

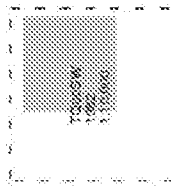


Geo-Environmental Ordinance Survey Plan Published 1982

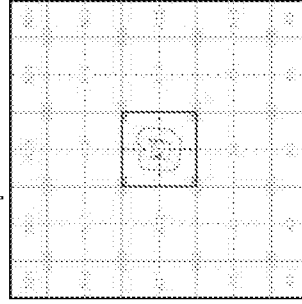
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey, which were adopted for England, Wales and Scotland in the 1840's. In 1854 the 2,500 maps of the Ordnance Survey were published. These maps were then used to update the 1:10,000 maps. The published data, however, is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in collating areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,000 mapping from a number of sources. The maps appear 'unfinished', with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 145702729_1_1
Customer Ref: GE16903
National Grid Reference: 503370, 103260
Slice: A
Site Area (Ha): 2.71
Search Buffer (m): 1000

Site Details

Daisyfields Touring Park, Cornfield Close, Wick,
LITTLEHAMPTON, BN17 6LD

Landmark
We're the Ordnance Survey

Tel: 0844 844 8952
Fax: 0844 844 8951
Web: www.ordnancesurvey.co.uk

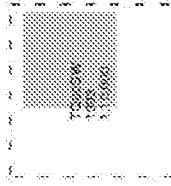


Geo-Environmental Ordnance Survey Plan Published 1993

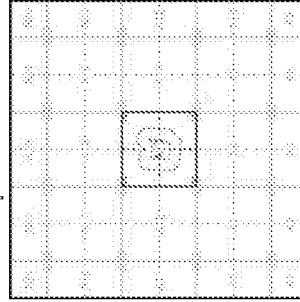
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the Ordnance Survey, Warley and Scotland in the 1840's. In 1854 the 2,500 maps of the Ordnance Survey were published. These maps were then used to update the 1:10,000 maps. The published data, however, is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in collating areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,000 mapping from a number of sources. The maps appear 'unfinished' - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

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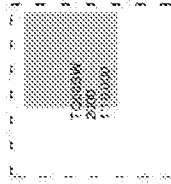


Geo-Environmental 10k Raster Mapping Published 2000

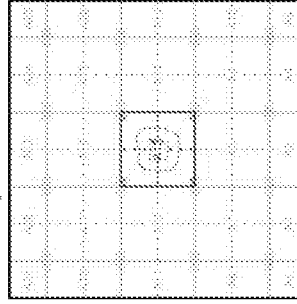
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colored topographical maps. These maps are derived from aerial photography taken in 1970. The data is highly detailed showing buildings, roads, railways, and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information (designation includes county, unitary authority, district, civil parish and constituency).

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 145702729_1_1
Customer Ref: GE16903
National Grid Reference: 503370, 103260
Slice: A
Site Area (Ha): 2.71
Search Buffer (m): 1000

Site Details

Daisyfields Touring Park, Cornfield Close, Wick,
LITTLEHAMPTON, BN17 6LD

Landmark
A Landmark Information Group Service - v50.0

Tel: 0844 844 8952
Fax: 0844 844 8951
Web: www.ordnancesurvey.co.uk

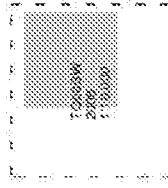


**Geo-Environmental
10k Raster Mapping
Published 2006**

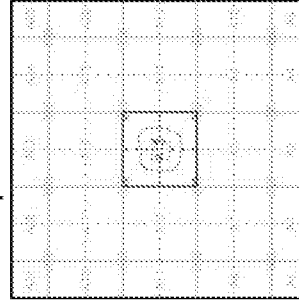
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster maps. These maps are derived from the original 1:10,000 maps which were produced in 1970. The data is highly detailed showing buildings, roads, railways, water features, as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information (election includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

Order Number: 145702729_1_1
Customer Ref: GE16903
National Grid Reference: 503370, 103260
Slice: A
Site Area (Ha): 2.71
Search Buffer (m): 1000

Site Details

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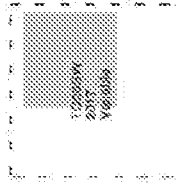


Geo-Environmental VectorMap Local Published 2017

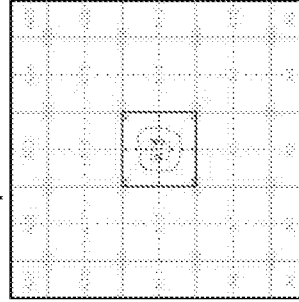
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'background' mapping product. These maps are produced at a national scale of 1:10,000. OS VectorMap Local, a raster map of Great Britain, that has been designed and produced by Ordnance Survey. OS VectorMap Local is derived from large-scale information surveyed at 1:250 scale (covering major towns and cities) 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10,000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

