary A aquifers exist.
		Principal and Secondary A Aquifers – Railway Land, Pumping Station, unrecorded ironstone workings / spoil heaps – Regions 2d and 7b				
		Leaching of contaminants in the unsaturated zone to groundwater in underlying aquifers	Likely	Medium	Moderate Risk	In the isolated areas where the water pumping station and railway are present, the underlying bedrock noted in these areas is a Secondary A for Region 2d (pumping station), and a principal aquifer directly adjacent of the railway line in Region 7b associated with the limestone bedrock geologies. In both these locations, there are no published superficial deposits present which could
		Lateral and vertical migration of groundwater	Likely	Medium	Moderate Risk	

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						form a barrier to contaminants migrating downwards into the bedrock aquifers. Based on this, a Moderate risk has been deemed appropriate within 250 m of these areas. No potable groundwater abstraction points are noted 250 m of the site (listed in Table 3-25). However, SPZ1s are noted within 250 m of the site – 82 m south and 92 m north of Region 1h. However, there are no on-site sources which are deemed as significantly contaminating within 1 km of the SPZs. Ironstone workings were historically permitted on Region 7, but it is unconfirmed whether these actually took place, at both shallow and deep level. Considering the potential acidification of groundwater following exposure of workings to groundwater, and the presence of limestone (noted that the limestone overlies the ironstone bearing strata, but considerate of changing groundwater levels) contaminants may be transported to deeper groundwater, and contribute to background concentrations of contaminants. Shallow workings or unrefined spoil may produce contaminants when exposed to water, which in turn may leach downwards to groundwater receptors.
Surface Water Features listed in Report Section 3.12, including numerous named and unnamed drains/drainage channels.	Areas of Impermeable Soils (cohesive deposits)					From review of the railway land, tanks and the pumping station on-site, no major surface water features are noted within 250 m of these sources. However, where the extent of the site is occupied by agricultural land, the potential for herbicides/pesticides used on site to enter watercourses is possible. No potable abstraction points are noted within influencing distance of the site. However, the presence of major drainage channels and streams cannot be discounted, which would result in connecting waters to those larger watercourses.
	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Medium	Low Risk		
	Discharge of contaminants entrained in surface water run-off followed by overland flow and discharge.	Low	Medium	Moderate/Low Risk	With the land dominated by crops and vegetation the ground limits the amount of runoff. However, although the superficial deposits across the site are variable, the presence of impermeable clay layers either within units such as glaciofluvial deposits or river terrace deposits, or as the prevalent soil type such as in Alluvium, Till and tidal flat deposits would limit the permeability in these areas. Equally in some areas, confining aquifers with impermeable strata (Blisworth Clay Formation, Kellaways Clay Member and the Oxford Clay Formation) have no superficial deposits published above, also resulting in these impermeable barriers to migrating contaminants. Based on this, the risk to surface waters has been sub divided into the below:	
	Areas of Permeable Soils (granular deposits)					
	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Low	Medium	Moderate/Low Risk		
	Discharge of contaminants entrained in surface water run-off followed by overland flow and discharge.	Unlikely	Medium	Low Risk		

