

Please consult the legends to
Combined "Surface Geology"

More information on 1:10,000 explanations of rock classifications can be obtained by visiting the LEX Codes website. Using the LEX Codes website, rock types can be obtained by rock type name, by Named Rock Units'. This data can be obtained by the 'Information and Data' link

British Geological Survey
Kingsley Dunham Centre
Keyworth
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NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Order Number: 20
Customer Ref: C
National Grid Reference: 20
Slice: A
Site Area (Ha): 0
Search Buffer (m): 1

Site Details

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	No. Supplied - Holocene
	WGR	Worked Ground (Undivided)	Void	No. Supplied - Holocene
	SLIP	Landslide Deposit	Unknown/Undifferentiated Entry	No. Supplied - Quaternary

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay, Silt, Sand and Gravel	No. Supplied - Holocene
	GFDUD	Glaciofluvial Deposits, Devensian	Sand and Gravel	No. Supplied - Devensian
	TILLD	Till, Devensian	Diamicton	No. Supplied - Devensian
	GFICD	Glaciofluvial Ice Contact Deposits, Devensian	Sand and Gravel	No. Supplied - Devensian
	ALF	Alluvial Fan Deposits	Sand and Gravel	No. Supplied - Quaternary
	PEAT	Peat	Peat	No. Supplied - Quaternary
	RTDU	River Terrace Deposits (Undifferentiated)	Sand and Gravel	No. Supplied - Quaternary
	HEAD	Head	Clay, Silt, Sand and Gravel	No. Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	BD	Brithdir Member	Mudstone, Siltstone and Sandstone	No. Supplied - Westphalian
	BD	Brithdir Member	Sandstone	No. Supplied - Westphalian
	H	Hughes Member	Sandstone	No. Supplied - Westphalian
	H	Hughes Member	Mudstone, Siltstone and Sandstone	No. Supplied - Westphalian
	GDB	Grovesend Formation	Sandstone	No. Supplied - Westphalian
	GDB	Grovesend Formation	Mudstone, Siltstone and Sandstone	No. Supplied - Westphalian

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	SW	Swansea Member	Sandstone	Not Supplied - Westphalian
	SW	Swansea Member	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	RA	Rhondda Member	Sandstone	Not Supplied - Westphalian
	RA	Rhondda Member	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
		Rock Segments		
		Faults		

Geology 1:50,000 Maps

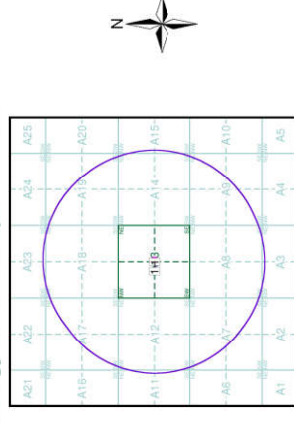
This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.

The various geological layers - artificial and landslide deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	1
Map Sheet No:	229
Map Name:	Ammanford
Map Date:	1977
Bedrock Geology:	Available
Superficial Geology:	Available
Artificial Geology:	Available
Faults:	Not Supplied
Landslip:	Available
Rock Segments:	Not Supplied

Geology 1:50,000 Maps - Slice A



Order Details:

Order Number: 241492517 1_1
 Customer Reference: C-15297-C_1
 National Grid Reference: 272290, 203500
 Slice: A
 Site Area (Ha): 0.31
 Search Buffer (m): 1000

Site Details:

Tesco Stores Ltd, Gwyns Drift, Alltwen, Pontardawe, SWANSEA SA8 3AZ



Hydrock

Artificial Ground and Landslip

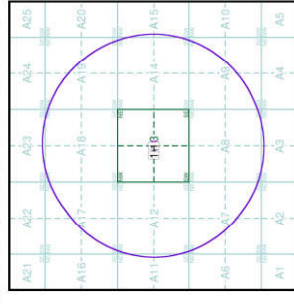
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- In-filled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes founded strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



Order Details:

Order Number: 241492517 1_1
Customer Reference: C-15297-C_1
National Grid Reference: 277290, 203500
Slice: A
Site Area (Ha): 0.31
Search Buffer (m): 1000

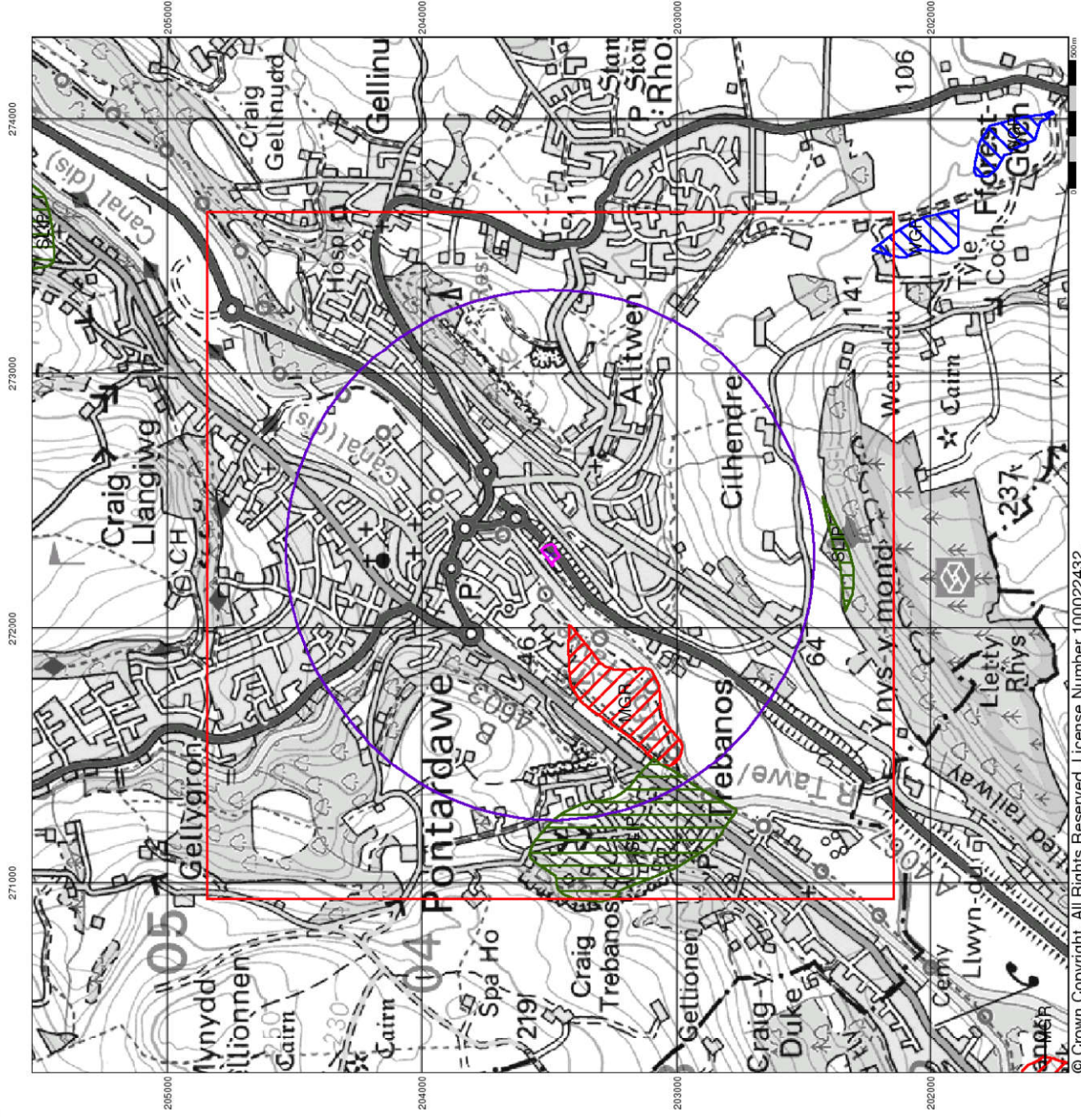
Site Details:

Tesco Stores Ltd, Gwyns Drift, Alltwen, Pontardawe, SWANSEA SA8 3AZ



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v15.0 23-Apr-2020





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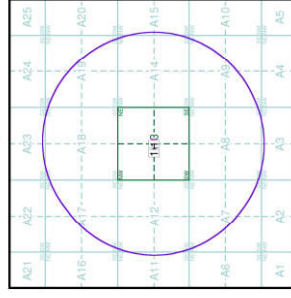
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



Order Details:

Order Number: 241492517 1_1
Customer Reference: C-15297-C_1
National Grid Reference: 277290, 203500
Slice: A
Site Area (Ha): 0.31
Search Buffer (m): 1000

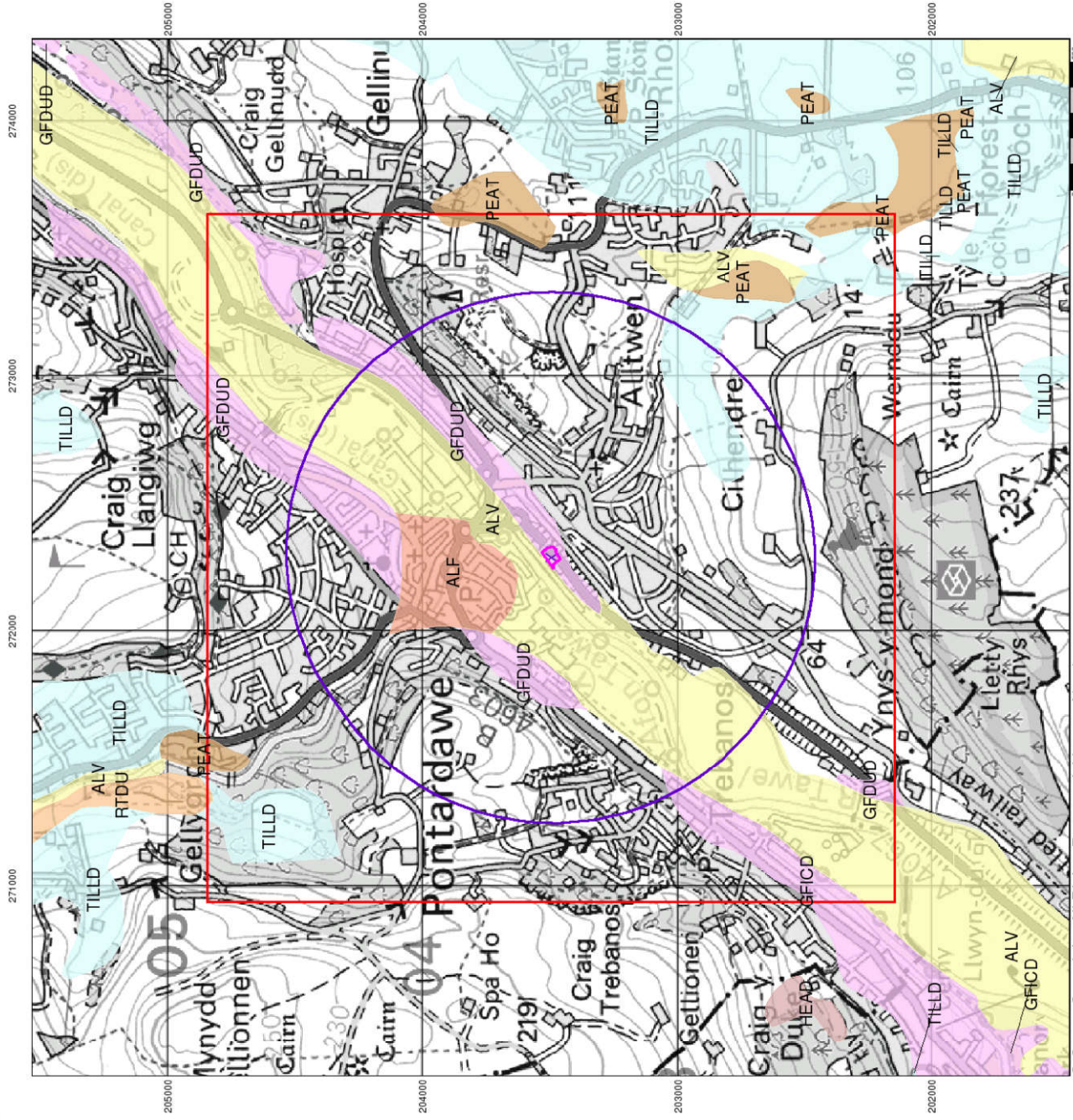
Site Details:

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Bedrock and Faults

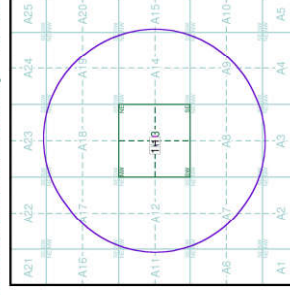
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



Order Details:

Order Number: 241492517 1 1
Customer Reference: C-15297-C_1
National Grid Reference: 277290, 203500
Slice: A
Site Area (Ha): 0.31
Search Buffer (m): 1000

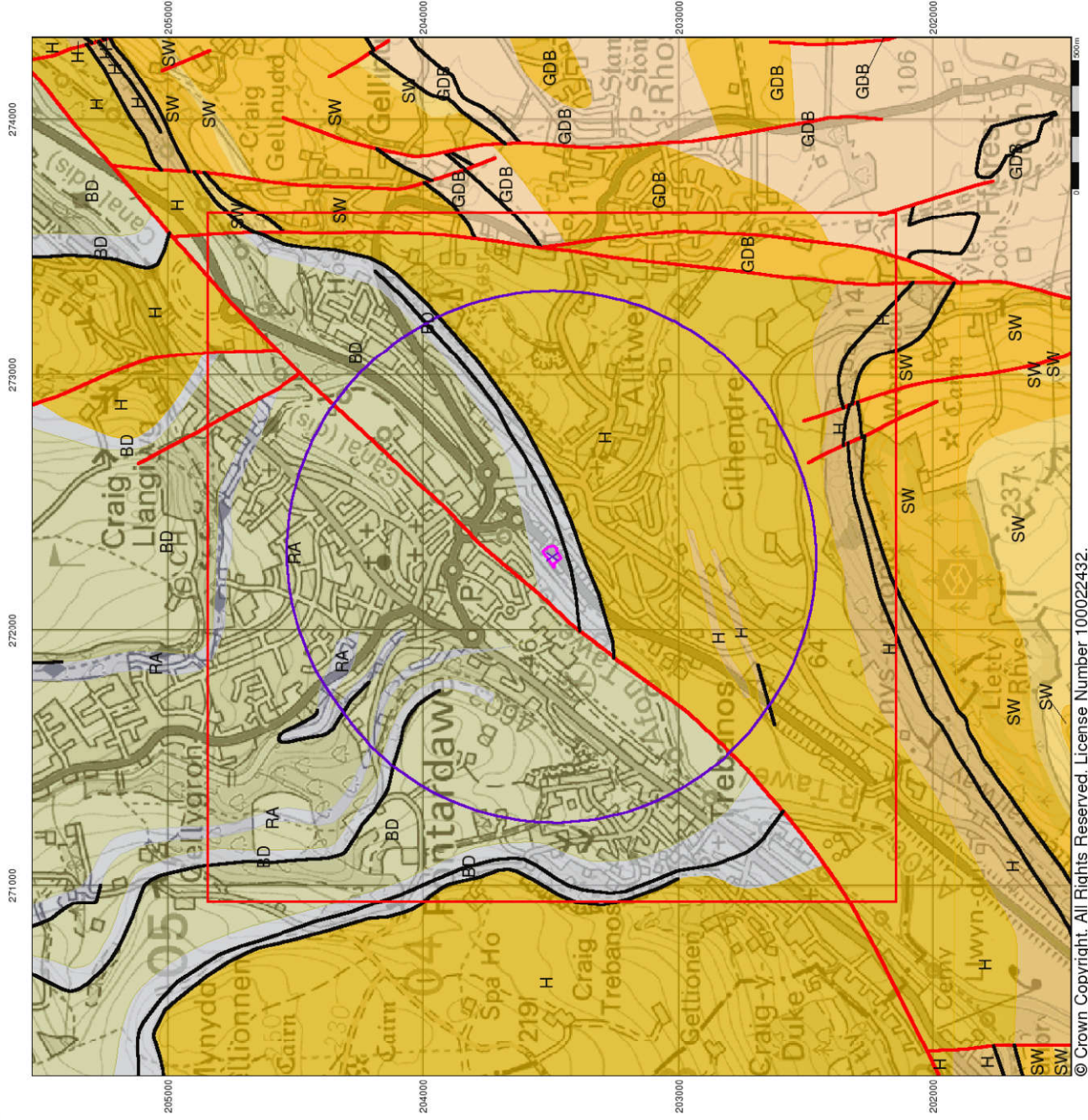
Site Details:

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v15.0 23-Apr-2020





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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

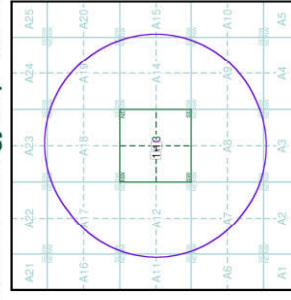
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

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email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



Order Details:

Order Number: 241492517_1_1
Customer Reference: C-15297-C_1
National Grid Reference: 277290, 203500
Slice: A
Site Area (Ha): 0.31
Search Buffer (m): 1000

Site Details:

Tesco Stores Ltd, Gwyns Drift, Alltwen, Pontardawe, SWANSEA SA8 3AZ



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BGS Archive Records

Norwest Holst Soil Engineering Ltd.						Borehole No. 59
Contract No. F6220 BOREHOLE LOG SNTOSW 94						
Location A4067 Glais to Pontardawe Sheet 1 of 1						
Client West Glamorgan County Council Co-ordinates E72353.50 N63467.50						
Method of Boring Percussion Ground Level 37.43 m.A.O.D.						
Diameter of Borehole 200mm Date 26/2/85						

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
MADE GROUND:- Sand and gravel of ash and brick fragments	[Pattern]	0.20	37.23				
Grey and brown mottled clayey medium to coarse SAND and GRAVEL	[Pattern]	1.20	36.23	200mm to 1.50m	1.00 8/7-5-8-8 c 1.45 1.50 22/11-12- c 1.95	28	
Grey, with brown iron staining SILTSTONE	[Pattern]	2.00	35.43			54	

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

Norwest Holst Soil Engineering Ltd.						Borehole No. 59A	
Contract No. F6220		BOREHOLE LOG		Sheet 1 of 1			
Location: A4067 Glais to Pontardawe		Client: West Glamorgan County Council		Co-ordinates: E72349.82N 03491.12			
Method of Boring: Rotary Openhole		Diameter of Borehole: 125mm		Ground Level: 36.95 m.A.O.D.		Date: 24/4/85	
Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	W/R.O.D. %	Daily Progress
MADE GROUND: Ash and brick (Drillers description)		1.00	35.95				
Hard grey SANDSTONE (Drillers description)		4.00	32.95				
Void (possible workings)		6.00	30.95				
Type of Sample		Remarks (Observations of Ground Water etc.)					
S.P.T. ☐ Undisturbed ☐ C.P.T. ☐ Vane ☐ Jar ☐ Water ☐ Bulk ☐ Piezometer ☐		Borehole cased off to 4.00m to allow inspection of workings by a down the hole video camera.					

Norwest Holst Soil Engineering Ltd.						Borehole No.	
BOREHOLE LOG						59B	
Contract No. F6220		Location A4067 Clais to Pontardawe		Sheet 1 of 1		Co-ords E7235.462 N06439.111	
Client West Glamorgan County Council		Method of Boring Rotary		Ground Level 36.95 m.A.O.D.		Date 30/4/85	
Diameter of Borehole 105mm							
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
MADE GROUND:- Ash and stone fill (drillers description)		1.00	35.95	125mm to 1.50m	0/H		
Grey, discoloured yellow brown in places thinly bedded, moderately weathered SILTSTONE weak to moderately strong in places, some decomposition along bedding and near vertical fractures		2.90	34.05		2.00	100%	0%
Grey, moderately weathered, disintergrated silty MUDSTONE weak		3.75	33.20		3.00	100%	0%
Light grey, thinly bedded, slightly weathered SILTSTONE moderately weak some discolouration along vertical fractures		4.60	32.35		4.70	100%	0%
Grey, thinly bedded, moderate to slightly weathered, silty MUDSTONE moderately weak Disintergrated to 7.30m, below which becomes moderately strong		7.70	29.25		6.00	100%	13%
Grey, fine grained, thinly bedded slightly weathered, SANDSTONE moderately strong		9.20	27.75		7.50	100%	18%
Dark grey, thinly laminated, slightly weathered, MUDSTONE, weak		9.50	27.45		9.50		30th
Type of Sample		Remarks (Observations of Ground Water etc.)					
☒ S.P.T. ☒ Undisturbed ☒ C.P.T. ☒ Vane ☒ Jar ☒ Water ☒ Bulk ☒ Piezometer		O/H Openholed Seepage of water at 3.00m					

Norwest Holst Soil Engineering Ltd. Borehole No. 60R					
BOREHOLE LOG Sheet <u>1</u> of <u>1</u>					
Contract No. <u>FC220</u>		Location <u>A4067 Gleais to Pontardawe</u>		Co-Grids <u>E72375.50 N03506.50</u>	
Client <u>West Glamorgan County Council</u>		Method of Boring <u>Rotary</u>		Ground Level <u>37.50</u> m.A.O.D.	
Diameter of Borehole <u>105mm</u>		Date <u>1/5/85</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
MADE GROUND:- Sandstone boulder (drillers Description)	[Pattern]	0.50	37.00				
MADE GROUND:- Ash, stone fill (drillers description)	[Pattern]	1.50	36.00		0/H		
Grey, highly weathered, partial disintegrated silty MUDDSTONE weak	X				2.00		
	X				3.50		
	X				100%	0%	
	X				100%	0%	
	X	5.10	32.40				
Grey fine to medium grained, moderately weathered SANDSTONE moderately strong, vertical fractures 5.10 to 5.40 and 6.00 to 6.20	[Pattern]				5.40	100%	0%
	[Pattern]				5.80	100%	0%
	[Pattern]	6.50	31.00		6.20	100%	25%
Grey, moderately weathered, silty MUDDSTONE weak and disintegrated to 7.35m becoming moderately weak to moderately strong with depth	X				7.00		
	X				100%	15%	
	X				9.00	100%	0%
	X	9.50	28.00		9.50	100%	0%
	X				1st		

Type of Sample S.P.T. Undisturbed C.P.T. Vane Jar Water Bulk Piezometer	Remarks (Observations of Ground Water etc.) 0/H Openholed Seepage of water at 3.50m
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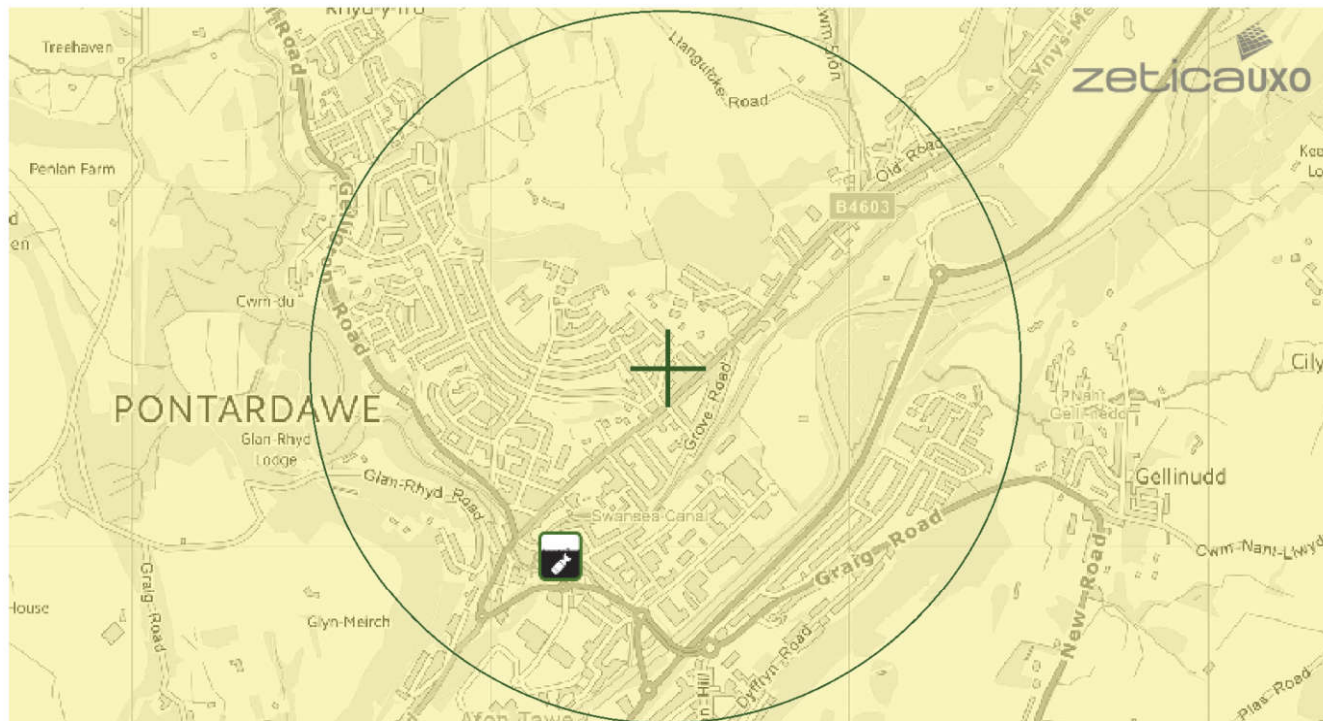
Zetica UXB Risk Maps

UNEXPLODED BOMB RISK MAP



SITE LOCATION

Location: Pontardawe, Neath Port Talbot
Map Centre: 272500,204500



LEGEND

- High:** Areas indicated as having a bombing density of 50 bombs per 1000acre or higher.
- Moderate:** Areas indicated as having a bombing density of 15 to 49 bombs per 1000acre.
- Low:** Areas indicated as having 15 bombs per 1000acre or less.

- military
- industry
- UXO find
- transport
- dock
- Luftwaffe targets
- utilities
- Bombing decoy
- other

How to use your Unexploded Bomb (UXB) risk map?

The map indicates the potential for Unexploded Bombs (UXB) to be present as a result of World War Two (WWII) bombing.

You can incorporate the map into your preliminary risk assessment* for potential Unexploded Ordnance (UXO) for a site. Using this map, you can make an informed decision as to whether more in-depth detailed risk assessment* is necessary.

What do I do if my site is in a moderate or high risk area?

Generally, we recommend that a detailed UXO desk study and risk assessment is undertaken for sites in a moderate or high UXB risk area.

Similarly, if your site is near to a designated Luftwaffe target or bombing decoy then additional detailed research is recommended.

More often than not, this further detailed research will conclude that the potential for a significant UXO hazard to be present on your site is actually low.

Never plan site work or undertake a risk assessment using these maps alone. More detail is required, particularly where there may be a source of UXO from other military operations which are not reflected on these maps.

If my site is in a low risk area, do I need to do anything?

If both the map and other research confirms that there is a low potential for UXO to be present on your site then, subject to your own comfort and risk tolerance, works can proceed with no special precautions.

A low risk really means that there is no greater probability of encountering UXO than anywhere else in the UK.

If you are unsure whether other sources of UXO may be present, you can ask for one of our **pre-desk study assessments (PDSA)**

If I have any questions, who do I contact?

tel: +44 (0) 1993 886682

email: uxo@zetica.com

web: www.zeticauxo.com

The information in this UXB risk map is derived from a number of sources and should be used in conjunction with the accompanying notes on our website: (<https://zeticauxo.com/downloads-and-resources/risk-maps/>)

Zetica cannot guarantee the accuracy or completeness of the information or data used and cannot accept any liability for any use of the maps. These maps can be used as part of a technical report or similar publication, subject to acknowledgment. The copyright remains with Zetica Ltd.

It is important to note that this map is not a UXO risk assessment and should not be reported as such when reproduced.

*Preliminary and detailed UXO risk assessments are advocated as good practice by industry guidance such as CIRIA C681 'Unexploded Ordnance (UXO), a guide for the construction industry'.

Coal Authority 'Consultants Coal Mining Report'



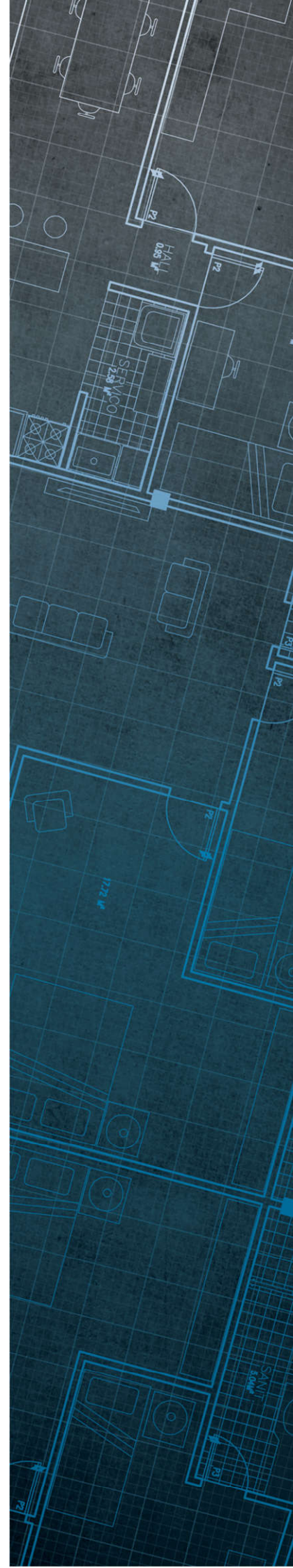
The Coal
Authority

Consultants Coal Mining Report

Mcdonalds Pontardawe
A4067 From Glais To Pontardawe
Alltwen
Pontardawe
Neath Port Talbot
SA8 3AZ

Date of enquiry:	22 April 2020
Date enquiry received:	22 April 2020
Issue date:	22 April 2020

Our reference:	51002283306001
Your reference:	C-15297



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

HYDROCK CONSULTANTS LTD

Enquiry address

Mcdonalds Pontardawe
A4067 From Glais To Pontardawe
Alltwen
Pontardawe
Neath Port Talbot
SA8 3AZ

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

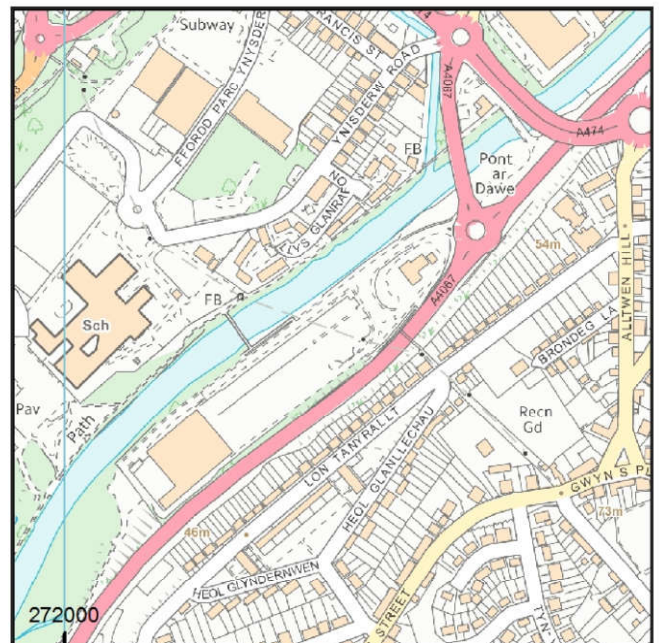
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

No past mining recorded.

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

Distance to spine roadway (m)	Direction to spine roadway
Within	N/A

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	272203-007	272308 203538	This adit was investigated by West Glamorgan County Council as part of the A4067 Swansea Valley Trunk Road Scheme in 1987. Drainage works were undertaken as part of the treatment works	Coal	
Adit	272203-008	272328 203512	This adit was investigated by West Glamorgan County Council as part of the A4067 Swansea Valey Trunk Road Scheme in 1987. Drainage works were undertaken as part of the treatment works	Coal	
Adit	272203-014	272336 203545		Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

9259	5995	6067
SWR1666	R12044	

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Fault under or close to the property recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

Based on the responses in this report, no further information has been highlighted.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

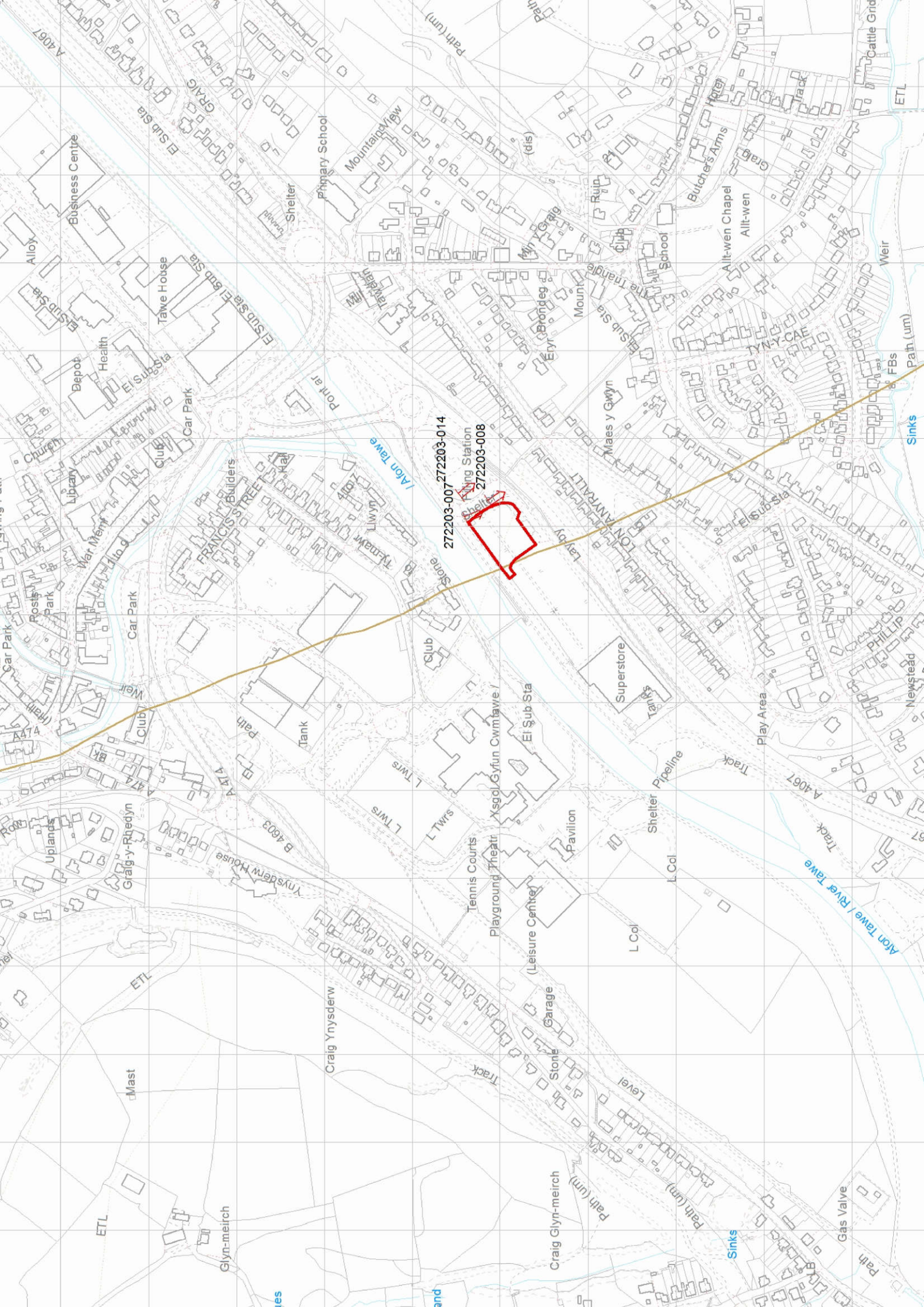
Payment to owners of former copyhold land

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	22 April 2020
Issued to	HYDROCK CONSULTANTS LTD CASTLEBRIDGE 4 5-19 COWBRIDGE ROAD EAST RIVERSIDE CARDIFF CF11 9AB
Property search for	MCDONALDS PONTARDAWE A4067 FROM GLAIS TO PONTARDAWE ALLTWEN PONTARDAWE NEATH PORT TALBOT SA8 3AZ
Reference number	51002283306001
Date of issue	22 April 2020
Cost	£112.13
VAT @ 20%	£22.43
Total received	£134.56
VAT registration	598 5850 68



BGS Radon Report



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**Matthew Holbourn
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Castlebridge 5
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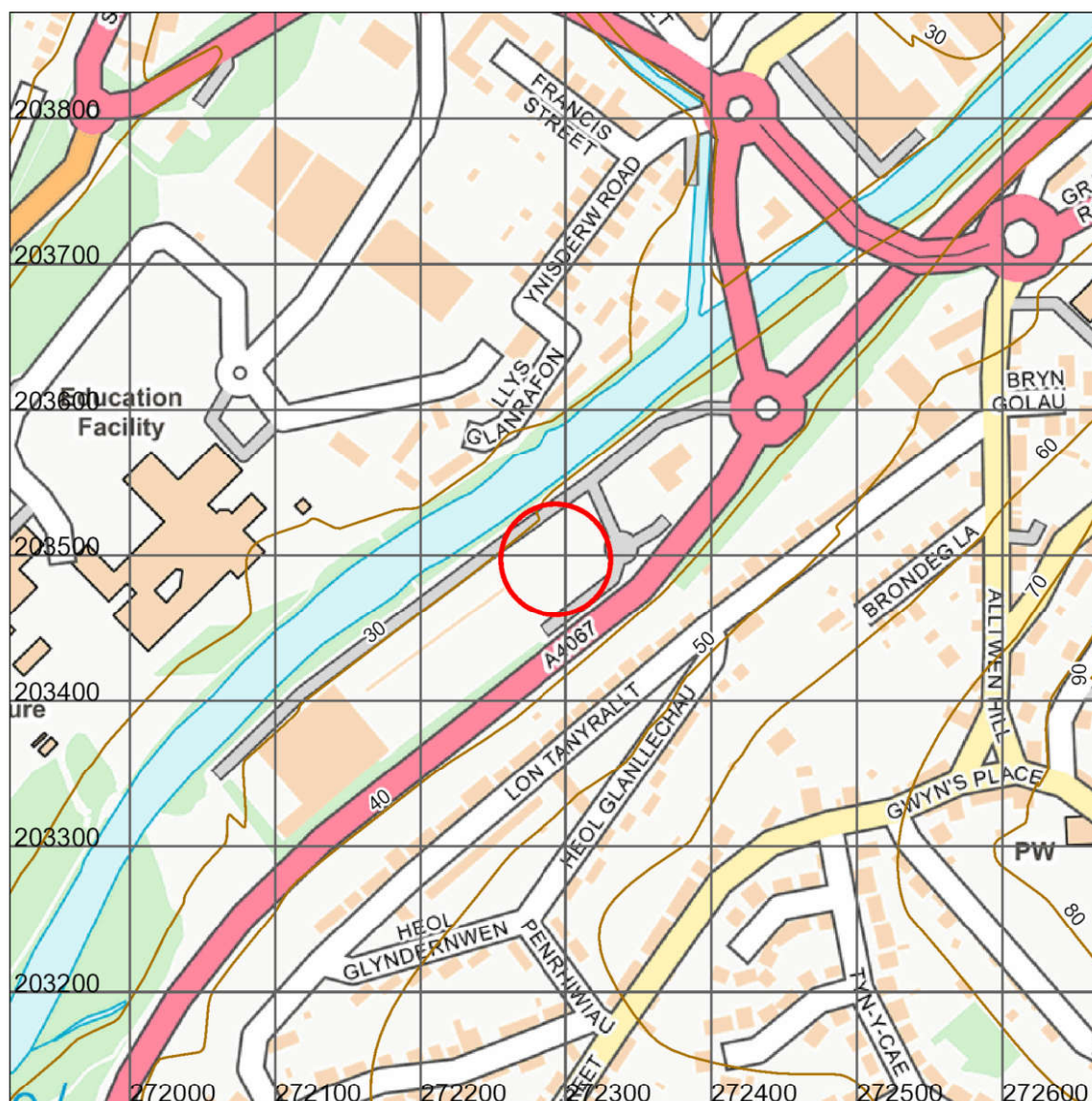
Radon Report

Advisory report on the requirement for radon protective measures in new buildings, conversions and extensions to existing buildings. The report also indicates whether a site is located within a radon Affected Area

Report Id: *BGS_308501/11263*

Client reference: C-15297-C

Search location



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Search location indicated in red

Area centred at: 272293,203497

Radius of site area: 38 metres

Radon Report: UK

When extensions are made to existing buildings in high radon areas, or new buildings are constructed in these areas, the Building Regulations for England, Wales, Scotland and Northern Ireland require that protective measures are taken against radon entering the building.