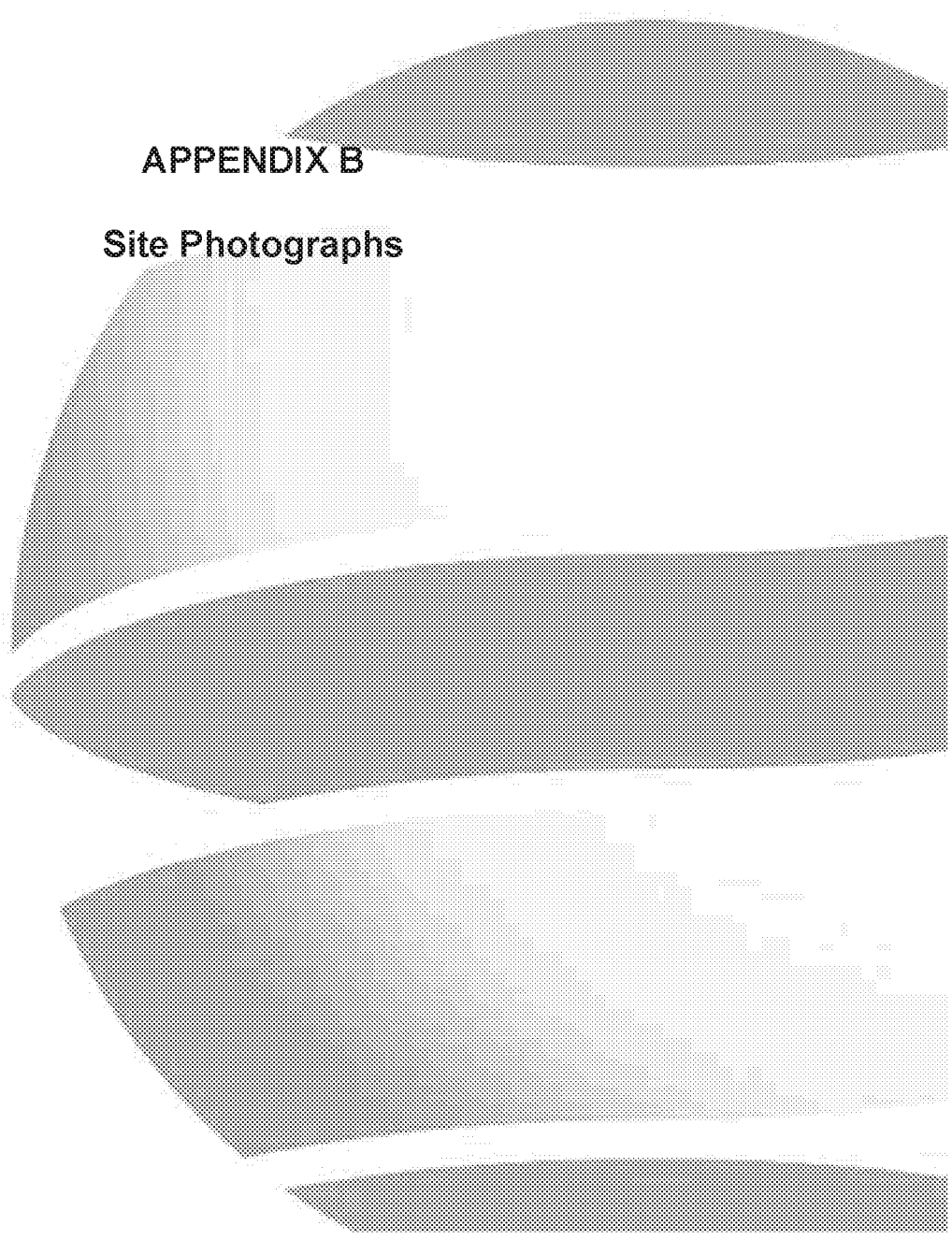
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Customer Ref: GE16903
National Grid Reference: 503370, 103260
Slice: A
Site Area (Ha): 2.71
Search Buffer (m): 1000

Site Details

Daisyfields Touring Park, Cornfield Close, Wick,
LITTLEHAMPTON, BN17 6LD

Landmark
A Landmark Information Group Service - v50.0

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Fax: 0844 844 8951
Web: www.ordnancesurvey.co.uk



