



SOLUTIONS LIMITED

SOAKAWAY INVESTIGATION REPORT
AT
LAND OFF WATLING STREET,
HINCKLEY
FOR
BEK LTD

Report Reference: 3162-23 SA

GeoEnviro Solutions Ltd
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QUALITY ASSURANCE

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1	Drawings and Plans
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LIST OF ACRONYMS

Acronym	Meaning
BGS	British Geological Survey
BH	Borehole
CDM	Construction Design and Management
CL:AIRE	Contaminated Land: Applications In Real Environments
CLR	Contaminated Land Report
COSHH	Control Of Substances Hazardous to Health
CSM	Conceptual Site Model
DCP	Dynamic Cone Penetrometer
DEFRA	Department for Environment Foods and Rural Affairs
DoE	Department of Environment
DP	Dynamic Probe
DWS	Drinking Water Standard
EA	Environment Agency
EQS	Environmental Quality Standard
GAC	Generic Acceptance Criteria
HA	Hand Auger
HP	Hand Pit
LPA	Local Planning Authority
LQM	Land Quality Management
mbgl	Metres Below Ground Level
MP	Mackintosh Probe
NGR	National Grid Reference
NPPF	National Planning Policy Framework
OS	Ordnance Survey
SGV	Soil Guideline Value
SPOSH	Significant Possibility of Significant Harm
SPT	Standard Penetration Test
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SSV	Soil Screening Value
TP	Trial Pit
TT	Trial Trench
WS	Windowless Sample / Window Sample
WSV	Water Screening Value

1. INTRODUCTION

1.1 BACKGROUND AND INSTRUCTION

GeoEnviro Solutions Ltd (GES) was instructed by Bek Ltd (the Client) to conduct a soakaway investigation at a site encompassing land south of the A5 Watling Street, Hinckley, LE10 3ED.

A site location plan is presented as GES Drawing No. 3162-23/01 in **Appendix 1**.

1.2 PROPOSED DEVELOPMENT

GES is not currently aware of the proposed development.

1.3 OBJECTIVES

The objectives of this ground investigation report are to identify the ground conditions and provide details of their infiltration properties.

1.4 SCOPE

The ground investigation undertaken was specified by the Client.

Prior to commencing the site works the proposed scope of investigation comprised one day's infiltration testing in two locations.

However, the proposed scope may be subject to change dependent upon site conditions, access, restrictions and obstructions.

1.5 PREVIOUS INVESTIGATIONS

GES have not been provided with any previous investigation reports and are unaware that any have been carried out to date.

2. PHYSICAL SETTING

2.1 SITE INFORMATION

Location

The site is located at land south of the A5 Watling Street, Hinckley, LE10 3ED, at approximate National Grid Reference NGR: 440759: 292560 (centre of the site).

Topography

The topography of the site is generally flat.

Access

The site was accessible via farm gates from the adjacent BP forecourt.

Site Description

At the time of the investigation the site was occupied by grass land surrounded by mixed hedges and trees.

An approximate distribution of the surface covering is given below in Table 2.1.

Table 2.1: Site Surface Covering

Type of Surface Cover	Distribution (%)
Soft Ground (grassed and landscaped areas)	100
Hardstanding	0
Roadways	0
Buildings	0
Water (ponds, streams)	0

2.2 GEOLOGY

The British Geological Survey shows the site to be underlain by the geological succession outlined below in Table 2.2.

Table 2.2: Published Geology

Geology	Description /strata
Artificial	None Recorded
Superficial	Alluvium, potential Bosworth Clay Member
Bedrock	Mercia Mudstone Group

There are no artificial deposits recorded underlying the site.

Alluvium is recorded to be present across the site, which is generally described as '*unconsolidated detrital material of clay, silty and gravel from a fluvial system*' (BGS Lexicon Description). Alluvium is recorded to be present across the site, which is generally described as '*soft to firm, consolidated, compressible silty clay, with layers of silt, sand, peat and basal gravel*' (BGS Lexicon Description).

Potential Bosworth Clay Member may be present beneath the Alluvium which is generally described as '*firm to stiff, stratified silt and clay*' (BGS Lexicon Description).

The bedrock geology beneath the majority of the site is recorded to be the Mercia Mudstone Group which is generally described as *'dominantly red, less commonly grey-green mudstones and subordinates siltstone'* (BGS Lexicon description).