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						The presence of an impermeable barrier would suggest a Low risk with respect to baseflow and a Moderate/Low risk with respect to surface run-off, due to the opposing effects an impermeable stratum would have on surface waters. Conversely, in areas where permeable granular deposits are noted a Moderate/Low risk with respect to baseflow, and a Low risk with respect to surface run-off is considered.
	Property	Foundations for Pylons	Made Ground, Infilled Land, Railways, Tanks and Pumping Station – All Regions			The foundations associated with the transmission towers will be in direct contact with the soils on-site. Although direct evidence of the corrosive nature of the soils/ groundwater on-site is unknown, the CoPC relating to the on-site sources suggest there may be a potential for isolated areas of aggressive ground conditions – particularly in the vicinity of the Made Ground, infilled land, water pumping stations and railway land. In particular, where railway land is present, ballast and the build-up of embankments associated with this may result in aggressive ground conditions in these areas. Although as mentioned within Report Section 9.6 – these railway areas will be subject to mandatory standoff distances with respect to the pylon locations.
		Direct contact of contaminants in soil and/or groundwater	Low	Mild	Low Risk	
		Agricultural Land (only) – All Regions			The majority of the site is undeveloped agricultural land with the presence of herbicides/ pesticides associated with farming which are unlikely to affect aggressive ground conditions. Based on this an overall Low risk has been given for the site, although a Very Low risk may be considered for the majority.	
		Direct contact of contaminants in soil and/or groundwater	Unlikely	Mild		Very Low Risk
	Livestock and Crops	Railway Land, Tanks and Water Pumping Station – Regions 1a, 1b, 2d and 7a			There is a potential for livestock/crops to be present on-site due to the rural nature. However, in areas where particular risk is present (i.e., railway land, tanks, pumping stations) these areas are likely to be sectioned off/located away from livestock and crop faming. Based on this, a Low risk has been assessed for railways, tanks and pumping stations and a Very Low risk for agricultural land, Made Ground and infilled land.	
		Direct contact, ingestion and inhalation of contaminants in soil and/or groundwater	Low	Mild		Low Risk
		Plant uptake via roots				
		Agricultural Land, Made Ground and Infilled Land – All Regions				
		Direct contact, ingestion and inhalation of contaminants in soil and/or groundwater	Unlikely	Mild		Very Low Risk
		Plant uptake via roots				
Off-site Sources:		All Off-site Sources – All Regions				

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
Made Ground, Infilled Ground, Agricultural Land, Tanks, Electricity Substation, Sewage Pumping Station, Water Pumping Station,, Landfill, Blacksmiths, Railway Land/Sidings and Distribution/Haulage site, unrecorded ironstone workings / spoil heaps and vehicle and component site.	Human Health - On-site	Trespassers, general public and site users post development/ during construction i.e., owners of land or public passing through rights of way Inhalation of contaminants in soil-derived dust and asbestos fibres. Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water. Inhalation of vapours Inhalation of ground gas Gas ingress – explosive atmosphere	Unlikely	Medium	Low Risk	Railway Land, Made Ground, Infilled Land, Agricultural Land, Tanks, Electricity Substation and Distribution, Haulage site and Vehicle component site – All Regions Risks from off-site railway land, tanks, Made Ground, infilled land and agricultural land are all considered to be Low risk, in line with the ‘on-site sources’ section above. However, whilst agricultural land with respect to diffuse application (crop spray) is considered a low risk, the potential for ‘point sources’ associated with agricultural land use, such as tanks and sheep dips on farms would pose a greater risk. From review of the database and historical mapping, at this stage without a walkover, only 2 No. farms off-site (Westfield House north of Region 1f and Grange Farm north of Region 6c) are noted to have tanks present. In these areas, it is considered that although the risk remains Low with respect to the receptors, the suite of testing undertaken for those pylons within 250m should include for herbicides/pesticides. A number of other off-site sources including the electricity substation and distribution and haulage site and a vehicle component site, have also been included within this section as it is unlikely their presence due to distance from site and associated CoPC, will have a significant risk on the receptor type here. Based on this, a Low risk is given across board for all listed pathway, including the risk from ground gas where BS8576 notes a ‘very low to low’ ground gas generation with respect to Made Ground and infilled land. Sewage Pumping Station, Water Pumping Station, Landfills and Blacksmiths – Regions 1c, 1d, 1e, 1h, 2b, 2d A number of isolated sources are located along the extent of the site. Within 250 m of these, the risks are likely to be slightly increased in some instances due to their higher-level contamination. However, all of these off-site sources are classed as Low risk with respect to dermal contact and ingestion. Due to their distance from site, it is unlikely that contaminants from these sources would come into contact with receptors on-site, where soils are susceptible to minimal disturbance. For inhalation of dust particulates the level of risk would potentially increase slightly where sources with the potential presence of asbestos are noted, such as the sewage pumping station (Region 1c), water pumping stations (Regions 1h, 2b and 6), landfills (Region 1d to 1e) and the blacksmith (Region 2d). However, it is unlikely that soils in

