

Appendix G

Geotechnical Laboratory Testing Certificates



LABORATORY REPORT



4043

Contract Number: PSL22/4501

Report Date: 02 August 2022

Client's Reference:

Client Name: Arcadis
Cornerblock
2 Cornwall Street
Birmingham
B3 2DX

For the attention of: Tukanh Agapakis

Contract Title: Hill Top Farm

Date Received: 5/7/2022
Date Commenced: 5/7/2022
Date Completed: 27/07/2022

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

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(Director)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH101	10	B	2.00	2.45	Brown slightly gravelly very sandy silty CLAY.
BH101	11	D	2.75		Brown slightly gravelly very sandy silty CLAY.
BH101	12	B	3.00	3.45	Reddish brown slightly gravelly very sandy very silty CLAY.
BH101	14	UT	4.00	4.45	Reddish brown slightly gravelly very sandy very silty CLAY.
BH101	16	B	5.00	5.45	Reddish brown slightly gravelly very sandy silty CLAY.
BH101	17	D	5.75		Reddish brown slightly gravelly very sandy silty CLAY.
BH101	18	UT	6.00	6.45	Firm reddish brown slightly gravelly very sandy silty CLAY.
BH102	8	UT	3.00	3.45	Reddish brown slightly gravelly very sandy silty CLAY
BH102	9	D	3.45	3.50	Reddish brown mottled grey slightly gravelly very sandy silty CLAY.
BH102	10	B	3.50	4.00	Reddish brown mottled grey slightly gravelly sandy very silty CLAY.
BH102	14	D	5.45	5.50	Reddish brown mottled grey slightly gravelly sandy very silty CLAY.
BH102	21	B	8.00	8.50	Reddish brown mottled grey slightly gravelly sandy very silty CLAY.
BH103	4	B	1.20	1.65	Reddish brown very sandy clayey silty GRAVEL.
BH103	5	D	1.75		Reddish brown slightly gravelly very sandy silty CLAY.
BH103	6	B	2.00	2.45	Reddish brown slightly gravelly very sandy silty CLAY.
BH103	10	B	4.00	4.45	Reddish brown slightly gravelly very sandy CLAY.
BH103	15	D	6.75		Reddish brown slightly gravelly very sandy CLAY.
BH103	21	D	7.45	7.50	Reddish brown slightly gravelly very sandy CLAY.
BH104	6	B	0.60	1.10	Brown TOPSOIL.



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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH104	10	B	1.50	2.00	Reddish brown slightly gravelly very sandy silty CLAY.
BH104	11	B	2.00	2.45	Reddish brown slightly gravelly very sandy silty CLAY.
BH104	13	UT	3.00	3.45	Reddish brown very gravelly very sandy silty CLAY
BH104	16	B	4.00	4.45	Reddish brown slightly gravelly very sandy silty CLAY.
BH105	6	D	1.75		Reddish brown slightly gravelly very sandy silty CLAY.
BH105	7	B	2.00	2.45	Reddish brown slightly gravelly very sandy silty CLAY.
BH105	12	D	4.75		Reddish brown slightly gravelly very sandy silty CLAY.
BH105	13	B	5.00	5.45	Brown slightly gravelly very clayey very silty SAND.
BH105	21	SPTLS	8.00	8.45	Brown slightly gravelly very clayey very silty SAND.
BH106	6	B	0.50	1.00	Brown slightly gravelly very sandy silty CLAY.
BH106	9	B	3.00	3.45	Brown gravelly very sandy silty CLAY.
BH106	10	D	3.75		Brown gravelly very sandy silty CLAY.
BH106	13	D	5.75		Brown slightly gravelly very sandy very silty CLAY.
BH106	16	B	5.00	5.45	Brown slightly gravelly very sandy very silty CLAY.
BH106	22	D	9.75		Brown slightly gravelly very sandy very silty CLAY.
TP106	8	D	3.00		Brown slightly gravelly very sandy very silty CLAY.
TP108	4	B	1.00		Brown very gravelly very sandy very silty CLAY.
TP110	7	B	1.60		Brown slightly gravelly very sandy CLAY.
TP110	10	B	3.70		Brown slightly gravelly very sandy CLAY.



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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

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SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m ³ Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
BH101	11	D	2.75		27			36	19	17	99	Intermediate Plasticity CI
BH101	17	D	5.75		17			37	20	17	98	Intermediate Plasticity CI
BH102	9	D	3.45	3.50	16			36	17	19	97	Intermediate Plasticity CI
BH102	14	D	5.45	5.50	24		2.61	38	22	16	99	Intermediate Plasticity CI
BH102	21	B	8.00	8.50	22			35	21	14	98	Intermediate Plasticity CI
BH103	5	D	1.75		20							
BH103	10	B	4.00	4.45	17		2.63					
BH103	15	D	6.75		20			36	17	19	96	Intermediate Plasticity CI
BH103	21	D	7.45	7.50	17			36	17	19	95	Intermediate Plasticity CI
BH104	6	B	0.60	1.10	19							
BH104	10	B	1.50	2.00	20			38	19	19	87	Intermediate Plasticity CI
BH104	16	B	4.00	4.45	21			39	19	20	93	Intermediate Plasticity CI
BH105	6	D	1.75		18							
BH105	7	B	2.00	2.45	21		2.65					
BH105	12	D	4.75		15							
BH105	13	B	5.00	5.45	18		2.57					
BH106	6	B	0.50	1.00			2.54					
BH106	9	B	3.00	3.45			2.67					
BH106	10	D	3.75		17							

SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.



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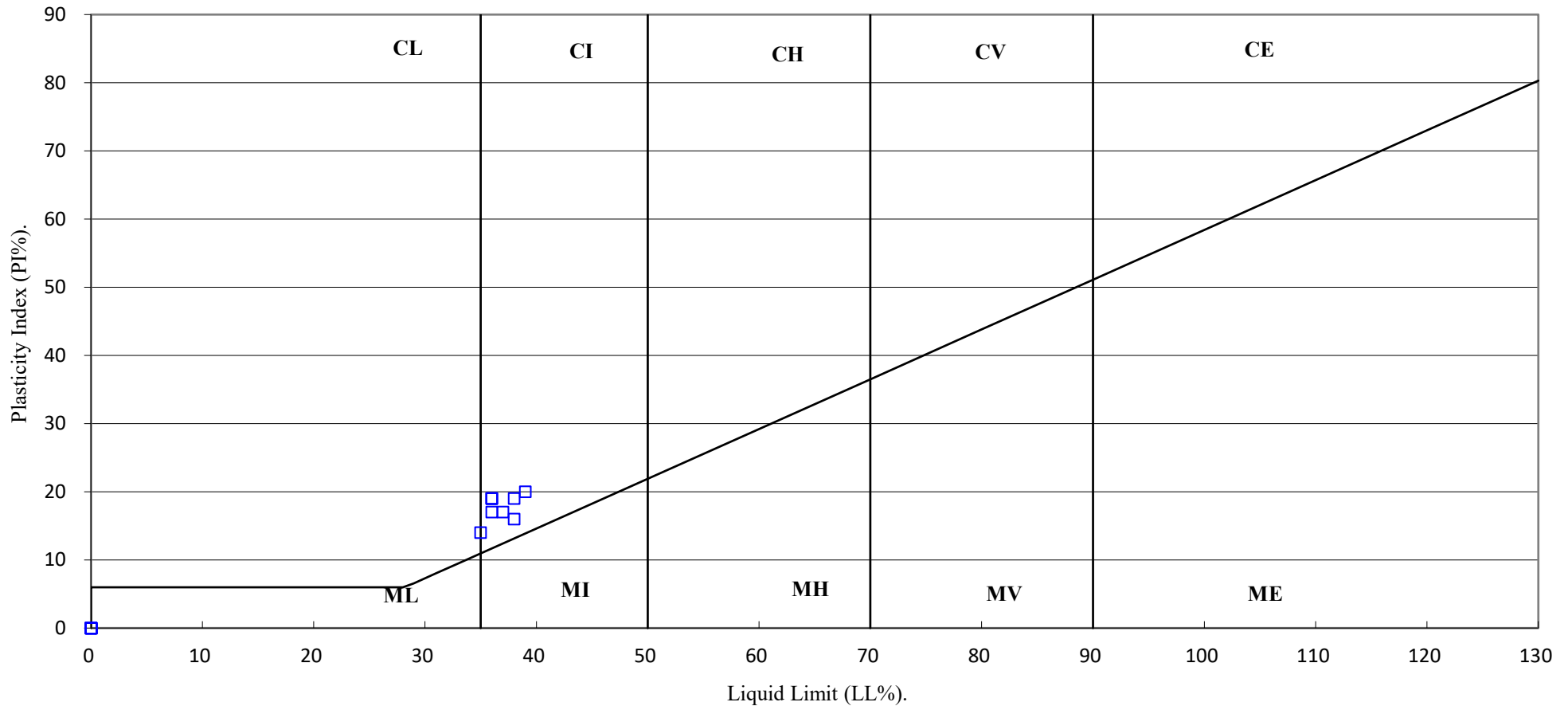
Hill Top Farm

Contract No:

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Client Ref:

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



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SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



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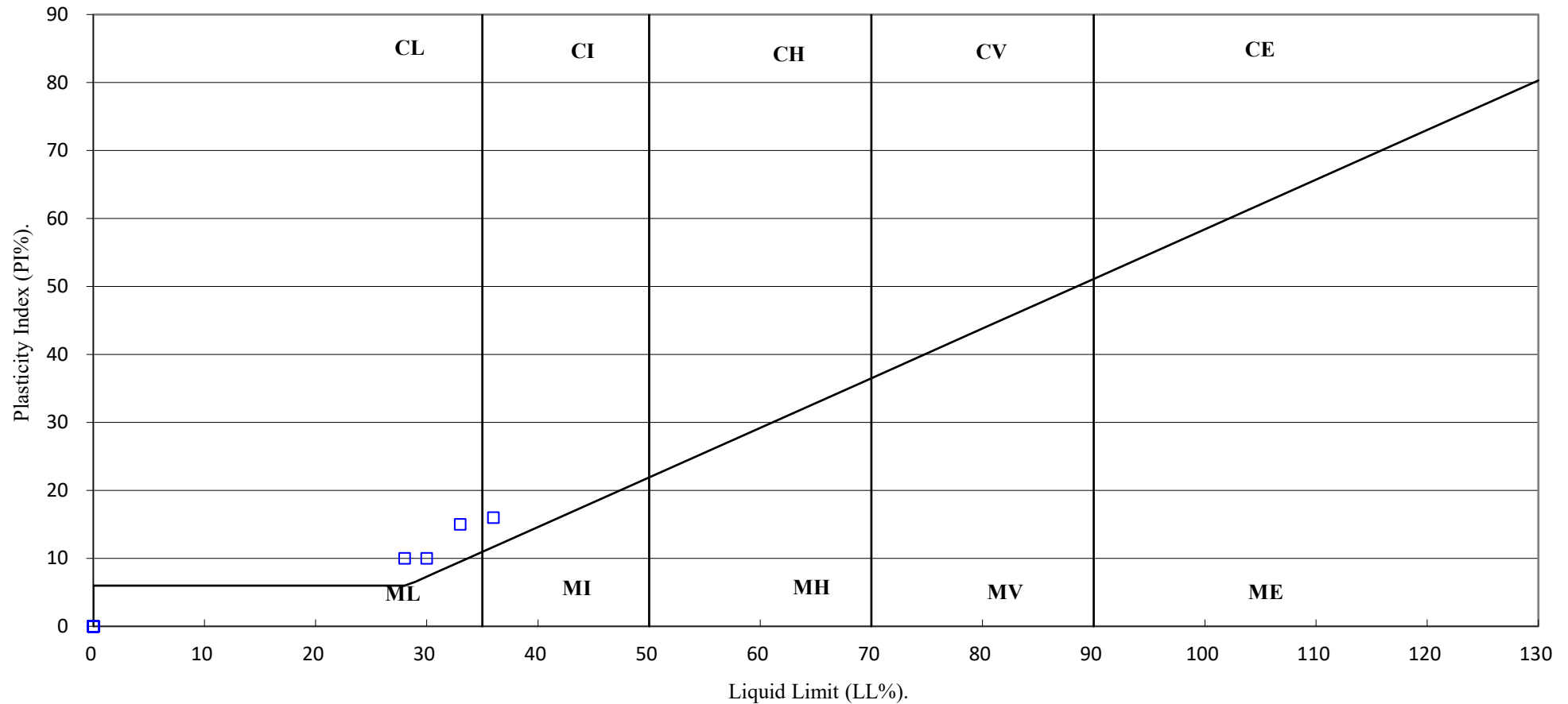
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PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



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SUMMARY OF LABORATORY HAND VANES

(BS1377 : PART 7 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Peak Shear Strength kPa	Residual Shear Strength kPa	Remarks
BH104	6	B	0.60	1.10	9.0	150>		
BH104	6	B	0.60	1.10	12	150>		
BH104	6	B	0.60	1.10	15	120		
BH104	6	B	0.60	1.10	18	62		
BH104	6	B	0.60	1.10	21	42		
BH104	11	B	2.00	2.45	9.0	150>		
BH104	11	B	2.00	2.45	12	150>		
BH104	11	B	2.00	2.45	15	124		
BH104	11	B	2.00	2.45	18	63		
BH104	11	B	2.00	2.45	21	32		
BH106	6	B	0.50	1.00	4.5	150>		
BH106	6	B	0.50	1.00	7.6	150>		
BH106	6	B	0.50	1.00	11	66		
BH106	6	B	0.50	1.00	14	27		
BH106	6	B	0.50	1.00	17	15		
BH106	9	B	3.00	3.45	4.5	150>		
BH106	9	B	3.00	3.45	7.6	150>		
BH106	9	B	3.00	3.45	11	130		
BH106	9	B	3.00	3.45	14	44		

* This test is out of our UKAS scope

	Hill Top Farm	Contract No:
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SUMMARY OF LABORATORY HAND VANES

(BS1377 : PART 7 : 1990)

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* This test is out of our UKAS scope



Hill Top Farm

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PARTICLE SIZE DISTRIBUTION TEST

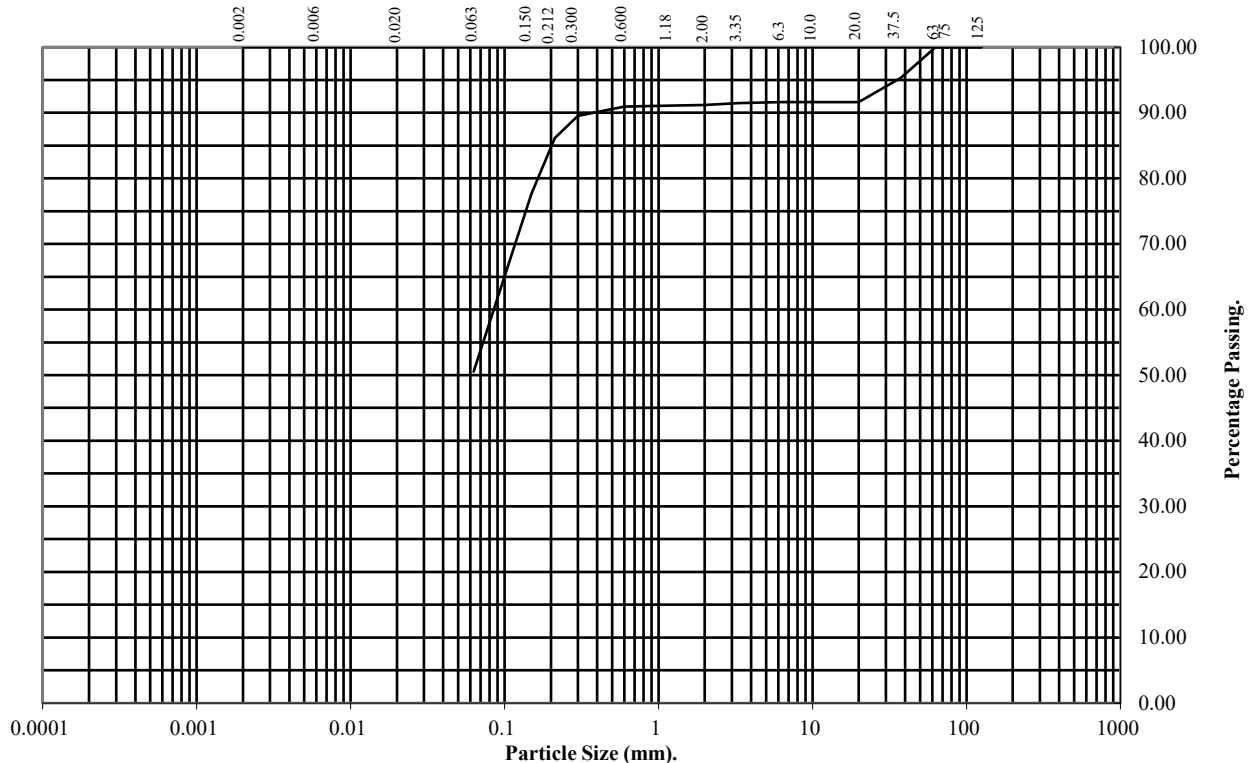
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH101 Top Depth (m): 2.00

Sample Number: 10 Base Depth(m): 2.45

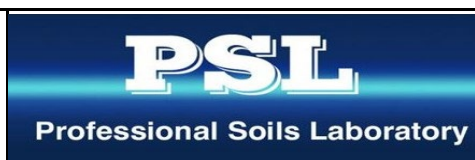
Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	95
20	92
10	92
6.3	92
3.35	91
2	91
1.18	91
0.6	91
0.3	90
0.212	86
0.15	78
0.063	51

Soil Fraction	Total Percentage
Cobbles	0
Gravel	9
Sand	40
Silt/Clay	51

Remarks:
See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

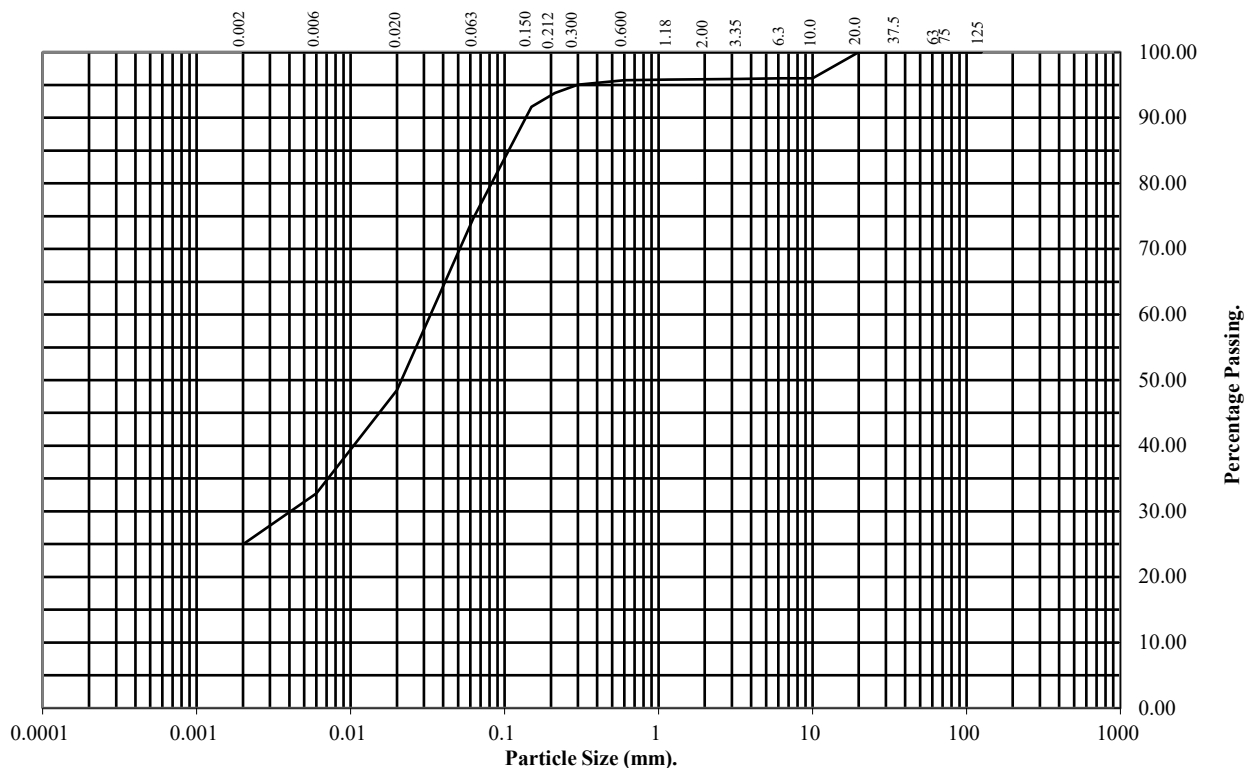
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH101 Top Depth (m): 3.00

Sample Number: 12 Base Depth(m): 3.45

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	96
6.3	96
3.35	96
2	96
1.18	96
0.6	96
0.3	95
0.212	94
0.15	92
0.063	75

Particle Diameter	Percentage Passing
0.02	48
0.006	33
0.002	25

Soil Fraction	Total Percentage
Cobbles	0
Gravel	4
Sand	21
Silt	50
Clay	25

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

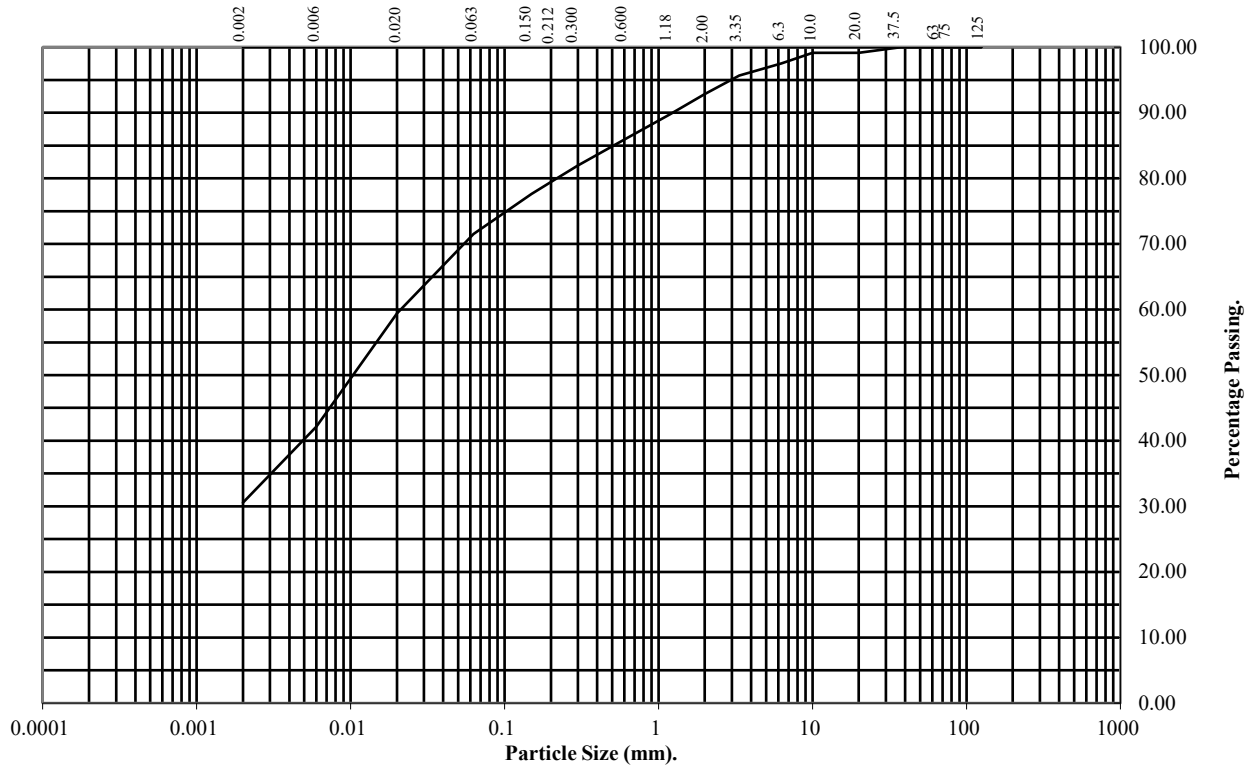
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH101 Top Depth (m): 5.00

Sample Number: 16 Base Depth(m): 5.45

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	99
10	99
6.3	98
3.35	96
2	93
1.18	90
0.6	86
0.3	82
0.212	80
0.15	78
0.063	72

Particle Diameter	Percentage Passing
0.02	59
0.006	42
0.002	31

Soil Fraction	Total Percentage
Cobbles	0
Gravel	7
Sand	21
Silt	41
Clay	31

Remarks:
See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

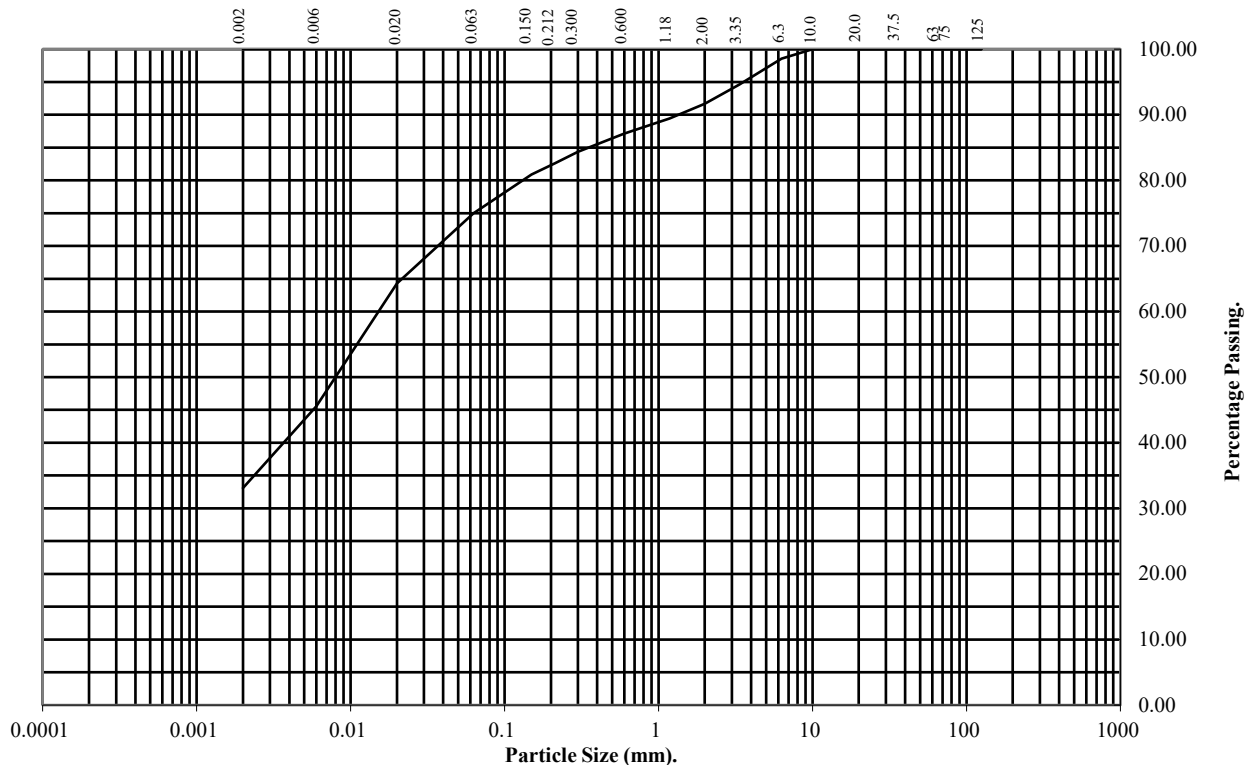
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH102 Top Depth (m): 3.50

Sample Number: 10 Base Depth(m): 4.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	95
2	92
1.18	89
0.6	87
0.3	84
0.212	83
0.15	81
0.063	75

Particle Diameter	Percentage Passing
0.02	64
0.006	46
0.002	33

Soil Fraction	Total Percentage
Cobbles	0
Gravel	8
Sand	17
Silt	42
Clay	33

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

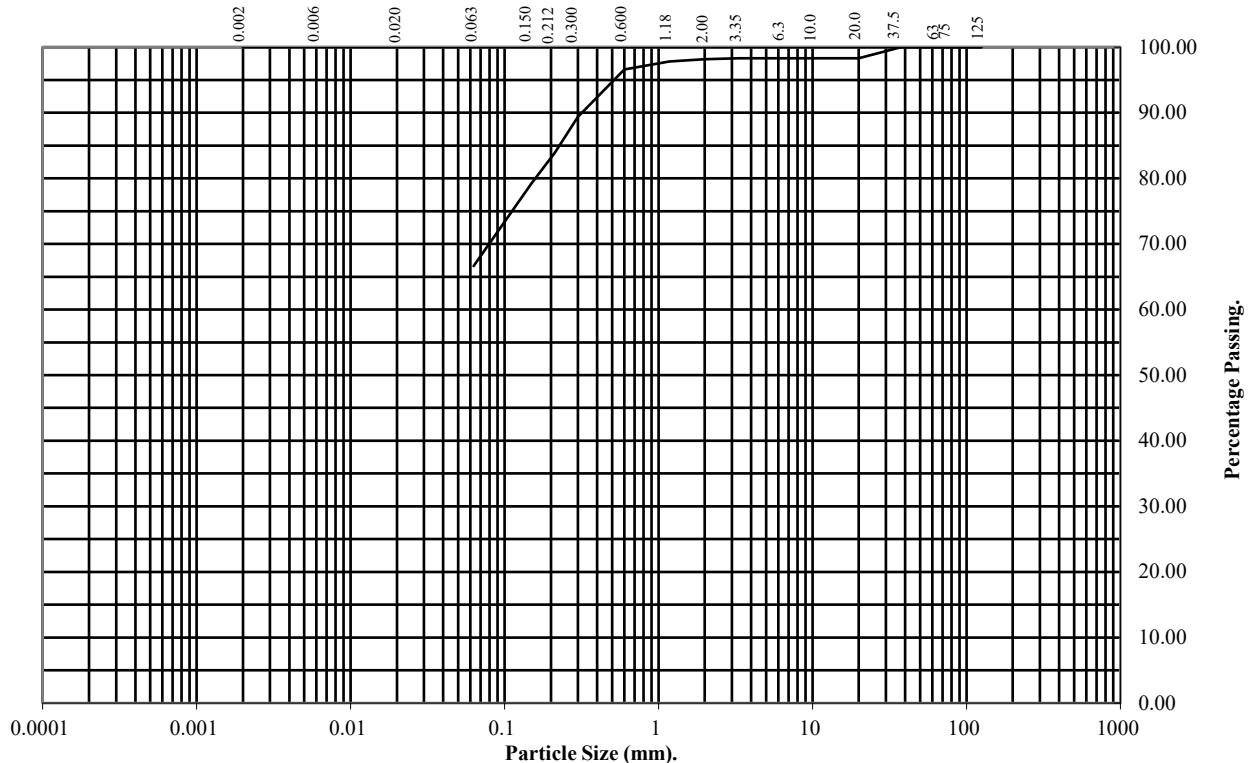
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH103 Top Depth (m): 2.00

Sample Number: 6 Base Depth(m): 2.45

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	98
10	98
6.3	98
3.35	98
2	98
1.18	98
0.6	97
0.3	89
0.212	84
0.15	79
0.063	67

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	31
Silt/Clay	67

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

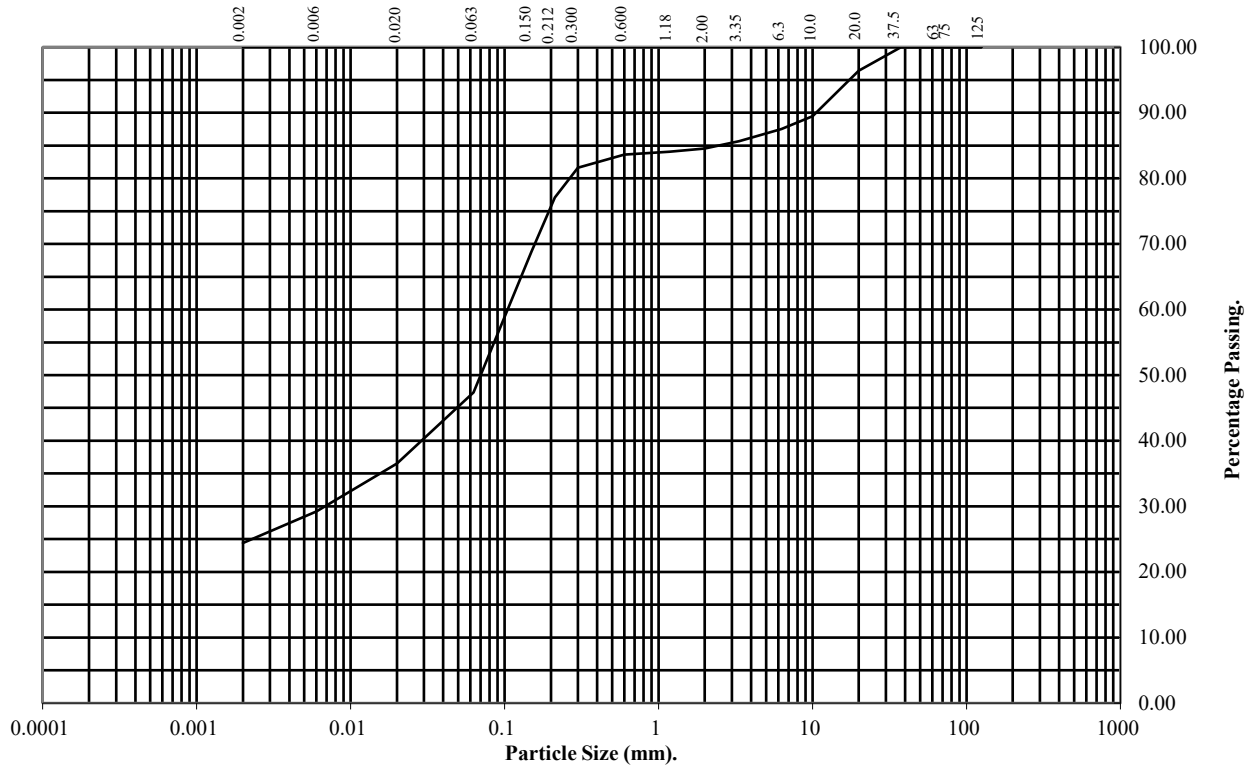
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH103 Top Depth (m): 4.00

Sample Number: 10 Base Depth(m): 4.45

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	96
10	89
6.3	88
3.35	86
2	85
1.18	84
0.6	84
0.3	82
0.212	77
0.15	69
0.063	47

Particle Diameter	Percentage Passing
0.02	37
0.006	29
0.002	24

Soil Fraction	Total Percentage
Cobbles	0
Gravel	15
Sand	38
Silt	23
Clay	24

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

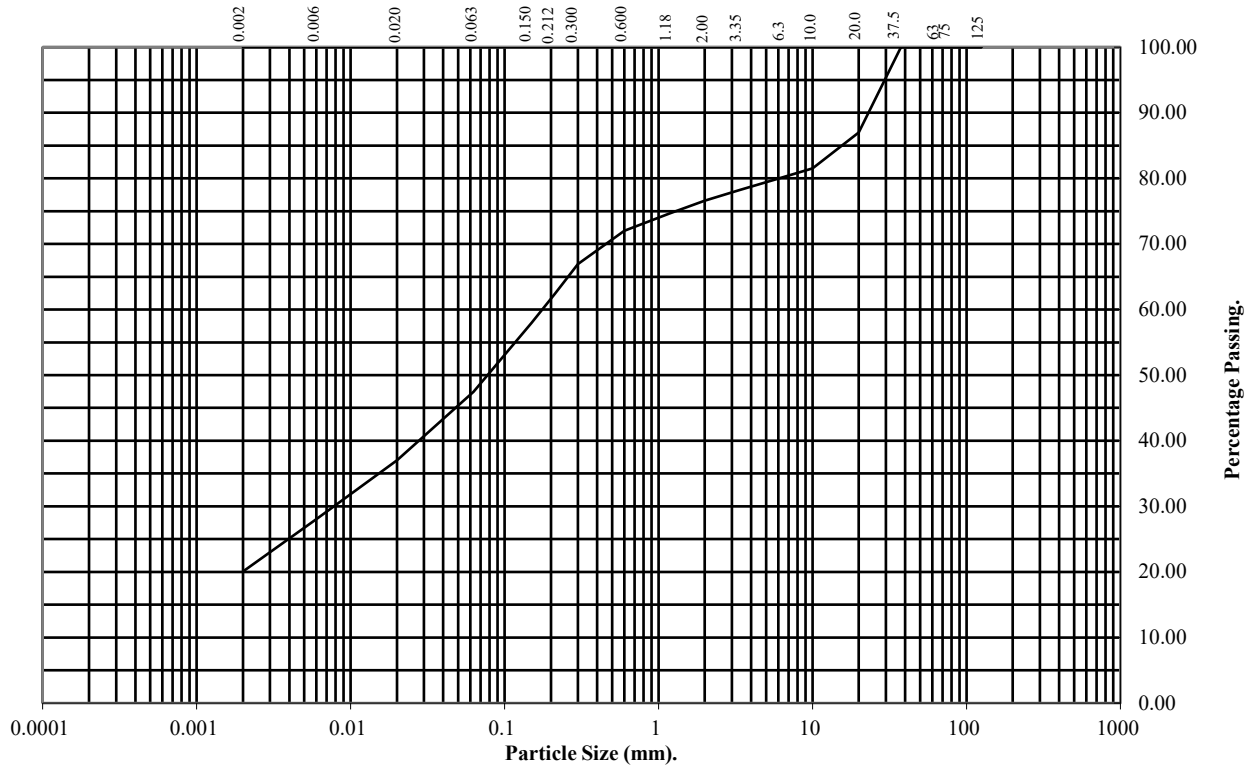
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH104 Top Depth (m): 1.50

Sample Number: 10 Base Depth(m): 2.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	87
10	82
6.3	80
3.35	78
2	77
1.18	75
0.6	72
0.3	67
0.212	62
0.15	58
0.063	47

Particle Diameter	Percentage Passing
0.02	37
0.006	28
0.002	20

Soil Fraction	Total Percentage
Cobbles	0
Gravel	23
Sand	30
Silt	27
Clay	20

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

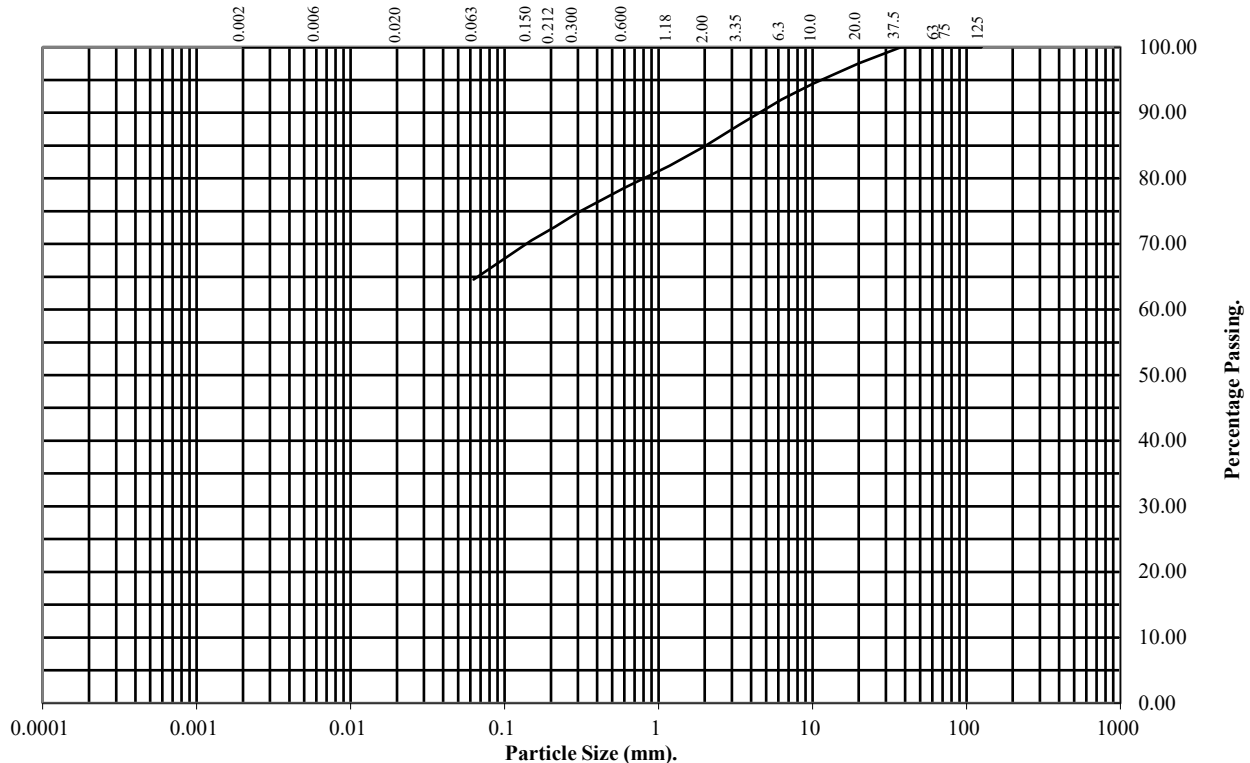
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: BH106 Top Depth (m): 3.00

Sample Number: 9 Base Depth(m): 3.45

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	98
10	94
6.3	92
3.35	88
2	85
1.18	82
0.6	79
0.3	75
0.212	73
0.15	71
0.063	65

Soil Fraction	Total Percentage
Cobbles	0
Gravel	15
Sand	20
Silt/Clay	65

Remarks:

See Summary of Soil Descriptions



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PARTICLE SIZE DISTRIBUTION TEST

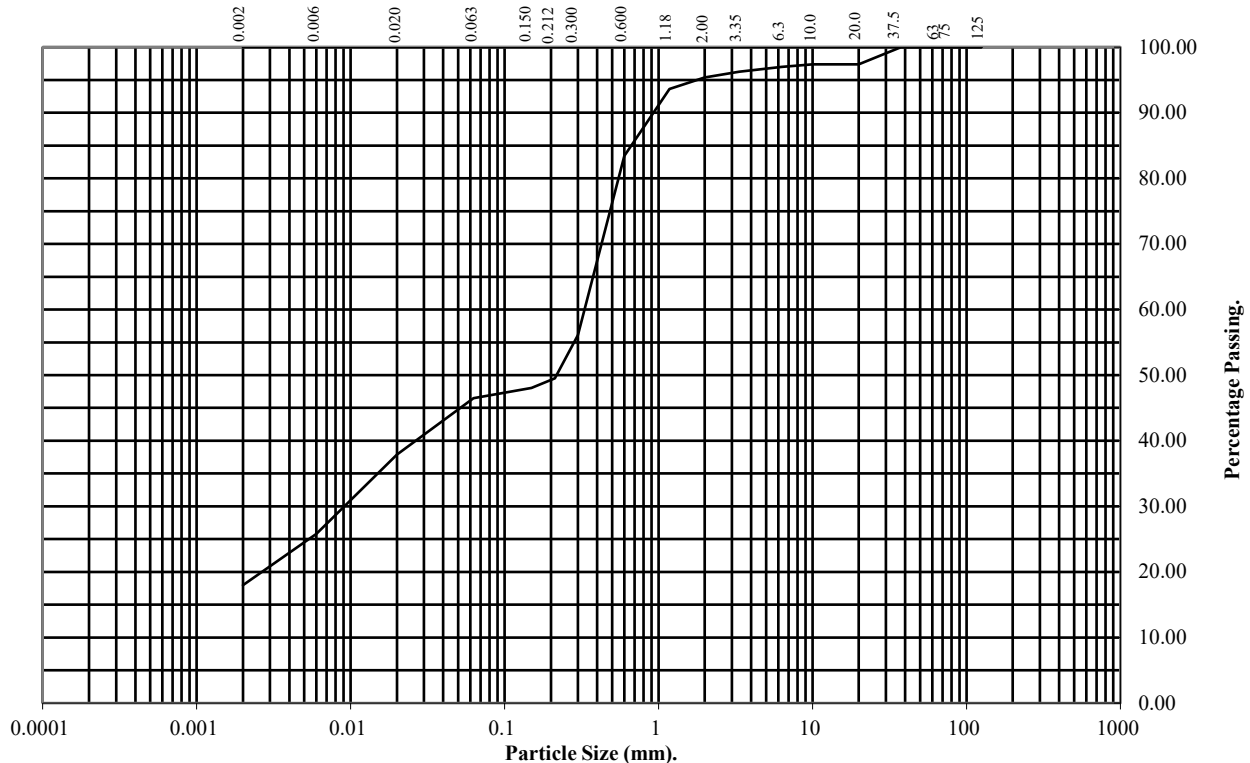
BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number: BH106 Top Depth (m): 0.50

Sample Number: 6 Base Depth(m): 1.00

Sample Type: B



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	97
6.3	97
3.35	96
2	95
1.18	94
0.6	83
0.3	56
0.212	50
0.15	48
0.063	46

Particle Diameter	Percentage Passing
0.02	38
0.006	26
0.002	18

Soil Fraction	Total Percentage
Cobbles	0
Gravel	5
Sand	49
Silt	28
Clay	18

Remarks:

See Summary of Soil Descriptions



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CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

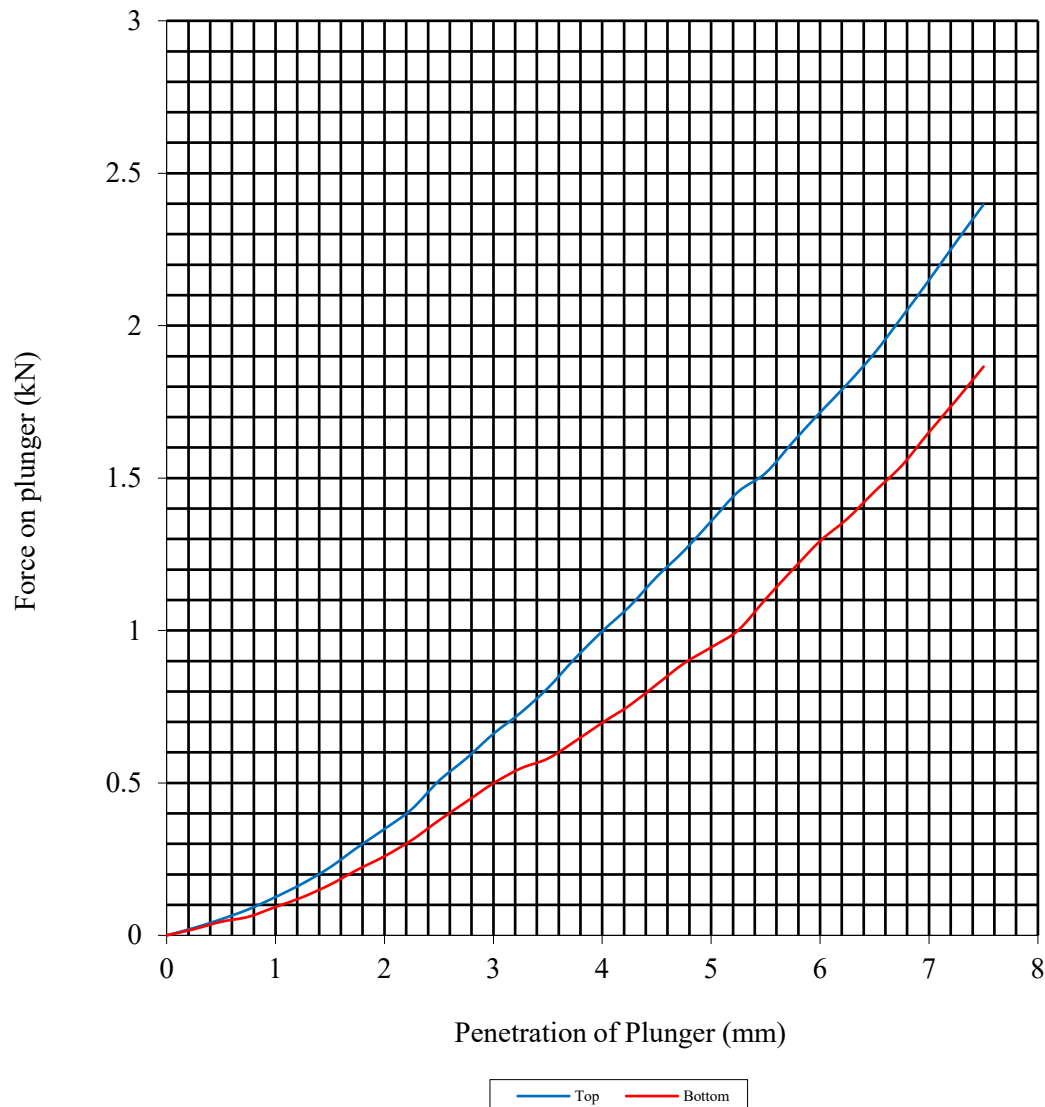
Hole Number: BH103

Top Depth (m): 1.20

Sample Number: 4

Base Depth (m): 1.65

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	9.6	Surcharge Kg:	4.00	Sample Top	9.2	Sample Top	6.8
Bulk Density Mg/m3:	2.27	Soaking Time hrs	0	Sample Bottom	10	Sample Bottom	4.7
Dry Density Mg/m3:	2.07	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:		24					
Compaction Conditions		2.5kg					



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CALIFORNIA BEARING RATIO TEST

Non compliance with BS 1377 : Part 4 : 1990

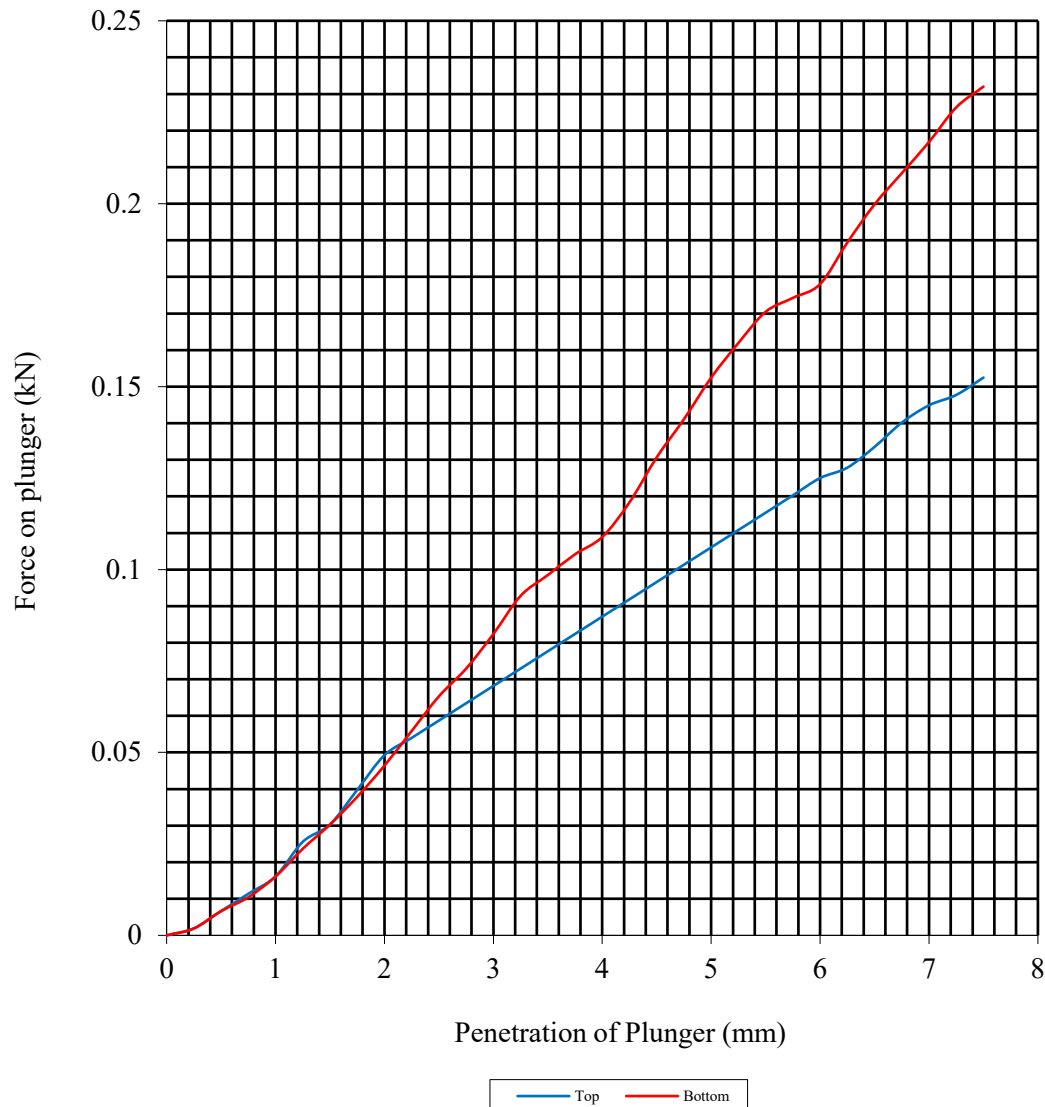
Hole Number: TP108

Top Depth (m): 1.00

Sample Number: 4

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	15	Surcharge Kg:	4.00	Sample Top	15	Sample Top	0.5
Bulk Density Mg/m ³ :	2.10	Soaking Time hrs	0	Sample Bottom	15	Sample Bottom	0.8
Dry Density Mg/m ³ :	1.83	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			31				
Compaction Conditions		2.5kg					



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CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

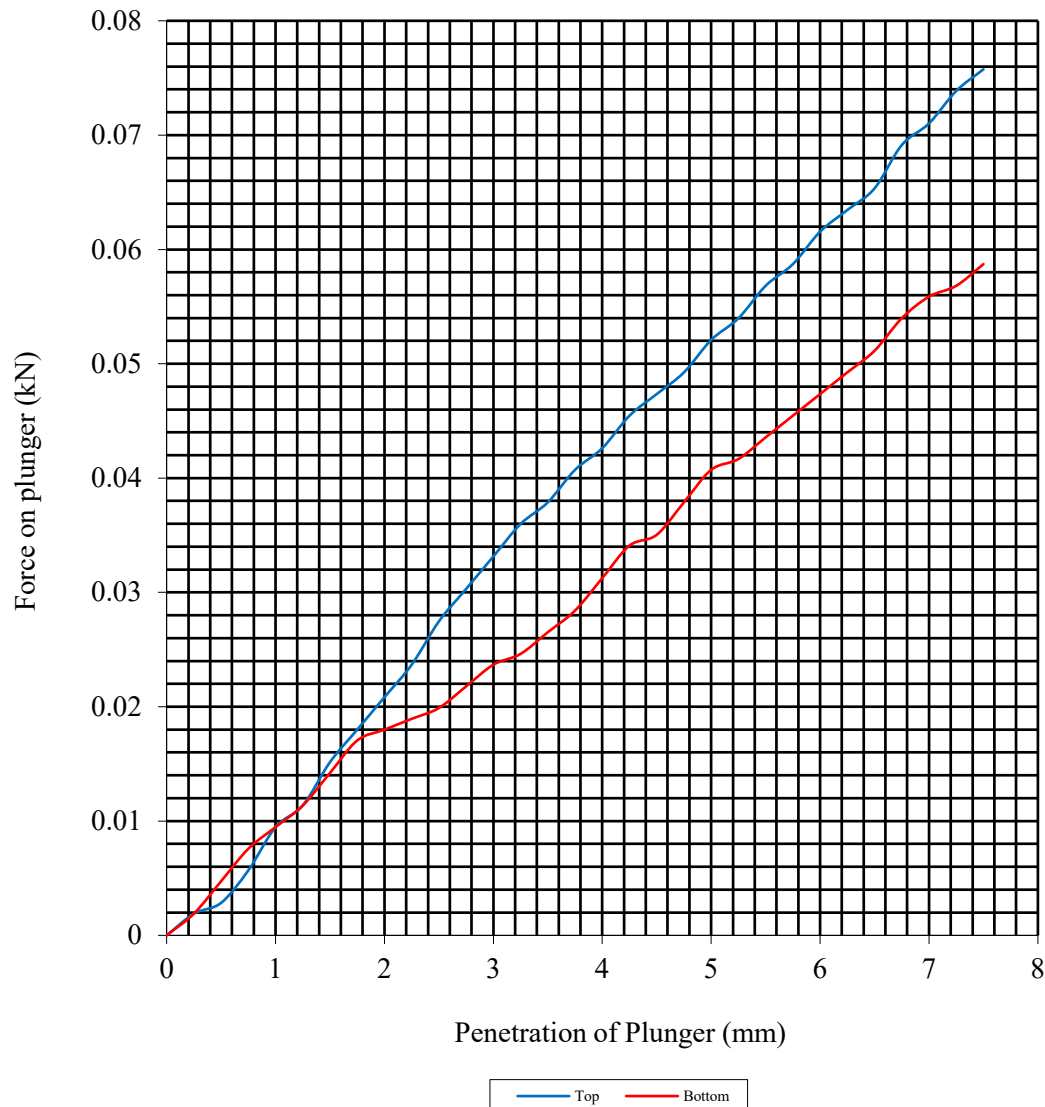
Hole Number: TP110

Top Depth (m): 3.70

Sample Number: 10

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	22	Surcharge Kg:	4.00	Sample Top	22	Sample Top	0.3
Bulk Density Mg/m ³ :	1.98	Soaking Time hrs	0	Sample Bottom	22	Sample Bottom	0.2
Dry Density Mg/m ³ :	1.62	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions		2.5kg					



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CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