This report provides information on whether radon protective measures are required. Depending on the probability of buildings having high radon levels, the Regulations may require either:

1. No protective measures
2. Basic protective measures
3. Full protective measures

This is an advisory report on the requirement for radon protective measures in new buildings, conversions and extensions. The report also indicates whether a site is located within a radon Affected Area

Requirement for radon protective measures

The determination below follows advice in *BR211 Radon: Guidance on protective measures for new buildings (2015 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Is the property in an area where radon protective measures are required for new buildings or extensions to existing ones as described in publication BR211 (2015 edition) Radon: Guidance on protective measures for new buildings?

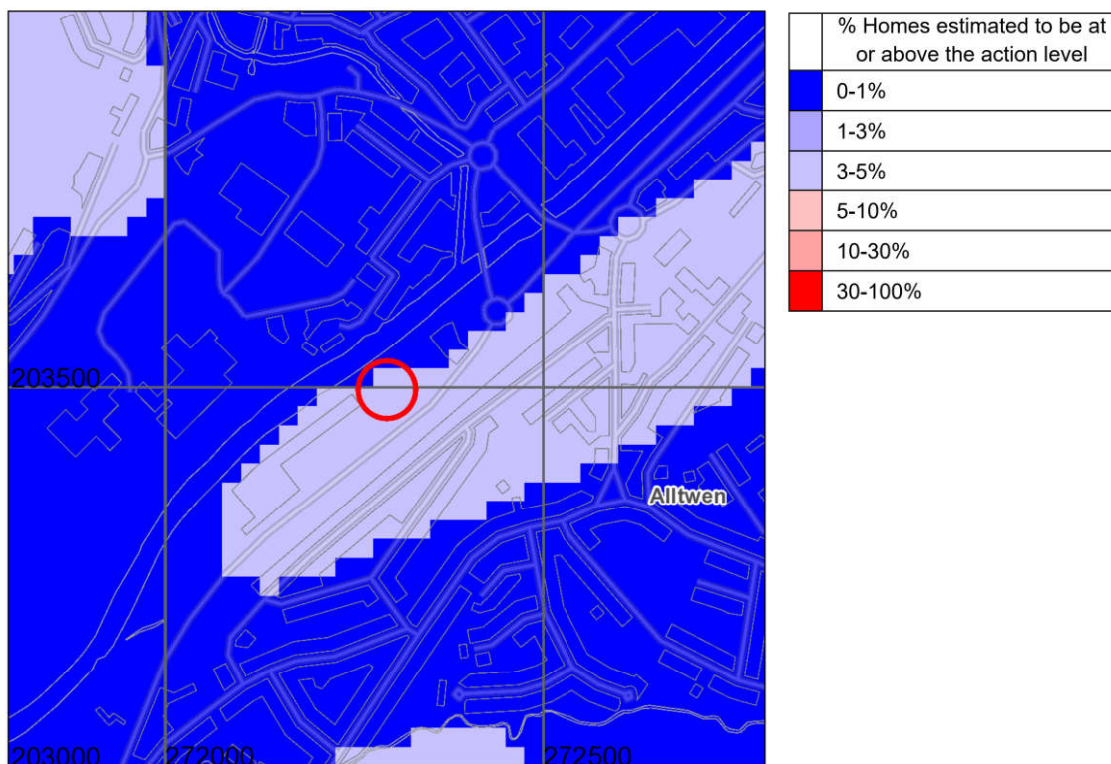
BASIC RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.

More details of the protective measures required are available in *BR211 Radon: Guidance on protective measures for new buildings (2015 Edition)*. Additional information and guidance is available from the Building Research Establishment website (<http://www.bre.co.uk/radon/>).

Whether or not the radon level in a building is above or below the radon Action Level can only be established by having the building tested. The PHE provides a radon testing service which can be accessed at www.ukradon.org or by telephone (01235 822622).

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Radon Affected Area



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Scale: 1:10 000 (1cm = 100 m)

Search area indicated in red

Is the property in a radon Affected Area as defined by Public Health England (PHE) and if so what percentage of homes are estimated to be above the Action Level? **YES**

Additional Information

THE PROPERTY IS IN A RADON AFFECTED AREA WHERE 3 TO 5% OF HOMES ARE ESTIMATED TO BE AT OR ABOVE THE ACTION LEVEL.

PHE recommends a radon 'Action Level' of 200 Becquerels per cubic metre of air (Bq m^{-3}) for the annual average of the radon gas concentration in a home. Where 1% or more of homes are estimated to exceed the Action Level the area should be regarded as a radon Affected Area.

This report informs you whether the property is in a radon Affected Area and the percentage of homes that are estimated to be at or above the radon Action Level at this location. Being in an Affected Area does not necessarily mean there is a radon problem in the property; the only way to find out whether the radon level is above or below the Action Level is to carry out a radon measurement.



PHE advises that radon gas should be measured in all properties within radon Affected Areas and that homes with radon levels above the Action Level (200 Bq m⁻³) should be remediated. Householders with levels between the Target Level (100 Bq m⁻³) and Action Level should seriously consider reducing their radon level, especially if they are at greater risk, such as if they are current or ex smokers. Whether or not a home is in fact above or below the Action Level or Target Level can only be established by having the building tested. PHE provides a validated radon testing service which can be accessed at www.ukradon.org.

The information in this report provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as Law Society CON29 Enquiries of the Local Authority (2016); 3.14 Radon Gas: Do records indicate that the property is in a “Radon Affected Area” as identified by PHE. The data can also be used to advise house buyers and sellers in Scotland and Northern Ireland.

If you are buying a new build property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

If you are buying a currently occupied property in a radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were above the radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and if the results of re-testing confirmed the effectiveness of the measures.

Further information on radon is available from PHE at www.ukradon.org.

What is radon?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters enclosed spaces such as some buildings (particularly basements), caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level exceeds the Action Level, measures should be taken to reduce the concentration.

Radon in workplaces

The Ionising Radiation Regulations, 1999, require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): **Radon in the workplace**. BRE publications may be obtained from the BRE Bookshop, Tel: 01923 664262, email: bookshop@bre.co.uk website: www.brebookshop.com



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- Note that for some sites, the latest available records may be historical in nature, and while every effort is made to place the analysis in a modern geological context, it is possible in some cases that the detailed geology at a site may differ from that described.

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**Report issued by
BGS Enquiry Service**

BGS SuDs Report



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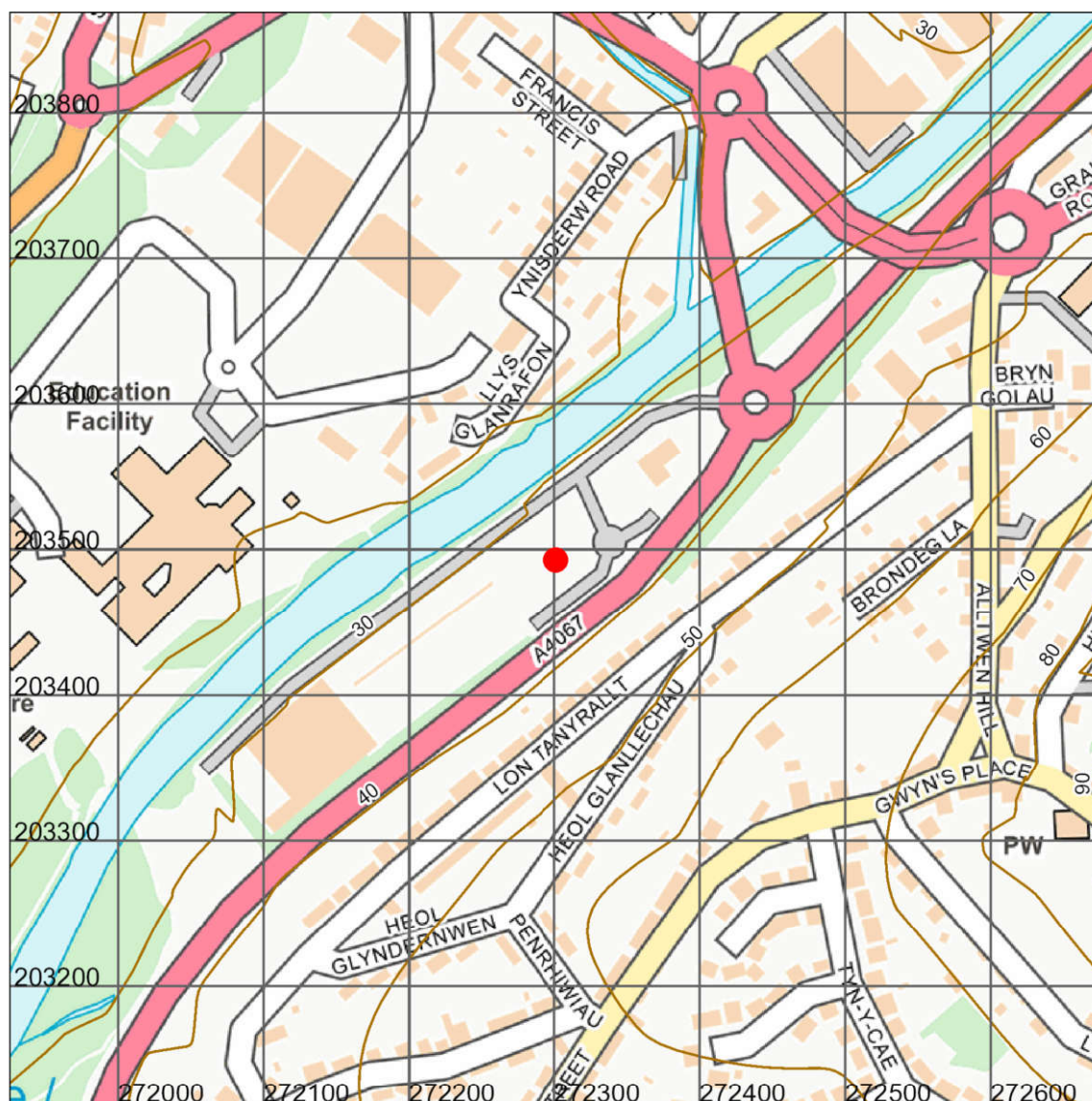
Infiltration SuDS GeoReport:

This report provides information on the suitability of the subsurface for the installation of infiltration sustainable drainage systems (SuDS). It provides information on the properties of the subsurface with respect to significant constraints, drainage, ground stability and groundwater quality protection.

Report Id: *BGS_308501/11262*

Client reference: C-15297-C

Search location



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Search location indicated in red

Point centred at: 272301,203493

Assessment for an infiltration sustainable drainage system

Introduction

Sustainable drainage systems (SuDS) are drainage solutions that manage the volume and quality of surface water close to where it falls as rain. They aim to reduce flow rates to rivers, increase local water storage capacity and reduce the transport of pollutants to the water environment. There are four main types of SuDS, which are often designed to be used in sequence. They comprise:

- **source control:** systems that control the rate of runoff
- **pre-treatment:** systems that remove sediments and pollutants
- **retention:** systems that delay the discharge of water by providing surface storage
- **infiltration:** systems that mimic natural recharge to the ground.

This report focuses on infiltration SuDS. It provides subsurface information on the properties of the ground with respect to drainage, ground stability and groundwater quality protection. It is intended principally for those involved in the preliminary assessment of the suitability of the ground for infiltration SuDS, and those involved in assessing proposals from others for sustainable drainage, but it may also be useful to help house-holders judge whether or not further professional advice should be sought. If in doubt, users should consult a suitably-qualified professional about the results in this report before making any decisions based upon it.

This GeoReport is structured in two parts:

- **Part 1. Summary data.**

Comprises three maps that summarise the data contained within Part 2.

- **Part 2. Detailed data.**

Comprises a further 24 maps in four thematic sections:

- **Very significant constraints.** Maps highlight areas where infiltration may result in adverse impacts due to factors including: ground instability (soluble rocks, non-coal shallow mining and landslide hazards); persistent shallow groundwater, or the presence of made ground, which may represent a ground stability or contamination hazard.
- **Drainage potential.** Maps indicate the drainage potential of the ground, by considering subsurface permeability, depth to groundwater and the presence of floodplain deposits.
- **Ground stability.** Maps indicate the presence of hazards that have the potential to cause ground instability resulting in damage to some buildings and structures, if water is infiltrated to the ground.
- **Groundwater protection.** Maps provide key indicators to help determine whether the groundwater may be susceptible to deterioration in quality as a result of infiltration.



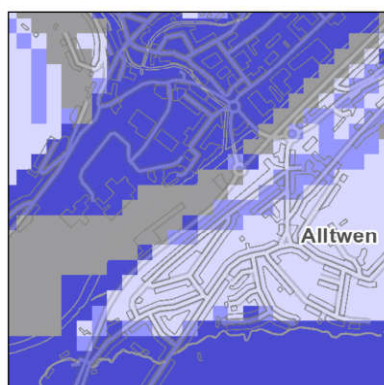
This report considers the suitability of the subsurface for the installation of infiltration SuDS, such as soakaways, infiltration basins or permeable pavements. It provides subsurface data to indicate whether, and which type of infiltration system may be appropriate. It does not state that infiltration SuDS are, or are not, appropriate as this is highly dependent on the design of the individual system. This report therefore describes the subsurface conditions at the site, allowing the reader to determine the suitability of the site for infiltration SuDS.

The map and text data in this report is similar to that provided in the '*Infiltration SuDS Map: Detailed*' national map product. For further information about the data, consult the '*User Guide for the Infiltration SuDS Map: Detailed*', available from <http://nora.nerc.ac.uk/16618/>.

PART 1: SUMMARY DATA

This section provides a summary of the data.

In terms of the drainage potential, is the ground suitable for infiltration SuDS?



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-  Highly compatible for infiltration SuDS.
The subsurface is likely to be suitable for free-draining infiltration SuDS.
-  Probably compatible for infiltration SuDS.
The subsurface is probably suitable although the design may be influenced by the ground conditions.
-  Opportunities for bespoke infiltration SuDS.
The subsurface is potentially suitable although the design will be influenced by the ground conditions.
-  Very significant constraints are indicated.
There is a very significant potential for one or more hazards associated with infiltration.

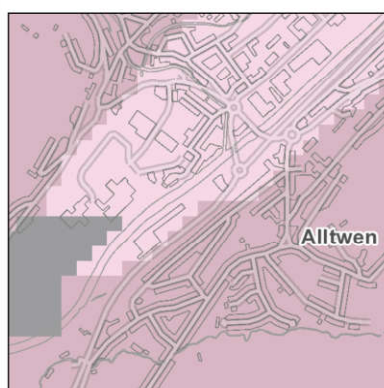
Is ground instability likely to be a problem?



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-  Increased infiltration is very unlikely to result in ground instability.
-  Ground instability problems may be present or anticipated, but increased infiltration is unlikely to result in ground instability.
-  Ground instability problems are probably present.
Increased infiltration may result in ground instability.
-  There is a very significant potential for one or more geohazards associated with infiltration.

Is the groundwater susceptible to deterioration in quality?



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-  The groundwater is not expected to be especially vulnerable to contamination.
-  The groundwater may be vulnerable to contamination.
-  The groundwater is likely to be vulnerable to contaminants.
-  Made ground is present at the surface. Infiltration may increase the possibility of remobilising pollutants.

PART 2: DETAILED DATA

This section provides further information about the properties of the ground and will help assess the suitability of the ground for infiltration SuDS.

Section 1. Very significant constraints

Where maps are overlain by grey polygons, geological or hydrogeological hazards may exist that could be made worse by infiltration. The following hazards are considered:

- soluble rocks
- landslides
- shallow mining
- shallow groundwater
- made ground

For more information read 'Explanation of terms' at the end of this report.

Soluble rock hazard



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☒ Very significant soluble rock hazard.
Soluble rocks are present with a very significant possibility of localised subsidence that could be initiated or made worse by infiltration. The site investigation should consider whether the potential for or the consequences of subsidence as a result of infiltration are significant.

☐ Very significant soluble rock hazards are not present; however this hazard may still need to be considered. See Part 3.

Landslide hazard



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☒ Very significant landslide hazard.
Slope instability problems are almost certainly present and may be active. An increase in moisture content as a result of infiltration may cause the slope to fail. The site investigation should consider whether the potential for or the consequences of landslide as a result of infiltration are significant.

☐ Very significant landslide hazards are not present; however this hazard may still need to be considered. See Part 3.

Shallow mining hazard



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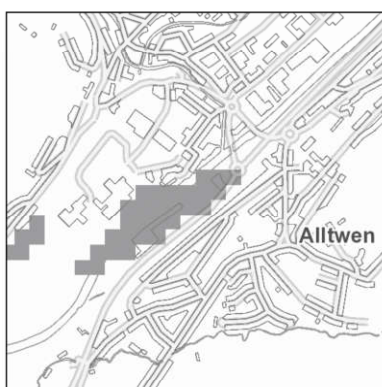
Very significant mining hazard.

Shallow mining is likely to be present with a very significant possibility of localised subsidence that could be initiated or made worse by increased infiltration. Also, infiltration may increase the possibility of remobilising pollutants. The site investigation should consider whether the potential for or consequences of subsidence and/or remobilisation of pollutants as a result of infiltration are significant.



Very significant mining hazards are not present; however this hazard may still need to be considered. See Part 3.

Persistent shallow groundwater



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Very high likelihood of persistent or seasonally shallow groundwater.

Persistent or seasonally shallow groundwater is likely to be present. Infiltration may increase the likelihood of soakaway inundation, or groundwater emergence at the surface. The site investigation should consider whether the potential for or the consequences of groundwater level rise as a result of infiltration are significant.



See Part 2 for the likely depth to water table.

Made ground



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Made ground present.

Made ground is present at the surface. Infiltration may affect ground stability or increase the possibility of remobilising pollutants. The site investigation should consider whether the potential for or consequences of ground instability and/or pollutant leaching as a result of infiltration are significant.



None recorded

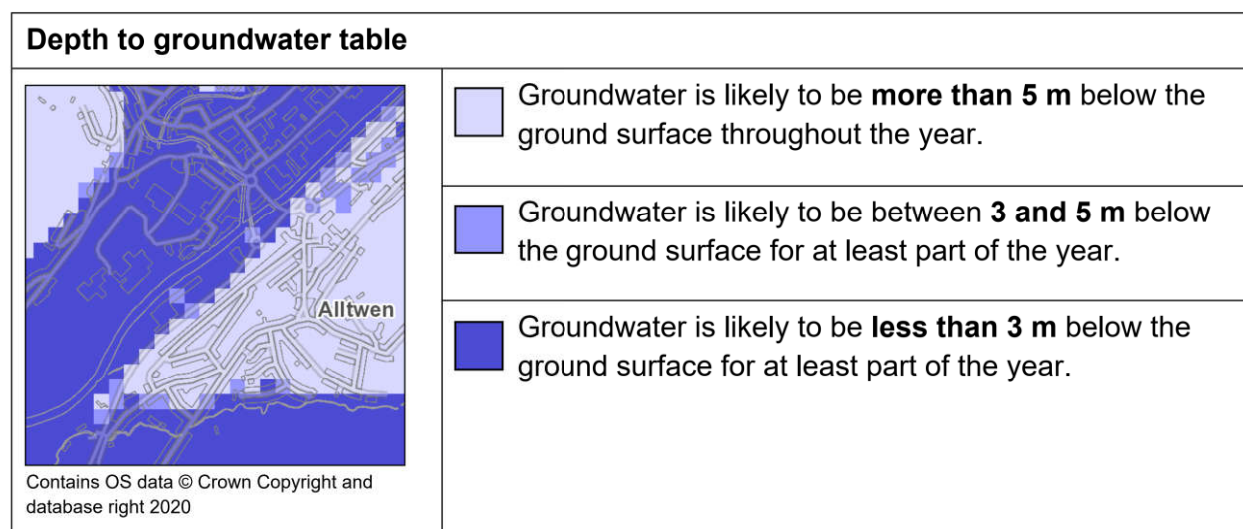
Section 2. Drainage potential

The following pages contain maps that will help you assess the drainage potential of the ground by considering the:

- depth to water table
- permeability of the superficial deposits
- thickness of the superficial deposits
- permeability of the bedrock
- presence of floodplains

Superficial deposits are not present everywhere and therefore some areas of the *superficial deposit permeability* map may not be coloured. Where this is the case, the *bedrock permeability* map shows the likely permeability of the ground. Superficial deposits in some places are very thin and hence in these places you may wish to consider both the permeability of the superficial deposits and the permeability of the bedrock. The *superficial thickness* map will tell you whether the superficial deposits are thin (< 3 m thick) or thick (>3 m). Where they are over 3 m thick, the permeability of the bedrock may not be relevant.

For more information read 'Explanation of terms' at the end of this report.



Superficial deposit permeability



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Superficial deposits are likely to be **free-draining**.



The superficial deposit permeability is **spatially variable**, but likely to permit moderate infiltration.



Superficial deposits are likely to be **poorly draining**.

These maps show the permeability range that is summarised above.

-  Very Low
-  Low
-  Moderate
-  High
-  Very High

Minimum



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Maximum



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Superficial deposit thickness



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The thickness of superficial deposits is **< 3 m** and hence the permeability of the ground may be dependent on both the superficial deposits (where present) and underlying bedrock (see below).



The thickness of superficial deposits is **> 3 m** and hence the permeability of the superficial deposits is likely to determine the permeability of the ground.

Bedrock permeability



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Bedrock deposits are likely to be **free-draining**.



The bedrock permeability is **spatially variable**, but likely to permit moderate infiltration.



Bedrock deposits are likely to be **poorly draining**.

These maps show the permeability range that is summarised above.

Key

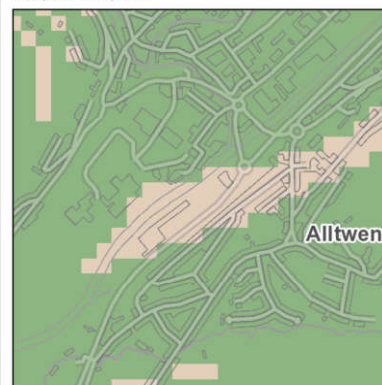
- Very Low
- Low
- Moderate
- High
- Very High

Minimum



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Maximum



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Geological indicators of flooding



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Superficial floodplain deposits or low-lying coastal areas have been identified. Groundwater levels may rise in response to high river or tide levels, potentially causing inundation of subsurface infiltration SuDS.

Section 3. Ground stability

The following pages contain maps that will help you assess whether infiltration may impact the stability of the ground. They consider hazards associated with:

- soluble rocks
- landslides
- shallow mining
- running sands
- swelling clays
- compressible ground, and
- collapsible ground

In the following maps, geohazards that are identified in green are unlikely to prevent infiltration SuDS from being installed, but they should be considered during design. For more information read 'Explanation of terms' at the end of this report.

Soluble rocks	
 Contains OS data © Crown Copyright and database right 2020	 Increased infiltration is unlikely to result in subsidence.
	 Increased infiltration is unlikely to cause localised subsidence, but potential impacts should be considered.
	 Increased infiltration may result in localised subsidence. The potential for or the consequences of subsidence associated with soluble rocks should be considered.
	 Very significant possibility of localised subsidence that could be initiated or made worse by infiltration.

Landslides



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-  Increased infiltration is unlikely to lead to slope instability.
-  Slope instability problems may be present or anticipated, but increased infiltration is unlikely to cause instability
-  Slope instability problems are probably present or have occurred in the past, and increased infiltration may result in slope instability.
-  Slope instability problems are almost certainly present and may be active. An increase in moisture content as a result of infiltration may cause the slope to fail.

Shallow mining



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-  Increased infiltration is unlikely to lead to subsidence.
-  Shallow mining is possibly present. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Shallow mining could be present with a significant possibility that localised subsidence could be initiated or made worse by increased infiltration.
-  Shallow mining is likely to be present, with a very significant possibility that localised subsidence may be initiated or made worse by increased infiltration.

Running sand



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-  Increased infiltration is unlikely to cause ground collapse associated with running sands.
-  Running sand is possibly present. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
-  Significant possibility for running sand problems. Increased infiltration may result in a geohazard.

Swelling clays



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- Increased infiltration is unlikely to cause shrink-swell ground movement.
- Ground is susceptible to shrink-swell ground movement. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
- Ground is susceptible to shrink-swell ground movement. Increased infiltration may result in a geohazard.

Compressible ground



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- Increased infiltration is unlikely to lead to ground compression.
- Compressibility and uneven settlement hazards are probably present. Increased infiltration may result in a geohazard.

Collapsible ground



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- Increased infiltration is unlikely to result in subsidence.
- Deposits with potential to collapse when loaded and saturated are possibly present in places. Increased infiltration is unlikely to cause a geohazard, but potential impacts should be considered.
- Deposits with potential to collapse when loaded and saturated are probably present in places. Increased infiltration may result in a geohazard.

Section 4. Groundwater quality protection

The following pages contain maps showing some of the information required to ensure the protection of groundwater quality. Data presented includes:

- groundwater source protection zones (Environment Agency data)
- predominant flow mechanism
- made ground

For more information read 'Explanation of terms' at the end of this report.

Groundwater source protection zones

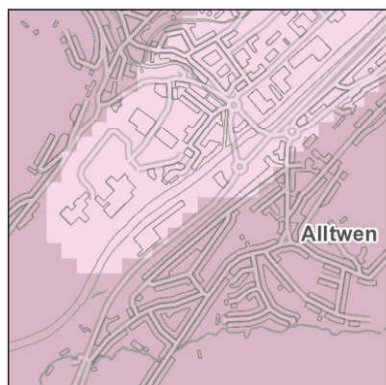


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-  Groundwater is not within a source protection zone.
-  Source protection zone IV
-  Source protection zone III
-  Source protection zone II
-  Source protection zone I

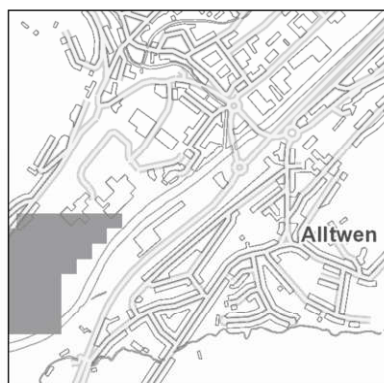
Predominant flow mechanism



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-  Water is likely to percolate through the unsaturated zone to the groundwater through either the pore space in granular media or through porespace and fractures; these processes have some potential for contaminant removal and breakdown.
-  Water is likely to percolate through the unsaturated zone to the groundwater through fractures, a process which has little potential for contaminant removal and breakdown.

Made ground



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 Made ground is present at the surface. Infiltration may increase the possibility of remobilising pollutants.

Section 5. Geological Maps

The following maps show the artificial, superficial and bedrock geology within the area of interest.

Artificial deposits



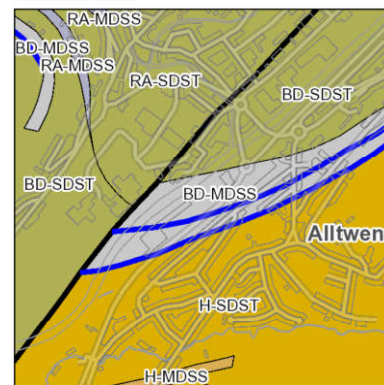
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Superficial deposits



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Bedrock



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Fault

Coal, ironstone or mineral vein

Note: Faults and Coals, ironstone & mineral veins are shown for illustration and to aid interpretation of the map. Not all such features are shown and their absence on the map face does not necessarily mean that none are present

Key to Artificial deposits:

Map colour	Computer Code	Rock name	Rock type
	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

Key to Superficial deposits:

Map colour	Computer Code	Rock name	Rock type
	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
	GFDUD-XSV	GLACIOFLUVIAL DEPOSITS, DEVENSIAN	SAND AND GRAVEL
	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
	ALF-XSV	ALLUVIAL FAN DEPOSITS	SAND AND GRAVEL

Key to Bedrock geology:

Map colour	Computer Code	Rock name	Rock type
	BD-MDSS	BRITHDIR MEMBER	MUDSTONE, SILTSTONE AND SANDSTONE
	BD-SDST	BRITHDIR MEMBER	SANDSTONE
	H-MDSS	HUGHES MEMBER	MUDSTONE, SILTSTONE AND SANDSTONE
	H-SDST	HUGHES MEMBER	SANDSTONE
	RA-MDSS	RHONDDA MEMBER	MUDSTONE, SILTSTONE AND SANDSTONE
	RA-SDST	RHONDDA MEMBER	SANDSTONE

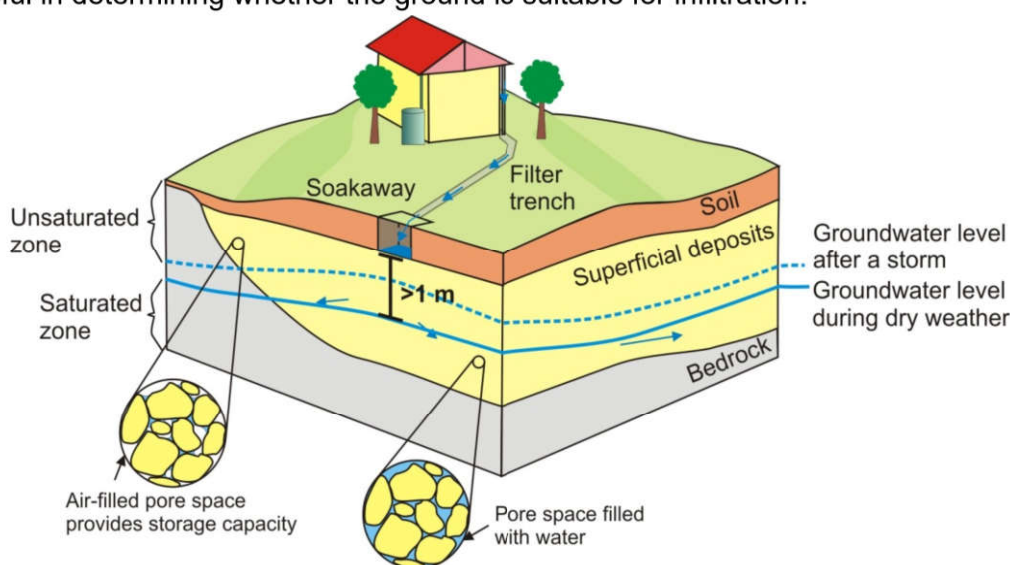
Limitations of this report:

- This report is concerned with the potential for infiltration-to-the-ground to be used as a SuDS technique at the site described. It only considers the subsurface beneath the search area and does NOT consider potential surface or subsurface impacts outside of that area.
- This report is NOT an alternative for an on-site investigation or soakaway test, which might reach a different conclusion.
- This report must NOT be used to justify disposal of foul waste or grey water.
- This report is based on and limited to an interpretation of the records held by the British Geological Survey (BGS) at the time the search is performed. The datasets used (with the exception of that showing depth to water table) are based on 1:50 000 digital geological maps and not site-specific data.
- Other more specific and detailed ground instability information for the site may be held by BGS, and an assessment of this could result in a modified assessment.
- To interpret the maps correctly, the report must be viewed and printed in colour.
- The search does NOT consider the suitability of sites with regard to:
 - previous land use,
 - potential for, or presence of contaminated land
 - presence of perched water tables
 - shallow mining hazards relating to coal mining. Searches of coal mining should be carried out via The Coal Authority Mine Reports Service: www.coalminingreports.co.uk.
 - made ground, where not recorded
 - proximity to landfill sites (searches for landfill sites or contaminated land should be carried out through consultation with local authorities/Environment Agency)
 - zones around private water supply boreholes that are susceptible to groundwater contamination.
- This report is supplied in accordance with the GeoReports Terms & Conditions available separately, and the copyright restrictions described at the end of this report

Explanation of terms

Depth to groundwater

In the shallow subsurface, the ground is commonly unsaturated with respect to water. Air fills the spaces within the soil and the underlying superficial deposits and bedrock. At some depth below the ground surface, there is a level below which these spaces are full of water. This level is known as the groundwater level, and the water below it is termed the groundwater. When water is infiltrated, the groundwater level may rise temporarily. To ensure that there is space in the unsaturated zone to accommodate this, there should be a minimum thickness of 1 m between the base of the infiltration system and the water table. An estimate of the *depth to groundwater* is therefore useful in determining whether the ground is suitable for infiltration.



Groundwater flooding

Groundwater flooding occurs when a rise in groundwater level results in very shallow groundwater or the emergence of groundwater at the surface. If infiltration systems are installed in areas that are susceptible to groundwater flooding, it is possible that the system could become inundated. The susceptibility map seeks to identify areas where the geological conditions and water tables indicate that groundwater level rise could occur under certain circumstances. A high susceptibility to groundwater flooding classification does not mean that groundwater flooding has ever occurred in the past, or will do so in the future as the susceptibility maps do not contain information on how often flooding may occur. The susceptibility maps are designed for planning; identifying areas where groundwater flooding might be an issue that needs to be taken into account.

Geological indicators of flooding

In floodplain deposits, groundwater level can be influenced by the water level in the adjacent river. Groundwater level may increase during periods of fluvial flood and therefore this should be taken into account when designing infiltration systems on such deposits. The *geological indicators of flooding* dataset shows where there is geological evidence (floodplain deposits) that flooding has occurred in the past.

For further information on flood-risk, the likely frequency of its recurrence in relation to any proposed development of the site, and the status of any flood prevention measures in place, you are advised to contact the local office of the Environment Agency (England and Wales) at www.environment-agency.gov.uk/ or the Scottish Environment Protection Agency (Scotland) at www.sepa.org.uk.

Artificial ground

Artificial ground comprises deposits and excavations that have been created or modified by human activity. It includes ground that is worked (quarries and road cuttings), infilled (back-filled quarries), landscaped (surface re-shaping), disturbed (near surface mineral workings) or classified as made ground (embankments and spoil heaps). The composition and properties of artificial ground are often unknown. In particular, the permeability and chemical composition of the artificial ground should be determined to ensure that the ground will drain and that any contaminants present will not be remobilised.

Superficial permeability

Superficial deposits are those geological deposits that were formed during the most recent period of geological time (as old as 2.6 million years before present). They generally comprise relatively thin deposits of gravel, sand, silt and clay and are present beneath the pedological soil in patches or larger spreads over much of Britain. The ease with which water can percolate through these deposits is controlled by their permeability and varies widely depending on their composition. Those deposits comprising clays and silts are less permeable and thus infiltration is likely to be slow, such that water may pool on the surface. In comparison, deposits comprising sands and gravels are more permeable allowing water to percolate freely.

Bedrock permeability

Bedrock forms the main mass of rock forming the Earth. It is present everywhere, commonly beneath superficial deposits. Where the superficial deposits are thin or absent, the ease with which water will percolate into the ground depends on the permeability of the bedrock.

Natural ground instability

Natural ground instability refers to the propensity for upward, lateral or downward movement of the ground that can be caused by a number of natural geological hazards (e.g. ground dissolution/compressible ground). Some movements associated with particular hazards may be gradual and of millimetre or centimetre scale, whilst others may be sudden and of metre or tens of metres scale. Significant natural ground instability has the potential to cause damage to buildings and structures, especially when the drainage characteristics of a site are altered. It should be noted, however, that many buildings, particularly more modern ones, are built to such a standard that they can remain unaffected in areas of significant ground movement.

Shrink-swell

A shrinking and swelling clay changes volume significantly according to how much water it contains. All clay deposits change volume as their water content varies, typically swelling in winter and shrinking in summer, but some do so to a greater extent than others. Contributory circumstances could include drought, leaking service pipes, tree roots drying-out the ground or changes to local drainage patterns, such as the creation of soakaways. Shrinkage may remove support from the foundations of buildings and structures, whereas clay expansion may lead to uplift (heave) or lateral stress on part or all of a structure; any such movements may cause cracking and distortion.

Landslides (slope stability)

A landslide is a relatively rapid outward and downward movement of a mass of ground on a slope, due to the force of gravity. A slope is under stress from gravity but will not move if its strength is greater than this stress. If the balance is altered so that the stress exceeds the strength, then movement will occur. The stability of a slope can be reduced by removing ground at the base of the slope, by placing material on the slope, especially at the top, or by increasing the water content of the materials forming the slope. Increase in subsurface water content beneath a soakaway could increase susceptibility to landslide hazards. The assessment of landslide hazard refers to the stability of the present land surface. It does not encompass a consideration of the stability of excavations.

Soluble rocks (dissolution)

Some rocks are soluble in water and can be progressively removed by the flow of water through the ground. This process tends to create cavities, potentially leading to the collapse of overlying materials and possibly subsidence at the surface. The release of water into the subsurface from infiltration systems may increase the dissolution of rock or destabilise material above or within a cavity. Dissolution cavities may create a pathway for rapid transport of contaminated water to an aquifer or water course.

Compressible ground

Many ground materials contain water-filled pores (the spaces between solid particles). Ground is compressible if a building (or other load) can cause the water in the pore space to be squeezed out, causing the ground to decrease in thickness. If ground is extremely compressible the building may sink. If the ground is not uniformly compressible, different parts of the building may sink by different amounts, possibly causing tilting, cracking or distortion. The compressibility of the ground may alter as a result of changes in subsurface water content caused by the release of water from soakaways.

Collapsible deposits

Collapsible ground comprises certain fine-grained materials with large pore spaces (the spaces between solid particles). It can collapse when it becomes saturated by water and/or a building (or other structure) places too great a load on it. If the material below a building collapses it may cause the building to sink. If the collapsible ground is variable in thickness or distribution, different parts of the building may sink by different amounts, possibly causing tilting, cracking or distortion. The subsurface underlying a soakaway will experience an increase in water content that may affect the stability of the ground. This hazard is most likely to be encountered only in parts of southern England.

Running sand

Running sand conditions occur when loosely-packed sand, saturated with water, flows into an excavation, borehole or other type of void. The pressure of the water filling the spaces between the sand grains reduces the contact between the grains and they are carried along by the flow. This can lead to subsidence of the surrounding ground. Running sand is potentially hazardous during the drainage system installation. During installation, excavation of the ground may create a space into which sand can flow, potentially causing subsidence of surrounding ground.

Shallow mining hazards (non coal)

Current or past underground mining for coal or for other commodities can give rise to cavities at shallow or intermediate depths, which may cause fracturing, general settlement, or the formation of crown-holes in the ground above. Spoil from mineral workings may also present a pollution hazard. The release of water into the subsurface from soakaways may destabilise material above or within a cavity. Cavities arising as a consequence of mining may also create a pathway for rapid transport of contaminated water to an aquifer or watercourse. The mining hazards map is derived from the geological map and considers the potential for subsidence associated with mining on the basis of geology type. Therefore if mining is known to occur within a certain rock, the map will highlight the potential for a hazard within the area covered by that geology.



For more information regarding underground and opencast **coal mining**, the location of mine entries (shafts and adits) and matters relating to subsidence or other ground movement induced by **coal mining** please contact the Coal Authority, Mining Reports, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG; telephone 0845 762 6848 or at www.coal.gov.uk. For more information regarding other types of mining (i.e. non-coal), please contact the British Geological Survey.

Groundwater source protection zones

In England and Wales, the Environment Agency has defined areas around wells, boreholes and springs that are used for the abstraction of public drinking water as source protection zones. In conjunction with Groundwater Protection Policy the zones are used to restrict activities that may impact groundwater quality, thereby preventing pollution of underlying aquifers, such that drinking water quality is upheld. The Environment Agency can provide advice on the location and implications of source protection zones in your area (www.environment-agency.gov.uk/)



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- Note that for some sites, the latest available records may be historical in nature, and while every effort is made to place the analysis in a modern geological context, it is possible in some cases that the detailed geology at a site may differ from that described.

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**Report issued by
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Reports prepared by others

Quantitative Risk Assessment for Contamination
Land adjacent to A4067, Pontardawe
for
ANTHONY HUNT ASSOCIATES

VOLUME I

28 April 2004

Job No.3920

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1.0 INTRODUCTION

Acting on instructions received from Anthony Hunt Associates Ltd, John Grimes Partnership Ltd has undertaken a review of existing ground information, determined the scope of any additional investigation and undertaken an appropriate Quantitative Risk Assessment for contaminants present on the site with respect to the proposed commercial land use and current UK guidance.

In order to assess the degree of contamination on site and to determine relevant soil clean up levels, the site has been subjected to a risk based assessment based on the methodologies described in the following relevant Environment Agency publications:

Assessment of Risks to Human Health from Land Contamination An Overview of the Development of Guideline Values and Related Research, Report CLR7. DEFRA and Environment Agency

Priority Contaminants Report, Report CLR8. DEFRA and Environment Agency

Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans, Report CLR9. DEFRA and Environment Agency

Toxicological Reports for Individual Soil Contaminants, CLR9 TOX 1-10. DEFRA and Environment Agency

The Contaminated Land Exposure Assessment (CLEA) Model: Technical Basis and Algorithms, Report CLR10. DEFRA and Environment Agency

Soil Guideline Values Report for Individual Soil Contaminants, Report CLR10 SGV 1-10. DEFRA and Environment Agency

Natural Attenuation of Petroleum Hydrocarbons and Chlorinated Solvents in Groundwater., Environment Agency Research and Development Technical Report P305.

Land Contamination Risk Assessment Tools, An Evaluation of Some of the Commonly Used Methods, Environment Agency Research and Development Technical Report P260.

Guidance for the Safe Development of Housing on Land Affected by Contamination, Environment Agency R & D Publication 66.

Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resource. Environment Agency R & D Publication 20s.