3. FIELDWORKS

3.1 SOAKAWAY INVESTIGATION

The soakaway investigation works were completed on 2nd February 2023 under the supervision of a Geoenvironmental Engineer from GES.

The soakaway investigation has been carried out in accordance with BS5930: 2015+A1:2020 and the UK Specification for Ground Investigation Second Edition 2012.

All strata descriptions were undertaken in accordance with BS5930: 2015+A1:2020; EN ISO 14688-1&2:2018; and EN ISO 14689:2018.

The soakaway investigation undertaken was in line with the scope as described in Section 1.4.

The positions of the exploratory holes in relation to the existing site layout can be reviewed on drawing number GES 3126-22/02 within [Appendix 1](#).

Photographs of the site works can be viewed within [Appendix 2](#).

3.2 RESTRICTIONS

No restrictions were encountered during this ground investigation.

4. GEOLOGY AND GROUND CONDITIONS

The following ground conditions were encountered during the soakaway investigation.

4.1 GENERAL

A generalised summary of the ground conditions encountered, depths to base, and thickness recorded from the exploratory hole records is presented below in Table 4.1, below.

Table 4.1: Summary of Ground Conditions

Geology / Strata	Depth (mbgl)				Thickness (m)		Locations encountered
	Top		Base		Min	Max	
	Min	Max	Min	Max			
Topsoil	0.00	-	0.28	0.40	0.28	0.40	TP01 and TP02
Bosworth Clay Member	0.28	0.40	1.50	1.60	Not proven		TP01 and TP02

Detailed strata descriptions are presented on the exploratory hole logs presented in [Appendix 3](#).

4.2 TOPSOIL

Topsoil generally comprised a firm, dark brown slightly sandy slightly gravelly with rootlets.

4.3 SUPERFICIAL DEPOSITS (ALLUVIUM)

Soils considered to represent Alluvium comprised firm slightly sandy gravelly clay.

4.4 BEDROCK (MERCIA MUDSTONE FORMATION)

Bedrock was not encountered during this ground investigation.

4.5 GROUNDWATER

Groundwater seepage was encountered during the ground investigation within TP02 at 1.40 mbgl. It should be noted that groundwater levels are dependent upon seasonal variations and can change after periods of prolonged rainfall or drought.

4.6 OBSTRUCTIONS

No obstructions were encountered during this ground investigation.

4.7 CONTAMINATION

No visual or olfactory evidence of contamination were encountered or observed during this ground investigation, in particular no obvious visual or olfactory evidence of mobile contamination were observed during the ground investigation.

5. INSITU TESTING

5.1 INFILTRATION TESTING

During the soakaway test the water level should achieve a fall from 75% to 25% of the effective depth of the storage volume. The results obtained from the soakaway tests are summarised in Table 5.1, below.

Table 5.1: Soakaway Testing

Hole ID	Soil Description (Base of TP)	Infiltration Rate (m/sec)	Drainage Characteristics
TP01 Test 1	Slightly sandy slightly gravelly clay	N/A	N/A
TP02 Test 1	Slightly sandy slightly gravelly clay	N/A	N/A

N/A – an infiltration rate could not be calculated, as the water level did not drop beneath the 25% effective depth.

The test results of the soakaway testing are presented in [Appendix 4](#).

6. SUMMARY

The works undertaken as part of this soakaway investigation have identified that Bosworth Clay Member is present the across the site.

Based on the results of the infiltration testing conducted with TP01 and TP02, it is considered that the Bosworth Clay Member is not suitable for use as a soakaway medium, as such alternative methods of managing surface water should be considered in accordance with the SUDs hierarchy.

7. RELIANCE AND LIMITATIONS

This report has been prepared using published information and information provided by the Client and their professional advisers which has been made available to GES at the time of writing only. GES accepts no liability for any changes resulting from new information which has become available since this time.

This report is provided for the sole use of the client and their professional advisers and is confidential to them unless agreed otherwise in writing. This report may only be used and relied on once the work has been paid for in full. GES owes no duty of care and has no liability to any third party who is not authorised by GES to use this report. Any unauthorised third parties using information contained in this report do so at their own risk.