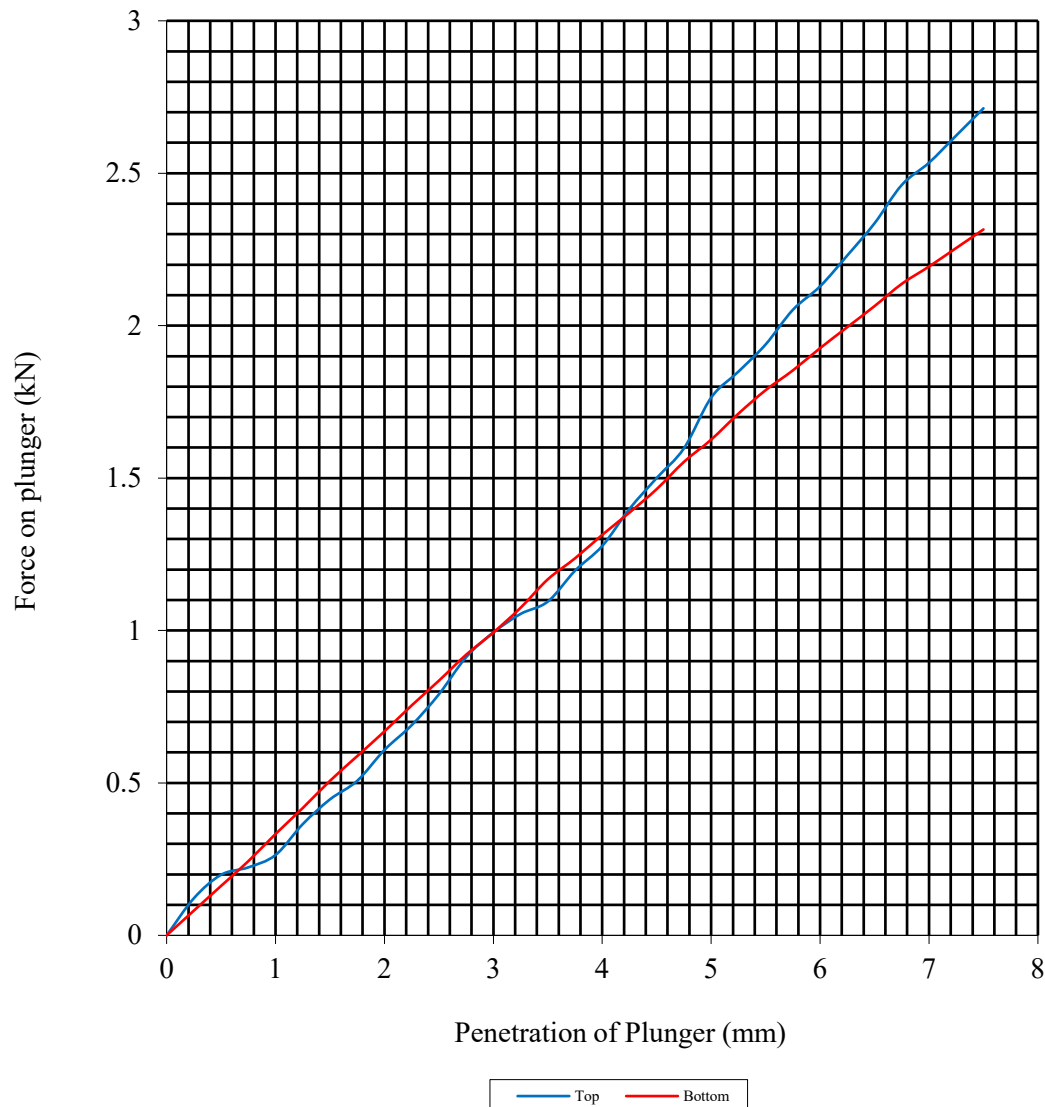
Hole Number: TP112

Top Depth (m): 0.50

Sample Number: 1

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	12	Surcharge Kg:	4.00	Sample Top	12	Sample Top	8.8
Bulk Density Mg/m3:	2.17	Soaking Time hrs	0	Sample Bottom	13	Sample Bottom	8.1
Dry Density Mg/m3:	1.93	Swelling mm:	0.00	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:		3					
Compaction Conditions		2.5kg					



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CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

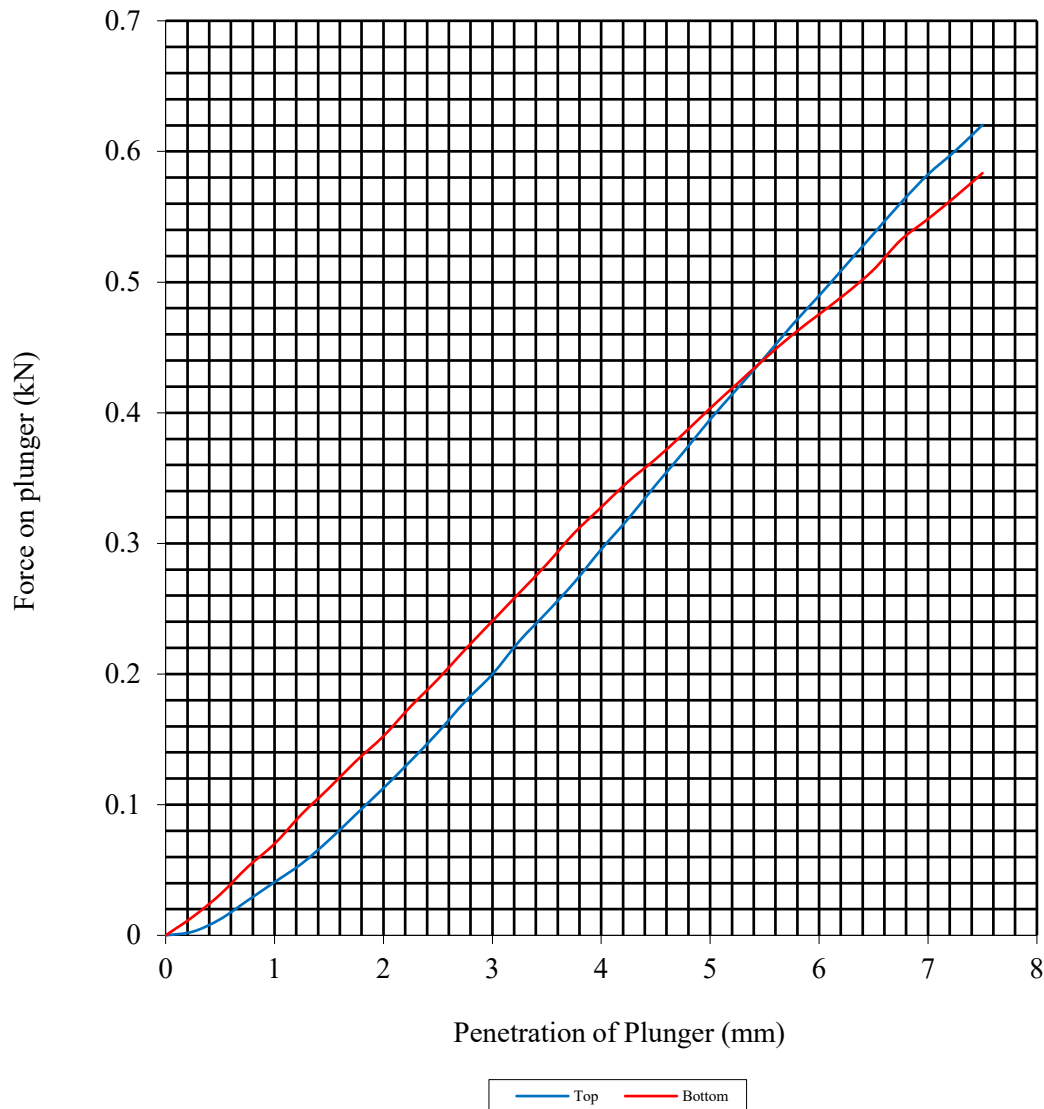
Hole Number: BH104

Top Depth (m): 4.00

Sample Number: 16

Base Depth (m): 4.45

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	16	Surcharge Kg:	4.00	Sample Top	16	Sample Top	2.0
Bulk Density Mg/m3:	2.09	Soaking Time hrs	0	Sample Bottom	16	Sample Bottom	2.0
Dry Density Mg/m3:	1.80	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:		0					
Compaction Conditions		2.5kg					



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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

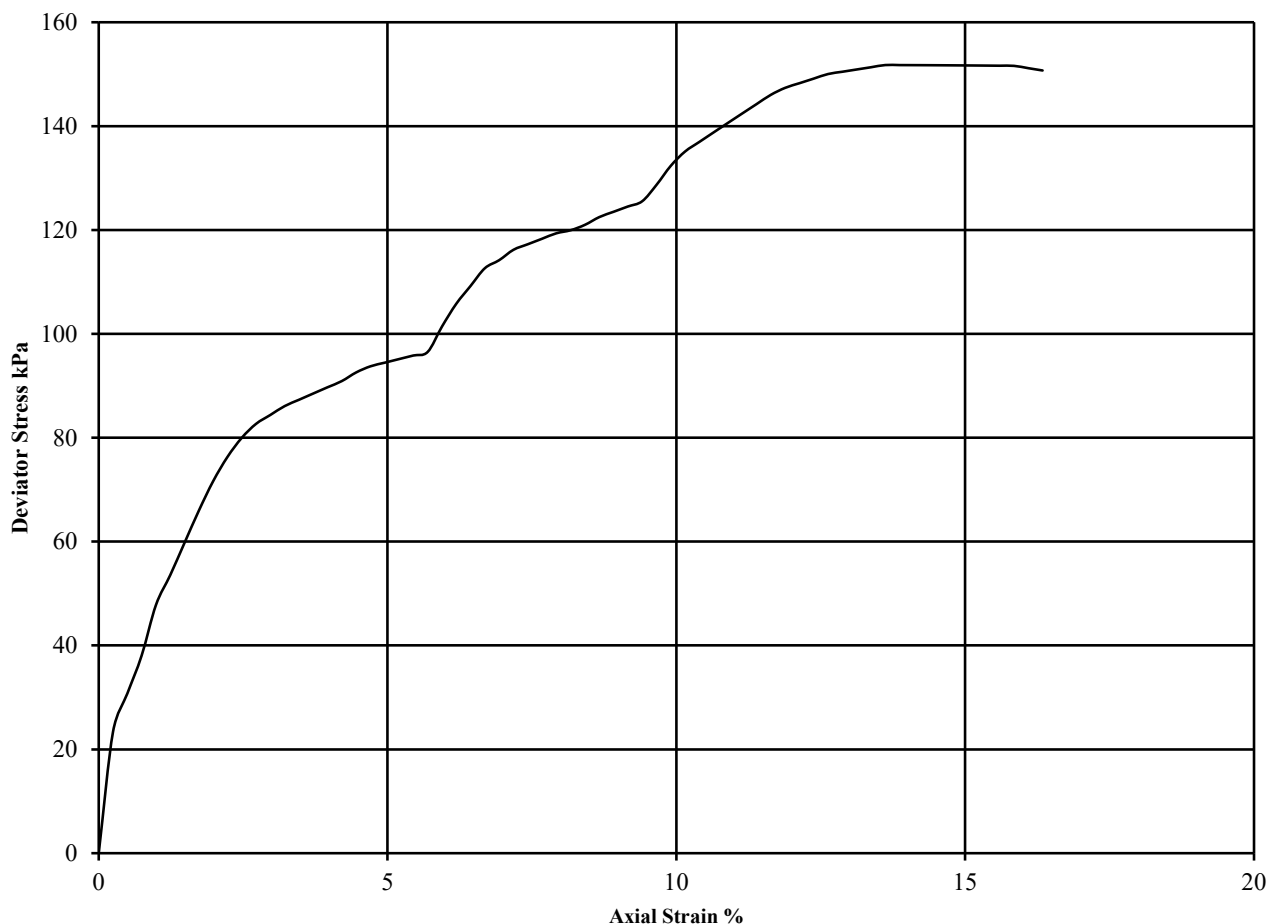
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 9

Hole Number: BH101 Top Depth (m): 6.00

Sample Number: 18 Base Depth (m): 6.45

Sample Type UT



Diameter (mm):		102	Height (mm):		206	Test:	UU Multistage		Remarks
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure	Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick Membrane Correction applied (kPa) 0.36 0.35 0.35 See summary of soil descriptions
1	17	2.19	1.87	75	97	48	5.7		
				150	126	63	9.4		
				250	152	76	13.6	Plastic	



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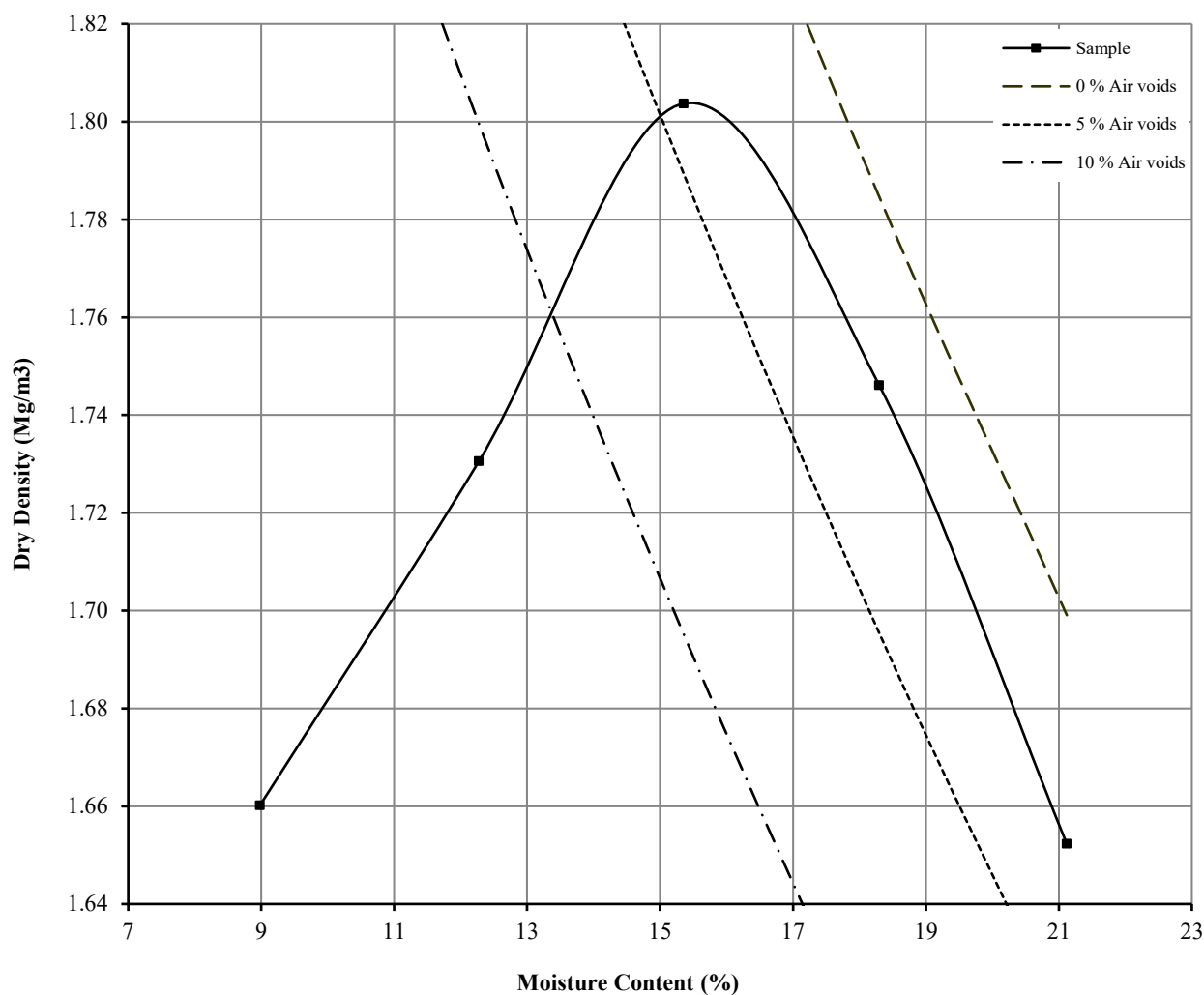
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

Hole Number: BH104 Top Depth (m) : 0.60

Sample Number: 6 Base Depth (m) : 1.10

Sample Type: B



Initial Moisture Content:	19	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m3):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m3):	1.80		Material Retained on 20.0 mm Test Sieve (%):	3
Optimum Moisture Content (%):	15			
Remarks See summary of soil descriptions				



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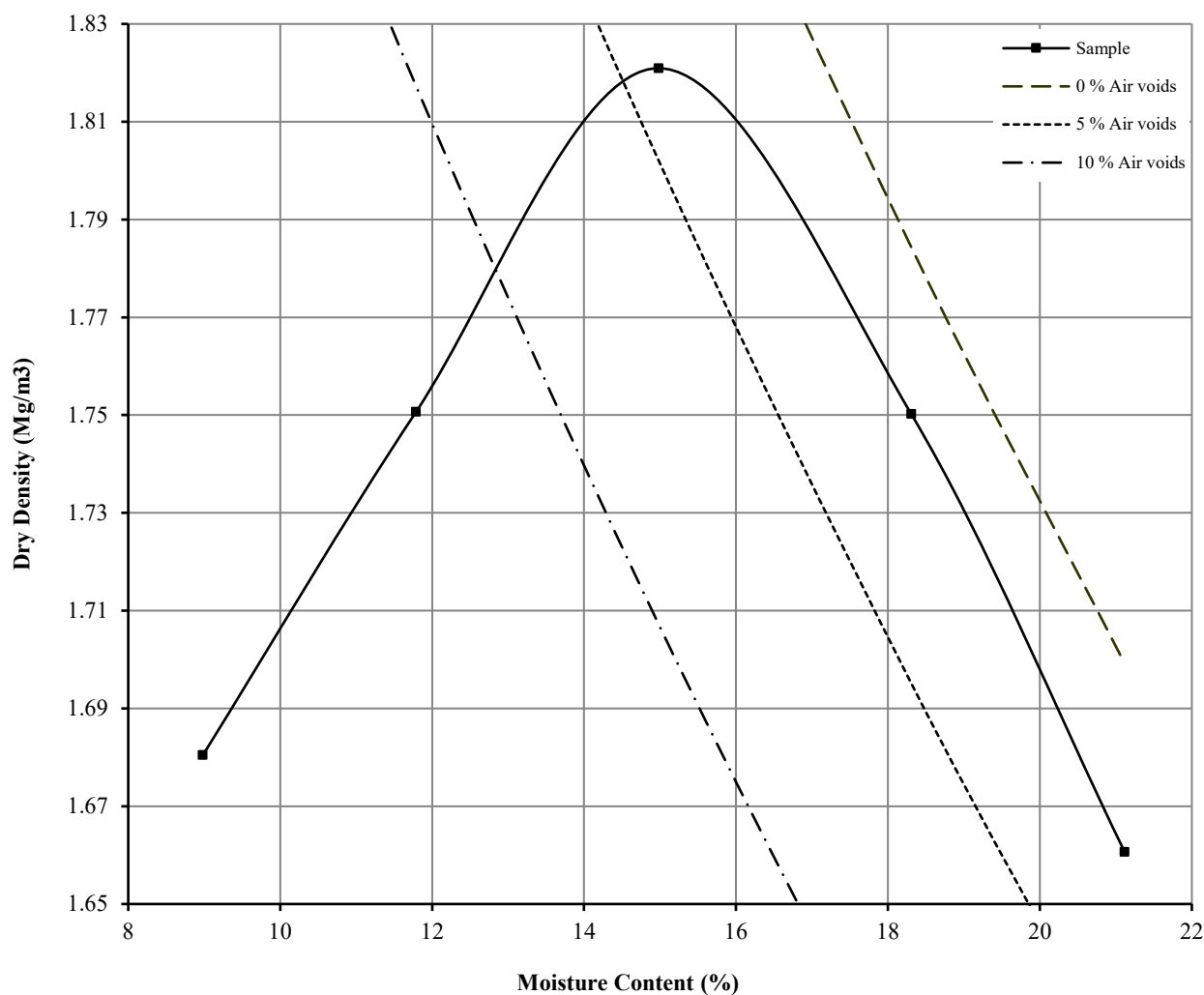
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

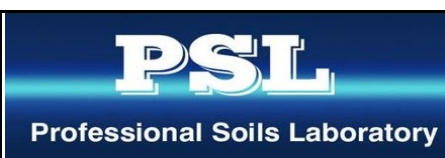
Hole Number: BH104 Top Depth (m) : 2.00

Sample Number: 11 Base Depth (m) : 2.45

Sample Type: B



Initial Moisture Content:	22	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m ³):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m ³):	1.82		Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	15			
Remarks See summary of soil descriptions				



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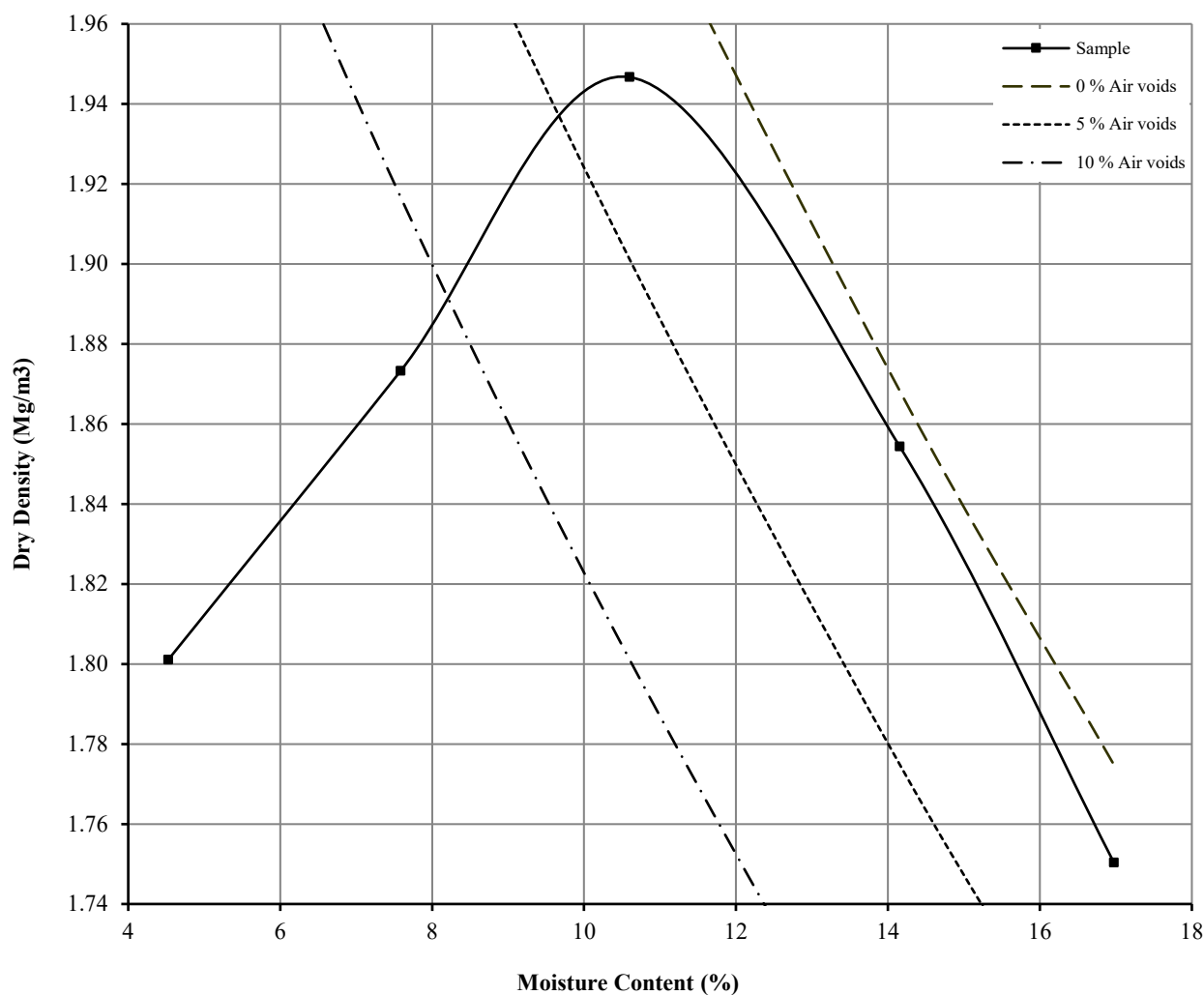
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

Hole Number: BH106 Top Depth (m) : 0.50

Sample Number: 6 Base Depth (m) : 1.00

Sample Type: B



Initial Moisture Content:	11	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m ³):	2.54	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m ³):	1.95		Material Retained on 20.0 mm Test Sieve (%):	3
Optimum Moisture Content (%):	11			
Remarks See summary of soil descriptions				



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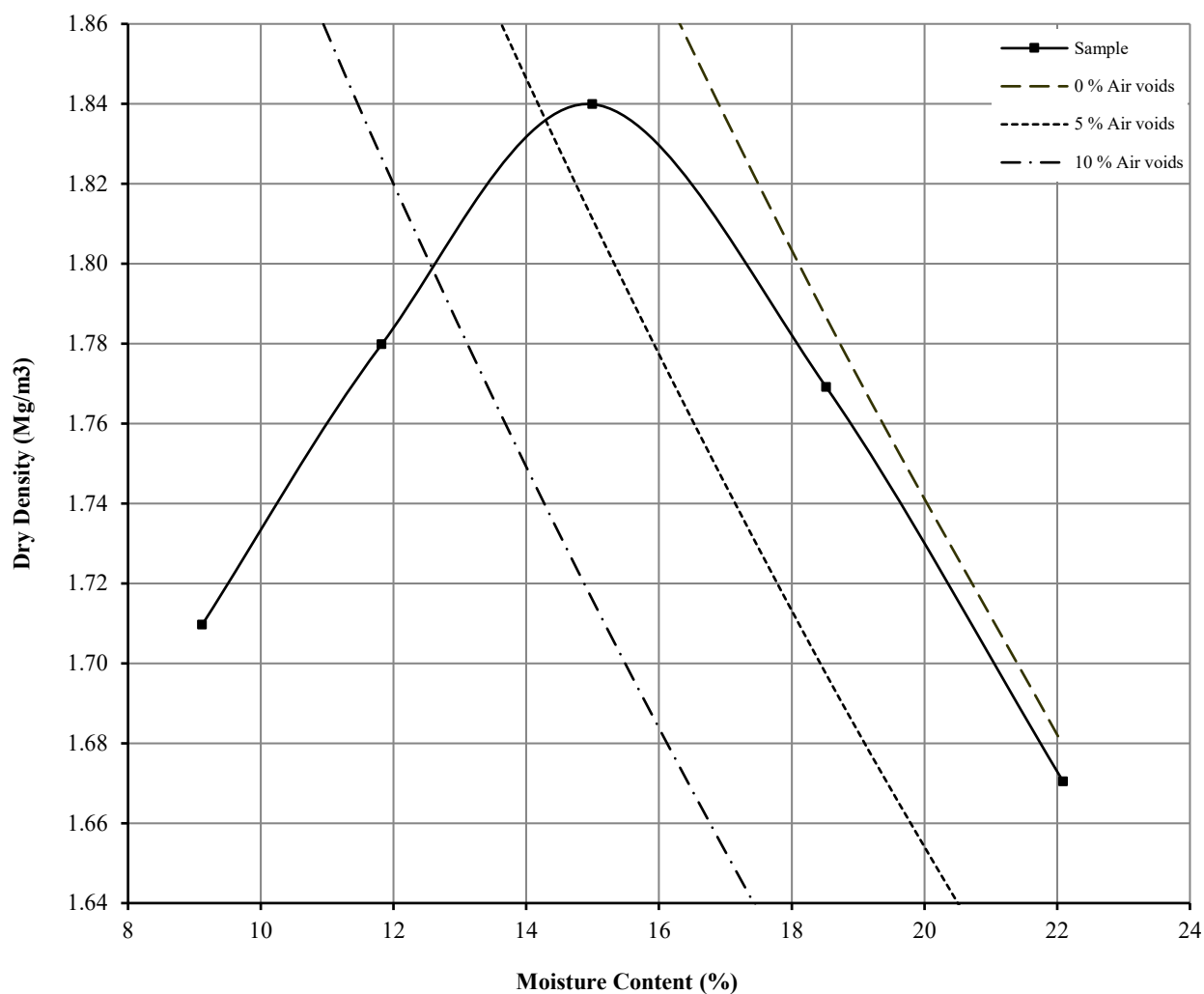
DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

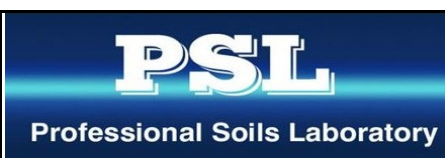
Hole Number: BH106 Top Depth (m) : 3.00

Sample Number: 9 Base Depth (m) : 3.45

Sample Type: B



Initial Moisture Content:	19	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m ³):	2.67	Measured	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m ³):	1.84		Material Retained on 20.0 mm Test Sieve (%):	2
Optimum Moisture Content (%):	15			
Remarks See summary of soil descriptions				



Hill Top Farm

Contract
PSL22/4501
Client Ref

DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.3 : 1990

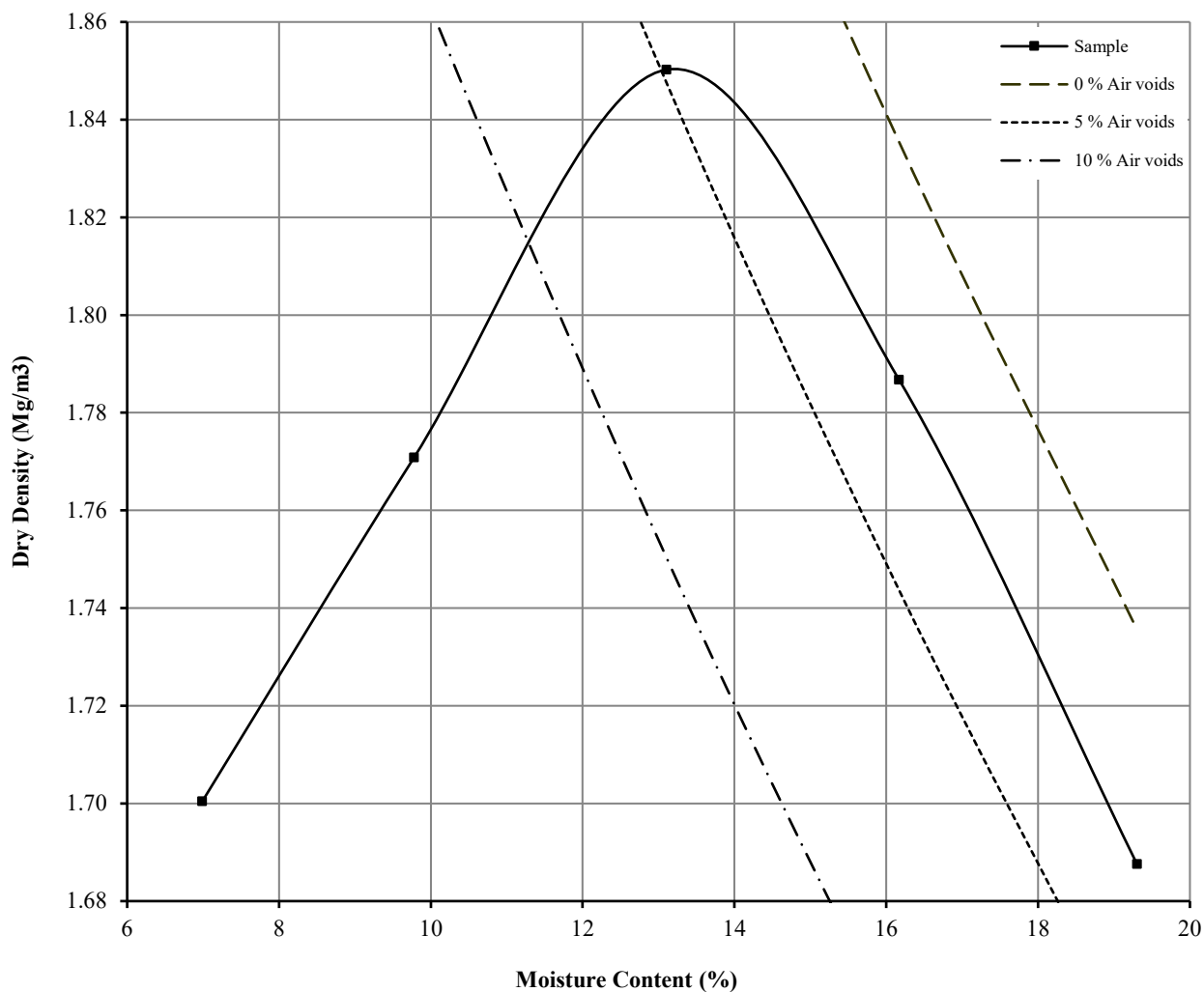
Hole Number: TP110

Top Depth (m) : 1.60

Sample Number: 7

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	20	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m ³):	2.61	Assumed	Material Retained on 37.5 mm Test Sieve (%):	0
Maximum Dry Density (Mg/m ³):	1.85		Material Retained on 20.0 mm Test Sieve (%):	0
Optimum Moisture Content (%):	13			
Remarks See summary of soil descriptions				



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DRY DENSITY / MOISTURE CONTENT RELATIONSHIP

BS 1377 : Part 4 : Clause 3.4 : 1990

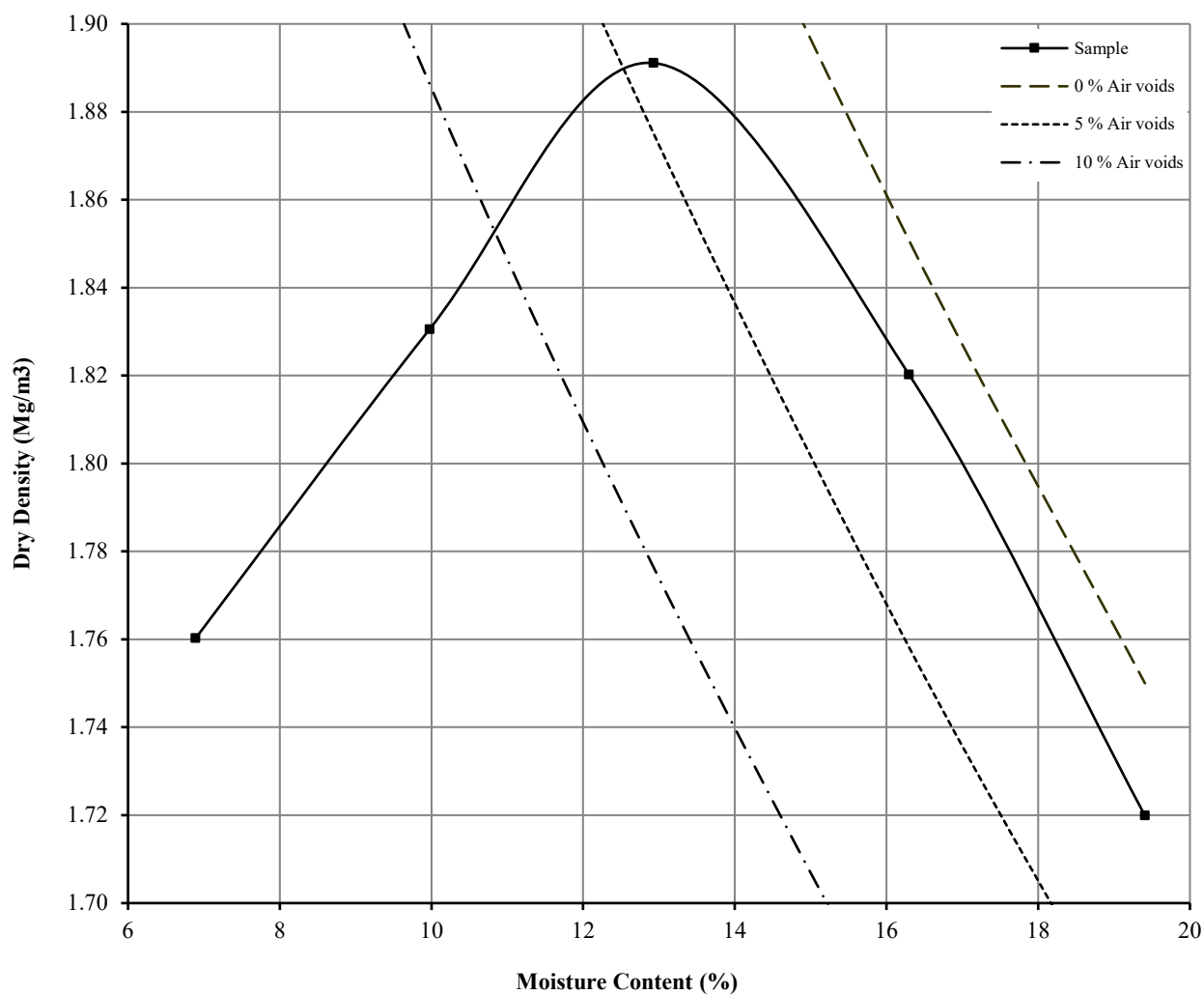
Hole Number: TP112

Top Depth (m) : 1.00

Sample Number: 4

Base Depth (m) :

Sample Type: B



Initial Moisture Content:	13	Method of Compaction:	2.5kg	Separate Samples
Particle Density (Mg/m ³):	2.65	Assumed	Material Retained on 37.5 mm Test Sieve (%):	5
Maximum Dry Density (Mg/m ³):	1.89		Material Retained on 20.0 mm Test Sieve (%):	1
Optimum Moisture Content (%):	13			
Remarks See summary of soil descriptions				



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ONE DIMENSIONAL CONSOLIDATION TEST

BS 1377: Part 5: 1990: Clause 3

Hole Number: BH104

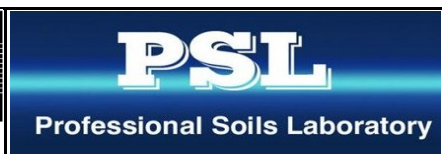
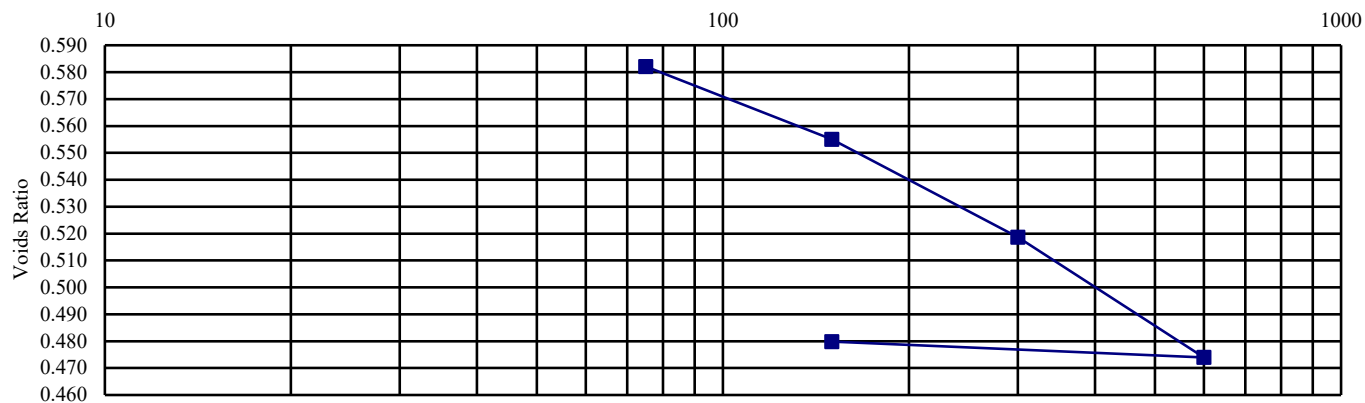
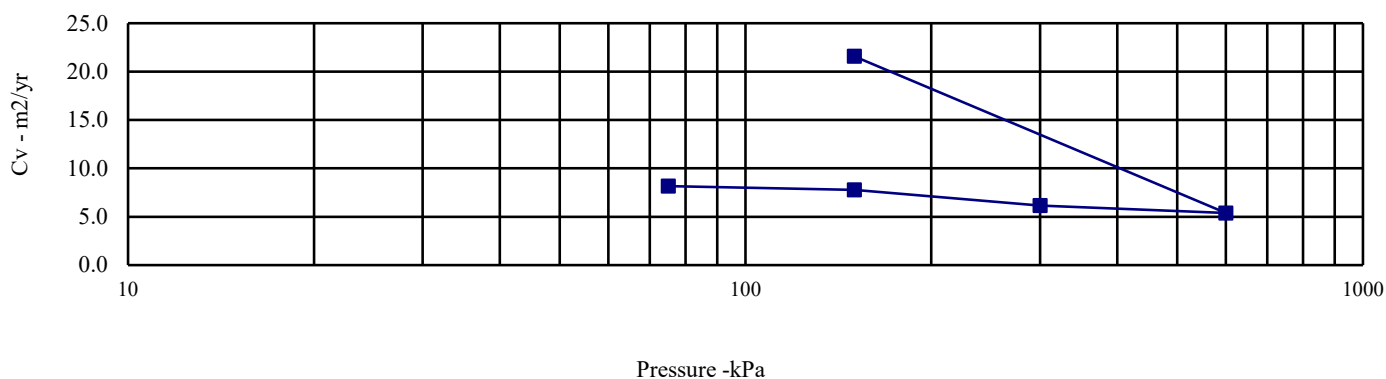
Top Depth (m): 3.00

Sample Number: 13

Base Depth (m) : 3.45

Sample Type: UT

Initial Conditions		Pressure Range		Mv	Cv	Specimen location	
Moisture Content (%):	20	kPa		m2/MN	m2/yr	within tube:	Top
Bulk Density (Mg/m3):	1.96	0	75	0.379	8.149	Method used to	
Dry Density (Mg/m3):	1.63	75	150	0.228	7.781	determine CV:	T90
Voids Ratio:	0.628	150	300	0.156	6.139	Nominal temperature	
Degree of saturation:	85.9	300	600	0.098	5.387	during test ' C:	20
Height (mm):	20.07	600	150	0.009	21.573	Remarks:	
Diameter (mm)	75.11					See summary of soil descriptions	
Particle Density (Mg/m3):	2.65						
Assumed							



Hill Top Farm

Contract No:

PSL22/4501

Client Ref:

ONE DIMENSIONAL CONSOLIDATION TEST

BS 1377: Part 5: 1990: Clause 3

Hole Number: BH101

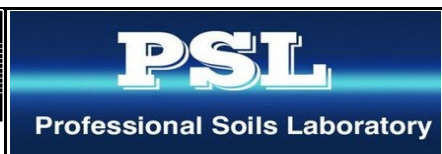
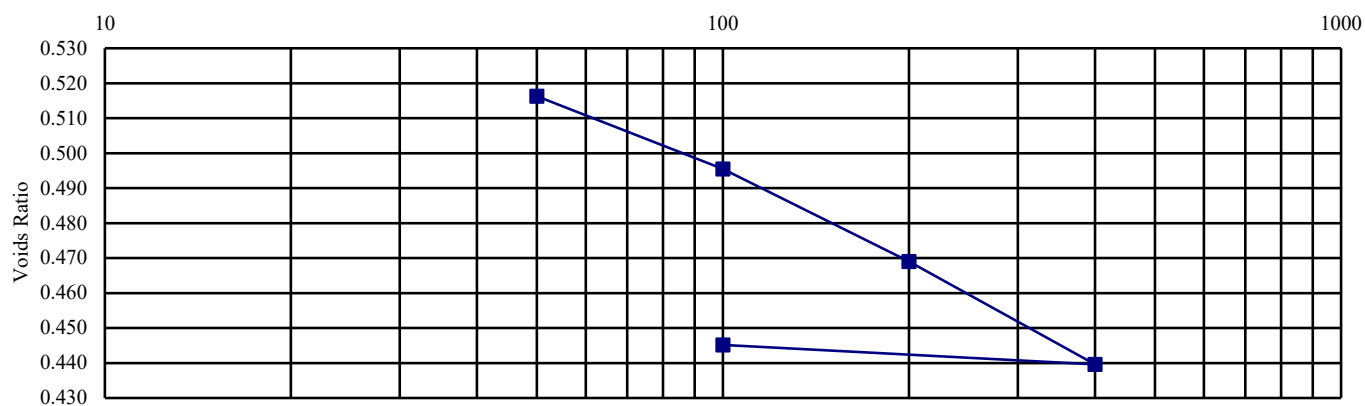
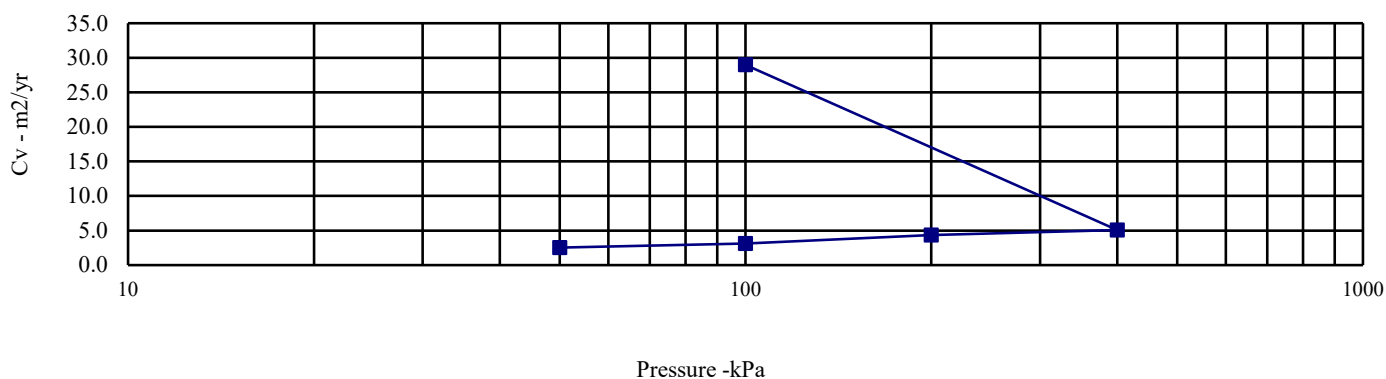
Top Depth (m): 4.00

Sample Number: 14

Base Depth (m) : 4.45

Sample Type: UT

Initial Conditions		Pressure Range		Mv	Cv	Specimen location	
Moisture Content (%):	22	kPa		m2/MN	m2/yr	within tube:	Top
Bulk Density (Mg/m3):	2.03	0	50	1.002	2.534	Method used to	
Dry Density (Mg/m3):	1.66	50	100	0.275	3.119	determine CV:	T90
Voids Ratio:	0.596	100	200	0.177	4.365	Nominal temperature	
Degree of saturation:	99.0	200	400	0.100	5.087	during test ' C:	20
Height (mm):	20.07	400	100	0.013	28.973	Remarks:	
Diameter (mm)	75.06					See summary of soil descriptions	
Particle Density (Mg/m3):	2.65						
Assumed							



Hill Top Farm

Contract No:
PSL22/4501
Client Ref:

ONE DIMENSIONAL CONSOLIDATION TEST

BS 1377: Part 5: 1990: Clause 3

Hole Number: BH102

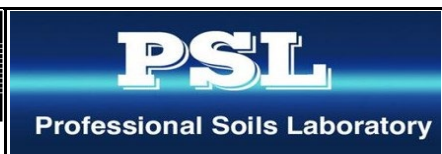
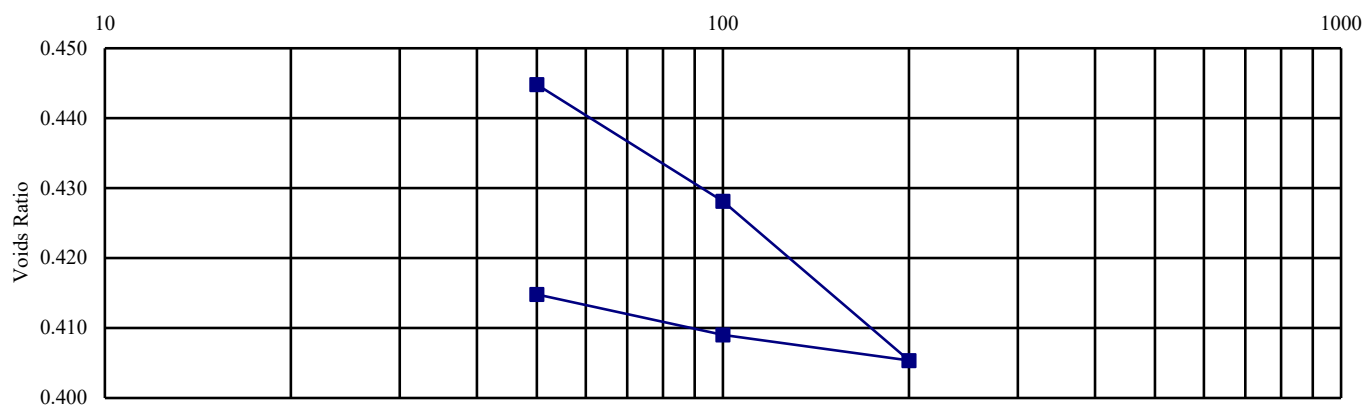
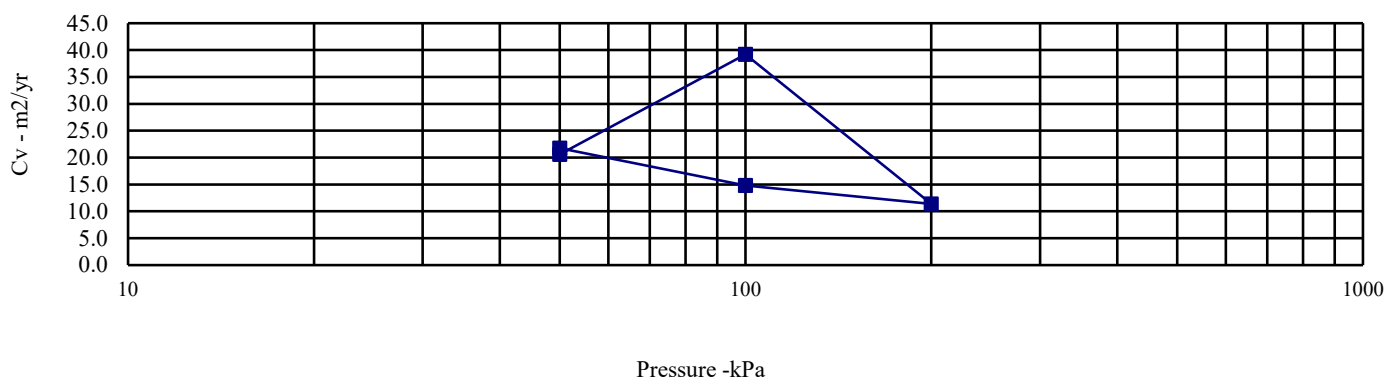
Top Depth (m): 3.00

Sample Number: 8

Base Depth (m) : 3.45

Sample Type: UT

Initial Conditions		Pressure Range		Mv	Cv	Specimen location	
Moisture Content (%):	17	kPa		m2/MN	m2/yr	within tube:	Top
Bulk Density (Mg/m3):	2.13	0	50	0.212	21.749	Method used to	
Dry Density (Mg/m3):	1.81	50	100	0.231	14.796	determine CV:	T90
Voids Ratio:	0.460	100	200	0.159	11.380	Nominal temperature	
Degree of saturation:	99.6	200	100	0.026	39.205	during test ' C:	20
Height (mm):	20.07	100	50	0.083	20.600	Remarks:	
Diameter (mm)	75.06					See summary of soil descriptions	
Particle Density (Mg/m3):	2.65						
Assumed							



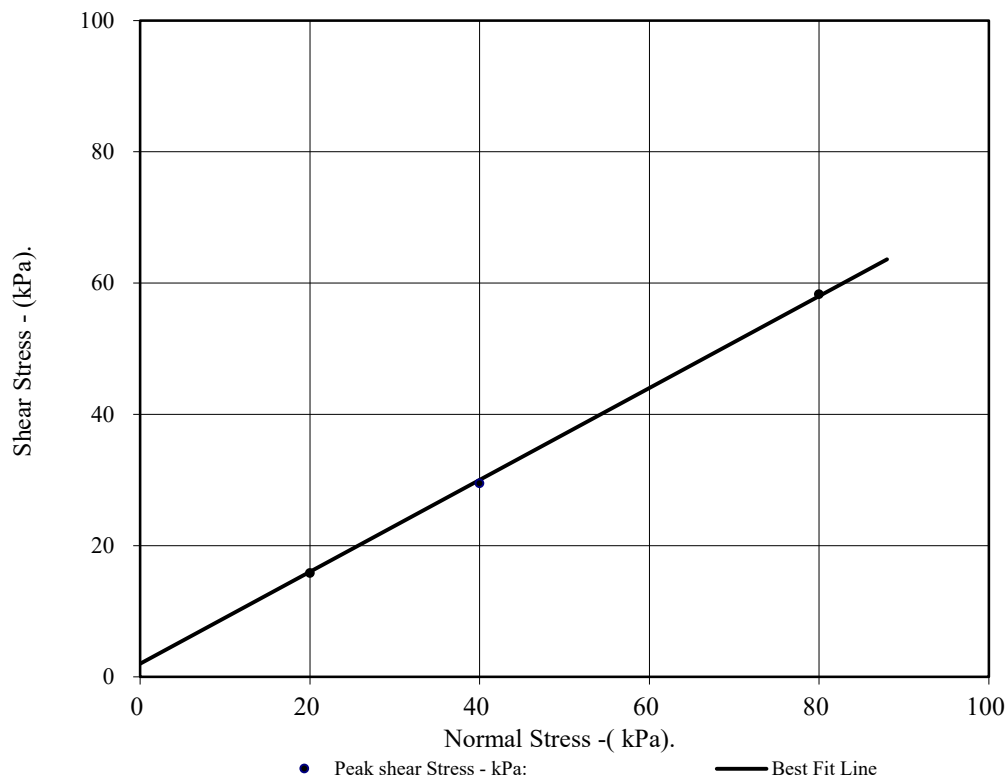
Hill Top Farm

Contract No:
PSL22/4501
Client Ref:

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	BH105		Top Depth:	2.00	
Sample Number:	7		Base Depth:	2.45	
Sample Conditions:	Submerged		Sample Type	B	
Particle Density - Mg/m3:	2.65	Assumed	Remarks:		
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.				
Sample Description:	See summary of soil descriptions.				
STAGE			1	2	3
Initial Conditions					
Height - mm:			20.05	20.05	20.05
Length - mm:			59.97	59.97	59.97
Moisture Content - %:			23	23	23
Bulk Density - Mg/m3:			2.25	2.25	2.25
Dry Density - Mg/m3:			1.83	1.83	1.83
Voids Ratio:			0.447	0.447	0.447
Normal Pressure- kPa			20	40	80
Consolidation Stage					
Consolidated Height - mm:			19.08	17.98	17.38
Shearing Stage					
Rate of Strain - mm/min			0.042	0.042	0.042
Displacement at peak shear stress - mm			9.60	7.81	8.10
Peak shear Stress - kPa:			16	30	58
Final Consolidated Conditions					
Moisture Content - %:			18	17	18
Bulk Density - Mg/m3:			2.36	2.50	2.59
Dry Density - Mg/m3:			2.00	2.14	2.20
Peak					
Angle of Shearing Resistance:(θ)			35		
Effective Cohesion - kPa:			2		