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						these areas are to be disturbed during works, and so the risk remains as Low. For vapour inhalation, no buildings in use by these identified receptors are present. Therefore, it is unlikely for vapours to accumulate to harmful levels – the risk remains Low across board. For ground gas, the presence of potential sewage sludge and the sewage settling bed landfill extending offsite are noted to have a ‘moderate’ ground gas generation potential in line with BS 8576. Additionally, the presence of a landfill 60 m south of Region 1d as stated in Table 9-2 is considered to have a ‘high to very high’ ground gas generation potential in line with BS 8576. However, due to the open-air environment and lack of enclosed spaces, the consequence has been downgraded to medium, and an overall risk of Low given.
Construction/Ground Investigation/ Maintenance Workers	Railway Land, Made Ground, Infilled Land, Agricultural Land, Tanks, Electricity Substation and Distribution, Haulage site , and Vehicle component site – All Regions, and unrecorded ironstone workings / spoil heaps (Region 7b)					Railway Land, Made Ground, Infilled Land, Agricultural Land, Tanks, Electricity Substation and Distribution, Haulage site and Vehicle component site – All Regions and unrecorded ironstone workings / spoil heaps (Region 7b)
	Inhalation of contaminants in soil-derived dust and asbestos fibres.	Unlikely	Medium	Low Risk	For dermal contact and inhalation of dust/fibres from the above sources the risk is generally the same as the receptors above. While the likelihood of being in direct contact with soils is increased for workers, the likelihood of potentially contaminated off-site soils being present in influencing quantities on-site is lower. Therefore, a Low risk is considered appropriate.	
	Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.					
	Inhalation of ground gas					
	Railway Land, Distribution and Haulage site, Sewage Pumping Station, Sludge Storage, Water Pumping Station, Landfill and Blacksmiths – Regions 1c, 1d, 1h, 1i, 2b, 2d, 6a, 7a and 7b					For ground gas, while construction workers may enter confined spaces the likelihood for gases to accumulate to harmful levels is unlikely – for Made Ground and infilled land, in accordance with BS 8576 the potential for gas generation is classified as ‘very low to low’. Therefore, due to the limited gas generation potential of the source, the risk in line with CIRIA C522 is considered to be Low.
	Inhalation of vapours	Low	Medium	Moderate/Low Risk		
	Made Ground, Infilled Land, Agricultural Land, Tanks and Electricity Substation – All Regions					VOCs and SVOCs have been noted in association with railway land (Regions 1b, 1d, 2b and 7b) and the distribution, d haulage site and vehicle component site (Region 1c). These have the potential to migrate onto site and accumulate within confined spaces such as excavations or inside manholes. The geology in these areas has been reviewed, noting the presence of sands and tidal flat deposits. Where impermeable strata are noted, this could create a lateral barrier to migrating vapours. Overall, where these volatile compounds are present, the risk is considered to be
	Inhalation of vapours	Unlikely	Medium	Low Risk		
	Sewage Pumping Station, Sludge Storage, Water Pumping Station, Landfill and Blacksmiths – Regions 1c, 1d, 1h, 1i, 2b, 2d, 6a, 7a and 7b					
Dermal contact with and ingestion of contaminants in soil, soil-derived dust and water.	Unlikely	Medium	Low Risk			
Inhalation of contaminants in soil-derived dust and asbestos fibres.						