We are content that as a result of the ground investigation works and subsequent soil testing undertaken, as outlined within this report, we have characterised the ground conditions and consequently the potential for contamination to exist on site. These works and ensuing assessment have been detailed in this report.

This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, resulting from potential contamination at the site, based on the proposed development. Should any revisions in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.

Whilst this report may reference observations made regarding the presence of features/ issues such as invasive species, ACM, site drainage and evidence of structural abnormalities, this report does not constitute specialist surveys on these matters. Should further specialist surveys be carried out in this regard, the findings of these should be reported to GES so that we may determine if this has any impact on the findings of this report.

The assessment of the factual data obtained as part of this ground investigation has been undertaken in accordance with standard consulting practise and with current national and international guidance.

This report presents the observations made during the ground investigation and the factual data obtained. GES assumes any third party data used within this report to be true and correct. No responsibility can be accepted by GES for inaccuracies in the information provided by any other party.

This report is written in the context of an agreed scope of works and should not be used in a different context.

Ground conditions can be variable and change rapidly, especially in areas of Made Ground, however it is assumed that the ground conditions encountered and observed are typical and representative of the site as a whole. Most specifically with regard to this limited investigation, the ground conditions have been determined from a limited number of exploratory holes formed across the site, therefore only a small percentage of the total area of the site has been investigated. Interpolation between exploratory holes has enabled a general picture of the subsurface conditions to be produced. Conclusions drawn from the ground investigation should be read in this context. GES cannot accept responsibility for any situations resulting from locally unforeseen ground conditions occurring between exploratory holes.

In addition, subsurface conditions including contaminant concentrations and groundwater levels may vary spatially with time. This factor should be given due consideration in the event that the information contained within this report is used after any significant period of time has elapsed.

APPENDIX 1
DRAWINGS AND PLANS



General
Site
Location



GeoEnviro Solutions Ltd
Unit 7 Springvale Works
Brighouse
West Yorkshire
HD6 2RA

Tel: 01484 986010

Email: info@geoenvirosolutions.com

Web: www.geoenvirosolutions.com



PROJECT NAME

Watling Street, Hinckley

PROJECT NUMBER

3162-23

TITLE

Site Location Plan

DRAWING NO.

3162-23/01

SCALE

N.T.S

DATE

February 2023

DRAWN BY

LW



— Site boundary within field

Trial Pit Location



GeoEnviro Solutions Ltd
Unit 7 Springvale Works
Brighouse
West Yorkshire
HD6 2RA
Tel: 01484 986010

Email: info@geoenvirosolutions.com
Web: www.geoenvirosolutions.com

PROJECT NAME Watling Steet, Hinckley

PROJECT NUMBER 3162-23

TITLE
Test Point Location Plan

DRAWING NO.
3162-23/02

DATE
February 2023

SCALE
N.T.S

DRAWN BY
LW

A green rounded rectangle with a thin black border, centered on the page. It contains the text 'APPENDIX 2' and 'PHOTOGRAPHS' in black, uppercase letters.

APPENDIX 2
PHOTOGRAPHS

A.



B.



C.



D.



- A. Photograph generally overview of site.
- B. Photograph generally overview of site.
- C. Photograph generally overview of site.
- D. Photograph generally overview of site.

E.



F.



G.



H.



E. Photograph of TP01 side wall

F. Photograph of TP01 side wall

G. Photograph of TP01 arisings

H. Photograph of TP01 reinstatement.

I.



J.



K.



L.

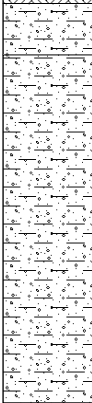


- I. Photograph of TP02 side wall
- J. Photograph of TP02 infiltration test.
- K. Photograph of TP02 airings
- L. Photograph of TP02 reinstatement.