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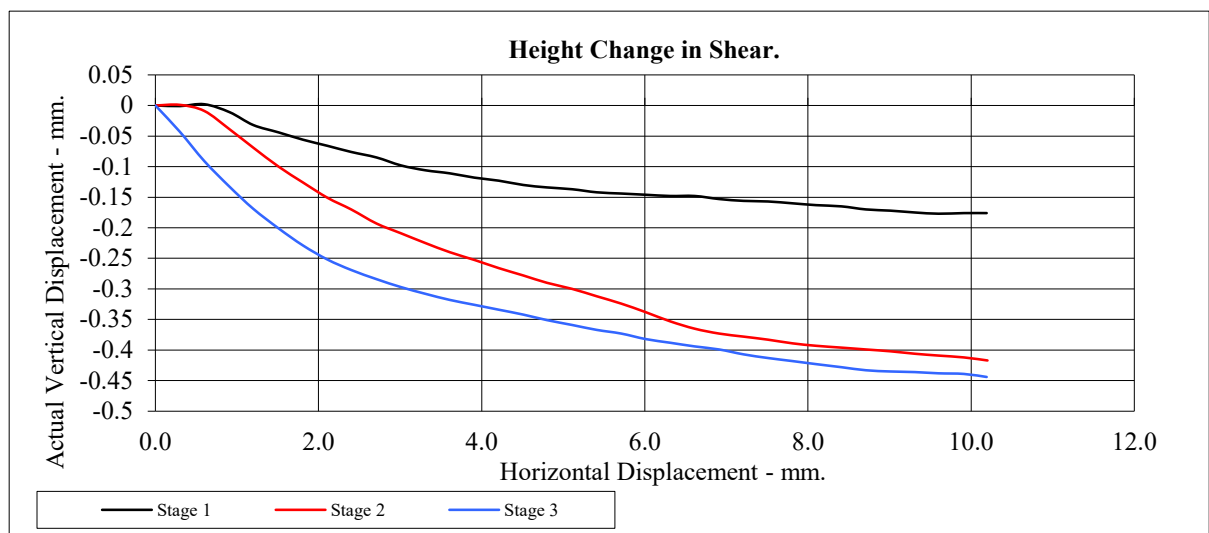
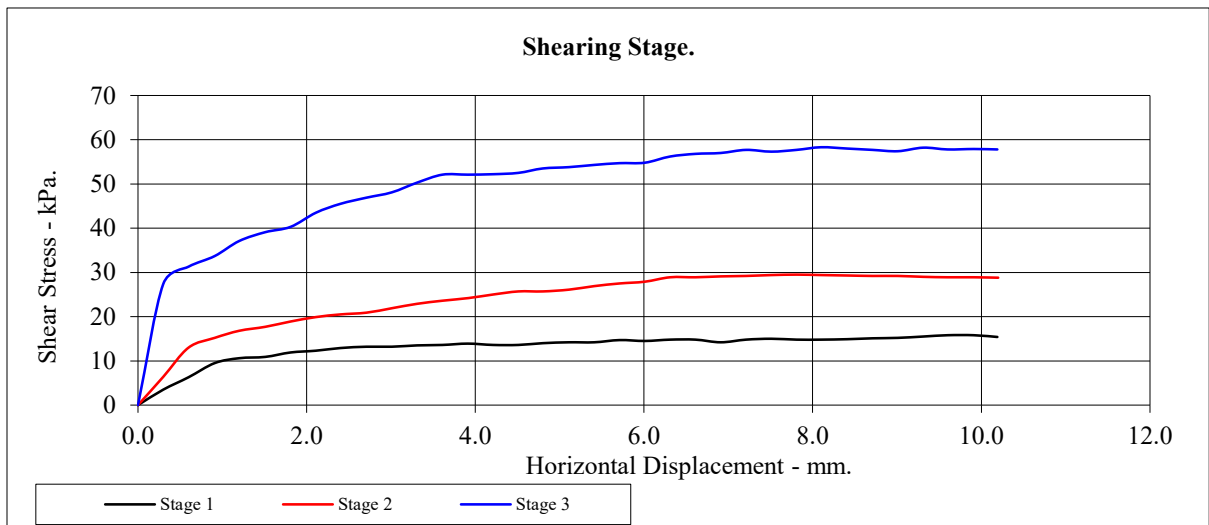
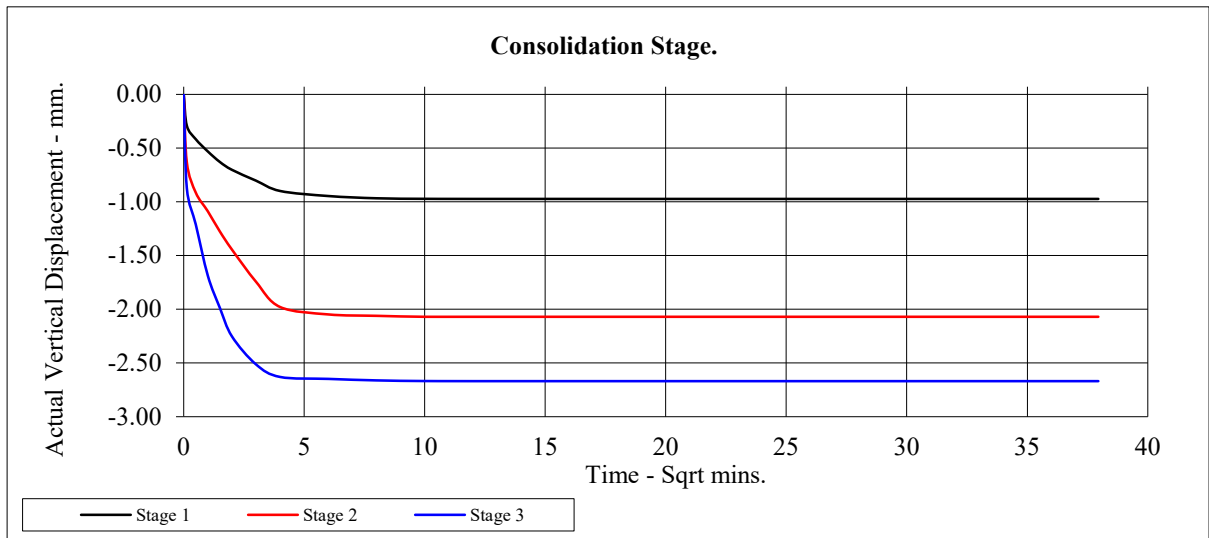
Hill Top Farm

Contract No:
PSL22/4501
Client Ref:

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	BH105	Top Depth:	2.00
Sample Number:	7	Base Depth:	2.45



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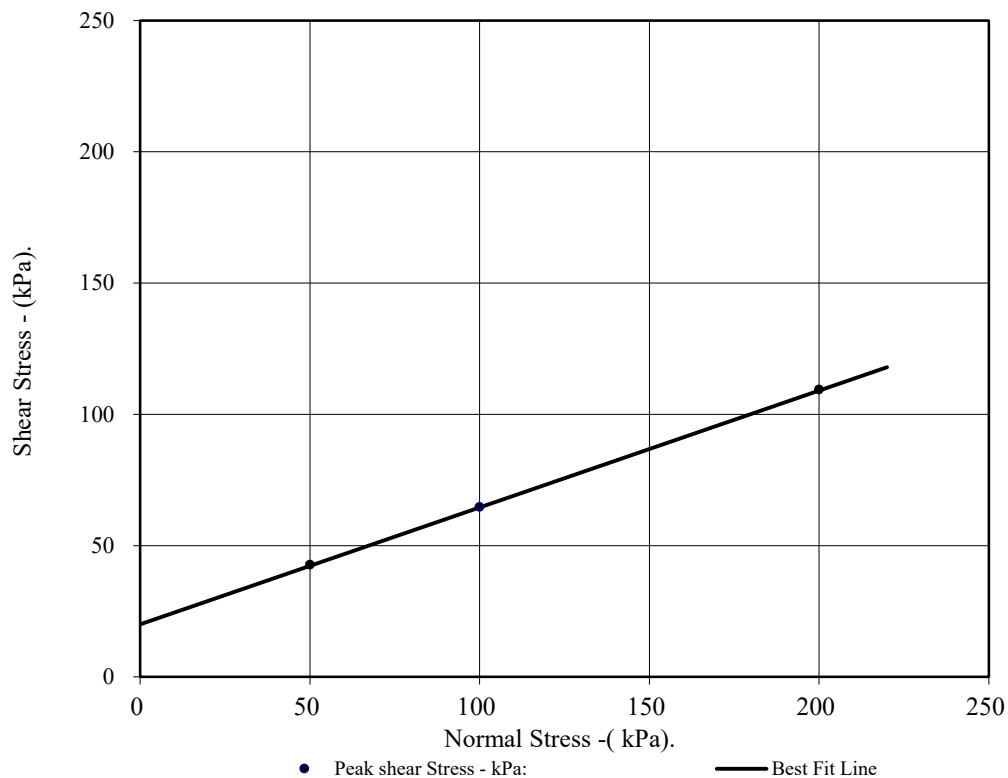
Hill Top Farm

Contract No:
PSL22/4501
Client Ref:

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	BH106		Top Depth:	5.00	
Sample Number:	16		Base Depth:	5.45	
Sample Conditions:	Submerged		Sample Type	B	
Particle Density - Mg/m3:	2.65	Assumed	Remarks:		
Sample Preparation:	Material tested passing 2mm sieve Remoulded using 2.5kg effort.				
Sample Description:	See summary of soil descriptions.				
STAGE			1	2	3
Initial Conditions					
Height - mm:			20.05	20.05	20.05
Length - mm:			59.97	59.97	59.97
Moisture Content - %:			23	23	23
Bulk Density - Mg/m3:			2.11	2.11	2.11
Dry Density - Mg/m3:			1.71	1.71	1.71
Voids Ratio:			0.550	0.550	0.550
Normal Pressure- kPa			50	100	200
Consolidation Stage					
Consolidated Height - mm:			19.57	19.09	18.71
Shearing Stage					
Rate of Strain - mm/min			0.042	0.042	0.042
Displacement at peak shear stress - mm			3.61	7.51	5.41
Peak shear Stress - kPa:			43	65	110
Final Consolidated Conditions					
Moisture Content - %:			18	17	17
Bulk Density - Mg/m3:			2.16	2.21	2.26
Dry Density - Mg/m3:			1.84	1.89	1.94
Peak					
Angle of Shearing Resistance:(θ)			24		
Effective Cohesion - kPa:			20		



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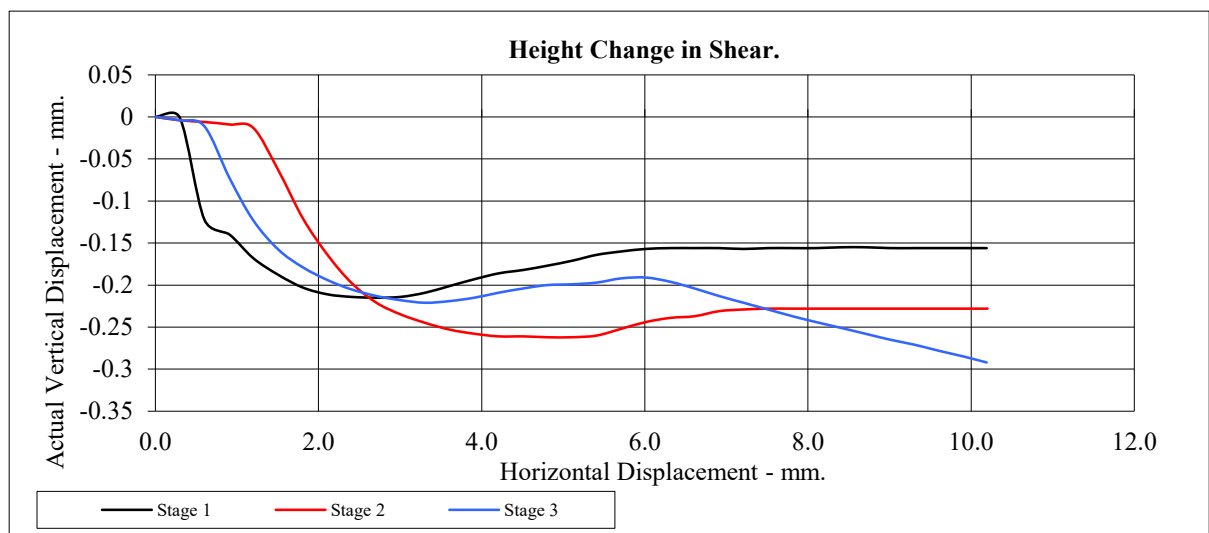
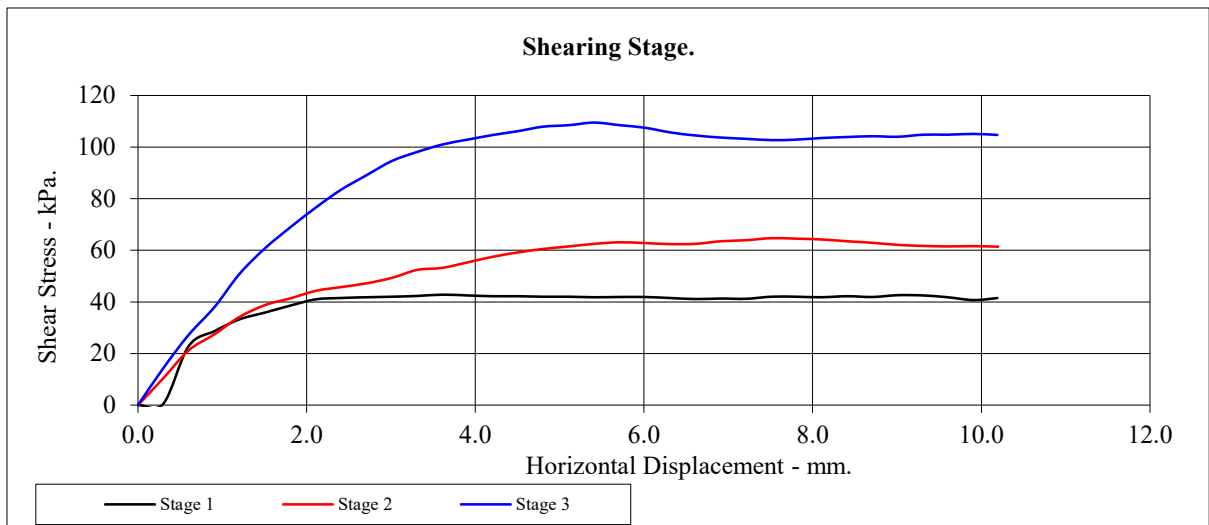
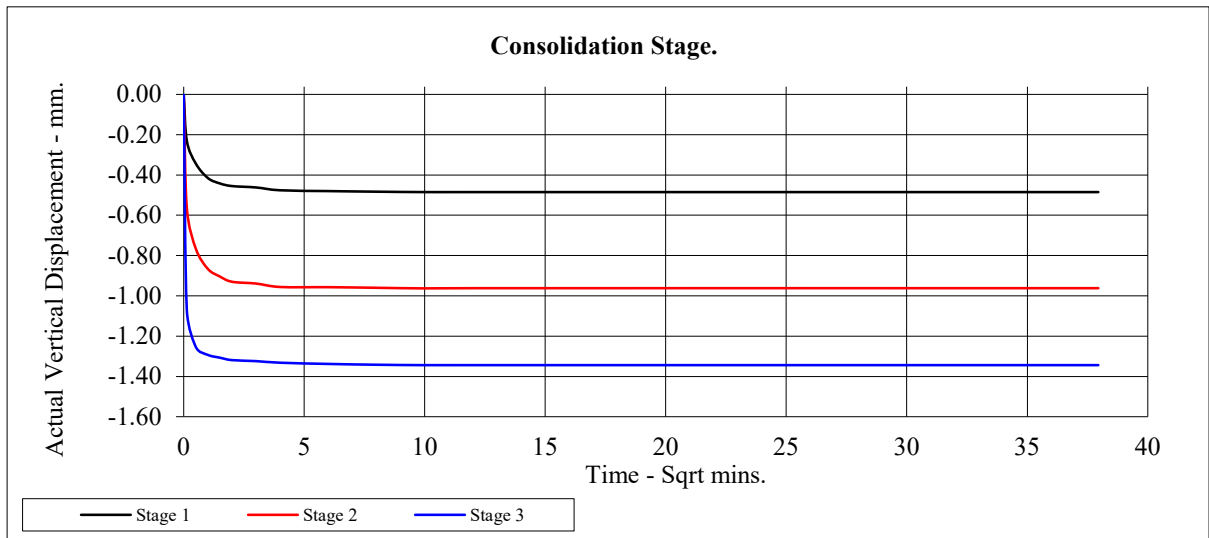
Hill Top Farm

Contract No:
PSL22/4501
Client Ref:

CONSOLIDATED DRAINED SHEARBOX TEST

BS1377:Part 7:1990 Clause 4

Hole Number:	BH106	Top Depth:	5.00
Sample Number:	16	Base Depth:	5.45



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Hill Top Farm

Contract No:
PSL22/4501
Client Ref:



Certificate of Analysis

Certificate Number 22-13310

Issued: 27-Jul-22

Client Professional Soils Laboratory Ltd
5/7 Hexthorpe Road
Hexthorpe
DN4 0AR

Our Reference 22-13310

Client Reference PSL22/4501

Order No (not supplied)

Contract Title Hill Top Farm

Description 18 Soil samples.

Date Received 13-Jul-22

Date Started 13-Jul-22

Date Completed 27-Jul-22

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis Soil Samples

Our Ref 22-13310

Client Ref PSL22/4501

Contract Title Hill Top Farm

Lab No	2031965	2031966	2031967	2031968	2031969	2031970	2031971	2031972	2031973	2031974	2031975
Sample ID	BH101	BH101	BH102	BH102	BH102	BH103	BH103	BH103	BH103	BH103	BH104
Depth	5.75	7.00-7.50	3.50-4.00	5.00-5.45	7.75	0.50-1.00	1.75	4.00-4.45	6.00-6.45	9.50-10.00	2.70
Other ID	17	21	10	13	19	3	5	10	14	23	12
Sample Type	D	B	B	U	D	B	D	B	B	B	D
Sampling Date	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units											
Metals														
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10		13					< 10	< 10	< 10	30
Inorganics														
pH	DETSC 2008#		pH	8.5		8.7					8.0	7.9	8.6	7.5
Chloride Aqueous Extract	DETSC 2055	1	mg/l	8.7		6.6					17	2.9	10	19
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	1.2		< 1.0					7.7	1.3	1.9	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	33	20	640	49	32	11	< 10	39	19	35	500
Sulphur as S, Total	DETSC 2320	0.01	%	0.02		0.01					< 0.01	< 0.01	0.02	0.21
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.04		0.04					0.01	< 0.01	0.04	0.14

Summary of Chemical Analysis

Soil Samples

Our Ref 22-13310

Client Ref PSL22/4501

Contract Title Hill Top Farm

Lab No	2031976	2031977	2031978	2031979	2031980	2031981	2031982
Sample ID	BH104	BH104	BH104	BH105	BH105	BH105	BH105
Depth	4.75	8.00-8.45	10.75	4.75	7.00-7.45	8.75	10.00
Other ID	17	23	27	12	19	22	25
Sample Type	D	B	D	D	B	D	D
Sampling Date	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022	05/07/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l			< 10			
Inorganics									
pH	DETSC 2008#		pH			8.4			
Chloride Aqueous Extract	DETSC 2055	1	mg/l			4.7			
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l			4.2			
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	42	26	38	33	24	29
Sulphur as S, Total	DETSC 2320	0.01	%			0.02			
Sulphate as SO4, Total	DETSC 2321#	0.01	%			0.04			

Information in Support of the Analytical Results

Our Ref 22-13310
Client Ref PSL22/4501
Contract Hill Top Farm

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2031965	BH101 5.75 SOIL	05/07/22	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2031966	BH101 7.00-7.50 SOIL	05/07/22	PT 500ml		
2031967	BH102 3.50-4.00 SOIL	05/07/22	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2031968	BH102 5.00-5.45 SOIL	05/07/22	PT 500ml		
2031969	BH102 7.75 SOIL	05/07/22	PT 1L		
2031970	BH103 0.50-1.00 SOIL	05/07/22	PT 500ml		
2031971	BH103 1.75 SOIL	05/07/22	PT 500ml		
2031972	BH103 4.00-4.45 SOIL	05/07/22	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2031973	BH103 6.00-6.45 SOIL	05/07/22	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2031974	BH103 9.50-10.00 SOIL	05/07/22	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2031975	BH104 2.70 SOIL	05/07/22	PT 1L	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2031976	BH104 4.75 SOIL	05/07/22	PT 500ml		
2031977	BH104 8.00-8.45 SOIL	05/07/22	PT 500ml		
2031978	BH104 10.75 SOIL	05/07/22	PT 500ml	Total Sulphur ICP (7 days), pH + Conductivity (7 days)	
2031979	BH105 4.75 SOIL	05/07/22	PT 1L		
2031980	BH105 7.00-7.45 SOIL	05/07/22	PT 500ml		
2031981	BH105 8.75 SOIL	05/07/22	PT 1L		
2031982	BH105 10.00 SOIL	05/07/22	PT 1L		

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Appendix H

Chemical Laboratory Testing Certificates



Units 7-8 Hawarden Business Park

Manor Road (off Manor Lane)

Hawarden

Deeside

CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

ARCADIS UK Ltd
Suite 1A
4 Piccadilly Place
Manchester
M1 3BN

Attention: Dale Fisher

CERTIFICATE OF ANALYSIS

Date of report Generation:	12 July 2022
Customer:	ARCADIS UK Ltd
Sample Delivery Group (SDG):	220623-179
Your Reference:	10056074
Location:	Hill Top Farm
Report No:	653927
Order Number:	10056074

We received 14 samples on Thursday June 23, 2022 and 6 of these samples were scheduled for analysis which was completed on Tuesday July 12, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26480553	BH03		1.20 - 1.30	21/06/2022
26480562	BH103		0.10 - 0.20	20/06/2022
26480563	BH103		0.50 - 0.60	20/06/2022
26480556	BH105		0.20 - 0.30	21/06/2022
26480555	BH105		0.70 - 0.80	21/06/2022
26480561	TP101		0.40	21/06/2022
26480560	TP101		1.20	21/06/2022
26480551	TP101		3.20	21/06/2022
26480557	TP102		0.30	21/06/2022
26480558	TP102		0.80	21/06/2022
26480559	TP102		1.40	21/06/2022
26480552	TP103		0.50	21/06/2022
26480554	TP103		2.00	21/06/2022
26480550	TP103		3.60	21/06/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Results Legend



Test

No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

Customer
Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

			26480563		26480566		26480565		26480561		26480551		26480557
			BH103		BH105		BH105		TP101		TP101		TP102
			0.50 - 0.60		0.20 - 0.30		0.70 - 0.80		0.40		3.20		0.30
			1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			S	S	S	S	S	S	S	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 6		X		X	X		X	X		X	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	X		X						X		
CEN Readings	All	NDPs: 0 Tests: 2						X			X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6	X		X	X		X	X		X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2					X				X		
EPH CWG GC (S)	All	NDPs: 0 Tests: 6	X		X	X		X	X		X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 6		X		X	X		X	X		X	
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 6	X		X	X		X	X		X		
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2					X				X		
Mercury Dissolved	All	NDPs: 0 Tests: 2					X				X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 6	X		X	X		X	X		X		
PAH by GCMS	All	NDPs: 0 Tests: 6	X		X	X		X	X		X		
pH	All	NDPs: 0 Tests: 6	X		X	X		X	X		X		
pH Value of Filtered Water	All	NDPs: 0 Tests: 2					X				X		
Phenols by HPLC (S)	All	NDPs: 0 Tests: 6	X		X	X		X	X		X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Results Legend														
X Test N No Determination Possible			Lab Sample No(s)		26480563		26480556		26480555		26480561		26480551	
			Customer Sample Reference		BH103		BH105		BH105		TP101		TP101	
			AGS Reference											
			Depth (m)		0.50 - 0.60		0.20 - 0.30		0.70 - 0.80		0.40		3.20	
			Container		1kg TUB with Handle (ALE260)		250g Amber Jar (ALE210)		60g VOC (ALE215)		250g Amber Jar (ALE210)		60g VOC (ALE215)	
			Sample Type		S		S		S		S		S	
Sample description	All	NDPs: 0 Tests: 6												
					X		X		X		X		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 6			X		X		X		X		X	
VOC MS (S)	All	NDPs: 0 Tests: 6			X		X		X		X		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26480563	BH103	0.50 - 0.60	Dark Brown	Sand	Brick	Stones
26480555	BH105	0.70 - 0.80	Dark Brown	Sandy Loam	Stones	Vegetation
26480556	BH105	0.20 - 0.30	Dark Brown	Sand	Brick	Stones
26480551	TP101	3.20	Dark Brown	Sand	Stones	Vegetation
26480561	TP101	0.40	Dark Brown	Sand	Stones	Vegetation
26480557	TP102	0.30	Dark Brown	Sand	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&\$@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH103 0.50 - 0.60 MISC_SOLID 20/06/2022 00:00:00 23/06/2022 05:00:00 220623-179 26480563 TM048	08/07/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	BH105 0.20 - 0.30 MISC_SOLID 21/06/2022 00:00:00 23/06/2022 05:00:00 220623-179 26480556 TM048	08/07/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	TP102 0.30 MISC_SOLID 21/06/2022 00:00:00 23/06/2022 05:00:00 220623-179 26480557 TM048	08/07/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074Report Number: 653927
Location: Hill Top Farm

Superseded Report:

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference

Mass Sample taken (kg) 0.202

Mass of dry sample (kg) 0.175

Particle Size <4mm >95%

Site Location

Hill Top Farm

Natural Moisture Content (%) 15

Dry Matter Content (%) 87

Case

SDG 220623-179

Lab Sample Number(s) 26480557

Sampled Date 21-Jun-2022

Customer Sample Ref. TP102

Depth (m) 0.30

Eluate Analysis

	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
Hexavalent Chromium	<0.03	<0.03	<0.06	<0.06
pH Value of Filtered Water	7.3	<0.001	-	-
Mercury Dissolved (CVAf)	0.000215	<0.00001	0.00043	<0.00002
Arsenic	0.00335	<0.0005	0.0067	<0.001
Boron	0.0576	<0.01	0.115	<0.02
Cadmium	<0.00008	<0.00008	<0.00016	<0.00016
Chromium	0.00186	<0.001	0.00372	<0.002
Copper	0.0819	<0.0003	0.164	<0.0006
Lead	0.0164	<0.0002	0.0328	<0.0004
Nickel	0.00505	<0.0004	0.0101	<0.0008
Zinc	0.0341	<0.001	0.0682	<0.002

Leach Test Information

Date Prepared 05-Jul-2022
pH (pH Units) 6.73
Conductivity (µS/cm) 91.70
Temperature (°C) 19.90
Volume Leachant (Litres) 0.324
Volume of Eluate VE1 (Litres)Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

12/07/2022 08:52:39

08:51:43 12/07/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074Report Number: 653927
Location: Hill Top Farm

Superseded Report:

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference

Mass Sample taken (kg) 0.187

Mass of dry sample (kg) 0.175

Particle Size <4mm >95%

Site Location

Hill Top Farm

Natural Moisture Content (%) 6.74

Dry Matter Content (%) 93.7

Case

SDG 220623-179

Lab Sample Number(s) 26480561

Sampled Date 21-Jun-2022

Customer Sample Ref. TP101

Depth (m) 0.40

Eluate Analysis

	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
Hexavalent Chromium	<0.03	<0.03	<0.06	<0.06
pH Value of Filtered Water	7.6	<0.001	-	-
Mercury Dissolved (CVAf)	0.000278	<0.00001	0.000556	<0.00002
Arsenic	0.00353	<0.0005	0.00706	<0.001
Boron	0.0808	<0.01	0.162	<0.02
Cadmium	<0.00008	<0.00008	<0.00016	<0.00016
Chromium	0.0047	<0.001	0.0094	<0.002
Copper	0.037	<0.0003	0.074	<0.0006
Lead	0.0185	<0.0002	0.037	<0.0004
Nickel	0.00861	<0.0004	0.0172	<0.0008
Zinc	0.0203	<0.001	0.0406	<0.002

Leach Test Information

Date Prepared 04-Jul-2022
pH (pH Units) 6.77
Conductivity (µS/cm) 86.30
Temperature (°C) 17.50
Volume Leachant (Litres) 0.338
Volume of Eluate VE1 (Litres)Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

12/07/2022 08:52:39

08:51:43 12/07/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26480563	26480555	26480556	26480551	26480561	26480557
Customer Sample Ref.	BH103	BH105	BH105	TP101	TP101	TP102
AGS Ref.						
Depth	0.50 - 0.60	0.70 - 0.80	0.20 - 0.30	3.20	0.40	0.30
Type	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So	Unspecified So
Anions by Kone (soil)	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022
Asbestos ID in Solid Samples	08-Jul-2022		08-Jul-2022			08-Jul-2022
CEN 2:1 Leachate (1 Stage)					04-Jul-2022	05-Jul-2022
CEN Readings					07-Jul-2022	07-Jul-2022
Cyanide Comp/Free/Total/Thiocyanate	08-Jul-2022	08-Jul-2022	08-Jul-2022	07-Jul-2022	08-Jul-2022	08-Jul-2022
Dissolved Metals by ICP-MS					07-Jul-2022	07-Jul-2022
EPH CWG GC (S)	06-Jul-2022	05-Jul-2022	06-Jul-2022	05-Jul-2022	05-Jul-2022	06-Jul-2022
GRO by GC-FID (S)	10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022
Hexavalent Chromium (s)	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022
Hexavalent Chromium (w)					07-Jul-2022	07-Jul-2022
Mercury Dissolved					08-Jul-2022	08-Jul-2022
Metals in solid samples by OES	06-Jul-2022	06-Jul-2022	07-Jul-2022	06-Jul-2022	06-Jul-2022	07-Jul-2022
Moisture at 105C					04-Jul-2022	05-Jul-2022
PAH by GCMS	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022
pH	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022
pH Value of Filtered Water					08-Jul-2022	08-Jul-2022
Phenols by HPLC (S)	08-Jul-2022	08-Jul-2022	08-Jul-2022	08-Jul-2022	08-Jul-2022	08-Jul-2022
Sample description	03-Jul-2022	03-Jul-2022	03-Jul-2022	03-Jul-2022	03-Jul-2022	03-Jul-2022
TPH CWG GC (S)	10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022
VOC MS (S)	11-Jul-2022	11-Jul-2022		11-Jul-2022	11-Jul-2022	11-Jul-2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074Report Number: 653927
Location: Hill Top Farm

Superseded Report:

ASSOCIATED AQC DATA

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2684	QC 2633	QC 2677
Free Cyanide	TM153	86.14 71.70 : 110.70	90.79 71.70 : 110.70	88.81 71.70 : 110.70
Thiocyanate	TM153	93.59 87.27 : 113.27	95.51 87.27 : 113.27	94.23 87.27 : 113.27
Total Cyanide	TM153	92.31 72.73 : 109.93	93.71 72.73 : 109.93	91.61 72.73 : 109.93

Dissolved Metals by ICP-MS

Component	Method Code	QC 2698
Aluminium	TM152	104.33 90.98 : 111.82
Antimony	TM152	99.5 90.44 : 113.04
Arsenic	TM152	102.0 94.33 : 107.73
Barium	TM152	101.83 90.20 : 111.19
Beryllium	TM152	103.0 87.77 : 113.97
Bismuth	TM152	99.33 91.90 : 112.20
Borate	TM152	104.94 88.00 : 112.00
Boron	TM152	104.67 92.27 : 112.40
Cadmium	TM152	104.0 94.93 : 106.93
Calcium	TM152	100.67 95.14 : 110.01
Chromium	TM152	102.33 91.84 : 108.67
Cobalt	TM152	102.83 90.72 : 109.61
Copper	TM152	103.83 94.47 : 109.05
Iron	TM152	102.0 94.40 : 107.90
Lead	TM152	101.17 93.55 : 109.46
Lithium	TM152	102.5 91.62 : 113.12
Magnesium	TM152	100.0 92.30 : 110.57
Manganese	TM152	103.17 94.75 : 108.21
Molybdenum	TM152	101.17 93.77 : 103.54
Nickel	TM152	104.33 93.65 : 106.90
Phosphorus	TM152	99.17 92.51 : 109.27



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Dissolved Metals by ICP-MS

		QC 2698
Potassium	TM152	99.33 92.16 : 109.93
Selenium	TM152	105.5 91.58 : 115.98
Silver	TM152	101.33 96.03 : 105.53
Sodium	TM152	99.33 89.47 : 109.62
Strontium	TM152	101.67 95.67 : 106.20
Tellurium	TM152	100.83 93.32 : 114.66
Thallium	TM152	100.83 88.00 : 112.00
Tin	TM152	100.67 92.63 : 109.70
Titanium	TM152	101.0 95.08 : 109.28
Tungsten	TM152	100.17 94.68 : 107.68
Uranium	TM152	101.83 93.63 : 105.43
Vanadium	TM152	104.33 88.00 : 112.00
Zinc	TM152	104.0 95.31 : 110.74

EPH CWG GC (S)

Component	Method Code	QC 2606
EPH >C8-C40 Raw	TM414	90.45 79.56 : 113.20
Total Aliphatics Raw	TM414	97.75 79.29 : 113.82
Total Aromatics Raw	TM414	88.68 61.16 : 129.42

GRO by GC-FID (S)

Component	Method Code	QC 2655	QC 2602
QC	TM089	74.04 65.61 : 111.21	73.35 65.61 : 111.21

Hexavalent Chromium (s)

Component	Method Code	QC 2655	QC 2698
Hexavalent Chromium	TM151	106.0 88.20 : 118.20	104.0 88.20 : 118.20



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Hexavalent Chromium (w)

Component	Method Code	QC 2678
Hexavalent Chromium	TM241	97.4 94.17 : 106.17

Mercury Dissolved

Component	Method Code	QC 2661	QC 2644
Mercury Dissolved (CVAf)	TM183	104.0 0.00 : 0.00	113.0 0.00 : 0.00

Metals in solid samples by OES

Component	Method Code	QC 2662	QC 2630	QC 2639	QC 2681
Aluminium	TM181	92.11 84.95 : 125.04	92.98 84.95 : 125.04	100.0 84.95 : 125.04	102.63 84.95 : 125.04
Antimony	TM181	113.39 91.44 : 127.13	112.2 91.44 : 127.13	114.96 91.44 : 127.13	115.35 91.44 : 127.13
Arsenic	TM181	110.81 95.27 : 120.80	109.46 95.27 : 120.80	116.89 95.27 : 120.80	115.2 95.27 : 120.80
Barium	TM181	105.64 94.57 : 124.93	106.67 94.57 : 124.93	107.69 94.57 : 124.93	111.79 94.57 : 124.93
Beryllium	TM181	105.54 85.72 : 122.69	105.25 85.72 : 122.69	109.33 85.72 : 122.69	110.2 85.72 : 122.69
Boron	TM181	103.22 91.59 : 122.22	102.57 91.59 : 122.22	109.32 91.59 : 122.22	111.58 91.59 : 122.22
Cadmium	TM181	108.12 87.31 : 121.62	106.64 87.31 : 121.62	114.02 87.31 : 121.62	111.81 87.31 : 121.62
Chromium	TM181	101.95 85.06 : 113.81	100.24 85.06 : 113.81	101.71 85.06 : 113.81	104.63 85.06 : 113.81
Cobalt	TM181	104.0 90.60 : 110.35	101.27 90.60 : 110.35	108.0 90.60 : 110.35	106.73 90.60 : 110.35
Copper	TM181	95.26 81.22 : 113.40	96.45 81.22 : 113.40	100.0 81.22 : 113.40	99.83 81.22 : 113.40
Iron	TM181	91.74 86.44 : 122.27	90.64 86.44 : 122.27	103.67 86.44 : 122.27	102.75 86.44 : 122.27
Lead	TM181	105.45 86.83 : 123.12	102.48 86.83 : 123.12	109.9 86.83 : 123.12	107.43 86.83 : 123.12
Manganese	TM181	107.87 89.22 : 121.75	107.3 89.22 : 121.75	110.96 89.22 : 121.75	111.24 89.22 : 121.75
Mercury	TM181	107.82 84.95 : 119.42	107.17 84.95 : 119.42	114.33 84.95 : 119.42	111.73 84.95 : 119.42
Molybdenum	TM181	102.69 85.98 : 123.80	101.01 85.98 : 123.80	107.07 85.98 : 123.80	106.06 85.98 : 123.80
Nickel	TM181	105.34 88.05 : 119.19	104.45 88.05 : 119.19	111.57 88.05 : 119.19	110.39 88.05 : 119.19
Phosphorus	TM181	109.74 90.13 : 121.54	108.03 90.13 : 121.54	110.94 90.13 : 121.54	109.57 90.13 : 121.54



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Location: Hill Top Farm

Superseded Report:

Metals in solid samples by OES

		QC 2662	QC 2630	QC 2639	QC 2681
Selenium	TM181	109.89 90.68 : 124.14	107.69 90.68 : 124.14	115.75 90.68 : 124.14	114.65 90.68 : 124.14
Strontium	TM181	93.06 80.65 : 106.55	93.51 80.65 : 106.55	99.33 80.65 : 106.55	100.45 80.65 : 106.55
Thallium	TM181	107.05 76.88 : 121.51	105.7 76.88 : 121.51	113.09 76.88 : 121.51	110.4 76.88 : 121.51
Tin	TM181	104.15 86.96 : 122.18	101.19 86.96 : 122.18	106.82 86.96 : 122.18	106.82 86.96 : 122.18
Titanium	TM181	91.82 77.07 : 118.83	94.55 77.07 : 118.83	103.64 77.07 : 118.83	100.91 77.07 : 118.83
Vanadium	TM181	99.28 84.00 : 115.50	99.28 84.00 : 115.50	105.4 84.00 : 115.50	105.76 84.00 : 115.50
Zinc	TM181	103.61 85.62 : 122.35	102.48 85.62 : 122.35	106.32 85.62 : 122.35	107.9 85.62 : 122.35

PAH by GCMS

Component	Method Code	QC 2652	QC 2622
Acenaphthene	TM218	88.5 76.79 : 103.90	90.0 76.79 : 103.90
Acenaphthylene	TM218	85.5 74.19 : 106.17	88.0 74.19 : 106.17
Anthracene	TM218	84.0 70.90 : 109.22	89.5 70.90 : 109.22
Benz(a)anthracene	TM218	85.5 73.77 : 119.26	95.5 73.77 : 119.26
Benzo(a)pyrene	TM218	83.0 73.20 : 114.18	89.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	89.5 75.36 : 117.58	95.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	86.0 70.73 : 116.12	88.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	85.5 75.98 : 116.59	92.5 75.98 : 116.59
Chrysene	TM218	84.0 74.82 : 114.18	94.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	82.5 69.17 : 115.30	86.0 69.17 : 115.30
Fluoranthene	TM218	82.5 66.06 : 114.63	96.5 66.06 : 114.63
Fluorene	TM218	87.0 76.66 : 107.56	89.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	86.5 70.26 : 117.95	87.0 70.26 : 117.95
Naphthalene	TM218	90.5 74.70 : 101.83	93.5 74.70 : 101.83
Phenanthrene	TM218	85.0 73.62 : 109.34	93.5 73.62 : 109.34
Pyrene	TM218	80.0 71.46 : 117.00	93.5 71.46 : 117.00

pH



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Superseded Report:

pH

Component	Method Code	QC 2698	QC 2600	QC 2698
pH	TM133	99.27 96.92 : 102.20	100.0 96.92 : 102.20	99.27 96.92 : 102.20

pH Value of Filtered Water

Component	Method Code	QC 2667
pH	TM256	100.27 99.20 : 102.41

Phenols by HPLC (S)

Component	Method Code	QC 2655	QC 2673
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.9 69.38 : 125.27	53.9 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	48.54 69.79 : 122.84	47.37 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	51.77 77.98 : 111.41	50.31 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	54.97 67.94 : 117.69	52.98 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	51.87 82.04 : 108.38	50.52 82.04 : 108.38

VOC MS (S)

Component	Method Code	QC 2664	QC 2625	QC 2682
1,1,1,2-tetrachloroethane	TM116	98.6 86.59 : 118.97	98.6 84.42 : 110.51	94.0 84.84 : 116.25
1,1,1-Trichloroethane	TM116	104.4 86.26 : 117.53	102.6 88.34 : 114.50	102.6 85.52 : 113.22
1,1,2-Trichloroethane	TM116	95.8 75.16 : 112.70	92.6 81.29 : 113.79	94.0 77.12 : 116.04
1,1-Dichloroethane	TM116	111.8 87.14 : 128.34	110.6 91.34 : 123.49	113.2 74.46 : 129.15
1,2-Dichloroethane	TM116	106.8 89.30 : 133.10	106.8 90.04 : 132.28	107.8 92.38 : 131.65
1,4-Dichlorobenzene	TM116	99.2 82.59 : 123.23	102.4 80.81 : 125.07	96.4 76.78 : 122.98
2-Chlorotoluene	TM116	96.8 66.81 : 118.43	92.2 73.13 : 114.13	93.2 68.55 : 109.58
4-Chlorotoluene	TM116	92.0 65.88 : 114.76	86.6 68.66 : 109.13	90.4 66.29 : 107.51
Benzene	TM116	106.2 93.16 : 123.63	102.4 84.29 : 112.22	106.6 88.60 : 113.80
Carbon Disulphide	TM116	102.2 75.11 : 124.81	103.8 75.11 : 124.81	101.0 74.91 : 122.14
Carbontetrachloride	TM116	107.2 82.06 : 121.42	102.4 82.35 : 126.46	103.2 80.31 : 124.50



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
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Location: Hill Top Farm

Superseded Report:

VOC MS (S)

		QC 2664	QC 2625	QC 2682
Chlorobenzene	TM116	99.8 85.07 : 118.13	104.0 82.88 : 122.42	97.2 83.81 : 114.18
Chloroform	TM116	108.6 88.13 : 122.71	109.4 90.35 : 120.38	108.0 87.40 : 122.49
Chloromethane	TM116	111.0 61.62 : 145.66	101.6 67.89 : 143.51	107.8 63.11 : 124.36
Cis-1,2-Dichloroethene	TM116	109.8 88.41 : 121.33	101.0 78.27 : 128.90	107.8 80.67 : 126.72
Dibromomethane	TM116	94.6 77.47 : 121.29	96.4 76.00 : 120.73	96.6 73.23 : 118.35
Dichloromethane	TM116	117.4 87.89 : 134.72	119.2 97.64 : 133.75	118.8 81.11 : 133.25
Ethylbenzene	TM116	92.4 76.29 : 106.31	89.4 70.95 : 113.07	90.0 75.92 : 110.41
Hexachlorobutadiene	TM116	84.2 16.78 : 153.29	69.0 14.55 : 147.92	53.4 12.82 : 152.73
Isopropylbenzene	TM116	86.8 59.16 : 110.07	69.8 43.42 : 101.34	80.6 54.30 : 105.91
Naphthalene	TM116	101.0 79.29 : 125.59	108.2 80.90 : 124.24	101.8 80.86 : 128.81
o-Xylene	TM116	90.6 72.86 : 102.10	82.0 68.34 : 101.99	85.8 69.99 : 108.74
p/m-Xylene	TM116	87.3 68.99 : 102.40	87.2 69.47 : 97.31	86.0 68.32 : 108.91
Sec-Butylbenzene	TM116	85.0 44.71 : 117.87	65.4 27.03 : 135.73	74.0 38.50 : 101.50
Tetrachloroethene	TM116	99.0 77.82 : 125.00	100.8 80.10 : 120.38	93.4 76.95 : 121.02
Toluene	TM116	97.0 87.82 : 116.21	94.4 80.66 : 100.10	96.0 74.24 : 107.42
Trichloroethene	TM116	98.4 79.80 : 112.33	95.0 79.80 : 112.33	96.2 85.28 : 109.36
Trichlorofluoromethane	TM116	110.6 80.52 : 132.12	113.0 83.13 : 123.97	103.6 81.46 : 120.52
Vinyl Chloride	TM116	110.2 74.57 : 146.88	107.2 69.66 : 136.55	108.2 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

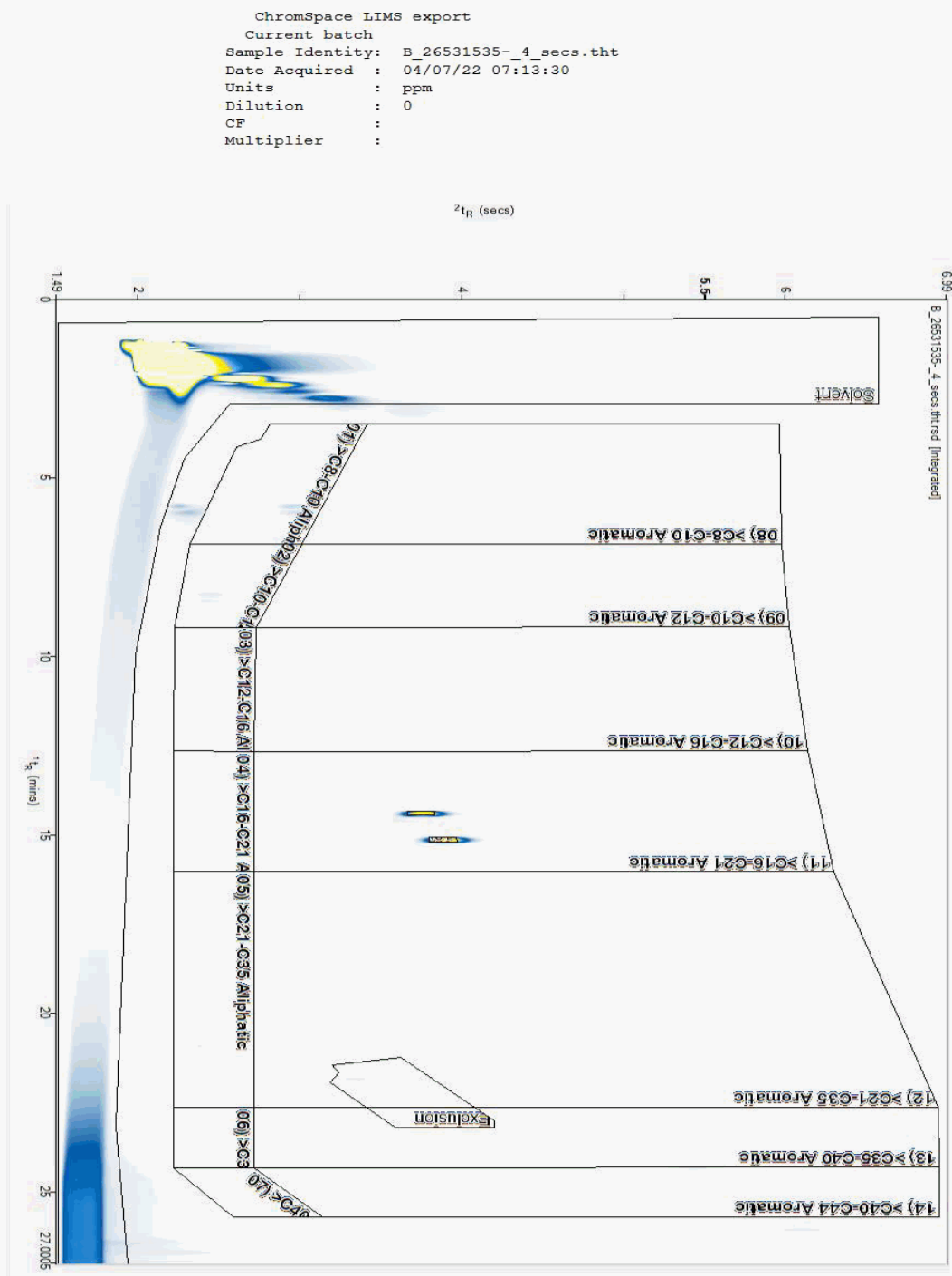
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26531535
Sample ID : BH105

Depth : 0.70 - 0.80





CERTIFICATE OF ANALYSIS

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Report Number: 653927
Location: Hill Top Farm

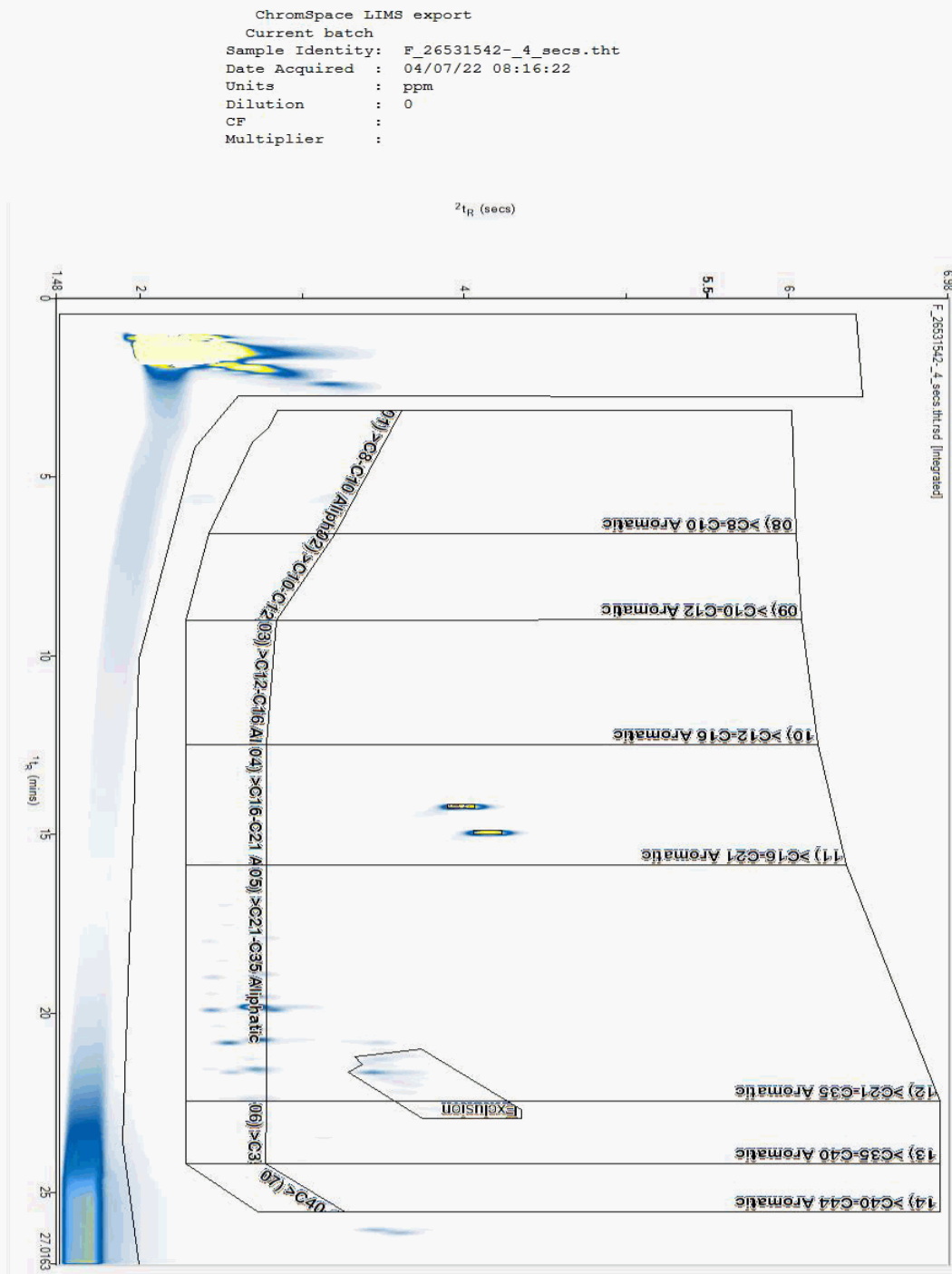
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26531542
Sample ID : TP102

Depth : 0.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

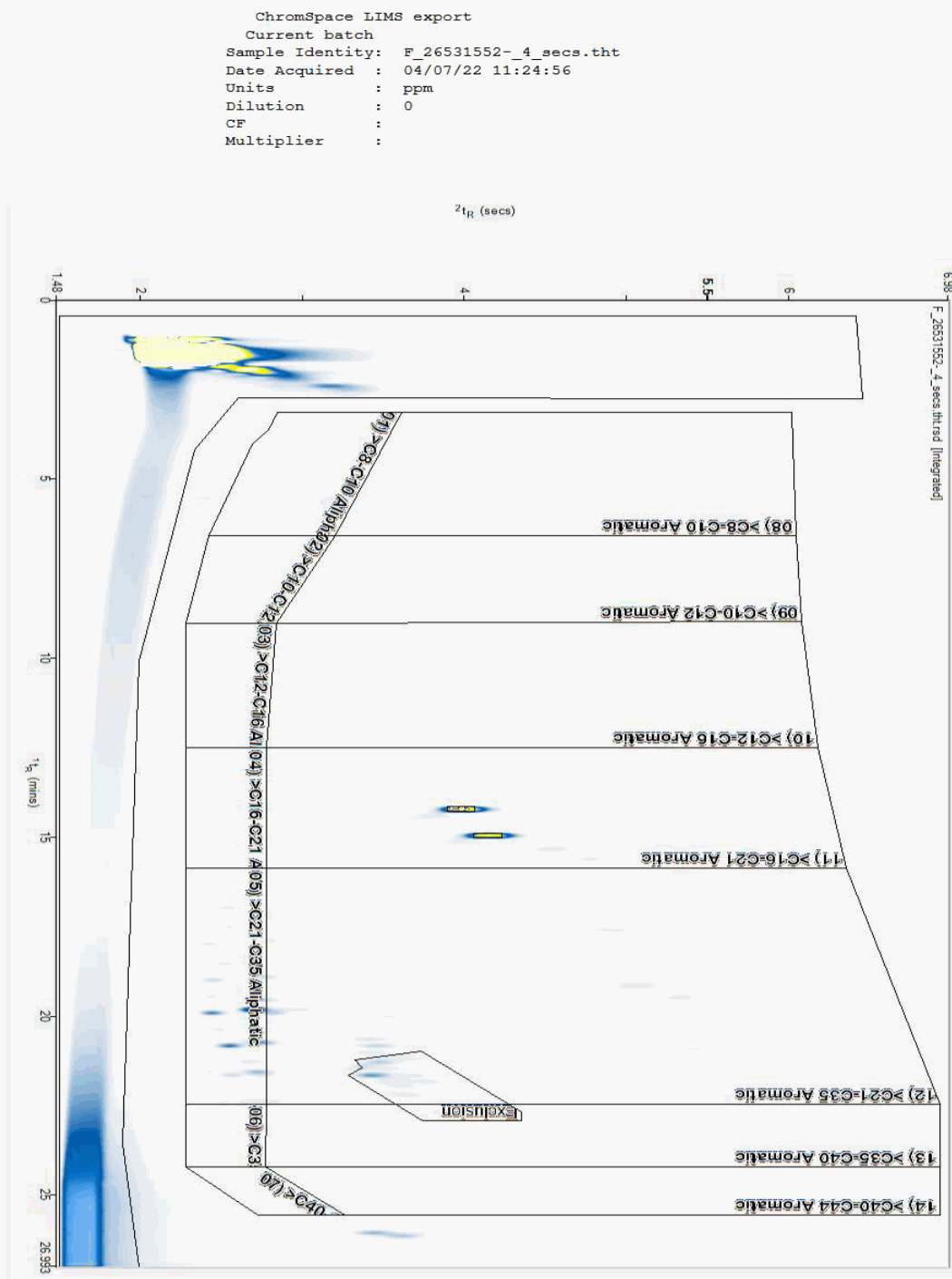
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26531552
Sample ID : BH105

Depth : 0.20 - 0.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

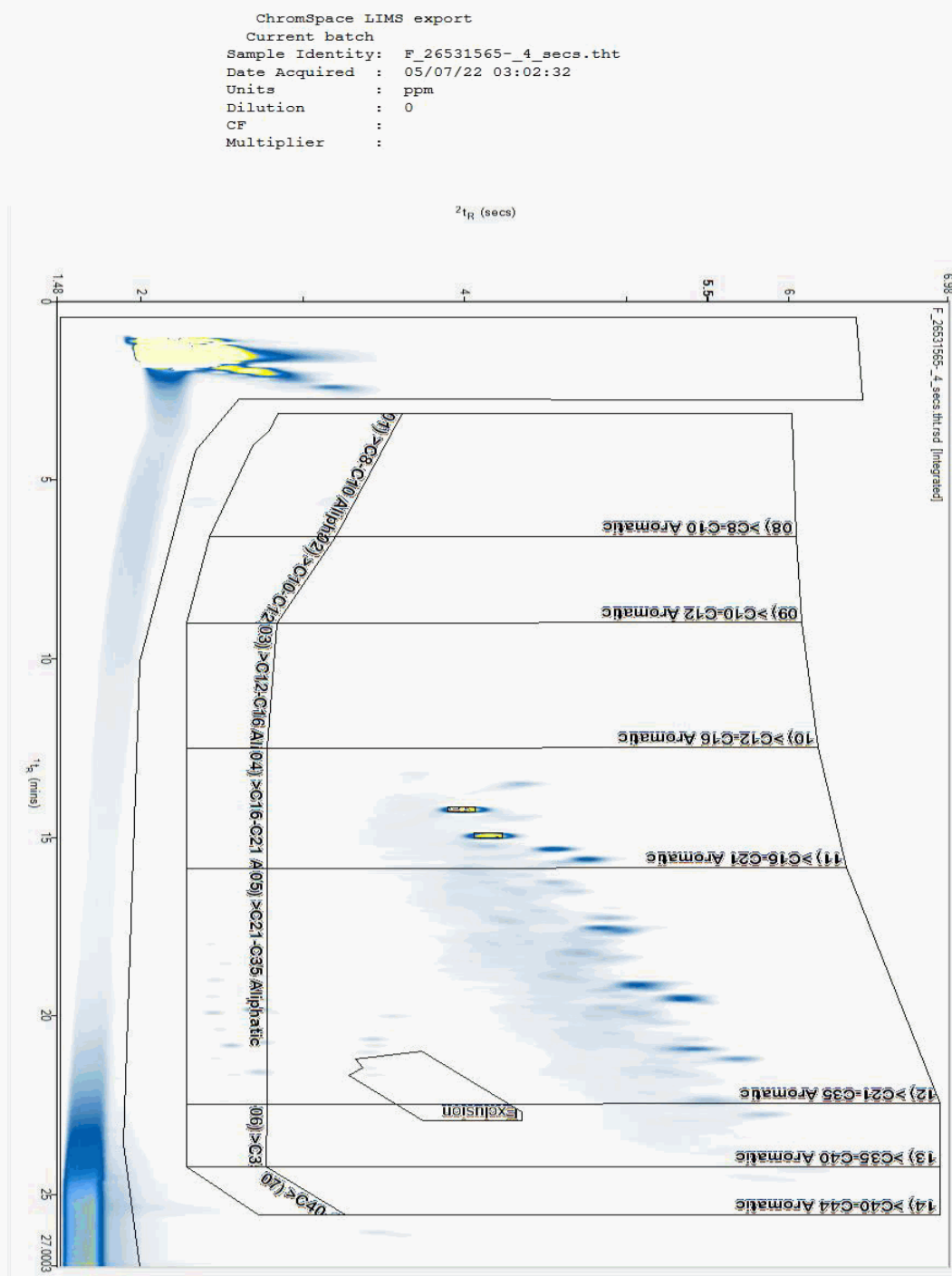
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26531565
Sample ID : BH103