APPENDIX B

Site Photographs



1 Site Entrance Looking South



2 Northern Portion Looking East



3 Northern Portion Looking South



4 Northern Portion Looking East



5 Northern Portion Looking South-East



6 Eastern Portion Looking North-East



7 Eastern Portion Looking West



8 Northern Portion Looking West



9 South Eastern Portion Looking East



10 Southern Portion Looking North



11 Southern Portion Looking West



12 Southern Portion Looking North-West



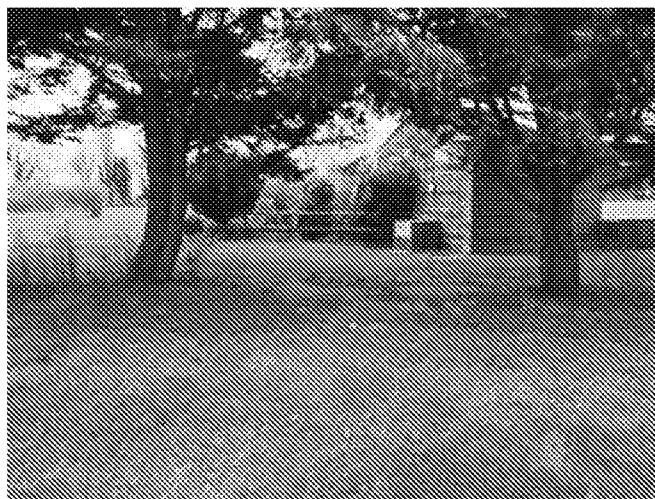
13 Southern Portion Looking North



14 Western Portion Looking North



15 North-Western Portion Looking South



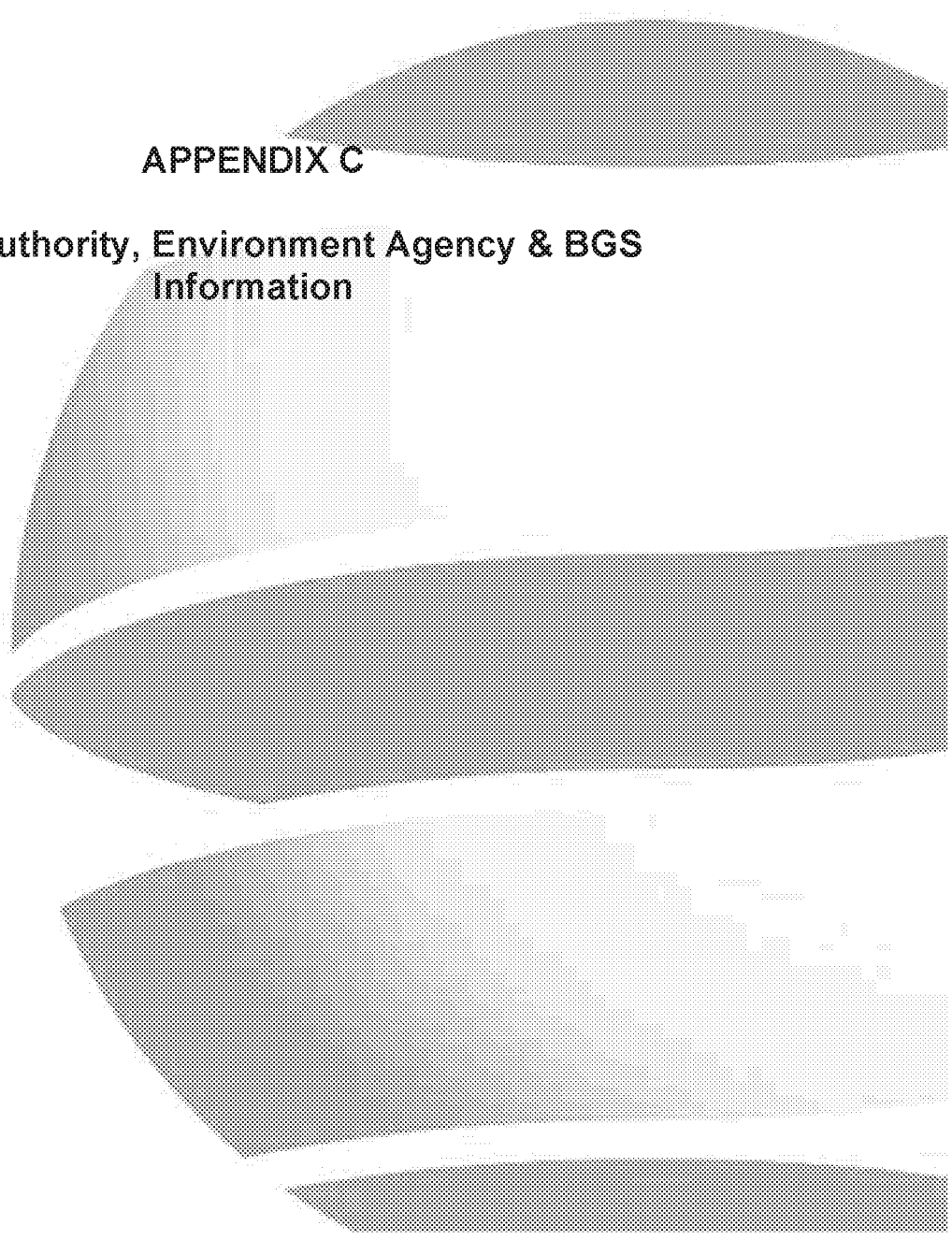
16 Northern Portion Looking South



17 Northern Portion Looking West



18 Northern Portion Looking North



APPENDIX C

Local Authority, Environment Agency & BGS Information

PCL 028 (PL 104)

LANDFILL GAS MONITORING

CORNFIELD CLOSE, LITTLEHAMPTON

FOREWORD

GENERAL

The recommendations and opinions expressed in this report are based upon the results obtained from on-site monitoring for methane and carbon dioxide at standpipes on the site.

Further information concerning ground conditions and geology at the site can be obtained from the report prepared by Norwest Holst Soil Engineering Ltd in April 1991 - Reference PAR/TW/F9006.

SITE INVESTIGATION

1.0 INTRODUCTION

Following on from the Norwest Holst Report of April 1991 - Reference PAR/TW/F9006, consultation with West Sussex County Council Trading Standards Department and the Directorate of Environment, Tourism & Leisure, Arun District Council's Planning & Housing Committee considered the issue of developing the site for residential development.

Planning Permission was granted subject to a number of conditions, one of which required a "...further two year period of investigation and assessment of landfill gas..."

This report documents the findings of a two year investigation of landfill gas at the Cornfield Close site.

2.0 SITE DESCRIPTION

The site is located to the south of Worthing Road, Littlehampton, adjacent to Cornfield Close and comprises an area of slightly undulating grassland which is used as a caravan site during the summer months. A site plan can be seen in Appendix 1.

The area is known to have been used for tipping of domestic refuse in the past, and the site comprises made ground to a depth of approximately 2.0 m. The fill

includes inert materials, concrete bricks and soil and domestic refuse at variable depths between 0.8 m and 2.0 m. The fill overlies strata which is mainly silty sand and clay. It is believed that the site has been closed for approximately 20 years.

3.0 INSTALLATIONS