APPENDIX 3
EXPLORATORY HOLE LOGS

Trial Pit Log

Project Name: Watling Street, Hinckley		Client: Bek Ltd		Date: 02/02/2023	
Location: Land South of A5 Watling Street, Hinckley, LE10 3ED		Contractor: Geo Enviro Solutions			
Project No. : 3162-23		Crew Name: Borehole Solutions		Equipment: Excavator	
Location Number TP01	Location Type TP	Level	Logged By LW	Scale 1:25	Page Number Sheet 1 of 1

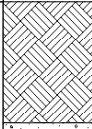
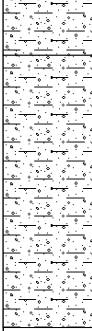
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.28 - 0.45	B		0.28			TOPSOIL: Firm, dark brown, slightly sandy slightly gravelly CLAY with rootlets	1
		0.45 - 1.60	B		0.45			Stiff, brown mottled grey, slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse of sub-rounded quartzite. [BOSWORTH CLAY MEMEBER]	
					1.60			Stiff, greyish mottled brown, slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium of sub-rounded quartzite. [BOSWORTH CLAY MEMEMBER]	
								End of Borehole at 1.600m	2
									3
									4
									5

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks
 1. No visual or olfactory evidence of hydrocarbon contamination was noted. 2. Groundwater was not encountered. 3. The trail pit was backfilled with arisings.

Trial Pit Log

Project Name: Watling Street, Hinckley		Client: Bek Ltd		Date: 02/02/2023	
Location: Land South of A5 Watling Street, Hinckley, LE10 3ED		Contractor: Geo Enviro Solutions			
Project No. : 3162-23		Crew Name: Borehole Solutions		Equipment: Excavator	
Location Number TP02	Location Type TP	Level	Logged By LW	Scale 1:25	Page Number Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.40 - 0.60	B		0.40			TOPSOIL: Firm, dark brown, slightly sandy slightly gravelly CLAY with rootlets	1
		0.60 - 1.50	B		0.60			Stiff, grey mottled brown, slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse of sub-rounded quartzite. [BOSWORTH CLAY MEMBER]	
					1.50			Stiff, grey mottled brown, slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse. [BOSWORTH CLAY MEMBER]	
								End of Borehole at 1.500m	2
									3
									4
									5

Dimensions		Trench Support and Comment				Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks		Date	Rate	Remarks

Remarks
 1. No visual or olfactory evidence of hydrocarbon contamination was noted. 2. Groundwater seepage was encountered at 1.40 mbgl. 3. The trial pit was backfilled with arisings.

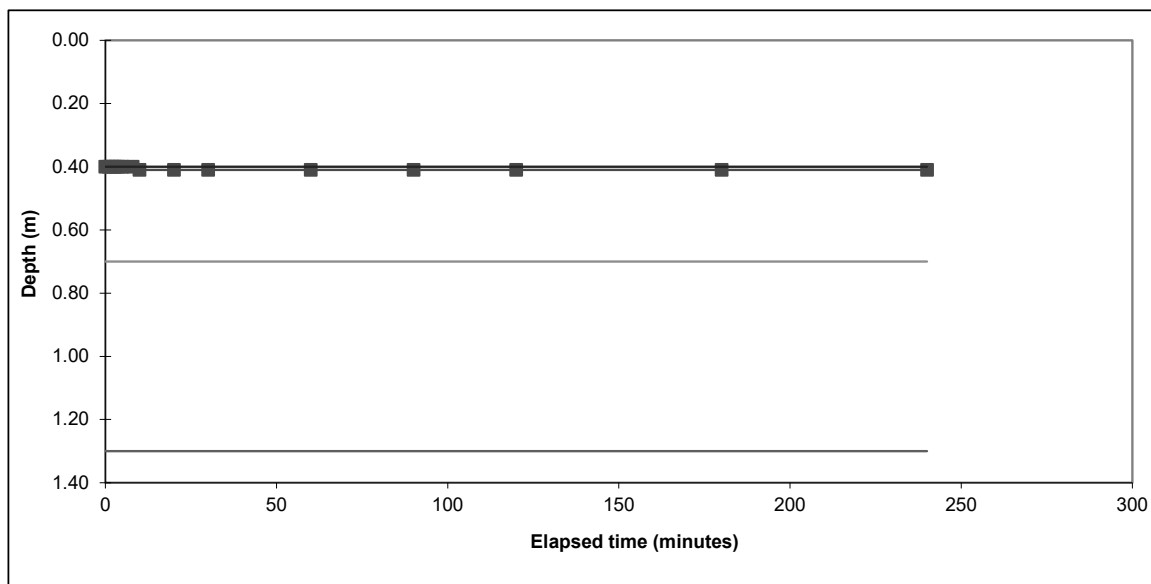
APPENDIX 4
INFILTRATION TESTING RESULTS

GeoEnviro Solutions

Soakaway Test

Trial Pit No:	TP01	Test No:	1	Date:	02/02/2023
Length (m):	1.00	Datum Height:	0.00 m agl		
Width (m):	0.30	Granular infill:	None		
Depth (m):	1.60	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.400	240	0.410
1	0.400		
2	0.400		
3	0.400		
4	0.400		
5	0.400		
8	0.400		
10	0.410		
20	0.410		
30	0.410		
60	0.410		
90	0.410		
120	0.410		
180	0.410		