Depth : 0.50 - 0.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

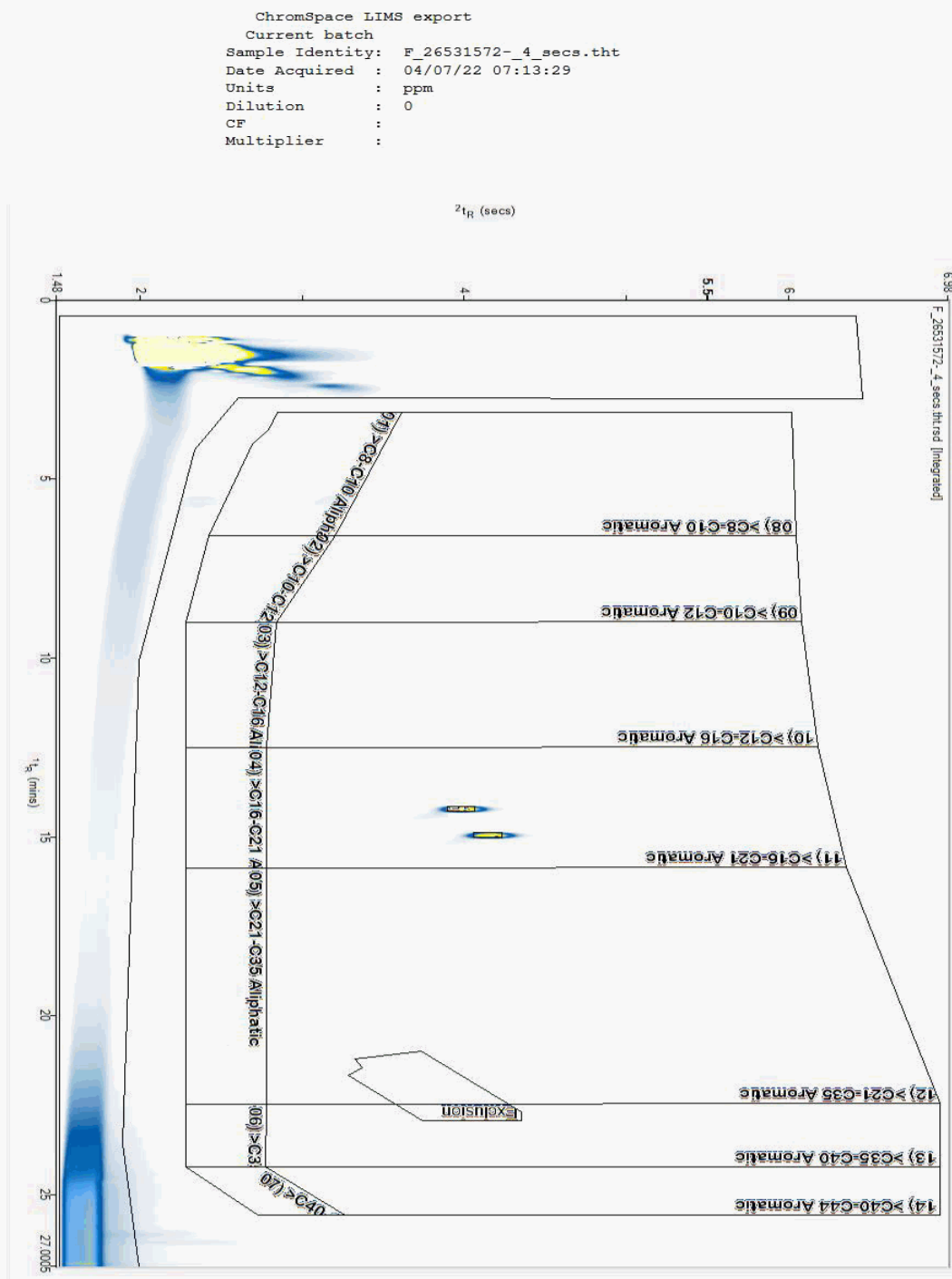
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26531572
Sample ID : TP101

Depth : 3.20





CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

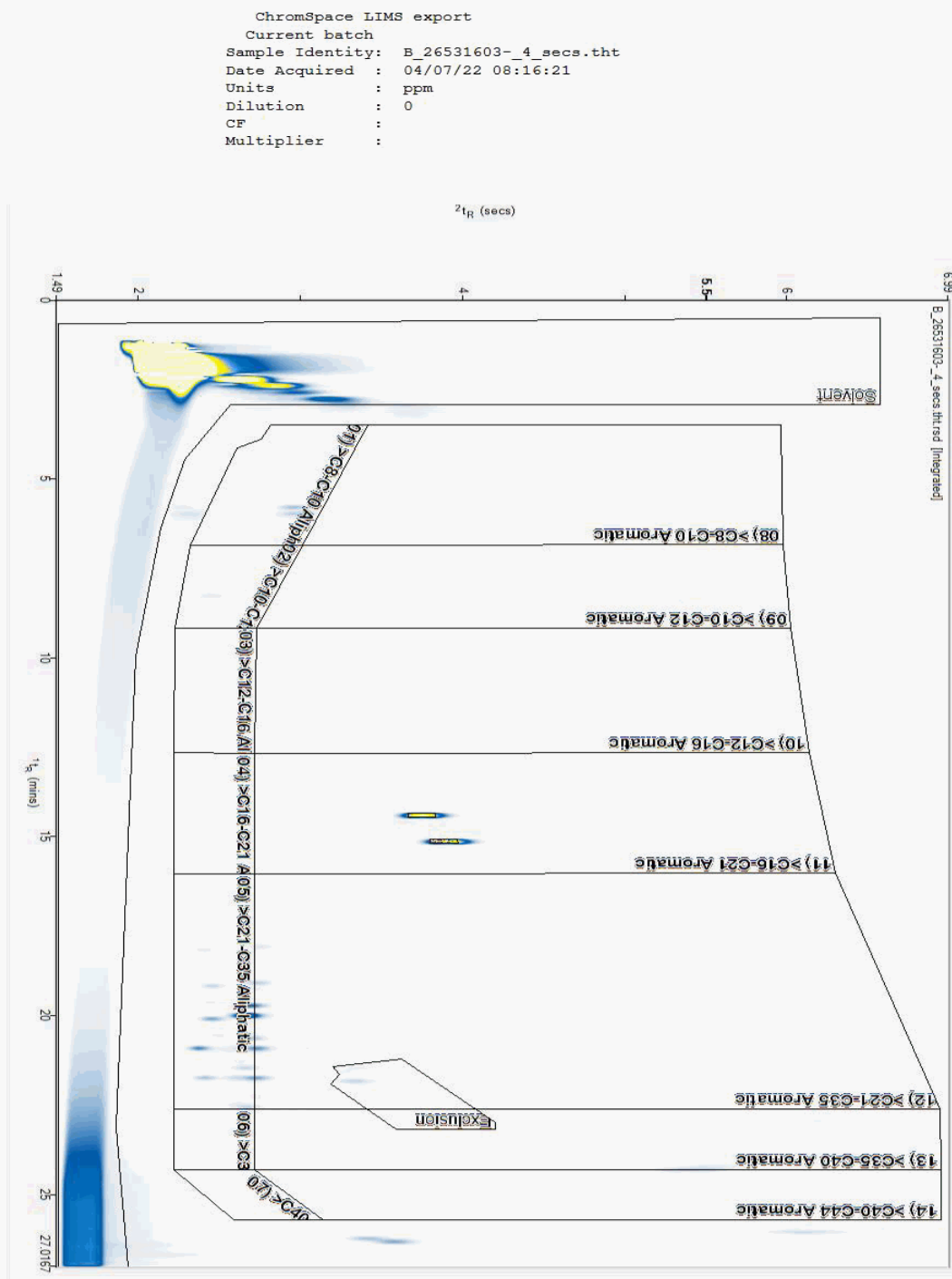
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26531603
Sample ID : TP101

Depth : 0.40





CERTIFICATE OF ANALYSIS

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SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

Superseded Report:

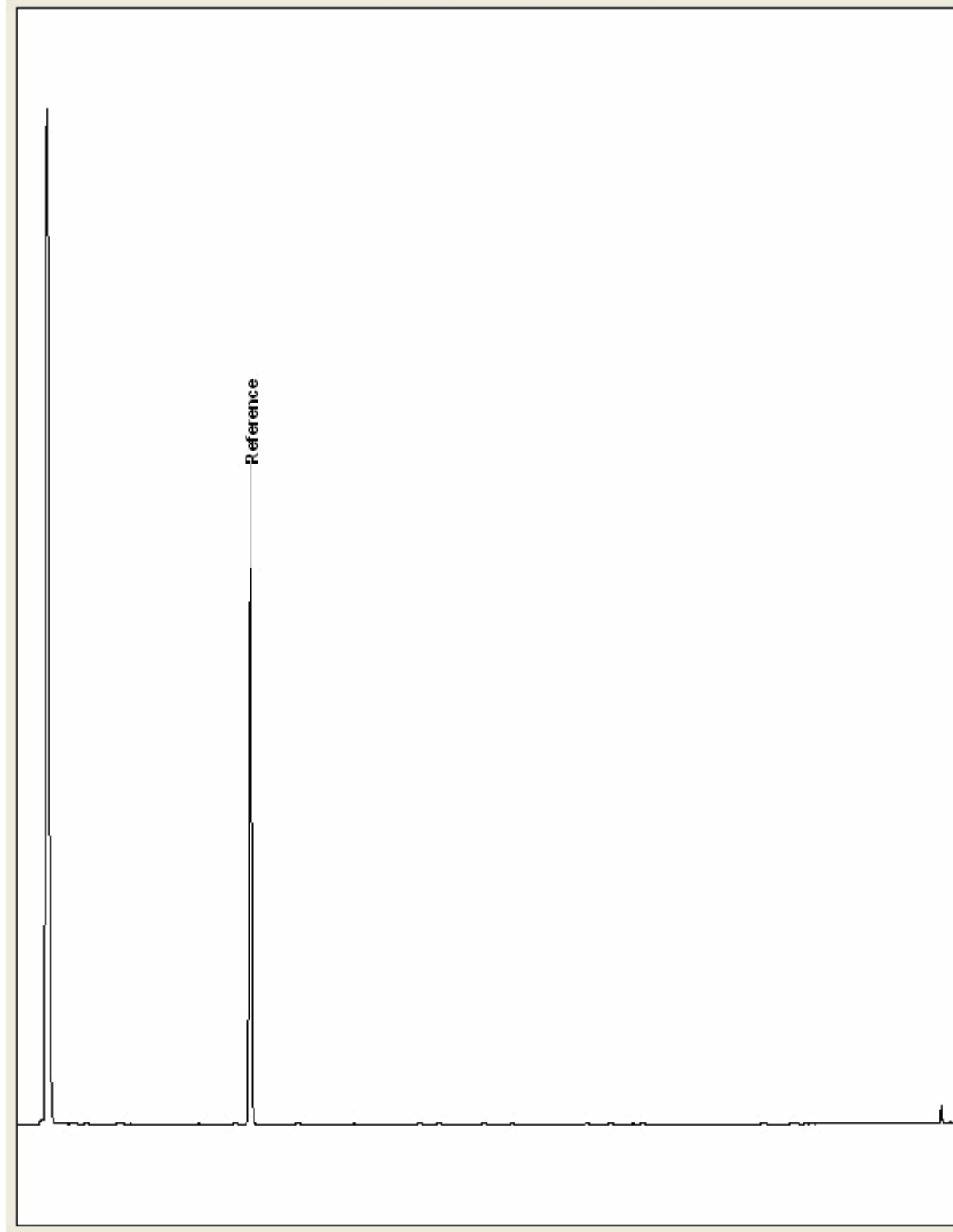
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26558308
Sample ID : TP102

Depth : 0.30

26558308_GRO_S.DATA - HP6850 Signal 1





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Location: Hill Top Farm

Superseded Report:

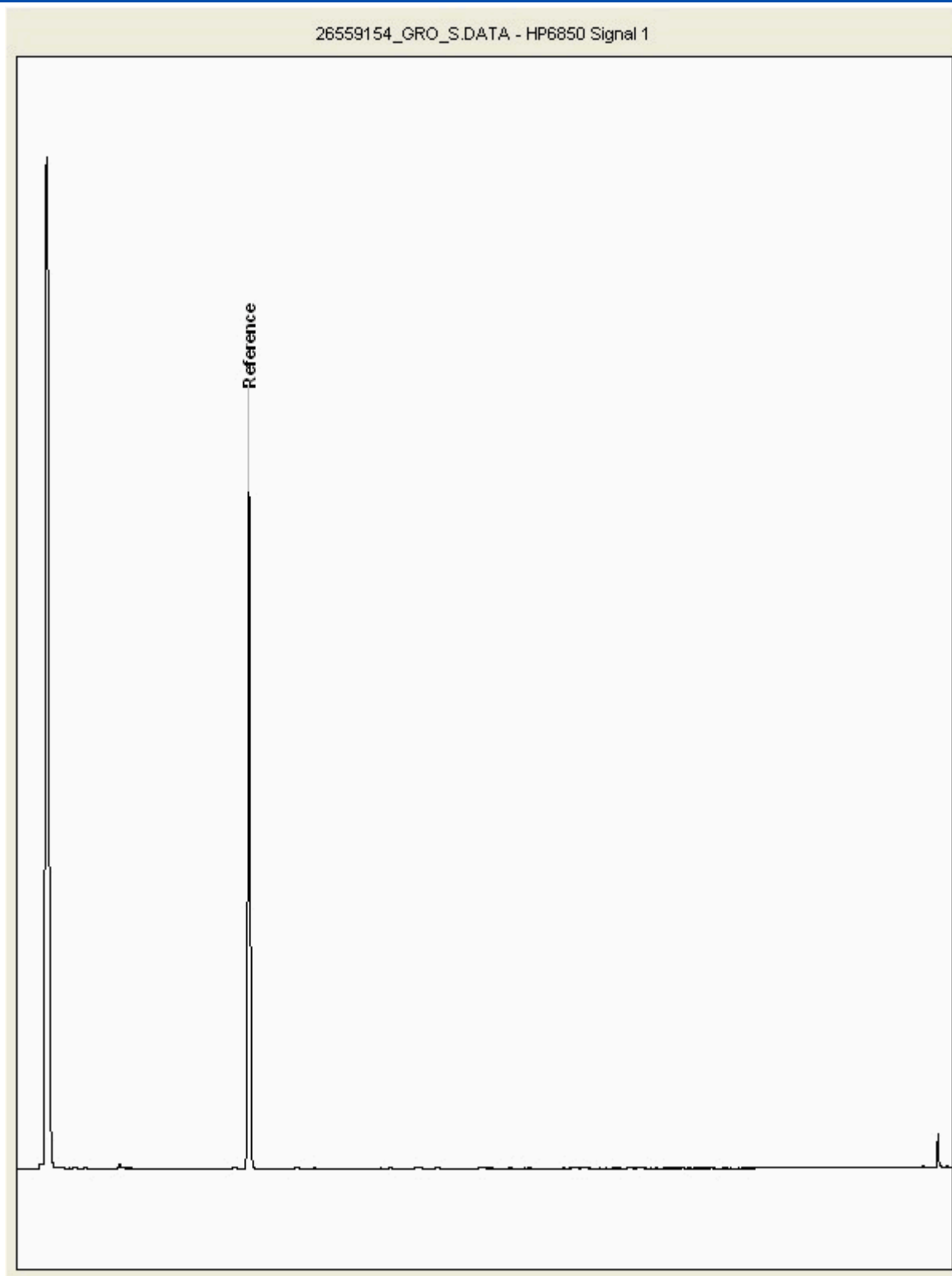
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26559154
Sample ID : BH105

Depth : 0.70 - 0.80

26559154_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

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SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

Superseded Report:

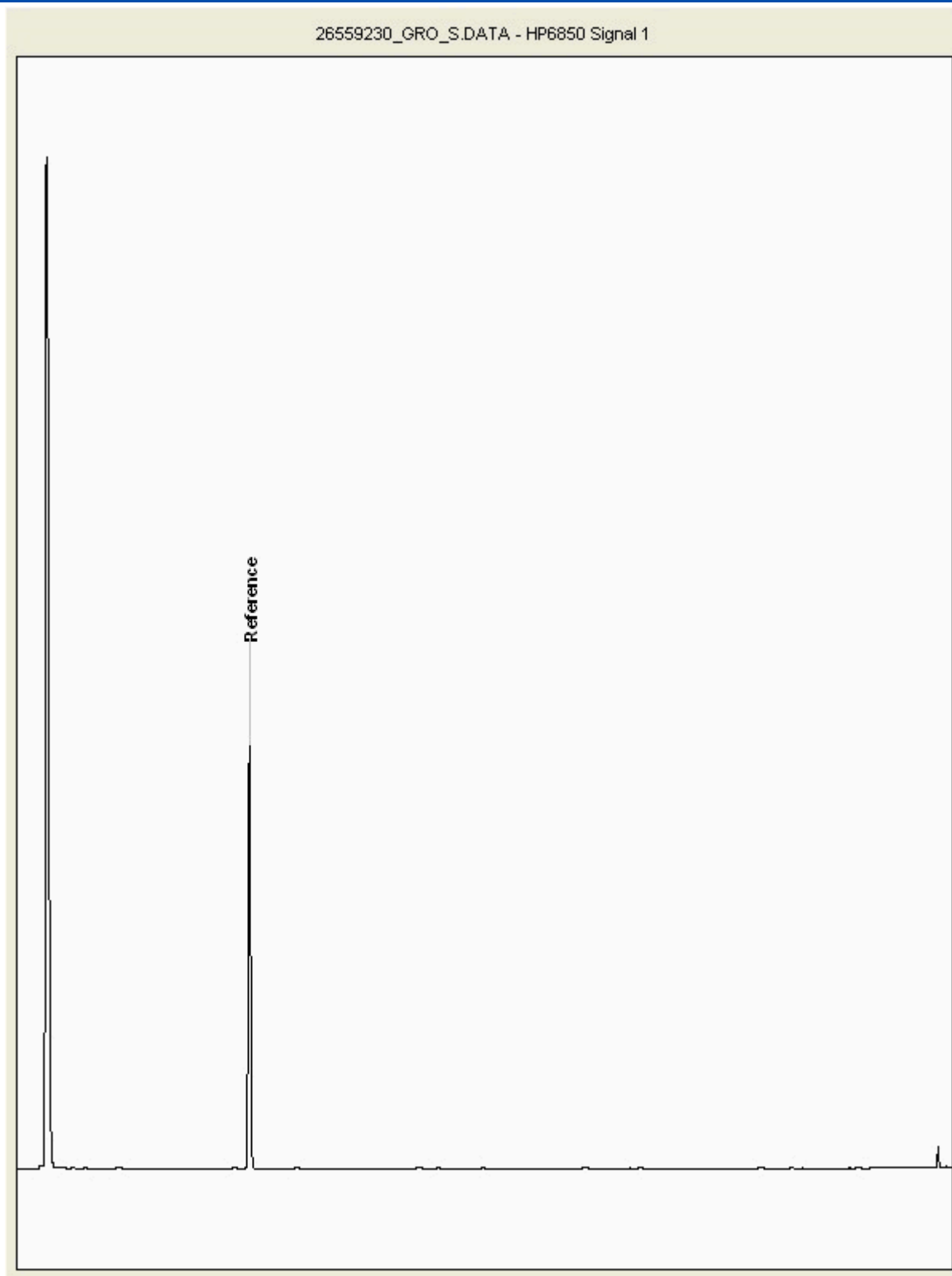
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26559230
Sample ID : BH105

Depth : 0.20 - 0.30

26559230_GRO_S.DATA - HP6850 Signal 1





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Report Number: 653927
Location: Hill Top Farm

Superseded Report:

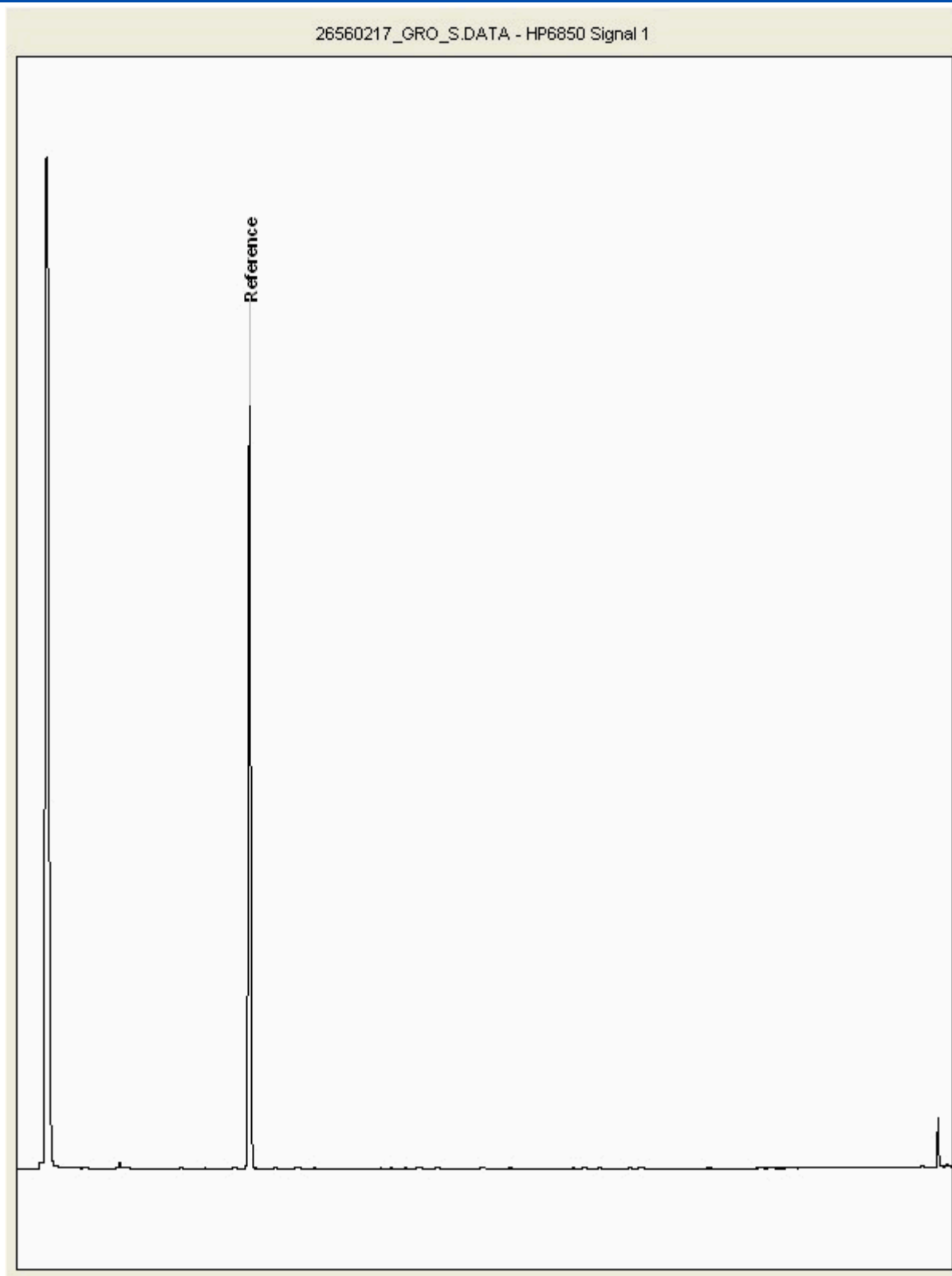
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560217
Sample ID : BH103

Depth : 0.50 - 0.60

26560217_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

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Location: Hill Top Farm

Superseded Report:

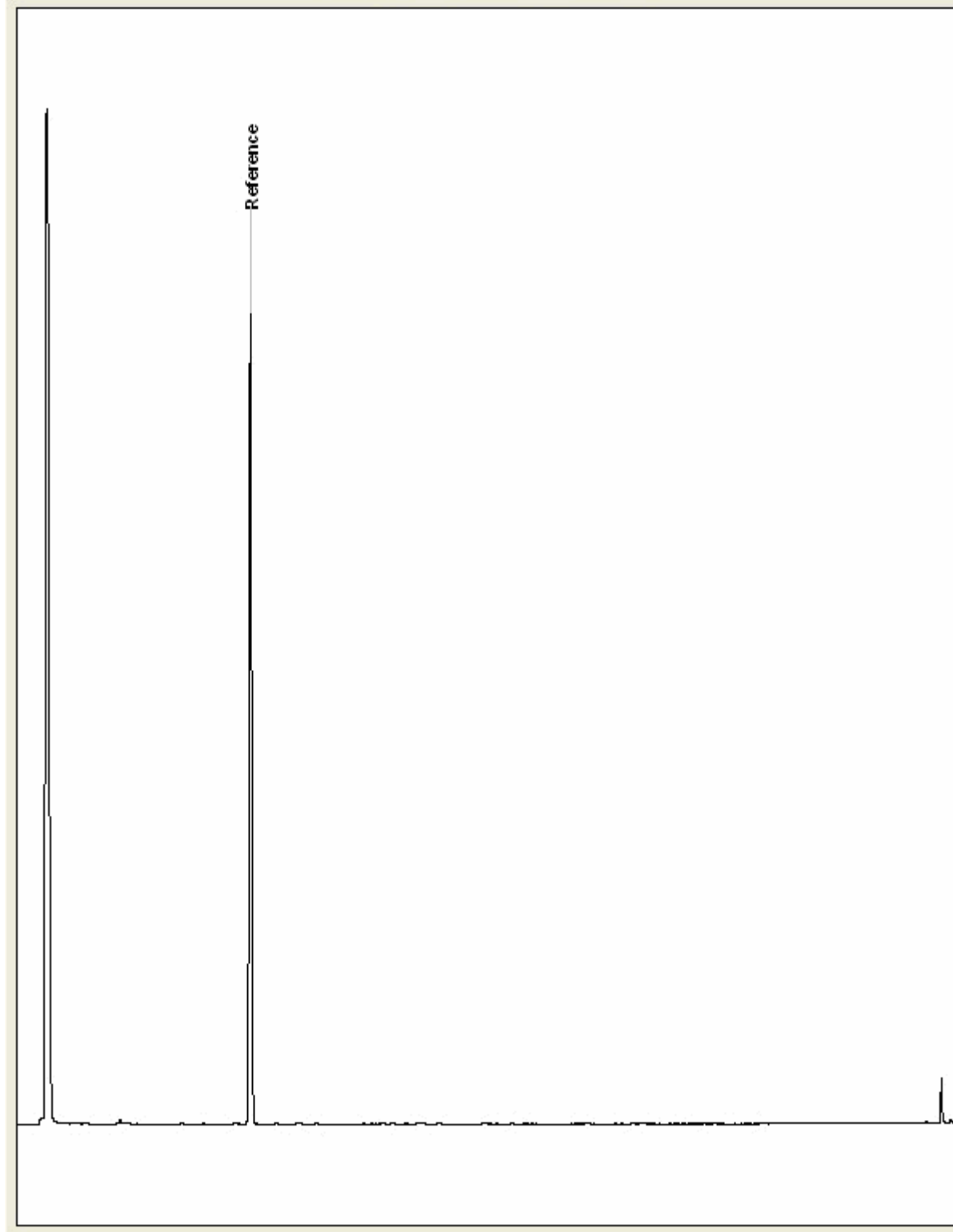
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560364
Sample ID : TP101

Depth : 3.20

26560364_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220623-179
Client Ref.: 10056074

Report Number: 653927
Location: Hill Top Farm

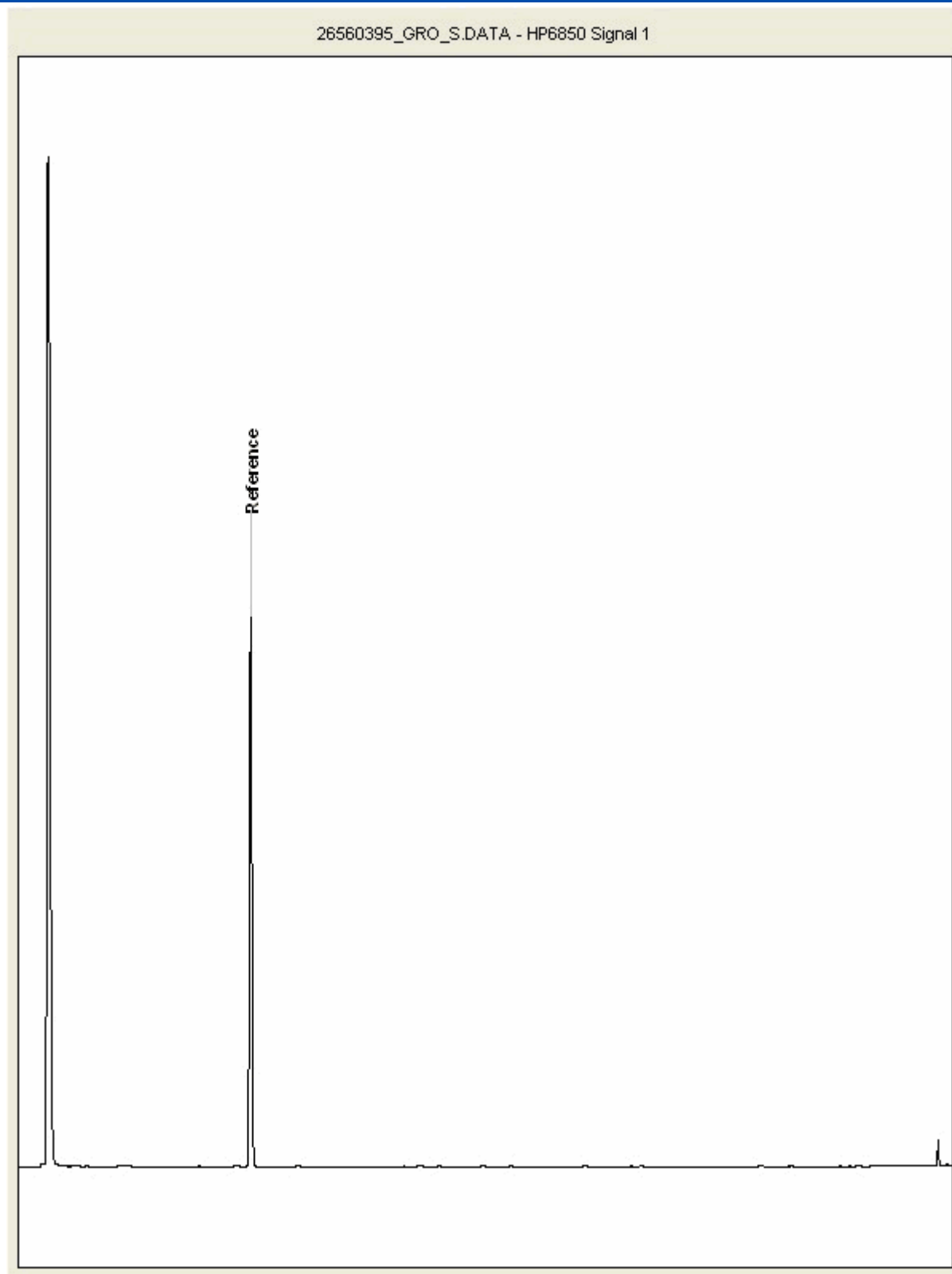
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560395
Sample ID : TP101

Depth : 0.40





CERTIFICATE OF ANALYSIS

SDG: 220623-179
Client Ref: 10056074

Report Number: 653927
Location: Hill Top Farm

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

ARCADIS UK Ltd
Suite 1A
4 Piccadilly Place
Manchester
M1 3BN

Attention: Dale Fisher

CERTIFICATE OF ANALYSIS

Date of report Generation:	20 July 2022
Customer:	ARCADIS UK Ltd
Sample Delivery Group (SDG):	220625-35
Your Reference:	10056074
Location:	Hill Top Farm
Report No:	654847
Order Number:	10056074

We received 29 samples on Friday June 24, 2022 and 12 of these samples were scheduled for analysis which was completed on Wednesday July 20, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26488715	BH106	ES1	0.20 - 0.30	22/06/2022
26488716	BH106	ES2	0.80 - 0.90	22/06/2022
26488717	BH106	ES3	1.55 - 1.65	22/06/2022
26488718	TP104	ES1	0.30 - 0.30	22/06/2022
26488719	TP104	ES2	1.00 - 1.00	22/06/2022
26488720	TP104	ES3	2.00 - 2.00	22/06/2022
26480569	TP106	ES1	0.40	21/06/2022
26480564	TP106	ES2	2.00	21/06/2022
26480565	TP106	ES3	3.00	21/06/2022
26480568	TP106	ES4	4.00	21/06/2022
26488730	TP107	ES1	0.50 - 0.50	22/06/2022
26488731	TP107	ES2	1.20 - 1.20	22/06/2022
26488732	TP107	ES3	2.00 - 2.00	22/06/2022
26488721	TP108	ES1	0.30 - 0.30	22/06/2022
26488722	TP108	ES2	1.00 - 1.00	22/06/2022
26488723	TP108	ES3	2.00 - 2.00	22/06/2022
26488727	TP109	ES1	0.30 - 0.30	22/06/2022
26488728	TP109	ES2	1.00 - 1.00	22/06/2022
26488729	TP109	ES3	3.00 - 3.00	22/06/2022
26480570	TP110	ES1	0.30	21/06/2022
26480566	TP110	ES2	0.60	21/06/2022
26480567	TP110	ES3	1.60	21/06/2022
26480571	TP110	ES4	3.60	21/06/2022
26488733	TP111	ES1	0.40 - 0.40	22/06/2022
26488734	TP111	ES2	1.00 - 1.00	22/06/2022
26488736	TP111	ES3	1.50 - 1.50	22/06/2022
26488724	TP112	ES1	0.50 - 0.50	22/06/2022
26488725	TP112	ES2	1.00 - 1.00	22/06/2022
26488726	TP112	ES3	1.50 - 1.50	22/06/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Results Legend



Test



No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container		Sample Type	
	26480571		TP110		ES4		3.60		60g VOC (ALE215)	S		
	26480570		TP110		ES1		0.30		250g Amber Jar (ALE215)	S		
	26488721		TP108		ES1		0.30 - 0.30		60g VOC (ALE215)	S		
	26488731		TP107		ES2		1.20 - 1.20		250g Amber Jar (ALE215)	S		
	26480568		TP106		ES4		4.00		60g VOC (ALE215)	S		
	26480569		TP106		ES1		0.40		1kg TUB with Handle (ALE260)	S		
Anions by Kone (soil)	All	NDPs: 0 Tests: 13										
Anions by Kone (w)	All	NDPs: 0 Tests: 2										
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 5										
CEN Readings	All	NDPs: 0 Tests: 4										
Coronene	All	NDPs: 0 Tests: 2										
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 13										
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4										
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 2										
EPH by GCxGC-FID	All	NDPs: 0 Tests: 2										
EPH CWG GC (S)	All	NDPs: 0 Tests: 12										
Fluoride	All	NDPs: 0 Tests: 2										
GRO by GC-FID (S)	All	NDPs: 0 Tests: 11										
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 13										
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 2										
Mercury Dissolved	All	NDPs: 0 Tests: 4										



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Results Legend



Test

No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

Customer
Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

Metals in solid samples by OES

OC OP Pesticides and Triazine
Herb

PAH 16 & 17 Calc

PAH by GCMS

PCBs by GCMS

pH

pH Value of Filtered Water

Phenols by HPLC (S)

Phenols by HPLC (W)

Sample description

Total Organic Carbon

TPH CWG GC (S)

VOC MS (S)

NDPs: 0
Tests: 13NDPs: 0
Tests: 1NDPs: 0
Tests: 2NDPs: 0
Tests: 12NDPs: 0
Tests: 2NDPs: 0
Tests: 13NDPs: 0
Tests: 4NDPs: 0
Tests: 13NDPs: 0
Tests: 2NDPs: 0
Tests: 13NDPs: 0
Tests: 2NDPs: 0
Tests: 11NDPs: 0
Tests: 1160g VOC
(ALE215)250g Amber Jar
(ALE210)60g VOC
(ALE215)250g Amber Jar
(ALE210)60g VOC
(ALE215)250g Amber Jar
(ALE210)60g VOC
(ALE215)250g Amber Jar
(ALE210)60g VOC
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(ALE210)60g VOC
(ALE215)250g Amber Jar
(ALE210)



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26488716	BH106	0.80 - 0.90	Light Brown	Sandy Loam	Stones	Vegetation
26488717	BH106	1.55 - 1.65	Light Brown	Sandy Clay Loam	Stones	Vegetation
26488719	TP104	1.00 - 1.00	Light Brown	Sandy Loam	Vegetation	None
26480568	TP106	4.00	Light Brown	Sandy Clay Loam	Stones	Vegetation
26480569	TP106	0.40	Dark Brown	Sandy Silt Loam	Stones	Vegetation
26488731	TP107	1.20 - 1.20	Dark Brown	Loamy Sand	Stones	None
26488721	TP108	0.30 - 0.30	Light Brown	Sandy Loam	Stones	Vegetation
26480570	TP110	0.30	Dark Brown	Sandy Silt Loam	Vegetation	Brick
26480571	TP110	3.60	Dark Brown	Loamy Sand	Stones	Vegetation
26488734	TP111	1.00 - 1.00	Light Brown	Sandy Clay	Stones	None
26488724	TP112	0.50 - 0.50	Dark Brown	Sandy Silt Loam	Stones	None
26488726	TP112	1.50 - 1.50	Dark Brown	Sandy Silt Loam	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Results Legend		Customer Sample Ref.	BH106	BH106	TP104	TP106	TP106	TP107
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.80 - 0.90	1.55 - 1.65	1.00 - 1.00	0.40	4.00	1.20 - 1.20
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
aq	Aqueous / settled sample.		22/06/2022	22/06/2022	22/06/2022	21/06/2022	21/06/2022	22/06/2022
diss.filt	Dissolved / filtered sample.		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
tot.unfilt	Total / unfiltered sample.		220625-35	220625-35	220625-35	220625-35	220625-35	220625-35
*	Subcontracted - refer to subcontractor report for accreditation status.		26488716	26488717	26488719	26480569	26480568	26488731
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		ES2	ES3	ES2	ES1	ES4	ES2
(F)	Trigger breach confirmed							
1-4	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	9.8	19	11	8	18	16
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 @ M	<0.01 M	<0.01 M	<0.01 @ M	<0.01 @ M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 @ M	0.135 M	<0.01 M	<0.01 @ M	<0.01 @ M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 @ M	<0.015 M	<0.015 M	<0.015 @ M	<0.015 @	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035 @ M	0.135 M	<0.035 M	<0.035 @ M	<0.035 @ M	<0.035 M
Organic Carbon, Total	<0.2 %	TM132	0.626 M					1.68 M
pH	1 pH Units	TM133	6.82 M	6.91 M	6.35 M	8.28 M	8.29	7.32 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Cyanide, Total	<1 mg/kg	TM153	<1 @ M	<1 @ M	<1 @ M	<1 @ M	<1 @ M	<1 @ M
PCB congener 28	<0.003 mg/kg	TM168	<0.003 M					<0.003 M
PCB congener 52	<0.003 mg/kg	TM168	<0.003 M					<0.003 M
PCB congener 101	<0.003 mg/kg	TM168	<0.003 M					<0.003 M
PCB congener 118	<0.003 mg/kg	TM168	<0.003 M					<0.003 M
PCB congener 138	<0.003 mg/kg	TM168	<0.003 M					<0.003 M
PCB congener 153	<0.003 mg/kg	TM168	<0.003 M					<0.003 M
PCB congener 180	<0.003 mg/kg	TM168	<0.003 M					<0.003 M
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168	<0.021					<0.021
Arsenic	<0.6 mg/kg	TM181	7.89 M	11.6 M	7.42 M	9.36 M	6.51	11.4 M
Boron	<0.7 mg/kg	TM181	15.3 #	20.3 #	5.5 #	42.1 #	15.5	12.4 #
Cadmium	<0.02 mg/kg	TM181	0.0725 M	0.0697 M	0.0924 M	0.197 M	0.0675	0.194 M
Chromium	<0.9 mg/kg	TM181	10.7 M	19 M	7.16 M	9.78 M	14.2	8.95 M
Copper	<1.4 mg/kg	TM181	19.3 M	24 M	13.3 M	29.4 M	21.7	29.6 M
Lead	<0.7 mg/kg	TM181	19.7 M	15.6 M	21.6 M	39.6 M	11.3	48.7 M
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1	<0.1 M
Nickel	<0.2 mg/kg	TM181	18.9 M	27.9 M	14.2 M	23.4 M	27.8	21.7 M
Zinc	<1.9 mg/kg	TM181	79.7 M	90.7 M	44.2 M	88.8 M	60.3	101 M
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.0219 M	0.0179 M	0.0119 M	<0.004 M	0.0366 M	0.103 M
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410	<10					<10
Coronene	<0.2 mg/kg	TM410	<0.2					<0.2
EPH Surrogate % recovery**	%	TM415	92.6					95.8
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415	<5					19.2

CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

OC OP Pesticides and Triazine Herb

Results Legend		Customer Sample Ref.	TP108				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.30 - 0.30 Soil/Solid (S) 22/06/2022 24/06/2022 220625-35 26488721 ES1				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-4	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dichlorvos	<0.05 mg/kg	TM073	<0.05				
Mevinphos	<0.05 mg/kg	TM073	<0.05				
Tecnazene	<0.05 mg/kg	TM073	<0.05				
Hexachlorobenzene	<0.05 mg/kg	TM073	<0.05				
Trifluralin	<0.05 mg/kg	TM073	<0.05				
Phorate	<0.05 mg/kg	TM073	<0.05				
alpha-Hexachlorocyclohexane (HCH)	<0.05 mg/kg	TM073	<0.05				
Quintozene (PCNB)	<0.05 mg/kg	TM073	<0.05				
Diazinon	<0.05 mg/kg	TM073	<0.05				
Triallate	<0.05 mg/kg	TM073	<0.05				
Etrimpfos	<0.05 mg/kg	TM073	<0.05				
gamma-Hexachlorocyclohexane (HCH / Lindane)	<0.05 mg/kg	TM073	<0.05				
Disulfoton	<0.05 mg/kg	TM073	<0.05				
Propetamphos	<0.05 mg/kg	TM073	<0.05				
Heptachlor	<0.05 mg/kg	TM073	<0.05				
Chlorpyrifos methyl	<0.05 mg/kg	TM073	<0.05				
Dimethoate	<0.05 mg/kg	TM073	<0.05				
Aldrin	<0.05 mg/kg	TM073	<0.05				
Chlorothalonil	<0.05 mg/kg	TM073	<0.05				
Pirimiphos-methyl	<0.05 mg/kg	TM073	<0.05				
Telodrin	<0.05 mg/kg	TM073	<0.05				
beta-Hexachlorocyclohexane (HCH)	<0.05 mg/kg	TM073	<0.05				
Chlorpyrifos	<0.05 mg/kg	TM073	<0.05				
Methyl parathion	<0.05 mg/kg	TM073	<0.05				
Isodrin	<0.05 mg/kg	TM073	<0.05				
delta-Hexachlorocyclohexane (HCH)	<0.05 mg/kg	TM073	<0.05				
Malathion	<0.05 mg/kg	TM073	<0.05				
Fenthion	<0.05 mg/kg	TM073	<0.05				
Fenitrothion	<0.05 mg/kg	TM073	<0.05				
Heptachlor epoxide	<0.05 mg/kg	TM073	<0.05				
Triadimefon	<0.05 mg/kg	TM073	<0.05				
Pendimethalin	<0.05 mg/kg	TM073	<0.05				



Superseded Report:

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

PAH by GCMS

[illegible]

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

TPH CWG (S)

[illegible]

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&\$@ Sample deviation (see appendix)

Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
08/07/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
08/07/2022	Joanne Furnivall	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
08/07/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
09/07/2022	Joanne Furnivall	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
08/07/2022	Joanne Furnivall	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		Site Location	Hill Top Farm
Mass Sample taken (kg)	0.221	Natural Moisture Content (%)	27.2
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	78.6
Particle Size <4mm	>95%		

Case

SDG	220625-35
Lab Sample Number(s)	26480568
Sampled Date	21-Jun-2022
Customer Sample Ref.	TP106 ES4
Depth (m)	4.00

Eluate Analysis

	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
Hexavalent Chromium	<0.03	<0.03	<0.06	<0.06
pH Value of Filtered Water	8.5	<0.001	-	-
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.00002	<0.00002
Arsenic	0.000915	<0.0005	0.00183	<0.001
Boron	0.0395	<0.01	0.079	<0.02
Cadmium	<0.00008	<0.00008	<0.00016	<0.00016
Chromium	0.00121	<0.001	0.00242	<0.002
Copper	0.00999	<0.0003	0.02	<0.0006
Lead	<0.0002	<0.0002	<0.0004	<0.0004
Nickel	0.00144	<0.0004	0.00288	<0.0008
Zinc	0.0243	<0.001	0.0486	<0.002

Leach Test Information

Date Prepared	04-Jul-2022
pH (pH Units)	8.00
Conductivity (µS/cm)	176.00
Temperature (°C)	19.70
Volume Leachant (Litres)	0.303
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

20/07/2022 09:16:47

09:15:59 20/07/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference

Mass Sample taken (kg) 0.199

Mass of dry sample (kg) 0.175

Particle Size <4mm >95%

Site Location

Hill Top Farm

Natural Moisture Content (%) 14

Dry Matter Content (%) 87.7

Case

SDG 220625-35

Lab Sample Number(s) 26480570

Sampled Date 21-Jun-2022

Customer Sample Ref. TP110 ES1

Depth (m) 0.30

Eluate Analysis

	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
Hexavalent Chromium	<0.03	<0.03	<0.06	<0.06
pH Value of Filtered Water	8.4	<0.001	-	-
Mercury Dissolved (CVAf)	0.0000135	<0.00001	0.000027	<0.00002
Arsenic	0.00637	<0.0005	0.0127	<0.001
Boron	0.0992	<0.01	0.198	<0.02
Cadmium	<0.00008	<0.00008	<0.00016	<0.00016
Chromium	0.00125	<0.001	0.0025	<0.002
Copper	0.0285	<0.0003	0.057	<0.0006
Lead	0.00172	<0.0002	0.00344	<0.0004
Nickel	0.00356	<0.0004	0.00712	<0.0008
Zinc	0.0175	<0.001	0.035	<0.002

Leach Test Information

Date Prepared 11-Jul-2022
pH (pH Units) 8.07
Conductivity (µS/cm) 569.00
Temperature (°C) 21.10
Volume Leachant (Litres) 0.326
Volume of Eluate VE1 (Litres)Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

20/07/2022 09:16:47

09:15:59 20/07/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg)	0.100
Mass of dry sample (kg)	0.090
Particle Size <4mm	>95%

Site Location

Site Location	Hill Top Farm
Natural Moisture Content (%)	11.7
Dry Matter Content (%)	89.5

Case

SDG	220625-35
Lab Sample Number(s)	26488716
Sampled Date	22-Jun-2022
Customer Sample Ref.	BH106 ES2
Depth (m)	0.80 - 0.90

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	-
6	-	-
1	-	-
500	-	-
100	-	-
-	>6	-
-	-	-
-	-	-

Solid Waste Analysis

Result

Total Organic Carbon (%)	0.626
Loss on Ignition (%)	-
Sum of BTEX (mg/kg)	<0.04
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg) (EH_2D_AL)	<5
PAH Sum of 17 (mg/kg)	<10
pH (pH Units)	6.82
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis

C₂

Concⁿ in 10:1 eluate (mg/l)

A₂

10:1 concⁿ leached (mg/kg)

Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg

	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.00534	<0.0005	0.0534	<0.005	0.5	2	25
Barium	0.00494	<0.0002	0.0494	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.0177	<0.0003	0.177	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00127	<0.0004	0.0127	<0.004	0.4	10	40
Lead	0.000501	<0.0002	0.00501	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00453	<0.001	0.0453	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	32.3	<5	323	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	6.41	<3	64.1	<30	500	800	1000

Leach Test Information

Date Prepared	02-Jul-2022
pH (pH Units)	6.84
Conductivity (µS/cm)	32.90
Temperature (°C)	21.00
Volume Leachant (Litres)	0.890

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

20/07/2022 09:16:56



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.107

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site Location

Hill Top Farm

Natural Moisture Content (%) 19.7

Dry Matter Content (%) 83.5

Case

SDG 220625-35

Lab Sample Number(s) 26488731

Sampled Date 22-Jun-2022

Customer Sample Ref. TP107 ES2

Depth (m) 1.20 - 1.20

Landfill Waste Acceptance
Criteria Limits

Solid Waste Analysis

Result

Total Organic Carbon (%) 1.68

Loss on Ignition (%) -

Sum of BTEX (mg/kg) <0.8

Sum of 7 PCBs (mg/kg) <0.021

Mineral Oil (mg/kg) (EH_2D_AL) 19.2

PAH Sum of 17 (mg/kg) <10

pH (pH Units) 7.32

ANC to pH 6 (mol/kg) -

ANC to pH 4 (mol/kg) -

Inert Waste
LandfillStable
Non-reactive
Hazardous Waste
in Non-
Hazardous
LandfillHazardous
Waste Landfill

3

5

6

-

-

-

6

-

-

1

-

-

500

-

-

100

-

-

-

>6

-

-

-

-

-

-

-

Eluate Analysis

C₂Concⁿ in 10:1 eluate (mg/l)A₂10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

Result

Limit of Detection

Result

Limit of Detection

Arsenic

0.00493

<0.0005

0.0493

<0.005

0.5

2

25

Barium

0.0145

<0.0002

0.145

<0.002

20

100

300

Cadmium

<0.00008

<0.00008

<0.0008

<0.0008

0.04

1

5

Chromium

<0.001

<0.001

<0.01

<0.01

0.5

10

70

Copper

0.0186

<0.0003

0.186

<0.003

2

50

100

Mercury Dissolved (CVAf)

<0.00001

<0.00001

<0.0001

<0.0001

0.01

0.2

2

Molybdenum

0.00542

<0.003

0.0542

<0.03

0.5

10

30

Nickel

0.00143

<0.0004

0.0143

<0.004

0.4

10

40

Lead

0.00118

<0.0002

0.0118

<0.002

0.5

10

50

Antimony

0.0018

<0.001

0.018

<0.01

0.06

0.7

5

Selenium

<0.001

<0.001

<0.01

<0.01

0.1

0.5

7

Zinc

0.00304

<0.001

0.0304

<0.01

4

50

200

Chloride

<2

<2

<20

<20

800

15000

25000

Fluoride

<0.5

<0.5

<5

<5

10

150

500

Sulphate (soluble)

36.9

<2

369

<20

1000

20000

50000

Total Dissolved Solids

123

<5

1230

<50

4000

60000

100000

Total Monohydric Phenols (W)

<0.016

<0.016

<0.16

<0.16

1

-

-

Dissolved Organic Carbon

12

<3

120

<30

500

800

1000

Leach Test Information

Date Prepared 02-Jul-2022

pH (pH Units) 7.54

Conductivity (µS/cm) 159.00

Temperature (°C) 20.10

Volume Leachant (Litres) 0.883

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

20/07/2022 09:16:56



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM073	MEWAM BOOK 60 1980,95 1985, HMSO / Modified: US EPA Method 8081A & 8141A	Determination of organochlorine and organophosphorous pesticides by GCMS
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26488716	26488717	26488719	26480568	26480569	26488731	26488721	26480570	26480571	26488734
Customer Sample Ref.	BH106	BH106	TP104	TP106	TP106	TP107	TP108	TP110	TP110	TP111
AGS Ref.	ES2	ES3	ES2	ES4	ES1	ES2	ES1	ES1	ES4	ES2
Depth	0.80 - 0.90	1.55 - 1.65	1.00 - 1.00	4.00	0.40	1.20 - 1.20	0.30 - 0.30	0.30	3.60	1.00 - 1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022
Anions by Kone (w)	05-Jul-2022					05-Jul-2022				
Asbestos ID in Solid Samples	08-Jul-2022				08-Jul-2022	08-Jul-2022		09-Jul-2022		
CEN 10:1 Leachate (1 Stage)	02-Jul-2022					02-Jul-2022				
CEN 2:1 Leachate (1 Stage)				05-Jul-2022				09-Jul-2022		
CEN Readings	06-Jul-2022			07-Jul-2022		06-Jul-2022		15-Jul-2022		
Coronene	05-Jul-2022					05-Jul-2022				
Cyanide Comp/Free/Total/Thiocyanate	07-Jul-2022	08-Jul-2022	07-Jul-2022	08-Jul-2022	07-Jul-2022	08-Jul-2022	08-Jul-2022	07-Jul-2022	08-Jul-2022	08-Jul-2022
Dissolved Metals by ICP-MS	06-Jul-2022			07-Jul-2022		07-Jul-2022		18-Jul-2022		
Dissolved Organic/Inorganic Carbon	06-Jul-2022					06-Jul-2022				
EPH by GCxGC-FID	06-Jul-2022					06-Jul-2022				
EPH CWG GC (S)	05-Jul-2022		05-Jul-2022	05-Jul-2022	06-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022
Fluoride	05-Jul-2022					05-Jul-2022				
GRO by GC-FID (S)	10-Jul-2022			10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022		10-Jul-2022
Hexavalent Chromium (s)	04-Jul-2022	04-Jul-2022	04-Jul-2022	05-Jul-2022	05-Jul-2022	04-Jul-2022	04-Jul-2022	04-Jul-2022	05-Jul-2022	04-Jul-2022
Hexavalent Chromium (w)				07-Jul-2022				12-Jul-2022		
Mercury Dissolved	06-Jul-2022			08-Jul-2022		06-Jul-2022		13-Jul-2022		
Metals in solid samples by OES	07-Jul-2022	06-Jul-2022	06-Jul-2022	07-Jul-2022	07-Jul-2022	07-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022
Moisture at 105C	02-Jul-2022	02-Jul-2022	02-Jul-2022	04-Jul-2022		02-Jul-2022		04-Jul-2022		02-Jul-2022
OC OP Pesticides and Triazine Herb							15-Jul-2022			
PAH 16 & 17 Calc	05-Jul-2022					05-Jul-2022				
PAH by GCMS	05-Jul-2022		06-Jul-2022	06-Jul-2022	06-Jul-2022	05-Jul-2022	06-Jul-2022	06-Jul-2022	06-Jul-2022	04-Jul-2022
PCBs by GCMS	06-Jul-2022					06-Jul-2022				
pH	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	06-Jul-2022	05-Jul-2022	05-Jul-2022
pH Value of Filtered Water	05-Jul-2022			07-Jul-2022		05-Jul-2022		14-Jul-2022		
Phenols by HPLC (S)	08-Jul-2022	06-Jul-2022	06-Jul-2022	08-Jul-2022	08-Jul-2022	06-Jul-2022	06-Jul-2022	08-Jul-2022	08-Jul-2022	06-Jul-2022
Phenols by HPLC (W)	08-Jul-2022					07-Jul-2022				
Sample description	01-Jul-2022	01-Jul-2022	01-Jul-2022	03-Jul-2022	01-Jul-2022	01-Jul-2022	01-Jul-2022	02-Jul-2022	03-Jul-2022	01-Jul-2022
Total Organic Carbon	08-Jul-2022					08-Jul-2022				
TPH CWG GC (S)	10-Jul-2022		12-Jul-2022	20-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022	10-Jul-2022	12-Jul-2022	10-Jul-2022
VOC MS (S)	11-Jul-2022		11-Jul-2022	11-Jul-2022	11-Jul-2022	13-Jul-2022	11-Jul-2022	11-Jul-2022	11-Jul-2022	11-Jul-2022

Lab Sample No(s)	26488724	26488726
Customer Sample Ref.	TP112	TP112
AGS Ref.	ES1	ES3
Depth	0.50 - 0.50	1.50 - 1.50
Type	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	06-Jul-2022	06-Jul-2022
Asbestos ID in Solid Samples	08-Jul-2022	
Cyanide Comp/Free/Total/Thiocyanate	07-Jul-2022	07-Jul-2022
EPH CWG GC (S)	05-Jul-2022	05-Jul-2022
GRO by GC-FID (S)	10-Jul-2022	10-Jul-2022
Hexavalent Chromium (s)	05-Jul-2022	05-Jul-2022
Metals in solid samples by OES	07-Jul-2022	06-Jul-2022
Moisture at 105C	02-Jul-2022	
PAH by GCMS	06-Jul-2022	06-Jul-2022
pH	05-Jul-2022	05-Jul-2022
Phenols by HPLC (S)	08-Jul-2022	08-Jul-2022
Sample description	01-Jul-2022	01-Jul-2022
TPH CWG GC (S)	10-Jul-2022	10-Jul-2022
VOC MS (S)	11-Jul-2022	11-Jul-2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

ASSOCIATED AQC DATA

Anions by Kone (w)

Component	Method Code	QC 2642
Chloride	TM184	105.0 97.18 : 113.20
Sulphate (soluble)	TM184	101.6 96.54 : 111.66

Coronene

Component	Method Code	QC 2637
Coronene RAW	TM410	94.5 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2684	QC 2633	QC 2677
Free Cyanide	TM153	86.14 71.70 : 110.70	90.79 71.70 : 110.70	88.81 71.70 : 110.70
Thiocyanate	TM153	93.59 87.27 : 113.27	95.51 87.27 : 113.27	94.23 87.27 : 113.27
Total Cyanide	TM153	92.31 72.73 : 109.93	93.71 72.73 : 109.93	91.61 72.73 : 109.93

Dissolved Metals by ICP-MS

Component	Method Code	QC 2669	QC 2607	QC 2698	QC 2622
Aluminium	TM152	100.0 90.98 : 111.82	101.67 90.98 : 111.82	104.33 90.98 : 111.82	100.33 90.98 : 111.82
Antimony	TM152	100.17 90.44 : 113.04	99.5 90.44 : 113.04	99.5 90.44 : 113.04	102.5 90.44 : 113.04
Arsenic	TM152	100.5 94.33 : 107.73	101.33 94.33 : 107.73	102.0 94.33 : 107.73	100.67 94.33 : 107.73
Barium	TM152	101.83 90.20 : 111.19	102.17 90.20 : 111.19	101.83 90.20 : 111.19	99.17 90.20 : 111.19
Beryllium	TM152	102.17 87.77 : 113.97	102.83 87.77 : 113.97	103.0 87.77 : 113.97	101.67 87.77 : 113.97
Bismuth	TM152	99.17 91.90 : 112.20	100.5 91.90 : 112.20	99.33 91.90 : 112.20	99.83 91.90 : 112.20
Borate	TM152	101.23 88.00 : 112.00	100.62 88.00 : 112.00	104.94 88.00 : 112.00	100.62 88.00 : 112.00
Boron	TM152	101.33 92.27 : 112.40	100.67 92.27 : 112.40	104.67 92.27 : 112.40	100.67 92.27 : 112.40
Cadmium	TM152	103.5 94.93 : 106.93	103.5 94.93 : 106.93	104.0 94.93 : 106.93	99.5 94.93 : 106.93
Calcium	TM152	98.0 95.14 : 110.01	100.67 95.14 : 110.01	100.67 95.14 : 110.01	102.67 95.14 : 110.01
Chromium	TM152	97.33 91.84 : 108.67	97.33 91.84 : 108.67	102.33 91.84 : 108.67	99.33 91.84 : 108.67
Cobalt	TM152	97.67 90.72 : 109.61	96.83 90.72 : 109.61	102.83 90.72 : 109.61	99.83 90.72 : 109.61