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification	
		Water Pumping Station and Blacksmiths – Regions 1h, 2b, 2d, and unrecorded ironstone workings / spoil heaps (Region 7b)				Moderate/Low for workers entering confined spaces. With respect to Made Ground, infilled land, agricultural land, tanks and the electricity substations where VOCs are not a CoPC, the risk is Low.	
		Inhalation of ground gas	Unlikely	Medium	Low Risk		
		Gas Ingress – explosion	Unlikely	Medium	Low Risk	Sewage Pumping Station, Sludge Storage, Water Pumping Station,, Landfill and Blacksmiths – Regions 1c, 1d, 1h, 1i, 2b, 2d, 6a, 7a and 7b	
		Sewage Pumping Station, Sludge Storage Sites and Landfill – Regions 1c, 1h, 1i, 2d, 6a, 7a and 7b					
		Inhalation of ground gas	Low	Severe	Moderate Risk		Similar to above for dermal contact and inhalation of dust/fibres from the listed sources the likelihood of potentially contaminated off-site soils being present in influencing quantities on-site is lower. Therefore, a Low risk is considered appropriate.
		Gas Ingress – explosion	Low	Severe	Moderate Risk		VOCs and SVOCs have been noted in association the sewage pumping station (Region 1c), water pumping stations (Regions 1h, 2b and 6a),and landfill (Region 1d). These have the potential to migrate onto site and accumulate within confined spaces such as excavations. Based on this, where these volatile compounds are present, the risk is considered to be Moderate/Low for workers entering confined spaces. The Blacksmith is considered to be of Low risk due to the lack of VOCs associated with the historical source and time since passed where volatile vapours would have dissipated.
				For ground gas the same theory applies, whereby confined spaces result in the increased risk of gases accumulating to asphyxiant or explosive levels. The sewage pumping station, sludge storage sites and landfill have a ‘moderate to very high’ ground gas generation potential in line with BS 8576 therefore with a severe rating considered appropriate. Overall, a Moderate risk for workers has been given due to the general distance from site and/or the unlikely situation where workers would enter confined spaces without reasonable H&S protocols to limit the risk. For all other sources, no ground gas is anticipated so the risk remains Low. Generation of mine gasses in concentrations sufficient to create explosive atmospheres is considered unlikely as it is expected to dissipate in the open air before reaching site.			
Controlled Waters	Superficial Aquifers: Unproductive, Secondary Undifferentiated and Secondary A Bedrock Aquifers:	Unproductive and Secondary B Aquifers - All Sources – All Regions Undifferentiated Aquifer – Made Ground, Infilled Land and Agricultural Land – All Regions				The risks to controlled waters with respect to groundwater depend on both the proximity to the sources and the type of aquifer present in that area, as well the presence of any SPZs or abstraction points. Although the sources listed here are off-site, contaminants have the potential to leach downwards through soils into the underlying groundwater and be present on-site within the	
		Leaching of contaminants in the unsaturated zone to groundwater in underlying aquifers	Low	Mild	Low Risk		

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
	Unproductive, Secondary B, Secondary A and Principal.	Lateral and vertical migration of groundwater	Low	Mild	Low Risk	groundwater. Where confining aquifers are present or areas of impermeable superficial to depth, their presence may result in a barrier to lateral migration onto site. This has been discussed below.
		Principal and Secondary A Aquifers - Made Ground, Agricultural Land and Infilled Land – All Regions				Unproductive and Secondary B Aquifers These aquifers typically have a more limited water resource value and are less likely to transmit potential contamination as quickly or as widely due to their permeability. Based on this, and due to a Mild consequence, the risk to these aquifers from all sources is considered to be a Low risk.
		Leaching of contaminants in the unsaturated zone to groundwater in underlying aquifers	Low	Medium	Moderate/Low Risk	
		Lateral and vertical migration of groundwater	Low	Medium	Moderate/Low Risk	Secondary Undifferentiated The risk to the groundwater from the Made Ground, infilled land and agricultural land has been considered as Low risk across the site with respect to this aquifer. These sources have not been considered as containing highly contaminative compounds. One undifferentiated aquifer with respect to superficial deposits has been noted (Region 6a) although a principal bedrock aquifer is also noted here and so has been discussed below.
		Principal and Secondary A Aquifers – Railway Sidings, Water Pumping Stations, unrecorded ironstone workings / spoil heaps, and Blacksmith – Regions 2b, 2d, 6b, 6c and 7b				
		Leaching of contaminants in the unsaturated zone to groundwater in underlying aquifers	Likely	Medium	Moderate Risk	
		Lateral and vertical migration of groundwater	Likely	Medium	Moderate Risk	Principal and Secondary A Aquifers These aquifers are typically more permeable and productive, supporting water supply or baseflow to rivers and are therefore more vulnerable. Where agricultural land, Made Ground and infilled land is located along the extent of the site the geology where these aquifers sit within or are below varies, with Alluvium, till, tidal flat deposits or no superficial deposits noted. A lack of cohesive barrier allows for the downwards and lateral migration of contaminants from off-site sources into these more vulnerable aquifers. Based on this, a risk of Moderate/Low has been given. A number of the off-site sources are noted within areas where Secondary A or Principal aquifers are present which extend onto site. This is inclusive of the rail sidings within Regions 2b and 7b, the water pumping stations within Region 2b and 6band the blacksmith within Region 2d. For the railway sidings, water pumping station and blacksmith no superficial deposits are present (published). Therefore, no known barrier is present above these sensitive aquifers, protecting them from migrating contaminants. Based on this, the risk is considered to be Moderate. Should a cohesive barrier be evident, this risk can be downgraded. Ironstone workings were historically permitted on Region 7, but it is unconfirmed whether these actually took place, at both shallow and deep level. Considering the potential acidification of