Gas monitoring standpipes with caps were installed by Norwest Holst during their investigation in 1991. These were installed in ten of the trial pits prior to backfilling at depths of between 1.7 m and 2.3 m below ground level and have caps to prevent any gas escaping. The location of the standpipes is shown on the plan in Appendix 1.

4.0 MONITORING EQUIPMENT

Monitoring for methane, carbon dioxide, oxygen and atmospheric pressure was undertaken using an Analox 1200 Infra-Red Gas Analyser. The Analyser has independent infra-red sensors for methane and carbon dioxide which measure across a range 0-100% for both gases. A separate reference beam ensures self-calibration.

5.0 MONITORING

Monitoring was undertaken at ten standpipes on the site from February 1993 to April 1995.

Visits were initially made on a weekly basis and then every two/three weeks from June, as consistently low methane readings were recorded. Monitoring weekly would not have provided any greater benefit having have considered previous monitoring, the age of the site and known site contents.

A total of fifty-one site visits were made where all standpipes were sampled except on five occasions where access to some standpipes was not possible. This was due to vehicles being parked over the standpipes. Failure to sample standpipes on these occasions did not materially affect the significance of the monitoring data.

Monitoring data was collected for methane levels expressed as a percentage, carbon dioxide levels both average and peak expressed as a percentage, oxygen expressed as a percentage and atmospheric pressure expressed in millibars.

6.0 RESULTS

Monitoring results are contained in Appendix 2.

Waste Management Paper 27 - Landfill Gas - recommends that "monitoring shall continue until:- the maximum concentration of methane gas from biodegradation within the landfill remains less than 1% by volume (20% LEL) and the concentration of carbon dioxide from bio-degradation within the landfill remains less than 1.5% by volume, measured within the waste over a twenty-four month period taken on at least four separate occasions when atmospheric pressure was falling and was below 1,000 millibars....."

Methane was detected in standpipes during seven of the site visits with no methane detected on other visits.

Methane detection is shown below:-

Date	Standpipe Number	Level of Methane Percentage v/v
6/5/93	6 and 8	0.1
13/5/93	1, 5-10 inclusive	0.1
2/7/93	6 and 10	0.1
14/10/93	9	7.8
13/2/95	9	0.1
1/3/95	2, 3, 4, 6 and 9	0.1
26/4/95	9	1.3

RESULTS

With the exception of standpipe 9 on two occasions, the levels of methane detected were minimal at 0.1% v/v.