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Dissolved Metals by ICP-MS

		QC 2669	QC 2607	QC 2698	QC 2622
Copper	TM152	99.17 94.47 : 109.05	98.0 94.47 : 109.05	103.83 94.47 : 109.05	101.67 94.47 : 109.05
Iron	TM152	98.67 94.40 : 107.90	98.67 94.40 : 107.90	102.0 94.40 : 107.90	99.33 94.40 : 107.90
Lead	TM152	99.17 93.55 : 109.46	100.5 93.55 : 109.46	101.17 93.55 : 109.46	98.5 93.55 : 109.46
Lithium	TM152	102.17 91.62 : 113.12	103.0 91.62 : 113.12	102.5 91.62 : 113.12	100.83 91.62 : 113.12
Magnesium	TM152	98.0 92.30 : 110.57	98.67 92.30 : 110.57	100.0 92.30 : 110.57	101.33 92.30 : 110.57
Manganese	TM152	98.83 94.75 : 108.21	99.83 94.75 : 108.21	103.17 94.75 : 108.21	98.0 94.75 : 108.21
Molybdenum	TM152	98.83 93.77 : 103.54	98.67 93.77 : 103.54	101.17 93.77 : 103.54	96.33 93.77 : 103.54
Nickel	TM152	99.0 93.65 : 106.90	97.33 93.65 : 106.90	104.33 93.65 : 106.90	100.33 93.65 : 106.90
Phosphorus	TM152	98.83 92.51 : 109.27	100.5 92.51 : 109.27	99.17 92.51 : 109.27	99.0 92.51 : 109.27
Potassium	TM152	99.33 92.16 : 109.93	101.33 92.16 : 109.93	99.33 92.16 : 109.93	102.0 92.16 : 109.93
Selenium	TM152	102.0 91.58 : 115.98	100.33 91.58 : 115.98	105.5 91.58 : 115.98	100.83 91.58 : 115.98
Silver	TM152	101.0 96.03 : 105.53	101.17 96.03 : 105.53	101.33 96.03 : 105.53	98.33 96.03 : 105.53
Sodium	TM152	96.67 89.47 : 109.62	98.67 89.47 : 109.62	99.33 89.47 : 109.62	100.0 89.47 : 109.62
Strontium	TM152	102.0 95.67 : 106.20	103.33 95.67 : 106.20	101.67 95.67 : 106.20	99.33 95.67 : 106.20
Tellurium	TM152	100.17 93.32 : 114.66	102.33 93.32 : 114.66	100.83 93.32 : 114.66	98.67 93.32 : 114.66
Thallium	TM152	98.33 88.00 : 112.00	100.0 88.00 : 112.00	100.83 88.00 : 112.00	98.83 88.00 : 112.00
Tin	TM152	99.33 92.63 : 109.70	100.0 92.63 : 109.70	100.67 92.63 : 109.70	100.17 92.63 : 109.70
Titanium	TM152	98.17 95.08 : 109.28	100.33 95.08 : 109.28	101.0 95.08 : 109.28	101.67 95.08 : 109.28
Tungsten	TM152	97.33 94.68 : 107.68	97.83 94.68 : 107.68	100.17 94.68 : 107.68	100.0 94.68 : 107.68
Uranium	TM152	100.0 93.63 : 105.43	100.33 93.63 : 105.43	101.83 93.63 : 105.43	99.0 93.63 : 105.43
Vanadium	TM152	97.67 88.00 : 112.00	97.33 88.00 : 112.00	104.33 88.00 : 112.00	101.5 88.00 : 112.00
Zinc	TM152	101.0 95.31 : 110.74	100.0 95.31 : 110.74	104.0 95.31 : 110.74	103.0 95.31 : 110.74

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2614
Dissolved Inorganic Carbon	TM090	101.33 93.58 : 112.28
Dissolved Organic Carbon	TM090	101.67 97.42 : 107.52



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
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Superseded Report:

EPH CWG GC (S)

Component	Method Code	QC 2606
EPH >C8-C40 Raw	TM414	90.45 79.56 : 113.20
Total Aliphatics Raw	TM414	97.75 79.29 : 113.82
Total Aromatics Raw	TM414	88.68 61.16 : 129.42

Fluoride

Component	Method Code	QC 2678	QC 2693
Fluoride	TM104	102.67 96.67 : 108.67	102.67 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2655	QC 2602	QC 2638
QC	TM089	74.04 65.61 : 111.21	73.35 65.61 : 111.21	83.93 65.61 : 111.21

Hexavalent Chromium (s)

Component	Method Code	QC 2631	QC 2655	QC 2698
Hexavalent Chromium	TM151	100.0 88.20 : 118.20	106.0 88.20 : 118.20	104.0 88.20 : 118.20

Hexavalent Chromium (w)

Component	Method Code	QC 2653	QC 2688
Hexavalent Chromium	TM241	97.8 94.17 : 106.17	95.8 94.17 : 106.17

Mercury Dissolved

Component	Method Code	QC 2645	QC 2661	QC 2601
Mercury Dissolved (CVAf)	TM183	97.0 0.00 : 0.00	104.0 0.00 : 0.00	98.8 0.00 : 0.00

Metals in solid samples by OES



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SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Metals in solid samples by OES

Component	Method Code	QC 2607	QC 2630	QC 2639	QC 2681	QC 2624	QC 2629
Aluminium	TM181	93.86 84.95 : 125.04	92.98 84.95 : 125.04	100.0 84.95 : 125.04	102.63 84.95 : 125.04	97.37 84.95 : 125.04	91.23 84.95 : 125.04
Antimony	TM181	110.63 91.44 : 127.13	112.2 91.44 : 127.13	114.96 91.44 : 127.13	115.35 91.44 : 127.13	111.42 91.44 : 127.13	105.51 91.44 : 127.13
Arsenic	TM181	108.78 95.27 : 120.80	109.46 95.27 : 120.80	116.89 95.27 : 120.80	115.2 95.27 : 120.80	111.49 95.27 : 120.80	108.78 95.27 : 120.80
Barium	TM181	110.77 94.57 : 124.93	106.67 94.57 : 124.93	107.69 94.57 : 124.93	111.79 94.57 : 124.93	107.69 94.57 : 124.93	101.03 94.57 : 124.93
Beryllium	TM181	104.08 85.72 : 122.69	105.25 85.72 : 122.69	109.33 85.72 : 122.69	110.2 85.72 : 122.69	107.0 85.72 : 122.69	103.5 85.72 : 122.69
Boron	TM181	106.75 91.59 : 122.22	102.57 91.59 : 122.22	109.32 91.59 : 122.22	111.58 91.59 : 122.22	109.65 91.59 : 122.22	100.96 91.59 : 122.22
Cadmium	TM181	105.9 87.31 : 121.62	106.64 87.31 : 121.62	114.02 87.31 : 121.62	111.81 87.31 : 121.62	108.12 87.31 : 121.62	106.27 87.31 : 121.62
Chromium	TM181	100.98 85.06 : 113.81	100.24 85.06 : 113.81	101.71 85.06 : 113.81	104.63 85.06 : 113.81	103.17 85.06 : 113.81	96.59 85.06 : 113.81
Cobalt	TM181	101.09 90.60 : 110.35	101.27 90.60 : 110.35	108.0 90.60 : 110.35	106.73 90.60 : 110.35	103.09 90.60 : 110.35	104.18 90.60 : 110.35
Copper	TM181	94.25 81.22 : 113.40	96.45 81.22 : 113.40	100.0 81.22 : 113.40	99.83 81.22 : 113.40	96.62 81.22 : 113.40	94.59 81.22 : 113.40
Iron	TM181	91.38 86.44 : 122.27	90.64 86.44 : 122.27	103.67 86.44 : 122.27	102.75 86.44 : 122.27	97.25 86.44 : 122.27	96.33 86.44 : 122.27
Lead	TM181	104.21 86.83 : 123.12	102.48 86.83 : 123.12	109.9 86.83 : 123.12	107.43 86.83 : 123.12	113.37 86.83 : 123.12	99.5 86.83 : 123.12
Manganese	TM181	106.46 89.22 : 121.75	107.3 89.22 : 121.75	110.96 89.22 : 121.75	111.24 89.22 : 121.75	107.58 89.22 : 121.75	104.78 89.22 : 121.75
Mercury	TM181	106.51 84.95 : 119.42	107.17 84.95 : 119.42	114.33 84.95 : 119.42	111.73 84.95 : 119.42	108.14 84.95 : 119.42	105.86 84.95 : 119.42
Molybdenum	TM181	100.0 85.98 : 123.80	101.01 85.98 : 123.80	107.07 85.98 : 123.80	106.06 85.98 : 123.80	102.69 85.98 : 123.80	100.0 85.98 : 123.80
Nickel	TM181	104.15 88.05 : 119.19	104.45 88.05 : 119.19	111.57 88.05 : 119.19	110.39 88.05 : 119.19	106.23 88.05 : 119.19	103.86 88.05 : 119.19
Phosphorus	TM181	107.18 90.13 : 121.54	108.03 90.13 : 121.54	110.94 90.13 : 121.54	109.57 90.13 : 121.54	105.98 90.13 : 121.54	103.08 90.13 : 121.54
Selenium	TM181	107.33 90.68 : 124.14	107.69 90.68 : 124.14	115.75 90.68 : 124.14	114.65 90.68 : 124.14	111.36 90.68 : 124.14	107.69 90.68 : 124.14
Strontium	TM181	92.84 80.65 : 106.55	93.51 80.65 : 106.55	99.33 80.65 : 106.55	100.45 80.65 : 106.55	96.42 80.65 : 106.55	93.06 80.65 : 106.55
Thallium	TM181	105.03 76.88 : 121.51	105.7 76.88 : 121.51	113.09 76.88 : 121.51	110.4 76.88 : 121.51	108.05 76.88 : 121.51	105.03 76.88 : 121.51
Tin	TM181	102.08 86.96 : 122.18	101.19 86.96 : 122.18	106.82 86.96 : 122.18	106.82 86.96 : 122.18	104.75 86.96 : 122.18	100.0 86.96 : 122.18
Titanium	TM181	94.55 77.07 : 118.83	94.55 77.07 : 118.83	103.64 77.07 : 118.83	100.91 77.07 : 118.83	100.91 77.07 : 118.83	97.27 77.07 : 118.83
Vanadium	TM181	99.28 84.00 : 115.50	99.28 84.00 : 115.50	105.4 84.00 : 115.50	105.76 84.00 : 115.50	102.16 84.00 : 115.50	99.64 84.00 : 115.50
Zinc	TM181	102.48 85.62 : 122.35	102.48 85.62 : 122.35	106.32 85.62 : 122.35	107.9 85.62 : 122.35	104.74 85.62 : 122.35	97.74 85.62 : 122.35

OC OP Pesticides and Triazine Herb



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Validated

SDG: 220625-35
Client Ref.: 10056074Report Number: 654847
Location: Hill Top Farm

Superseded Report:

OC OP Pesticides and Triazine Herb

Component	Method Code	QC 2664
Atrazine (Raw)	TM073	112.29 78.55 : 119.92
Azinphos methyl (Raw)	TM073	128.8 58.68 : 154.71
cis-Chlordane (Raw)	TM073	108.79 71.90 : 129.99
Diazinon (Raw)	TM073	110.91 70.00 : 130.00
Dichlorvos (Raw)	TM073	114.2 70.00 : 130.00
Dieldrin (Raw)	TM073	124.94 70.00 : 130.00
gamma-HCH (Lindane) (Raw)	TM073	116.6 71.48 : 129.99
Heptachlor (Raw)	TM073	117.43 66.39 : 134.63
Hexachlorobenzene (Raw)	TM073	108.33 47.15 : 124.32
Malathion (Raw)	TM073	113.23 70.00 : 130.00
p,p-DDT (Raw)	TM073	129.59 70.00 : 130.00
Parathion (Raw)	TM073	104.51 64.13 : 127.88

PAH by GCMS

Component	Method Code	QC 2619	QC 2628	QC 2652	QC 2608	QC 2622
Acenaphthene	TM218	89.5 76.79 : 103.90	88.5 76.79 : 103.90	88.5 76.79 : 103.90	97.5 73.47 : 109.80	90.0 76.79 : 103.90
Acenaphthylene	TM218	87.0 74.19 : 106.17	86.0 74.19 : 106.17	85.5 74.19 : 106.17	98.5 70.00 : 130.00	88.0 74.19 : 106.17
Anthracene	TM218	90.5 70.90 : 109.22	86.5 70.90 : 109.22	84.0 70.90 : 109.22	95.5 68.68 : 111.89	89.5 70.90 : 109.22
Benz(a)anthracene	TM218	94.0 73.77 : 119.26	97.0 73.77 : 119.26	85.5 73.77 : 119.26	102.5 68.12 : 118.39	95.5 73.77 : 119.26
Benzo(a)pyrene	TM218	88.0 73.20 : 114.18	99.0 73.20 : 114.18	83.0 73.20 : 114.18	98.5 65.65 : 105.78	89.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	88.5 75.36 : 117.58	102.5 75.36 : 117.58	89.5 75.36 : 117.58	101.0 66.89 : 120.40	95.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	86.0 70.73 : 116.12	95.0 70.73 : 116.12	86.0 70.73 : 116.12	106.5 67.82 : 118.49	88.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	92.0 75.98 : 116.59	99.5 75.98 : 116.59	85.5 75.98 : 116.59	99.5 73.10 : 117.03	92.5 75.98 : 116.59
Chrysene	TM218	92.5 74.82 : 114.18	96.0 74.82 : 114.18	84.0 74.82 : 114.18	102.5 69.58 : 115.47	94.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	86.5 69.17 : 115.30	98.0 69.17 : 115.30	82.5 69.17 : 115.30	100.5 67.32 : 121.35	86.0 69.17 : 115.30
Fluoranthene	TM218	93.0 66.06 : 114.63	89.5 66.06 : 114.63	82.5 66.06 : 114.63	95.5 64.99 : 117.80	96.5 66.06 : 114.63
Fluorene	TM218	90.5 76.66 : 107.56	89.5 76.66 : 107.56	87.0 76.66 : 107.56	99.0 73.81 : 108.66	89.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	80.0 70.26 : 117.95	95.5 70.26 : 117.95	86.5 70.26 : 117.95	101.5 68.91 : 117.62	87.0 70.26 : 117.95



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PAH by GCMS

		QC 2619	QC 2628	QC 2652	QC 2608	QC 2622
Naphthalene	TM218	88.0 74.70 : 101.83	88.5 74.70 : 101.83	90.5 74.70 : 101.83	103.0 80.21 : 109.02	93.5 74.70 : 101.83
Phenanthrene	TM218	94.0 73.62 : 109.34	88.5 73.62 : 109.34	85.0 73.62 : 109.34	97.5 69.01 : 113.72	93.5 73.62 : 109.34
Pyrene	TM218	90.0 71.46 : 117.00	89.0 71.46 : 117.00	80.0 71.46 : 117.00	95.5 64.28 : 115.75	93.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2635
PCB congener 101	TM168	95.5 65.66 : 110.06
PCB congener 105	TM168	85.7 58.10 : 106.34
PCB congener 114	TM168	90.3 59.38 : 106.48
PCB congener 118	TM168	92.8 60.02 : 106.23
PCB congener 123	TM168	90.1 65.01 : 99.81
PCB congener 126	TM168	88.5 59.31 : 109.23
PCB congener 138	TM168	91.4 63.95 : 107.63
PCB congener 153	TM168	93.0 62.65 : 108.85
PCB congener 156	TM168	92.2 61.69 : 112.27
PCB congener 157	TM168	86.3 55.37 : 104.81
PCB congener 167	TM168	93.2 65.58 : 109.14
PCB congener 169	TM168	93.0 56.84 : 112.10
PCB congener 180	TM168	92.1 66.99 : 111.63
PCB congener 189	TM168	87.8 57.75 : 112.59
PCB congener 28	TM168	97.7 65.82 : 104.46
PCB congener 52	TM168	94.7 67.24 : 107.62
PCB congener 77	TM168	88.3 64.87 : 108.49
PCB congener 81	TM168	104.0 61.93 : 107.41

pH



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Superseded Report:

pH

Component	Method Code	QC 2698	QC 2600	QC 2614	QC 2622
pH	TM133	99.27 96.92 : 102.20	100.0 96.92 : 102.20	100.29 96.92 : 102.20	99.85 96.92 : 102.20

pH Value of Filtered Water

Component	Method Code	QC 2673	QC 2691	QC 2632
EC QC	TM256			102.1 95.52 : 108.13
pH	TM256	100.27 99.20 : 102.41	101.2 99.20 : 102.41	100.8 99.20 : 102.41

Phenols by HPLC (S)

Component	Method Code	QC 2639	QC 2655	QC 2673
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 69.38 : 125.27	53.9 69.38 : 125.27	53.9 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	47.37 69.79 : 122.84	48.54 69.79 : 122.84	47.37 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	50.94 77.98 : 111.41	51.77 77.98 : 111.41	50.31 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	54.3 67.94 : 117.69	54.97 67.94 : 117.69	52.98 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	51.15 82.04 : 108.38	51.87 82.04 : 108.38	50.52 82.04 : 108.38

Phenols by HPLC (W)

Component	Method Code	QC 2638
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	105.47 76.00 : 124.00
2-Isopropyl Phenol by HPLC (W)	TM259	103.25 76.00 : 124.00
Cresols by HPLC (W)	TM259	105.92 76.00 : 124.00
Napthol by HPLC (W)	TM259	95.7 76.00 : 124.00
Phenol by HPLC (W)	TM259	102.08 76.00 : 124.00
Xylenols by HPLC (W)	TM259	104.43 76.00 : 124.00

Total Organic Carbon

Component	Method Code	QC 2664
Total Organic Carbon	TM132	108.2 86.33 : 116.80



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Superseded Report:

VOC MS (S)

Component	Method Code	QC 2664	QC 2625	QC 2635
1,1,1,2-tetrachloroethane	TM116	98.6 86.59 : 118.97	98.6 84.42 : 110.51	100.2 84.84 : 116.25
1,1,1-Trichloroethane	TM116	104.4 86.26 : 117.53	102.6 88.34 : 114.50	103.8 85.52 : 113.22
1,1,2-Trichloroethane	TM116	95.8 75.16 : 112.70	92.6 81.29 : 113.79	92.8 77.12 : 116.04
1,1-Dichloroethane	TM116	111.8 87.14 : 128.34	110.6 91.34 : 123.49	112.6 74.46 : 129.15
1,2-Dichloroethane	TM116	106.8 89.30 : 133.10	106.8 90.04 : 132.28	106.6 92.38 : 131.65
1,4-Dichlorobenzene	TM116	99.2 82.59 : 123.23	102.4 80.81 : 125.07	103.6 76.78 : 122.98
2-Chlorotoluene	TM116	96.8 66.81 : 118.43	92.2 73.13 : 114.13	94.2 68.55 : 109.58
4-Chlorotoluene	TM116	92.0 65.88 : 114.76	86.6 68.66 : 109.13	93.0 66.29 : 107.51
Benzene	TM116	106.2 93.16 : 123.63	102.4 84.29 : 112.22	106.4 88.60 : 113.80
Carbon Disulphide	TM116	102.2 75.11 : 124.81	103.8 75.11 : 124.81	98.8 74.91 : 122.14
Carbontetrachloride	TM116	107.2 82.06 : 121.42	102.4 82.35 : 126.46	107.0 80.31 : 124.50
Chlorobenzene	TM116	99.8 85.07 : 118.13	104.0 82.88 : 122.42	103.6 83.81 : 114.18
Chloroform	TM116	108.6 88.13 : 122.71	109.4 90.35 : 120.38	111.2 87.40 : 122.49
Chloromethane	TM116	111.0 61.62 : 145.66	101.6 67.89 : 143.51	106.8 63.11 : 124.36
Cis-1,2-Dichloroethene	TM116	109.8 88.41 : 121.33	101.0 78.27 : 128.90	107.0 80.67 : 126.72
Dibromomethane	TM116	94.6 77.47 : 121.29	96.4 76.00 : 120.73	98.4 73.23 : 118.35
Dichloromethane	TM116	117.4 87.89 : 134.72	119.2 97.64 : 133.75	118.2 81.11 : 133.25
Ethylbenzene	TM116	92.4 76.29 : 106.31	89.4 70.95 : 113.07	94.6 75.92 : 110.41
Hexachlorobutadiene	TM116	84.2 16.78 : 153.29	69.0 14.55 : 147.92	82.8 12.82 : 152.73
Isopropylbenzene	TM116	86.8 59.16 : 110.07	69.8 43.42 : 101.34	88.6 54.30 : 105.91
Naphthalene	TM116	101.0 79.29 : 125.59	108.2 80.90 : 124.24	106.4 80.86 : 128.81
o-Xylene	TM116	90.6 72.86 : 102.10	82.0 68.34 : 101.99	90.0 69.99 : 108.74
p/m-Xylene	TM116	87.3 68.99 : 102.40	87.2 69.47 : 97.31	91.5 68.32 : 108.91
Sec-Butylbenzene	TM116	85.0 44.71 : 117.87	65.4 27.03 : 135.73	98.4 38.50 : 101.50
Tetrachloroethene	TM116	99.0 77.82 : 125.00	100.8 80.10 : 120.38	101.2 76.95 : 121.02
Toluene	TM116	97.0 87.82 : 116.21	94.4 80.66 : 100.10	95.0 74.24 : 107.42
Trichloroethene	TM116	98.4 79.80 : 112.33	95.0 79.80 : 112.33	96.4 85.28 : 109.36



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Superseded Report:

VOC MS (S)

		QC 2664	QC 2625	QC 2635
Trichlorofluoromethane	TM116	110.6 80.52 : 132.12	113.0 83.13 : 123.97	109.6 81.46 : 120.52
Vinyl Chloride	TM116	110.2 74.57 : 146.88	107.2 69.66 : 136.55	107.6 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis .

The figure detailed is the percentage recovery result for the AQC .

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control .



CERTIFICATE OF ANALYSIS

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SDG: 220625-35
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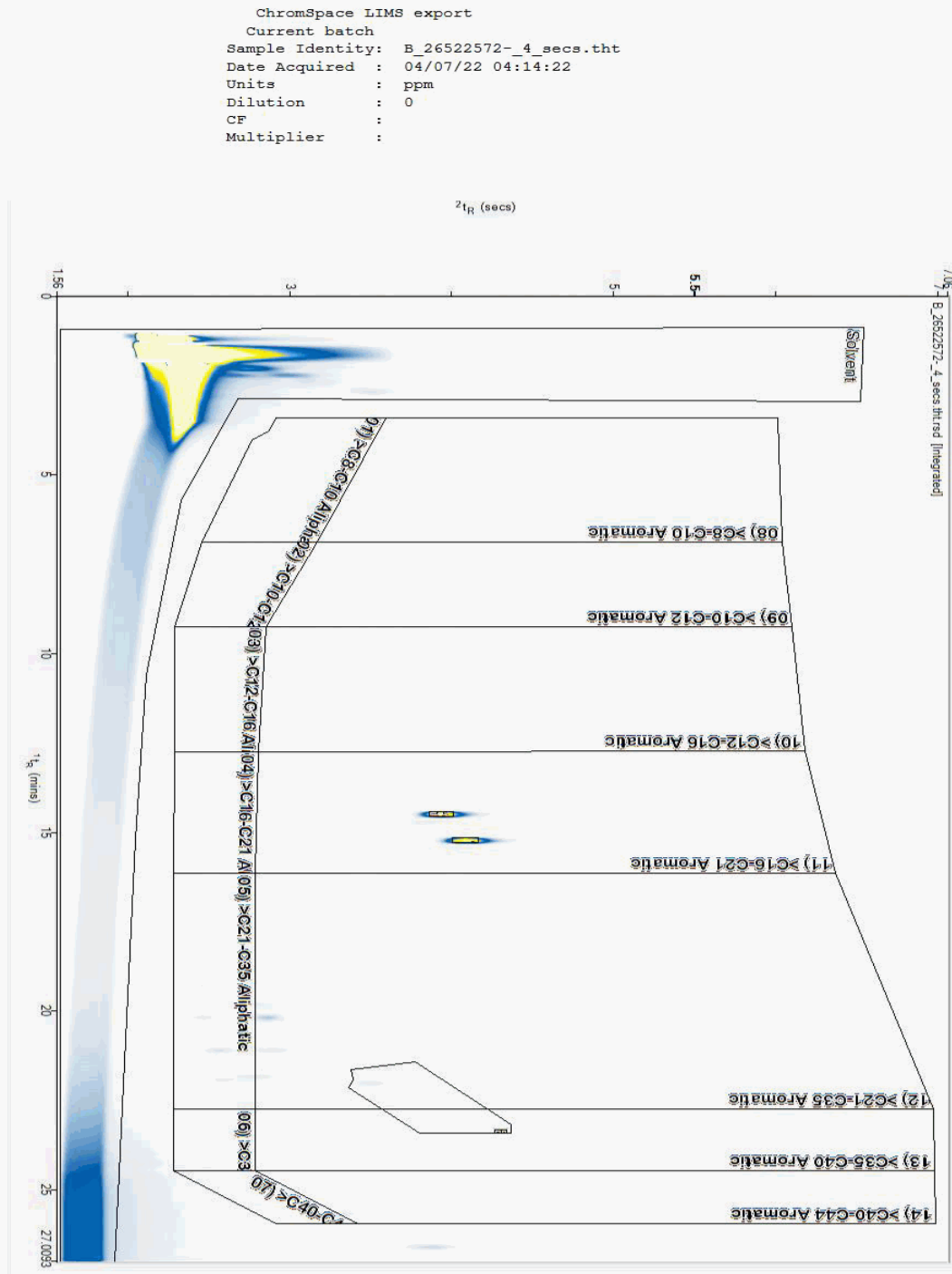
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26522572
Sample ID : BH106

Depth : 0.80 - 0.90





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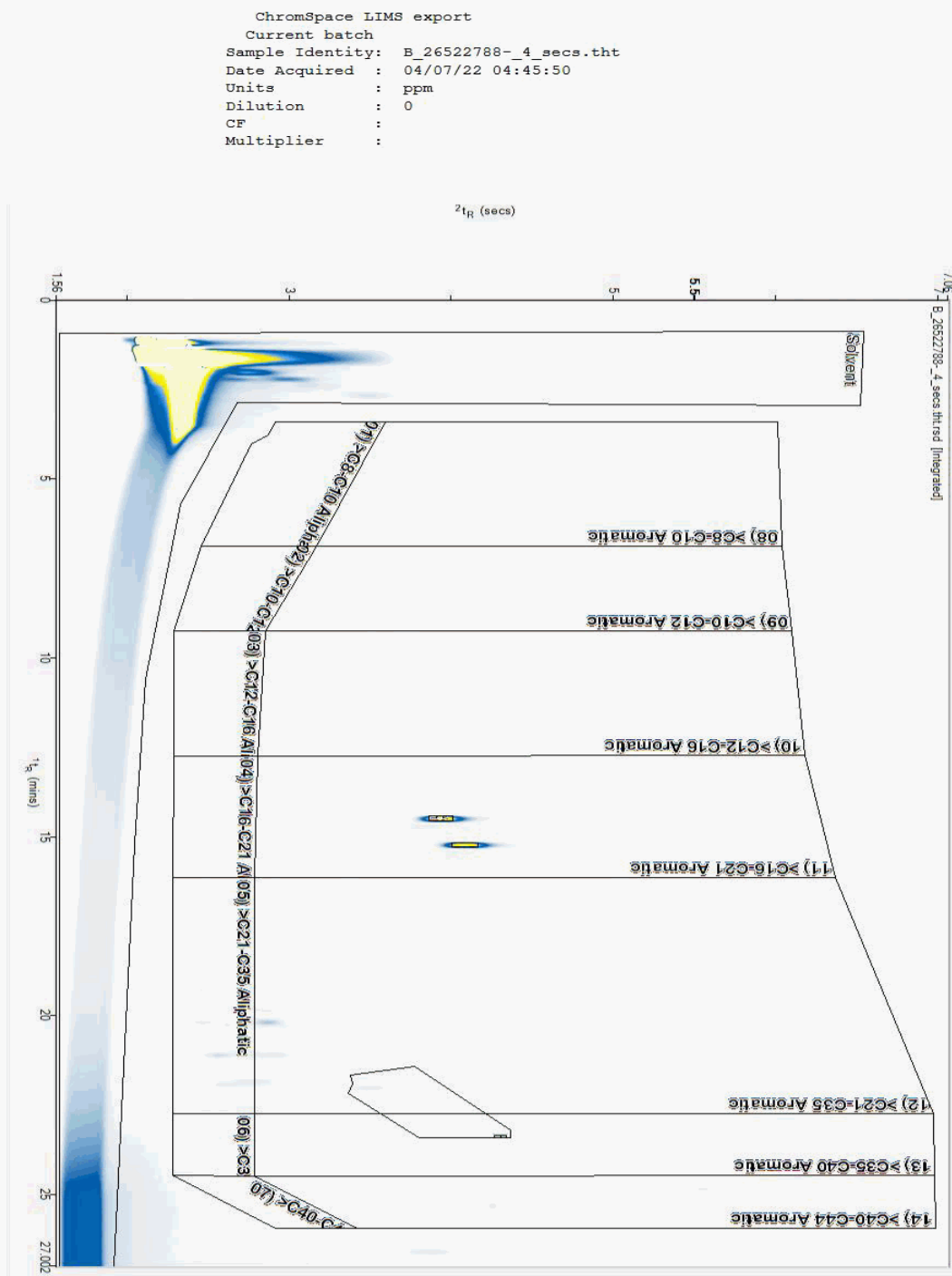
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26522788
Sample ID : TP104

Depth : 1.00 - 1.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
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Report Number: 654847
Location: Hill Top Farm

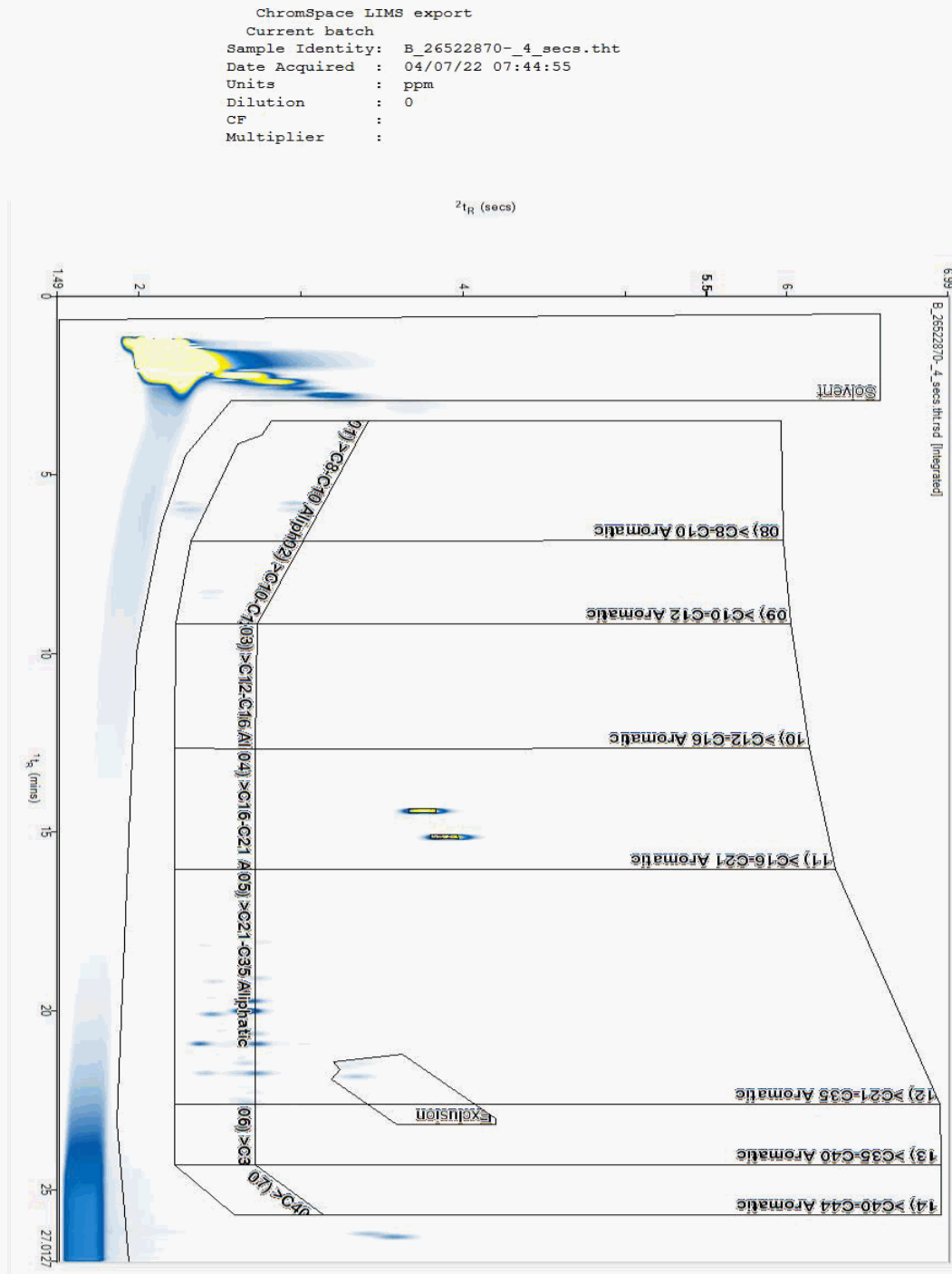
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26522870
Sample ID : TP108

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

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SDG: 220625-35
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Report Number: 654847
Location: Hill Top Farm

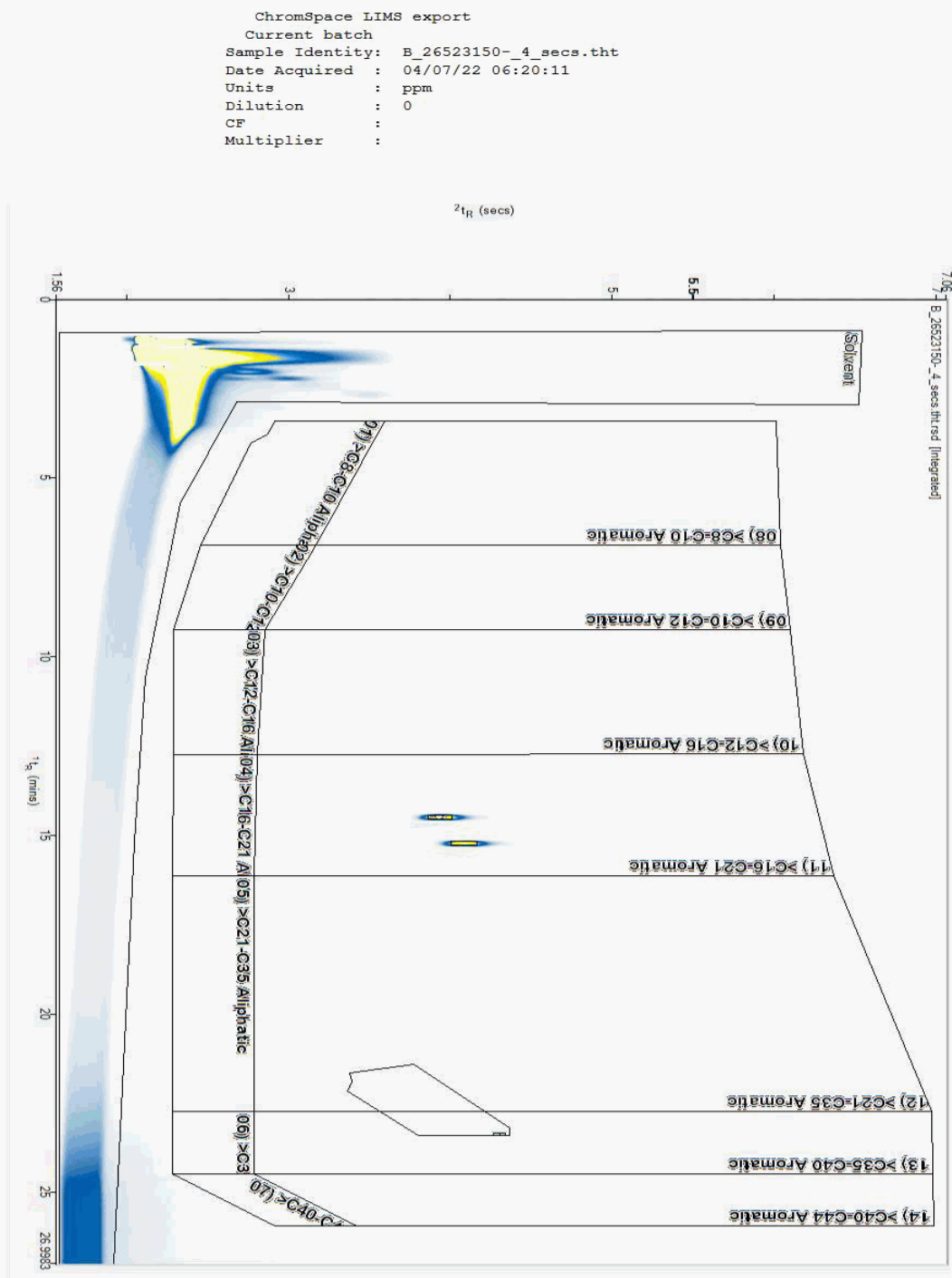
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26523150
Sample ID : TP112

Depth : 1.50 - 1.50





CERTIFICATE OF ANALYSIS

Validated

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Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

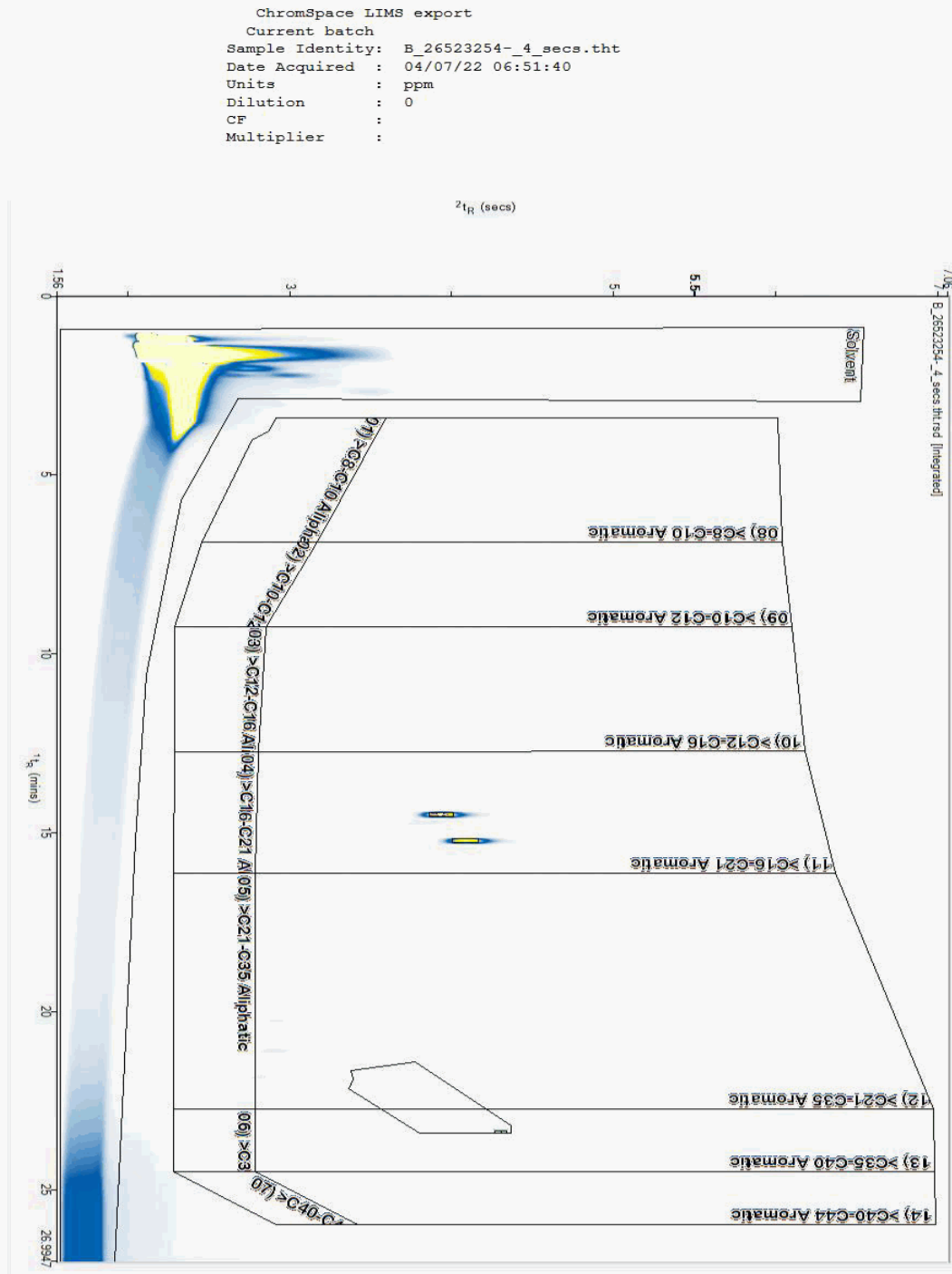
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26523254
Sample ID : TP112

Depth : 0.50 - 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

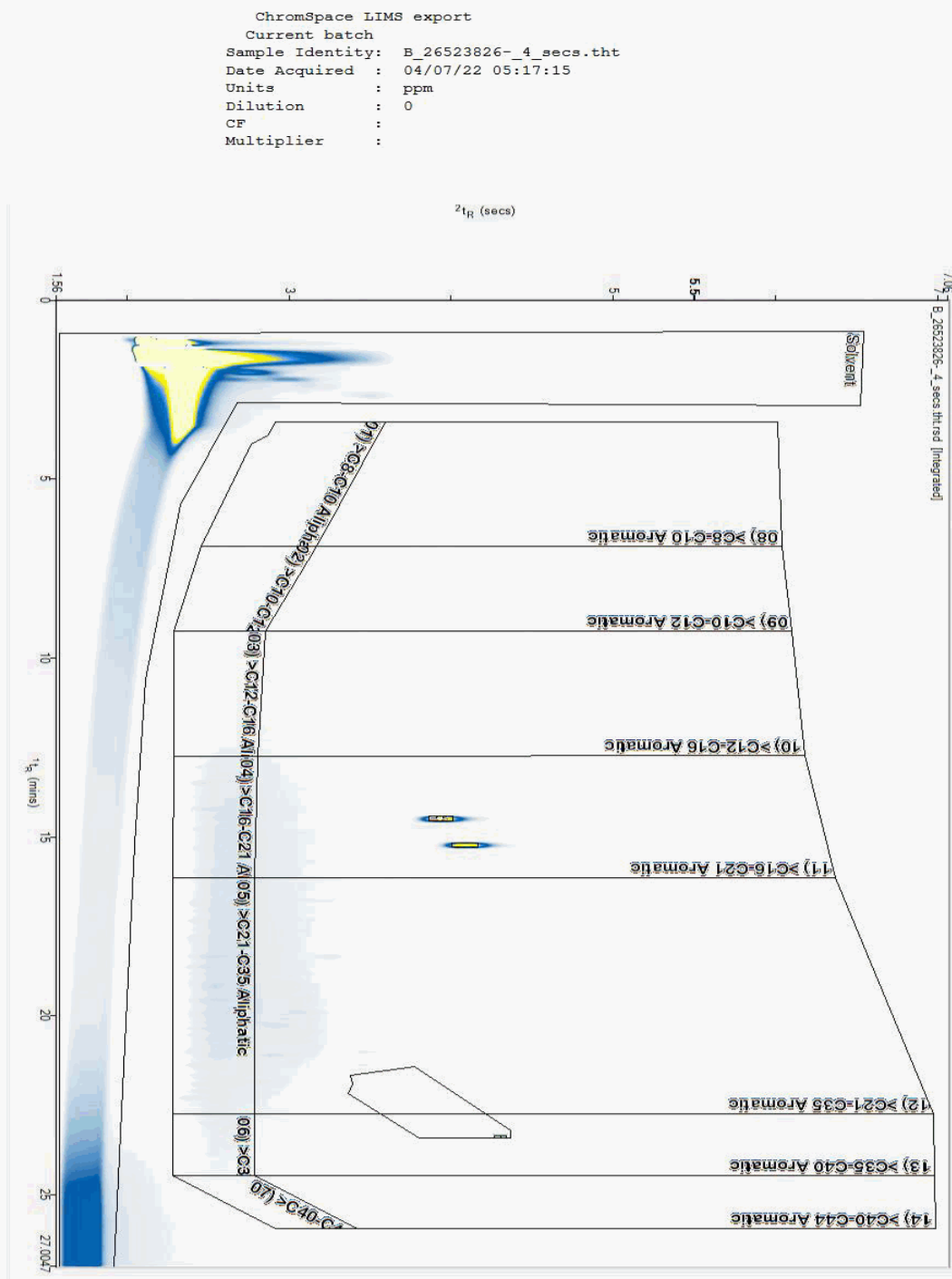
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26523826
Sample ID : TP111

Depth : 1.00 - 1.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

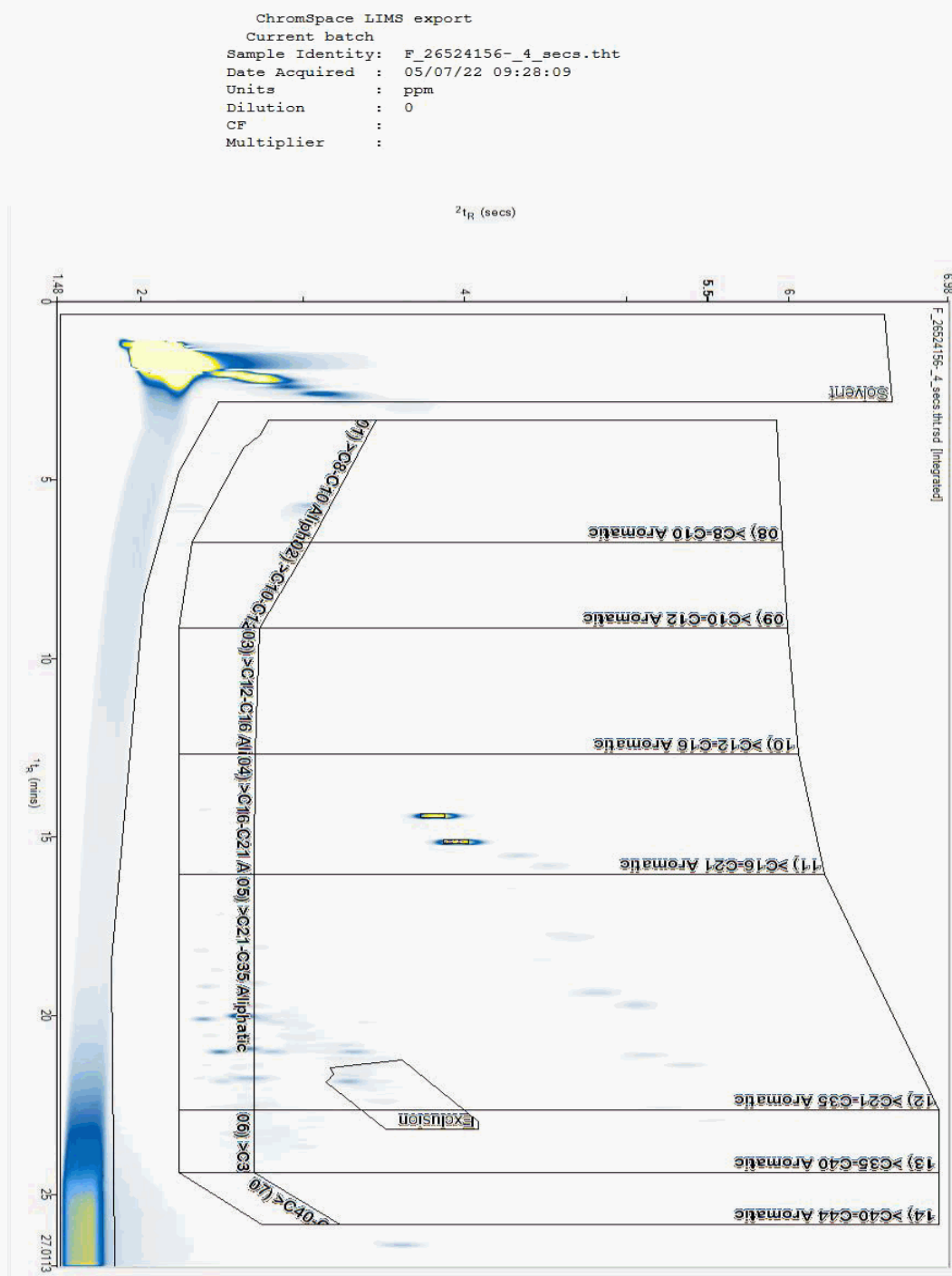
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26524156
Sample ID : TP106

Depth : 0.40





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
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Report Number: 654847
Location: Hill Top Farm

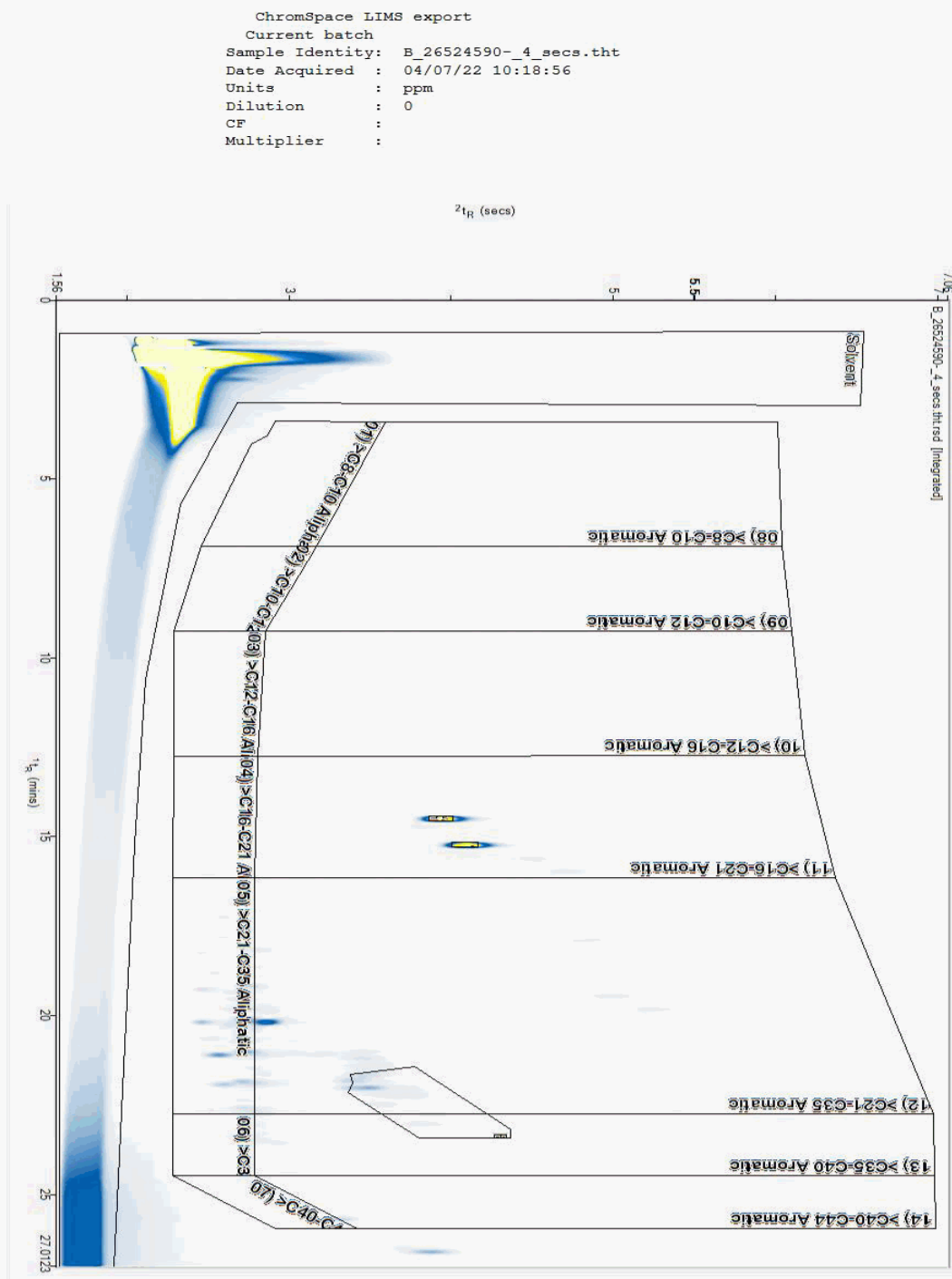
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26524590
Sample ID : TP107

Depth : 1.20 - 1.20





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

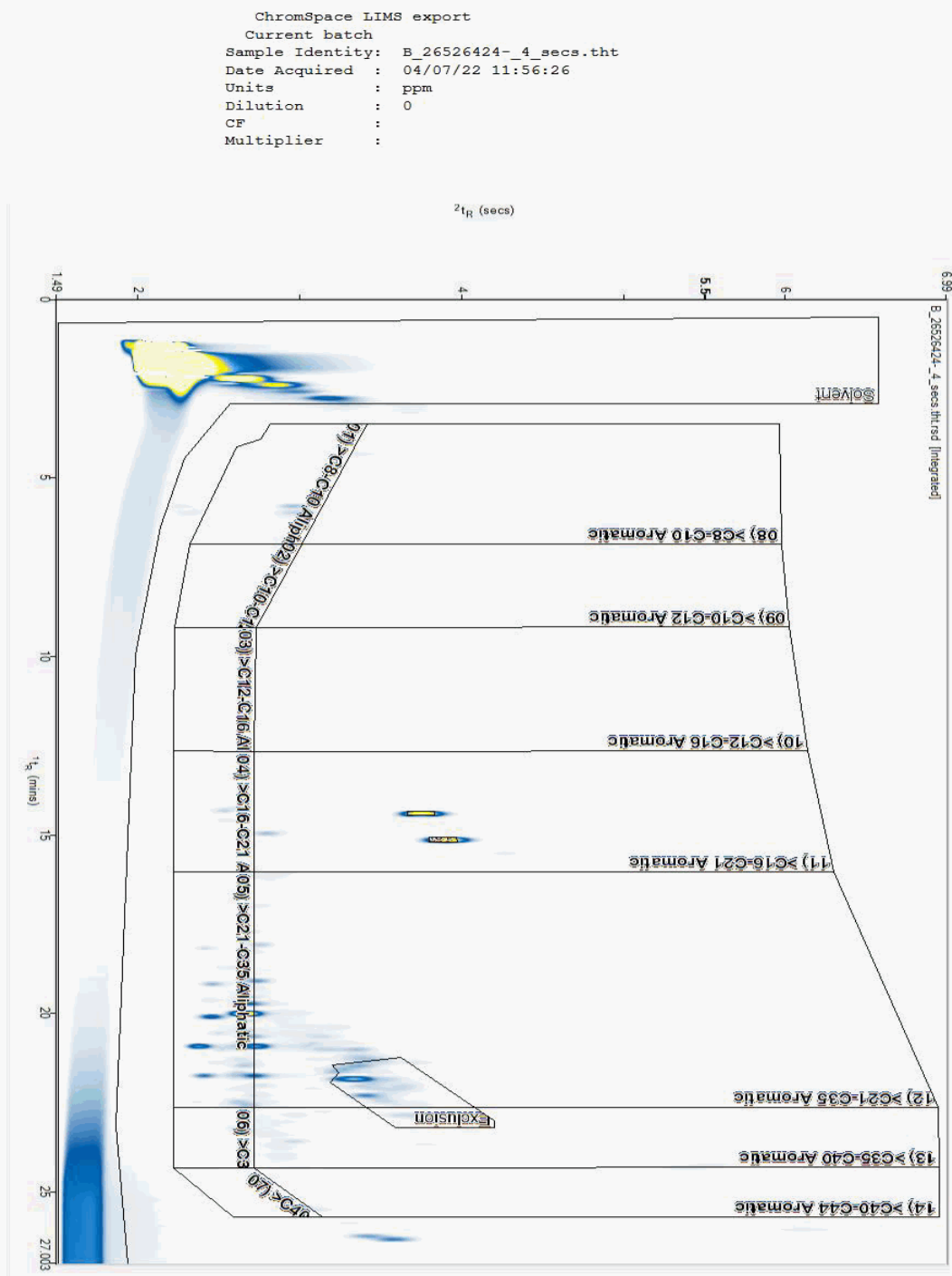
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26526424
Sample ID : TP110