In addition further information regarding appropriate soil targets was obtained from the Scottish Environmental Protection Agency Publication:

Framework for deriving Numeric Targets to Minimise the Adverse Effects of Exposure to Contaminants in Soil. Report Number LQ01.

2.0 SITE DESCRIPTION

The site is situated to the south-east of the centre of Pontardawe. The location of the site is shown on drawing 01. The national grid reference for the site is SN 722 034. The site is immediately adjacent to the River Tawe which flows from north to south along the western boundary of the site. The A4067 forms the eastern site boundary. The site for proposed redevelopment is rectangular in shape and has an area of approximately 4 hectares.

There are a number of building remnants and hard surfaces on the site, particularly to the northern end of the site

2.1 Proposed Land Use

It is intended to develop the site as a commercial food retail outlet, fast food outlet, recycling centre and petrol filling station. It is intended to provide a food retail building at the southern end of the site with hardsurfaced car parking to the north. A

proposed Fast Food and Petrol Filling Facilities are to be located at the northern portion of the site.

It is intended that the rear of the majority of the site is raised at least 1m above the 1 in 100 year river flood level, with safe egress from the site being provided from the north of the site under these river level conditions. The majority of the development will be hardsurfacing. It is intended to raise the level of ground forming the present flood plain to the south of the proposed development to 1m above the 1 in 100 year river flood level. It will be necessary to cut into the bank along the eastern side of the site by up to 5m.

The use of dynamic compaction and/or vibro replacement columns is being considered to improve foundation conditions beneath the location of the proposed store. The use of cement stabilisation is also being considered to improve formation conditions for the large areas of car parking, hard surfacing and roads on the site.

It is intended to retain all excavated material on site.

2.2 Site History

The site history has been previously established by Oscar Faber "from a review of existing information as well as the Ordnance Survey maps included in the Envirocheck Report" which is included in Appendix 1. Maps have been consulted dating back to 1877 up to the most recent map of the area dated 1989.

The earliest maps show the southern part of the site to be undeveloped with a small stream meandering through it which must have been infilled at some stage as it is not shown on later maps. Previous trial pits by others raised the question of a canal possibly occurring on the site. Reference to the OS maps shows a canal on the other side of the river. It is believed this stream may be the item previously discovered.

Approximately half way up the site a tramway was shown to cross the site from east to west. North of the tramway an "old coal level" is shown as well as a scattering of

buildings which continue northwards where the Pontardawe "Chemical Works" on the site is not shown on any mapping after 1942.

More recent maps show a number of other coal levels as well as buildings, chimneys, a haulage contractor's yard and tanks, again all in the northern part of the site. It is also evident from some of the maps that particularly the southern part of the site was subject to substantial amounts of tipping over the years. By 1989 the site had predominantly become disused and there is very little evidence of any of the old building or works on the site shown on this map.

2.3 Geology

The published 1:50,000 scale solid geology map of the area describes the geological succession as follows:

- Quaternary alluvium
- Pleistocene, glacial Sand and Gravel
- Carboniferous, Upper Pennant Sandstone

2.4 Hydrogeology

The published Environment Agency 1:100,000 scale Groundwater Vulnerability map, Sheet No.35 "West Glamorgan", shows the Glacial Sand and Gravel underlying the site as an Aquifer of minor importance. The infiltration of the soils on the site is shown as high being within an urban built up area as is normal with this type of map. Given the nature of the overlying soil deposits being predominantly a granular fill, it is considered that high infiltration of surface water falling on the site is appropriate.

The site is located immediately adjacent to the River Tawe. This is considered to be the major environmental receptor for potential contaminants from the site. Flow within pore water within granular fill material present on the site is considered to be directed towards the River.

Clayey alluvium strata between the overlying fill material and the underlying glacial sands and gravels will act as an aquitard for vertical downward migration of contaminants. This will further direct water flow within the fill towards the river.

The underlying gravel and sands will contribute as a source of base flow to the river.

There is also a mine water discharge which egresses onto the site from a conduited coal mine adit on the site. This discharge flows across part of the site for a distance of approximately 50m before discharging into the River Tawe. The channel of the discharge is coated in iron oxide precipitated from the mine water. The chemical composition and quality of the mine water discharge is discussed in this report. It is intended to divert the existing open channel, which currently runs parallel to the main river for some distance more directly to the river and to construct a headwall at the proposed stream discharge.

3.0 SITE INVESTIGATION

3.1 Previous Site Investigation

The site was subject to previous site investigation by Oscar Faber in 2000/2001. This investigation comprised 26no. trial pits, 12no. shell and auger boreholes and 10no. rotary openhole boreholes. The investigation was targeted to assess the nature and composition of the near surface materials in terms of geotechnical and contamination status and to establish the presence or otherwise of coal seams impacting development on the site.

The ground investigation found the glacial deposits to be of much greater thicknesses than originally anticipated with thicknesses in excess of 17.1 m. As a result of this it was concluded that the outcrop of the coal seams within the underlying bedrock would occur to the east of the site and would not impact onto the site.

The majority of the made ground deposits encountered on the site comprised colliery waste material made up of brown, silty, sandy, angular fine to coarse sandstone and burnt siltstone with some ash, coal, clinker and brick.

The conclusions of the previous site investigation by Oscar Faber in respect of contamination were that the site contained elevated levels of Arsenic, Copper, Nickel, Zinc, Lead, Mercury, Selenium and total Phenol.

3.2 Current Site Investigation

The current investigation was intended to complement the findings of the previous investigation in respect of contamination present on the site. The aims of the investigation were to:

- extend the sampling and analysis of soils around areas of previously identified elevated levels of contaminants .
- to assess the bioavailability of the lead on the site and to identify the species of mercury present.
- to assess the species of mercury present in the soil and to confirm whether organo-mercury compounds were present.
- to undertake further quantitative risk assessment on the site for identified contaminants using the Environment Agency source-pathway-receptor paradigm and the CLEA methodology.
- to undertake further sampling of groundwater flowing from the site and contributing to the quality of the River Tawe.
- to assess the leachability of the contaminants in the fill materials on the site and to assess whether this property changes with compaction.
- to assess the quality of the mine water discharge and assess whether the mine water discharge would significantly affect the quality of the River Tawe.

4.0 INITIAL CONCEPTUAL MODEL.

Following the review of the findings of Oscar Faber, an initial conceptual model was developed for the site. This was developed for contaminants on the site in terms of the Source-Pathway-Receptor paradigm adopted by the Environment Agency.

Source

It is considered that the majority of the contaminants present on the site in fill material deposited over the top of natural alluvium and gravels. These materials consist mainly of colliery waste and, more locally, layers of purpley, burnt siltstone. The site has been used in the past as a part of the Pontardawe "Chemical Works", which carried out a range of metal working. The elevated levels of a number of metals are consistent with this past use of the site and the nature of the fill material. Small amounts of organic contamination on the site are consistent with a past industrial use.

A further source of environmental contamination is the mine water discharge issuing to the River Tawe.

Pathways

In respect of the guidance given in CLR 10, the pathways of concern relate to the human receptor, (Table 3.4). It is considered that the oral Index Dose or Tolerable Daily Soil Intake depending on whether the contaminant is carcinogenic or non-carcinogenic respectively are the relevant Health Criteria value for the standard commercial land use where CLR 10 (Table 3.4) only consider oral exposure pathways to contribute significantly to overall exposure. The exposure pathways that are considered are:

- Ingestion of soil and dust.

With regard to the environment, the exposure pathway is through leaching of the contamination from the fill either directly to the river or via the underlying alluvium and gravels.

There is also the direct pathway formed by the existing stream conduit between the mine discharge and the river Tawe.

Receptors

It is considered that there are two receptors present on the site which need assessment. These are

- The end user of the site as the significant human receptor
- The River Tawe is a significant environmental receptor

In respect of the guidance given in CLR 10 for the proposed industrial/commercial use of the site, the human receptor of concern is taken as a female employee working on the site (i.e. between the ages of 16 to 57 years.)

A conceptual ground model for contamination is presented in drawing 02.

5.0 CHEMICAL ANALYSIS OF SOILS FOR TOTAL, BIOACCESSIBLE, SPECIATION AND LEACHABLE CONTAMINANTS

5.1 Methodology

5.1.1 Total Analysis

Samples of soils collected from site were sent for Total Analysis by Robertson Laboratories.

All samples on receipt were dried at 40°C, broken down, sieved (2mm – 10#), riffled and hand ground. Loss on drying and amount discarded is recorded to enable analytical results to be calculated on an original weight basis where required.

Arsenic analysis is then carried out by Nitric/Hydrochloric digestion/ICP using ELISA/53 method for which Robertson Laboratories hold current UKAS accreditation.

5.1.2 PBET Testing

PBET tests were carried out on 12no. samples obtained across the site and representing the range of fill materials encountered. PBET tests were undertaken for both lead and arsenic.

This method of bioaccessibility assessment was carried out by the British Geological Survey Laboratories Ltd (BGS) on samples provided to them by Chemex Ltd and comprising representative subsamples of soils tested by Chemex for total metals. Total analysis was also carried out on these subsamples as described above. The test is known as the Physiological Based Extraction Technique (PBET) Assessment published by Ruby, et. al. (1996). The BGS undertakes the test as described by Ruby (op. cit.) with slight modification. However we have found the results provided by the unmodified method and modified method to give similar results for a range of soils.

The test involves taking a sample of the soil and subjecting it to an extraction solution designed to simulate the conditions in the human gut. This method is currently the most established and calibrated procedure for bioavailability assessment of lead and arsenic.

The method involves incubating a sample of soil in an extraction medium at 40°C, for one hour at a pH of 2.5. The mixture is constantly agitated by bubbling argon through the mixture. Samples of extract are taken at 20 min., 40 min. and 60 min. intervals. After an hour the pH of the extraction medium is adjusted to pH 7 and porcine bile and pancreas extracts added to simulate migration of soil through the small intestine. Samples of extract are taken at 1 hour and 3 hours after pH adjustment.

5.1.3 Mercury Speciation

Organo-metallic mercury was determined by Chemex Ltd by performing a volatiles analysis for methyl mercury species and calculating the inorganic mercury by subtracting the organic amount from the total.

5.1.4 Leachability Tests

Leachability tests were carried out on samples of contaminated fill using the L/S 10 l/kg batch leaching test procedure as described in BS EN 12457-3.

Tests were carried out on representative samples both in their natural condition and in a compacted state. Compaction was achieved using a standard Proctor mould and 2.5 kg Proctor hammer to simulate the effect of the possible compaction of the material on site by the use of either dynamic compaction or stone columns for ground improvement.

5.2 Results

5.2.1 Bivariate Analysis of Total Analyses

Results of total chemical analyses for the all samples of soils are given in Appendix 1. The results were subjected to two types of statistical analyses.

In the first analysis levels of each of the contaminant were compared against each other. This type of bivariate analysis can be useful as it can indicate whether the soils analysed are representative of a single source, or whether various sources are present. Inspection of the correlation between Cadmium vs Lead, Lead vs Copper, Zinc vs Cadmium and Copper vs Zinc show clear positive linear relationships indicative of two different soil sources for the majority of the sample results. This finding is consistent with the conclusions of site investigation that there are two main types of fill present on the site consisting of colliery waste and burnt sandstone. The relationships are not very strongly correlated, reflecting the anthropogenic nature of

the sources. Variability of the fill may also account for the presence of the number of data points away from the observed trends.

The results of the bivariate plots for the above four pairs of elements are shown in Appendix 3.

The second statistical analysis which was applied to the total soil analysis data were the mean value and maximum value tests as described in volume CLR7 of CLR – *Assessment of Risks to Human Health from Land Contamination: An Overview of the Development of Soil Guidance Values and Related Research*. These tests indicate the level of the 95% percentile of the soil contaminant for the set of data against which the SGV for the particular contaminant should be assessed as well as a statistical test to indicate whether all of the data set is ascribable to a single normal distribution.

The results of the mean and maximum value tests for arsenic, cadmium, lead or nickel are given in Appendix 6. The results can be summarised below:

Contaminant	Upper 95% percentile soil contaminant level. (mg/kg)	Does Max. value test indicate all data set normally distributed?
Arsenic	181	No
Lead	695	No

Table 01 : Summary of Mean Value and Maximum Value Tests (CLEA 2002)

The above table would indicate that whilst a maximum level of arsenic of 5510 mg/kg was determined for the soils on the site that the mean of the arsenic values for the data within a confidence of 95% was 181 mg/kg. The maximum lead level on the site was 12200 mg/kg.

Given the proposed commercial/industrial use of the site, the relevant soil guideline values for arsenic and lead is 500 mg/kg and 750 mg/kg.

5.2.2 PBET Testing

PBET tests were carried out for both lead and arsenic. Results are shown in Appendix 4. Results are expressed as both a concentration of bioaccessible arsenic and as a percentage of the total aqua regia extractable arsenic. This percentage is known as the relative bioaccessibility (RBA) for the contaminant.

Due to the inaccuracy in the test it is generally recommended that the maximum concentration of bioaccessible whether in the stomach or intestinal phase is used to calculate the RBA.

The results indicate that the maximum RBA As was 21.3% and the maximum RBA Pb was 39.4 %. It is considered that these values should be used in the assessment of bioaccessible arsenic and lead for the fill materials encountered on the site.

5.2.3 Mercury Speciation

Organo-metallic mercury was determined by Chemex Ltd by performing a volatiles analysis for methyl mercury species and calculating the inorganic mercury by subtracting the organic amount from the total. The results indicate that there was less than 0.1 mg/kg volatile mercury present in the soils tested.

5.2.4 Leachability Results

21no. L/S 10 l/kg batch leachate tests were carried out on the site for the range of fill materials encountered. Samples taken from the area of the proposed new store where it is possibly intended to compact the fill material were tested both uncompacted and compacted. The results are shown in Appendix 05. Results are generally below detection limit for the laboratory which in the majority of analyses is below the Environmental Quality Standard for the contaminant. In the case of Copper and Zinc the level of leachable contaminant is slightly raised above the EQS for the softest water. However the leachable levels of neither of these contaminants is above the EQS for moderately hard waters.

There is little significant difference between the results for the uncompacted or compacted samples in terms of additional leachability of contaminants.

Results are given as both mg/l concentration of leachate and as equivalent mg/kg leachable contaminant present within the contaminated fill materials. It is considered that the concentrations expressed as mg/l are most appropriate for assessment as variations observed between compacted and uncompacted samples are not affected by compaction. The compacting of the samples will cause changes in density of the samples and this change will cause variations in calculated leachability when expressed as mg/kg. Therefore when comparing changes in leachability results of leachate concentration have been compared.

It is considered that the concentration of leachate within the test conditions would represent significantly higher concentration of leachate than would be present in the ground under natural conditions, given the relatively high permeability and flow through of groundwater within the site.

5.2.5 Mine Water Quality

Results of analyses of the mine water discharging from the site are given in Appendix 7.

6.0 ASSESSMENT OF TOTAL SOIL LEVELS AGAINST CURRENT GUIDANCE

6.1 Long-Term Human Health

6.1.1 Calculation of Site Specific Assessment Criterion (SSAC) for Arsenic

SSAC have been determined using the SNIFFER (2003) methodology for the commercial/industrial land use scenario. For the determination the critical receptor of a 16-57 old female adult has been used. Default soil ingestion rates as given by SNIFFER (2003) have been used for relevant standard land use scenario.

6.1.1.1 Derivation of Relevant Oral Index Dose

CLR 9 TOX 1 indicates that an oral index dose of 0.0003 mg/kgbw/day for inorganic arsenic should be adopted, assuming that inorganic arsenic is a carcinogen. This value is used in all subsequent SNIFFER worksheets for the derivation of SSAC values.

6.1.1.2 SSAC Based on Commercial / Industrial Land Use Scenario - Site Specific Bioaccessibility

SNIFFER worksheet (run 1) are given in Appendix 8 deriving an SSAC based on a bioaccessibility of 21% and including default soil ingestion rates. Using these parameters and toxicity discussed in Section 6.1.1.1, an SSAC of 1100 mg/kg has been calculated.

Where levels of arsenic are over this level on significant areas of the site it should be considered that such material should be covered or laid beneath hard surfacing. Areas so affected are shown on drawing 03. Areas shown on this drawing refer to existing surface concentrations. Concentrations of arsenic at reduced level dig should be determined when site contours are finally established and where material is above SSAC this should be capped beneath hard surfacing.

6.1.2 Calculation of Site Specific Assessment Criterion (SSAC) for Lead

In the commercial land use scenario the CLEA model uses the USEPA IEUBK model for lead uptake into adults. CLEA does not use this model for children. However in the IEUBK model the expected bioavailability of lead in soil is set at 0.6. The measured level of bioavailability of lead on site varied between 0.08 and 0.18 and therefore the site specific bioavailability was less than 1/3rd of the default bioavailability. Kelley et. al. (2002) indicate the direct equivalence of assessed bioavailability to the IEUBK soil availability factor

The commercial land use scenario of the CLEA model uses the USEPA Integrated Exposure Uptake BioKinetic IEUBK (USEPA, 1996) model for lead uptake into adults. CLEA does not use this model for children. However in the IEUBK model

the expected bioavailability of lead in soil is set at 0.6. The measured level of bioavailability of lead on site varied between 0.0062 and 0.39 and therefore the site specific bioavailability of 1/2 of the default bioavailability is considered appropriate. Kelley et. al. (2002) indicate the direct equivalence of assessed bioavailability to the IEUBK soil availability factor.

The critical receptor in the commercial land use scenario is a female employee between the age of 16 to 57. Therefore the IEUBK model is considered most appropriate.

Generally CLEA assesses the proportion of risk from each individual pathway (i.e. direct ingestion, plant consumption etc.) in terms of a percentage. Therefore it is possible to determine the allowable revised soil concentrations for each pathway using the following formula:

$$\text{Level 1 SGV} = \text{PR}_1.\text{SSAC}.\text{SAM}_1 + \text{PR}_2.\text{SSAC}.\text{SAM}_2 + \dots\dots\dots$$

where Level 1 SGV is the published Soil Guideline Value,

PR_1 and PR_2 are the percentage contribution from each pathway.

SSAC is the Site Specific Acceptance Criterion.

SAM_1 and SAM_2 are pathway specific soil availability multiplier.

Where there is more than one pathway, the importance of each pathway will change as the pathway specific soil availability multiplier for other pathways reduces their importance. However, for the commercial/industrial land use in the CLEA methodology 100% intake of lead is considered to be due to direct ingestion of soil and soil derived dust. Therefore there is only one pathway of importance and the above equation can be reduced to the following:

$$\text{Level 1 SGV} = \text{PR}_1.\text{SSAC}.\text{SAM}_1$$

The SGV for lead in the relevant land use is 750 mg/kg. The SAM_1 is shown above to be taken as 0.5. Therefore the SSAC for the site can be calculated as equal to 1500 mg/kg.

Where levels of lead are over this level on significant areas of the site it should be considered that such material should be covered or laid beneath hard surfacing. Areas so affected are shown on drawing 04. Areas shown on this drawing refer to existing surface concentrations. Concentrations of lead at reduced level dig should be determined when site contours are finally established and where material is above SSAC this should be capped beneath hard surfacing.

6.1.3 Mercury Under Buildings

The Soil Guideline Value for mercury in the residential with garden land use is 8 mg/kg. This level is for inorganic mercury and excludes both inhalation of mercury vapour and the absorption of mercury compounds through the skin. The level is calculated due to direct ingestion of soil and dust and by consumption of site-grown vegetables. The only applicable route for mercury contamination under the buildings is through volatisation and vapour ingress. There is at present no Guideline value for organic mercury which accounts for this. Therefore it is necessary to use a methodology which will enable the vapour ingress to be determined. SNIFFER (2000) is an appropriate methodology.

SNIFFER (2000) approximates the indoor inhalation of vapour using two physical constants, the Organic Carbon-Water Partition Coefficient and the Henrys Law Constant. Values of these two physical constants for organo-mercury compounds were obtained from the PHYSPROP database maintained by Syracuse Research Corporation. Henrys Law Constants were converted to the appropriate dimensionless term using an online converter maintained by the US EPA.

Acceptable Soil Reference Target Concentrations were calculated on the SNIFFER methodology worksheet given in Appendix 8.

Relevant toxicological data was obtained using the TDI_{inh} for mercury of 0.018 mg/day for a 60 kg adult and a mean adult dietary intake for non inorganic mercury of 0.001 mg/day. As the target receptor is a female adult it is more likely that they would be exposed to mercury from amalgam fillings. TOX 7 (DEFRA & EA, 2002) indicate that the mean intake of mercury through amalgam fillings is of the order of 0.01 mg/day. The RTC was calculated assuming that all of the exposure from soil mercury on the site came from the vapour pathway. This assumption is made on the basis that direct ingestion of mercury on the site has such a large relative SGV in relation to the total soil concentration that the importance of this pathway is negligible. In the calculation of RTC the highly conservative assumption has been made that all the mercury in the soil is volatile.

In the SNIFFER worksheet the use of a non standard Dilution Ratio between soil air and indoor air of 100,000 is used. This is considered appropriate as the default SNIFFER DR of 20,000 is based on timber floors taken from Swedish Environment Agency Guidelines, and that recent CLEA guidelines would indicate a ratio of vapour transfer across timber to concrete floors of at least 5.

The minimum RTC calculated value of 0.9 mg/kg is greater than the detection limit for organic mercury for fill material on the site. Therefore it is considered that there is a low risk to long-term human health from mercury vapour ingress into residential building built on top of the existing fill material.

The toxic end points for organo-metallic and inorganic mercury are different. Organo-metallic compounds tend to target the brain whilst the kidneys retain inorganic mercury and are the target for this type of mercury. It is therefore considered appropriate to assess the acceptable levels of inorganic and organic mercury separately.

The results indicate that there was no volatile mercury present in the soils tested and therefore it would be appropriate to consider all of the mercury as inorganic.

Therefore it is considered appropriate to adopt the CLEA SGV for mercury for the commercial land use scenario for the level of mercury on the site. The SGV is

480 mg/kg, well above the level of mercury found in any of the soil samples analysed from the site. It is considered that soil mercury does not pose a long-term human health risk on the site for the proposed land use.

6.1.4 Hydrocarbons Under Buildings

No currently published UK guideline is available for soil TPH levels appropriate to the relevant inhalation pathway. An appropriate soil screening level is taken from Total Petroleum Hydrocarbon Criteria Working Group Series, Volume 5 – Human Health Risk – Based Evaluation of Petroleum Release Sites: Implementing the Working Group Approach. (TPHCWG 5) This approach splits the total hydrocarbon into a number of separate fractions, assigns a fraction specific Risk Based Screening Level to each of these fractions which are then aggregated relative to the proportion of each fraction in the total hydrocarbon to give a RBSL for the mixture. The fraction specific RBSLs are pathway specific. The relevant RBSLs for the soil to indoor vapour pathway are:

Fraction	Fraction specific RBSL
>5-6 Aliphatic	44
>6-8 Aliphatic	100
>8-10 Aliphatic	25
>10-12 Aliphatic	130
>12-16 Aliphatic	580
>16-21 Aliphatic	no RfC
>5-7 Aromatic	0.25
>7-8 Aromatic	25
>8-10 Aromatic	40
>10-12 Aromatic	220
>12-16 Aromatic	1100
>16-21 Aromatic	no RfC
>21-35 Aromatic	no RfC

It is evident from the fraction RBSLs that the >5-7 aromatic fraction is far more toxic than any of the other fractions. The >5-7 aromatic fraction contains the common aromatic compounds, benzene, toluene, ethylbenzene and xylene (BTEX). These compounds are absent in the VOC analysis. Therefore the RBSL of the total hydrocarbon will be significantly less than for hydrocarbon mixtures containing BTEX compounds. TPHCWG 5 gives a SSL of 300 mg/kg for typical hydrocarbon

mixtures containing BTEX and it is considered that in the absence of these compounds that an appropriate SSL for the soil to indoor air inhalation pathway would be greater than 500 mg/kg. The use of such a surrogate mixture of hydrocarbons was necessitated due to the low levels of total hydrocarbons found.

The calculated SSL value of 500 mg/kg is greater than the maximum concentration of mg/kg for material sampled from beneath the proposed buildings on the site. Therefore it is considered that there is a low risk to long-term human health from petroleum vapour ingress into residential building built on top of the existing on site materials.

6.2. Environment

6.2.1 River Tawe

The results of groundwater analyses carried out from trial pits dug along the banks of the River Tawe would indicate there is very little contamination discharging from the site into the river. These results would tend to support the conclusions of the leachability testing carried out that the contaminants are of low mobility and that the average level of contamination across the site was not particularly elevated.

6.2.2 Chemical Analyses of Mine Water

Samples were collected from the adit discharge egressing from the north-eastern portion of the site. Samples were collected from the portal of the adit, along the conduit and at the outfall.

Water chemistry is plotted as Piper diagrams and on a Fe-SO₄-HCO₃ ternary diagram (drawings 05 and 06). The second type of diagram can be very useful in assessing and monitoring mine water treatment requirements and processes operating in either engineered or natural passive treatment of acid mine drainage as it indicates changes in three of the most important improvement requirement, i.e. increase in alkalinity, reduction in SO₄ and reduction in Fe.

Changes in SO_4 and Fe are commonly associated with the behaviour of bacteria including the common bacteria *Thiobacillus ferrooxidans*. *Thiobacillus ferrooxidans* has been linked with the co-precipitation of iron and arsenic in wetland areas and it is considered probable that reductions in the levels of heavy metals and iron are linked. Arsenic removal in such natural systems may be as high as 80%.

Eh – pH relationships for the waters sampled are shown on drawing 07. This drawing also showing the positions of each water sample with respect to the environmental limits for different *Thiobacilli* bacteria and also the equilibrium stability limits for Fe(II)/Fe(III).

All of the Eh – pH results plot within the overlap of environmental limits for reducing and oxidising bacteria. Whilst no opportunity has been possible to monitor changes with time elsewhere, where such bacteria are active under similar conditions monitoring over a period of time has indicated the cycling of Sulphur between reduced and oxidised forms with time as either oxidising or reducing bacteria dominate.

All water samples plot on the Ferric side of the Iron Equilibrium Stability Limit, indicating that $\text{Fe}(\text{OH})_3$ is the dominant iron species and that this is likely to remain a stable chemical sink for co-precipitated heavy metals.

6.2.2.1 Dissolved Elements

The quality of the mine water was good and it is considered that the impact of the mine water discharge on the quality of the River Tawe water will be insignificant. There is evidence of ferric iron precipitate along the length of the existing stream bed. However it is not known how long this deposit has been present or has taken to accumulate. The possibility of cyclic variation in water parameters is discussed above. The pH of the water at the time of measurement was near neutral. The use of limestone filter material and an aeration cascade within any stream training works could be considered advantageous to ameliorate any adverse changes in water quality with time. These measures, although they would act as effective initial measures to

ameliorate water quality, may need to be reviewed if long-term changes in water quality were to occur.

6.3 Compaction of Material on Site

Results for compacted and uncompacted samples of soil are compared graphically in Appendix 5. The results indicate that there is little change in concentration between the levels of leachate from samples tested before and after compaction and that levels of leachate concentration are all below relevant EQSs.

It is therefore considered that compaction of material on parts of the site will not significantly affect the mobilisation of contaminants within the site or affect the quality of shallow groundwater discharging to the river.

7.0 RISK CHARACTERISATION

An initial site conceptual model for the site identified a number of long-term human health and environmental concerns with respect to the proposed commercial development of the site.

Potential risks to future employees included:

- migration of arsenic and lead contaminated soils from landscaping areas, across the site and into buildings.
- migration of volatile mercury contaminants in soils as indoor and outdoor vapours.

These risks have been addressed in the report by:

- assessing the bioaccessibility of lead and arsenic on the site and using this level to calculate site specific assessment criteria for these two contaminants.

- measuring the volatile mercury present on the site and providing an SSAC for volatile mercury within the SNIFFER methodology to assess appropriate detection limits for volatile mercury.

Potential risks to the environment included:

- mobile contamination migrating from the site to the River Tawe.
- discharge from the mine adit affecting the quality of the River Tawe.
- effect of dissolved hydrocarbons present in groundwater at one location along the bank of the River Tawe affecting the quality of the Tawe.
- potential mobilisation of contaminants by engineering groundworks on the site e.g. vibrocompaction.

These risks have been addressed in the report by:

- sampling and analysis of groundwater close to the River Tawe along the whole length of river bank adjacent to the development and comparison of results against relevant EQSs.
- sampling and analysis of the mine discharge, interpretation of the mine water chemistry and comparison of the results against relevant EQSs. In addition it is recommended that a basic limestone treatment bed and aeration cascade is incorporated as part of the diverting works.
- assessing the toxicity of the hydrocarbon present on the site using the TPHCWG methodology given that dissolved levels of BTEX compounds are below detection. The level of dissolved hydrocarbon found on the site have then been compared with the assessed toxicity.

- leachability tests have been undertaken for both uncompacted and compacted samples of soils. Both sets of results have been compared with relevant EQSs.

In addition to these long-term concerns there are a number of issues regarding the construction phase of the development which should be addressed to ensure that risks during this phase of the development are also satisfactorily addressed. These construction risks include:

- risk of dust migration to construction workers and the wider environment.
- risk of physical contamination of the river by accidental discharge of soil or surface water into the river.

These risks should be addressed satisfactorily by the following actions.

- provision of separate decontamination and clean welfare facilities for site workers.
- provision of adequate site induction for all workers in respect of contamination issues.
- provision of appropriate PPE in the form of overalls and gloves.
- provision of appropriate risk assessments and method statements from the Contractor to identify measures to deal with the above concerns.
- provision of dust suppression and surface water containment measures such as bunding adjacent to the river.

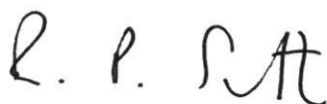
It is considered that dust inhalation on site can be adequately controlled by normal suppression measures. Research by the BRE into generation of PM_{2.5} and PM₁₀ levels from typical construction sites would indicate that risks to human health from the concentrations of lead, mercury or arsenic on the site are low.

8.0 CONCLUSIONS

The results of the further site investigation and soil tests carried out on the site have indicated that the environmental and human health risks associated with the site are generally low due to the low mobility of the contaminants, arsenic and lead and that the average level of contamination across the site was not particularly elevated.

The human health risk of significant hotspots in near surface arsenic and lead concentrations should be satisfactorily mitigated by covering areas of concern with hard cover. Volatile Mercury levels related to indoor vapour transport are not considered significant.

Other environments risks associated with the development of the site are addressed within the risk characterisation.



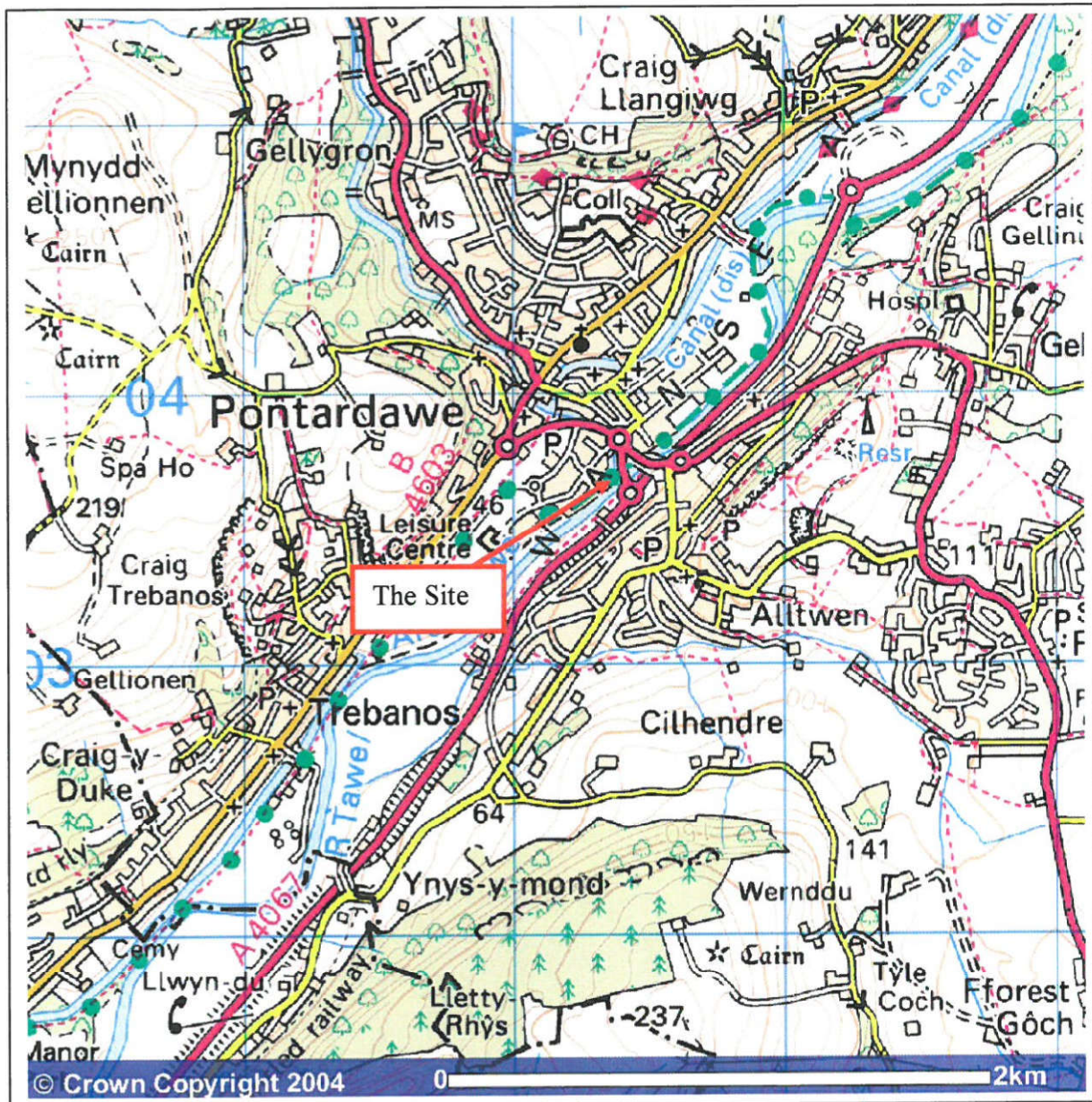
R P Smith

on behalf of John Grimes Partnership Ltd

28 April 2004

FIGURES

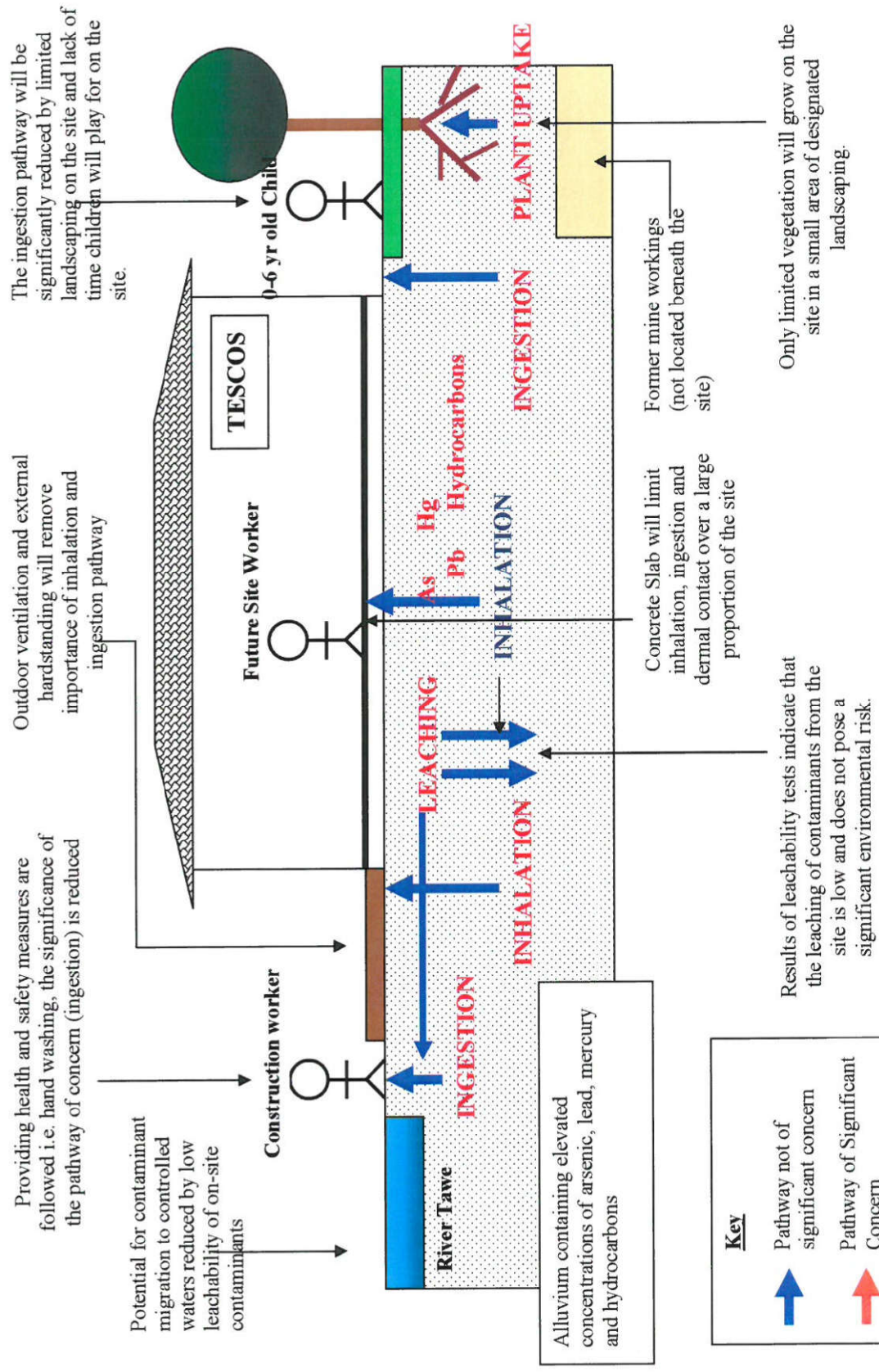
Figure 01: Location Plan.