It is believed that the higher reading on 14/10/93 was a "one off" and inconsistent with the trend. It may have been caused by organic matter entering the standpipe and then decomposing and this result should therefore be set aside.

The level of 1.3% methane measured on 26/4/95 is above the maximum level of 1% but is inconsistent with the overall trend of values of 0 or 0.1%.

Carbon dioxide levels fluctuated at all the standpipes above and below the 1.5% level.

Levels range from 0 to 13.6% v/v and can be seen in Appendix II.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Relatively high levels of carbon dioxide (in excess of 2% of all standpipes except standpipe 4) have been found over the two year monitoring period, as was the case in 1991. The site survey in 1991 revealed inert matter, e.g. concrete, bricks and soil in addition to domestic refuse and it was suggested that the relatively high concentrations of carbon dioxide found then could be due to:-

- ◆ Methane oxidating to carbon dioxide and water within aerobic parts of the refuse body.
- ◆ Evidence that landfill gas production is drawing to the end of its active phase.

Given the constantly low methane levels when compared with varying carbon dioxide levels, it is believed that based upon the age of the site and previous analysis of contents which includes inert material, the landfill gas production is drawing to the end of its active phase.

Monitoring indicates that the very low levels of methane do not constitute a hazard to future developments on or adjacent to the site or existing development near to the site.

Monitoring has shown levels of carbon dioxide to be above the recommended level of 1.5%; however, the volumes being produced are not known. Given that landfill gas production is believed to be coming to a close, it is unlikely that large volumes of carbon dioxide are being produced.

However, a precautionary principle should be adopted when developing on or adjacent to ex-landfill sites which continue to produce either methane or carbon dioxide above the levels recognised as indicating all biodegradation has ceased.

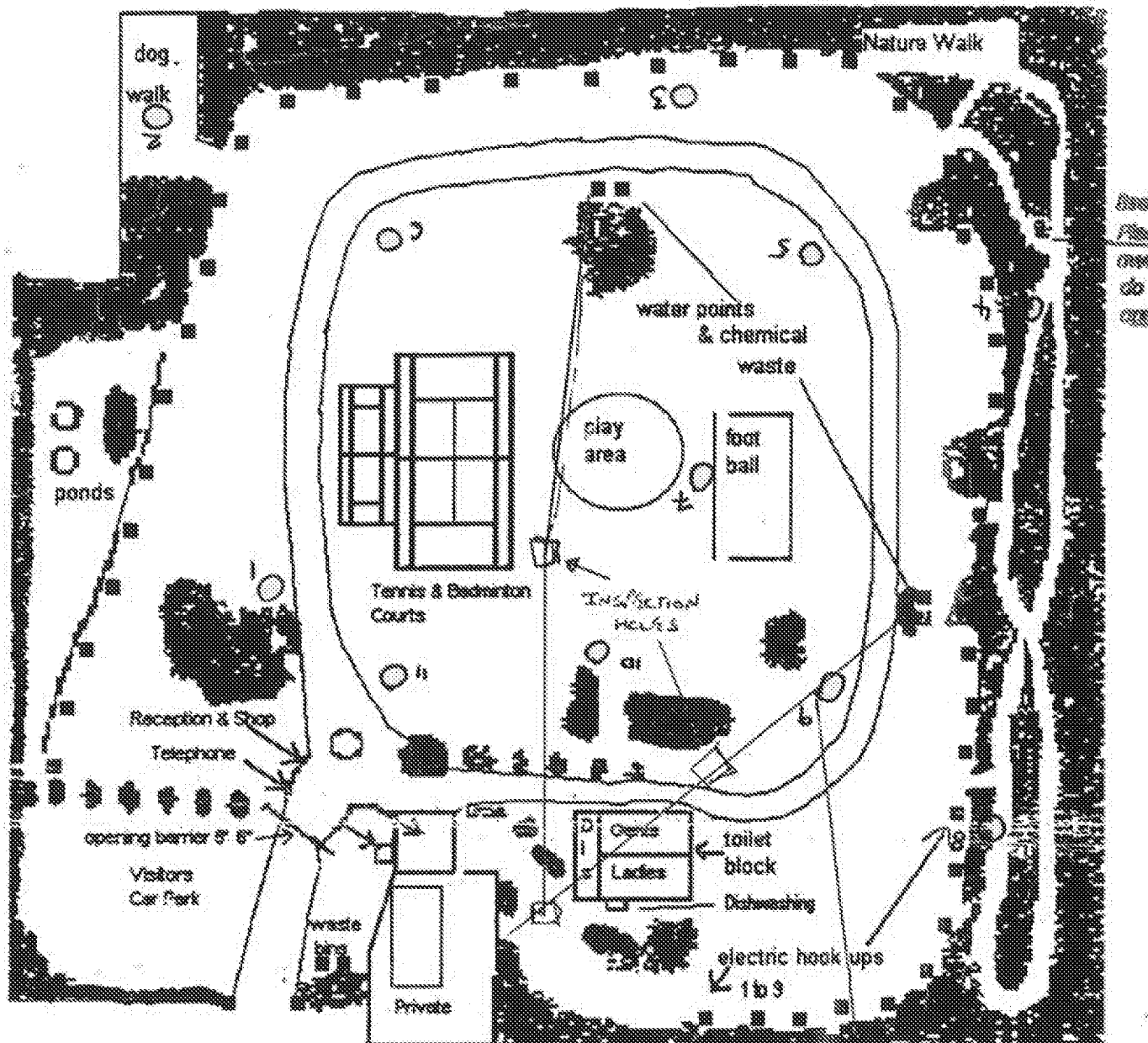
The following measures are recommended for consideration:-