Depth : 0.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

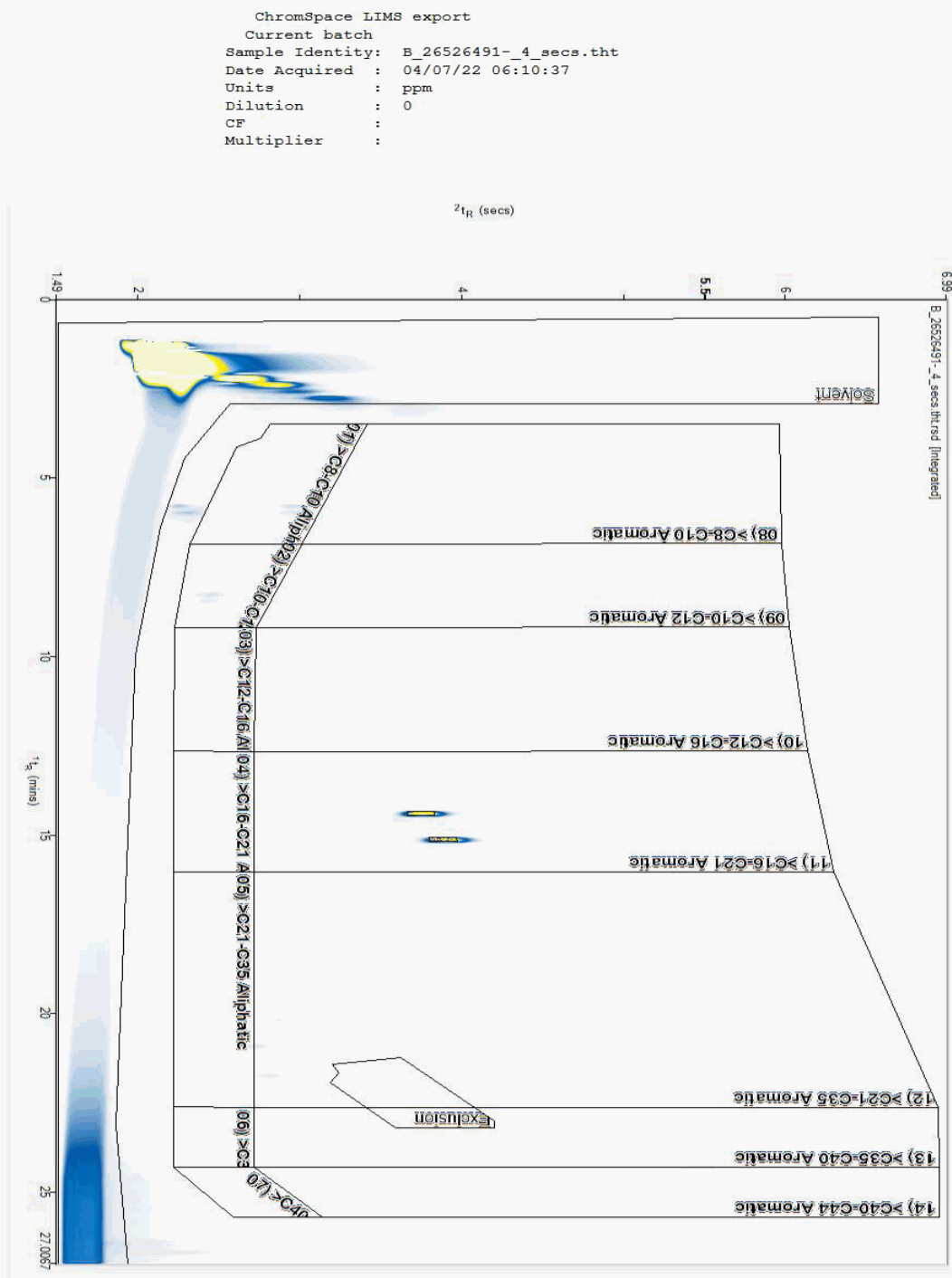
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26526491
Sample ID : TP106

Depth : 4.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

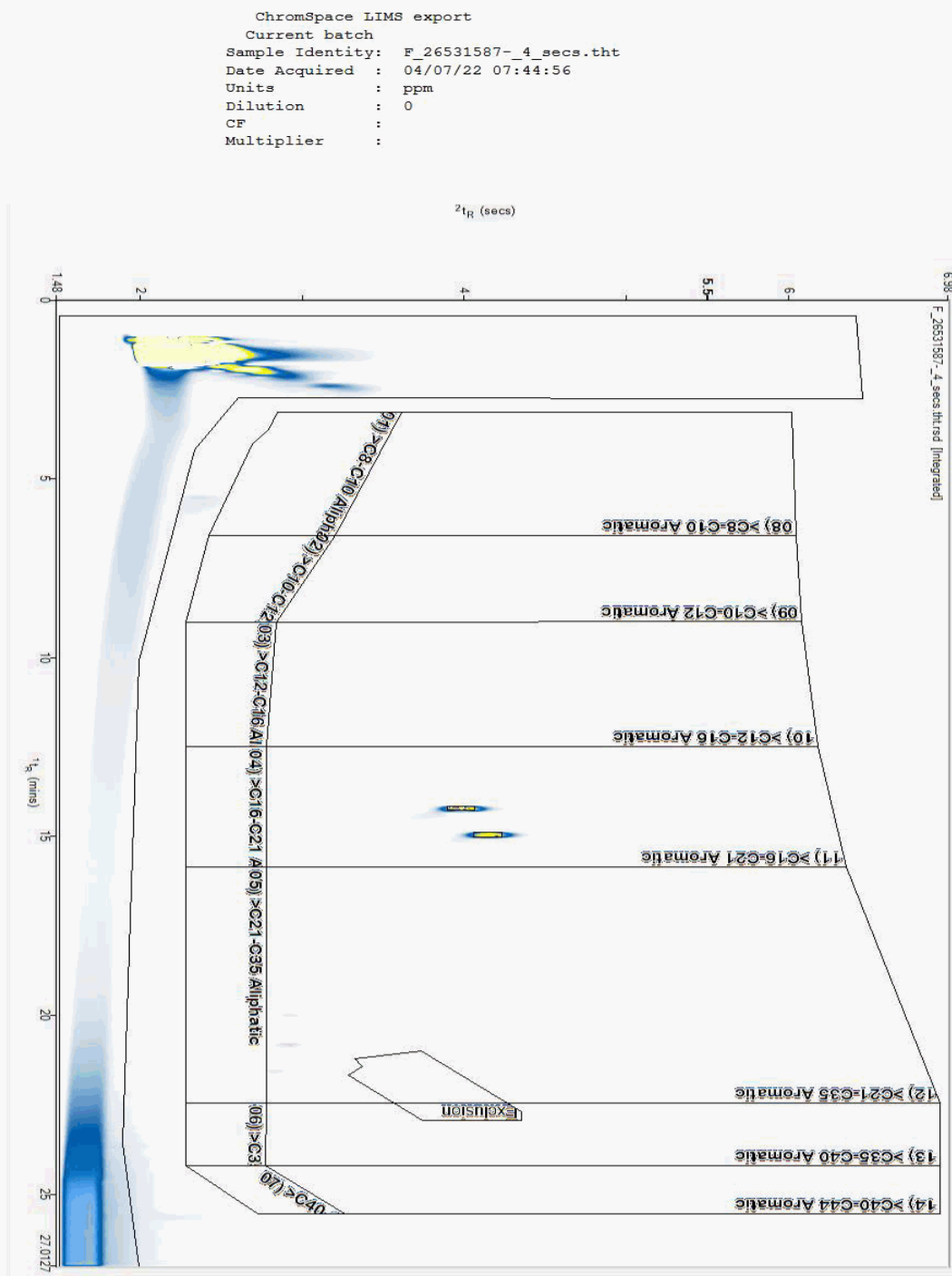
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26531587
Sample ID : TP110

Depth : 3.60





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

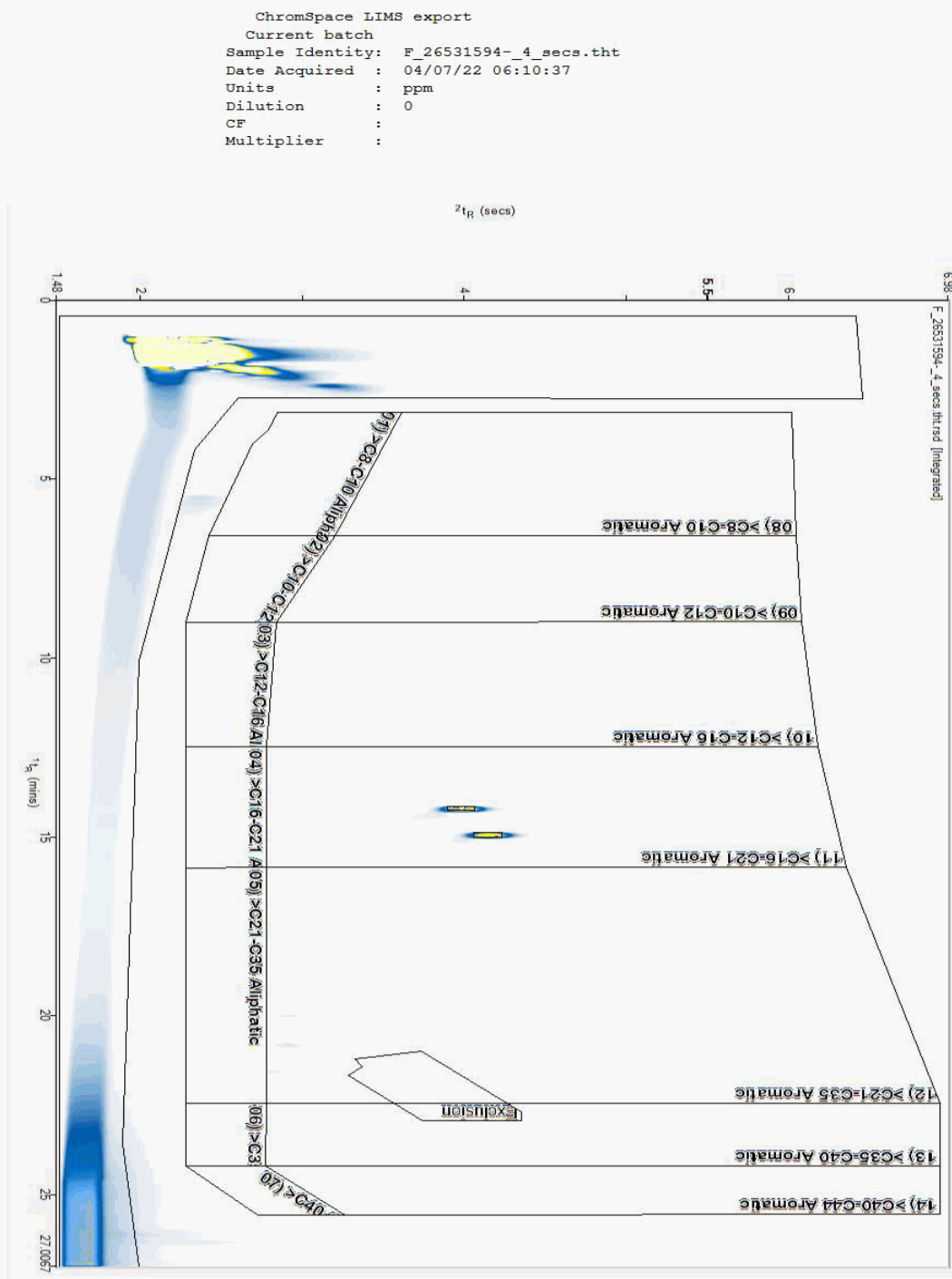
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26531594
Sample ID : TP106

Depth : 4.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

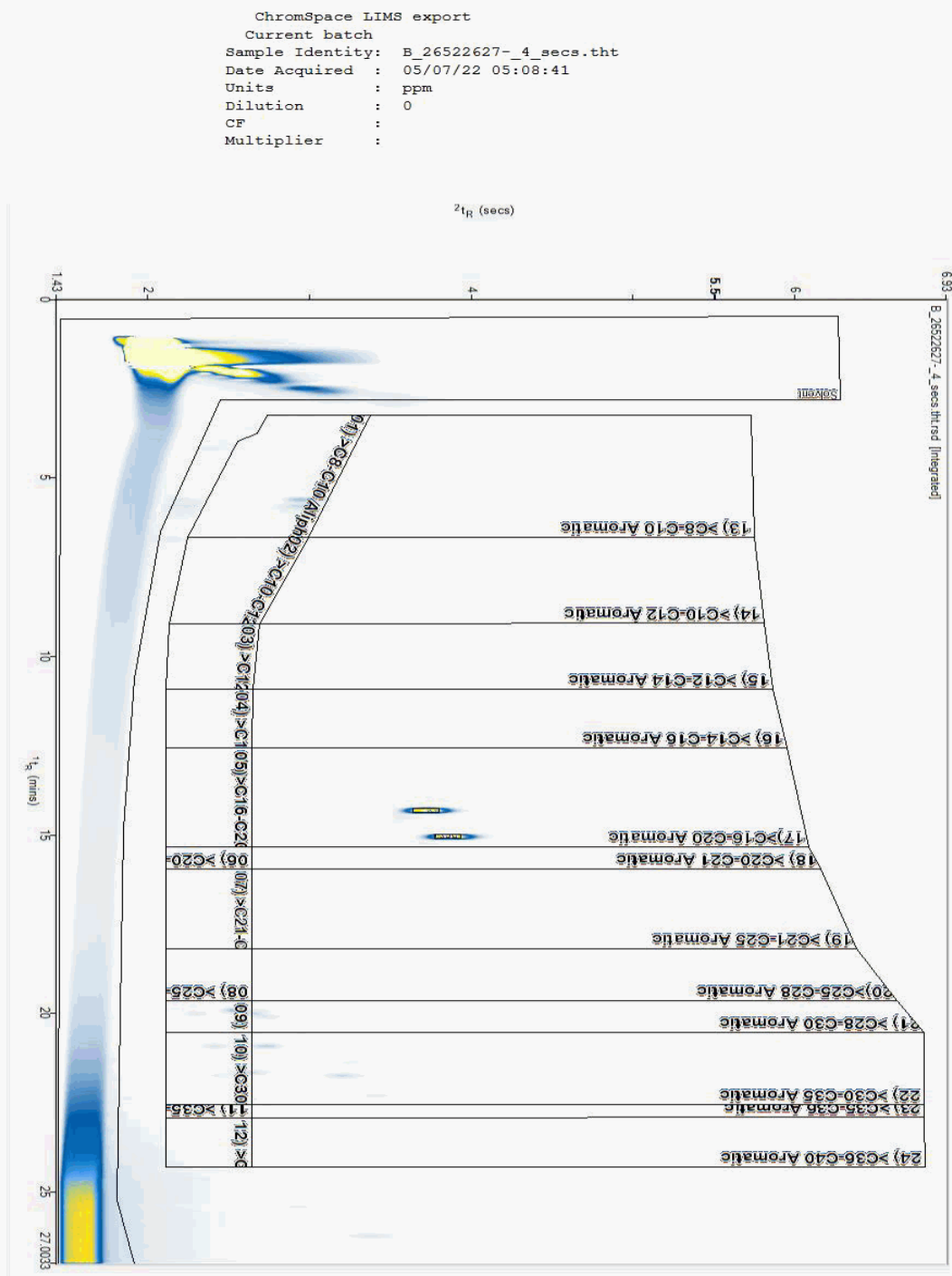
Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 26522627
Sample ID : BH106

Depth : 0.80 - 0.90





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

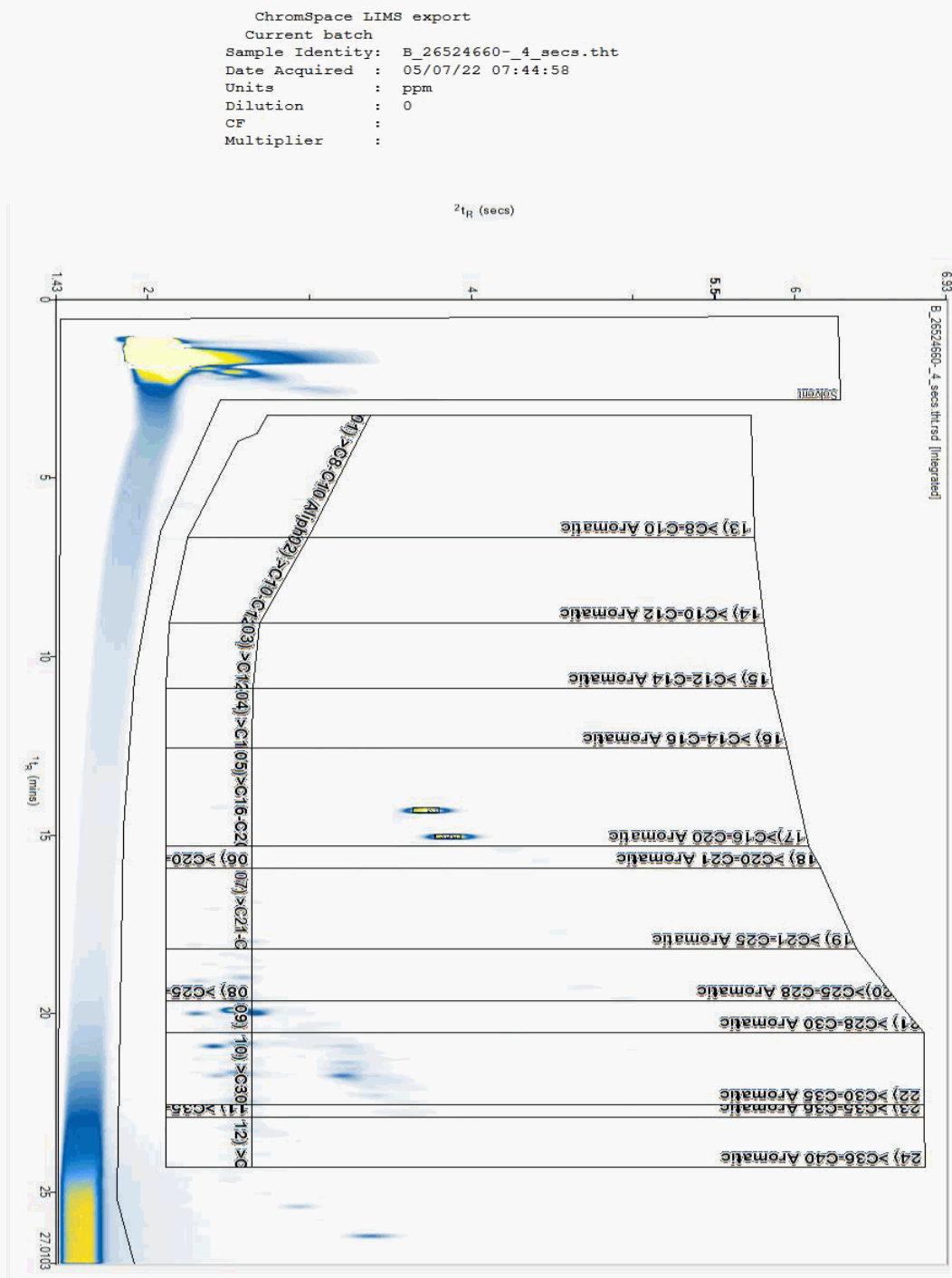
Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 26524660
Sample ID : TP107

Depth : 1.20 - 1.20





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

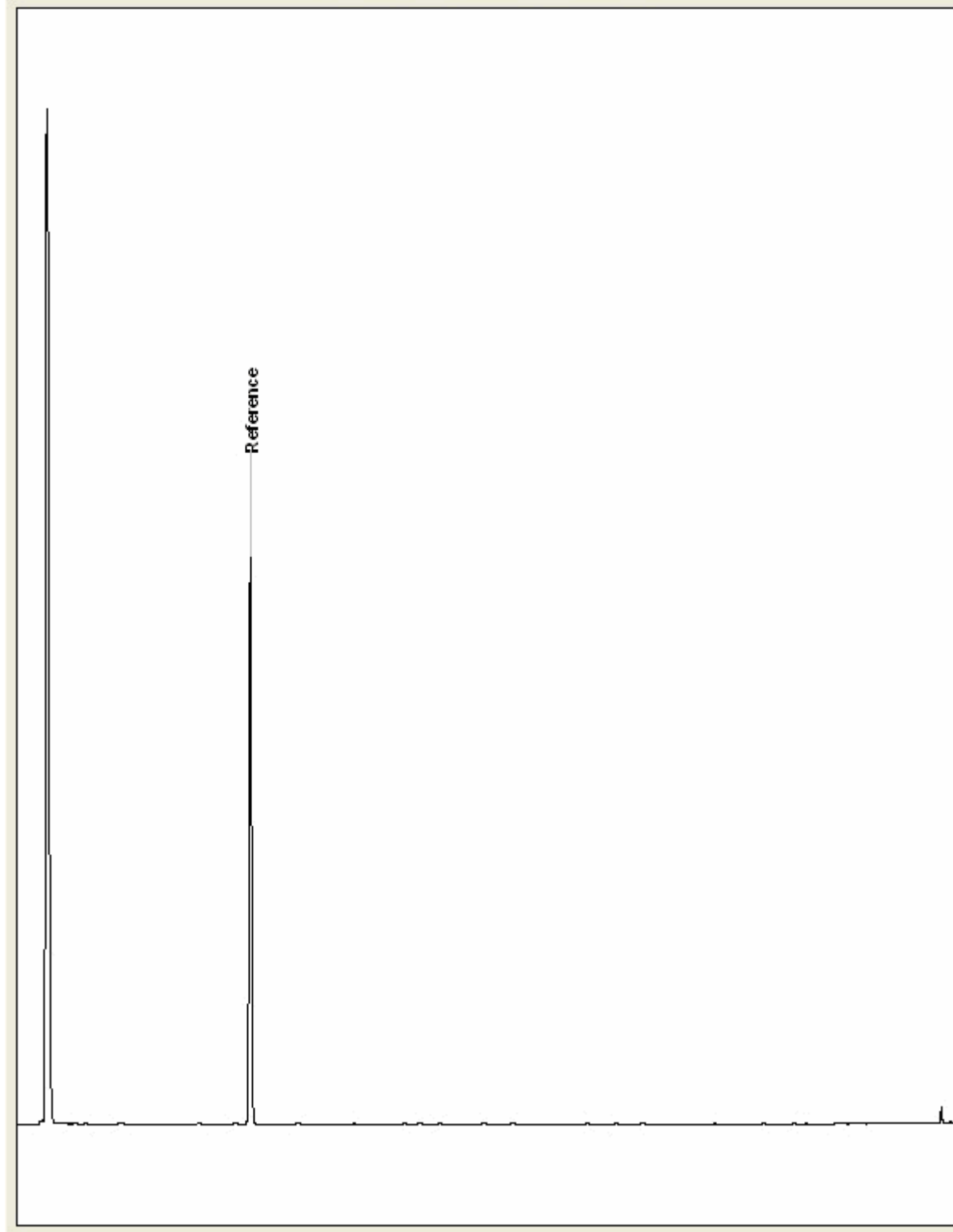
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26559005
Sample ID : TP110

Depth : 0.30

26559005_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

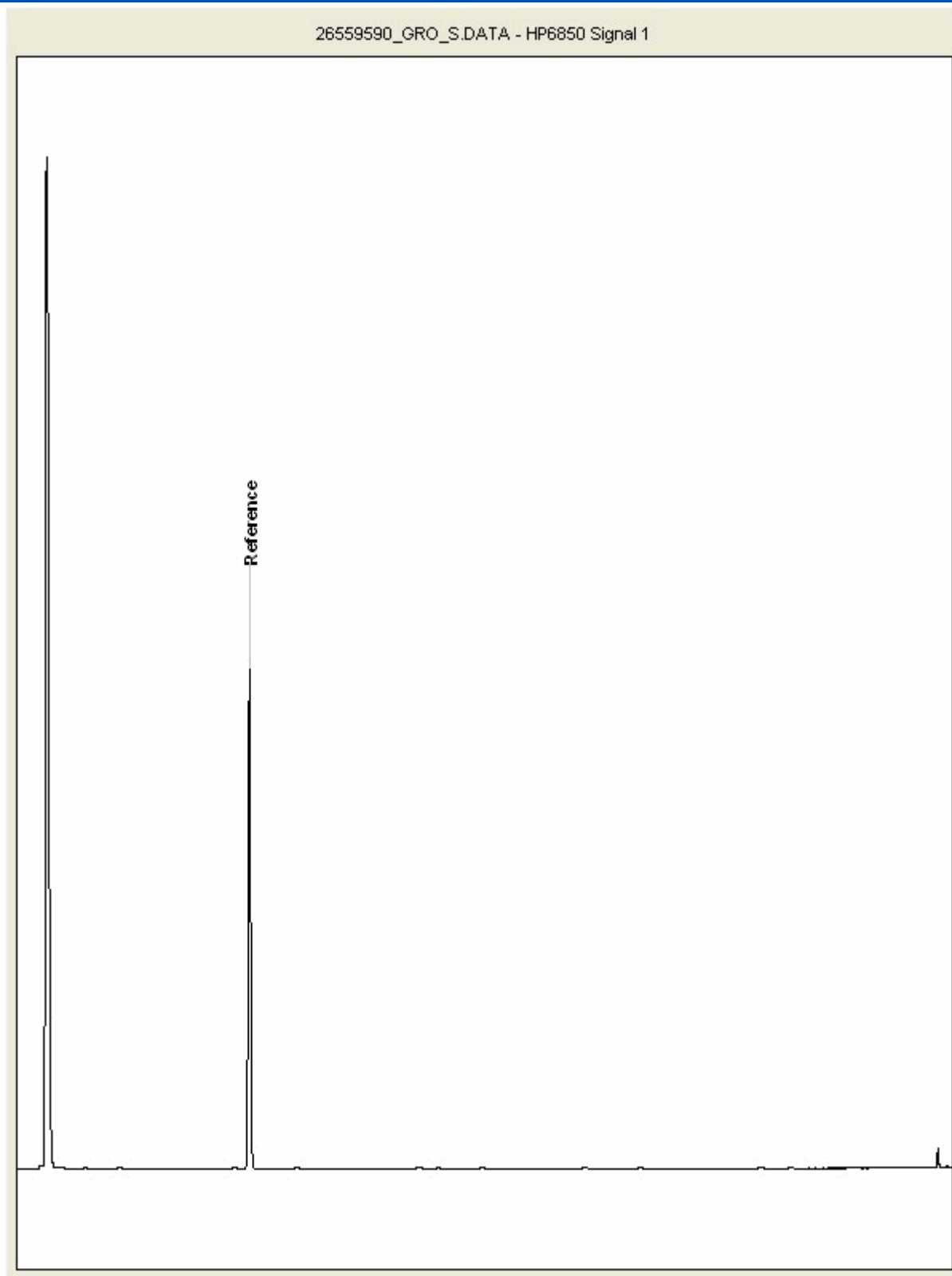
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26559590
Sample ID : TP108

Depth : 0.30 - 0.30

26559590_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

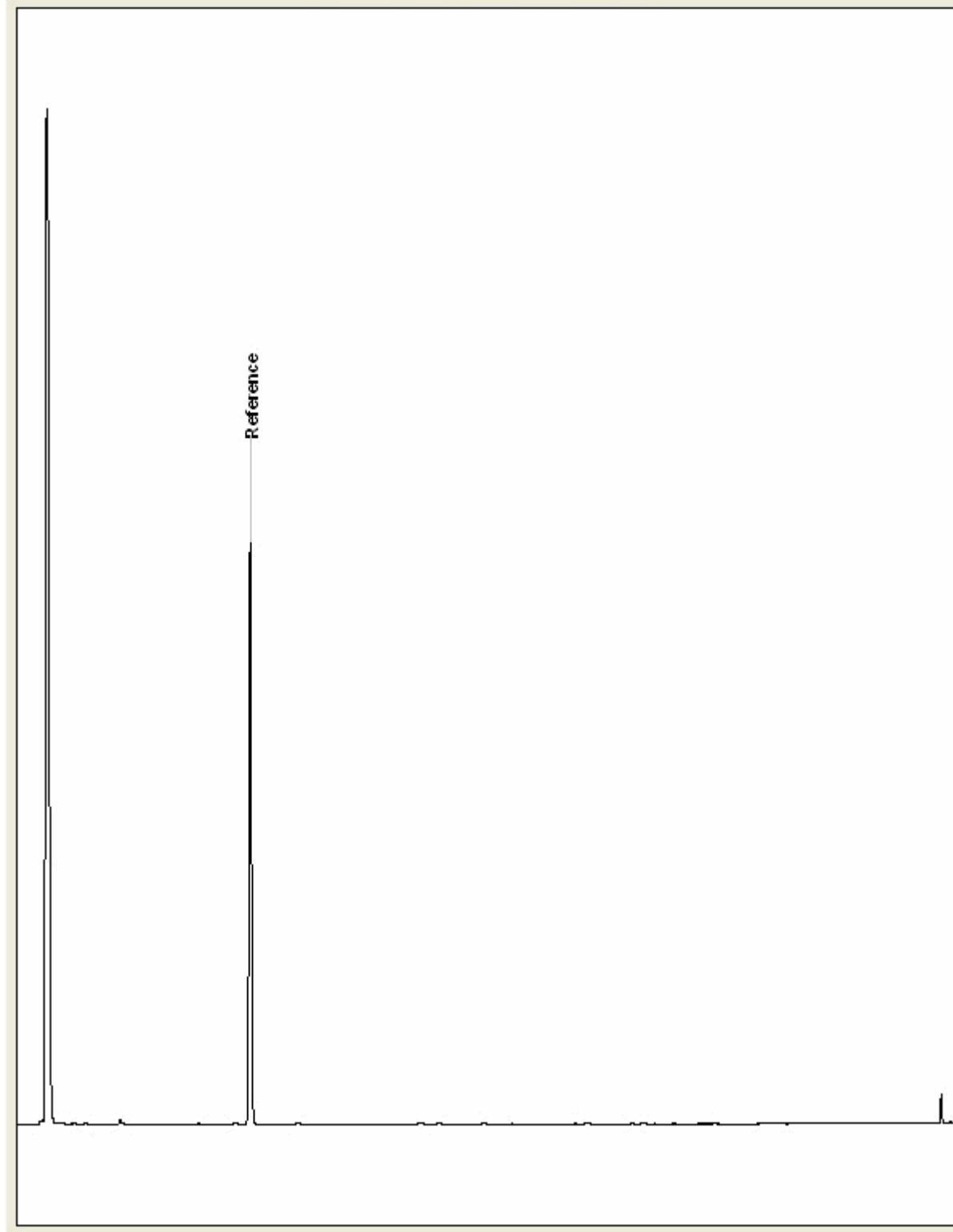
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26559668
Sample ID : BH106

Depth : 0.80 - 0.90

26559668_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

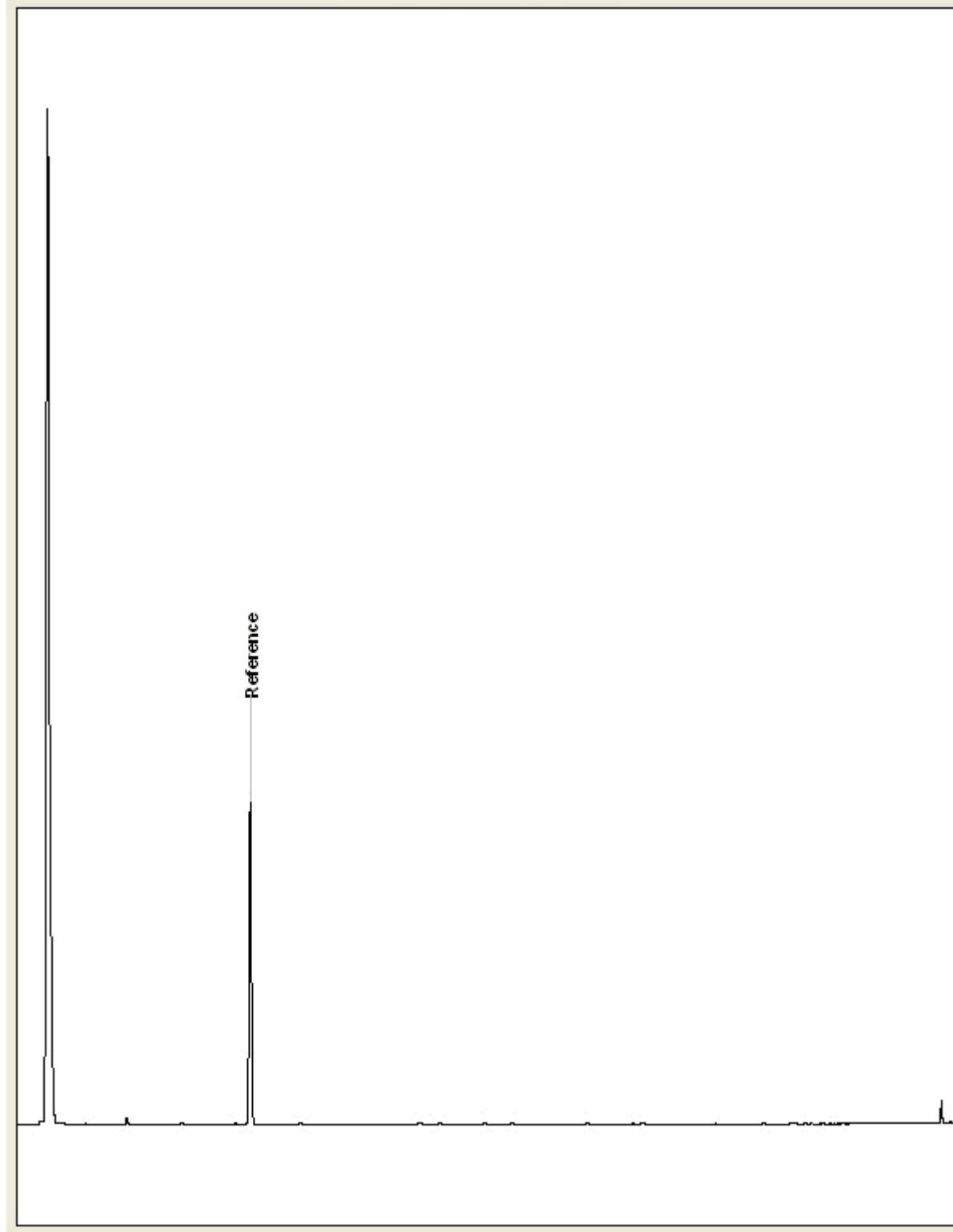
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26559691
Sample ID : TP107

Depth : 1.20 - 1.20

26559691_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

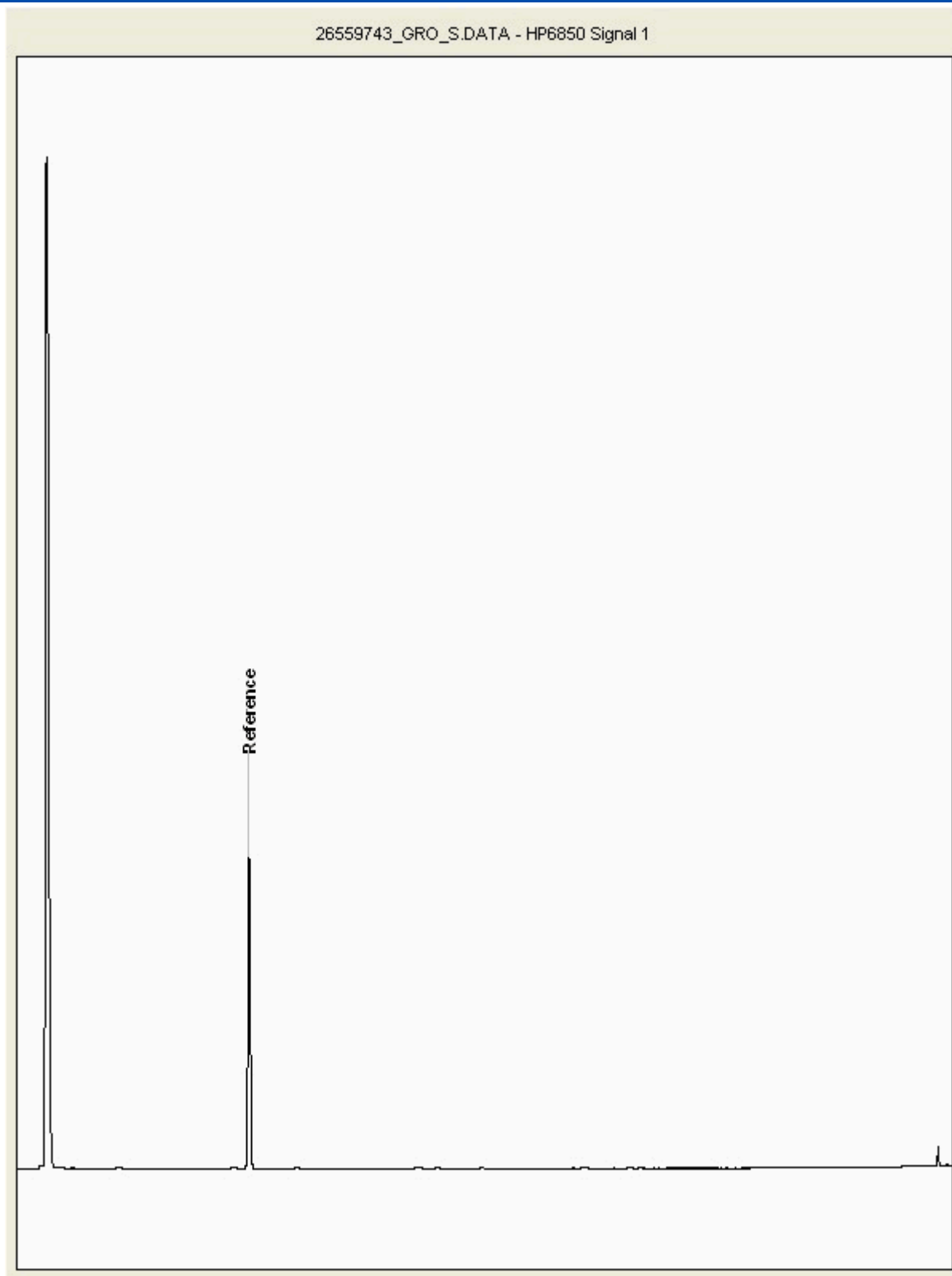
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26559743
Sample ID : TP111

Depth : 1.00 - 1.00

26559743_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

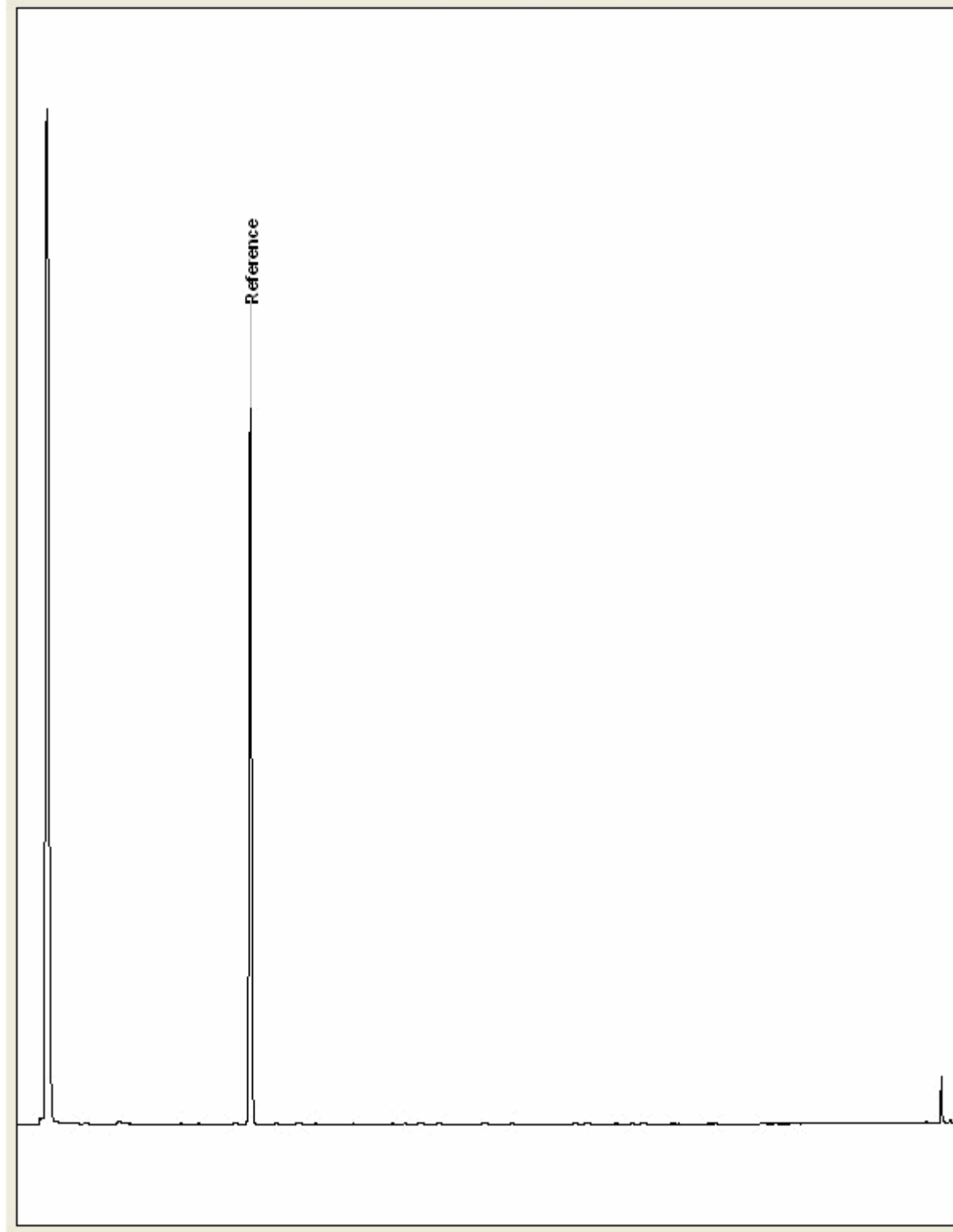
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560277
Sample ID : TP106

Depth : 0.40

26560277_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

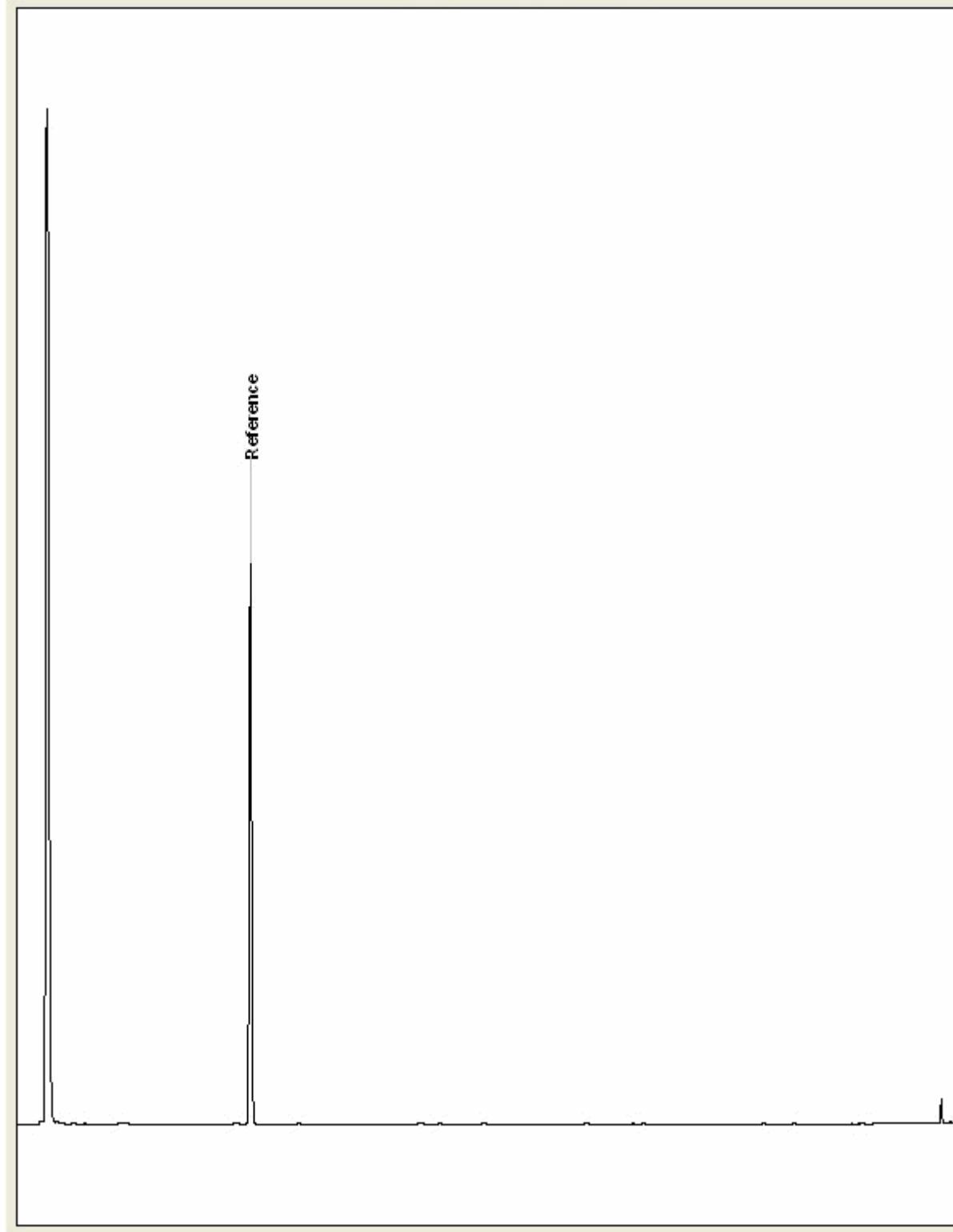
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560327
Sample ID : TP106

Depth : 4.00

26560327_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

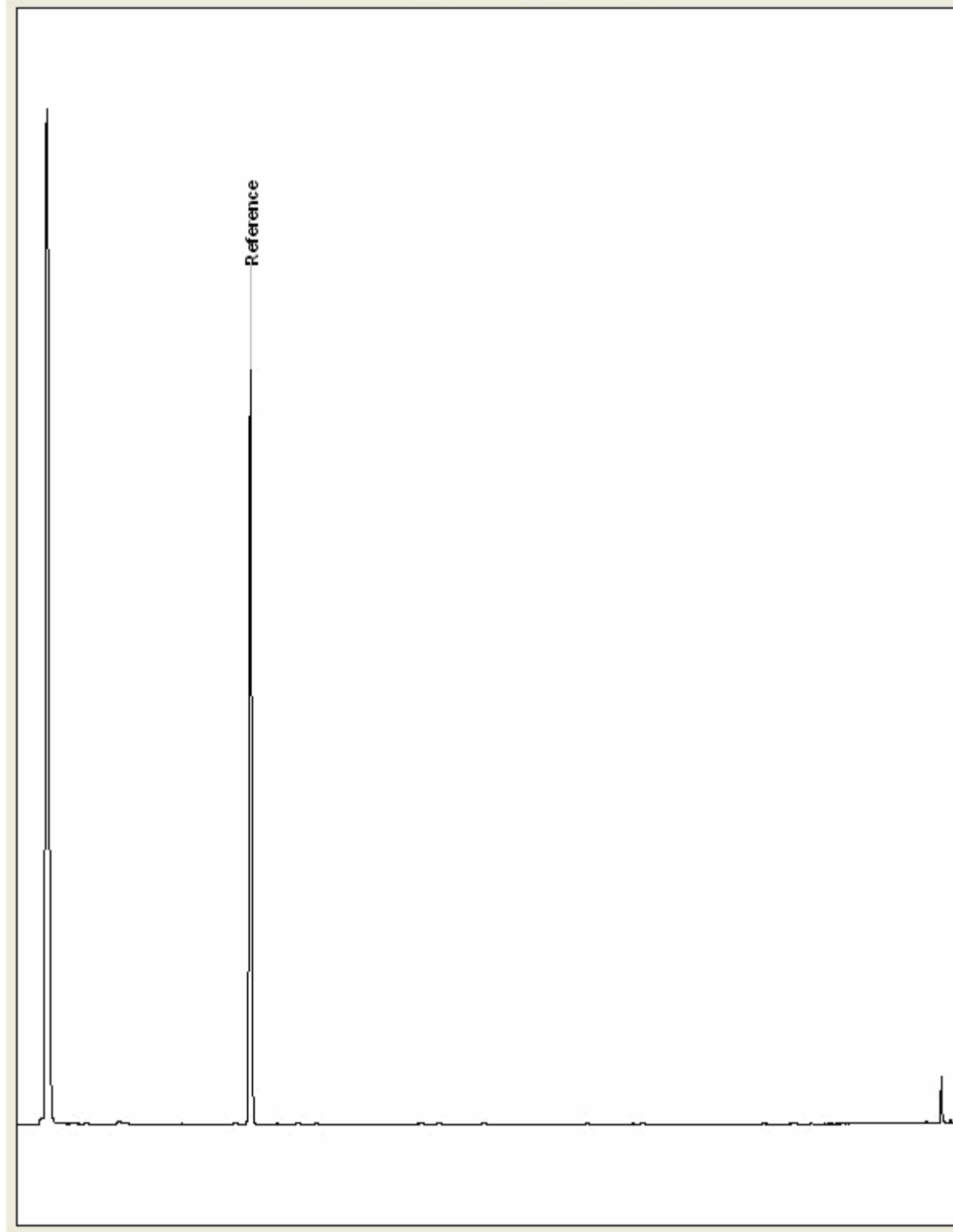
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560736
Sample ID : TP112

Depth : 0.50 - 0.50

26560736_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

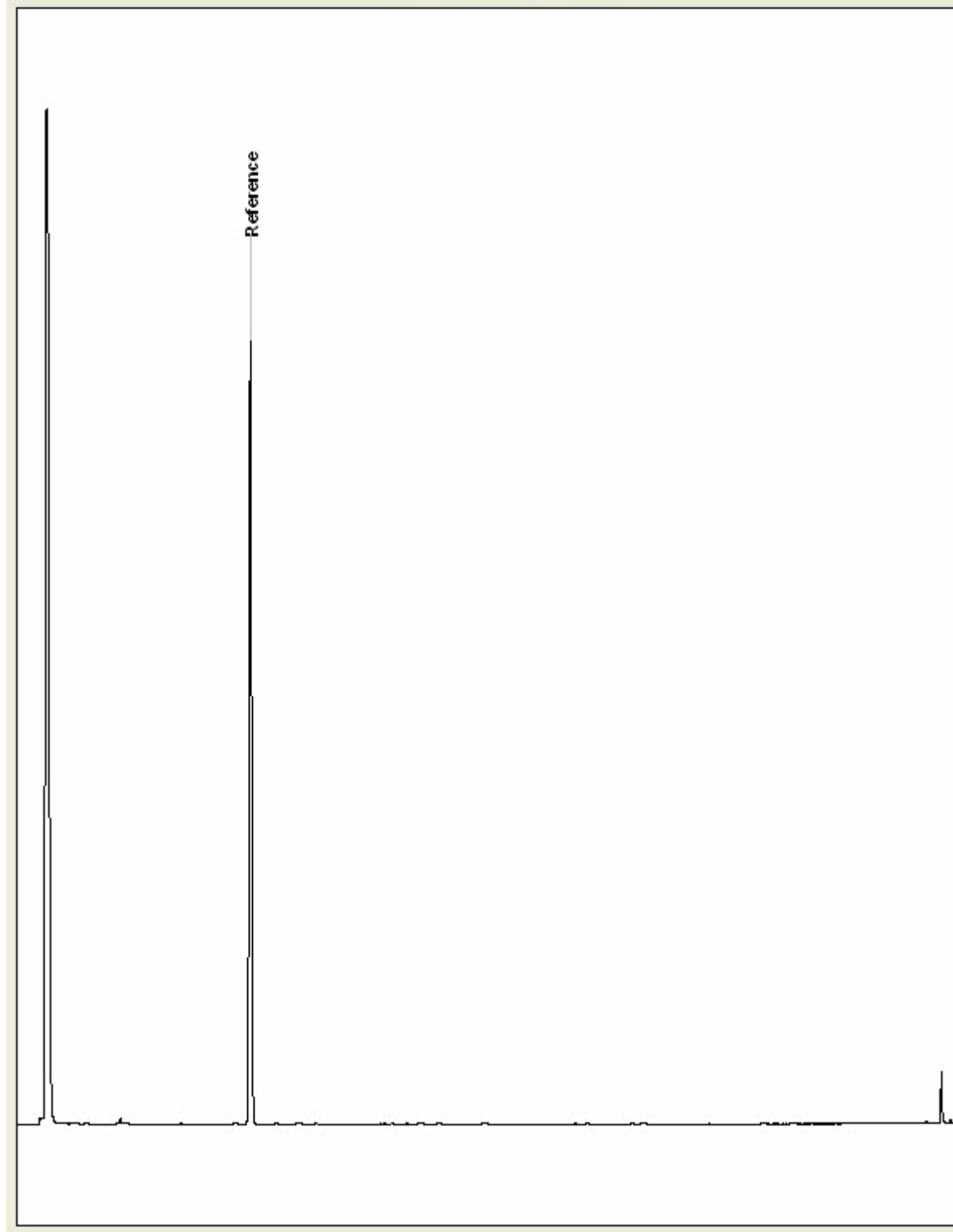
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560748
Sample ID : TP112

Depth : 1.50 - 1.50

26560748_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

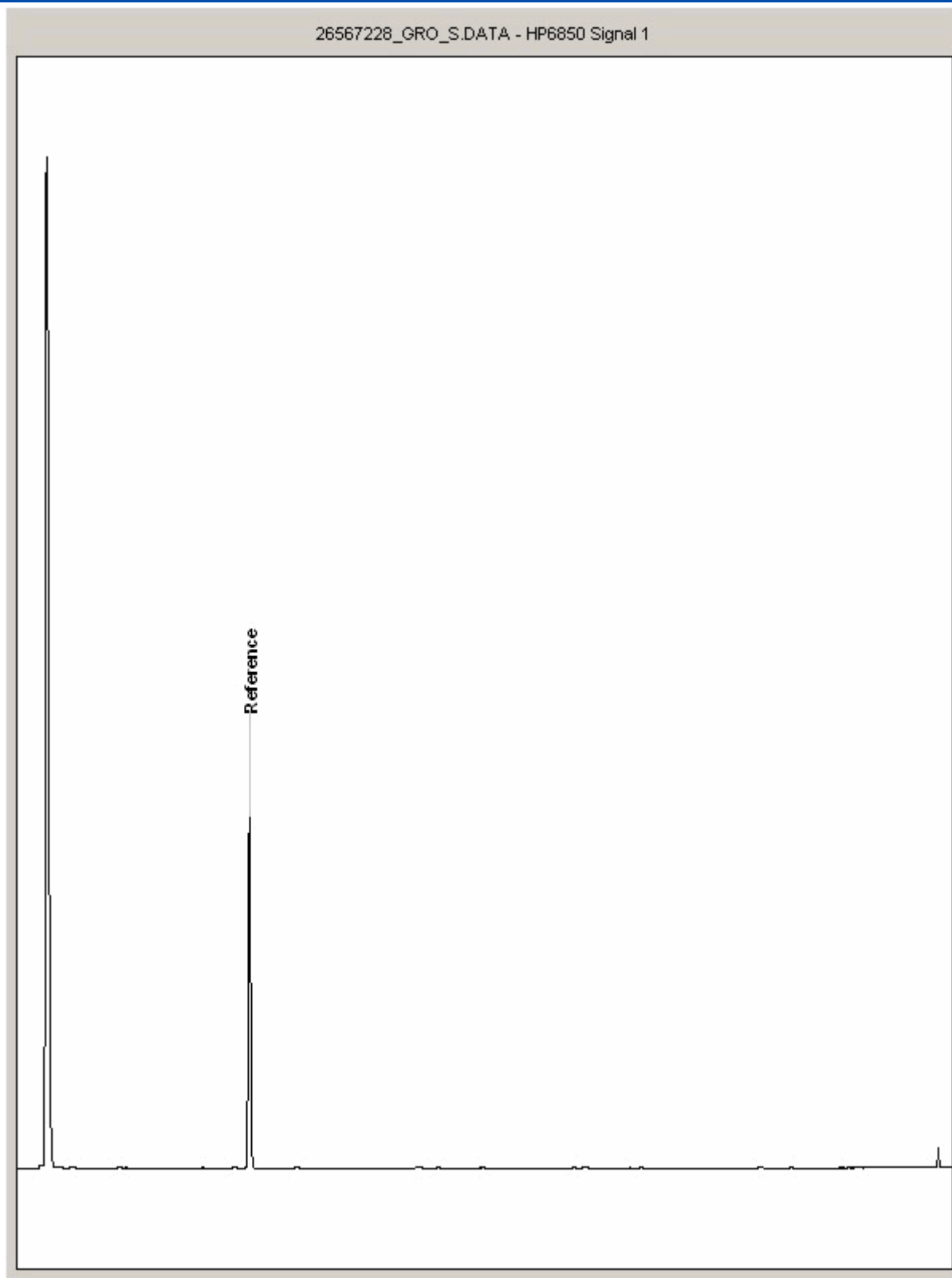
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26567228
Sample ID : TP104

Depth : 1.00 - 1.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-35
Client Ref.: 10056074