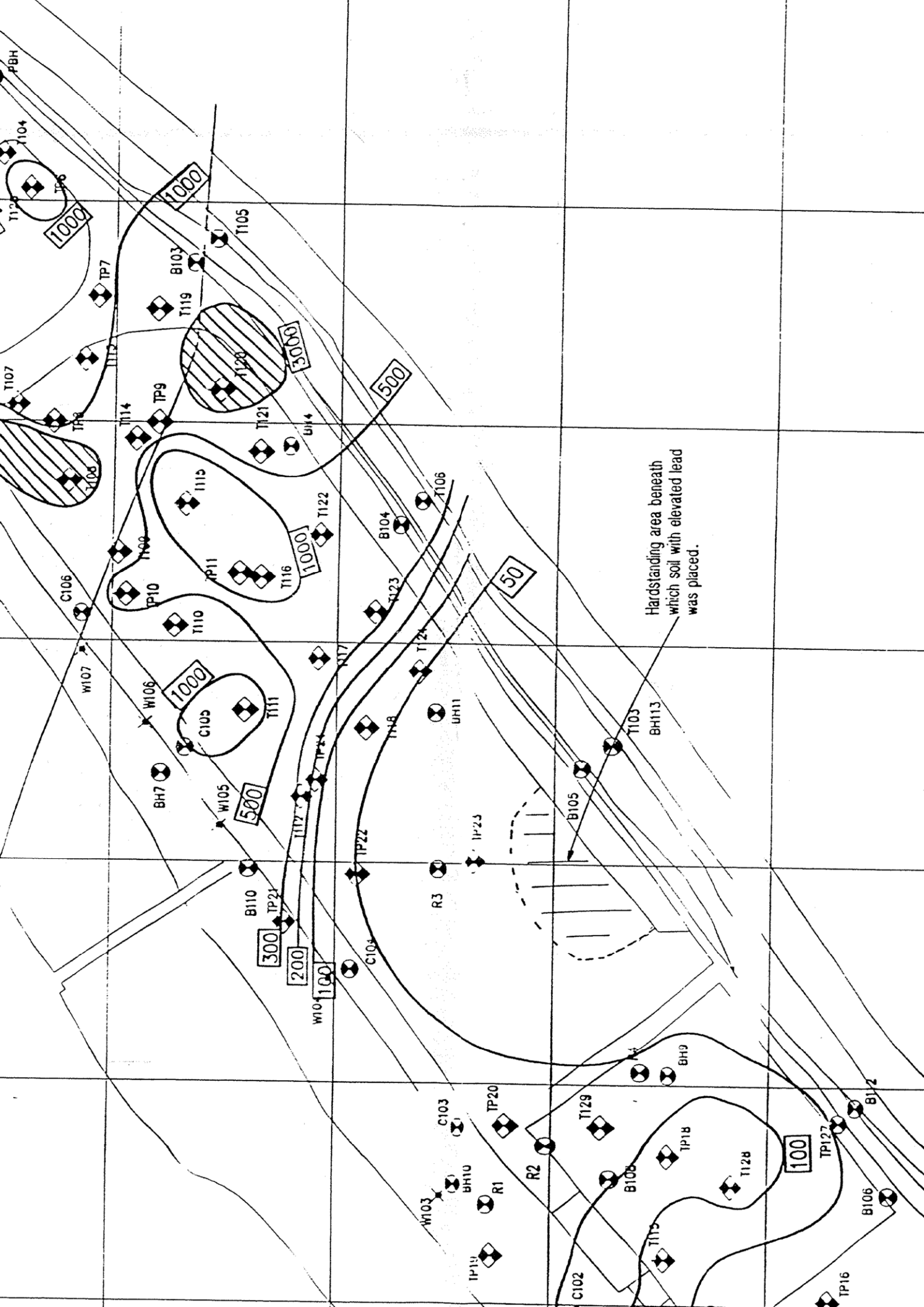


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Figure 2: Diagrammatic Representation of Pontardawe



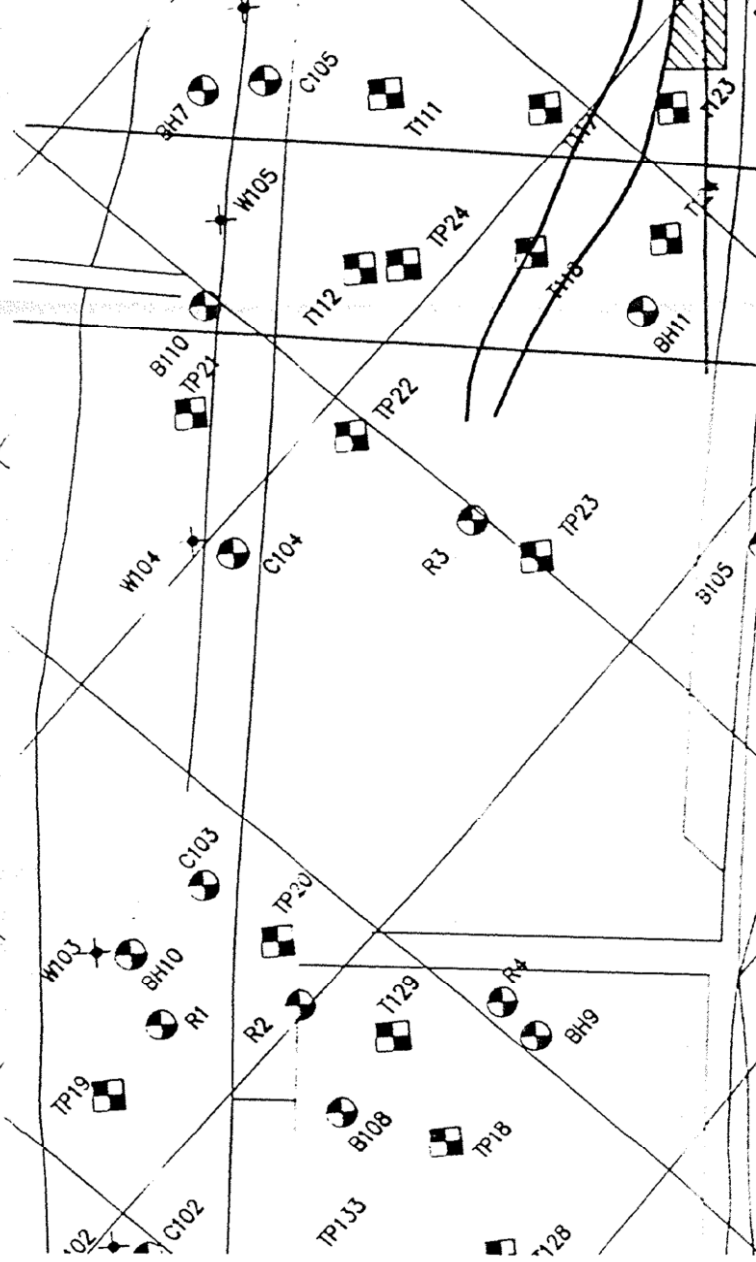


AREAS OF REQUIRED EXCAVATION AT CUT DEPTH 2-3M

5A

6

T103
BH113

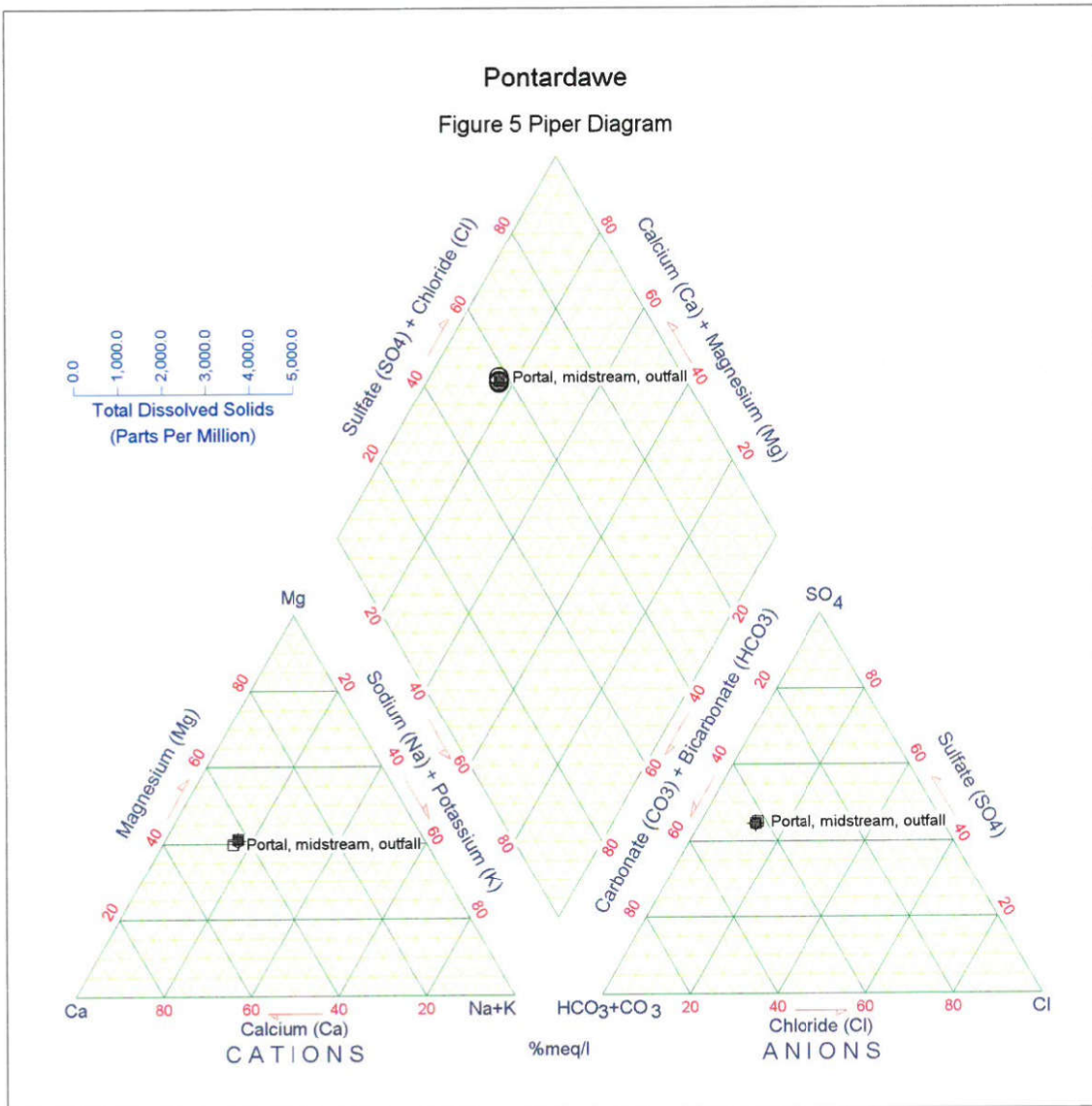


2

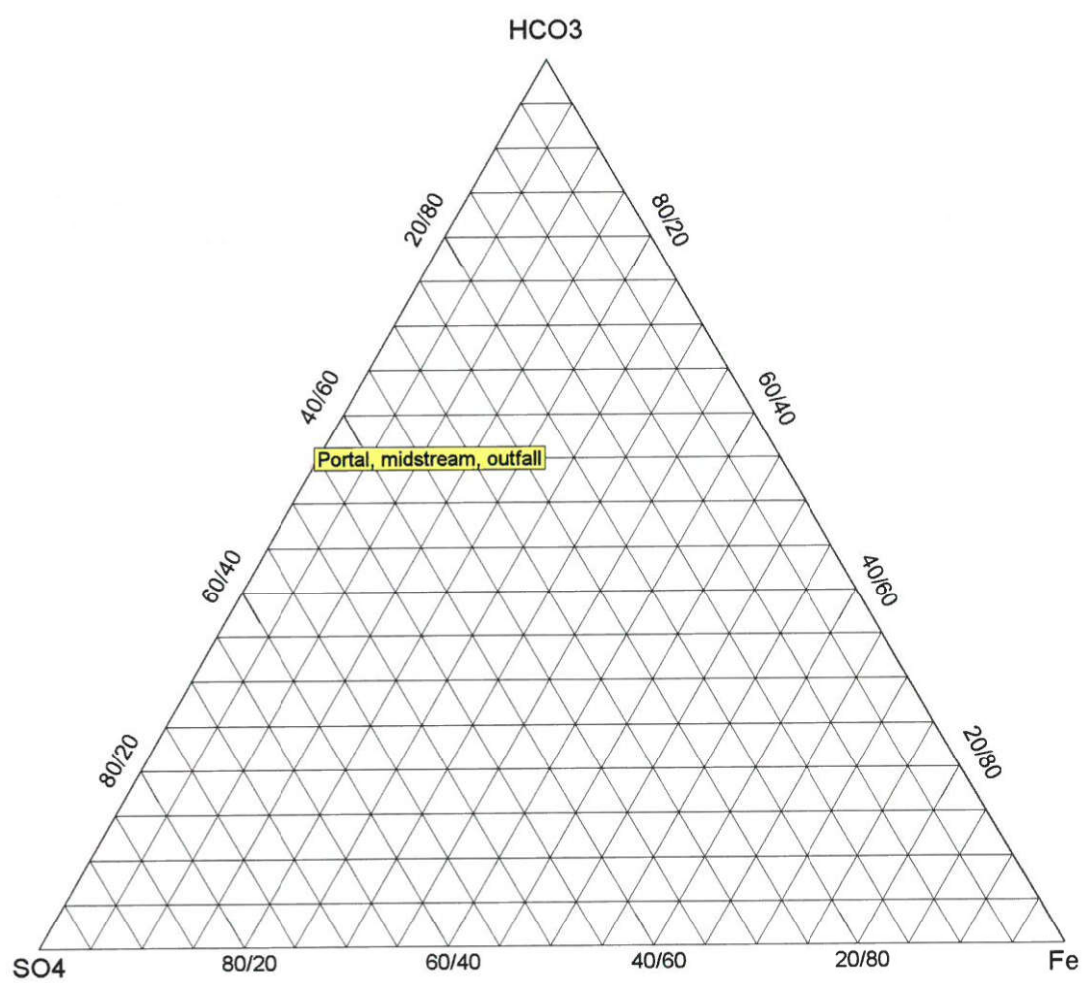
2A

Pontardawe

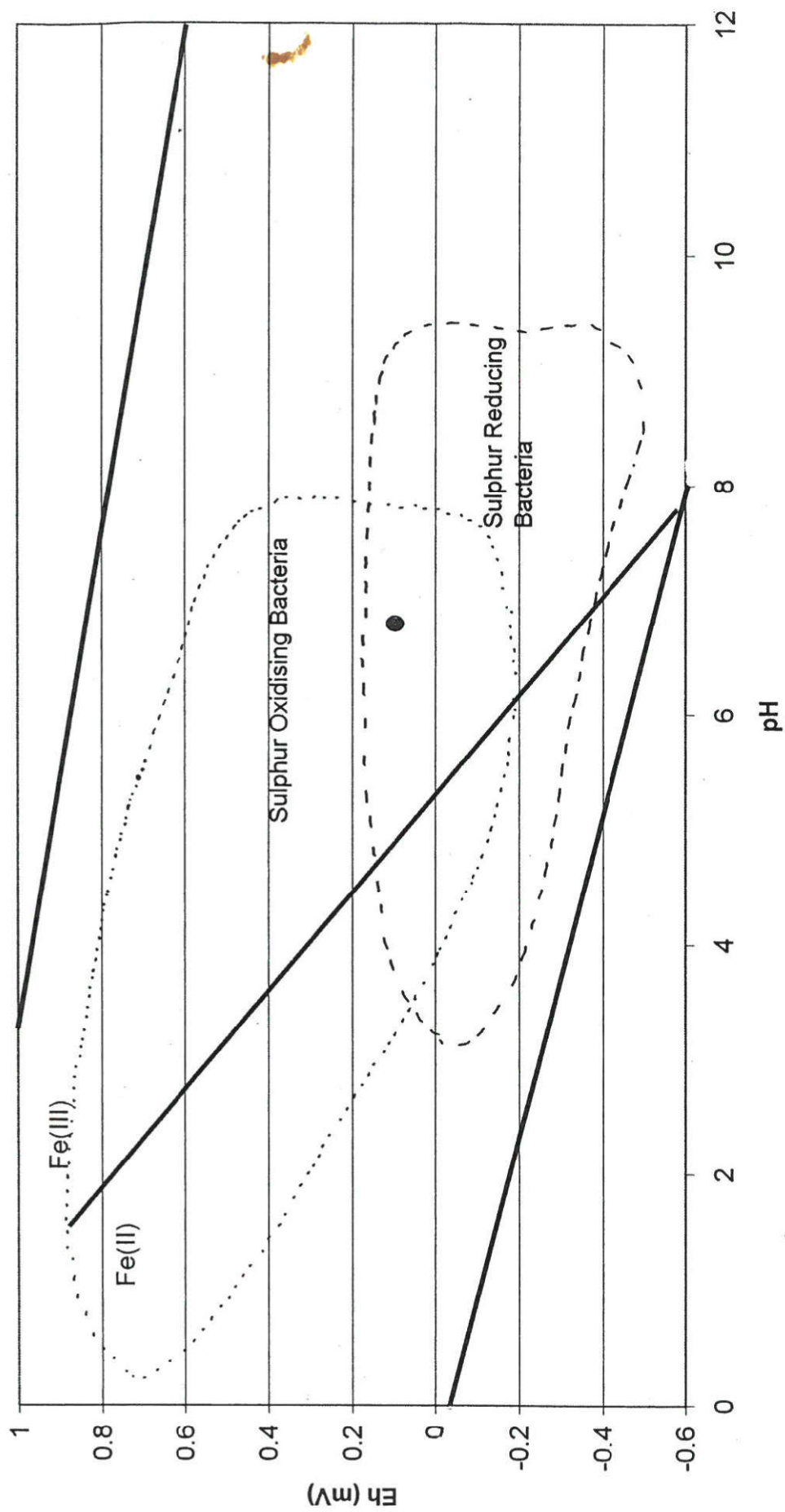
Figure 5 Piper Diagram



Pontardawe
Figure 6 Ternary Diagram



Eh/pH Relationship for mine adit discharge



**Quantitative Risk Assessment for Contamination
Land adjacent to A4067, Pontardawe
for
ANTHONY HUNT ASSOCIATES**

APPENDICES

VOLUME II

28 April 2004

Job No.3920

APPENDIX 1

EnviroCheck Report on:

Gwyn's Drift and Chemical Works
Alltwen
PONTADAWNE

National Grid Reference :

272200, 203400

Prepared For :

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22 OCT 2003

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Ordnance Survey County Series Published 1884

County	Mapsheet	Scale	Year
Glamorganshire	008_00	1:10,560	1884

Ordnance Survey County Series Published 1900

County	Mapsheet	Scale	Year
Glamorganshire	008_SE	1:10,560	1900

Ordnance Survey County Series Published 1921

County	Mapsheet	Scale	Year
Glamorganshire	008_SE	1:10,560	1921

Ordnance Survey County Series Published 1942

County	Mapsheet	Scale	Year
Glamorganshire	008_SE	1:10,560	1942

Ordnance Survey Plan Published 1964

National Grid Series	Mapsheet	Scale	Year
Sheet	SN70SW	1:10,560	1964

Ordnance Survey Plan Published 1968

National Grid Series	Mapsheet	Scale	Year
Sheet	SN70SW	1:10,560	1968

Ordnance Survey Plan Published 1982

National Grid Series	Mapsheet	Scale	Year
Sheet	SN70SW	1:10,000	1982

Ordnance Survey Plan Published 1992

National Grid Series	Mapsheet	Scale	Year
Sheet	SN70SW	1:10,000	1992

EnviroCheck Report on:
LAND ADJACENT A4067

National Grid Reference :
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Ordnance Survey County Series Published 1877 to 1878

County	Mapsheet	Scale	Year
Glamorganshire	008_11	1:2,500	1877
Glamorganshire	008_12	1:2,500	1878
Glamorganshire	008_15	1:2,500	1878
Glamorganshire	008_16	1:2,500	1877

Ordnance Survey County Series Published 1898

County	Mapsheet	Scale	Year
Glamorganshire	008_11	1:2,500	1898
Glamorganshire	008_12	1:2,500	1898
Glamorganshire	008_15	1:2,500	1898
Glamorganshire	008_16	1:2,500	1898

Ordnance Survey County Series Published 1918 to 1919

County	Mapsheet	Scale	Year
Glamorganshire	008_11	1:2,500	1918
Glamorganshire	008_12	1:2,500	1918
Glamorganshire	008_15	1:2,500	1918
Glamorganshire	008_16	1:2,500	1919

Ordnance Survey County Series Published 1941 to 1942

County	Mapsheet	Scale	Year
Glamorganshire	008_11	1:2,500	1941
Glamorganshire	008_12	1:2,500	1942
Glamorganshire	008_15	1:2,500	1941
Glamorganshire	008_16	1:2,500	1942

Ordnance Survey Plan Published 1962 to 1964

National Grid Series	Mapsheet	Scale	Year
Sheet	SN7103	1:2,500	1962
Sheet	SN7203	1:2,500	1964



Ordnance Survey Plan Published 1973

National Grid Series	Mapsheet	Scale	Year
Sheet	SN7203	1:2,500	1973

Ordnance Survey Plan Published 1989

National Grid Series	Mapsheet	Scale	Year
Sheet	SN7203	1:2,500	1989

Appendix A

Envirocheck Report



EnviroCheck Report on:

Gwyn's Drift and Chemical Works
Alltwen
PONTADAWE

National Grid Reference :

272200, 203400

Prepared For :

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Summary

Environmental Setting

Industrial Setting

Useful Contacts

BGS Borehole Order Form

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does to the potential sources of contamination. For this reason, Landmark's Site Sensitivity Data Sheet places great emphasis on statutory data provided by the Environment Agency and the Scottish Environment Protection Agency; it also incorporates data from English Nature (and the Scottish and Welsh equivalents), the Environment Agency (and the Scottish equivalent) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The data sheet is produced by querying the legend database to 1km from a single point provided by the client.

Landmark has geocoded and plotted the data to 1m accuracy where possible. Where this isn't the case, data is geocoded to +/- 100m accuracy. In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 100m in accordance with Landmark's agreements with a number of Data Suppliers.

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Data Type	50m	250m	500m	1000m
Water				
Water Abstractions				✓ 1
Discharge Consents			✓ 5	✓ 1
Red List Discharge Consents				
Prosecutions relating to Controlled Waters			✓ 2	
Pollution Incidents to Controlled Waters		✓ 4	✓ 14	✓ 55
Nearest Surface Water Feature		✓		
Waste				
Landfill Sites			✓ 1	
BGS Recorded Landfill Sites				
Waste Treatment or Disposal Sites				
Waste Transfer Sites				
IPC Registered Waste Sites				
Statutory / Authorisation				
Integrated Pollution Controls				
Air Pollution Controls			✓ 1	✓ 3
Registered Radioactive Substances				
Prosecutions relating to Authorised Processes				
Enforcement and Prohibition Notices				
Planning Hazardous Substance Consents				
Planning Hazardous Substance Enforcements				
COMAH Sites				
NIHHS Sites				
Explosive Sites				
Other				
Post 1988 Planning Applications (of possible contaminative uses)			✓ 1	✓ 4
BGS Recorded Mineral Sites				
BGS Boreholes				✓ 1
Sites of Special Scientific Interest				
Trade Directory Entry			✓ 5	✓ 18
Fuel Station Entry			✓ 2	✓ 2

Water Abstractions identified, whose centres are more than 1000 metres (but less than 2000 metres) from the centre of the site: 2
Please refer to back of report for information on data update cycles and currency



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
-	Water Abstraction Operator: T G Jones Licence No: 22/59/1/0049 Location: Location Description Not Available Abstraction: General Farming And Domestic Source: Groundwater Daily Rate: 2 cubic metres Yearly Rate: 746.68 cubic metres Details: Spring In Field No. 229 At Wernddu Isaf	SE	1780	EA	273300 202000
-	Water Abstraction Operator: Pontardawe Golf Club Licence No: 22/59/1/0111 Location: Location Description Not Available Abstraction: Golf Courses: Spray Irrigation - Storage Source: Surface Daily Rate: 86 cubic metres Yearly Rate: 600 cubic metres Details: Trib Of The Upper Clydach	N	1800	EA	272100 205200
-	Groundwater Vulnerability Geological Classification: Minor Aquifer (Variably permeable) - These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although not producing large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise Drift Deposit: None Map Sheet: Derived from Sheet 35 West Glamorgan Scale: 1:100,000	-	-	EA	272200 203400
-	Radon Affected Area Less than 1% of homes are above the Action Level	-	-	NRFB	272200 203400
1	Water Abstraction Operator: British Waterways Board Licence No: 22/53/1/0107 Location: Location Description Not Available Abstraction: Water Supply Related: Effluent/Slurry Dilution Source: Surface Daily Rate: 3 cubic metres Yearly Rate: 870 cubic metres Details: Swansea Canal Swansea Valley	N	720	EA	272400 204100
2	Discharge Consent Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers Location: Swo (Soc 18), Alltwen, Trebanos Catchment Area: Not Given Discharge Reference: BW2303001 Issued: 22nd July 1966 Discharge Type: Sewage Effluent Discharge-Storm Effluent Discharge Environment: Freshwater Stream/River Received Water: River Tawe	SW	270	EA	272000 203200
2	Discharge Consent Operator: Dwr Cymru Cyfyngedig Property Type: Sewerage Network - Sewers Location: Sso, Alltwen/Rhos O'Fall Catchment Area: Not Given Discharge Reference: BW4108701 Issued: 20th October 1989 Discharge Type: Sewage Effluent Discharge-Storm Effluent Discharge Environment: Freshwater Stream/River Received Water: River Tawe	SW	270	EA	272000 203200



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
3	Discharge Consent Operator Dwr Cymru Cyfyngedig Property Type Sewerage Network - Sewers Location Swo Soc19, Alloy Industrial Site Catchment Area Not Given Discharge Reference BW2302901 Issued 22nd July 1966 Discharge Type Sewage Effluent Discharge-Storm Effluent Discharge Freshwater Stream/River Environment Received Water River Tawe	NE	410	EA	272500 203700
4	Discharge Consent Operator Dwr Cymru Cyfyngedig Property Type Sewerage Network - Sewers Location Sso Pontardawe No 2 , Swansea Valley Trunk Sewer Catchment Area Not Given Discharge Reference BC0016801 Issued 22nd July 1966 Discharge Type Sewage Effluent Discharge-Storm Effluent Discharge Freshwater Stream/River Environment Received Water River Tawe	NE	470	EA	272500 203800
5	Discharge Consent Operator Davies G Property Type Not Given Location 48 Denwen Road, Alltwn , West Giamorgan SA6 3 AU Catchment Area Not Given Discharge Reference BP0129401 Issued 5th September 1989 Discharge Type Sewage Effluent Discharge-Treated Effluent Discharge Onto Land Environment Received Water To Land	SW	450	EA	272000 203000
6	Discharge Consent Operator Dwr Cymru Cyfyngedig Property Type Sewerage Network - Sewers Location Swo Soc 21, Arthur Terrace , P'Dawe Catchment Area Not Given Discharge Reference BW2302701 Issued 20th October 1989 Discharge Type Sewage Effluent Discharge-Storm Effluent Discharge Freshwater Stream/River Environment Received Water Unnamed Stream	N	860	EA	272500 204200
41	BGS Borehole BGS Reference SN70SW 28 Drilled Length 4 metres Bore Name ABATTOIR EXT, PONTIARDAWE	NE	930	BGS	272800 204100



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
42	Landfill Site Licence Holder W H J Edwards Licence Reference 1/84 Site Location Danycraig House, Trebanos, Pontardawe, Swansea, West Glamorgan, Licence Holder Address 5 Francis Street, Pontardawe, West Glamorgan, Authority Environment Agency - Welsh Region South West Area Site Category LANDFILL Maximum Input Rate Undefined Waste Source No known restriction on source of waste Restrictions Licence Status Licence lapsed/cancelled/defunct/not applicable/surrendered Date Feb-1984 Preceded By Licence Not Given Superseded By Not Given Licence Confidence Positional accuracy - approximate location provided by supplier Waste Types On Site: Authorised Wastes Hardcore And Rubble Inert Waste Wastes Prohibited Animal Or Fish Waste Biodegradable/Flammable Waste Carcasses And Flesh Corrosive Material Explosive Waste Highly Flammable Material Toxic/Poisonous Wastes	W	410	EA	271800 203500



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
	Coal Authority Data				
-	Description In an area which may be affected by coal mining activity. It is recommended that a coal mining report is obtained from the Coal Authority. Contact details are included in the Useful Contacts section of this report.	-	-	CA	272200 203400
7	Pollution Incident to Controlled Waters				
	Name Property Type Location Authority Pollutant Note Incident Date Incident Reference Catchment Area Received Water Cause Severity	Unknown Operator Unknown Glaes Bridge, And Upstream Environment Agency Welsh Region Agricultural: Silage Liquor Deliberate Act 23rd August 1994 20682 Not Given Not Given Direct Discharge Category 3 - Minor Incident	N 410	EA	272300 203800
7	Pollution Incident to Controlled Waters				
	Name Property Type Location Authority Pollutant Note Incident Date Incident Reference Catchment Area Received Water Cause Severity	Unknown Operator Unknown Glaes Environment Agency Welsh Region Mud/Clay/Soil Deliberate Act 23rd August 1994 20682 Not Given Not Given Direct Discharge Category 3 - Minor Incident	N 410	EA	272300 203800
7	Pollution Incident to Controlled Waters				
	Name Property Type Location Authority Pollutant Note Incident Date Incident Reference Catchment Area Received Water Cause Severity	Unknown Operator Unknown Glaes, Pontardawe Environment Agency Welsh Region Unknown Deliberate Act 25th August 1994 20686 Not Given Not Given Direct Discharge Category 3 - Minor Incident	N 410	EA	272300 203800
7	Pollution Incident to Controlled Waters				
	Name Property Type Location Authority Pollutant Note Incident Date Incident Reference Catchment Area Received Water Cause Severity	Unknown Operator Unknown Clydach, Trebanos Environment Agency Welsh Region Mud/Clay/Soil Deliberate Act 23rd August 1994 20682 Not Given Not Given Direct Discharge Category 3 - Minor Incident	N 410	EA	272300 203800



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
8	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Council Premises Location: Leisure Centre, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Blocked Sewer Incident Date: 27th December 1991 Incident Reference: 1843 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 2 - Significant Incident	NE	360	EA	272500 203600
9	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Water Company Sewage: Storm Overflow Location: George, Cohen Factory, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Blocked Sewer Incident Date: 18th September 1994 Incident Reference: 21270 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	NW	980	EA	271800 204300
9	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Water Company Sewage: Storm Overflow Location: Opposite Morris Cohen Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Blocked Sewer Incident Date: 19th August 1991 Incident Reference: 1393 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	NW	980	EA	271800 204300
10	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Castle Hotel, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Sewage - Treated Effluent Note: Not Given Incident Date: 27th February 1995 Incident Reference: 23324 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	N	660	EA	272000 204000
11	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Council Premises Location: Leisure Centre, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Weather Incident Date: 3rd March 1995 Incident Reference: 23194 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	310	EA	272300 203700



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
11	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Confluence Of, Upper Clydach And Tawe Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Not Given Incident Date: 18th September 1994 Incident Reference: 21167 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	N	310	EA	272300 203700
12	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Leisure Centre, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Not Given Incident Date: 9th October 1995 Incident Reference: 26513 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	NE	500	EA	272500 203800
13	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Water Company Sewage: Surface Water Outfall Location: Ffordd Tawe, Opposite Somerfield Supermarket Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Accidental Spillage/Leakage Incident Date: 3rd April 1996 Incident Reference: 27835 Catchment Area: Not Given Received Water: Not Given Cause: Runoff Severity: Category 3 - Minor Incident	N	900	EA	272300 204300
13	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Ffordd Tawe, Opposite Pelican Public House, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Accidental Spillage/Leakage Incident Date: 3rd April 1996 Incident Reference: 27835 Catchment Area: Not Given Received Water: Not Given Cause: Runoff Severity: Category 3 - Minor Incident	N	900	EA	272300 204300
14	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Old Bridge, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Not Given Incident Date: 6th December 1991 Incident Reference: 1661 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	NE	420	EA	272500 203700

Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
14	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Road Location: Bridge, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Poor Operational Practise Incident Date: 2nd July 1991 Incident Reference: 960 Catchment Area: Not Given Received Water: Not Given Cause: Effluent Discharge Severity: Category 2 - Significant Incident	NE	420	EA	272500 203700
15	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Between, Rhydyfro And Pontardawe Authority: Environment Agency Welsh Region Pollutant: Sewage - Septic Tank Effluent Note: Not Given Incident Date: 22nd April 1991 Incident Reference: 180 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	N	620	EA	272100 204000
16	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Coal Location: Road Bridge, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Cement/Mortar Note: Poor Operational Practise Incident Date: 4th January 1991 Incident Reference: 2238 Catchment Area: Not Given Received Water: Not Given Cause: Runoff Severity: Category 3 - Minor Incident	N	630	EA	272000 204000
16	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Coal Location: Confluence, With Tawe Authority: Environment Agency Welsh Region Pollutant: Foam/Soap Suds Note: Weather Incident Date: 13th February 1991 Incident Reference: 2020 Catchment Area: Not Given Received Water: Not Given Cause: Runoff Severity: Category 2 - Significant Incident	N	630	EA	272000 204000
16	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Near Canal Overflow, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blockage Incident Date: 7th January 1997 Incident Reference: 30798 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	630	EA	272000 204000



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
17	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Drain, Road/Footpath Authority: Environment Agency Welsh Region Pollutant: Mining Water Note: Not Given Incident Date: 28th March 1995 Incident Reference: 23368 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	SE	870	EA	273000 203100
18	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Water Company Sewage: Storm Overflow Location: Stone Shelter Near, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Weather Incident Date: 11th March 1995 Incident Reference: 23326 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	100	EA	272200 203500
19	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: River, To Pontardawe, Leisure Centre Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Not Given Incident Date: 25th September 1995 Incident Reference: 26331 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	NE	220	EA	272300 203600
20	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Miscellaneous Premises: Surface Runoff Location: A & M Transport, Ynisdwr Road Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Deliberate Act Incident Date: 6th May 1992 Incident Reference: 4585 Catchment Area: Not Given Received Water: Not Given Cause: Runoff Severity: Category 3 - Minor Incident	NE	520	EA	272500 203900
21	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Abernant Authority: Environment Agency Welsh Region Pollutant: Sewage - Treated Effluent Note: Not Given Incident Date: 27th September 1995 Incident Reference: 26350 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	E	600	EA	272300 203400

Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
22	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: The Crossroads, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Light Oil Note: Not Given Incident Date: 15th July 1991 Incident Reference: 1034 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	N	610	EA	272100 204000
23	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Pontardawe Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Weather Incident Date: 9th June 1991 Incident Reference: 787 Catchment Area: Not Given Received Water: Not Given Cause: Runoff Severity: Category 3 - Minor Incident	N	710	EA	272100 204100
24	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Pontardawe Authority: Environment Agency Welsh Region Pollutant: Light Oil Note: Deliberate Act Incident Date: 31st August 1994 Incident Reference: 20705 Catchment Area: Not Given Received Water: Not Given Cause: Direct Discharge Severity: Category 2 - Significant Incident	N	730	EA	272000 204100
25	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Water Company Sewage: Storm Overflow Location: Cwmdu Grian Area, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Rubble/Litter Or Solids Note: Blocked Sewer Incident Date: 6th March 1996 Incident Reference: 27731 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	830	EA	272000 204200
25	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Water Company Sewage: Storm Overflow Location: Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blocked Sewer Incident Date: 6th March 1996 Incident Reference: 27731 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	830	EA	272000 204200



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
25	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Pontardawe Past Traffic Lights, 20 Yards Up Road To The Estate Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blocked Sewer Incident Date: 6th March 1998 Incident Reference: 27731 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	830	EA	272000 204200
25	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Cwmdu Glan Area, Pontabraham And Tycroes, Rear Of Jones Street, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Rubble/Litter Or Solids Note: Blocked Sewer Incident Date: 6th March 1998 Incident Reference: 27731 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	830	EA	272000 204200
26	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Road Location: Pontardawe Authority: Environment Agency Welsh Region Pollutant: Foam/Soap Suds Note: Deliberate Act Incident Date: 17th January 1991 Incident Reference: 4018 Catchment Area: Not Given Received Water: Not Given Cause: Direct Discharge Severity: Category 2 - Significant Incident	N	730	EA	272400 204100
27	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Alltwen Authority: Environment Agency Welsh Region Pollutant: Farm Effluent/Slurry Note: Not Given Incident Date: 13th April 1995 Incident Reference: 23755 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	SE	360	EA	272500 203200
28	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Water Company Sewage: Sewerage Location: Upper Ciydachi Authority: Environment Agency Welsh Region Pollutant: Natural Foam Note: Poor Operational Practise Incident Date: 3rd May 1998 Incident Reference: 28324 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	510	EA	272100 203900



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
28	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Upper Clydach Authority: Environment Agency Welsh Region Pollutant: Natural Foam Note: Poor Management Control Incident Date: 3rd May 1996 Incident Reference: 28324 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	510	EA	272100 203900
28	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Dilwyn Arms Crude Sewage Overflow Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 9th February 1998 Incident Reference: 34738 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	510	EA	272100 203900
28	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: 500 Yards U/S Picnic Site Above Cwmgledid, Enters On Left Bank Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 13th October 1997 Incident Reference: 34337 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 2 - Significant Incident	N	510	EA	272100 203900
28	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Rear Of Dilwyn Hotel, Close To The Aqueduct Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 12th August 1997 Incident Reference: 33221 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	510	EA	272100 203900
28	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 3rd October 1997 Incident Reference: 33966 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	510	EA	272100 203900



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
29	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Council Premises Location: Location Description Not Available Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Not Given Incident Date: 24th May 1991 Incident Reference: 770 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	S	400	EA	272000 203000
30	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Unknown Location: Location Description Not Available Authority: Environment Agency Welsh Region Pollutant: Miscellaneous - Fire water / Foam Note: Not Given Incident Date: 20th August 1995 Incident Reference: 25/91 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	N	540	EA	272000 203900
30	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Cso/Pipe, Dingle Farm, Near Nightclub Authority: Environment Agency Welsh Region Pollutant: Sewage - Treated Effluent Note: Blocked Sewer Incident Date: 21st September 1996 Incident Reference: 30126 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	540	EA	272000 203900
31	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Downstream Of Footbridge At, Primary School Authority: Environment Agency Welsh Region Pollutant: Algae Note: Blocked Sewer Incident Date: 8th July 1996 Incident Reference: 29115 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	E	830	EA	273000 203200
31	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Rear Of Garden Of, 200m Upstream Of Sun Inn, Alltwen Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blocked Sewer Incident Date: 8th July 1996 Incident Reference: 29115 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	E	830	EA	273000 203200



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
31	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Near Westlake Public House, From Rhos To, Alltwen Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blocked Sewer Incident Date: 8th July 1996 Incident Reference: 29115 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	E	830	EA	273000 203200
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Rear Dillwyn Arms, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blocked Sewer Incident Date: 13th July 1996 Incident Reference: 29208 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Dillwyn Arms, Protection Station Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blocked Sewer Incident Date: 13th July 1996 Incident Reference: 29208 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Upper Clydach Authority: Environment Agency Welsh Region Pollutant: Unknown Note: Blocked Sewer Incident Date: 13th July 1996 Incident Reference: 29208 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Near Aqueduct, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blockage Incident Date: 3rd June 1997 Incident Reference: 32453 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	500	EA	272200 203900



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: At Pontardawe Cross Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blockage Incident Date: 3rd June 1997 Incident Reference: 32453 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Near Paradise Nightclub, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blockage Incident Date: 3rd June 1997 Incident Reference: 32453 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Rear Of Paradise Nightclub, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Blockage Incident Date: 3rd June 1997 Incident Reference: 32453 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Near Aqueduct, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 3rd June 1997 Incident Reference: 32453 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Under Canal Aqueduct By, The Paradise Nightclub Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 21st August 1997 Incident Reference: 33308 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: In Pontardawe, Close To Cross Behind, Dillwyn Arms Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 21st August 1997 Incident Reference: 33308 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: At Pontardawe Cross, Seen From Bridge, By Traffic Lights Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 3rd June 1997 Incident Reference: 32453 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Pontardawe Cross, Pontardawe, Swansea Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 10th September 1997 Incident Reference: 33674 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Canal Aqueduct, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 13th September 1997 Incident Reference: 33674 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Behind Dillwyn Arms, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 13th September 1997 Incident Reference: 33674 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Rear Of Dillwyn Arms, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach, Overflow Incident Date: 13th September 1997 Incident Reference: 33674 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Near Paradise Nightclub, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach, Overflow Incident Date: 3rd June 1997 Incident Reference: 32453 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Outside Paradise Nightclub, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Sewage Debris/Litter Note: Upper Clydach, Overflow Incident Date: 11th February 1998 Incident Reference: 34779 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
32	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Rear Of Paradise Nightclub, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach, Overflow Incident Date: 3rd June 1997 Incident Reference: 32453 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	500	EA	272200 203900
33	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Opposite Baird Wear Factory Authority: Environment Agency Welsh Region Pollutant: Coat Solids Note: Blocked Sewer Incident Date: 18th July 1996 Incident Reference: 29211 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	860	EA	271900 204200



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
34	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Crude Sewage Overflow Up From, Pontardawe On Ammanford Road, 200 Yards On Left Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Not Given Incident Date: 26th February 1997 Incident Reference: 31376 Catchment Area: Not Given Received Water: Not Given Cause: Overflow Severity: Category 3 - Minor Incident	N	920	EA	272000 204300
34	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Pontardawe Authority: Environment Agency Welsh Region Pollutant: Light Oil Note: Upper Clydach Incident Date: 16th March 1998 Incident Reference: 35075 Catchment Area: Not Given Received Water: Not Given Cause: Unknown Severity: Category 3 - Minor Incident	N	920	EA	272000 204300
35	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Ponty Bypass, Rear Snack Bar, Lt Bank-Stream From Alltwen Side Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Tributary Of River Tawe; Overflow Incident Date: 16th December 1997 Incident Reference: 34396 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	NE	1000	EA	273000 204000
36	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Pontardawe Square Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: Upper Clydach; Overflow Incident Date: 29th December 1997 Incident Reference: 34393 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	N	560	EA	272300 204000
37	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Opposite Leisure Centre, Playing Field On Left Bank Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: River Tawe; Overflow Incident Date: 12th November 1997 Incident Reference: 34213 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	W	200	EA	272000 203400



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
37	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Storm Water Outlet On, The Aitwen Side, Opposite Leisure Centre Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: River Tawe, Overflow Incident Date: 28th October 1997 Incident Reference: 34084 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	W	200	EA	272000 203400
38	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: 200m Down From, Leisure Centre, Pontardawe Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: River Tawe, Overflow Incident Date: 15th March 1998 Incident Reference: 35678 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 2 - Significant Incident	SW	360	EA	271900 203200
39	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: By Leisure Centre, Pontardawe; By Concrete Wall, Aitwen Side Authority: Environment Agency Welsh Region Pollutant: Crude Sewage Note: River Tawe, Overflow Incident Date: 11th September 1997 Incident Reference: 33516 Catchment Area: Not Given Received Water: Not Given Cause: Blocked Sewer Severity: Category 3 - Minor Incident	SW	810	EA	271500 203000
40	Pollution Incident to Controlled Waters Name: Unknown Operator Property Type: Not Given Location: Stream, Below Building Developments Authority: Environment Agency Welsh Region Pollutant: Mud/Clay/Soil Note: Llan Llechau (Tributary Of River Tawe); Run-Off Incident Date: 20th June 1997 Incident Reference: 32915 Catchment Area: Not Given Received Water: Not Given Cause: Poor Management Control Severity: Category 3 - Minor Incident	S	450	EA	272200 203000
43	Air Pollution Control Name: Economic Packaging Limited Location: Pontardawe, Swansea, West Glamorgan SA8 4EH Authority: Neath Port Talbot County Borough Council Permit Reference: e3/1/55 Permit Date: 9th May 1997 Process Type: Local Authority Air Pollution Control Description: PG6/15 Coating in drum manufacturing and reconditioning processes Status: Authorisation superseded by a substantial or non substantial variation	N	290	LA	272200 203700