1. Undertake gas monitoring at existing standpipes until carbon dioxide levels fall below recommended levels.
2. Undertake gas monitoring at existing standpipes and in addition establish three new standpipes adjacent to existing standpipes 6, 9 and 10 and monitor for carbon dioxide and methane. This to be for a one-year period to assist in providing additional data on which to draw conclusions.
3. The construction of a gas barrier around the site in the form of a trench in association with either passive (e.g. vent trenches) or pumped methods of

dispersing gases produced within the site. Development should not take place until carbon dioxide levels are below the recommended level.

4. Construction of a gas venting system and the installation of continuous gas monitoring devices in buildings until the site is shown to be gas free.

It is recommended that West Sussex County Council, who are the responsible Waste Regulation Authority, are consulted and their opinions sought with respect to the results and conclusions with a view to future development of the site.

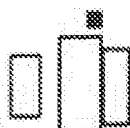


All tents to be pitched in centre of field except, for people with dogs.

No dogs allowed in centre of field.

Caravans Campervans to go on outer edge. Keeping to left of markers.

I.e.



Marker ■
Car Caravan awning

Young children must be supervised in the play area, Parents allow children to play at their own risk

water + Drinks
in Bar

No gas use
bottles only

From:
To:
Subject:
Date:
Attachments:

From: SSD Enquiries
Sent: 20 November 2017 14:45
To: [REDACTED]
Subject: 171120 SSD67271 Cornfield Close, Littlehampton

Dear Mr Tingley

Thank you for your request for information received on 9 November 2017. Please find attached our response.

We are unable to provide any information as we no longer hold the records for historic landfill sites. We recommend that you contact the Environmental Health / Environmental Protection Department of the relevant local authority for further advice and information. They are the lead regulator for these sites and are responsible for the inspection of contaminated land in their area, which includes historic landfill site.

If you have any further questions please contact us using the details below and quote the reference number SSD67271.

Kind regards
Hannah Osborn

Customers and Engagement Officer
Environment Planning and Engagement, Solent and South Downs Area
Environment Agency | Guildbourne House, Chatsworth Road, Worthing, West Sussex, BN11 1LD

ssdenquiries@environment-agency.gov.uk

External: 02030257278 or our National Contact Call Centre 03708506506



**Creating a better place
for people and wildlife**



From: Jon Tingley [REDACTED]
Sent: 09 November 2017 09:40
To: Enquiries, Unit <[REDACTED]>
Subject: 171110/ER15 Cornfield Close, Littlehampton

Dear Sirs,

We've been instructed by our Client to undertake a desk study for the above named site. It is understood the site is a historic commercial landfill.

Please can we commission an Environmental Search, with particular interest in any information the Environment Agency may hold with respect to the landfill.