Report Number: 654847
Location: Hill Top Farm

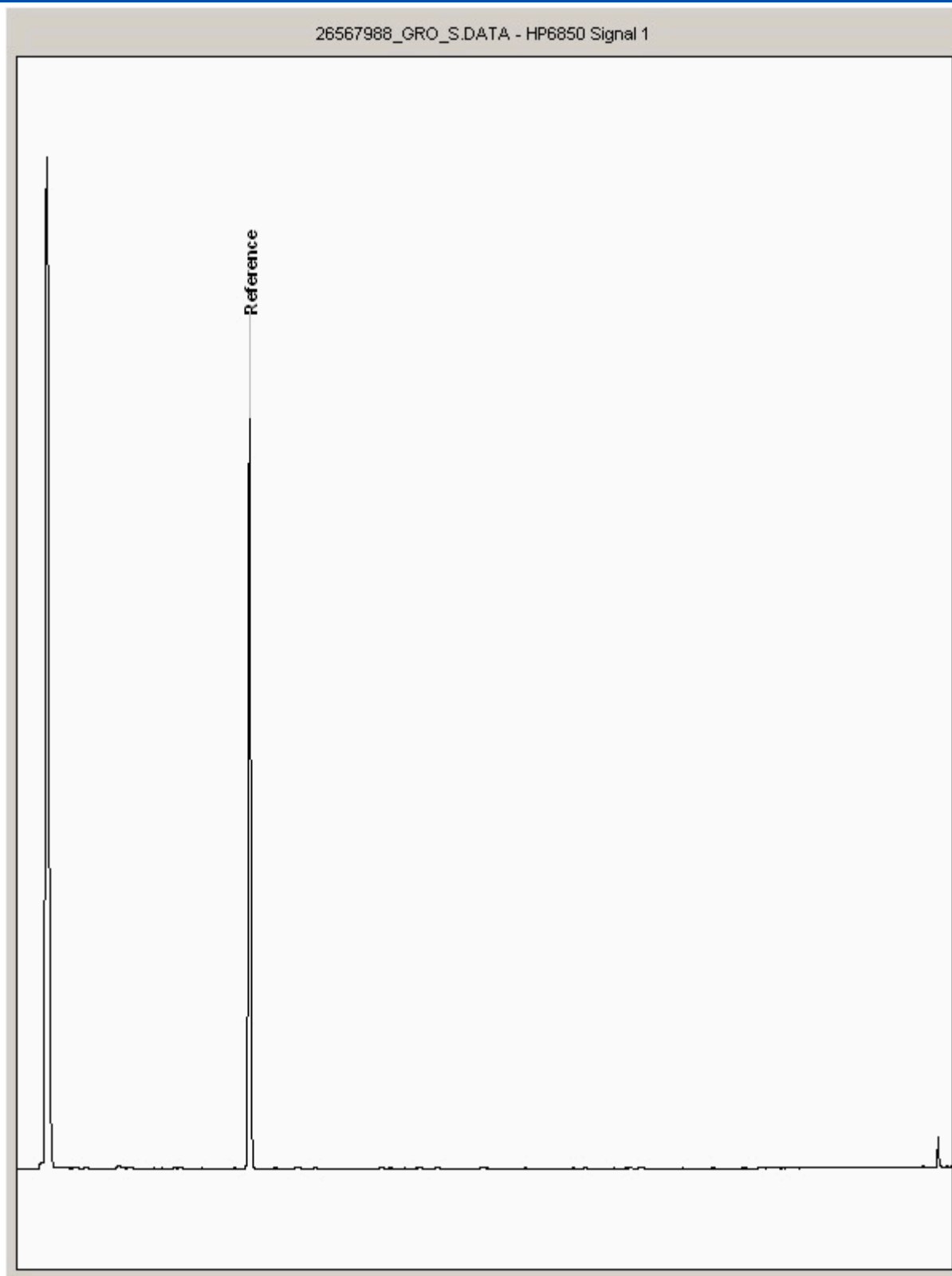
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26567988
Sample ID : TP110

Depth : 3.60





CERTIFICATE OF ANALYSIS

SDG: 220625-35
Client Ref: 10056074

Report Number: 654847
Location: Hill Top Farm

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Units 7-8 Hawarden Business Park
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Deeside
CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

ARCADIS UK Ltd
Suite 1A
4 Piccadilly Place
Manchester
M1 3BN

Attention: Dale Fisher

CERTIFICATE OF ANALYSIS

Date of report Generation:	11 July 2022
Customer:	ARCADIS UK Ltd
Sample Delivery Group (SDG):	220625-77
Your Reference:	10056074
Location:	Hill Top Farm
Report No:	653827
Order Number:	10056074

We received 3 samples on Saturday June 25, 2022 and 2 of these samples were scheduled for analysis which was completed on Monday July 11, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26491254	BH102	ES1	0.50	23/06/2022
26491255	BH102	ES2	0.90 - 1.00	23/06/2022
26491257	BH102	ES3	2.50	24/06/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

26491254

26491257

Customer
Sample Reference

BH102

BH102

AGS Reference

ES1

ES3

Depth (m)

0.50

2.50

Container

250g Amber Jar
(ALE210)
60g VOC
(ALE215)
1kg TUB with
Handle (ALE280)
250g Amber Jar
(ALE215)
60g VOC
(ALE215)

Sample Type

S S S S S

Semi Volatile Organic Compounds

All

NDPs: 0
Tests: 1

X

TPH CWG GC (S)

All

NDPs: 0
Tests: 2

X

X

VOC MS (S)

All

NDPs: 0
Tests: 2

X

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26491254	BH102	0.50	Light Brown	Sandy Loam	Stones	Vegetation
26491257	BH102	2.50	Light Brown	Sandy Clay	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

[illegible]

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

PAH by GCMS

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	BH102				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.50 Soil/Solid (S) 24/06/2022 25/06/2022 220625-77 26491257 ES3				
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-4	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Phenol	<0.1 mg/kg	TM157	<0.1				
Pentachlorophenol	<0.1 mg/kg	TM157	<0.1				
n-Nitroso-n-dipropylamine	<0.1 mg/kg	TM157	<0.1				
Nitrobenzene	<0.1 mg/kg	TM157	<0.1				
Isophorone	<0.1 mg/kg	TM157	<0.1				
Hexachloroethane	<0.1 mg/kg	TM157	<0.1				
Hexachlorocyclopentadiene	<0.1 mg/kg	TM157	<0.1				
Hexachlorobutadiene	<0.1 mg/kg	TM157	<0.1				
Hexachlorobenzene	<0.1 mg/kg	TM157	<0.1				
n-Dioctyl phthalate	<0.1 mg/kg	TM157	<0.1				
Dimethyl phthalate	<0.1 mg/kg	TM157	<0.1				
Diethyl phthalate	<0.1 mg/kg	TM157	<0.1				
n-Dibutyl phthalate	<0.1 mg/kg	TM157	<0.1				
Dibenzofuran	<0.1 mg/kg	TM157	<0.1				
Carbazole	<0.1 mg/kg	TM157	<0.1				
Butylbenzyl phthalate	<0.1 mg/kg	TM157	<0.1				
bis(2-Ethylhexyl) phthalate	<0.1 mg/kg	TM157	<0.1				
bis(2-Chloroethoxy)methane	<0.1 mg/kg	TM157	<0.1				
bis(2-Chloroethyl)ether	<0.1 mg/kg	TM157	<0.1				
Azobenzene	<0.1 mg/kg	TM157	<0.1				
4-Nitrophenol	<0.1 mg/kg	TM157	<0.1				
4-Nitroaniline	<0.1 mg/kg	TM157	<0.1				
4-Methylphenol	<0.1 mg/kg	TM157	<0.1				
4-Chlorophenylphenylether	<0.1 mg/kg	TM157	<0.1				
4-Chloroaniline	<0.1 mg/kg	TM157	<0.1				
4-Chloro-3-methylphenol	<0.1 mg/kg	TM157	<0.1				
4-Bromophenylphenylether	<0.1 mg/kg	TM157	<0.1				
3-Nitroaniline	<0.1 mg/kg	TM157	<0.1				
2-Nitrophenol	<0.1 mg/kg	TM157	<0.1				
2-Nitroaniline	<0.1 mg/kg	TM157	<0.1				
2-Methylphenol	<0.1 mg/kg	TM157	<0.1				
1,2,4-Trichlorobenzene	<0.1 mg/kg	TM157	<0.1				



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Semi Volatile Organic Compounds

Results Legend		Customer Sample Ref.	BH102				
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.50				
M	mCERTS accredited.		Soil/Solid (S)				
aq	Aqueous / settled sample.		24/06/2022				
dis.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.		25/06/2022				
+	Subcontracted - refer to subcontractor report for accreditation status.		220625-77				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		26491257				
(F)	Trigger breach confirmed		ES3				
1-4-5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
2-Chlorophenol	<0.1 mg/kg	TM157	<0.1				
2,6-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1				
2,4-Dinitrotoluene	<0.1 mg/kg	TM157	<0.1				
2,4-Dimethylphenol	<0.1 mg/kg	TM157	<0.1				
2,4-Dichlorophenol	<0.1 mg/kg	TM157	<0.1				
2,4,6-Trichlorophenol	<0.1 mg/kg	TM157	<0.1				
2,4,5-Trichlorophenol	<0.1 mg/kg	TM157	<0.1				
1,4-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1				
1,3-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1				
1,2-Dichlorobenzene	<0.1 mg/kg	TM157	<0.1				
2-Chloronaphthalene	<0.1 mg/kg	TM157	<0.1				
2-Methylnaphthalene	<0.1 mg/kg	TM157	<0.1				
Acenaphthylene	<0.1 mg/kg	TM157	<0.1				
Acenaphthene	<0.1 mg/kg	TM157	<0.1				
Anthracene	<0.1 mg/kg	TM157	<0.1				
Benzo(a)anthracene	<0.1 mg/kg	TM157	<0.1				
Benzo(b)fluoranthene	<0.1 mg/kg	TM157	<0.1				
Benzo(k)fluoranthene	<0.1 mg/kg	TM157	<0.1				
Benzo(a)pyrene	<0.1 mg/kg	TM157	<0.1				
Benzo(g,h,i)perylene	<0.1 mg/kg	TM157	<0.1				
Chrysene	<0.1 mg/kg	TM157	<0.1				
Fluoranthene	<0.1 mg/kg	TM157	<0.1				
Fluorene	<0.1 mg/kg	TM157	<0.1				
Indeno(1,2,3-cd)pyrene	<0.1 mg/kg	TM157	<0.1				
Phenanthrene	<0.1 mg/kg	TM157	<0.1				
Pyrene	<0.1 mg/kg	TM157	<0.1				
Naphthalene	<0.1 mg/kg	TM157	<0.1				
Dibenzo(a,h)anthracene	<0.1 mg/kg	TM157	<0.1				
Bis(2-chloroisopropyl) ether	<0.1 mg/kg	TM157	<0.1				



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.	BH102	BH102			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.50	2.50			
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)			
aq	Aqueous / settled sample.		23/06/2022	24/06/2022			
diss.filt	Dissolved / filtered sample.		25/06/2022	25/06/2022			
tot.unfilt	Total / unfiltered sample.		220625-77	220625-77			
*	Subcontracted - refer to subcontractor report for accreditation status.		26491254	26491257			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		ES1	ES3			
(F)	Trigger breach confirmed						
1-4	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Dibromofluoromethane**	%	TM116	115	133			
			@	@			
Toluene-d8**	%	TM116	97.7	100			
			@	@			
4-Bromofluorobenzene**	%	TM116	81.1	101			
			@	@			
Dichlorodifluoromethane	<0.006 mg/kg	TM116		<0.006			
				@ #			
Chloromethane	<0.007 mg/kg	TM116		<0.007			
				@ #			
Vinyl Chloride	<0.006 mg/kg	TM116		<0.006			
				@ M			
Bromomethane	<0.01 mg/kg	TM116		<0.01			
				@ M			
Chloroethane	<0.01 mg/kg	TM116		<0.01			
				@ M			
Trichlorofluoromethane	<0.006 mg/kg	TM116		<0.006			
				@ M			
1,1-Dichloroethene	<0.01 mg/kg	TM116		<0.01			
				@ #			
Carbon Disulphide	<0.007 mg/kg	TM116		<0.007			
				@ M			
Dichloromethane	<0.01 mg/kg	TM116		<0.01			
				3 @ #			
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.01	<0.01			
			@ M	@ M			
trans-1,2-Dichloroethene	<0.01 mg/kg	TM116		<0.01			
				@ M			
1,1-Dichloroethane	<0.008 mg/kg	TM116		<0.008			
				@ M			
cis-1,2-Dichloroethene	<0.006 mg/kg	TM116		<0.006			
				@ M			
2,2-Dichloropropane	<0.01 mg/kg	TM116		<0.01			
				@			
Bromochloromethane	<0.01 mg/kg	TM116		<0.01			
				@ M			
Chloroform	<0.008 mg/kg	TM116		<0.008			
				@ M			
1,1,1-Trichloroethane	<0.007 mg/kg	TM116		<0.007			
				@ M			
1,1-Dichloropropene	<0.01 mg/kg	TM116		<0.01			
				@ M			
Carbontetrachloride	<0.01 mg/kg	TM116		<0.01			
				@ M			
1,2-Dichloroethane	<0.005 mg/kg	TM116		<0.005			
				@ M			
Benzene	<0.009 mg/kg	TM116	<0.009	<0.009			
			@ M	@ M			
Trichloroethene	<0.009 mg/kg	TM116		<0.009			
				@ #			
1,2-Dichloropropane	<0.01 mg/kg	TM116		<0.01			
				@ M			
Dibromomethane	<0.009 mg/kg	TM116		<0.009			
				@ M			
Bromodichloromethane	<0.007 mg/kg	TM116		<0.007			
				@ M			
cis-1,3-Dichloropropene	<0.01 mg/kg	TM116		<0.01			
				@ M			
Toluene	<0.007 mg/kg	TM116	<0.007	<0.007			
			@ M	@ M			
trans-1,3-Dichloropropene	<0.01 mg/kg	TM116		<0.01			
				@			
1,1,2-Trichloroethane	<0.01 mg/kg	TM116		<0.01			
				@ M			



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

VOC MS (S)

Results Legend		Customer Sample Ref.		BH102	BH102			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	BH102	0.50	2.50			
M	mCERTS accredited.			Soil/Solid (S)	Soil/Solid (S)			
aq	Aqueous / settled sample.			23/06/2022	24/06/2022			
diss.filt	Dissolved / filtered sample.			.	.			
tot.unfilt	Total / unfiltered sample.			25/06/2022	25/06/2022			
+	Subcontracted - refer to subcontractor report for accreditation status.			220625-77	220625-77			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery			26491254	26491257			
(F)	Trigger breach confirmed			ES1	ES3			
1-4-5@	Sample deviation (see appendix)							
Component	LOD/Units	Method						
1,3-Dichloropropane	<0.007 mg/kg	TM116		<0.007 @ M				
Tetrachloroethene	<0.005 mg/kg	TM116		<0.005 @ M				
Dibromochloromethane	<0.01 mg/kg	TM116		<0.01 @ M				
1,2-Dibromoethane	<0.01 mg/kg	TM116		<0.01 @ M				
Chlorobenzene	<0.005 mg/kg	TM116		<0.005 @ M				
1,1,1,2-Tetrachloroethane	<0.01 mg/kg	TM116		<0.01 @ M				
Ethylbenzene	<0.004 mg/kg	TM116	<0.004 @ M	<0.004 @ M				
p/m-Xylene	<0.01 mg/kg	TM116	<0.01 @ #	<0.01 @ #				
o-Xylene	<0.01 mg/kg	TM116	<0.01 @ M	<0.01 @ M				
Styrene	<0.01 mg/kg	TM116		<0.01 @ #				
Bromoform	<0.01 mg/kg	TM116		<0.01 @ M				
Isopropylbenzene	<0.005 mg/kg	TM116		<0.005 @ #				
1,1,2,2-Tetrachloroethane	<0.01 mg/kg	TM116		<0.01 @ #				
1,2,3-Trichloropropane	<0.016 mg/kg	TM116		<0.016 @ M				
Bromobenzene	<0.01 mg/kg	TM116		<0.01 @ M				
Propylbenzene	<0.01 mg/kg	TM116		<0.01 @ M				
2-Chlorotoluene	<0.009 mg/kg	TM116		<0.009 @ M				
1,3,5-Trimethylbenzene	<0.008 mg/kg	TM116		<0.008 @ M				
4-Chlorotoluene	<0.01 mg/kg	TM116		<0.01 @ M				
tert-Butylbenzene	<0.014 mg/kg	TM116		<0.014 @ #				
1,2,4-Trimethylbenzene	<0.009 mg/kg	TM116		<0.009 @ #				
sec-Butylbenzene	<0.01 mg/kg	TM116		<0.01 @				
4-Isopropyltoluene	<0.01 mg/kg	TM116		<0.01 @				
1,3-Dichlorobenzene	<0.008 mg/kg	TM116		<0.008 @ M				
1,4-Dichlorobenzene	<0.005 mg/kg	TM116		<0.005 @ M				
n-Butylbenzene	<0.011 mg/kg	TM116		<0.011 @				
1,2-Dichlorobenzene	<0.01 mg/kg	TM116		<0.01 @ M				
1,2-Dibromo-3-chloropropane	<0.014 mg/kg	TM116		<0.014 @ M				
Tert-amyl methyl ether	<0.01 mg/kg	TM116		<0.01 @ #				
1,2,4-Trichlorobenzene	<0.02 mg/kg	TM116		<0.02 @				
Hexachlorobutadiene	<0.02 mg/kg	TM116		<0.02 @				
Naphthalene	<0.013 mg/kg	TM116		<0.013 @ M				



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference

Mass Sample taken (kg) 0.209

Mass of dry sample (kg) 0.175

Particle Size <4mm >95%

Site Location

Hill Top Farm

Natural Moisture Content (%) 19

Dry Matter Content (%) 84

Case

SDG 220625-77

Lab Sample Number(s) 26491257

Sampled Date 24-Jun-2022

Customer Sample Ref. BH102 ES3

Depth (m) 2.50

Eluate Analysis

	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
Hexavalent Chromium	<0.03	<0.03	<0.06	<0.06
pH Value of Filtered Water	8.7	<0.001	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.00002
Arsenic	0.00086	<0.0005	0.00172	<0.001
Boron	0.067	<0.01	0.134	<0.02
Cadmium	<0.00008	<0.00008	<0.00016	<0.00016
Chromium	<0.001	<0.001	<0.002	<0.002
Copper	0.0163	<0.0003	0.0326	<0.0006
Lead	<0.0002	<0.0002	<0.0004	<0.0004
Nickel	0.00193	<0.0004	0.00386	<0.0008
Zinc	0.00291	<0.001	0.00582	<0.002

Leach Test Information

Date Prepared 02-Jul-2022
pH (pH Units) 8.01
Conductivity (µS/cm) 272.00
Temperature (°C) 19.90
Volume Leachant (Litres) 0.317
Volume of Eluate VE1 (Litres)Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

11/07/2022 11:21:55

11:21:38 11/07/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26491254	26491257
Customer Sample Ref.	BH102	BH102
AGS Ref.	ES1	ES3
Depth	0.50	2.50
Type	Soil/Solid (S)	Soil/Solid (S)

Anions by Kone (soil)	06-Jul-2022	06-Jul-2022
CEN 2:1 Leachate (1 Stage)		02-Jul-2022
CEN Readings		06-Jul-2022
Cyanide Comp/Free/Total/Thiocyanate	08-Jul-2022	08-Jul-2022
Dissolved Metals by ICP-MS		07-Jul-2022
EPH CWG GC (S)	04-Jul-2022	06-Jul-2022
GRO by GC-FID (S)	10-Jul-2022	10-Jul-2022
Hexavalent Chromium (s)	04-Jul-2022	04-Jul-2022
Hexavalent Chromium (w)		05-Jul-2022
Mercury Dissolved		07-Jul-2022
Metals in solid samples by OES	06-Jul-2022	06-Jul-2022
Moisture at 105C		02-Jul-2022
PAH by GCMS	04-Jul-2022	06-Jul-2022
pH	05-Jul-2022	05-Jul-2022
pH Value of Filtered Water		05-Jul-2022
Phenols by HPLC (S)	06-Jul-2022	06-Jul-2022
Sample description	01-Jul-2022	01-Jul-2022
Semi Volatile Organic Compounds		05-Jul-2022
TPH CWG GC (S)	10-Jul-2022	10-Jul-2022
VOC MS (S)	11-Jul-2022	11-Jul-2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

ASSOCIATED AQC DATA

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2677
Free Cyanide	TM153	88.81 71.70 : 110.70
Thiocyanate	TM153	94.23 87.27 : 113.27
Total Cyanide	TM153	91.61 72.73 : 109.93

Dissolved Metals by ICP-MS

Component	Method Code	QC 2607
Aluminium	TM152	101.67 90.98 : 111.82
Antimony	TM152	99.5 90.44 : 113.04
Arsenic	TM152	101.33 94.33 : 107.73
Barium	TM152	102.17 90.20 : 111.19
Beryllium	TM152	102.83 87.77 : 113.97
Bismuth	TM152	100.5 91.90 : 112.20
Borate	TM152	100.62 88.00 : 112.00
Boron	TM152	100.67 92.27 : 112.40
Cadmium	TM152	103.5 94.93 : 106.93
Calcium	TM152	100.67 95.14 : 110.01
Chromium	TM152	97.33 91.84 : 108.67
Cobalt	TM152	96.83 90.72 : 109.61
Copper	TM152	98.0 94.47 : 109.05
Iron	TM152	98.67 94.40 : 107.90
Lead	TM152	100.5 93.55 : 109.46
Lithium	TM152	103.0 91.62 : 113.12
Magnesium	TM152	98.67 92.30 : 110.57
Manganese	TM152	99.83 94.75 : 108.21
Molybdenum	TM152	98.67 93.77 : 103.54
Nickel	TM152	97.33 93.65 : 106.90
Phosphorus	TM152	100.5 92.51 : 109.27



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Dissolved Metals by ICP-MS

		QC 2607
Potassium	TM152	101.33 92.16 : 109.93
Selenium	TM152	100.33 91.58 : 115.98
Silver	TM152	101.17 96.03 : 105.53
Sodium	TM152	98.67 89.47 : 109.62
Strontium	TM152	103.33 95.67 : 106.20
Tellurium	TM152	102.33 93.32 : 114.66
Thallium	TM152	100.0 88.00 : 112.00
Tin	TM152	100.0 92.63 : 109.70
Titanium	TM152	100.33 95.08 : 109.28
Tungsten	TM152	97.83 94.68 : 107.68
Uranium	TM152	100.33 93.63 : 105.43
Vanadium	TM152	97.33 88.00 : 112.00
Zinc	TM152	100.0 95.31 : 110.74

GRO by GC-FID (S)

Component	Method Code	QC 2602
QC	TM089	73.35 65.61 : 111.21

Hexavalent Chromium (s)

Component	Method Code	QC 2613	QC 2631
Hexavalent Chromium	TM151	102.0 88.20 : 118.20	100.0 88.20 : 118.20

Hexavalent Chromium (w)

Component	Method Code	QC 2697
Hexavalent Chromium	TM241	99.6 94.17 : 106.17



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Mercury Dissolved

Component	Method Code	QC 2612
Mercury Dissolved (CVAf)	TM183	112.0 0.00 : 0.00

Metals in solid samples by OES

Component	Method Code	QC 2629
Aluminium	TM181	91.23 84.95 : 125.04
Antimony	TM181	105.51 91.44 : 127.13
Arsenic	TM181	108.78 95.27 : 120.80
Barium	TM181	101.03 94.57 : 124.93
Beryllium	TM181	103.5 85.72 : 122.69
Boron	TM181	100.96 91.59 : 122.22
Cadmium	TM181	106.27 87.31 : 121.62
Chromium	TM181	96.59 85.06 : 113.81
Cobalt	TM181	104.18 90.60 : 110.35
Copper	TM181	94.59 81.22 : 113.40
Iron	TM181	96.33 86.44 : 122.27
Lead	TM181	99.5 86.83 : 123.12
Manganese	TM181	104.78 89.22 : 121.75
Mercury	TM181	105.86 84.95 : 119.42
Molybdenum	TM181	100.0 85.98 : 123.80
Nickel	TM181	103.86 88.05 : 119.19
Phosphorus	TM181	103.08 90.13 : 121.54
Selenium	TM181	107.69 90.68 : 124.14
Strontium	TM181	93.06 80.65 : 106.55
Thallium	TM181	105.03 76.88 : 121.51
Tin	TM181	100.0 86.96 : 122.18
Titanium	TM181	97.27 77.07 : 118.83



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Metals in solid samples by OES

		QC 2629
Vanadium	TM181	99.64 84.00 : 115.50
Zinc	TM181	97.74 85.62 : 122.35

PAH by GCMS

Component	Method Code	QC 2619	QC 2608
Acenaphthene	TM218	89.5 76.79 : 103.90	97.5 73.47 : 109.80
Acenaphthylene	TM218	87.0 74.19 : 106.17	98.5 70.00 : 130.00
Anthracene	TM218	90.5 70.90 : 109.22	95.5 68.68 : 111.89
Benz(a)anthracene	TM218	94.0 73.77 : 119.26	102.5 68.12 : 118.39
Benzo(a)pyrene	TM218	88.0 73.20 : 114.18	98.5 65.65 : 105.78
Benzo(b)fluoranthene	TM218	88.5 75.36 : 117.58	101.0 66.89 : 120.40
Benzo(ghi)perylene	TM218	86.0 70.73 : 116.12	106.5 67.82 : 118.49
Benzo(k)fluoranthene	TM218	92.0 75.98 : 116.59	99.5 73.10 : 117.03
Chrysene	TM218	92.5 74.82 : 114.18	102.5 69.58 : 115.47
Dibenzo(ah)anthracene	TM218	86.5 69.17 : 115.30	100.5 67.32 : 121.35
Fluoranthene	TM218	93.0 66.06 : 114.63	95.5 64.99 : 117.80
Fluorene	TM218	90.5 76.66 : 107.56	99.0 73.81 : 108.66
Indeno(123cd)pyrene	TM218	80.0 70.26 : 117.95	101.5 68.91 : 117.62
Naphthalene	TM218	88.0 74.70 : 101.83	103.0 80.21 : 109.02
Phenanthrene	TM218	94.0 73.62 : 109.34	97.5 69.01 : 113.72
Pyrene	TM218	90.0 71.46 : 117.00	95.5 64.28 : 115.75

pH

Component	Method Code	QC 2698
pH	TM133	99.27 96.92 : 102.20

pH Value of Filtered Water



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074Report Number: 653827
Location: Hill Top Farm

Superseded Report:

pH Value of Filtered Water

Component	Method Code	QC 2677
pH	TM256	100.4 99.20 : 102.41

Phenols by HPLC (S)

Component	Method Code	QC 2639
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	47.37 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	50.94 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	54.3 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	51.15 82.04 : 108.38

Semi Volatile Organic Compounds

Component	Method Code	QC 2660
4-Bromophenylphenylether (Soil)	TM157	97.0 63.50 : 114.50
Benzo(a)anthracene (Soil)	TM157	96.0 71.89 : 120.91
Hexachlorobutadiene (Soil)	TM157	98.5 69.80 : 117.77
Naphthalene (Soil)	TM157	97.5 70.00 : 115.00
Nitrobenzene (Soil)	TM157	94.5 70.00 : 118.00
Phenol (Soil)	TM157	100.5 72.00 : 117.00

VOC MS (S)

Component	Method Code	QC 2625
1,1,1,2-tetrachloroethane	TM116	98.6 84.42 : 110.51
1,1,1-Trichloroethane	TM116	102.6 88.34 : 114.50
1,1,2-Trichloroethane	TM116	92.6 81.29 : 113.79
1,1-Dichloroethane	TM116	110.6 91.34 : 123.49
1,2-Dichloroethane	TM116	106.8 90.04 : 132.28
1,4-Dichlorobenzene	TM116	102.4 80.81 : 125.07
2-Chlorotoluene	TM116	92.2 73.13 : 114.13
4-Chlorotoluene	TM116	86.6 68.66 : 109.13



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

VOC MS (S)

		QC 2625
Benzene	TM116	102.4 84.29 : 112.22
Carbon Disulphide	TM116	103.8 75.11 : 124.81
Carbontetrachloride	TM116	102.4 82.35 : 126.46
Chlorobenzene	TM116	104.0 82.88 : 122.42
Chloroform	TM116	109.4 90.35 : 120.38
Chloromethane	TM116	101.6 67.89 : 143.51
Cis-1,2-Dichloroethene	TM116	101.0 78.27 : 128.90
Dibromomethane	TM116	96.4 76.00 : 120.73
Dichloromethane	TM116	119.2 97.64 : 133.75
Ethylbenzene	TM116	89.4 70.95 : 113.07
Hexachlorobutadiene	TM116	69.0 14.55 : 147.92
Isopropylbenzene	TM116	69.8 43.42 : 101.34
Naphthalene	TM116	108.2 80.90 : 124.24
o-Xylene	TM116	82.0 68.34 : 101.99
p/m-Xylene	TM116	87.2 69.47 : 97.31
Sec-Butylbenzene	TM116	65.4 27.03 : 135.73
Tetrachloroethene	TM116	100.8 80.10 : 120.38
Toluene	TM116	94.4 80.66 : 100.10
Trichloroethene	TM116	95.0 79.80 : 112.33
Trichlorofluoromethane	TM116	113.0 83.13 : 123.97
Vinyl Chloride	TM116	107.2 69.66 : 136.55

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

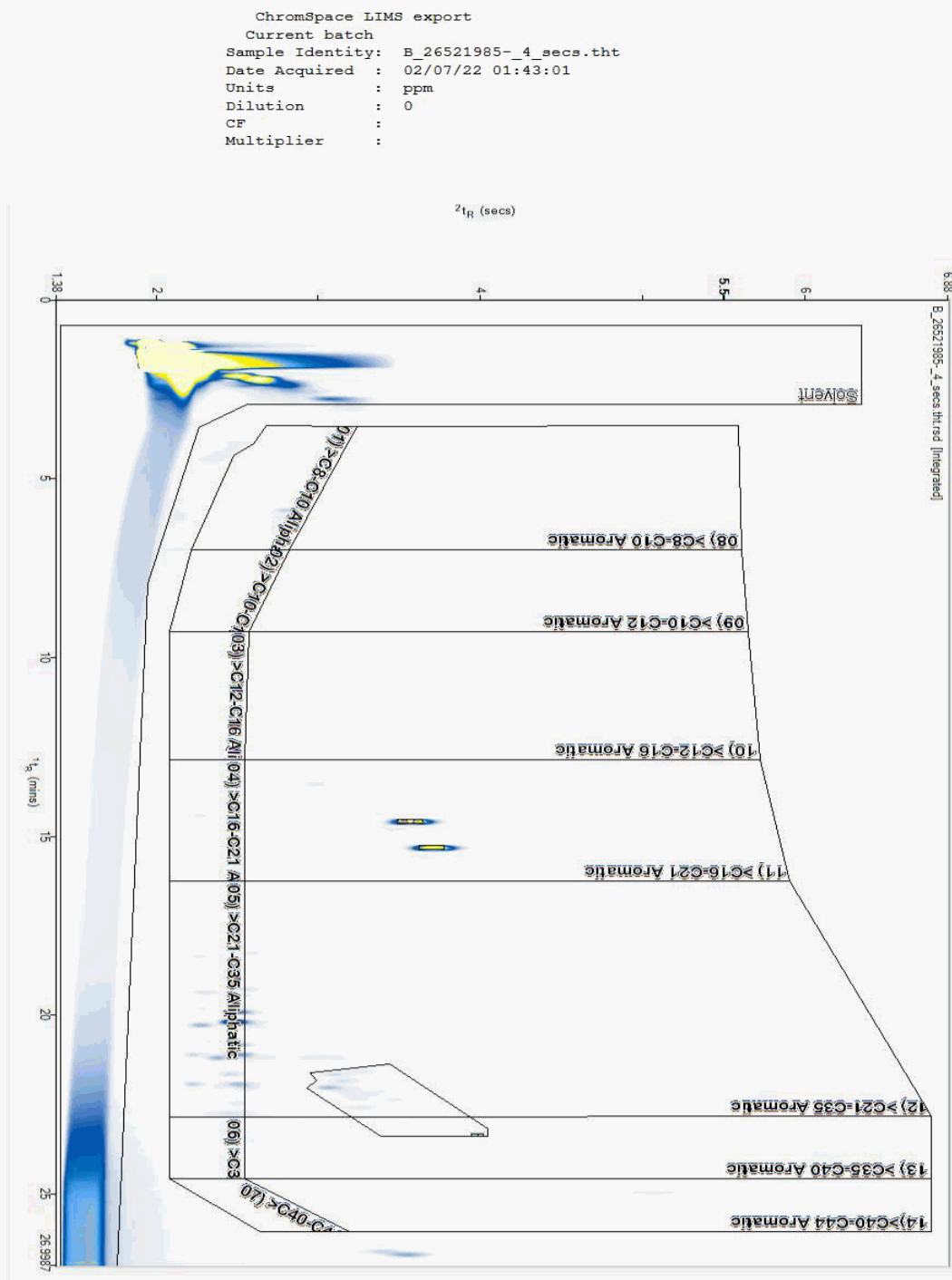
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26521985
Sample ID : BH102

Depth : 0.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

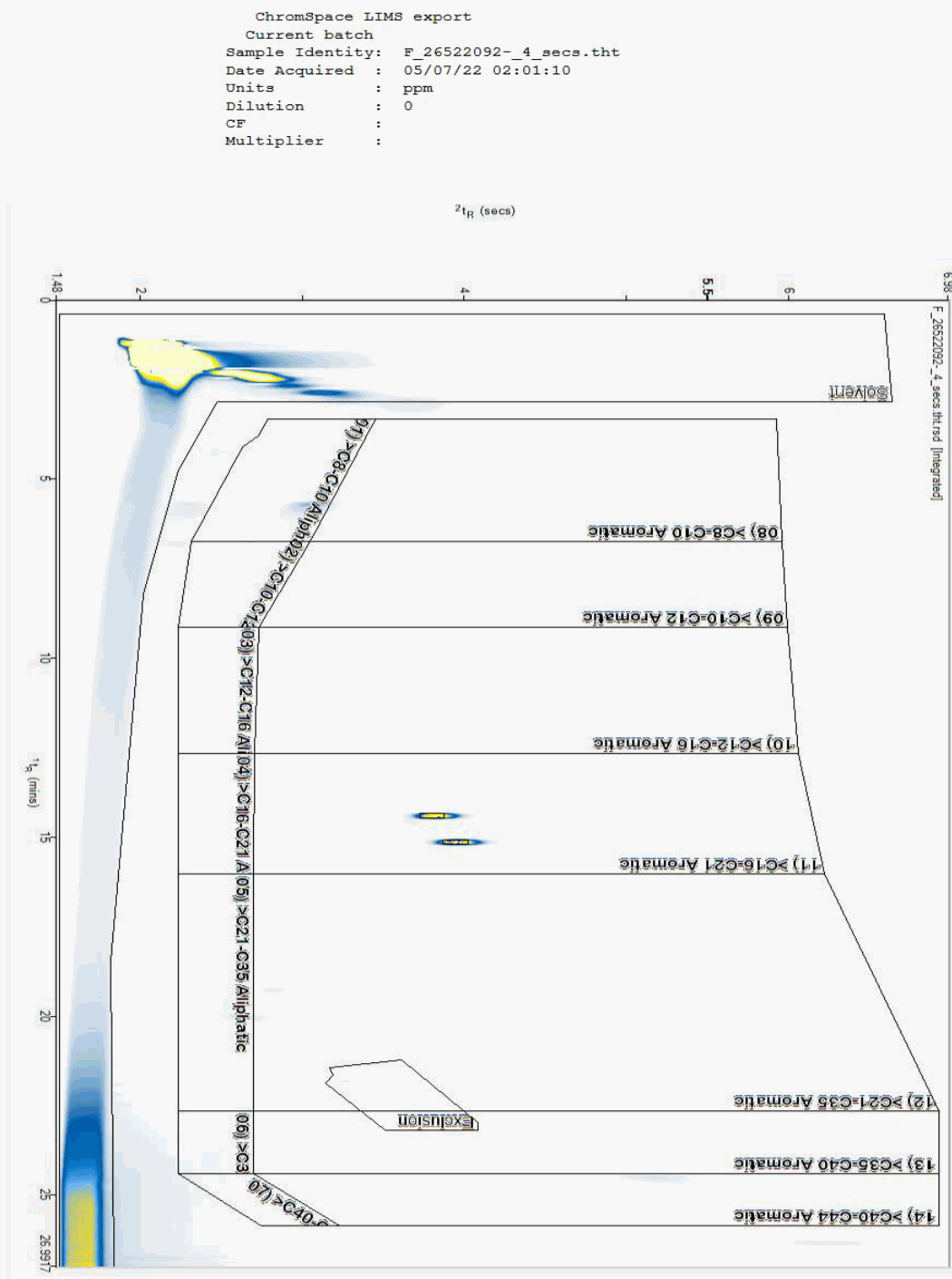
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26522092
Sample ID : BH102

Depth : 2.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

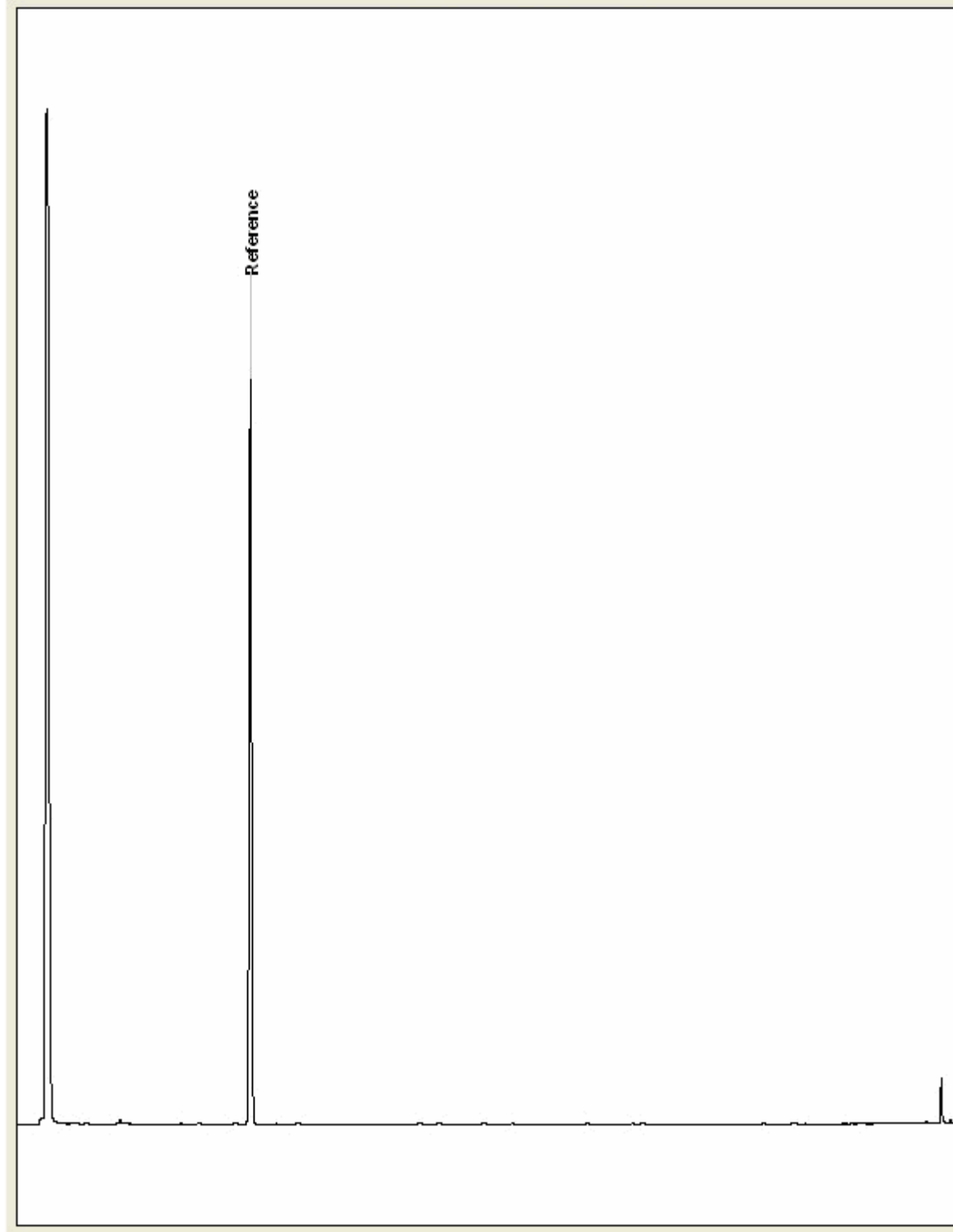
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560610
Sample ID : BH102

Depth : 0.50

26560610_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-77
Client Ref.: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

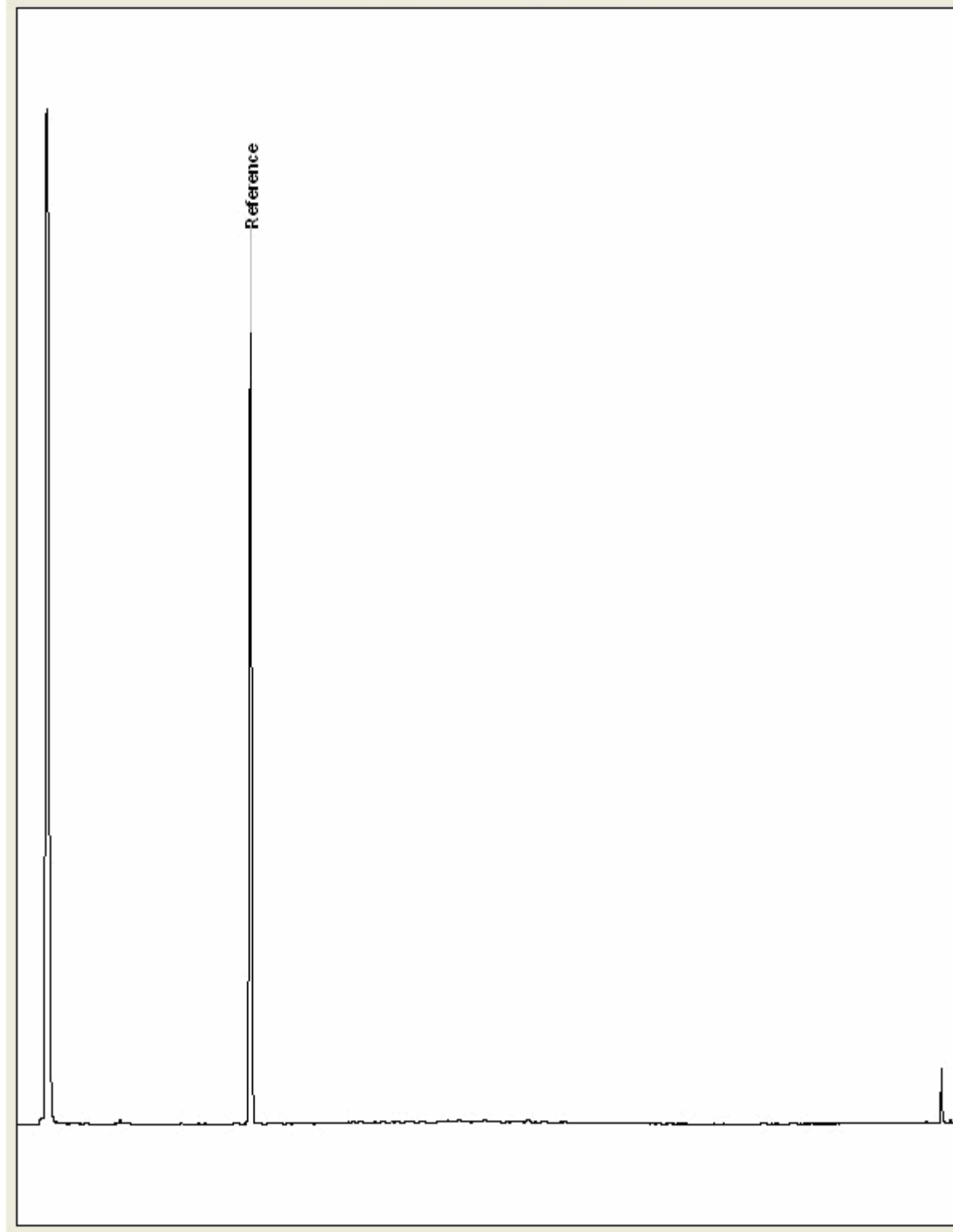
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26560656
Sample ID : BH102

Depth : 2.50

26560656_GRO_S.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

SDG: 220625-77
Client Ref: 10056074

Report Number: 653827
Location: Hill Top Farm

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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ARCADIS UK Ltd
Suite 1A
4 Piccadilly Place
Manchester
M1 3BN

Attention: Dale Fisher

CERTIFICATE OF ANALYSIS

Date of report Generation:	14 July 2022
Customer:	ARCADIS UK Ltd
Sample Delivery Group (SDG):	220625-78
Your Reference:	10056074
Location:	Hill Top Farm
Report No:	654416
Order Number:	10056074

We received 9 samples on Saturday June 25, 2022 and 3 of these samples were scheduled for analysis which was completed on Thursday July 14, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
Client Ref.: 10056074

Report Number: 654416
Location: Hill Top Farm

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26491396	HP101	ES1	0.30 - 0.30	24/06/2022
26491397	HP101	ES2	0.80 - 0.80	24/06/2022
26491398	HP101	ES3	1.00 - 1.00	24/06/2022
26491361	HP102	ES1	0.40 - 0.40	24/06/2022
26491358	HP103	ES1	0.50 - 0.50	24/06/2022
26491360	HP103	ES2	1.00 - 1.00	24/06/2022
26491399	HP104	ES1	0.40 - 0.40	24/06/2022
26491362	HP104	ES1	0.50 - 0.50	24/06/2022
26491400	HP104	ES2	0.60 - 0.60	24/06/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
Client Ref.: 10056074

Report Number: 654416
Location: Hill Top Farm

Superseded Report:

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		26491397	26491358	26491399
	Customer Sample Reference		HP101	HP103	HP104
	AGS Reference		ES2	ES1	ES1
	Depth (m)		0.80 - 0.80	0.50 - 0.50	0.40 - 0.40
	Container		1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE215)	1kg TUB with Handle (ALE210)
	Sample Type		S	S	S
			S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 3	X	X	X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3	X	X	X
Asbestos Quantification - Full	All	NDPs: 0 Tests: 2		X	X
CEN Readings	All	NDPs: 0 Tests: 1		X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 3	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1		X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 3	X	X	X
GRO by GC-FID (S)	All	NDPs: 0 Tests: 3		X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 3	X	X	X
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1		X	
Mercury Dissolved	All	NDPs: 0 Tests: 1		X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 3	X	X	X
PAH by GCMS	All	NDPs: 0 Tests: 3	X	X	X
pH	All	NDPs: 0 Tests: 3	X	X	X
pH Value of Filtered Water	All	NDPs: 0 Tests: 1		X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
Client Ref.: 10056074Report Number: 654416
Location: Hill Top Farm

Superseded Report:

Results Legend



Test

No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)

Customer
Sample Reference

AGS Reference

Depth (m)

Container

Sample Type

Phenols by HPLC (S)

Sample description

TPH CWG GC (S)

VOC MS (S)

All

All

All

All

NDPs: 0
Tests: 3NDPs: 0
Tests: 3NDPs: 0
Tests: 3NDPs: 0
Tests: 3

26491397

HP101

ES2

0.80 - 0.80

1kg TUB with
Handle (ALE260)250g Amber Jar
(ALE210)60g VOC
(ALE215)1kg TUB with
Handle (ALE260)60g VOC
(ALE215)1kg TUB with
Handle (ALE260)250g Amber Jar
(ALE210)60g VOC
(ALE215)60g VOC
(ALE215)

S

S

S

S

S

S

S

S

S

X

X

X

X

X

X

X

X

X

X

X

X



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
Client Ref.: 10056074

Report Number: 654416
Location: Hill Top Farm

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26491397	HP101	0.80 - 0.80	Dark Brown	Sandy Silt Loam	Vegetation	Stones
26491358	HP103	0.50 - 0.50	Light Brown	Sandy Loam	Stones	Brick
26491399	HP104	0.40 - 0.40	Dark Brown	Sandy Loam	Brick	Stones

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
Client Ref.: 10056074Report Number: 654416
Location: Hill Top Farm

Superseded Report:

Results Legend			Customer Sample Ref.	HP101	HP103	HP104			
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
diss.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-4**@	Sample deviation (see appendix)								
Component	LOD/Units	Method							
Moisture Content Ratio (% of as received sample)	%	PM024	17	15	7				
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M				
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M				
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M				
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035 M	<0.035 M	<0.035 M				
pH	1 pH Units	TM133	6.71 M	7.97 M	10.1 M				
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #				
Cyanide, Total	<1 mg/kg	TM153	<1 M	<1 M	<1 M				
Arsenic	<0.6 mg/kg	TM181	7.71 M	13 M	6.15 M				
Boron	<0.7 mg/kg	TM181	8.5 #	16.9 #	6.77 #				
Cadmium	<0.02 mg/kg	TM181	0.202 M	0.625 M	0.163 M				
Chromium	<0.9 mg/kg	TM181	9.23 M	20.3 M	5.92 M				
Copper	<1.4 mg/kg	TM181	30.6 M	41.6 M	17 M				
Lead	<0.7 mg/kg	TM181	53.3 M	156 M	40.2 M				
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	<0.1 M				
Nickel	<0.2 mg/kg	TM181	12.8 M	24.1 M	9.98 M				
Zinc	<1.9 mg/kg	TM181	87.6 M	363 M	104 M				
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.23 M	0.075 M	0.149 M				
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304		<0.001 #	<0.001 #				
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304		<0.001 #	<0.001 #				
Additional Asbestos Components (Using TM048)		TM304		None #	None #				
Analysts Comments		TM304		0	0				
Asbestos Quantification - Total - %	<0.001 %	TM304		<0.001 #	<0.001 #				

SDG: 220625-78
Client Ref.: 10056074

Report Number: 654416
Location: Hill Top Farm

Superseded Report:

PAH by GCMS

[illegible]

SDG: 220625-78
Client Ref.: 10056074

Report Number: 654416
Location: Hill Top Farm

Superseded Report:

VOC MS (S)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
Client Ref.: 10056074

Report Number: 654416
Location: Hill Top Farm

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&S@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	HP101ES2 0.80 - 0.80 SOLID 24/06/2022 00:00:00 25/06/2022 05:00:00 220625-78 26491397 TM048	08/07/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	HP103ES1 0.50 - 0.50 SOLID 24/06/2022 00:00:00 25/06/2022 05:00:00 220625-78 26491358 TM048	08/07/2022	James Richards	Fibre bundles in soil	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	HP104ES1 0.40 - 0.40 SOLID 24/06/2022 00:00:00 25/06/2022 05:00:00 220625-78 26491399 TM048	09/07/2022	Joanne Furnivall	fibre bundles in soil	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected (#)	Not Detected (#)	Not Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
Client Ref.: 10056074

Report Number: 654416
Location: Hill Top Farm

Superseded Report:

Asbestos Quantification - Full

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*&@ Sample deviation (see appendix)

		Additional Asbestos Components	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM	Asbestos Quantification - Total - %
Cust. Sample Ref.	HP103ES1 0.50 - 0.50 SOLID	None (#)	-	<0.001 (#)	<0.001 (#)	<0.001 (#)
Depth (m)						
Sample Type	24/06/2022 00:00:00					
Date Sampled	25/06/2022 05:00:00					
Date Received	220625-78					
SDG	26491358					
Original Sample	TM304					
Method Number						
Cust. Sample Ref.	HP104ES1 0.40 - 0.40 SOLID	None (#)	-	<0.001 (#)	<0.001 (#)	<0.001 (#)
Depth (m)						
Sample Type	24/06/2022 00:00:00					
Date Sampled	25/06/2022 05:00:00					
Date Received	220625-78					
SDG	26491399					
Original Sample	TM304					
Method Number						



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
Client Ref.: 10056074Report Number: 654416
Location: Hill Top Farm

Superseded Report:

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		Site Location	Hill Top Farm
Mass Sample taken (kg)	0.206	Natural Moisture Content (%)	17.6
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	85
Particle Size <4mm	>95%		

Case

SDG	220625-78
Lab Sample Number(s)	26491358
Sampled Date	24-Jun-2022
Customer Sample Ref.	HP103 ES1
Depth (m)	0.50 - 0.50

Eluate Analysis

	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
Hexavalent Chromium	<0.03	<0.03	<0.06	<0.06
pH Value of Filtered Water	8.5	<0.001	-	-
Mercury Dissolved (CVAf)	0.0000334	<0.00001	0.0000668	<0.00002
Arsenic	0.0179	<0.0005	0.0358	<0.001
Boron	0.0951	<0.01	0.19	<0.02
Cadmium	0.0000874	<0.00008	0.000175	<0.00016
Chromium	0.00128	<0.001	0.00256	<0.002
Copper	0.0503	<0.0003	0.101	<0.0006
Lead	0.00312	<0.0002	0.00624	<0.0004
Nickel	0.00849	<0.0004	0.017	<0.0008
Zinc	0.0212	<0.001	0.0424	<0.002

Leach Test Information

Date Prepared	02-Jul-2022
pH (pH Units)	7.84
Conductivity (µS/cm)	373.00
Temperature (°C)	20.20
Volume Leachant (Litres)	0.319
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

14/07/2022 17:31:47

17:31:23 14/07/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
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Location: Hill Top Farm

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM).