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
44	Air Pollution Control Name: Pontardawe Foundry & Engineering Co Ltd Location: Holly Street, Pontardawe, Swansea, West Glamorgan SA8 4ET Authority: Neath Port Talbot County Borough Council Permit Reference: e3/1/22 Permit Date: 22nd August 1994 Process Type: Local Authority Air Pollution Control Description: PG2/4 Iron, steel and non-ferrous metal foundry processes Status: Authorisation superseded by a substantial or non substantial variation	N	700	LA	272400 204100
45	Air Pollution Control Name: Wall Colmonoy Limited Location: Pontardawe, Swansea, West Glamorgan SA8 4HL Authority: Neath Port Talbot County Borough Council Permit Reference: e3/1/53 Permit Date: 18th November 1997 Process Type: Local Authority Air Pollution Control Description: PG6/35 Metal and other thermal spraying processes Status: Authorisation superseded by a substantial or non substantial variation	NE	940	LA	272700 204200
46	Air Pollution Control Name: Avenue Garage D W M Ltd Location: Swansea Road, Pontardawe, Swansea, West Glamorgan SA8 4AA Authority: Neath Port Talbot County Borough Council Permit Reference: E3/1/81 Permit Date: 8th April 1999 Process Type: Local Authority Air Pollution Control Description: PG 1/14 Petrol filling station Status: Application has been authorised and any conditions apply to the operator	NW	510	LA	271900 203900
47	Post 1988 Planning Application (of possible contaminative use) Name: Abattoir (Extension) Location: T11 Cutcliffe, Alloy Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 Authority: Neath Port Talbot County Borough Council Description: Abattoirs Application Ref: 98/0051 Dated 6th January 1998 Status: Detailed Plans Submitted Site Area: n/a	NE	690	LA	272600 204000
47	Post 1988 Planning Application (of possible contaminative use) Name: Mot Centre (Change Of Use) Location: Hire Shop, Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4EN Authority: Neath Port Talbot County Borough Council Description: Vehicle Maintenance Application Ref: 97/0482 Dated 30th April 1997 Status: Detailed Plans Submitted Site Area: n/a	NE	690	LA	272600 204000
48	Post 1988 Planning Application (of possible contaminative use) Name: Industrial Building (Change Of Use) Location: Church Building (Former), Holly Street, Pontardawe, Swansea, West Glamorgan SA8 4ET Authority: City and County of Swansea Description: Factories/Spec Ind Application Ref: 2/2/95/0162/03 Dated 28th April 1995 Status: Detailed Plans Submitted Site Area: n/a	N	630	LA	272300 204000
49	Post 1988 Planning Application (of possible contaminative use) Name: Garage (Extension) Location: Western Garage, Swansea Road, Pontardawe, Swansea, West Glamorgan SA8 4AL Authority: Neath Port Talbot County Borough Council Description: Vehicle Maintenance Application Ref: 97/0808 Dated 16th July 1997 Status: Detailed Plans Submitted Site Area: n/a	W	470	LA	271700 203400

Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
50	Post 1988 Planning Application (of possible contaminative use) Name: Factory & Office (Extension) Location: Wall Colmonoy, Alloy Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4HL Authority: Neath Port Talbot County Borough Council Description: Light Industrial Application Ref.: P/99/0086 Dated 11th June 1999 Status: Detailed Plans Submitted Site Area: n/a	NE	940	LA	272700 204200
51	Prosecution relating to Controlled Waters Location: Pontardawe Leisure Centre, Ynyedwr Road, Pontardawe, Swansea, West Glamorgan SA8 4EG Prosecution: EA News Release 01/03/1999 (Case 2 of 2), Polluting River Tawe with sewage on 18th March 1998 due to a blocked sewer. Act: WRA91 s85(3) Hearing Date: 26th February 1999 Verdict: Guilty Fine: 1000 Costs 240	N	280	EA	272300 203700
51	Prosecution relating to Controlled Waters Location: Pontardawe Leisure Centre, Ynyedwr Road, Pontardawe, Swansea, West Glamorgan SA8 4EG Prosecution: EA News Release 12/04/1999, (Case 1 of 2), Polluting River Tawe with sewage on 18th March 1998 due to a blocked sewer. Act: WRA91 s85(3) Hearing Date: 7th April 1999 Verdict: Guilty Fine: 2000 Costs 400	N	280	EA	272300 203700
52	Fuel Station Entry Name: Avenue Garage Location: Swansea Road, Pontardawe, Swansea, West Glamorgan SA8 4AL Brand: ESSO Premise Type: Petrol Station Status: Open Confidence: Positional accuracy - automatically located to the address	W	470	Catalist	271700 203400
52	Fuel Station Entry Name: Western Garage Location: Swansea Road, Pontardawe, Swansea, West Glamorgan SA8 4AL Brand: UK Premise Type: Petrol Station Status: Open Confidence: Positional accuracy - automatically located to the address	W	470	Catalist	271700 203400
53	Fuel Station Entry Name: Pontardawe Service Station Location: High Street, Pontardawe, Neath, West Glamorgan SA8 4HU Brand: UNBRANDED Premise Type: Petrol Station Status: Open Confidence: Positional accuracy - automatically located to the address	N	700	Catalist	272200 204100
54	Fuel Station Entry Name: Gelligrn Garage Location: Gelligrn Road, Pontardawe, Neath, West Glamorgan SA8 4HU Brand: CLOSED Premise Type: Petrol Station Status: Closed Confidence: Positional accuracy - manually located to address	N	710	Catalist	272200 204100
55	Trade Directory Entry Name: Adams Bros & Burnley (1987) Location: Alloy Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4EN Classification: Metal Fabrications Premises Type: Branch Office Status: Active Confidence: Positional accuracy - automatically located to estate within address	NE	690	TDS Group Ltd	272600 204000



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
55	Trade Directory Entry Name: Canning Brett Location: Alloy Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4EN Classification: Engineering - Precision Premises Type: Branch Office Status: Active Confidence: Positional accuracy - automatically located to estate within address	NE	690	TDS Group Ltd	272600 204000
55	Trade Directory Entry Name: Turner Bros Location: Unit 3-5 Alloy Court, Alloy Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4EN Classification: Car Servicing & Repair Premises Type: Single Site Status: Active Confidence: Positional accuracy - unknown	NE	690	TDS Group Ltd	272600 204000
55	Trade Directory Entry Name: Eurogrind Location: Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4EN Classification: Tool Manufacture Premises Type: Single Site Status: Active Confidence: Positional accuracy - automatically located to estate within address	NE	690	TDS Group Ltd	272600 204000
55	Trade Directory Entry Name: Euro Grind Location: Pontardawe Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4EN Classification: Grinding Metals Premises Type: Single Site Status: Active Confidence: Positional accuracy - automatically located to estate within address	NE	690	TDS Group Ltd	272600 204000
56	Trade Directory Entry Name: Avenue Self Serve Location: The Avenue Garage, Swansea Road, Pontardawe, Swansea, West Glamorgan SA8 4AL Classification: Petrol Filling Stations Premises Type: Branch Office Status: Active Confidence: Positional accuracy - automatically located to the address	W	470	TDS Group Ltd	271700 203400
56	Trade Directory Entry Name: Western Garage Location: Swansea Road, Pontardawe, Swansea, West Glamorgan SA8 4AL Classification: Petrol Filling Stations Premises Type: Single Site Status: Active Confidence: Positional accuracy - automatically located to the address	W	470	TDS Group Ltd	271700 203400
57	Trade Directory Entry Name: B A W Precision Engineering Location: Alloy Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4EZ Classification: Engineering - Civil Premises Type: Single Site Status: Active Confidence: Positional accuracy - automatically located to estate within address	NE	670	TDS Group Ltd	272500 204000
56	Trade Directory Entry Name: D C Autos Location: Rear Workshop, High Street, Pontardawe, Swansea, West Glamorgan SA8 4HU Classification: Car Body Repairs Premises Type: Single Site Status: Active Confidence: Positional accuracy - automatically located to estate within address	N	710	TDS Group Ltd	272100 204100



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
58	Trade Directory Entry Name Kingfisher Blinds & Canopies Location 13 High Street, Pontardawe, Swansea, West Glamorgan SA8 4HU Classification Blinds & Awning Manufacture Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to estate within address	N	710	TDS Group Ltd	272100 204100
59	Trade Directory Entry Name Dry Cleaners Location 15 High Street, Pontardawe, Swansea, West Glamorgan SA8 4HU Classification Dry Cleaning - Retail Premises Type Single Site Status Active Confidence Positional accuracy - manually located to estate within address	N	690	TDS Group Ltd	272100 204100
60	Trade Directory Entry Name I G Engineering Location Unit E, Alltwn Industrial Estate, Lonhar Pontardawe, Swansea, West Glamorgan SA8 4HA Classification Engineering - Precision Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to estate within address	NE	550	TDS Group Ltd	272500 203900
60	Trade Directory Entry Name South Wales (Transport) Co Location Tawe Terrace, Pontardawe, Swansea, West Glamorgan SA8 4HA Classification Bus & Coach Operators (Scheduled) Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to estate within address	NE	550	TDS Group Ltd	272500 203900
61	Trade Directory Entry Name Pontardawe Foundry & Engineering Co Location Holly Street, Pontardawe, Swansea, West Glamorgan SA8 4ET Classification Iron Manufacture Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to road within address	N	630	TDS Group Ltd	272400 204000
62	Trade Directory Entry Name Pontardawe Tyre Service Location Works Lane, Pontardawe, Swansea, West Glamorgan SA8 4AF Classification Exhaust Replacement Premises Type Branch Office Status Active Confidence Positional accuracy - automatically located to postcode unit	NW	580	TDS Group Ltd	271900 203900
63	Trade Directory Entry Name Quality Autofinishes Location Unit 6 Alloy Court, Pontardawe Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4EN Classification Car Body Repairs Premises Type Single Site Status Active Confidence Positional accuracy - unknown	NE	720	TDS Group Ltd	272500 204000
63	Trade Directory Entry Name A S Gunter Location Unit 7 Alloy Court, Pontardawe Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4HR Classification MOT Testing Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to the address	NE	720	TDS Group Ltd	272500 204000
64	Trade Directory Entry Name Wall Colmonoy Location Alloy Industrial Estate, Pontardawe, Swansea, West Glamorgan SA8 4HL Classification Smelting Services Premises Type Head Office Status Active Confidence Positional accuracy - automatically located to the address	NE	940	TDS Group Ltd	272700 204200



Map ID	Details	Compass Direction	Estimated Distance from Site	Source	NGR
65	Trade Directory Entry Name Windowline Location 2 High Street, Pontardawe, Swansea, West Glamorgan SA6 4HU Classification Blinds & Awning Manufacture Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to road within address	N	710	TDS Group Ltd	272100 204100
65	Trade Directory Entry Name Pvp Multimedia Location The Old Brewery, High Street, Pontardawe, Swansea, West Glamorgan SA6 4HU Classification Computer Manufacture Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to road within address	N	710	TDS Group Ltd	272100 204100
66	Trade Directory Entry Name Construction Management Services Location 48 Derwen Road, Alltwn Pontardawe, Neath, Swansea, West Glamorgan SA6 3AU Classification Engineering - Construction Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to the address	SW	460	TDS Group Ltd	272000 203000
67	Trade Directory Entry Name Group 4 Engineering Location Pontardawe Industrial Estate, Swansea, West Glamorgan SA8 4HR Classification Engineering - Precision Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to estate within address	NW	450	TDS Group Ltd	272000 203800
68	Trade Directory Entry Name Economic Packaging Location Ynysderw Road, Pontardawe, Swansea, West Glamorgan SA8 4EH Classification Drum & Keg Manufacture Premises Type Single Site Status Active Confidence Positional accuracy - automatically located to the address	N	290	TDS Group Ltd	272200 203700



Data Type	Version	Update Cycle
Water		
Water Abstractions Environment Agency Scottish Executive	Dec 1998 to Mar 2000 April 1998	Bi-Annually Variable
Discharge Consents Environment Agency Scottish Environment Protection Agency	Dec 1998 to Mar 2000 -	Bi-Annually Variable
Red List Discharge Consents Environment Agency Scottish Environment Protection Agency	March 2000 -	Bi-Annually Variable
Prosecutions relating to Controlled Waters Environment Agency Scottish Environment Protection Agency	- -	As Notified As Notified
Pollution Incidents to Controlled Waters Environment Agency Scottish Environment Protection Agency	Dec 1998 to Dec 1999 Not Applicable	Bi-Annually Not Applicable
Waste		
Landfill Sites Landmark SiteFile Database	Rolling Update	Annually
BGS Recorded Landfill Sites British Geological Survey	-	Not Applicable
Waste Treatment or Disposal Sites Landmark SiteFile Database	Rolling Update	Annually
Waste Transfer Sites Landmark SiteFile Database	Rolling Update	Annually
IPC Registered Waste Sites Environment Agency Scottish Environment Protection Agency	January 2000 -	Monthly Variable



Data Type	Version	Update Cycle
Statutory / Authorisation		
Integrated Pollution Controls Environment Agency Scottish Environment Protection Agency	January 2000 -	Monthly Variable
Air Pollution Controls Local Authorities Scottish Environment Protection Agency	Rolling Update -	Annually Variable
Registered Radioactive Substances Environment Agency Scottish Environment Protection Agency	January 2000 -	Monthly Variable
Prosecutions relating to Authorised Processes Environment Agency Scottish Environment Protection Agency	- -	As Notified As Notified
Enforcement and Prohibition Notices Environment Agency Scottish Environment Protection Agency	- -	As Notified As Notified
Planning Hazardous Substance Consents Local Authorities, DETR, The Welsh Office and Health and Safety Executive	Rolling Update	Annually
Planning Hazardous Substance Enforcements Local Authorities, DETR, The Welsh Office and Health and Safety Executive	Rolling Update	Annually
COMAH Sites Health & Safety Executive	February 2000	Bi-Annually
NIHMS Sites Health & Safety Executive	June 1999	Bi-Annually
Explosive Sites Health & Safety Executive	June 1999	Bi-Annually



Data Type	Version	Update Cycle
Other		
Post 1988 Planning Applications (of possible contaminative uses) Collected by Glenigans from Local Authorities	February 2000	Monthly
BGS Recorded Mineral Sites British Geological Survey	June 1999	Annually
BGS Boreholes British Geological Survey	December 1999	Bi-Annually
Sites of Special Scientific Interest English Nature Countryside Council for Wales Scottish Natural Heritage	September 1999 November 1999 February 1999	Quarterly Annually Annually
Trade Directory Entry TDS Group Ltd	January 2000	Quarterly
Fuel Station Entry Catalist	January 2000	Quarterly

Some of the organisations who provide data which is used within the report



Value Added Reseller

Ordnance Survey



**ENVIRONMENT
AGENCY**

Environment Agency



Scottish Environment Protection Agency



**Institute of
Hydrology**

Institute of Hydrology



**British
Geological
Survey**

British Geological Survey

Value Added Reseller



**CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES**

Countryside Council For Wales



Scottish Natural Heritage



English Nature

**British Geological Survey Information Services Group**

Keyworth
Nottingham
Nottinghamshire
NG12 5GG

Telephone 0115 936 3100
Fax 0115 936 3200

Catalist

Richmond House
22 Richmond Hill
Clifton
Bristol
Avon
BS8 1BA

Telephone 0117 923 7113
Fax 0117 923 7166

City and County of Swansea

The Guildhall
Swansea
Glamorgan
SA1 4PH

Telephone 01792 636000
Fax 01792 635719

Environment Agency - Welsh Region South West Area

Liys Afon
Hawthorn Rise
Haverfordwest
Pembrokeshire
SA61 2BH

Telephone 01437 760081
Fax 01437 760881

Environment Agency Welsh Region

Rivers House
St Mellons Business Park
St Mellons
Cardiff
Mid Glamorgan
CF3 0LT

Telephone 029 2077 0088
Fax 029 2079 8555

INSTITUTE OF HYDROLOGY

Maclean Building
Crowmarsh Gifford
WALLINGFORD
Oxfordshire
OX10 8BB

Telephone 01491 838800
Fax 01491 692424

National Radiological Protection Board

Chilton
Didcot
Oxfordshire
OX11 0RQ

Telephone 01235 831600
Fax 01235 833891

**Neath Port Talbot County Borough Council**

Civic Centre
Port Talbot
West Glamorgan
SA13 1PJ

Telephone 01639 763333
Fax 01693 763444

Ordnance Survey

Romsey Road
Southampton
Hampshire
SO16 4GU

Telephone 023 8079 2000
Fax 023 8079 2404

The Coal Authority Mining Reports

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

Telephone 0945 7626848
DX 716176 Mansfield 5



**British
Geological
Survey**

BGS ref no: ISGR/...../.....

Your ref/order no. (if required):

BOREHOLE RECORDS ORDER FORM

Please note this order form is only to be used for the supply of borehole records from the National Geological Records Centre (NGRC) identified from Landmark Reports

Name:-
Address:-

Company:-

Telephone Number:-

Fax Number:-

Date:-

With respect to the following boreholes I would like to: -

Enquire about the costs ☐ Purchase copies ☐ New Leaflet ☐

[illegible]

Note: More than 10 records can be ordered, but it is advisable to discuss your requirements first with NGRC staff

Unit price £12 (+VAT) per borehole.

Minimum charge £24(+VAT)

Method of delivery, please indicate preferred option.

1st class post ☐ Special delivery (guaranteed next day before 12:30pm.) ☐ Fax ☐

(Note 1st. class postage is included in the unit charge. Additional charges are made for fax or special delivery)

Please return this form to: - The Records Officer, National Geological Records Centre, British Geological Survey,
Keyworth, Nottingham, NG12 5GG. Tel: 0115936 3109 Fax: 0115936 3276

Tel: 0115936 3109 Fax: 0115936 3276
E-mail: nqis@bqs.ac.uk

EnviroCheck

Environmental Site Sensitivity Data

CLIENT DETAILS

Customer: Jet Card Neile
 Other: Jher
 Marlborough
 Houses Upper Marlborough Road
 ST ALLEANS
 Ref: 1/1 30T

Order No. EHA38249_1

SITE DETAILS

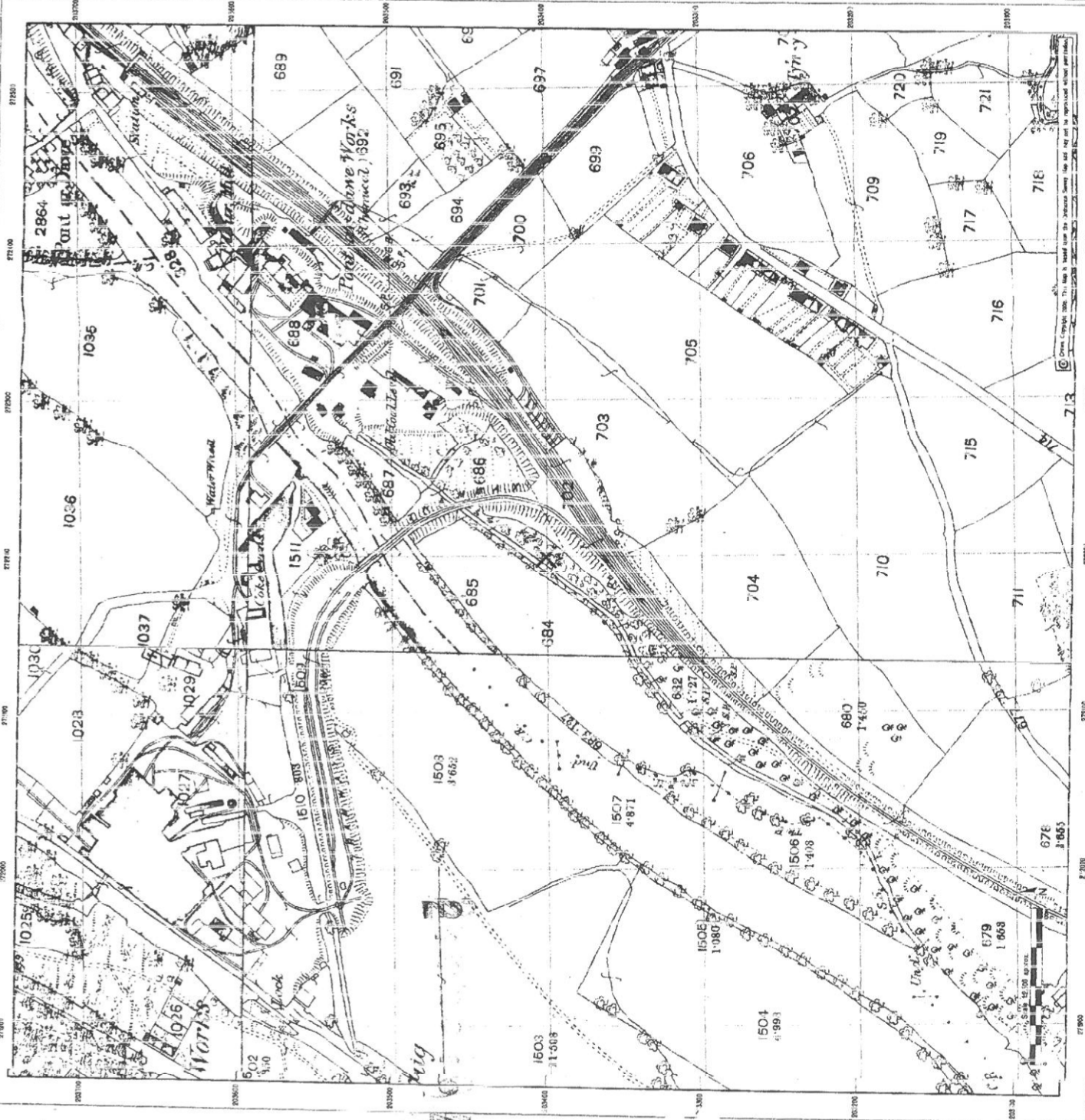
Grid Reference: 272200 201400
 Gwyn's Drift and Chemical Works
 All: wren
 PONTAIAVE

Historical Map Legend

*** Arrow denotes flow of water

Glamorgan-shire

This site map is a reproduction from maps and drawings held in the Glamorgan-shire County Council Archives. It is not a survey and should not be used for legal purposes. It is a reproduction of a map of the Glamorgan-shire County Council Archives. It is not a survey and should not be used for legal purposes. It is a reproduction of a map of the Glamorgan-shire County Council Archives. It is not a survey and should not be used for legal purposes.



EnviroCheck

Environmental Site Sensitivity Data

CLIENT DETAILS

Customer Ref: Crod Nale
 Clear Faber
 Marlborough House Upper Marlborough Road
 ST ALBANS
 Herts AL1 3JT

Order No. EHA33249_1

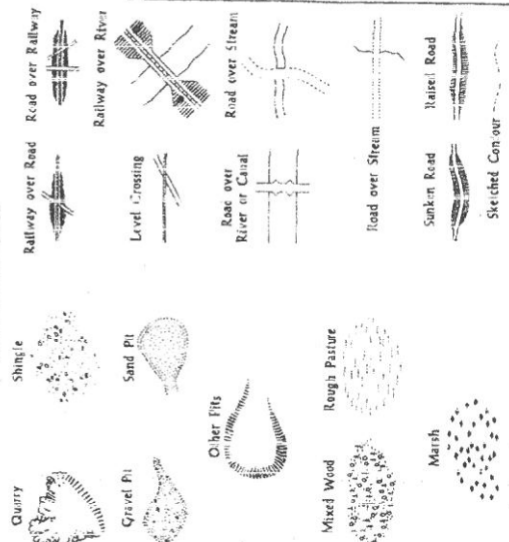
SITE DETAILS

Gwyn's Drift and Chemical Works
 Allwells

Grid Reference 272000 203400

PONT/DAWE

Historical Map Legend



*** Arrow denotes flow of water

Glamorganshire

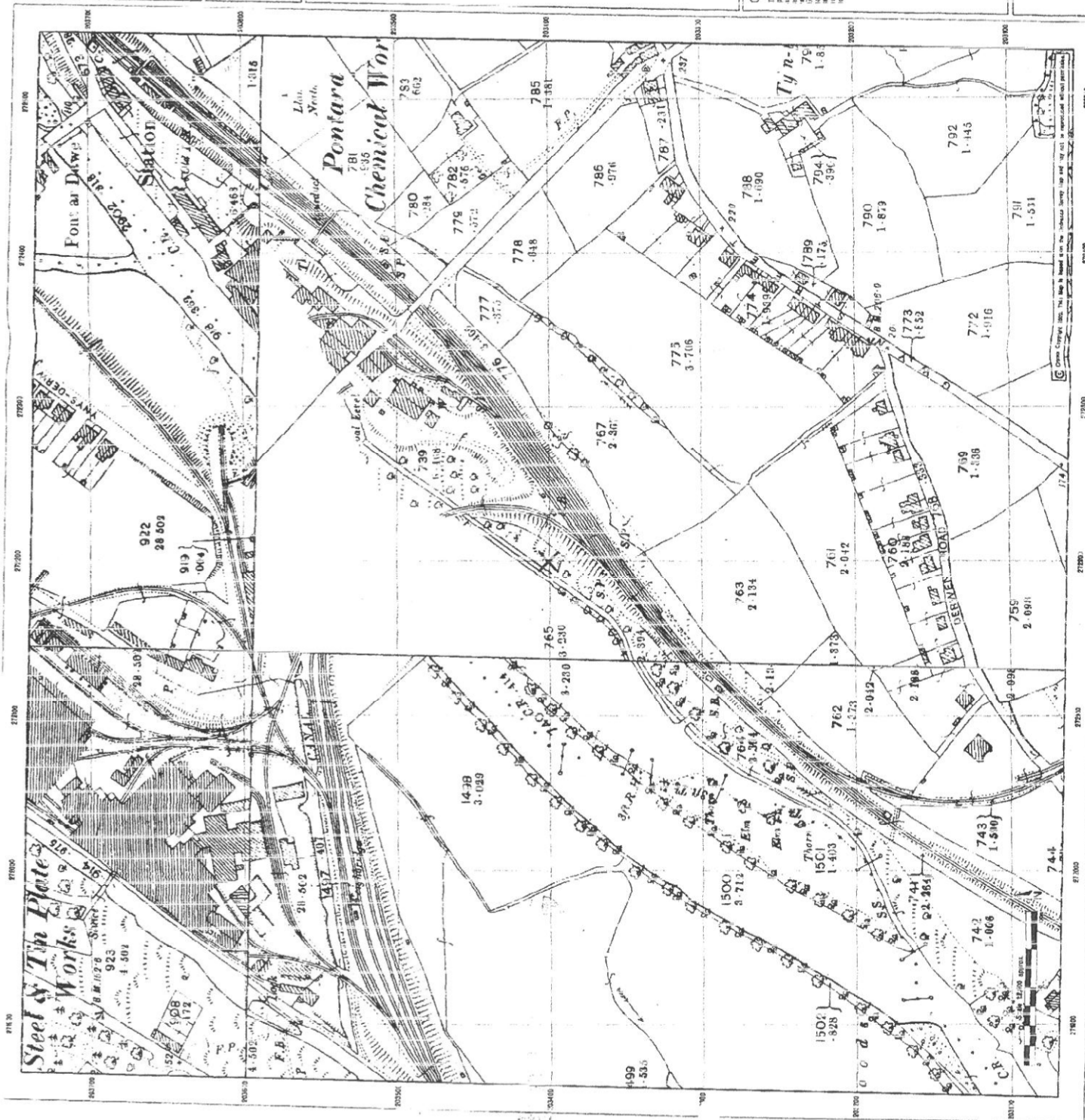
The historical maps shown here are reproduced from maps and documents in the possession of the Glamorgan Archives. The maps are of the Glamorgan area and are of varying scales. The maps are of the Glamorgan area and are of varying scales. The maps are of the Glamorgan area and are of varying scales.

1838	1838
1838	1838



Valley Added Release

Leamington Information Group Limited
 7 Alway Court, 10th Floor, Sevens
 Easton, CV3 9NY
 Telephone 0192 411229 Fax 0192 411230





Environmental Site Sensitivity Data

CLIENT DETAILS

Customer Ref: Carol Neale
Cesar Feder
Marlborough House Upper
55 ALIANS
Harris ALI 3JT

Order No. EHA30249_1

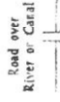
SITE DETAILS

Gwyn's Drift and Chemical Works
Alltwel

Grid Reference	272200	203400
----------------	--------	--------

PONTADAWÉ

Historical Map Legend



++++ Arrow denotes flow of water

Glamorganhire

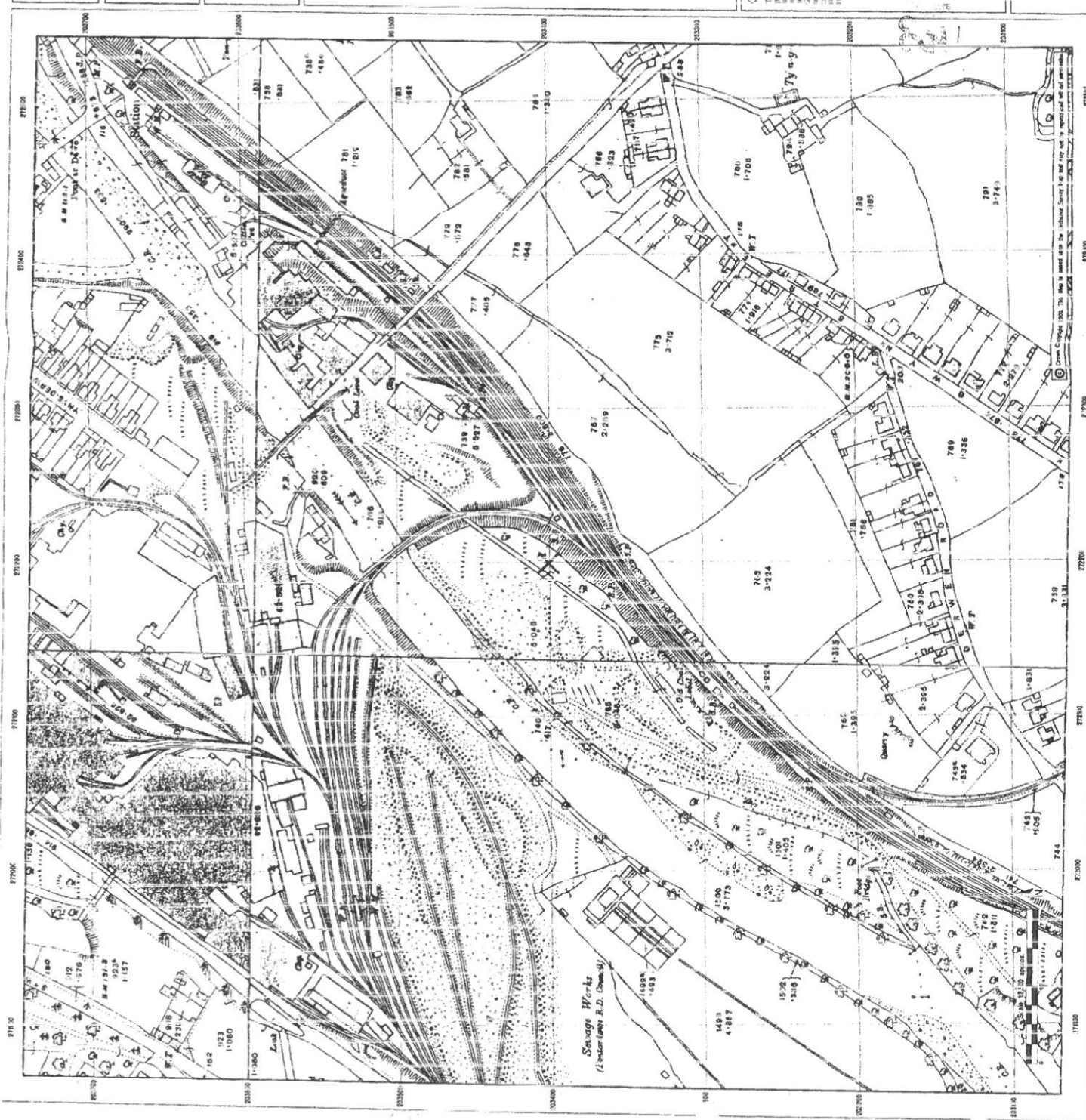
The historical maps down were reproduced from maps freely available until relatively recently for England, Wales and Scotland in the years 1863-1900. The earliest was adopted for many years as the official map of the country, and it has been considered to be the authoritative part of current Britain. The published data given as the right is often more recent than the surveyed data before 1863, all OS maps were based on the Cassini projection, i.e., independent of the effects of a large corner or shape of continents, giving a significant increase in mapping errors.

1968	1967
1968	1967



Value Added Reseller

Lancark Information Group: Limited
7 Abbey Court, Eagle Way, Sowton
Exeter EX2 1HY





Environmental Site Sensitivity Data

Order No. EHA36249 1

Customer Ref: Carol Neale

Marlborough House Under Marlborough Road

ST ALBANS
Woods 617 7017

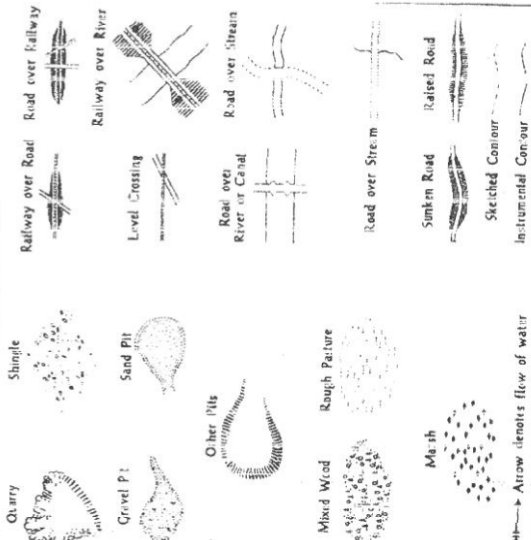
SITE DETAILS

Gwyn's Drift and Chemical Works

ALLOWED

PONT / DAW

Historical Map Legend



Glenn Groseclose

The Municipal map shown here was reworked from 1974 predominantly held at the sea is reduced for England, Wales and Scotland in the 1987. In 1984, the 1986 acre was reduced for England and Wales and 1986 acre was reduced for Scotland. The map was reworked from 1974 predominantly held at the sea is reduced for England, Wales and Scotland in the 1987. In 1984, the 1986 acre was reduced for England and Wales and 1986 acre was reduced for Scotland.

Ordnance Survey
Your Accredited Reseller

Landmark Information Group Limited
7 Abbey Court, Eagle Way, Sutton
Eastleigh EX9 7HY



Environmental Site Sensitivity Data

Order No. EH-A36249 1

Customer R.f. Carol Neale
Oscar Faber
Marlborough House Upper Marlborough Road
WEST ALBANS
Herts AL1 3UT

SITE DETAILS	
Grid Reference	272200 203400

Gwyn's Drift and Chemical Works

PONTA D'AVE

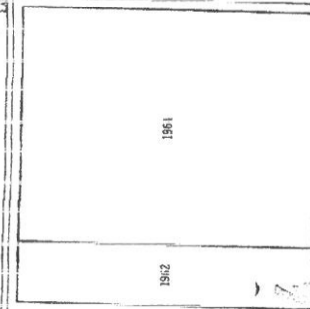
Small Pond
Clay Pit or Quarry
Gravel Pit
Sand Pit
Ditched Pit or Quarry
Refuse or Sling Heap
Lake, Loch or Pond

Druckon
Heath
Rough Grassland
Reeds
Marsh
Saltings
Standard Gauge
Multiple Track
Sands of Gauge
Single Track
Siding, Trolley or Main Line
Narrow Gauge

Coniferous Trees
Non-Coniferous Trees
Coniferous Trees
Scrib
Pylon
Electricity Transmission Line
Direction of Flow of Water
Embankment
Road Over
Level Crossing
Foot Bridge
Narrow Gauge

Ordnance Survey Plan

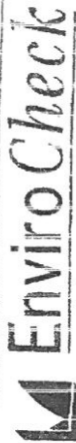
The 12,500 National Grid series began in 1948 and was completed in the early fifties. The quality of the type was poor, and the type was replaced by a new type in 1950. The quality of the type was poor, and the type was replaced by a new type in 1950. The quality of the type was poor, and the type was replaced by a new type in 1950.

 Ordnance Survey

Value Added Reseller

Landmark Information Group Limited
7 Abbey Court, East Way, Sowton

FOR ORDER 44709



Environmental Site Sensitivity Data

CLIENT DETAILS

Customer: Red Cat Nale
Owner: Fisher
Marlborough House Upper Marlborough Road
ST ALBANS
Herts AL9 3UT

Order No. EHA3E249_1

SITE DETAILS

Grid References: 272200 203400
Geys Drift and Chertal Works
A1120

PONTADRE

Historical Map Legend	
	Chalk Pit
	Clay Pit
	Gravel Pit
	Sand Pit
	Drainage Pit or Quarry
	Refuse or Slag Heap
	Lake, Loch or Pond
	Non-Coniferous Trees
	Coniferous Trees
	Scrub
	Pylen
	Electricity Transmission
	Pole
	Line
	Direction of Flow of Water
	Single Sand
	Standard Gauge Multiple Track
	Standard Gauge Single Track
	Siding, Tramway or Mineral Line
	Narrow Gauge

Ordinance Survey Plan

The 1:25,000 National Grid series began in 1948 and was the first to be produced by the Ordnance Survey. It was a major project and the maps were produced by photographing the air. The maps were then processed by computer to produce the final map. The maps were then processed by computer to produce the final map. The maps were then processed by computer to produce the final map.