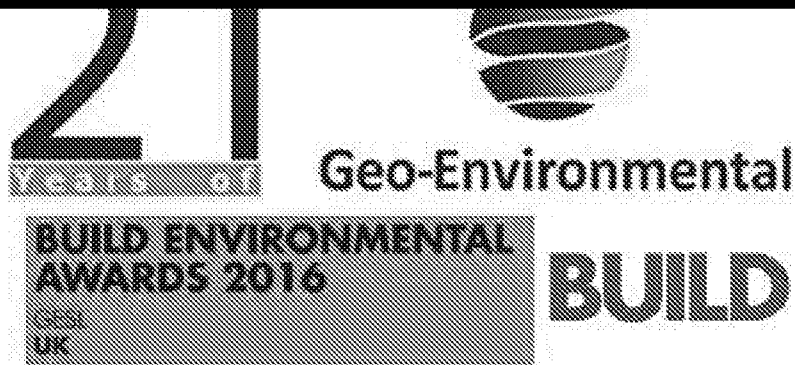
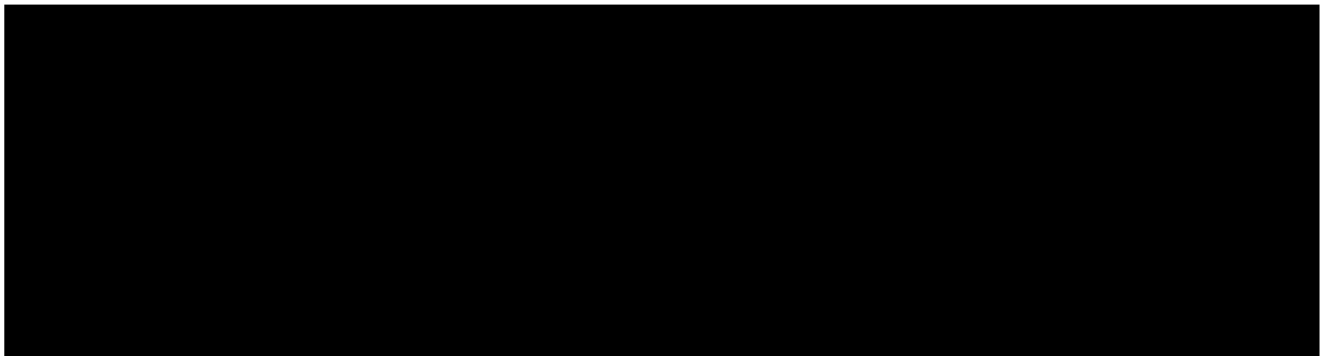
Please can you confirm the charges, payment method and timescales?

Kind regards

For and on behalf of Geo-Environmental Services Ltd

Jonathan Tingley

CEnv, BEng (Hons), MSc, FGS, MEnvSc
Technical Director



Geo-Environmental Services Limited has ISO9001, ISO14001 and OHSAS18001 accreditation.
The Company Registration No. is 3214980 and the VAT Registration No. is 679544479.

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100056 101

Norwest Holst Soil Engineering Ltd.

Borehole No. **1**

Contract No. FA403 **BOREHOLE LOG** **0329 0333**

Location Littlehampton **Sheet** 1 of 1

Client Arun District Council **Chainage**

Method of Boring Percussion **Ground Level** 7.73 m.A.O.D.

Diameter of Borehole 150mm **Date** 8/11/79

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D.%	Daily Progress
TOPSOIL		0.25	7.5				
MADEGROUND: Firm friable mottled brown silty sandy clay with occasional fine gravel.		1.20	6.5		0.50		
MADEGROUND: Soft brown silty clay with domestic refuse,		2.10	5.6		1.50	3	
Soft orange-brown silty fine sandy CLAY with occasional chert gravel.		4.50	3.1		2.30		
		5.00	2.7		3.90		
Greyish-white structural CHALK lumps up to 50mm, (Grade V).					4.60	32	

Type of Sample

S.P.T. ☒ Undisturbed

C.P.T. ☒ Vane

Jar ☒ Water

Bulk ☒ Piezometer

Remarks (Observations of Ground Water etc.)

Borehole dry.

Norwest Holst Soil Engineering Ltd.						Borehole No. 2	
BOREHOLE LOG				Sheet 1 of 1			
Contract No. F4403		Location Littlehampton		Chainage			
Client Arun District Council		Method of Boring Percussion		Ground Level 7.87 m.A.O.D.			
Diameter of Borehole 150mm		Date 8/11/79		Date			
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth or Sampling	Sampling and Coring	"N" / R.O.D. %	Daily Progress
TOP SOIL		0.20	7.8				
MADEGROUND: Clay with ash.		0.50	7.5		0.50	10	
MADEGROUND: Loose ash and clay with domestic refuse.					1.50	5	
		2.20	5.8		2.50	18	
Medium dense orange-brown fine to medium SAND with occasional gravel and bands of firm sandy clay.					4.00		
		4.50	3.5				
Medium dense brown SAND,		5.00	3.0				

Type of Sample

☐ S.P.T. ☐ Undisturbed
☐ C.P.T. ☐ Vane
☐ Jar ☐ Water
☐ Bulk ☐ Piezometer

Remarks (Observations of Ground Water etc.)

Borehole dry.