Start water depth for analysis (mbgl)	0.40		
75% effective depth (mbgl):	0.70	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.00		
25% effective depth (mbgl):	1.30	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.60		
Volume outflow between 75% and 25% effective depth (m ³):			
Mean surface area of outflow (m ²):			1.86
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
Remarks	Results processed following BRE 365 (2007). Test extrapolated to 12 hours, test still not complete.

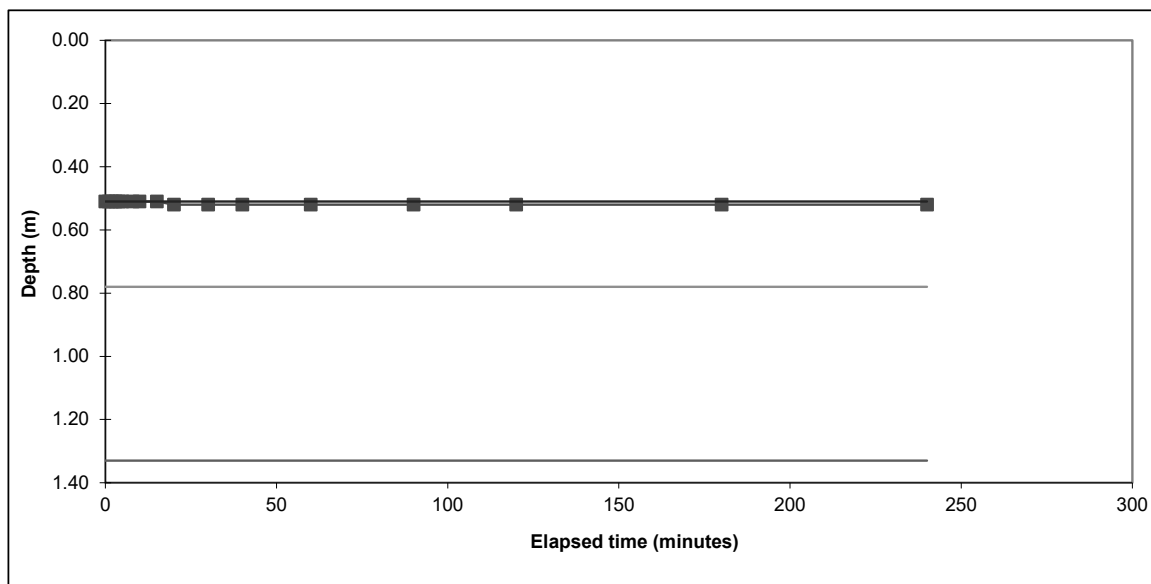
Client:	Bek Ltd	TP01
Site:	Watling Street, Hinckley	

GeoEnviro Solutions

Soakaway Test

Trial Pit No:	TP02	Test No:	1	Date:	02/02/2023
Length (m):	1.00	Datum Height:	0.00 m agl		
Width (m):	0.30	Granular infill:	None		
Depth (m):	1.60	Porosity of infill:	1	(assumed)	

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	0.510	120	0.520
1	0.510	180	0.520
2	0.510	240	0.520
3	0.510		
4	0.510		
5	0.510		
8	0.510		
10	0.510		
15	0.510		
20	0.520		
30	0.520		
40	0.520		
60	0.520		
90	0.520		



Start water depth for analysis (mbgl)	0.51		
75% effective depth (mbgl):	0.78	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	1.06		
25% effective depth (mbgl):	1.33	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	1.60		
Volume outflow between 75% and 25% effective depth (m ³):			
Mean surface area of outflow (m ²):			1.70
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.
Remarks Results processed following BRE 365 (2007). Test extrapolated to 12 hours, test still not complete.	

Client:	Bek Ltd	TP02
Site:	Watling Street, Hinckley	