1973

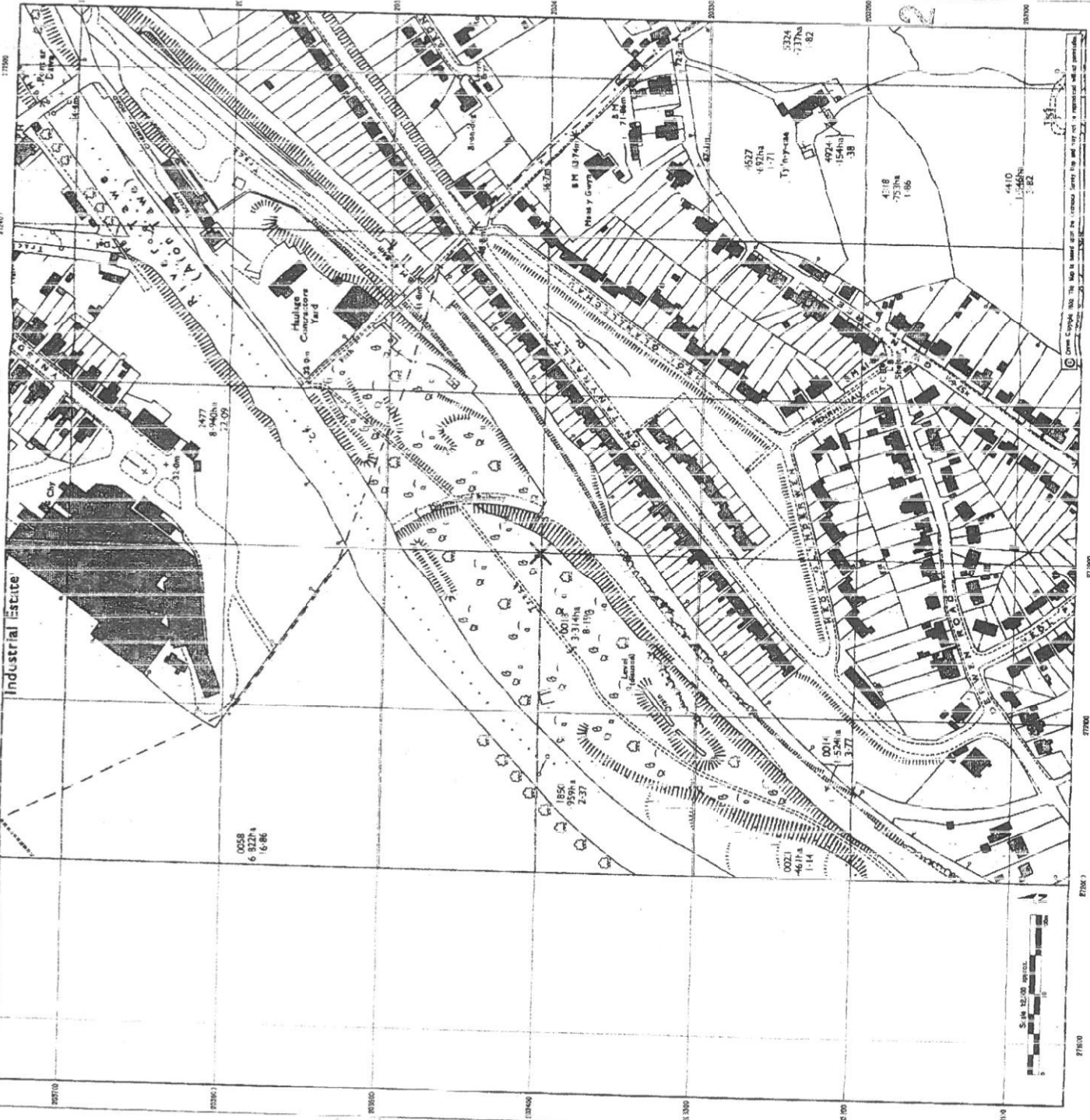


Ordnance Survey

Landmark Information Group Limited
7 Avery Court, Ely, Cambs, UK
Ely CB9 7JY
Tel: 01353 441179
Fax: 01353 441178



Landmark Information Group Limited





CLIENT DETAILS

Customer Ref: Carol Neale
 (Oscar Faber
 Atariborough House Upper
 ST ALBANS
 Herts AL1 3UT

Order No. EH36249-1

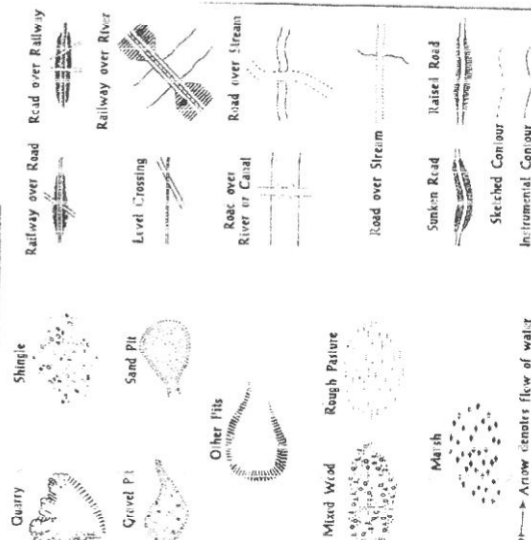
SITE DETAILS

Gwyn's Drift and Chemical Works

Grid Reference : 272200 203400

MONTAGNA

Historical Map Legend



GLAMORGANSHIRE COUNTY

The historical maps shown were reproduced from maps predominantly held at the sea and adopted for England, Wales and Scotland. The maps in 1855 at 1:250,000 scale were adopted for mapping at a scale that maps were used to generate the 1:50,000 map. The published data prior to the survey is of a few years later than the survey date. Therefore, all of the maps were based on the Cassini projection, with the datum, which is a little away from the Cassini projection, having the significant less accuracy in defining area.

in the late 1940's, a Peruvian Edison was produced, which captured the big bang exploding from a number of sources. The image appears as flashed with all military camps and other strategic sites marked. These maps were laterily encrypted (only the North of Chile, in 1971, the first 10, 40 maps were produced) and he Insurance Mortgage Protection. The entire process consisted of until recently with an efficient appearing

197

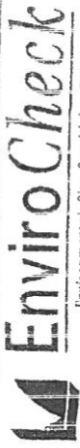
Date(s) of Publication



Landmark Information Group Limited
7 Alber Court, Eagle Way, Solihull
B37 7YU
Tel: 0121 717 8000 Fax: 0121 717 8001



Value Added Factor



Environmental Site Sensitivity Data

CLIENT DETAILS

Customer: J&C Coal Velle

Order No. EH36749-1

Client: J&C Coal Velle

Address: House Upper Marlborough Road

ST ALBANS

Herts AL1 1JT

SITE DETAILS

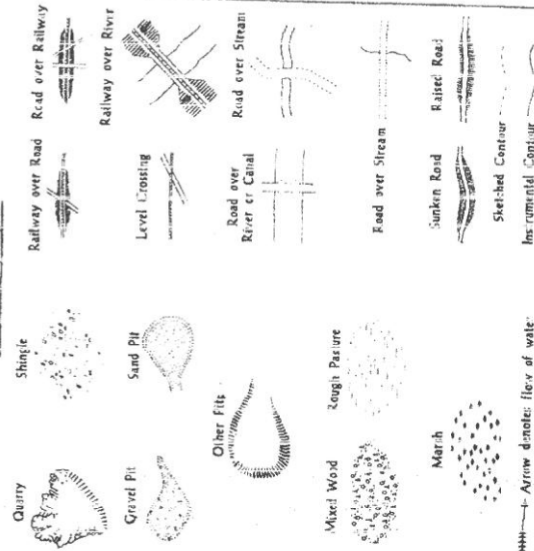
Grid Reference: 212000 203400

Owner: Drift and Chemical Works

Address: Allerton

PONT-DAVE

Historical Map Legend



Arrow denotes flow of water

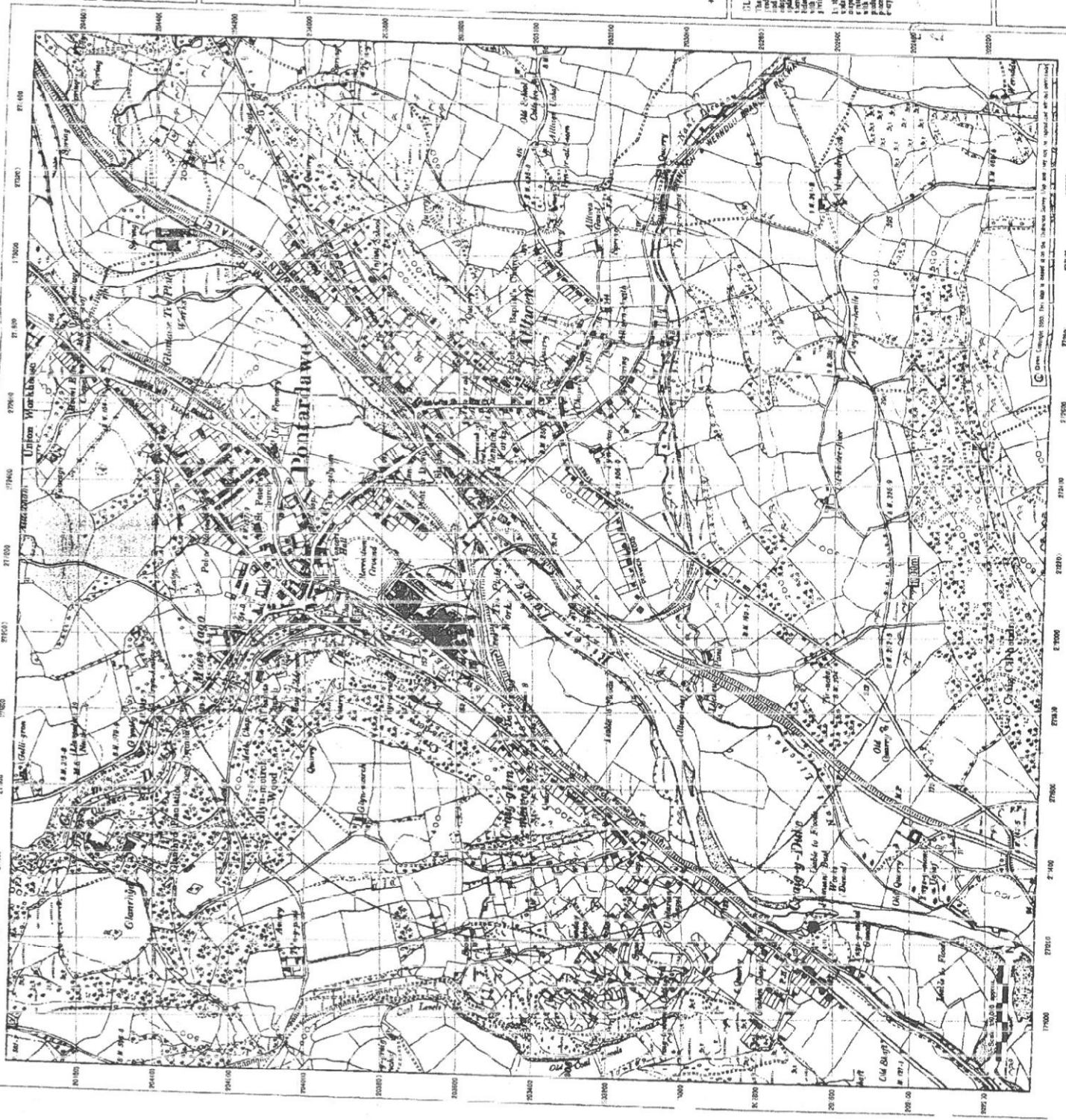
CLAMOROUS COUNTY

The Ministry of Agriculture and Fisheries has been notified that the proposed development is situated in a Special Area of Scientific Interest (SASI) and is therefore subject to the provisions of the Wildlife and Countryside Act 1981. The proposed development is situated in a SASI and is therefore subject to the provisions of the Wildlife and Countryside Act 1981. The proposed development is situated in a SASI and is therefore subject to the provisions of the Wildlife and Countryside Act 1981.

Date of Publication



Landmark Information Group Limited
7 Allerton Way, St Albans
Herts AL1 1JT
Tel: 0452 441111 Fax: 0452 441111



Order No. E136249-1

CLIENT DETAILS
 Cuscorner Bt Carol Neale
 Ceres Fisher
 Marlborough House Upper Marlborough Road
 ST ALBANS
 Herts AL1 3JT

SITE DETAILS
 Grid Reference 272500 203400
 Geology: Drift and Chemical Works
 Alluvial
 PONTI DAWI

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over River or Canal	Road over Stream
Mixed Wood	Rough Pasture	Ford over Stream	Sunken Road
March		Sketched Contour	Instrumental Contour

*** Arrow denotes flow of water

GLAMORGANSHIRE COUNTY

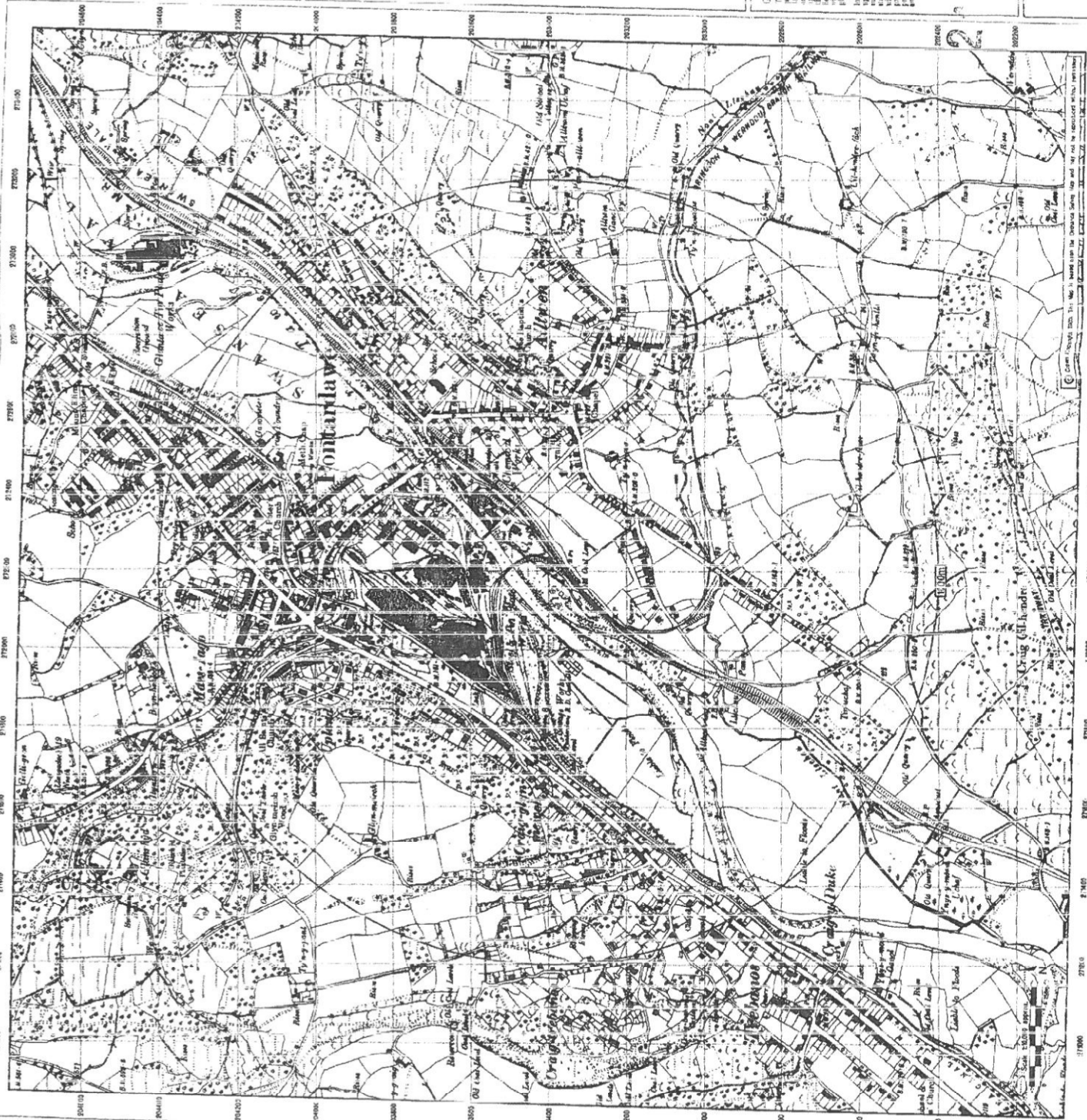
The historical map of Glamorgan county is a very important document for the study of the county's history and geography. It was first published in 1847 and has since been revised several times. The map shows the county's boundaries, major roads, railways, and other features. It is a valuable resource for anyone interested in the history of Glamorgan county.

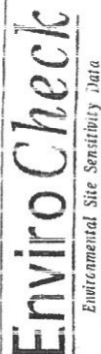
Date of Publication



Ordnance Survey

Leamington Information Group Limited
 7 Abbot Court, East Wall, Seven
 Earths, E10 7HT
 Telephone 0181 44779 Fax 0181 44780



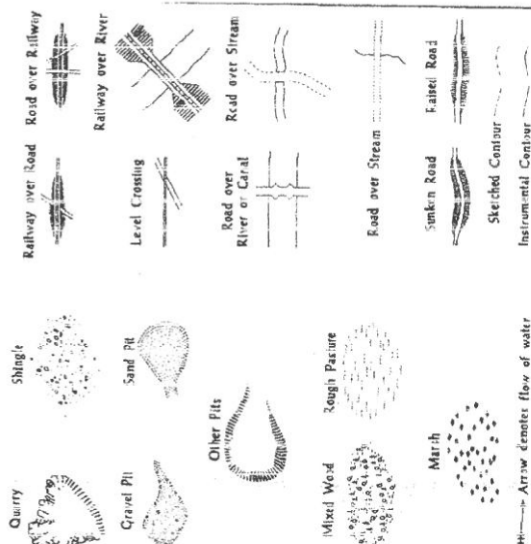


Order No. EH36249-1

Grid Reference	272200	203400
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PINTA DAWE

Historical Map Legend



Arrow denotes flow of water

LAMORGANSHPH CC UNITV

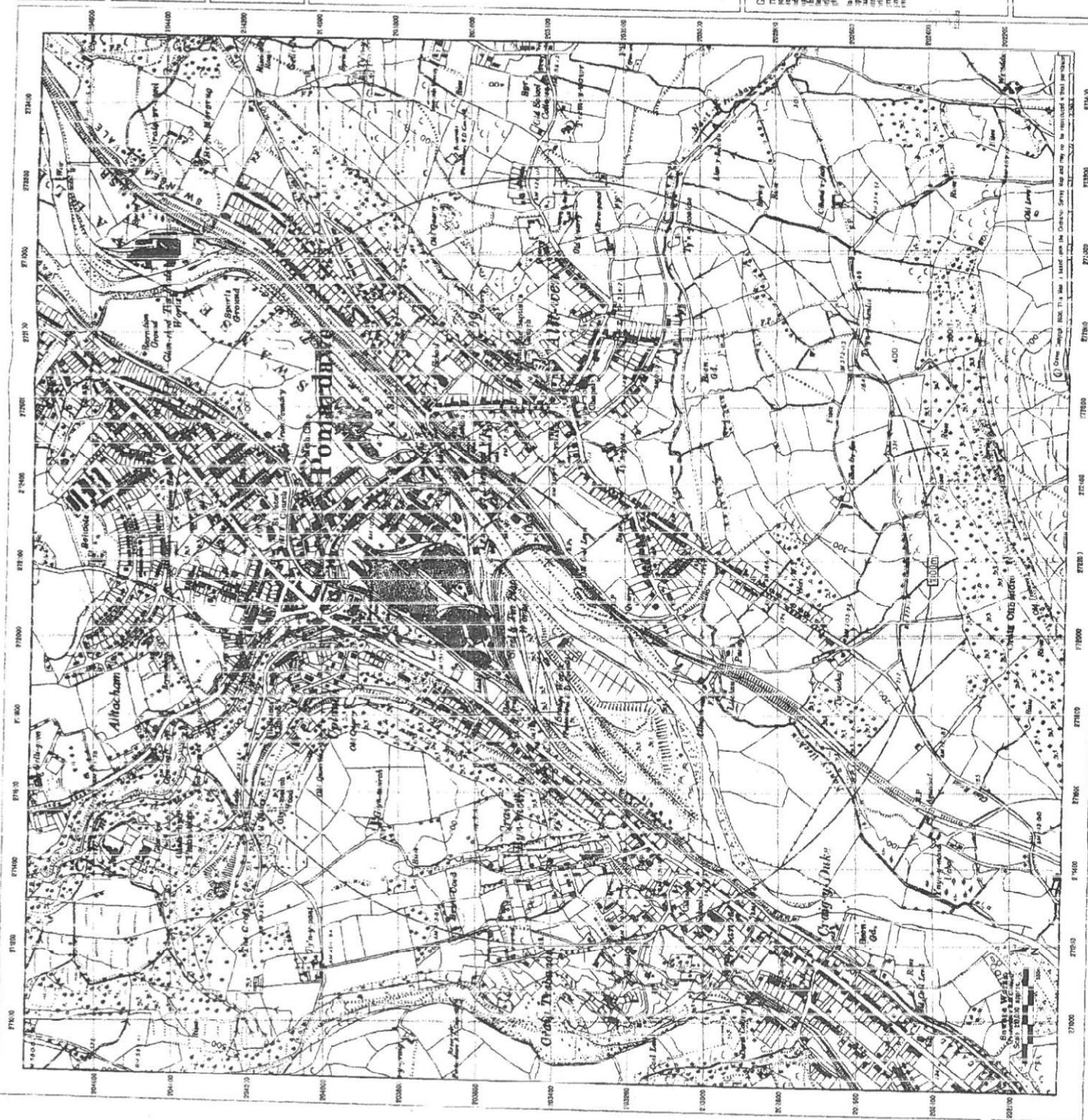
In Louisiana, snailshells are a byproduct of the sugar industry and at the local level, they are sold for \$1.00 per bushel. In 1983, the U.S. Postal Service began using snailshells as a postage stamp. The shells were used to make the postage stamps, and the shells were sold for \$1.00 per bushel. The shells were sold for \$1.00 per bushel. The shells were sold for \$1.00 per bushel.

0.9

Date(s) of Publication



LANDMARK
 Landmark Information Group Limited
7 Albany Court, Eagle Way, Salford
Greater Manchester M6 6JY
Tel: 0161 275 4112 Fax: 0161 275 4116



EnviroCheck

Environmental Site Sensitivity Data

CLIENT DETAILS

Customer Ref: Canal Niala
Oscar Fisher
Marlborough House Upper Marlborough's Road
St. ALBANS
Herts AL1 3UT

Order No. EH38219-1

SITE DETAILS

Company's Shift and Chemical Works
Allison
PCNFAJAWWE

Grid Reference: 278200 203400

Historical Map Legend

Quarry	Shingle	Railway over Road	Road over Railway
Gravel Pit	Sand Pit	Level Crossing	Railway over River
Other Pits		Road over River or Canal	Road over Stream
Mixed Wood	Rough Pasture	Road over Stream	Sunken Road
Marsh		Steeled Contour	Instrumental Contour

Arrow denotes flow of water

Ordinance Survey Plan

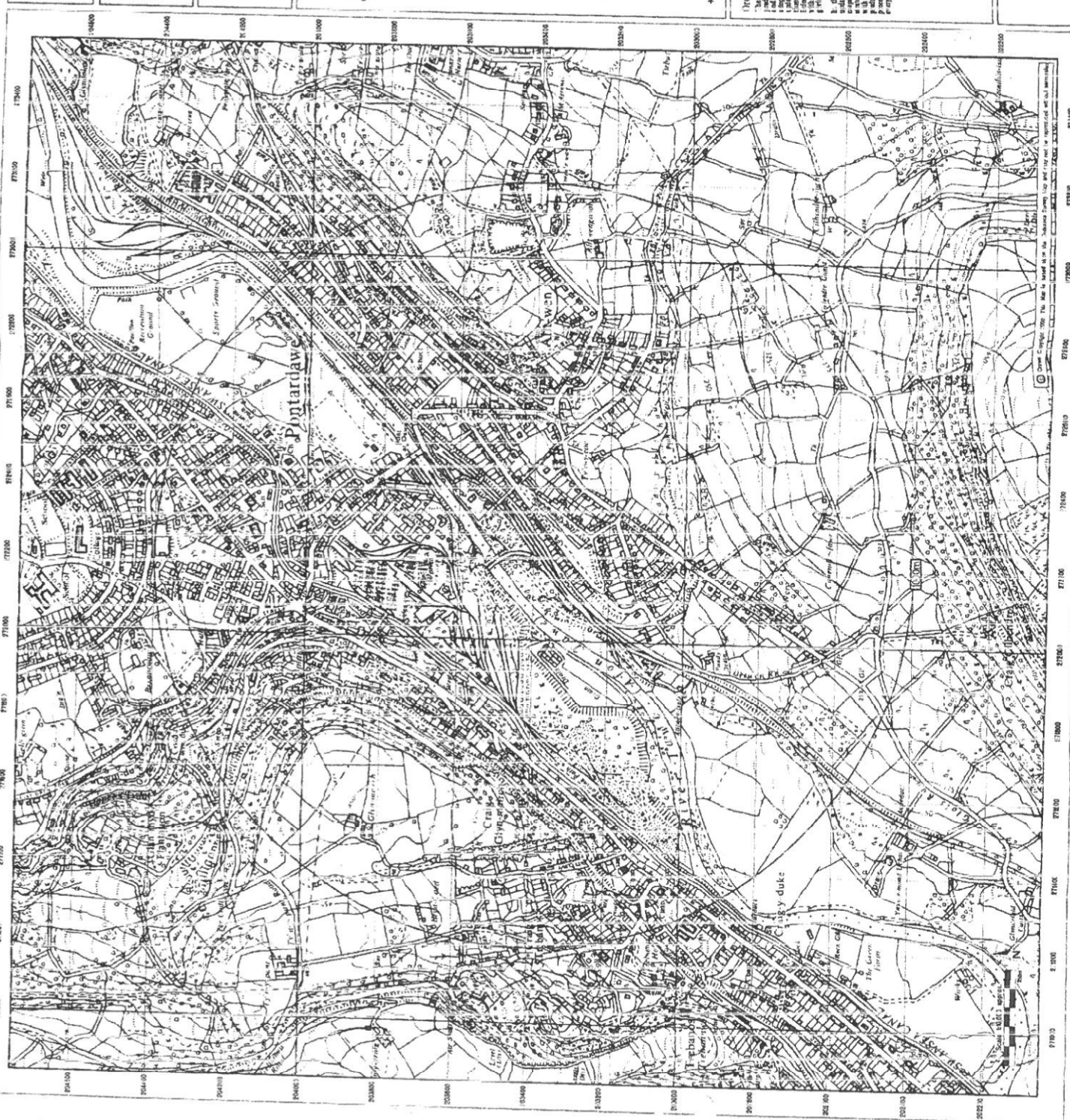
The Ordnance Survey plan was reproduced from the 1:25,000 scale map of the area, which was surveyed in 1962. The plan shows the site of the proposed development, which is a 1.5 hectare area of land, and the surrounding area. The plan also shows the location of the proposed development, which is a 1.5 hectare area of land, and the surrounding area. The plan also shows the location of the proposed development, which is a 1.5 hectare area of land, and the surrounding area.

Date(s) of Publication



Visit: www.ordnancesurvey.co.uk

Landmark Information Group Limited
7 Abbey Court, Elm's Way, St. Albans
Herts AL1 1JF
Tel: 01438 441100





Environmental Site Sensitivity Data

CLIENT DETAILS

Customer Ref: Carol Nisale
Oscar Fisher
Nuthborough House Upper Marlborough Road
ST ALBANS
Herts AL1 3JT

Order No. EH36219-1

SITE DETAILS

Grid Reference 272000 203400

Geop. Drift and Chemical Works

Alluvium

PONTADAWNE

Historical Map Legend	
	Shell Pit, Clay Pit or Quarry
	Gravel Pit
	Sand Pit
	Troughed Pit or Quarry
	Ridge or Silt Heap
	Lake, Loch or Pond
	Pylon
	Electricity Transmission Line
	Direction of Flow of Water
	Branch on
	Heath
	Rough Grassland
	Reeds
	Marsh
	Saltings
	Standard Gauge Multiple Track
	Single Gauge Track
	Road Under
	Road Over
	Levee
	Grassland
	Silt, Sand or Mineral Line
	Narrow Gauge

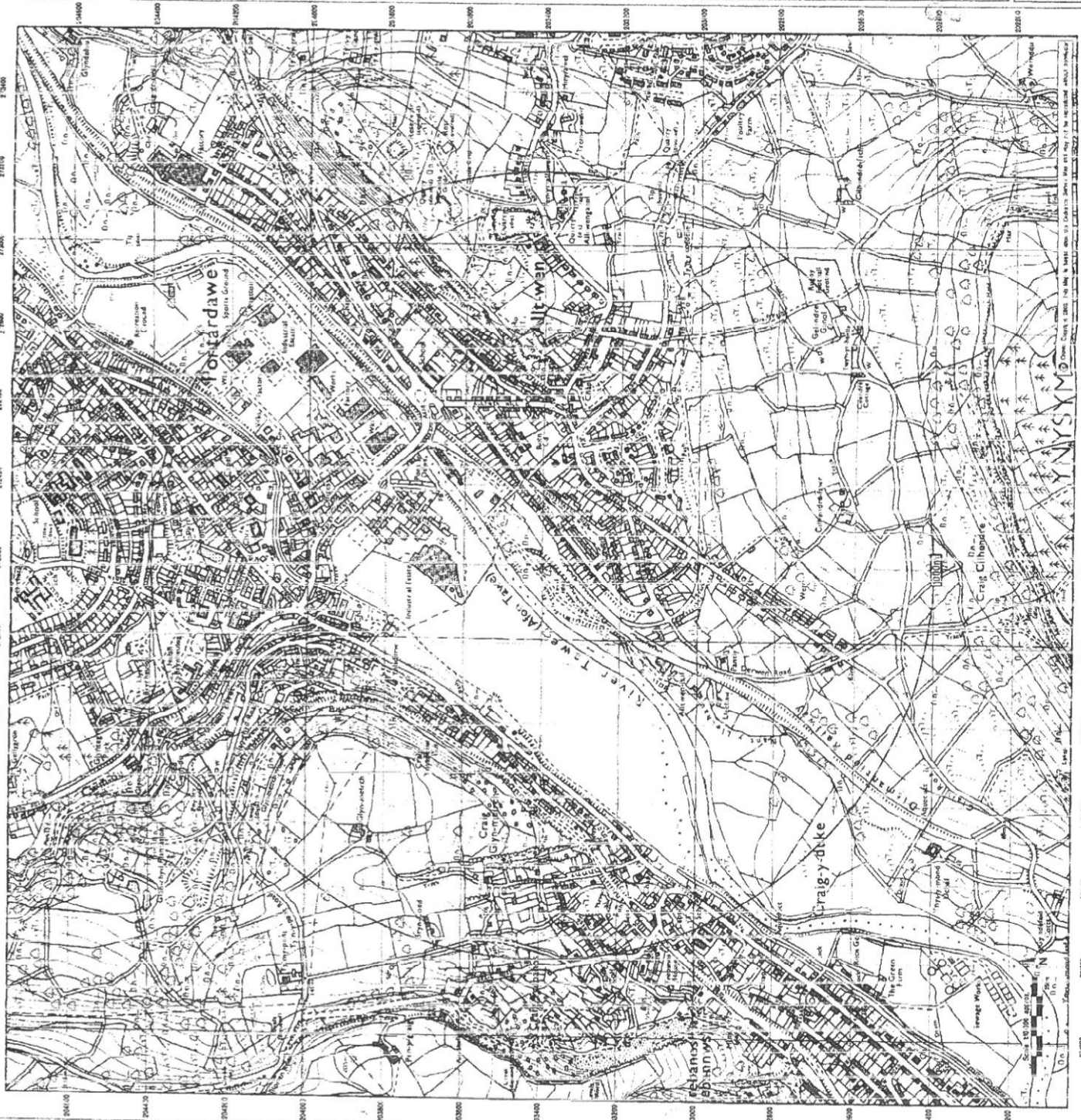
Orthorectified Survey Data
The historical survey data was derived from four maps produced between 1860 and 1900. The maps were produced by the Ordnance Survey and are based on a grid system. The maps are not to scale and are not intended to be used for navigation. The maps are provided for information only. The maps are not to be used for any other purpose. The maps are not to be used for any other purpose. The maps are not to be used for any other purpose.

Date of Publication



Leamster Information Group Limited
7 Abbey Court, Eagle Way, S.W. 10
Ealing, W5 3JY
LANDMARK Telephone 0202 547575 Fax 0202 547576

Via e-Postcard



EnviroCheck

Environmental Site Sensitivity Data

CLIENT DETAILS

Customer of: Cured Waste
 Oscar Faber
 Marlborough House Upper Marlborough Road
 ST ALBAN
 Herts AL1 3UT

Order No. ES36249-1

SITE DETAILS

Gwyn's Drift and Chemical Works
 Allwyn

Grid Reference 272200 233400

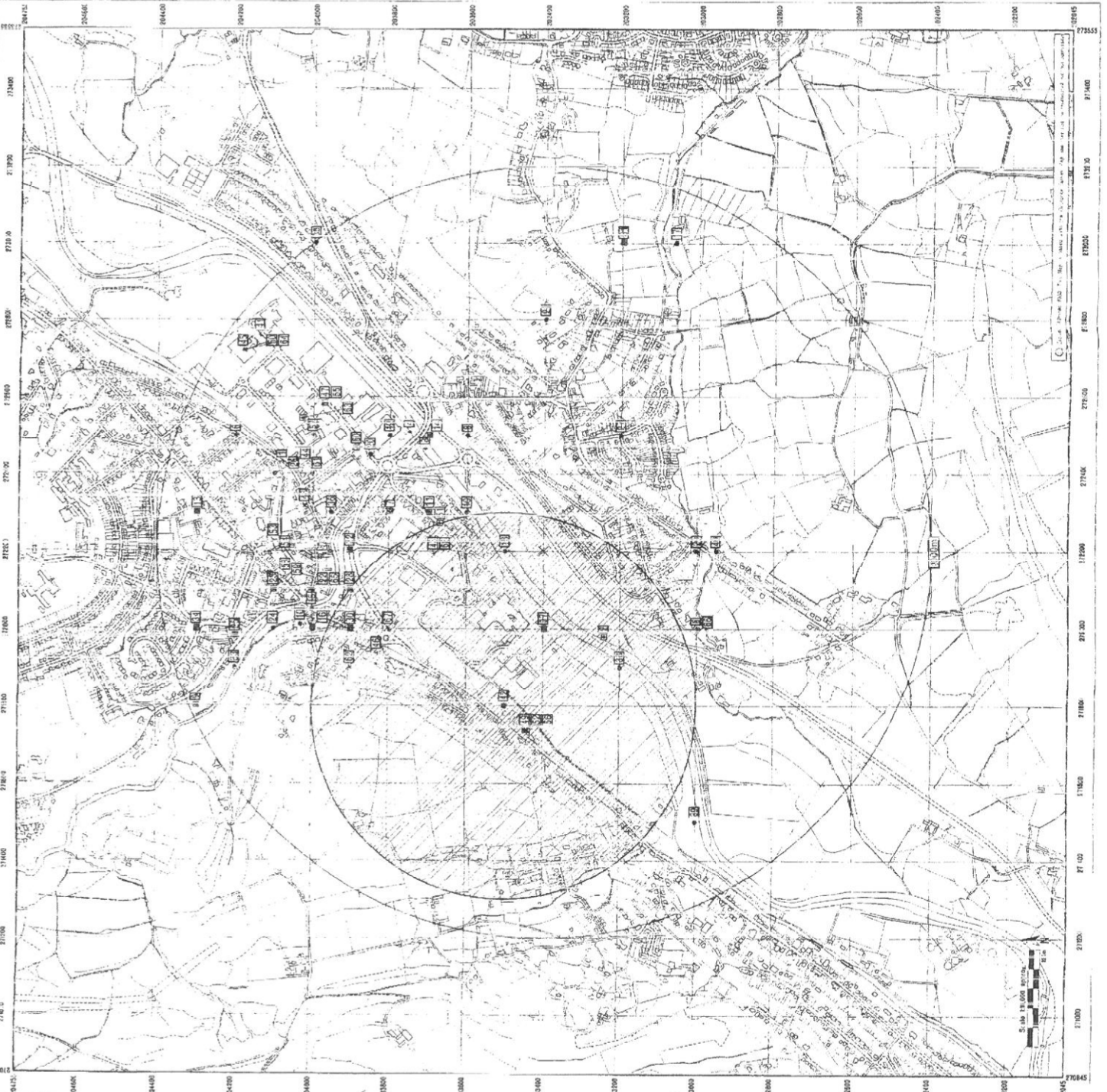
XYNT WAYE

21020104

KEY TO THE LEGEND DATABASE

- | | |
|--|--|
| <ul style="list-style-type: none"> Specified Site Buffer Reference Number Sevent of Type at Location Pylon or Mast and III ICS licensed Landfill Site ICS licensed Mineral Site ICS Airfield River Network and Water Feature Water Abstraction Discharge Consent Site of Special Scientific Interest Integrated Pollution Control Air Pollution Control Red List Discharge Consent | <ul style="list-style-type: none"> Enforcement or Prohibition Notice Prosecution Relating to Authorised Process Registered Radioactive Substance Post 1998 Planning Application (of Possible Contaminative Use) Was a Treatment or Disposal Site Was a Transfer Site Integrated Pollution Control Registered Waste Site Planning Hazardous Substance Consent Planning Hazardous Substance Enforcement Trade Directory Entry Fuel Station Entry Prosecution Relating to Controlled Waters Pollution Incident Relating to Controlled Waters COMAH Site NIHIS Site Explosive Site |
|--|--|

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APPENDIX 2

Pontardawe: Results of Chemical Analysis

Location	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
TP26	28	1	8	67	198	0.5	60	272
TP26	47	1	9	56	131	0.5	32	235
TP25	18	1	9	49	131	0.5	22	248
TP13	66	1	12	399	277	0.5	44	1910
TP14	25	1	10	19	29	0.5	14	82
TP15	60	1	11	38	34	0.5	24	137
TP129	66.4	0.3	8.04	78.1	26	0.25	13.4	46.6
TP129	57.5	0.3	6.99	75.2	21.4	0.33	11.8	33.9
TP128	68.6	0.75	9.91	87.8	193	0.31	43.1	204
TP128	676	1.51	11.9	110	87.2	0.87	43	266
TP128	183	0.89	15.7	87	180	0.56	49.3	245
TP128	219	0.37	18.2	64	131	0.45	46.3	286
TP128	135	1.05	17.9	84.2	86.1	0.21	58.6	165
TP128	21.9	0.33	16	17.9	22.5	0.06	24.3	59.4
TP130	46.2	2.08	17.6	154	39.9	0.1	77	171
TP130	33	0.29	12.2	85.6	15.1	0.06	51.9	62.2
TP130	15	0.3	14.2	15.2	22.3	0.06	20.9	54.6
TP130	46.2	0.18	7.3	40.3	28.7	0.17	21.9	50.1
TP130	10.9	0.43	14.7	17	33.4	0.27	24.1	79.4
TP130	41.7	0.3	12	20.4	22.4	0.17	19.5	51.8
TP130	6.12	0.31	13.3	12.2	15.6	0.1	21	45.8
TP17	20	1	3	46	136	0.5	36	180
TP126	133	1.37	19.8	592	2530	0.39	46.4	2340
TP126	16.9	0.31	15.3	46.1	28.4	0.08	34.9	92.8
TP126	24.6	0.3	17	27.2	57.2	0.08	46.1	100
TP18	5	1	10	20	16	0.5	6	39
TP129	36.5	0.64	7.97	47.7	49.3	0.23	26.9	79.8
BH9	65	0.66	10.5	59.1	13.7	0.07	16.2	24.1
BH9	14.9	0.31	15.8	15.4	25.4	0.06	27.1	77
BH9	20.9	0.32	14.1	24.9	20.9	0.1	30.9	141
TP23	10	1	13	35	43	0.5	26	99
TP23	9	1	19	22	34	0.5	17	58
TP103	36.1	0.31	18.4	57.2	103	0.25	46.3	144
TP124	53.8	1.22	26.5	106	225	0.26	31.4	369
TP124	53.1	1.34	23.6	68.6	154	0.14	24.3	265
TP124	34.9	1.05	25.9	21.2	70.5	0.27	12.5	58.5
TP124	35.3	1.47	33.3	19.8	81.4	0.14	6.37	86.7
TP124	39.8	0.32	23.1	63	108	0.15	123	139
TP124	30.9	0.42	26.2	49.5	113	0.13	26.1	114
TP124	31.1	0.87	24.2	19	63	0.08	11.9	61.8
TP118	17.4	0.29	17.4	18.9	19.5	0.06	22.7	63.3
TP118	28.6	0.6	22.8	22.4	31.5	0.55	24	81
TP118	24.6	1.11	20.3	19.9	22	0.21	21.1	64.5
TP118	25.1	0.55	16.8	28.2	24.6	0.16	17.4	65
TP118	24.4	0.28	21.5	23.8	25.7	0.31	27.1	72
TP118	22	0.27	18.4	19.8	18.5	0.14	28.3	83
TP118	26	0.29	20.6	21.2	17.7	0.13	25	84
TP118	21.8	0.29	22.8	26.1	27.5	0.17	30.6	92.4
TP24	15	1	19	54	73	0.5	27	136
TP24	88	1	17	1200	246	0.5	72	328
TP112	106	1.37	24.6	427	622	1.27	49.7	474
TP112	49.2	0.36	12.8	91.9	87.3	0.41	17.3	157
TP116	46.4	0.74	20.1	141	90	0.12	45.9	178
TP116	592	1.04	14.9	622	818	1.41	31.8	638
TP116	70.1	1.6	71.5	47.8	263	0.13	28.3	108
TP116	5.51	0.28	13.1	116	33.8	0.06	25.4	81
TP116	35.8	0.91	11.4	219	85.2	0.06	26.7	119
TP116	35.8	1.26	11.3	168	192	0.08	17.7	238
TP117	122	1.07	20.1	398	465	0.87	13.7	178
TP117	173	0.67	9.88	279	248	0.08	11.3	45
TP117	167	0.36	15.4	90.9	1040	0.11	9.55	52.9
TP117	221	1.53	23.5	92.6	1080	0.09	8.71	81.6
TP117	23.3	0.33	22.6	490	33.7	0.07	9.45	50.1
TP117	72.6	0.35	23.9	101	86.5	0.08	9.59	702
TP11	210	1	10	345	2860	48	12	150