Norwest Holst Soil Engineering Ltd.						Borehole No. 3	
Contract No. <u>F4403</u>		BOREHOLE LOG		Sheet <u>1</u> of <u>1</u>		0237 0333	
Location <u>Littlehampton</u>		Client <u>Arun District Council</u>		Chainage <u> </u>		Ground Level <u>7.89</u> m.A.O.D.	
Method of Boring <u>Percussion</u>		Diameter of Borehole <u>150 mm</u>		Date <u>8/11/79</u>			

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D.%	Daily Progress
TOPSOIL		0.22	7.7				
MADEGROUND:					0.50	5	
Loose ash and domestic refuse.					1.50	5	
		2.50	5.4		2.50		
Soft brown very silty sandy CLAY with patches of coarse brown sand and occasional subangular medium gravel.		3.10	4.8		3.10	37	
Dense brown clayey fine to medium SAND with some medium to coarse sub-angular chert gravel.		5.00	2.9		4.50		

Type of Sample 1/2" S.P.T. Undisturbed 1/2" C.P.T. Vane O Jar Water ● Bulk Piezometer	Remarks (Observations of Ground Water etc.) Borehole dry during drilling. 11/11/79 water standing at 3.10 m.
--	--

Norwest Holst Soil Engineering Ltd.						Borehole No. 4	
BOREHOLE LOG						Sheet 1 of 1	
Contract No. F4403						Chainage	
Location Littlehampton						Ground Level 7.71 m.A.O.D.	
Client Arun District Council						Date 2/11/78	
Method of Boring Percussion							
Diameter of Borehole 150mm							

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/ R.O.D.N.	Daily Progress
TOPSOIL		0.20	7.5				
MADEGROUND; Very loose clay brick ash and domestic refuse					0.50 1.50 2.50	3 2 2	
Soft brown very silty fine sandy occasionally very sandy CLAY with occasional subangular fine gravel		2.60	5.1		3.00 4.00	2	
Structureless greyish-white CHALK lumps up to 80mm in chalky clayey matrix (grade V) Size of lumps increase with depth		3.80	3.9		5.50 7.00 8.50 9.50	50 31	
		10.00	-2.3				

Type of Sample S.P.T. Undisturbed C.P.T. Vane Jer Water Bulk Piezometer	Remarks (Observations of Ground Water etc.) Seepage from 7.50m to 10.00m 11/11/78 standing at 8.00m
--	--

Norwest Holst Soil Engineering Ltd.						Borehole No. 5	
BOREHOLE LOG				Sheet 1 of 1			
Contract No. <u>F4403</u>				Chainage <u>0329 0329</u>			
Location <u>Littlehampton</u>				Ground Level <u>8.35</u> m.A.D.D.			
Client <u>Arun District Council</u>				Date <u>9/33/78</u>			
Method of Boring <u>Percussion</u>							
Diameter of Borehole <u>150mm</u>							

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth or Sampling	Sampling and Coring	"N"/R.O.D. %	Daily Progress
TOPSOIL		0.25	8.1				
MADEGROUND: Soft dark brown silty clay with domestic refuse		3.30	5.1				
Firm brown silty sandy CLAY with occasional medium subangular chert gravel		5.00	3.4				

Type of Sample ☒ S.P.T. ☒ Undisturbed ☒ C.P.T. ☒ Vane ☐ Jar ☐ Water ☐ Bulk ☐ Piezometer	Remarks (Observations of Ground Water etc.) Borehole dry
---	---

Norwest Holst Soil Engineering Ltd.						Borehole No. 6	
BOREHOLE LOG				Sheet 1 of 1			
Contract No. F4409 Location Littlenhampton Client Arun District Council Method of Boring Percussion Diameter of Borehole 150mm				Chainage Ground Level 8.38 m.A.D.D. Date 8/11/79			
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/ R.O.D. %	Daily Progress
TOPSOIL		0.25	8.1				
MADEGROUND: Medium dense clay, ash and brick with domestic refuse	[Pattern]				0.50	11	
					1.50	11	
		2.20	8.1				
Soft brown silty very sandy CLAY with occasional gravel	[Pattern]				2.40		
					3.50	20	
		3.50	4.8				
Medium dense brown SAND and GRAVEL with bands of firm brown sandy clay	[Pattern]				5.00	28	
					6.50		
		6.35	2.0				
Creamy white structureless CHALK lumps up to 70mm with a slightly cemented friable sandy chalky matrix (Grade IV)	[Pattern]				8.00	39	
					9.50	28	
		10.00	-1.7				
Type of Sample S.P.T. Undisturbed C.P.T. X Vane Jar Δ Water Bulk Piezometer		Remarks (Observations of Ground Water etc.) Borehole dry					