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
						groundwater following exposure of workings to groundwater, and the presence of limestone (noted that the limestone overlies the ironstone bearing strata, but considerate of changing groundwater levels) contaminants may be transported to deeper groundwater, and contribute to background concentrations of contaminants. Shallow workings or unrefined spoil may produce contaminants when exposed to water, which in turn may leach downwards to groundwater receptors. Because contamination generation is expected to be dominated by deeper underground workings, impact on the site is considered to be moderate, if migration towards the site is confirmed.
Surface Water Features listed in Report Section 3.12, including numerous named and unnamed drains/drainage channels.	Water Pumping Station – Region 1h					The risks to controlled waters with respect to surface waters depends on the proximity and gradient (groundwater base flow) of the source to the surface water feature and the ground conditions (permeability of the soils). Off-site sources have the potential to pollute watercourses which extend onto the site, by either baseflow or via runoff.
	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Medium	Low Risk		
	Discharge of contaminants entrained in surface water run-off followed by overland flow and discharge.	Low	Medium	Moderate/Low Risk		All off-site sources are >250 m from major water courses with the exception of the water pumping station 10 m north of Star Lode and 30 m east of South Forty-Foot Drain, and the lower contaminative sources of the Made infilled, land and agricultural land. Where Made Ground, infilled land or agricultural land is present within 250 m of a watercourse extending onto site the risk is still considered Low based on the CoPC and likelihood of these CoPC being present. Similarly, the risk to surface waters from sources >250 m is considered to also be Low due to distance to the watercourses, and in turn then distance to site.
	All other sources – All Regions					
	Lateral migration of contaminated groundwater with discharge to surface watercourses as base flow.	Unlikely	Medium	Low Risk		
	Discharge of contaminants entrained in surface water run-off followed by overland flow and discharge.	Unlikely	Medium	Low Risk		For the water pumping station off-site of Region 1h within 10 m of a major watercourse the risk is considered to be slightly elevated. No superficial deposits are noted in this area, with the Oxford Clay Formation present. The presence of an impermeable layer is likely to increase the likelihood surface run off into the surface, however, decrease the migration via baseflow. With this in mind and Low to Moderate/Low risk has been deemed appropriate in this area.
Property	Existing and future structures, Foundations for Pylons	All remaining other off-site sources – All Regions				The foundations associated with the transmission towers will be in direct contact with the soils on-site. Although direct evidence of the corrosive nature of the soils/ groundwater on-site is unknown, the CoPC relating to the off-site sources suggest there may be a potential for areas of aggressive ground conditions – particularly in the vicinity of the Made Ground, infilled land, railway land, sewage pumping
		Direct contact of contaminants in soil and/or groundwater	Low	Mild	Low Risk	

Source	Receptor	Exposure Pathway	Probability	Consequence	Risk Category	Justification
		Agricultural Land – All Regions			Very Low Risk	station, water pumping stations, blacksmiths and the landfill. The majority of the surrounding land of the site is undeveloped agricultural land with the presence of herbicides/ pesticides associated with farming are unlikely to affect aggressive ground conditions. Based on this a Low risk and Very Low risk has been considered for the site from off-site sources.
		Direct contact of contaminants in soil and/or groundwater	Unlikely	Mild		
		Buildings and Infrastructure: Structures with enclosed spaces	Gas ingress – explosion	Unlikely	Medium	Low Risk
	Livestock and Crops	Direct contact of contaminants in soil and/or groundwater Plant uptake via roots	Unlikely	Mild	Very Low Risk	There is a potential for livestock/crops to be present on-site due to the rural nature. However, due to the distance from those sources off-site, and as noted above that many sources will be sectioned off and deemed inaccessible to crops/livestock a Very Low risk is considered.

Appendix G

Preliminary UXO

Risk Assessment

Appendix G Preliminary UXO Risk Assessment

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