Location	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
TP21	29	1	17	49	54	0.5	51	165
TP123	50.9	1.19	6	85.1	357	0.18	31.9	207
TP123	43.4	1.07	29.5	81.5	231	0.22	34.4	222
TP123	46.9	1.59	22.3	81.5	167	0.32	28.6	267
TP123	22.5	0.67	20.6	41	102	0.13	23.4	111
TP106	57.9	0.42	12.1	212	397	0.8	28	123
TP106	87.1	0.33	15.7	153	313	0.61	28.3	112
TP106	46.1	1.15	19.3	207	30.3	0.11	36.8	322
TP121	53.8	1.91	18.8	193	251	0.75	50.8	391
TP121	37.5	2.21	17.1	176	1320	0.75	47.4	351
TP121	21.6	0.52	22.5	29.3	24.4	0.09	19.4	75
TP111	252	1.48	20.7	222	995	2.2	51.2	459
TP111	116	2.55	23.2	405	507	2.16	44	748
TP111	58.8	2.05	15.3	164	238	0.18	52.1	445
TP111	68.2	1.01	17.7	751	198	0.2	25.1	365
TP110	28.3	2.75	10.6	1090	119	0.16	10.5	2510
TP110	139	3.41	16.9	2430	9500	1.16	28.7	1450
TP10	47	1	16	111	43	0.5	8	68
TP109	78.7	0.5	16.3	174	545	0.46	26.5	123
TP109	54.3	2.27	12	693	480	0.14	30.4	368
TP115	40.2	0.42	17	41.9	107	0.12	28.1	151
TP115	41.3	0.36	19.9	134	96.7	0.15	35.4	192
TP115	40.3	0.29	17.7	106	136	0.09	33.4	192
TP115	26.4	0.45	16.1	57.2	109	0.17	30.9	146
TP115	26.5	0.38	17	80	68.7	0.1	23.2	99.5
TP115	32.9	4.21	12.9	137	121	0.14	22.9	864
TP115	42.1	2.65	15.4	93.2	52.8	0.1	25.6	610
TP115	42.6	1.34	12.4	222	103	0.13	24.7	411
TP9	87	1	18	426	1290	0.5	71	
TP114	66.9	2.93	25.2	157	577	0.71	44.1	508
TP114	44.4	1.38	39.5	150	179	0.22	54.7	313
TP114	51.9	1.27	23.5	117	262	0.18	55.9	294
TP114	85.1	1.37	19.5	195	184	0.24	45.9	267
TP114	70.9	2.34	21	129	167	0.48	60.2	283
TP114	137	2.41	34.9	350	1650	1.11	46.7	369
TP114	84.8	2.35	24.4	494	469	0.34	65.9	495
TP108	64.6	0.99	30.5	147	786	0.42	55.7	206
TP108	55.2	0.86	17.6	154	2840	1.52	31.1	194
TP108	49.8	0.3	24.1	110	1120	0.4	16.4	146
TP108	144	1.63	30.1	692	5970	0.55	34.4	489
TP108	1.15	18.1	22.9	313	4410	0.7	29.6	201
TP108	140	0.91	13.7	621	2950	0.33	31.9	420
TP8	20	1	29	58	133	0.5	39	155
TP107	27.3	0.56	15.6	82	82.2	0.17	32.6	149
TP107	539	0.38	12.4	137	665	0.75	8.82	80.5
TP107	301	0.39	26	39.7	657	0.3	16.3	32.5
TP107	195	0.42	14.6	20.8	270	0.14	10.8	45.7
TP107	257	0.65	11.8	90.5	244	0.24	8.49	65.8
TP107	243	0.54	39.2	77.5	702	1.18	17.5	68.6
TP113	89.5	1.98	16.1	442	1440	0.47	33.8	569
TP113	141	3.64	21.3	1110	1380	0.84	34.8	997
TP113	111	1.89	21.6	845	563	0.4	42.6	963
TP113	136	0.99	11.8	483	595	0.75	20.5	383
TP113	130	1.71	17.3	632	1020	1.06	31.4	528
TP113	35.3	0.65	20	163	177	0.17	20.4	
TP113	23.6	0.49	16.7	154	68	0.17	20.6	248
TP113	53.7	1	11.2	318	529	0.35	18.5	476
TP120	52.4	2.78	20.2	304	290	0.56	53.9	460
TP120	33.8	1.01	26.5	61.7	45	0.16	34.6	137
TP120	63.6	2.4	15.7	439	5700	1.85	66.5	414
TP120	45.8	2.77	18.2	236	582	0.44	50.7	497
TP120	67.8	2.97	17.5	241	6050	1.49	82.2	375
TP120	33.7	1.23	11.3	117	2350	1.69	46.2	214
TP120	26.8	1.31	14.1	108	228	0.16	34.1	213
TP119	36.1	1.39	42.6	171	147	0.21	107	306
TP119	32.6	1.62	18.2	127	310	0.31	42.8	346
TP119	63.1	0.76	21.7	379	152	0.18	10.9	213
TP119	28.2	1.04	19.7	48.6	30.6	0.09	13.1	127

Location	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
TP119	25.3	1.28	23.9	174	66.1	0.2	26.1	164
TP7	19	1	13	72	49	0.5	22	98
TP122	37.4	1.1	14.5	109	370	0.51	25	357
TP122	40.5	0.47	23.3	52.9	122	0.14	22.5	107
TP122	5510	5.8	16.7	380	3140	9.86	53.2	327
TP122	20.4	0.3	19.1	8.19	16.1	0.06	9.26	29
TP122	1260	1.43	19	164	1590	13.2	37.9	387
TP122	199	4.43	8.35	252	206	0.55	34.5	1810
TP122	758	4.23	26.5	578	1720	7.46	87.9	523
TP6	37	1	16	70	987	0.5	29	330
TP104	19	0.31	20.3	30.9	97.1	0.23	31.1	105
TP104	13.1	0.29	12.5	12	8.41	0.09	19.6	46.1
TP104	16.9	0.27	12.6	50.3	53.3	0.27	17	31
TP4	27	8	11	829	119	0.5	39	5610
TP3	10	1	13	24	99	0.5	23	146
TP2	18	1	12	34	113	0.5	14	185
TP102	390	8.21	23.3	138	1520	3.03	53	786
TP102	193	13.5	34.6	269	2610	1.02	66.3	1270
TP102	49.6	0.65	11.8	1190	656	0.21	7.03	110
TP102	55.9	1.21	28.8	58.9	196	0.26	43	199
TP102	30.8	0.33	22	42.7	101	0.12	26.6	90.6
TP1	114	1	23	165	4900	2	64	883
TP1	3	1	2	2	19	0.5	2	11
TP101	81.5	4.32	24.9	137	1930	2.42	49.9	781
TP101	105	5.91	21.2	159	12200	2.78	68.3	800
TP101	40.5	0.34	9.93	13.3	397	0.31	12.9	41.8
TP5	49	1	39	89	388	0.5	58	996
TP5	68	1	22	312	262	0.5	40	402

Leachate Results, Pontedawe

Analyte (method)	EQS	TP128/1.0m	TP129/2.0m	TP130/2.0m	TP122/1.5m
Arsenic (M)	50	< 4.44	< 4.44	< 4.44	16.1
Boron (M)	2000	23.1	14.2	68.2	52.9
Cadmium (M)	5	< 0.56	< 0.56	< 0.56	29.9
Chromium (M)	5-250	< 4.44	< 4.44	< 4.44	< 4.44
Copper (M)	1-28	< 4.44	< 4.44	< 4.44	10.9
Lead (M)	4-250	< 1.11	< 1.11	< 1.11	2.92
Nickel (M)	50-200	< 4.44	< 4.44	< 4.44	24.8
Selenium (M)	n/a	< 2.22	< 2.22	< 2.22	13.1
Zinc (M)	8-500	25.2	16.3	13.4	840

Analyte (method)	EQS	TP128/1.0m	TP129/2.0m	TP130/2.0m	TP122/1.5m
Arsenic (M)	50	< 12.01	< 11.34	< 9.80	41.5
Boron (M)	2000	62.4	36.2	150	137
Cadmium (M)	5	< 1.50	< 1.42	< 1.23	77.2
Chromium (M)	5-250	< 12.01	< 11.34	< 9.80	< 11.47
Copper (M)	1-28	< 12.01	< 11.34	< 9.80	28.1
Lead (M)	4-250	< 3.00	< 2.83	< 2.45	7.53
Nickel (M)	50-200	< 12.01	< 11.34	< 9.80	64.0
Selenium (M)	n/a	< 6.01	< 5.67	< 4.90	33.8
Zinc (M)	8-500	68.1	41.6	29.5	2170

Analyte (method)	EQS	TP128/1.0m	TP129/2.0m	TP130/2.0m	TP122/1.5m
Arsenic (M)	50	< 12.01	< 11.34	< 9.80	41.5
Boron (M)	2000	62.4	36.2	150	137
Cadmium (M)	5	< 1.50	< 1.42	< 1.23	77.2
Chromium (M)	5-250	< 12.01	< 11.34	< 9.80	< 11.47
Copper (M)	1-28	< 12.01	< 11.34	< 9.80	28.1
Lead (M)	4-250	< 3.00	< 2.83	< 2.45	7.53
Nickel (M)	50-200	< 12.01	< 11.34	< 9.80	64.0
Selenium (M)	n/a	< 6.01	< 5.67	< 4.90	33.8
Zinc (M)	8-500	68.1	41.6	29.5	2170

Analyte (method)	EQS	TP128/1.0m	TP129/2.0m	TP130/2.0m	TP122/1.5m
Arsenic (M)	50	< 12.01	< 11.34	< 9.80	74.8
Boron (M)	2000	67.3	38.8	146	125
Cadmium (M)	5	< 1.50	< 1.42	< 1.23	61.4
Chromium (M)	5-250	< 12.01	< 11.34	< 9.80	< 11.47
Copper (M)	1-28	< 12.01	< 11.34	< 9.80	32.3
Lead (M)	4-250	< 3.00	< 2.83	< 2.45	10.09
Nickel (M)	50-200	< 19.65	< 11.34	< 9.80	44.4
Selenium (M)	n/a	< 6.01	< 5.67	< 4.90	40.3
Zinc (M)	8-500	80.5	46.4	35.9	1097

Analyte (method)	EQS	TP128/1.5m	TP128/2.0m	TP128/1.0m	TP129/2.0m
Arsenic (M)	50	< 4.44	< 4.44	< 4.44	4.4
Boron (M)	2000	9.9	7.1	25	15
Cadmium (M)	5	< 0.56	< 0.56	< 0.56	0.6
Chromium (M)	5-250	< 4.44	< 4.44	< 4.44	< 4.44
Copper (M)	1-28	< 4.44	< 4.44	< 4.44	4.4
Lead (M)	4-250	< 1.11	< 1.11	< 1.11	1.11
Nickel (M)	50-200	< 4.44	< 4.44	< 7.27	4.4
Selenium (M)	n/a	< 2.22	< 2.22	< 2.22	2.2
Zinc (M)	8-500	17.3	13.0	29.8	18

Analyte (method)	EQS	TP128/1.5m	TP128/2.0m	TP128/1.0m	TP129/2.0m
Arsenic (M)	50	< 12.13	< 13.68	< 12.01	11.3
Boron (M)	2000	26.9	22.0	67	39
Cadmium (M)	5	< 1.52	< 1.71	< 1.50	1.4
Chromium (M)	5-250	< 12.13	< 13.68	< 12.01	< 11.34
Copper (M)	1-28	< 12.13	< 13.68	< 12.01	11.3
Lead (M)	4-250	< 3.03	< 3.42	< 3.00	2.83
Nickel (M)	50-200	< 12.13	< 13.68	< 19.65	11.3
Selenium (M)	n/a	< 6.06	< 6.84	< 6.01	5.7
Zinc (M)	8-500	47.2	40.0	80.5	46

Analyte (method)	EQS	TP130/2.0m	TP122/1.5m	TP128/1.5m	TP128/2.0m
Arsenic (M)	50	< 4.44	< 29.00	< 4.44	7.1
Boron (M)	2000	66.2	48.3	13	12
Cadmium (M)	5	< 0.56	< 23.80	< 0.56	0.6
Chromium (M)	5-250	< 4.44	< 4.44	< 4.44	< 4.44
Copper (M)	1-28	< 4.44	< 12.50	< 4.44	4.4
Lead (M)	4-250	< 1.11	< 3.91	< 1.11	1.11
Nickel (M)	50-200	< 4.44	< 17.20	< 4.44	4.4
Selenium (M)	n/a	< 2.22	< 15.60	< 2.22	2.2
Zinc (M)	8-500	16.3	425.0	13.4	11

Analyte (method)	EQS	TP130/2.0m	TP122/1.5m	TP128/1.5m	TP128/2.0m
Arsenic (M)	50	< 9.80	< 74.84	< 12.13	21.7
Boron (M)	2000	146.0	124.6	36	37
Cadmium (M)	5	< 1.23	< 61.42	< 1.52	1.7
Chromium (M)	5-250	< 9.80	< 11.47	< 12.13	< 13.68
Copper (M)	1-28	< 9.80	< 32.26	< 12.13	13.7
Lead (M)	4-250	< 2.45	< 10.09	< 3.03	3.42
Nickel (M)	50-200	< 9.80	< 44.39	< 12.13	13.7
Selenium (M)	n/a	< 4.90	< 40.26	< 6.06	6.8
Zinc (M)	8-500	35.9	1096.8	36.6	34

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
 REF: 31070
 DATE: JANUARY 2004

SAMPLE LOCATION	TP101	TP101	TP101	TP102	TP102	TP102	TP102	TP102	TP102	TP102	TP104	TP104
DEPTH (m)	0.50	1.00	2.00	0.50	1.00	1.50	2.50	3.00	4.00	0.50	1.00	1.50
Arsenic	81.5	105	40.5	390	193	49.6	55.9	24	30.8	36.1	19	13.1
Boron	0.42	0.45	0.15	0.42	0.99	1.04	0.79	0.23	0.41	0.43	0.17	0.26
Cadmium	4.32	5.91	<0.34	8.21	13.5	0.65	1.21	<0.29	<0.33	0.31	<0.31	<0.29
Chromium (total)	24.9	21.2	9.93	23.3	34.6	11.8	28.8	21.8	22	18.4	20.3	12.5
Copper	137	159	13.3	138	269	1190	58.9	23.9	42.7	57.2	30.9	12
Mercury	2.42	2.78	0.31	3.03	1.02	0.21	0.26	0.25	0.12	0.25	0.23	0.09
Nickel	49.9	68.3	12.9	53	66.3	<7.03	43	27.7	26.6	46.3	31.1	19.6
Lead	1930	12200	397	1520	2610	656	196	16.6	101	103	97.1	8.41
Selenium	7.28	7.55	<1.34	3.25	3.7	<1.14	<1.58	<1.16	<1.32	<1.16	<1.24	<1.18
Zinc	781	800	41.8	786	1270	110	199	92.5	90.6	144	105	46.1

Results expressed as mg/kg air dried unless otherwise stated.
 Any outlier values which exceed relevant SGVs are shown shaded.

Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
 REF: 31070
 DATE: JANUARY 2004

SAMPLE LOCATION	TP104	TP106	TP106	TP106	TP107	TP107	TP107	TP107	TP107	TP107	TP107	TP108	TP108	TP108
DEPTH (m)	2.00	0.50	1.00	3.00	0.50	1.00	1.50	2.00	2.50	3.00	0.50	1.00	0.50	1.00
Arsenic	16.9	57.9	87.1	46.1	27.3	539	301	195	257	243	64.6	55.2	64.6	55.2
Boron	0.24	0.3	0.45	0.68	0.2	0.55	0.17	0.19	0.1	0.29	0.64	0.46	0.64	0.46
Cadmium	<0.27	0.42	<0.33	1.15	0.56	0.38	<0.39	0.42	0.65	0.54	0.99	0.86	0.99	0.86
Chromium (total)	12.6	12.1	15.7	19.3	15.6	12.4	26	14.6	11.8	39.2	30.5	17.6	30.5	17.6
Copper	50.3	212	153	207	82	137	39.7	20.8	90.5	77.5	147	154	147	154
Mercury	0.27	0.8	0.61	0.11	0.17	0.75	0.3	0.14	0.24	1.18	0.42	1.52	0.42	1.52
Nickel	17	28	28.3	36.8	32.6	8.82	16.3	10.8	8.49	17.5	55.7	31.1	55.7	31.1
Lead	53.5	397	313	30.3	82.2	665	657	270	244	702	786	2840	786	2840
Selenium	2.39	2.01	4.1	1.56	<1.14	2.09	<1.58	<1.5	<1.46	2.18	<1.36	4.1	<1.36	4.1
Zinc	31	123	112	322	149	80.5	32.5	45.7	65.8	68.6	206	194	206	194

Results expressed as mg/kg air dried unless otherwise stated.
 Any outlier values which exceed relevant SGVs are shown shaded.

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SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
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SAMPLE LOCATION	TP108	TP108	TP108	TP108	TP109	TP109	TP110	TP110	TP111	TP111	TP111	TP111
DEPTH (m)	2.00	2.50	3.00	3.50	0.50	0.50	0.50	0.50	0.50	1.00	1.00	1.50
Arsenic	49.8	144	181	140	78.7	54.3	28.3	139	252	116	58.8	68.2
Boron	0.34	0.51	0.42	0.44	0.5	0.42	0.25	0.35	0.5	0.56	0.51	0.48
Cadmium	0.3	1.63	1.15	0.91	0.5	2.27	2.75	3.41	1.48	2.55	2.05	1.01
Chromium (total)	24.1	30.1	22.9	13.7	16.3	12	10.6	16.9	20.7	23.2	15.3	17.7
Copper	110	692	313	621	174	693	1090	2430	222	405	164	751
Mercury	0.4	0.55	0.7	0.33	0.46	0.14	0.16	1.16	2.2	2.16	0.18	0.2
Nickel	16.4	34.4	29.6	31.9	26.5	30.4	10.5	28.7	51.2	44	52.1	25.1
Lead	1120	5970	4410	2950	545	480	119	9500	995	507	238	198
Selenium	<1.22	3.25	9.43	3.75	2.14	2.76	<1.24	42.4	5.37	3.28	4.76	4.4
Zinc	146	489	201	420	123	368	2510	1450	459	748	445	365

Results expressed as mg/kg air dried unless otherwise stated.
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Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
REF: 31070
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Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
REF: 31070
DATE: JANUARY 2004

SAMPLE LOCATION	TP114	TP114	TP114	TP114	TP115	TP115	TP115	TP115	TP115	TP115	TP116
DEPTH (m)	2.00	2.50	3.00	3.50	TP115	TP115	TP115	TP115	TP115	TP115	TP116
Arsenic	85.1	70.9	137	84.8	26.4	40.2	41.3	2.00	2.50	3.00	0.5
Boron	0.67	0.77	0.6	0.61	0.18	0.36	0.22	0.2	0.42	0.27	0.36
Cadmium	1.37	2.34	2.41	2.35	0.45	0.42	0.36	<0.29	0.38	4.21	0.74
Chromium (total)	19.5	21	34.9	24.4	16.1	17	19.9	17.7	17	12.9	20.1
Copper	195	129	350	494	57.2	41.9	134	106	80	137	141
Mercury	0.24	0.48	1.11	0.34	0.17	0.12	0.15	0.09	0.1	0.14	0.12
Nickel	45.9	60.2	46.7	65.9	30.9	28.1	35.4	33.4	23.2	22.9	45.9
Lead	184	167	1650	469	109	107	96.7	136	68.7	121	90
Selenium	1.82	2.08	<1.34	<1.38	<1.08	<1.22	<1.18	<1.14	<1.22	2.46	<1.24
Zinc	267	283	369	495	146	151	192	192	99.5	864	178

Results expressed as mg/kg air dried unless otherwise stated. Any outlier values which exceed relevant SGVs are shown shaded.

Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
 REF: 31070
 DATE: JANUARY 2004

SAMPLE LOCATION	TP116	TP116	TP116	TP116	TP116	TP117	TP117	TP117	TP117	TP117	TP117	TP117	TP117	TP117	TP118	TP118
DEPTH (m)	1.00	1.50	2.00	2.50	3.00	0.50	1.00	1.50	2.00	2.50	3.00	0.50	1.00	1.50	2.00	2.50
Arsenic	592	70.1	0.52	0.84	0.85	122	173	167	221	23.3	72.6	17.4	28.6			
Boron	0.34					0.39	0.21	0.33	0.49	0.3	0.5	0.26	0.19			
Cadmium	1.04	1.6	<0.28	0.91	1.26	1.07	0.67	0.36	1.53	<0.33	<0.35	<0.29	0.6			
Chromium (total)	14.9	71.5	13.1	11.4	11.3	20.1	9.88	15.4	23.5	22.6	23.9	17.4	22.8			
Copper	622	47.8	116	219	168	398	279	90.9	92.6	490	101	18.9	22.4			
Mercury	1.41	0.13	<0.06	<0.06	0.08	0.87	0.08	0.11	<0.09	<0.07	0.08	<0.06	0.55			
Nickel	31.8	28.3	25.4	26.7	17.7	13.7	11.3	9.55	<8.71	9.45	9.59	22.7	24			
Lead	818	263	33.8	85.2	192	465	248	1040	1080	33.7	86.5	19.5	31.5			
Selenium	3.6	<1.62	<1.12	7.64	11.3	<1.44	5.83	<1.28	<1.74	<1.32	<1.40	<1.18	<1.16			
Zinc	638	108	81	119	238	178	45	52.9	81.6	50.1	702	63.3	81			

Results expressed as mg/kg air dried unless otherwise stated.
 Any outlier values which exceed relevant SGVs are shown shaded.

Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
 REF: 31070
 DATE: JANUARY 2004

SAMPLE LOCATION	TP118	TP118	TP118	TP118	TP118	TP118	TP118	TP118	TP119	TP119	TP119	TP119	TP119	TP120	TP120
DEPTH (m)	1.50	2.00	2.50	3.00	3.50	4.00	4.00	4.00	0.50	1.00	2.00	3.00	4.00	0.50	1.00
Arsenic	24.6	25.1	24.4	22	26	21.8	0.22	0.36	36.1	32.6	63.1	28.2	25.3	26.8	52.4
Boron	0.27	0.28	2.5	3	3.5	0.22	0.22	0.36	0.36	0.62	0.48	0.38	0.22	0.36	0.84
Cadmium	1.11	0.55	<0.28	<0.27	<0.29	<0.29	<0.29	1.39	1.39	1.62	0.76	1.04	1.28	1.31	2.78
Chromium (total)	20.3	16.8	21.5	18.4	20.6	22.8	22.8	42.6	42.6	18.2	21.7	19.7	23.9	14.1	20.2
Copper	19.9	28.2	23.8	19.8	21.2	26.1	26.1	171	171	127	379	48.6	174	108	304
Mercury	0.21	0.16	0.31	0.14	0.13	0.17	0.17	0.21	0.21	0.31	0.18	0.09	0.2	0.16	0.56
Nickel	21.1	17.4	27.1	28.3	25	30.6	30.6	107	107	42.8	10.9	13.1	26.1	34.1	53.9
Lead	22	24.6	25.7	18.5	17.7	27.5	27.5	147	147	310	152	30.6	66.1	228	290
Selenium	<1.2	<1.26	<1.14	<1.06	<1.14	<1.14	<1.14	<1.16	<1.16	<1.22	4.44	<1.24	<1.14	<1.18	1.7
Zinc	64.5	65	72	83.5	84	92.4	92.4	306	306	346	213	127	164	213	460

Results expressed as mg/kg air dried unless otherwise stated.
 Any outlier values which exceed relevant SGVs are shown shaded.

Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
 REF: 31070
 DATE: JANUARY 2004

SAMPLE LOCATION	TP120	TP120	TP120	TP120	TP120	TP120	TP120	TP121	TP121	TP121	TP122	TP122	TP122
DEPTH (m)	1.50	2.00	2.50	3.00	3.50	0.50	1.50	2.00	0.50	1.00	1.50	2.50	3.00
Arsenic	33.8	63.6	45.8	67.8	33.7	53.8	37.5	21.6	37.4	40.5	55.10	20.4	1260
Boron	0.44	0.4	0.74	0.34	0.23	0.61	0.13	0.29	0.32	0.26	0.38	0.38	0.36
Cadmium	1.01	2.4	2.77	2.97	1.23	1.91	2.21	0.52	1.1	0.47	5.8	<0.3	1.43
Chromium (total)	26.5	15.7	18.2	17.5	11.3	18.8	17.1	22.5	14.5	23.3	16.7	19.1	19
Copper	61.7	439	236	241	117	193	176	29.3	109	52.9	380	8.19	164
Mercury	0.16	1.85	0.44	1.49	1.69	0.75	0.75	0.09	0.51	0.14	9.86	<0.06	13.2
Nickel	34.6	66.5	50.7	82.2	46.2	50.8	47.4	19.4	25	22.5	53.2	9.26	37.9
Lead	45	5700	582	6050	2350	251	1320	24.4	370	122	3140	16.1	1590
Selenium	<1.26	8.28	2.56	20.4	12	1.83	7.62	<1.14	<1.12	<1.18	27.7	<1.18	12.7
Zinc	137	414	497	375	214	391	351	75	357	107	327	29	387

Results expressed as mg/kg air dried unless otherwise stated.
 Any outlier values which exceed relevant SGVs are shown shaded.

Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
 REF: 31070
 DATE: JANUARY 2004

SAMPLE LOCATION	TP122	TP122	TP123	TP123	TP123	TP123	TP123	TP123	TP124	TP124	TP124	TP124	TP124	TP124
DEPTH (m)	3.50	4.00	0.50	1.00	1.50	2.00	0.50	1.00	1.50	2.00	2.50	3.00	3.50	
Arsenic	199	758	50.9	43.4	46.9	22.5	53.8	53.1	34.9	35.3	39.8	30.9	31.1	
Boron	0.31	0.46	0.21	0.24	0.4	0.3	0.42	0.7	0.07	0.18	0.3	0.32	0.25	
Cadmium	4.43	4.23	1.19	10.7	1.59	0.67	1.22	1.34	1.05	1.47	<0.32	0.42	0.87	
Chromium (total)	8.35	26.5	19.6	29.5	22.3	20.6	26.5	23.6	25.9	33.3	23.1	26.2	24.2	
Copper	252	578	85.1	81.4	81.5	41	106	68.6	21.2	19.8	63	49.5	19	
Mercury	0.55	7.46	0.18	0.22	0.32	0.13	0.26	0.14	0.27	0.14	0.15	0.13	0.08	
Nickel	34.5	87.9	31.9	34.4	28.6	23.4	31.4	24.3	12.5	<6.37	123	26.1	11.9	
Lead	206	1720	357	231	167	102	225	154	70.5	81.4	108	113	63	
Selenium	<1.8	11.4	<1.26	<1.24	<1.3	<1.22	<1.42	<1.32	<1.18	<1.28	<1.3	<1.4	<1.28	
Zinc	1810	523	207	222	267	111	369	265	58.5	86.7	139	114	61.8	

Results expressed as mg/kg air dried unless otherwise stated.
 Any outlier values which exceed relevant SGVs are shown shaded.

Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
REF: 31070
DATE: JANUARY 2004

SAMPLE LOCATION	TP125	TP126	TP126	TP126	TP128	TP128	TP128	TP128	TP128	TP128	TP128	TP129	TP129	TP129
DEPTH (m)	1.00	0.5	1.00	1.50	0.50	1.00	1.50	2.00	2.50	3.00	0.50	1.00	1.50	1.50
Arsenic	34.9	133	16.9	24.6	68.6	676	183	219	135	21.9	36.5	66.4	57.5	57.5
Boron	0.17	0.41	0.15	0.15	0.17	0.29	0.28	0.33	0.39	0.18	0.15	0.19	0.37	0.37
Cadmium	1.61	1.37	<0.31	<0.3	0.75	1.51	0.89	<0.37	1.05	0.33	0.64	<0.3	<0.3	<0.3
Chromium (total)	24	19.8	15.3	17	9.91	11.9	15.7	18.2	17.9	16	7.97	8.04	6.99	6.99
Copper	90.7	592	46.1	27.2	87.8	110	87	64	84.2	17.9	47.7	78.1	75.2	75.2
Mercury	0.14	0.39	0.08	0.08	0.31	0.87	0.56	0.45	0.21	<0.06	0.23	0.25	0.33	0.33
Nickel	28.3	46.4	34.9	46.1	43.1	43	49.3	46.3	58.6	24.3	26.9	13.4	11.8	11.8
Lead	6940	2530	28.4	57.2	193	87.2	180	131	86.1	22.5	49.3	26	21.4	21.4
Selenium	1.29	<3.03	<3.09	<3.04	<2.91	<3.28	<3.31	<3.7	<3.3	<3.07	<2.98	2.36	1.95	1.95
Zinc	352	2340	92.8	100	204	266	245	286	165	59.4	79.8	46.6	33.9	33.9

Results expressed as mg/kg air dried unless otherwise stated.
Any outlier values which exceed relevant SGVs are shown shaded.

Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
 REF: 31070
 DATE: JANUARY 2004

SAMPLE LOCATION	TP129	TP129	TP129	TP130	TP130	TP130	TP130	TP130	TP130	TP130	TP130	TP132	TP132	TP132
DEPTH (m)	2.00	3.00	3.50	0.50	1.00	1.50	2.00	3.00	3.50	4.00	0.50	1.00	1.50	
Arsenic	65	14.9	20.9	46.2	33	15	46.2	10.9	41.7	6.12	49.7	418	40	
Boron	0.23	0.31	0.17	0.71	0.74	0.3	0.38	0.49	0.34	0.35	0.63	0.72	0.25	
Cadmium	<0.66	<0.31	<0.32	2.08	<0.29	<0.3	<0.18	0.43	<0.30	<0.31	0.52	128	0.85	
Chromium (total)	10.5	15.8	14.1	17.6	12.2	14.2	7.3	14.7	12	13.3	18.4	33.1	14.2	
Copper	59.1	15.4	24.9	154	85.6	15.2	40.3	17	20.4	12.2	108	224	56.6	
Mercury	<0.07	<0.06	0.1	0.1	<0.06	<0.06	0.17	0.27	0.17	0.1	0.39	55.5	0.22	
Nickel	16.2	27.1	30.9	77	51.9	20.9	21.9	24.1	19.5	21	50.1	69.2	45	
Lead	13.7	25.4	20.9	39.9	15.1	22.3	28.7	33.4	22.4	15.6	520	3420	284	
Selenium	<3.29	<3.07	<3.21	<3.55	<2.91	<3.02	<1.84	<3.79	<3.01	<3.09	<3.19	<2.98	<3.26	
Zinc	24.1	77.8	141	171	62.2	54.6	50.1	79.4	51.8	45.8	193	1370	100	

Results expressed as mg/kg air dried unless otherwise stated.
 Any outlier values which exceed relevant SGVs are shown shaded.

Checked by/Date:

SUMMARY OF CONTAMINATION ANALYSIS: SOIL

SITE: GWYNS' DRIFT, PONTARDAWE
REF: 31070
DATE: JANUARY 2004

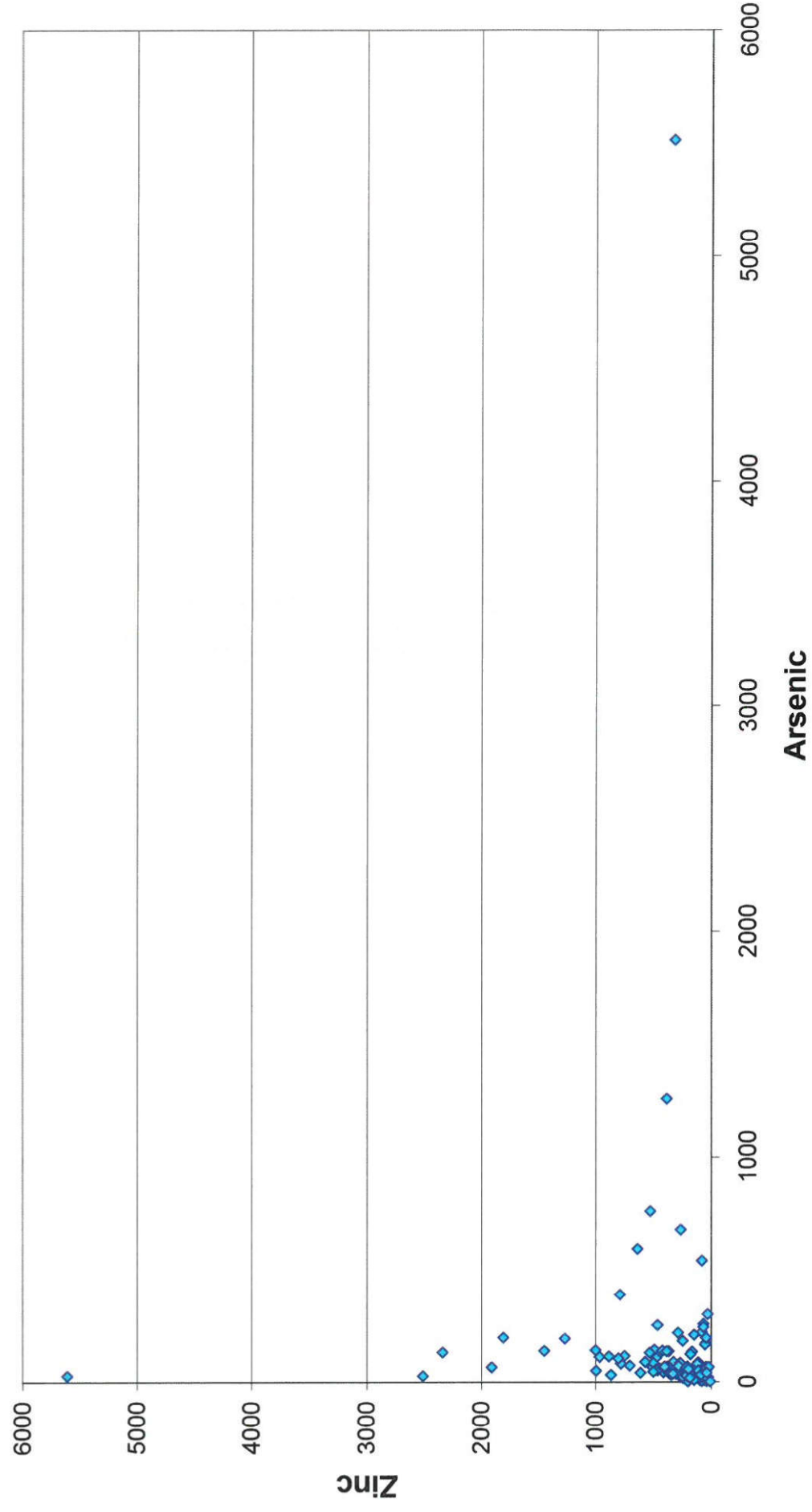
SAMPLE LOCATION	TP132	TP132	TP132	TP132	TP132
DEPTH (m)	2.00	2.50	3.00	3.50	4.00
Arsenic	228	692	1630	772	1110
Boron	0.57	0.83	0.96	0.7	0.83
Cadmium	24.2	23	10.6	2.32	13.3
Chromium (total)	17.7	29.2	26.8	21.2	40.4
Copper	361	635	713	427	499
Mercury	2.6	2.87	2.69	7.96	0.65
Nickel	47.8	50.7	52.3	66.6	145
Lead	912	1150	1040	5560	546
Selenium	<2.84	<3.55	<3.44	<3.46	<4.42
Zinc	1230	1490	699	474	8320

Results expressed as mg/kg air dried unless otherwise stated.
Any outlier values which exceed relevant SGVs are shown shaded.

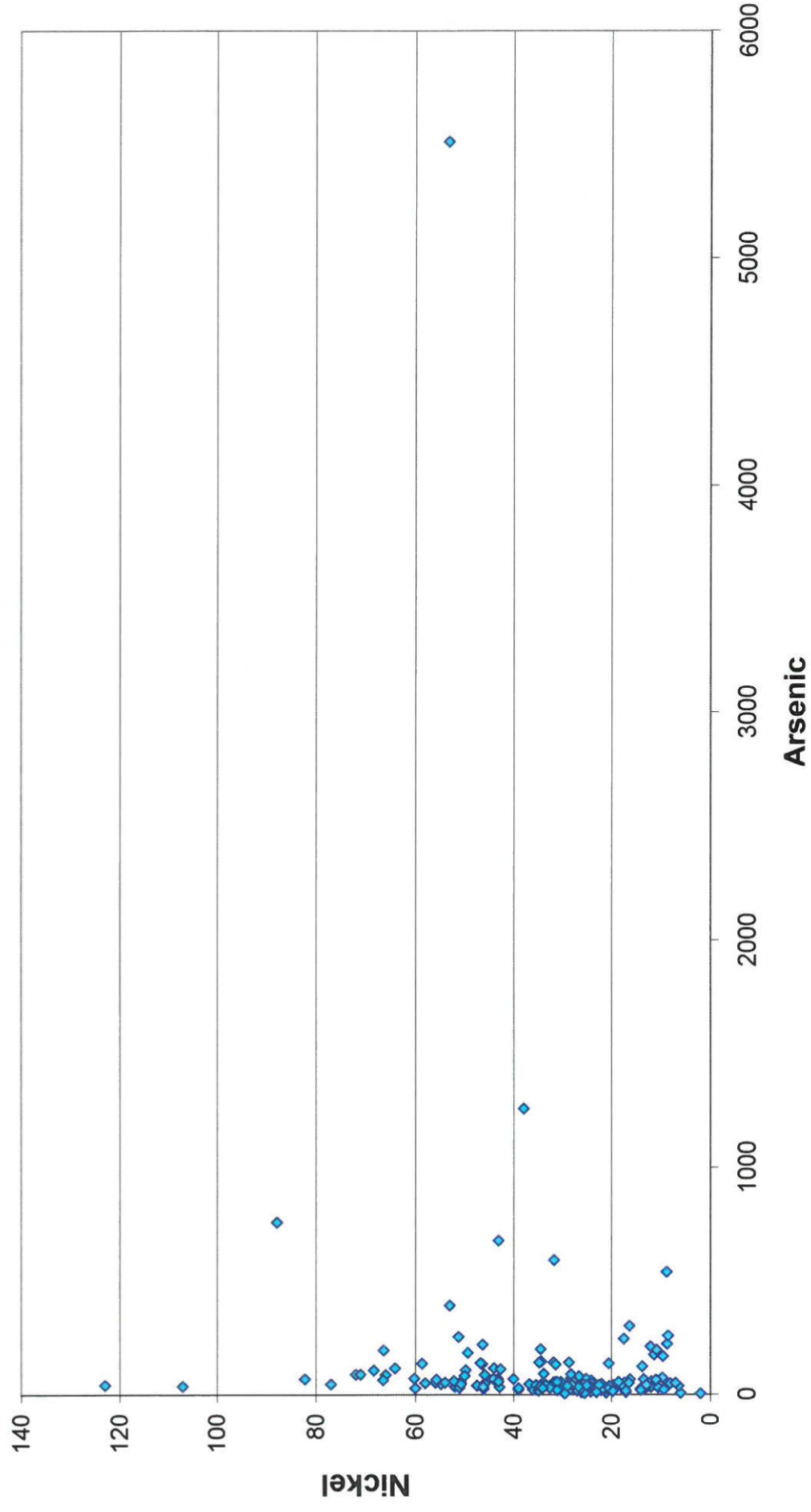
Checked by/Date:

APPENDIX 3

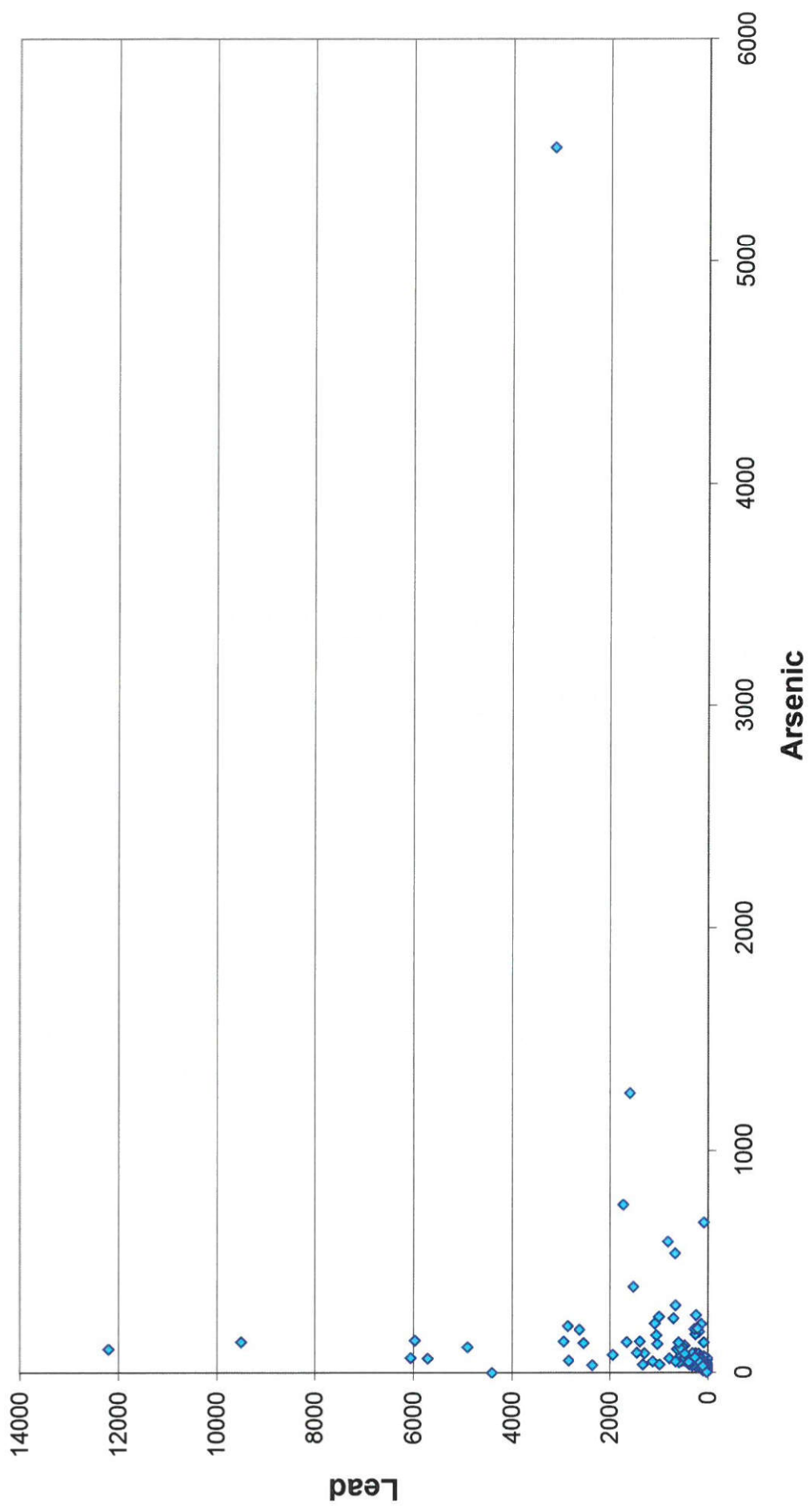
Bivariate Analysis: Arsenic and Zinc



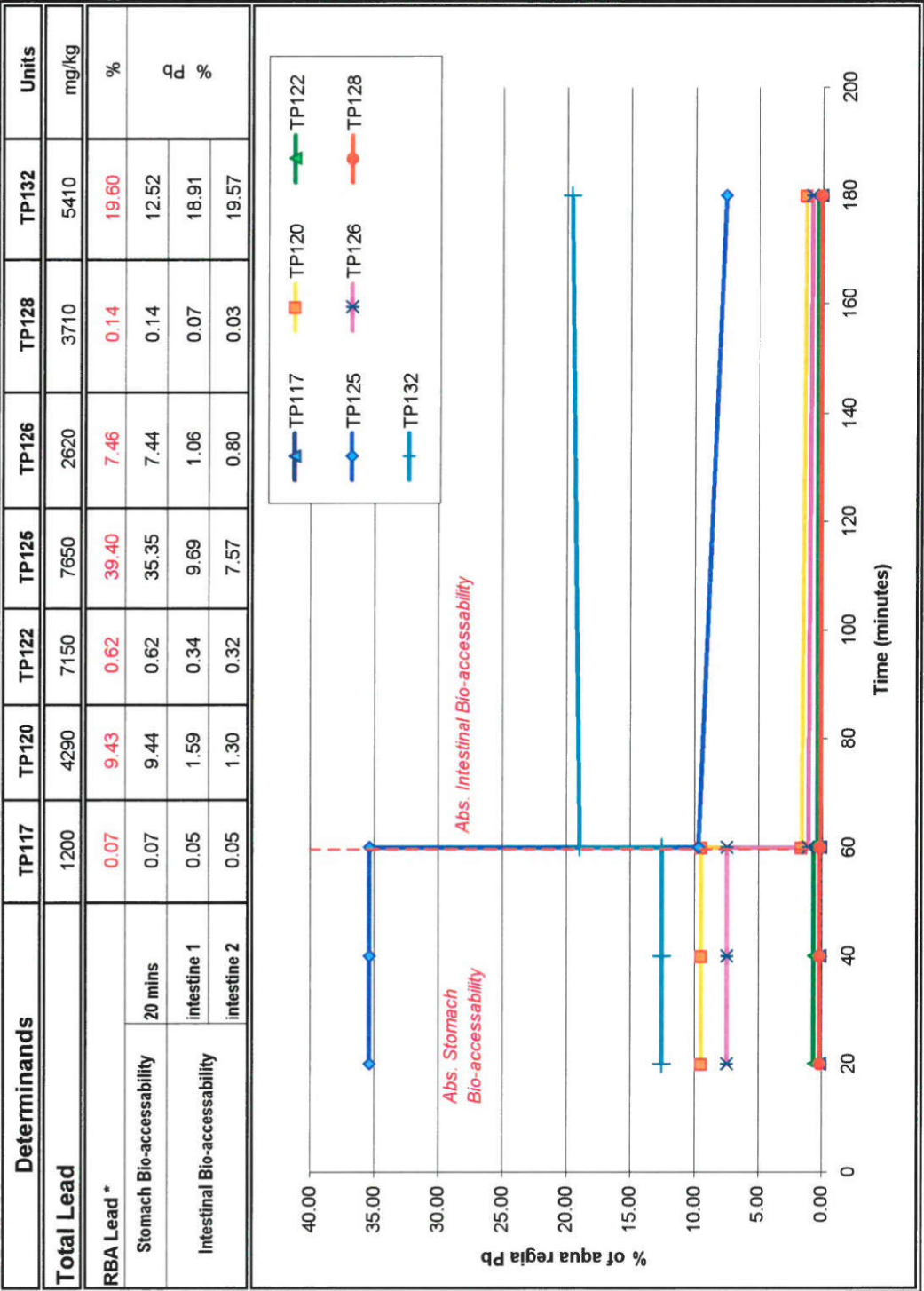
Bivariate Analysis: Arsenic and Nickel



Bivariate Analysis: Arsenic and Lead



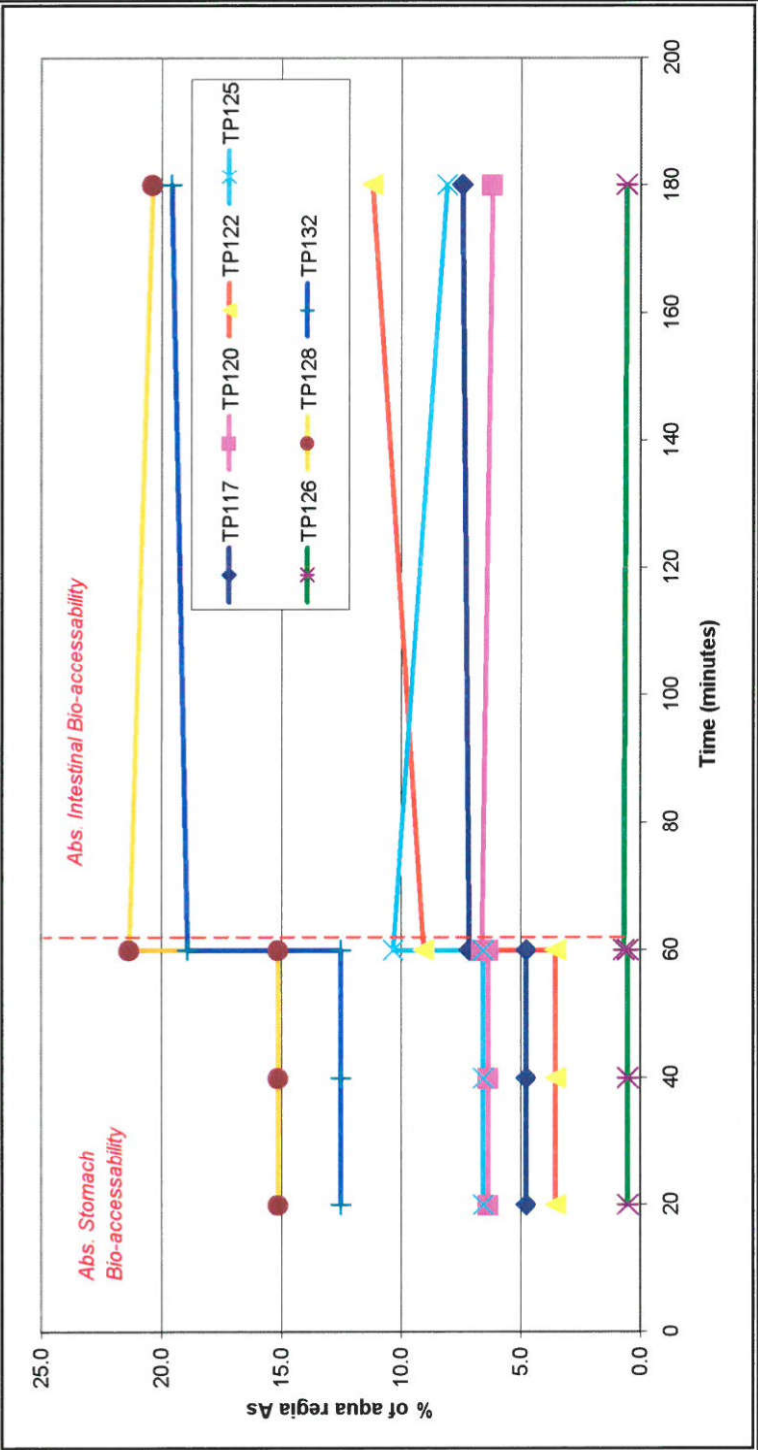
APPENDIX 4



Notes: * RBA = Relative Bioaccessibility of determinand (using the highest value for % of aqua regia)

Summary of PBET Analysis - Arsenic:

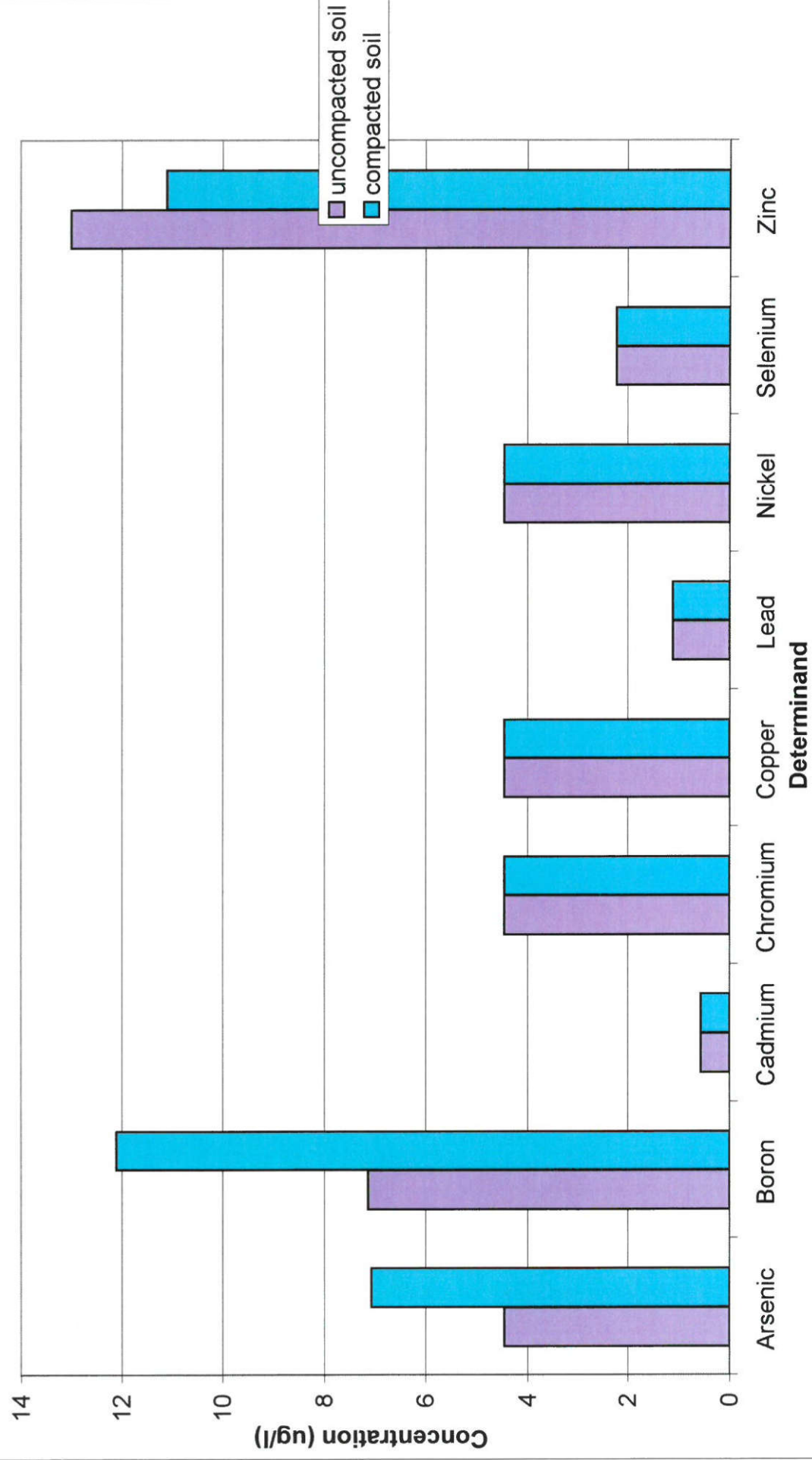
Determinands		TP117	TP120	TP122	TP125	TP126	TP128	TP132	Units
Total Arsenic		371	105	9560	40.1	1030	105	608	mg/kg
RBA Arsenic *		7.44	6.58	11.20	10.30	0.66	21.30	19.60	%
Stomach Bio-accessibility	20 mins	4.8	6.3	3.5	6.6	0.5	15.1	12.5	% of aqua regia
	intestine 1	7.1	6.6	9.0	10.3	0.7	21.3	18.9	
	intestine 2	7.4	6.2	11.2	8.1	0.6	20.4	19.6	



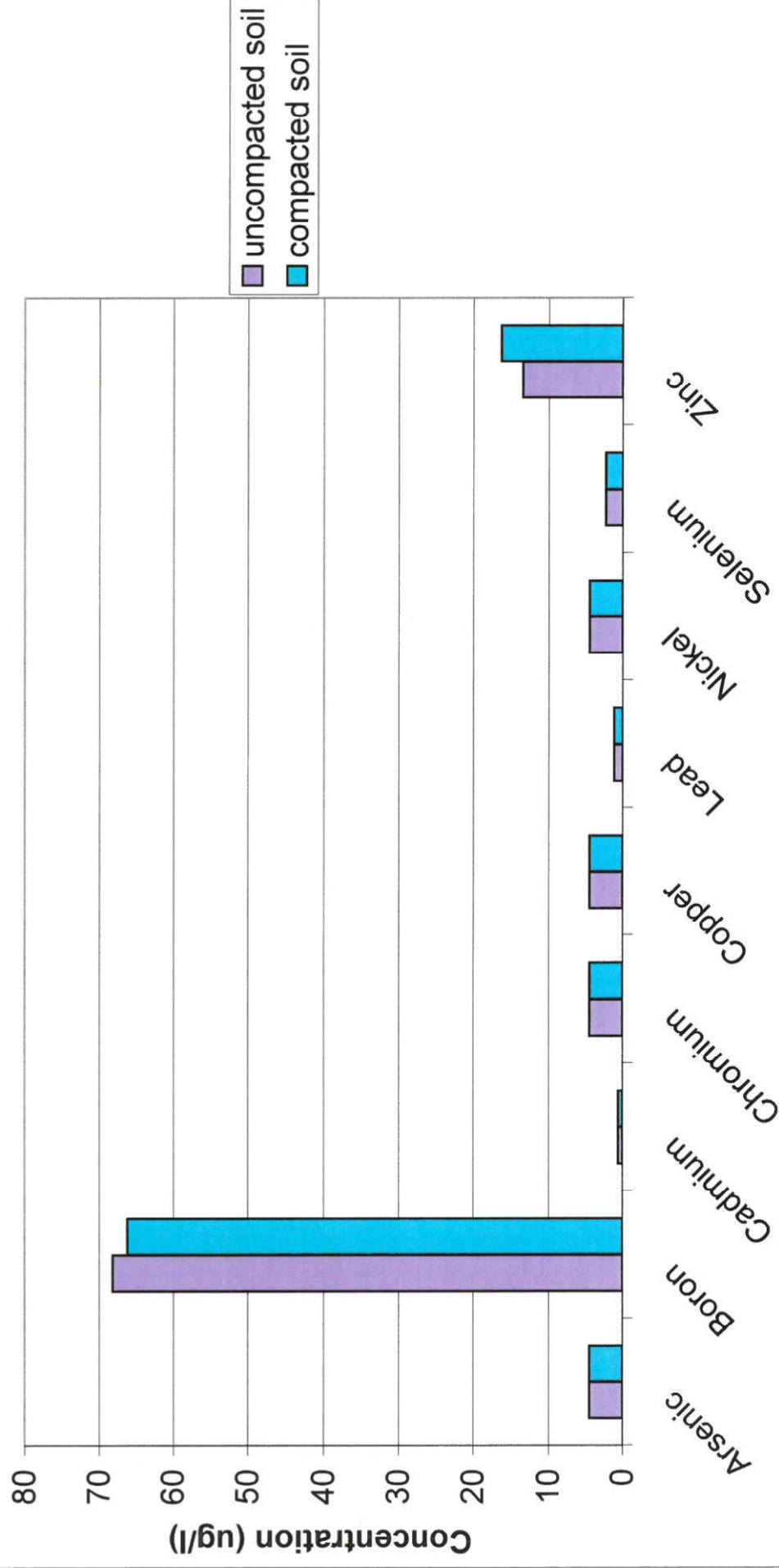
Notes: * RBA = Relative Bioaccessibility of determinand (using the highest value for % of aqua regia)

APPENDIX 5

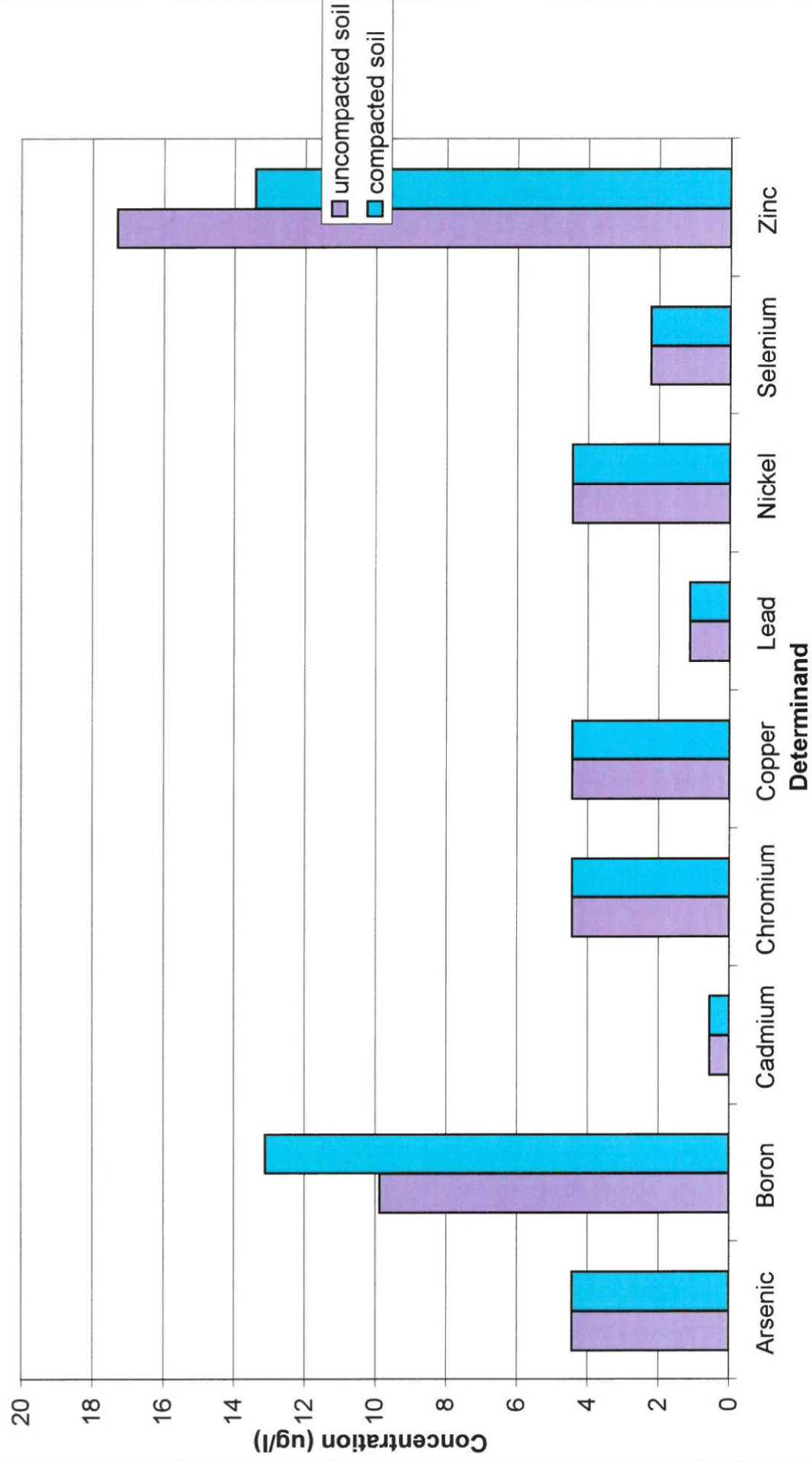
TP128 (2.0m)



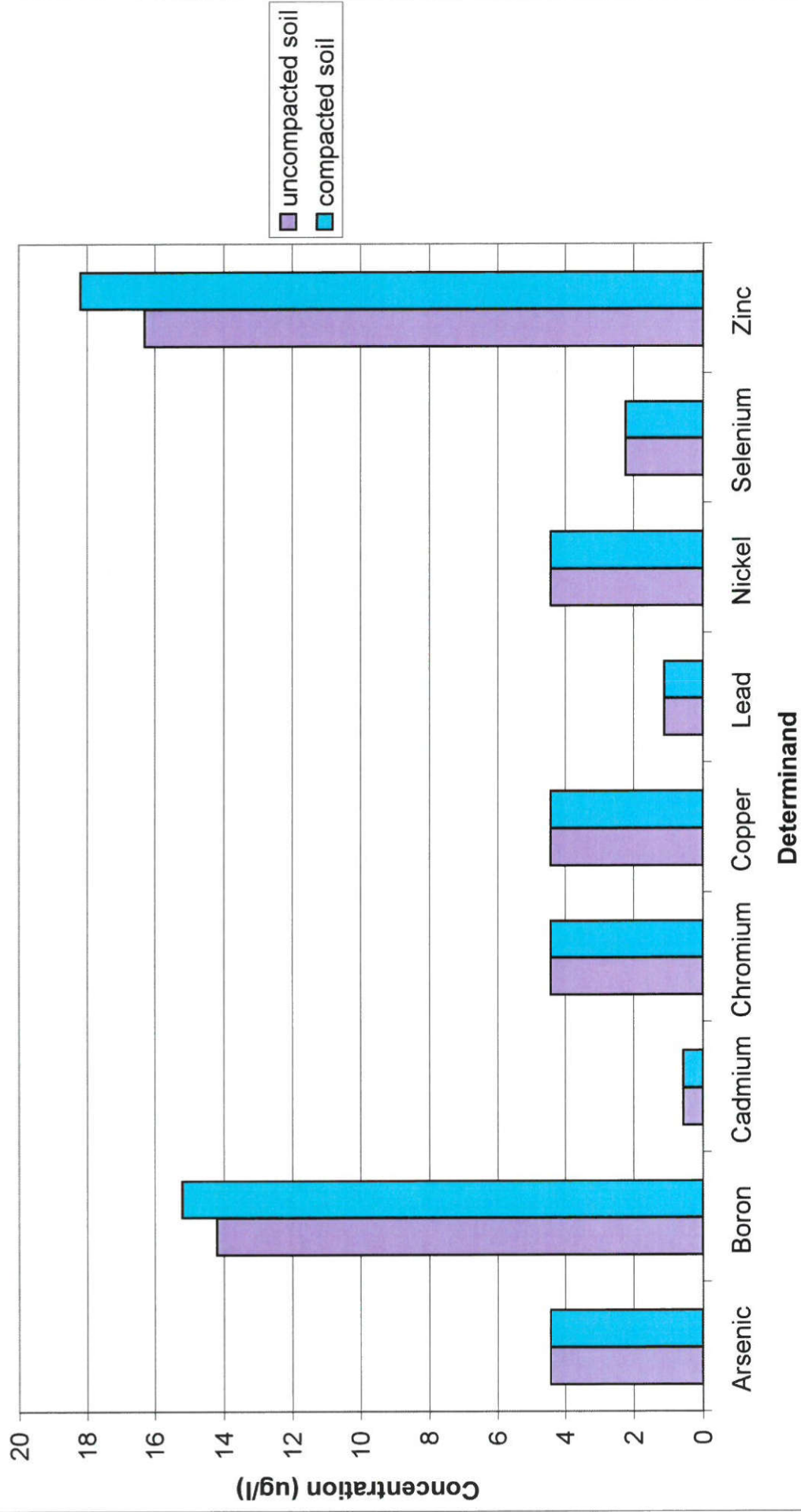
TP130 (2.0m)



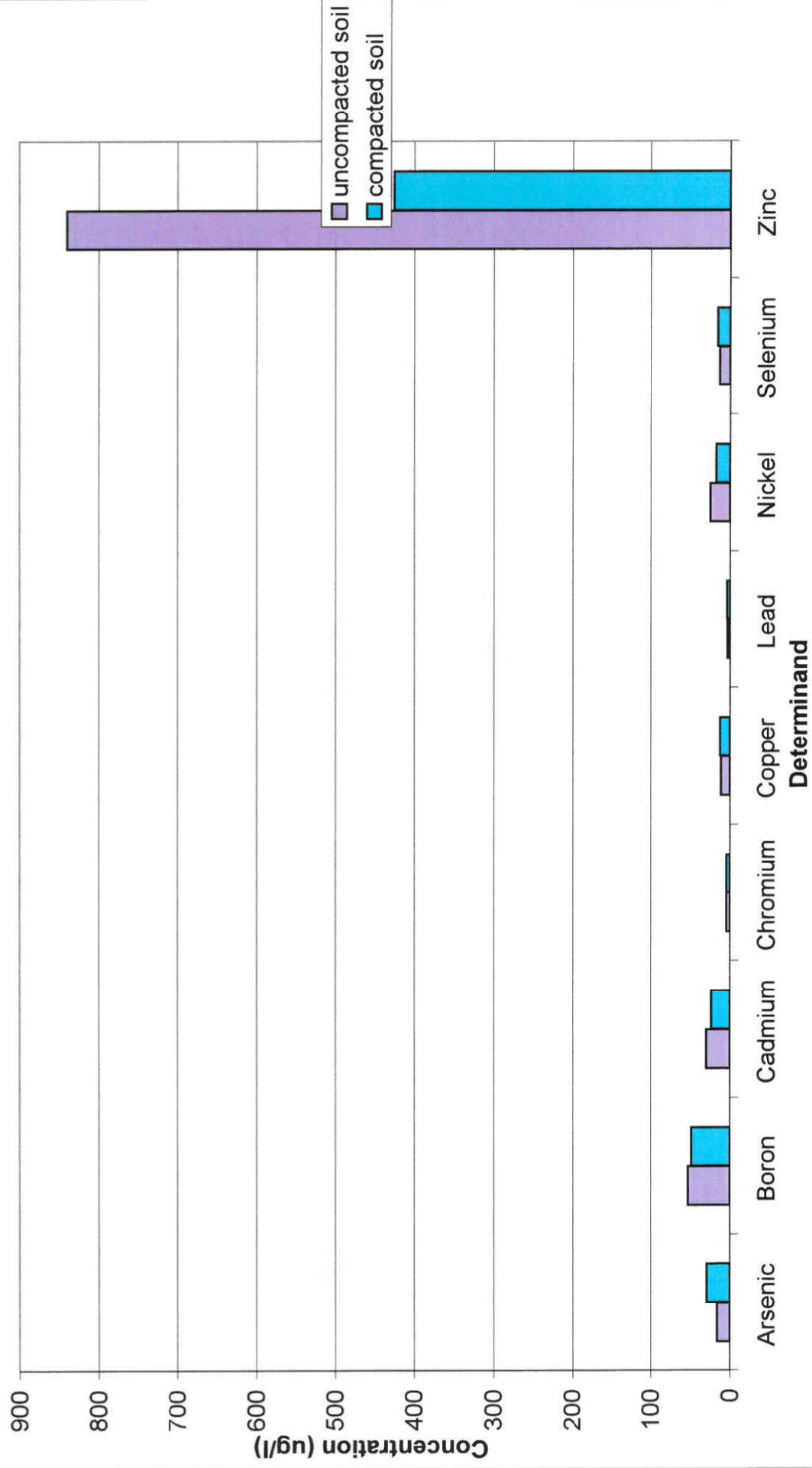
TP128 (1.5m)



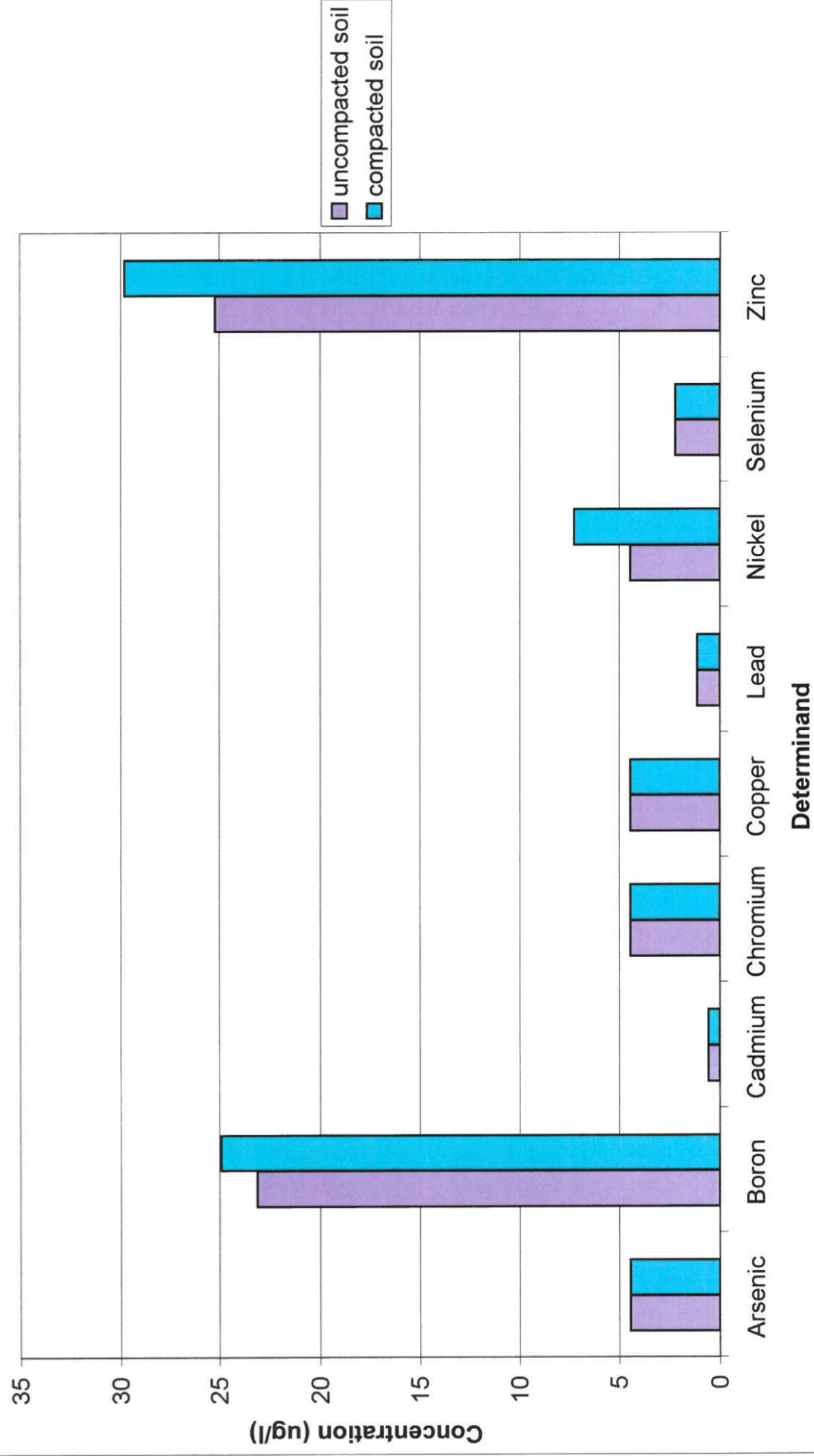
TP129 (2.0m)



TP122 (1.5m)



TP128 (1.0m)



APPENDIX 6

Calculation of the Mean Value Test and Maximum Value Test for Soil Samples - for arsenic

Sample Pool:

Sample no	x_i	$y_i = \log x_i$
TP26	28	1.447
TP26	47	1.672
TP25	18	1.255
TP13	66	1.820
TP14	25	1.398
TP15	60	1.778
TP129	66.4	1.822
TP129	57.5	1.760
TP128	68.6	1.836
TP128	676	2.830
TP128	183	2.262
TP128	219	2.340
TP128	135	2.130
TP128	21.9	1.340
TP130	46.2	1.665
TP130	33	1.519
TP130	15	1.176
TP130	46.2	1.665
TP130	10.9	1.037
TP130	41.7	1.620
TP130	6.12	0.787
TP17	20	1.301
TP126	133	2.124
TP126	16.9	1.228
TP126	24.6	1.391
TP18	5	0.699
TP129	36.5	1.562
BH9	65	1.813
BH9	14.9	1.173
BH9	20.9	1.320
TP23	10	1.000
TP23	9	0.954
TP103	36.1	1.558
TP124	53.8	1.731
TP124	53.1	1.725
TP124	34.9	1.543
TP124	35.3	1.548
TP124	39.8	1.600
TP124	30.9	1.490
TP124	31.1	1.493
TP118	17.4	1.241
TP118	28.6	1.456
TP118	24.6	1.391
TP118	25.1	1.400

Mean Value Test	
Sample mean ($\bar{x}$):	120.84
Standard Deviation (s):	451.02
Count (n):	161
t [derived from standard tables]:	1.70
Upper 95th Percentile bound of sample (US_{95}):	181.16

Maximum Value Test	
Mean value of y:	1.702
Standard Deviation (S):	0.468
Maximum y:	3.741
Outlier test Statistic (T):	4.358
$T_{crit} (10\%)$ [derived from standard tables]:	2.570

If $T < T_{crit} (10\%)$ then it is statistically valid to treat the maximum observed value as part of a single normally distributed data set.

Method: following guidelines published in CLEA 2002

TP118	24.4	1.387
TP118	22	1.342
TP118	26	1.415
TP118	21.8	1.338
TP24	15	1.176
TP24	88	1.944
TP112	106	2.025
TP112	49.2	1.692
TP116	46.4	1.667
TP116	592	2.772
TP116	70.1	1.846
TP116	5.51	0.741
TP116	35.8	1.554
TP116	35.8	1.554
TP117	122	2.086
TP117	173	2.238
TP117	167	2.223
TP117	221	2.344
TP117	23.3	1.367
TP117	72.6	1.861
TP11	210	2.322
TP21	29	1.462
TP123	50.9	1.707
TP123	43.4	1.637
TP123	46.9	1.671
TP123	22.5	1.352
TP106	57.9	1.763
TP106	87.1	1.940
TP106	46.1	1.664
TP121	53.8	1.731
TP121	37.5	1.574
TP121	21.6	1.334
TP111	252	2.401
TP111	116	2.064
TP111	58.8	1.769
TP111	68.2	1.834
TP110	28.3	1.452
TP110	139	2.143
TP10	47	1.672
TP109	78.7	1.896
TP109	54.3	1.735
TP115	40.2	1.604
TP115	41.3	1.616
TP115	40.3	1.605
TP115	26.4	1.422
TP115	26.5	1.423
TP115	32.9	1.517
TP115	42.1	1.624
TP115	42.6	1.629
TP9	87	1.940
TP114	66.9	1.825
TP114	44.4	1.647
TP114	51.9	1.715
TP114	85.1	1.930
TP114	70.9	1.851

TP114	137	2.137
TP114	84.8	1.928
TP108	64.6	1.810
TP108	55.2	1.742
TP108	49.8	1.697
TP108	144	2.158
TP108	1.15	0.061
TP108	140	2.146
TP8	20	1.301
TP107	27.3	1.436
TP107	539	2.732
TP107	301	2.479
TP107	195	2.290
TP107	257	2.410
TP107	243	2.386
TP113	89.5	1.952
TP113	141	2.149
TP113	111	2.045
TP113	136	2.134
TP113	130	2.114
TP113	35.3	1.548
TP113	23.6	1.373
TP113	53.7	1.730
TP120	52.4	1.719
TP120	33.8	1.529
TP120	63.6	1.803
TP120	45.8	1.661
TP120	67.8	1.831
TP120	33.7	1.528
TP120	26.8	1.428
TP119	36.1	1.558
TP119	32.6	1.513
TP119	63.1	1.800
TP119	28.2	1.450
TP119	25.3	1.403
TP7	19	1.279
TP122	37.4	1.573
TP122	40.5	1.607
TP122	5510	3.741
TP122	20.4	1.310
TP122	1260	3.100
TP122	199	2.299
TP122	758	2.880
TP6	37	1.568
TP104	19	1.279
TP104	13.1	1.117
TP104	16.9	1.228
TP4	27	1.431
TP3	10	1.000
TP2	18	1.255
TP102	390	2.591
TP102	193	2.286
TP102	49.6	1.695
TP102	55.9	1.747
TP102	30.8	1.489

TP1	114	2.057
TP1	3	0.477
TP101	81.5	1.911
TP101	105	2.021
TP101	40.5	1.607
TP5	49	1.690
TP5	68	1.833

Calculation of the Mean Value Test and Maximum Value Test for Soil Samples - for lead

Sample Pool:

Sample no	x_i	$y_i = \log x_i$
TP26	198	2.297
TP26	131	2.117
TP25	131	2.117
TP13	277	2.442
TP14	29	1.462
TP15	34	1.531
TP129	26	1.415
TP129	21.4	1.330
TP128	193	2.286
TP128	87.2	1.941
TP128	180	2.255
TP128	131	2.117
TP128	86.1	1.935
TP128	22.5	1.352
TP130	39.9	1.601
TP130	15.1	1.179
TP130	22.3	1.348
TP130	28.7	1.458
TP130	33.4	1.524
TP130	22.4	1.350
TP130	15.6	1.193
TP17	136	2.134
TP126	2530	3.403
TP126	28.4	1.453
TP126	57.2	1.757
TP18	16	1.204
TP129	49.3	1.693
BH9	13.7	1.137
BH9	25.4	1.405
BH9	20.9	1.320
TP23	43	1.633
TP23	34	1.531
TP103	103	2.013
TP124	225	2.352
TP124	154	2.188
TP124	70.5	1.848
TP124	81.4	1.911
TP124	108	2.033
TP124	113	2.053
TP124	63	1.799
TP118	19.5	1.290
TP118	31.5	1.498
TP118	22	1.342
TP118	24.6	1.391

Mean Value Test	
Sample mean ($\bar{x}$):	2.26
Standard Deviation (s):	0.69
Count (n):	161
t [derived from standard tables]:	1.70
Upper 95th Percentile bound of sample (US_{95}):	2.35
guideline value	2.875

Maximum Value Test	
Mean value of y:	1.817
Standard Deviation (S):	0.534
Maximum y:	3.403
Outlier test Statistic (T):	2.972
$T_{crit (10\%)}$ [derived from standard tables]:	2.570

TP118	25.7	1.410
TP118	18.5	1.267
TP118	17.7	1.248
TP118	27.5	1.439
TP24	73	1.863
TP24	246	2.391
TP112	622	2.794
TP112	87.3	1.941
TP116	90	1.954
TP116	818	2.913
TP116	263	2.420
TP116	33.8	1.529
TP116	85.2	1.930
TP116	192	2.283
TP117	465	2.667
TP117	248	2.394
TP117	1040	3.017
TP117	1080	3.033
TP117	33.7	1.528
TP117	86.5	1.937
TP11	2860	3.456
TP21	54	1.732
TP123	357	2.553
TP123	231	2.364
TP123	167	2.223
TP123	102	2.009
TP106	397	2.599
TP106	313	2.496
TP106	30.3	1.481
TP121	251	2.400
TP121	1320	3.121
TP121	24.4	1.387
TP111	995	2.998
TP111	507	2.705
TP111	238	2.377
TP111	198	2.297
TP110	119	2.076
TP110	9500	3.978
TP10	43	1.633
TP109	545	2.736
TP109	480	2.681
TP115	107	2.029
TP115	96.7	1.985
TP115	136	2.134
TP115	109	2.037
TP115	68.7	1.837
TP115	121	2.083
TP115	52.8	1.723
TP115	103	2.013
TP9	1290	3.111
TP114	577	2.761
TP114	179	2.253
TP114	262	2.418
TP114	184	2.265
TP114	167	2.223

TP114	1650	3.217
TP114	469	2.671
TP108	786	2.895
TP108	2840	3.453
TP108	1120	3.049
TP108	5970	3.776
TP108	4410	3.644
TP108	2950	3.470
TP8	133	2.124
TP107	82.2	1.915
TP107	665	2.823
TP107	657	2.818
TP107	270	2.431
TP107	244	2.387
TP107	702	2.846
TP113	1440	3.158
TP113	1380	3.140
TP113	563	2.751
TP113	595	2.775
TP113	1020	3.009
TP113	177	2.248
TP113	68	1.833
TP113	529	2.723
TP120	290	2.462
TP120	45	1.653
TP120	5700	3.756
TP120	582	2.765
TP120	6050	3.782
TP120	2350	3.371
TP120	228	2.358
TP119	147	2.167
TP119	310	2.491
TP119	152	2.182
TP119	30.6	1.486
TP119	66.1	1.820
TP7	49	1.690
TP122	370	2.568
TP122	122	2.086
TP122	3140	3.497
TP122	16.1	1.207
TP122	1590	3.201
TP122	206	2.314
TP122	1720	3.236
TP6	987	2.994
TP104	97.1	1.987
TP104	8.41	0.925
TP104	53.3	1.727
TP4	119	2.076
TP3	99	1.996
TP2	113	2.053
TP102	1520	3.182
TP102	2610	3.417
TP102	656	2.817
TP102	196	2.292
TP102	101	2.004

TP1	4900	3.690
TP1	19	1.279
TP101	1930	3.286
TP101	12200	4.086
TP101	397	2.599
TP5	388	2.589
TP5	262	2.418

APPENDIX 7