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Superseded Report:

Test Completion Dates

Lab Sample No(s)	26491397	26491358	26491399
Customer Sample Ref.	HP101	HP103	HP104
AGS Ref.	ES2	ES1	ES1
Depth	0.80 - 0.80	0.50 - 0.50	0.40 - 0.40
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	06-Jul-2022	06-Jul-2022	06-Jul-2022
Asbestos ID in Solid Samples	08-Jul-2022	08-Jul-2022	09-Jul-2022
Asbestos Quantification - Full		08-Jul-2022	11-Jul-2022
CEN 2:1 Leachate (1 Stage)		02-Jul-2022	
CEN Readings		06-Jul-2022	
Cyanide Comp/Free/Total/Thiocyanate	08-Jul-2022	08-Jul-2022	08-Jul-2022
Dissolved Metals by ICP-MS		07-Jul-2022	
EPH CWG GC (S)	05-Jul-2022	05-Jul-2022	05-Jul-2022
GRO by GC-FID (S)	13-Jul-2022	13-Jul-2022	
Hexavalent Chromium (s)	05-Jul-2022	04-Jul-2022	05-Jul-2022
Hexavalent Chromium (w)		05-Jul-2022	
Mercury Dissolved		07-Jul-2022	
Metals in solid samples by OES	07-Jul-2022	07-Jul-2022	07-Jul-2022
Moisture at 105C		02-Jul-2022	
PAH by GCMS	06-Jul-2022	06-Jul-2022	06-Jul-2022
pH	05-Jul-2022	05-Jul-2022	05-Jul-2022
pH Value of Filtered Water		05-Jul-2022	
Phenols by HPLC (S)	08-Jul-2022	06-Jul-2022	08-Jul-2022
Sample description	01-Jul-2022	01-Jul-2022	01-Jul-2022
TPH CWG GC (S)	13-Jul-2022	13-Jul-2022	14-Jul-2022
VOC MS (S)	13-Jul-2022	13-Jul-2022	13-Jul-2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220625-78
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Superseded Report:

ASSOCIATED AQC DATA

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2677
Free Cyanide	TM153	88.81 71.70 : 110.70
Thiocyanate	TM153	94.23 87.27 : 113.27
Total Cyanide	TM153	91.61 72.73 : 109.93

Dissolved Metals by ICP-MS

Component	Method Code	QC 2607
Aluminium	TM152	101.67 90.98 : 111.82
Antimony	TM152	99.5 90.44 : 113.04
Arsenic	TM152	101.33 94.33 : 107.73
Barium	TM152	102.17 90.20 : 111.19
Beryllium	TM152	102.83 87.77 : 113.97
Bismuth	TM152	100.5 91.90 : 112.20
Borate	TM152	100.62 88.00 : 112.00
Boron	TM152	100.67 92.27 : 112.40
Cadmium	TM152	103.5 94.93 : 106.93
Calcium	TM152	100.67 95.14 : 110.01
Chromium	TM152	97.33 91.84 : 108.67
Cobalt	TM152	96.83 90.72 : 109.61
Copper	TM152	98.0 94.47 : 109.05
Iron	TM152	98.67 94.40 : 107.90
Lead	TM152	100.5 93.55 : 109.46
Lithium	TM152	103.0 91.62 : 113.12
Magnesium	TM152	98.67 92.30 : 110.57
Manganese	TM152	99.83 94.75 : 108.21
Molybdenum	TM152	98.67 93.77 : 103.54
Nickel	TM152	97.33 93.65 : 106.90
Phosphorus	TM152	100.5 92.51 : 109.27



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Superseded Report:

Dissolved Metals by ICP-MS

		QC 2607
Potassium	TM152	101.33 92.16 : 109.93
Selenium	TM152	100.33 91.58 : 115.98
Silver	TM152	101.17 96.03 : 105.53
Sodium	TM152	98.67 89.47 : 109.62
Strontium	TM152	103.33 95.67 : 106.20
Tellurium	TM152	102.33 93.32 : 114.66
Thallium	TM152	100.0 88.00 : 112.00
Tin	TM152	100.0 92.63 : 109.70
Titanium	TM152	100.33 95.08 : 109.28
Tungsten	TM152	97.83 94.68 : 107.68
Uranium	TM152	100.33 93.63 : 105.43
Vanadium	TM152	97.33 88.00 : 112.00
Zinc	TM152	100.0 95.31 : 110.74

GRO by GC-FID (S)

Component	Method Code	QC 2612	QC 2604
QC	TM089	79.38 65.61 : 111.21	73.06 65.42 : 109.49

Hexavalent Chromium (s)

Component	Method Code	QC 2631	QC 2655
Hexavalent Chromium	TM151	100.0 88.20 : 118.20	106.0 88.20 : 118.20

Hexavalent Chromium (w)

Component	Method Code	QC 2697
Hexavalent Chromium	TM241	99.6 94.17 : 106.17



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Superseded Report:

Mercury Dissolved

Component	Method Code	QC 2612
Mercury Dissolved (CVAF)	TM183	112.0 0.00 : 0.00

Metals in solid samples by OES

Component	Method Code	QC 2681
Aluminium	TM181	102.63 84.95 : 125.04
Antimony	TM181	115.35 91.44 : 127.13
Arsenic	TM181	115.2 95.27 : 120.80
Barium	TM181	111.79 94.57 : 124.93
Beryllium	TM181	110.2 85.72 : 122.69
Boron	TM181	111.58 91.59 : 122.22
Cadmium	TM181	111.81 87.31 : 121.62
Chromium	TM181	104.63 85.06 : 113.81
Cobalt	TM181	106.73 90.60 : 110.35
Copper	TM181	99.83 81.22 : 113.40
Iron	TM181	102.75 86.44 : 122.27
Lead	TM181	107.43 86.83 : 123.12
Manganese	TM181	111.24 89.22 : 121.75
Mercury	TM181	111.73 84.95 : 119.42
Molybdenum	TM181	106.06 85.98 : 123.80
Nickel	TM181	110.39 88.05 : 119.19
Phosphorus	TM181	109.57 90.13 : 121.54
Selenium	TM181	114.65 90.68 : 124.14
Strontium	TM181	100.45 80.65 : 106.55
Thallium	TM181	110.4 76.88 : 121.51
Tin	TM181	106.82 86.96 : 122.18
Titanium	TM181	100.91 77.07 : 118.83



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Superseded Report:

Metals in solid samples by OES

		QC 2681
Vanadium	TM181	105.76 84.00 : 115.50
Zinc	TM181	107.9 85.62 : 122.35

PAH by GCMS

Component	Method Code	QC 2608	QC 2622
Acenaphthene	TM218	97.5 73.47 : 109.80	90.0 76.79 : 103.90
Acenaphthylene	TM218	98.5 70.00 : 130.00	88.0 74.19 : 106.17
Anthracene	TM218	95.5 68.68 : 111.89	89.5 70.90 : 109.22
Benz(a)anthracene	TM218	102.5 68.12 : 118.39	95.5 73.77 : 119.26
Benzo(a)pyrene	TM218	98.5 65.65 : 105.78	89.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	101.0 66.89 : 120.40	95.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	106.5 67.82 : 118.49	88.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	99.5 73.10 : 117.03	92.5 75.98 : 116.59
Chrysene	TM218	102.5 69.58 : 115.47	94.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	100.5 67.32 : 121.35	86.0 69.17 : 115.30
Fluoranthene	TM218	95.5 64.99 : 117.80	96.5 66.06 : 114.63
Fluorene	TM218	99.0 73.81 : 108.66	89.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	101.5 68.91 : 117.62	87.0 70.26 : 117.95
Naphthalene	TM218	103.0 80.21 : 109.02	93.5 74.70 : 101.83
Phenanthrene	TM218	97.5 69.01 : 113.72	93.5 73.62 : 109.34
Pyrene	TM218	95.5 64.28 : 115.75	93.5 71.46 : 117.00

pH

Component	Method Code	QC 2614
pH	TM133	100.29 96.92 : 102.20

pH Value of Filtered Water



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Superseded Report:

pH Value of Filtered Water

Component	Method Code	QC 2673
pH	TM256	100.27 99.20 : 102.41

Phenols by HPLC (S)

Component	Method Code	QC 2639	QC 2655	QC 2673
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	52.6 69.38 : 125.27	53.9 69.38 : 125.27	53.9 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	47.37 69.79 : 122.84	48.54 69.79 : 122.84	47.37 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	50.94 77.98 : 111.41	51.77 77.98 : 111.41	50.31 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	54.3 67.94 : 117.69	54.97 67.94 : 117.69	52.98 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	51.15 82.04 : 108.38	51.87 82.04 : 108.38	50.52 82.04 : 108.38

VOC MS (S)

Component	Method Code	QC 2601
1,1,1,2-tetrachloroethane	TM116	98.2 86.59 : 118.97
1,1,1-Trichloroethane	TM116	101.8 86.26 : 117.53
1,1,2-Trichloroethane	TM116	93.0 75.16 : 112.70
1,1-Dichloroethane	TM116	108.8 87.14 : 128.34
1,2-Dichloroethane	TM116	107.4 89.30 : 133.10
1,4-Dichlorobenzene	TM116	98.4 82.59 : 123.23
2-Chlorotoluene	TM116	96.4 66.81 : 118.43
4-Chlorotoluene	TM116	90.8 65.88 : 114.76
Benzene	TM116	103.0 93.16 : 123.63
Carbon Disulphide	TM116	94.6 75.11 : 124.81
Carbontetrachloride	TM116	103.6 82.06 : 121.42
Chlorobenzene	TM116	99.0 85.07 : 118.13
Chloroform	TM116	106.4 88.13 : 122.71
Chloromethane	TM116	108.0 61.62 : 145.66
Cis-1,2-Dichloroethene	TM116	106.6 88.41 : 121.33



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Superseded Report:

VOC MS (S)

		QC 2601
Dibromomethane	TM116	95.8 77.47 : 121.29
Dichloromethane	TM116	115.0 87.89 : 134.72
Ethylbenzene	TM116	95.0 76.29 : 106.31
Hexachlorobutadiene	TM116	95.4 16.78 : 153.29
Isopropylbenzene	TM116	95.0 59.16 : 110.07
Naphthalene	TM116	102.2 79.29 : 125.59
o-Xylene	TM116	92.2 72.86 : 102.10
p/m-Xylene	TM116	91.7 68.99 : 102.40
Sec-Butylbenzene	TM116	109.2 44.71 : 117.87
Tetrachloroethene	TM116	102.8 77.82 : 125.00
Toluene	TM116	93.8 87.82 : 116.21
Trichloroethene	TM116	92.8 79.80 : 112.33
Trichlorofluoromethane	TM116	104.6 80.52 : 132.12
Vinyl Chloride	TM116	103.0 74.57 : 146.88

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



CERTIFICATE OF ANALYSIS

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SDG: 220625-78
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Report Number: 654416
Location: Hill Top Farm

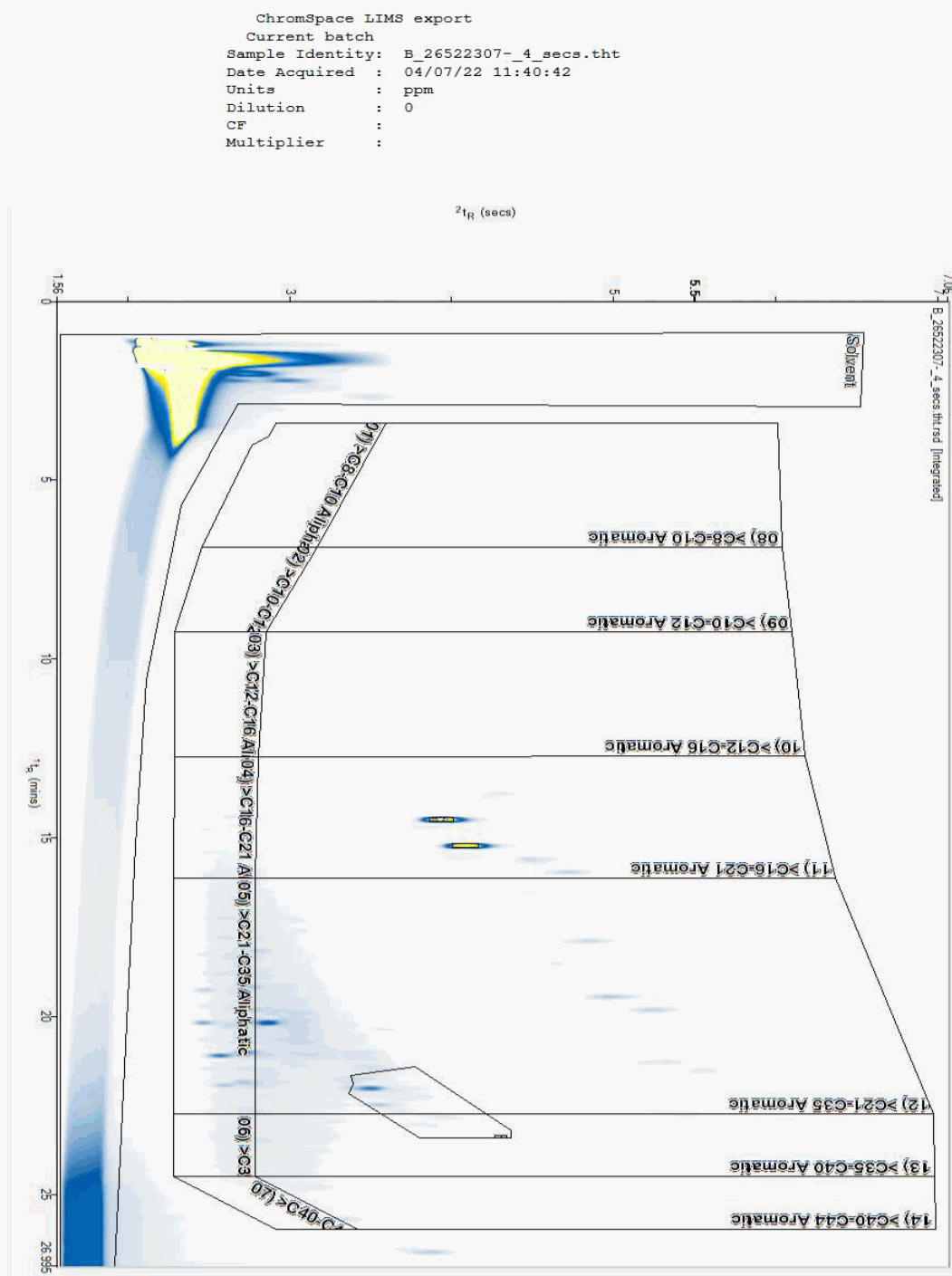
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26522307
Sample ID : HP103

Depth : 0.50 - 0.50





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Report Number: 654416
Location: Hill Top Farm

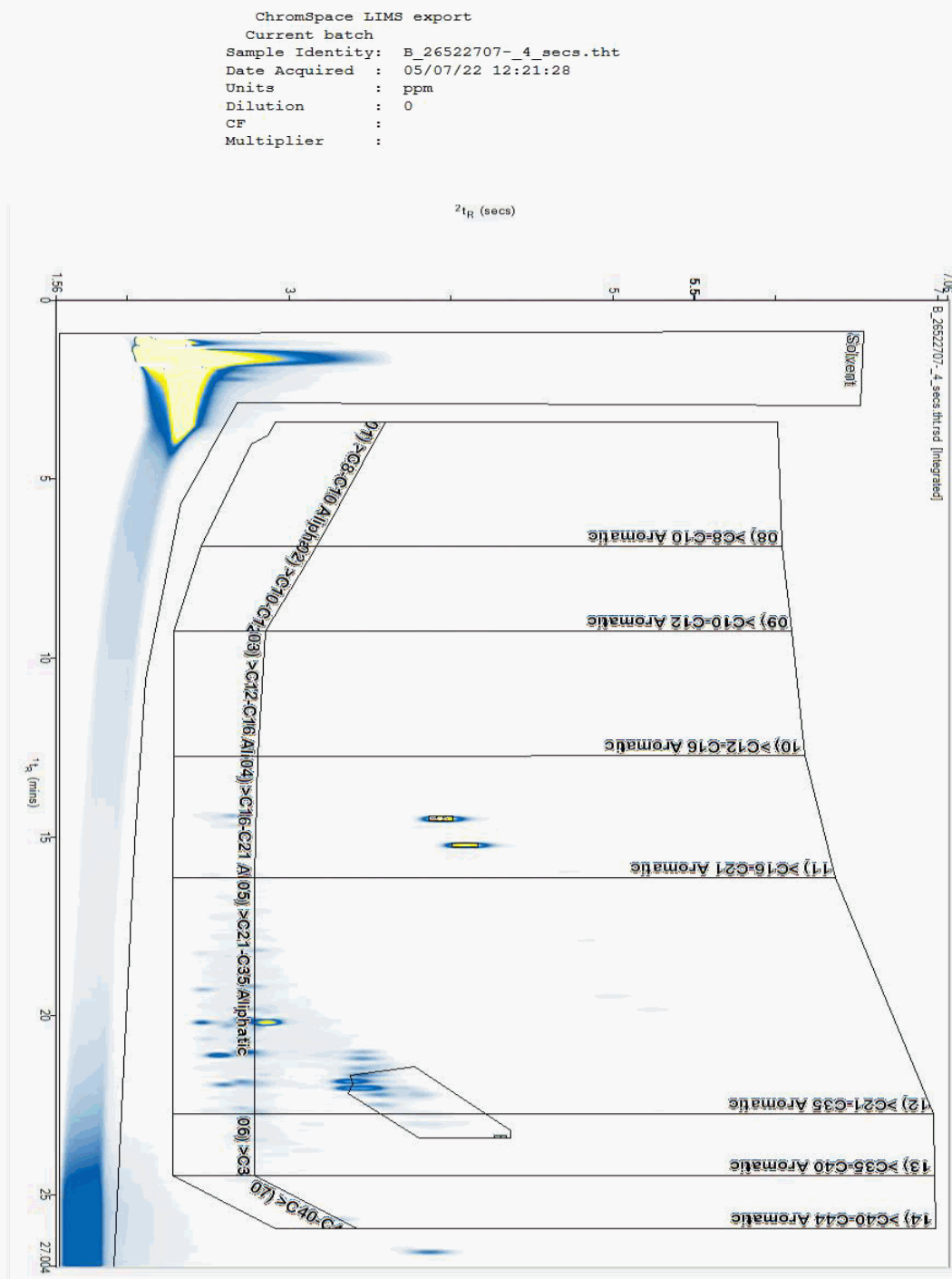
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26522707
Sample ID : HP101

Depth : 0.80 - 0.80





CERTIFICATE OF ANALYSIS

Validated

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Location: Hill Top Farm

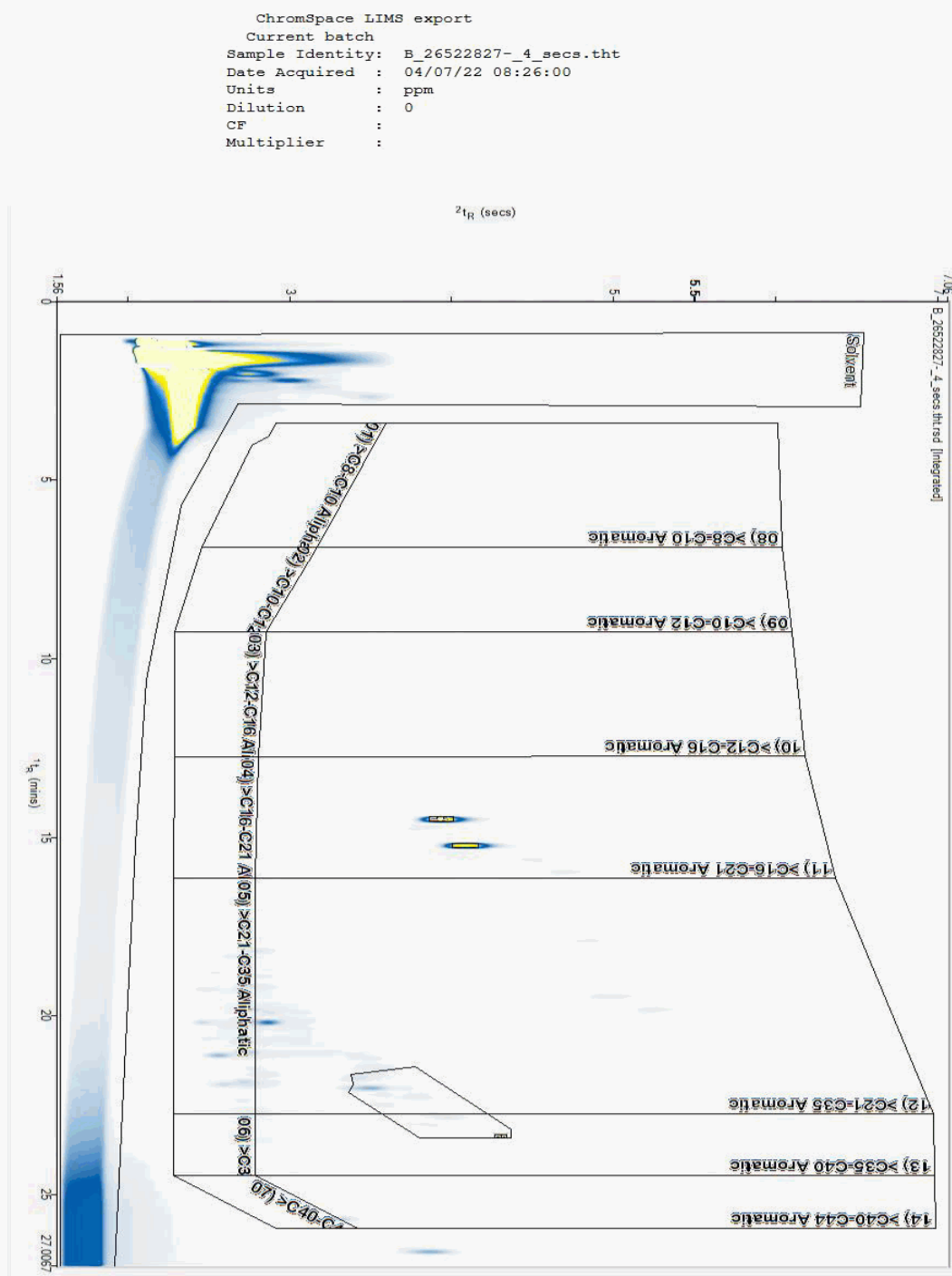
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26522827
Sample ID : HP104

Depth : 0.40 - 0.40





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SDG: 220625-78
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Location: Hill Top Farm

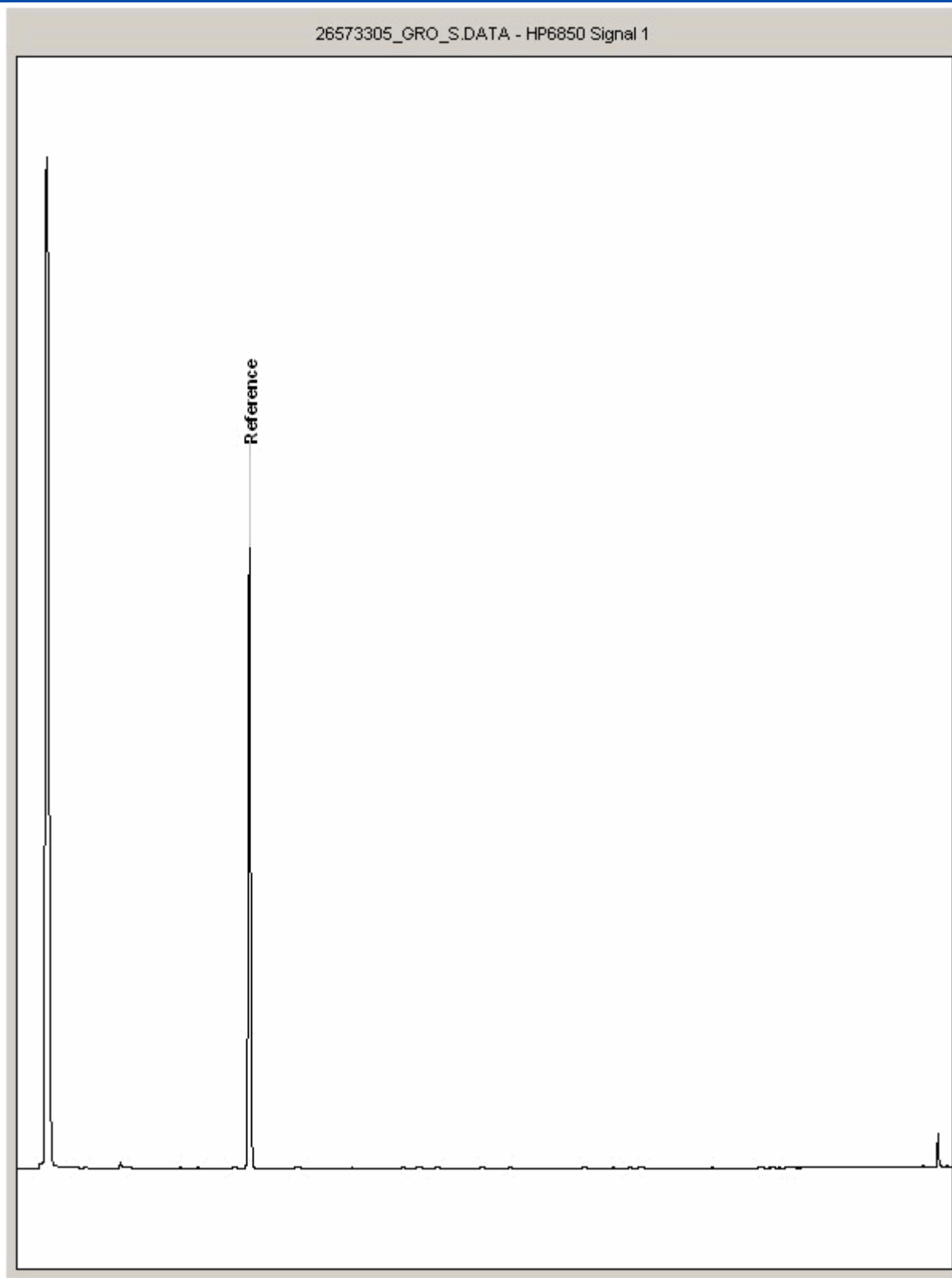
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26573305
Sample ID : HP101

Depth : 0.80 - 0.80





CERTIFICATE OF ANALYSIS

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SDG: 220625-78
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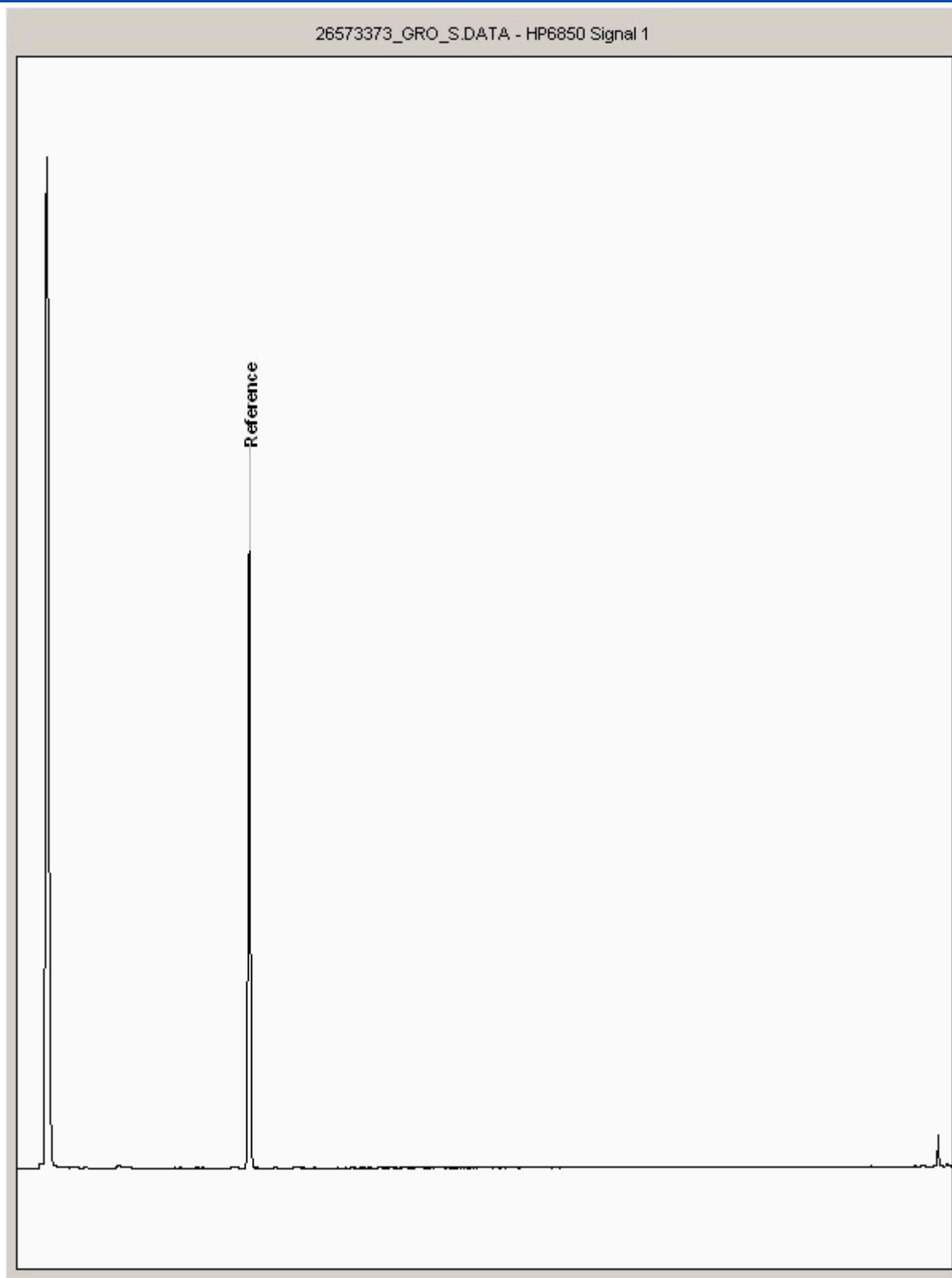
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26573373
Sample ID : HP103

Depth : 0.50 - 0.50





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SDG: 220625-78
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Superseded Report:

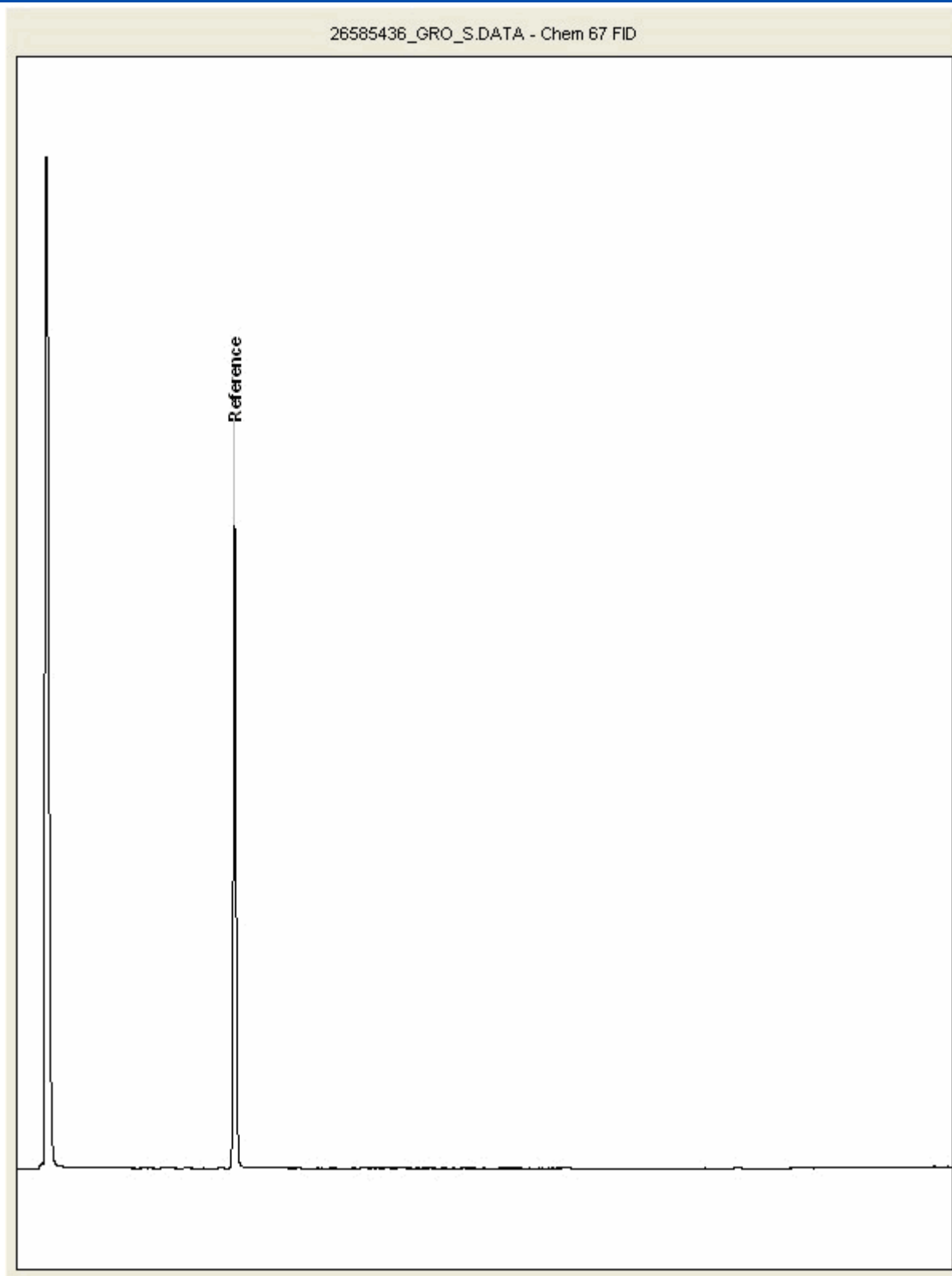
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26585436
Sample ID : HP104

Depth : 0.40 - 0.40

26585436_GRO_S.DATA - Chem 67 FID





CERTIFICATE OF ANALYSIS

SDG: 220625-78
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Location: Hill Top Farm

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



ARCADIS UK Ltd
Suite 1A
4 Piccadilly Place
Manchester
M1 3BN

Attention: Dale Fisher

Units 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

CERTIFICATE OF ANALYSIS

Date of report Generation:	14 July 2022
Customer:	ARCADIS UK Ltd
Sample Delivery Group (SDG):	220701-28
Your Reference:	10056074
Location:	Hill Top Farm
Report No:	654418
Order Number:	10056074

We received 12 samples on Thursday June 30, 2022 and 5 of these samples were scheduled for analysis which was completed on Thursday July 14, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26519347	BH101	ES	0.20 - 0.30	27/06/2022
26519348	BH101	ES	0.40 - 0.50	27/06/2022
26519349	BH101	ES	1.00 - 1.00	27/06/2022
26519350	BH101	ES	2.00 - 2.00	27/06/2022
26519351	BH101	ES	3.00 - 3.00	27/06/2022
26519354	BH104	ES	0.30 - 0.40	28/06/2022
26519355	BH104	ES	0.60 - 0.70	28/06/2022
26519356	BH104	ES	2.40 - 2.50	28/06/2022
26519357	BH104	ES	4.00 - 4.00	28/06/2022
26519352	HP105	ES	0.10 - 0.20	28/06/2022
26519353	HP106	ES	0.20 - 0.30	28/06/2022
26519358	HP107	ES	0.30 - 0.30	28/06/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Results Legend	Lab Sample No(s)		26519356	26519357	26519352	26519353	26519358
	Customer Sample Reference		BH104	BH104	HP105	HP106	HP107
	AGS Reference		ES	ES	ES	ES	ES
	Depth (m)		2.40 - 2.50	4.00 - 4.00	0.10 - 0.20	0.20 - 0.30	0.30 - 0.30
	Container		60g VOC (ALE215) 250g Amber Jar (ALE215)	1kg TUB with Handle (ALE260) 60g VOC (ALE215) 250g Amber Jar (ALE215)	1kg TUB with Handle (ALE260) 60g VOC (ALE215) 250g Amber Jar (ALE215)	1kg TUB with Handle (ALE260) 60g VOC (ALE215) 250g Amber Jar (ALE215)	60g VOC (ALE215) 250g Amber Jar (ALE215)
	Sample Type		S	S	S	S	S
			S	S	S	S	S
Anions by Kone (soil)	All	NDPs: 1 Tests: 4	X	X	X	N	X
Anions by Kone (w)	All	NDPs: 1 Tests: 1				N	
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 3			X		
Asbestos Quantification - Full	All	NDPs: 0 Tests: 1			X	X	
CEN Readings	All	NDPs: 1 Tests: 2		X	X	N	
Coronene	All	NDPs: 0 Tests: 2			X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5	X	X	X	X	X
Dissolved Metals by ICP-MS	All	NDPs: 1 Tests: 2		X		N	
Dissolved Organic/Inorganic Carbon	All	NDPs: 1 Tests: 1			X	N	
EPH by GCxGC-FID	All	NDPs: 0 Tests: 2			X	X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Fluoride	All	NDPs: 1 Tests: 1			X	N	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 1		X			



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Results Legend



Test



No Determination
Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Results Legend	Lab Sample No(s)		26519356	26519357	26519352	26519353	26519358
	Customer Sample Reference		BH104	BH104	HP105	HP106	HP107
	AGS Reference		ES	ES	ES	ES	ES
	Depth (m)		2.40 - 2.50	4.00 - 4.00	0.10 - 0.20	0.20 - 0.30	0.30 - 0.30
	Container		250g Amber Jar (ALE210)	1kg TUB with Handle (ALE280)	250g Amber Jar (ALE210)	1kg TUB with Handle (ALE280)	250g Amber Jar (ALE210)
	Sample Type		S	S	S	S	S
			S	S	S	S	S
Mercury Dissolved	All	NDPs: 1 Tests: 2		X	X	N	
Metals in solid samples by OES	All	NDPs: 0 Tests: 5	X	X	X	X	X
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 2			X	X	
PAH by GCMS	All	NDPs: 0 Tests: 5	X	X	X	X	X
PCBs by GCMS	All	NDPs: 0 Tests: 2			X	X	
pH	All	NDPs: 0 Tests: 5	X	X	X	X	X
pH Value of Filtered Water	All	NDPs: 1 Tests: 2		X	X	N	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
Phenols by HPLC (W)	All	NDPs: 1 Tests: 1			X	N	
Sample description	All	NDPs: 0 Tests: 5	X	X	X	X	X
Total Organic Carbon	All	NDPs: 0 Tests: 3			X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X
VOC MS (S)	All	NDPs: 0 Tests: 5	X	X	X	X	X



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26519356	BH104	2.40 - 2.50	Dark Brown	Sandy Silt Loam	Stones	None
26519357	BH104	4.00 - 4.00	Dark Brown	Silty Clay Loam	Stones	None
26519352	HP105	0.10 - 0.20	Light Brown	Silt Loam	Vegetation	Stones
26519353	HP106	0.20 - 0.30	Dark Brown	Sandy Loam	Vegetation	Plastic
26519358	HP107	0.30 - 0.30	Dark Brown	Sandy Silt Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Results Legend		Customer Sample Ref.	BH104	BH104	HP105	HP106	HP107	
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sampled Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	2.40 - 2.50	4.00 - 4.00	0.10 - 0.20	0.20 - 0.30	0.30 - 0.30	
M	mCERTS accredited.		Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
aq	Aqueous / settled sample.		28/06/2022	28/06/2022	28/06/2022	28/06/2022	28/06/2022	
diss.filt	Dissolved / filtered sample.		13:00:00	13:00:00	11:00:00	11:00:00	14:00:00	
tot.unfilt	Total / unfiltered sample.		30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022	
*	Subcontracted - refer to subcontractor report for accreditation status.		220701-28	220701-28	220701-28	220701-28	220701-28	
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery		26519356	26519357	26519352	26519353	26519358	
(F)	Trigger breach confirmed		ES	ES	ES	ES	ES	
1-4**	Sample deviation (see appendix)							
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	20	14	23	16	0	
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	
Cresols	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	0.0258 M	<0.01 M	<0.01 M	
Xylenols	<0.015 mg/kg	TM062 (S)	<0.015 M	<0.015 M	<0.015 M	<0.015 M	<0.015 M	
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)	<0.035 M	<0.035 M	<0.035 M	<0.035 M	<0.035 M	
Organic Carbon, Total	<0.2 %	TM132			22.4 M	15.8 M		
Soil Organic Matter (SOM)	<0.35 %	TM132			38.6 #	27.2 #	2.38 #	
pH	1 pH Units	TM133	8.72 M	8.32 M	6.58 M	6.76 M	6.31 M	
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	1.7 #	<0.6 #	<0.6 #	
Cyanide, Total	<1 mg/kg	TM153	<1 M	<1 M	1.25 M	<1 M	<1 M	
PCB congener 28	<0.003 mg/kg	TM168			<0.03 M	<0.03 M		
PCB congener 52	<0.003 mg/kg	TM168			<0.03 M	<0.03 M		
PCB congener 101	<0.003 mg/kg	TM168			<0.03 M	<0.03 M		
PCB congener 118	<0.003 mg/kg	TM168			<0.03 M	<0.03 M		
PCB congener 138	<0.003 mg/kg	TM168			<0.03 M	<0.03 M		
PCB congener 153	<0.003 mg/kg	TM168			<0.03 M	<0.03 M		
PCB congener 180	<0.003 mg/kg	TM168			<0.03 M	<0.03 M		
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168			<0.21 M	<0.21 M		
Arsenic	<0.6 mg/kg	TM181	6.59 M	6.31 M	8.57 M	5.3 M	9.61 M	
Boron	<0.7 mg/kg	TM181	20.4 #	20 #	15.2 #	25.4 #	6.93 #	
Cadmium	<0.02 mg/kg	TM181	0.028 M	0.112 M	0.355 M	0.413 M	0.221 M	
Chromium	<0.9 mg/kg	TM181	22 M	17.5 M	13.7 M	9.4 M	10.3 M	
Copper	<1.4 mg/kg	TM181	17.2 M	17.1 M	43.2 M	37.6 M	27.1 M	
Lead	<0.7 mg/kg	TM181	12.8 M	11.9 M	68.3 M	34 M	138 M	
Mercury	<0.1 mg/kg	TM181	<0.1 M	<0.1 M	<0.1 M	<0.1 M	<0.1 M	
Nickel	<0.2 mg/kg	TM181	35.1 M	29.4 M	9.22 M	7.22 M	16.7 M	
Zinc	<1.9 mg/kg	TM181	63 M	68.8 M	201 M	189 M	145 M	
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.0707 M	0.0402 M	<0.004 M		0.0159 M	
Asbestos Quantification - Gravimetric - %	<0.001 %	TM304					<0.001 #	
Asbestos Quantification - PCOM Evaluation - %	<0.001 %	TM304					<0.001 #	
Additional Asbestos Components (Using TM048)		TM304					None #	
Analysts Comments		TM304					0	



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Asbestos Identification - Solid Samples

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&\$@ Sample deviation (see appendix)

Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Asbestos Actinolite	Asbestos Anthophyllite	Asbestos Tremolite	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Non-Asbestos Fibre
09/07/22	Eva Guerra	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
08/07/2022	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
08/07/2022	Joanne Furnivall	fibre bundles in soil	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected (#)	Not Detected (#)	Detected



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Asbestos Quantification - Full

Results Legend

ISO17025 accredited.
M mCERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&*\$\$@ Sample deviation (see appendix)

		Additional Asbestos Components	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM	Asbestos Quantification - Total - %
Cust. Sample Ref.	HP107E5 0.30 - 0.30 SOLID	None (#)	-	<0.001 (#)	<0.001 (#)	<0.001 (#)
Depth (m)						
Sample Type	28/06/2022 00:00:00					
Date Sampled	30/06/2022 05:00:00					
Date Received	220701-28					
SDG	26519358					
Original Sample	TM304					
Method Number						



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074Report Number: 654418
Location: Hill Top Farm

Superseded Report:

CEN 2:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		Site Location	Hill Top Farm
Mass Sample taken (kg)	0.208	Natural Moisture Content (%)	19.2
Mass of dry sample (kg)	0.175	Dry Matter Content (%)	83.9
Particle Size <4mm	>95%		

Case

SDG 220701-28

Lab Sample Number(s) 26519357

Sampled Date 28-Jun-2022

Customer Sample Ref. BH104 ESZ

Depth (m) 4.00 - 4.00

Eluate Analysis	Conc ⁿ in 2:1 eluate (mg/l)		2:1 conc ⁿ leached (mg/kg)	
	Result	Limit of Detection	Result	Limit of Detection
Hexavalent Chromium	<0.03	<0.03	<0.06	<0.06
pH Value of Filtered Water	8.6	<0.001	-	-
Mercury Dissolved (CVAf)	0.00222	<0.00001	0.00444	<0.00002
Arsenic	0.00253	<0.0005	0.00506	<0.001
Boron	0.261	<0.01	0.522	<0.02
Cadmium	<0.00008	<0.00008	<0.00016	<0.00016
Chromium	0.0026	<0.001	0.0052	<0.002
Copper	0.0166	<0.0003	0.0332	<0.0006
Lead	0.000715	<0.0002	0.00143	<0.0004
Nickel	0.00745	<0.0004	0.0149	<0.0008
Zinc	0.0106	<0.001	0.0212	<0.002

Leach Test Information

Date Prepared	04-Jul-2022
pH (pH Units)	7.32
Conductivity (µS/cm)	218.00
Temperature (°C)	19.50
Volume Leachant (Litres)	0.317
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

14/07/2022 17:36:41

17:36:23 14/07/2022



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074Report Number: 654418
Location: Hill Top Farm

Superseded Report:

CEN 10:1 SINGLE STAGE LEACHATE TEST

CEN ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference

Mass Sample taken (kg) 0.120

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site Location

Hill Top Farm

Natural Moisture Content (%) 33.4

Dry Matter Content (%) 75

Case

SDG 220701-28

Lab Sample Number(s) 26519352

Sampled Date 28-Jun-2022

Customer Sample Ref. HP105 ESZ

Depth (m) 0.10 - 0.20

Landfill Waste Acceptance

Criteria Limits

Solid Waste Analysis

Result

Total Organic Carbon (%)

22.4

Loss on Ignition (%)

-

Sum of BTEX (mg/kg)

<0.8

Sum of 7 PCBs (mg/kg)

<0.21

Mineral Oil (mg/kg) (EH_2D_AL)

178

PAH Sum of 17 (mg/kg)

<10

pH (pH Units)

6.58

ANC to pH 6 (mol/kg)

-

ANC to pH 4 (mol/kg)

-

Inert Waste
LandfillStable
Non-reactive
Hazardous Waste
in Non-
Hazardous
LandfillHazardous
Waste Landfill

3

5

6

-

-

-

6

-

-

1

-

-

500

-

-

100

-

-

-

>6

-

-

-

-

-

-

-

Eluate Analysis

C₂Concⁿ in 10:1 eluate (mg/l)A₂10:1 concⁿ leached (mg/kg)Limit values for compliance leaching test
using BS EN 12457-3 at L/S 10 l/kg

Result

Limit of Detection

Result

Limit of Detection

Arsenic

0.008

<0.0005

0.08

<0.005

0.5

2

25

Barium

0.0208

<0.0002

0.208

<0.002

20

100

300

Cadmium

<0.00008

<0.00008

<0.0008

<0.0008

0.04

1

5

Chromium

0.00116

<0.001

0.0116

<0.01

0.5

10

70

Copper

0.0251

<0.0003

0.251

<0.003

2

50

100

Mercury Dissolved (CVAF)

0.0000157

<0.00001

0.000157

<0.0001

0.01

0.2

2

Molybdenum

<0.003

<0.003

<0.03

<0.03

0.5

10

30

Nickel

0.00259

<0.0004

0.0259

<0.004

0.4

10

40

Lead

0.000952

<0.0002

0.00952

<0.002

0.5

10

50

Antimony

<0.001

<0.001

<0.01

<0.01

0.06

0.7

5

Selenium

<0.001

<0.001

<0.01

<0.01

0.1

0.5

7

Zinc

0.0591

<0.001

0.591

<0.01

4

50

200

Chloride

3.4

<2

34

<20

800

15000

25000

Fluoride

<0.5

<0.5

<5

<5

10

150

500

Sulphate (soluble)

<4

<4

<40

<40

1000

20000

50000

Total Dissolved Solids

166

<5

1660

<50

4000

60000

100000

Total Monohydric Phenols (W)

<0.016

<0.016

<0.16

<0.16

1

-

-

Dissolved Organic Carbon

50.5

<6

505

<60

500

800

1000

Leach Test Information

Date Prepared 04-Jul-2022

pH (pH Units) 7.41

Conductivity (µS/cm) 217.00

Temperature (°C) 11.80

Volume Leachant (Litres) 0.870

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation

14/07/2022 17:36:42



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Notification of NDPs (No determination possible)

Date Received : 01/07/2022 06:01:00

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
26519353	HP106 ESZ	0.20 - 0.30	Moisture at 105C	Insufficient Sample
26519353	HP106	0.20 - 0.30	Anions by Kone (soil)	Sample cannot be filtered
26519353	HP106	0.20 - 0.30	Dissolved Organic/Inorganic Carbon	Insufficient Sample
26519353	HP106	0.20 - 0.30	Fluoride	Insufficient Sample
26519353	HP106	0.20 - 0.30	Mercury Dissolved	Insufficient Sample
26519353	HP106	0.20 - 0.30	Dissolved Metals by ICP-MS	Insufficient Sample
26519353	HP106	0.20 - 0.30	Anions by Kone (w)	Insufficient Sample
26519353	HP106	0.20 - 0.30	Phenols by HPLC (W)	Insufficient Sample
26519353	HP106	0.20 - 0.30	pH Value of Filtered Water	Insufficient Sample
26519353	HP106	0.20 - 0.30	CEN 10:1 Leachate (1 Stage)	Insufficient Sample
26519353	HP106	0.20 - 0.30	CEN Readings	Insufficient Sample



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM243		Mixed Anions In Soils By Kone
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
TM415	Analysis of Petroleum Hydrocarbons in Environmental Media.	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26519356	26519357	26519352	26519353	26519358
Customer Sample Ref.	BH104	BH104	HP105	HP106	HP107
AGS Ref.	ES	ES	ES	ES	ES
Depth	2.40 - 2.50	4.00 - 4.00	0.10 - 0.20	0.20 - 0.30	0.30 - 0.30
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	06-Jul-2022	06-Jul-2022	06-Jul-2022		06-Jul-2022
Anions by Kone (w)			07-Jul-2022		
Asbestos ID in Solid Samples			09-Jul-2022	08-Jul-2022	08-Jul-2022
Asbestos Quantification - Full					08-Jul-2022
CEN 10:1 Leachate (1 Stage)			05-Jul-2022		
CEN 2:1 Leachate (1 Stage)		04-Jul-2022			
CEN Readings		07-Jul-2022	06-Jul-2022		
Coronene			05-Jul-2022	05-Jul-2022	
Cyanide Comp/Free/Total/Thiocyanate	08-Jul-2022	08-Jul-2022	08-Jul-2022	08-Jul-2022	07-Jul-2022
Dissolved Metals by ICP-MS		07-Jul-2022	07-Jul-2022		
Dissolved Organic/Inorganic Carbon			07-Jul-2022		
EPH by GCxGC-FID			06-Jul-2022	06-Jul-2022	
EPH CWG GC (S)	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022
Fluoride			07-Jul-2022		
GRO by GC-FID (S)	14-Jul-2022	13-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
Hexavalent Chromium (s)	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022
Hexavalent Chromium (w)		07-Jul-2022			
Mercury Dissolved		08-Jul-2022	08-Jul-2022		
Metals in solid samples by OES	06-Jul-2022	06-Jul-2022	07-Jul-2022	07-Jul-2022	06-Jul-2022
Moisture at 105C		04-Jul-2022	04-Jul-2022		
PAH 16 & 17 Calc			05-Jul-2022	05-Jul-2022	
PAH by GCMS	06-Jul-2022	06-Jul-2022	05-Jul-2022	05-Jul-2022	06-Jul-2022
PCBs by GCMS			06-Jul-2022	06-Jul-2022	
pH	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022	05-Jul-2022
pH Value of Filtered Water		08-Jul-2022	08-Jul-2022		
Phenols by HPLC (S)	08-Jul-2022	08-Jul-2022	08-Jul-2022	08-Jul-2022	08-Jul-2022
Phenols by HPLC (W)			08-Jul-2022		
Sample description	02-Jul-2022	02-Jul-2022	02-Jul-2022	02-Jul-2022	02-Jul-2022
Total Organic Carbon			08-Jul-2022	11-Jul-2022	08-Jul-2022
TPH CWG GC (S)	14-Jul-2022	13-Jul-2022	14-Jul-2022	14-Jul-2022	14-Jul-2022
VOC MS (S)	13-Jul-2022	12-Jul-2022	14-Jul-2022	14-Jul-2022	13-Jul-2022



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Superseded Report:

ASSOCIATED AQC DATA

Anions by Kone (w)

Component	Method Code	QC 2647
Chloride	TM184	106.0 97.18 : 113.20
Sulphate (soluble)	TM184	103.6 96.54 : 111.66

Coronene

Component	Method Code	QC 2637
Coronene RAW	TM410	94.5 79.43 : 137.78

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2684	QC 2633	QC 2677
Free Cyanide	TM153	86.14 71.70 : 110.70	90.79 71.70 : 110.70	88.81 71.70 : 110.70
Thiocyanate	TM153	93.59 87.27 : 113.27	95.51 87.27 : 113.27	94.23 87.27 : 113.27
Total Cyanide	TM153	92.31 72.73 : 109.93	93.71 72.73 : 109.93	91.61 72.73 : 109.93

Dissolved Metals by ICP-MS

Component	Method Code	QC 2698
Aluminium	TM152	104.33 90.98 : 111.82
Antimony	TM152	99.5 90.44 : 113.04
Arsenic	TM152	102.0 94.33 : 107.73
Barium	TM152	101.83 90.20 : 111.19
Beryllium	TM152	103.0 87.77 : 113.97
Bismuth	TM152	99.33 91.90 : 112.20
Borate	TM152	104.94 88.00 : 112.00
Boron	TM152	104.67 92.27 : 112.40
Cadmium	TM152	104.0 94.93 : 106.93
Calcium	TM152	100.67 95.14 : 110.01
Chromium	TM152	102.33 91.84 : 108.67
Cobalt	TM152	102.83 90.72 : 109.61



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Dissolved Metals by ICP-MS

		QC 2698
Copper	TM152	103.83 94.47 : 109.05
Iron	TM152	102.0 94.40 : 107.90
Lead	TM152	101.17 93.55 : 109.46
Lithium	TM152	102.5 91.62 : 113.12
Magnesium	TM152	100.0 92.30 : 110.57
Manganese	TM152	103.17 94.75 : 108.21
Molybdenum	TM152	101.17 93.77 : 103.54
Nickel	TM152	104.33 93.65 : 106.90
Phosphorus	TM152	99.17 92.51 : 109.27
Potassium	TM152	99.33 92.16 : 109.93
Selenium	TM152	105.5 91.58 : 115.98
Silver	TM152	101.33 96.03 : 105.53
Sodium	TM152	99.33 89.47 : 109.62
Strontium	TM152	101.67 95.67 : 106.20
Tellurium	TM152	100.83 93.32 : 114.66
Thallium	TM152	100.83 88.00 : 112.00
Tin	TM152	100.67 92.63 : 109.70
Titanium	TM152	101.0 95.08 : 109.28
Tungsten	TM152	100.17 94.68 : 107.68
Uranium	TM152	101.83 93.63 : 105.43
Vanadium	TM152	104.33 88.00 : 112.00
Zinc	TM152	104.0 95.31 : 110.74

Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2696
Dissolved Inorganic Carbon	TM090	100.17 93.58 : 112.28
Dissolved Organic Carbon	TM090	101.17 97.42 : 107.52



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Superseded Report:

EPH CWG GC (S)

Component	Method Code	QC 2606
EPH >C8-C40 Raw	TM414	90.45 79.56 : 113.20
Total Aliphatics Raw	TM414	97.75 79.29 : 113.82
Total Aromatics Raw	TM414	88.68 61.16 : 129.42

Fluoride

Component	Method Code	QC 2625
Fluoride	TM104	102.0 96.67 : 108.67

GRO by GC-FID (S)

Component	Method Code	QC 2631	QC 2604
QC	TM089	68.46 65.42 : 109.49	73.06 65.42 : 109.49

Hexavalent Chromium (s)

Component	Method Code	QC 2655	QC 2698	QC 2660
Hexavalent Chromium	TM151	106.0 88.20 : 118.20	104.0 88.20 : 118.20	104.0 88.20 : 118.20

Hexavalent Chromium (w)

Component	Method Code	QC 2653
Hexavalent Chromium	TM241	97.8 94.17 : 106.17

Mercury Dissolved

Component	Method Code	QC 2661	QC 2644
Mercury Dissolved (CVAf)	TM183	104.0 0.00 : 0.00	113.0 0.00 : 0.00

Metals in solid samples by OES



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Superseded Report:

Metals in solid samples by OES

Component	Method Code	QC 2630	QC 2639	QC 2624
Aluminium	TM181	92.98 84.95 : 125.04	100.0 84.95 : 125.04	97.37 84.95 : 125.04
Antimony	TM181	112.2 91.44 : 127.13	114.96 91.44 : 127.13	111.42 91.44 : 127.13
Arsenic	TM181	109.46 95.27 : 120.80	116.89 95.27 : 120.80	111.49 95.27 : 120.80
Barium	TM181	106.67 94.57 : 124.93	107.69 94.57 : 124.93	107.69 94.57 : 124.93
Beryllium	TM181	105.25 85.72 : 122.69	109.33 85.72 : 122.69	107.0 85.72 : 122.69
Boron	TM181	102.57 91.59 : 122.22	109.32 91.59 : 122.22	109.65 91.59 : 122.22
Cadmium	TM181	106.64 87.31 : 121.62	114.02 87.31 : 121.62	108.12 87.31 : 121.62
Chromium	TM181	100.24 85.06 : 113.81	101.71 85.06 : 113.81	103.17 85.06 : 113.81
Cobalt	TM181	101.27 90.60 : 110.35	108.0 90.60 : 110.35	103.09 90.60 : 110.35
Copper	TM181	96.45 81.22 : 113.40	100.0 81.22 : 113.40	96.62 81.22 : 113.40
Iron	TM181	90.64 86.44 : 122.27	103.67 86.44 : 122.27	97.25 86.44 : 122.27
Lead	TM181	102.48 86.83 : 123.12	109.9 86.83 : 123.12	113.37 86.83 : 123.12
Manganese	TM181	107.3 89.22 : 121.75	110.96 89.22 : 121.75	107.58 89.22 : 121.75
Mercury	TM181	107.17 84.95 : 119.42	114.33 84.95 : 119.42	108.14 84.95 : 119.42
Molybdenum	TM181	101.01 85.98 : 123.80	107.07 85.98 : 123.80	102.69 85.98 : 123.80
Nickel	TM181	104.45 88.05 : 119.19	111.57 88.05 : 119.19	106.23 88.05 : 119.19
Phosphorus	TM181	108.03 90.13 : 121.54	110.94 90.13 : 121.54	105.98 90.13 : 121.54
Selenium	TM181	107.69 90.68 : 124.14	115.75 90.68 : 124.14	111.36 90.68 : 124.14
Strontium	TM181	93.51 80.65 : 106.55	99.33 80.65 : 106.55	96.42 80.65 : 106.55
Thallium	TM181	105.7 76.88 : 121.51	113.09 76.88 : 121.51	108.05 76.88 : 121.51
Tin	TM181	101.19 86.96 : 122.18	106.82 86.96 : 122.18	104.75 86.96 : 122.18
Titanium	TM181	94.55 77.07 : 118.83	103.64 77.07 : 118.83	100.91 77.07 : 118.83
Vanadium	TM181	99.28 84.00 : 115.50	105.4 84.00 : 115.50	102.16 84.00 : 115.50
Zinc	TM181	102.48 85.62 : 122.35	106.32 85.62 : 122.35	104.74 85.62 : 122.35

PAH by GCMS



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Superseded Report:

PAH by GCMS

Component	Method Code	QC 2628	QC 2622
Acenaphthene	TM218	88.5 76.79 : 103.90	90.0 76.79 : 103.90
Acenaphthylene	TM218	86.0 74.19 : 106.17	88.0 74.19 : 106.17
Anthracene	TM218	86.5 70.90 : 109.22	89.5 70.90 : 109.22
Benz(a)anthracene	TM218	97.0 73.77 : 119.26	95.5 73.77 : 119.26
Benzo(a)pyrene	TM218	99.0 73.20 : 114.18	89.0 73.20 : 114.18
Benzo(b)fluoranthene	TM218	102.5 75.36 : 117.58	95.0 75.36 : 117.58
Benzo(ghi)perylene	TM218	95.0 70.73 : 116.12	88.0 70.73 : 116.12
Benzo(k)fluoranthene	TM218	99.5 75.98 : 116.59	92.5 75.98 : 116.59
Chrysene	TM218	96.0 74.82 : 114.18	94.0 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	98.0 69.17 : 115.30	86.0 69.17 : 115.30
Fluoranthene	TM218	89.5 66.06 : 114.63	96.5 66.06 : 114.63
Fluorene	TM218	89.5 76.66 : 107.56	89.0 76.66 : 107.56
Indeno(123cd)pyrene	TM218	95.5 70.26 : 117.95	87.0 70.26 : 117.95
Naphthalene	TM218	88.5 74.70 : 101.83	93.5 74.70 : 101.83
Phenanthrene	TM218	88.5 73.62 : 109.34	93.5 73.62 : 109.34
Pyrene	TM218	89.0 71.46 : 117.00	93.5 71.46 : 117.00

PCBs by GCMS

Component	Method Code	QC 2635
PCB congener 101	TM168	95.5 65.66 : 110.06
PCB congener 105	TM168	85.7 58.10 : 106.34
PCB congener 114	TM168	90.3 59.38 : 106.48
PCB congener 118	TM168	92.8 60.02 : 106.23
PCB congener 123	TM168	90.1 65.01 : 99.81
PCB congener 126	TM168	88.5 59.31 : 109.23
PCB congener 138	TM168	91.4 63.95 : 107.63
PCB congener 153	TM168	93.0 62.65 : 108.85
PCB congener 156	TM168	92.2 61.69 : 112.27



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PCBs by GCMS

		QC 2635
PCB congener 157	TM168	86.3 55.37 : 104.81
PCB congener 167	TM168	93.2 65.58 : 109.14
PCB congener 169	TM168	93.0 56.84 : 112.10
PCB congener 180	TM168	92.1 66.99 : 111.63
PCB congener 189	TM168	87.8 57.75 : 112.59
PCB congener 28	TM168	97.7 65.82 : 104.46
PCB congener 52	TM168	94.7 67.24 : 107.62
PCB congener 77	TM168	88.3 64.87 : 108.49
PCB congener 81	TM168	104.0 61.93 : 107.41

pH

Component	Method Code	QC 2694	QC 2698	QC 2698	QC 2614
pH	TM133	100.44 96.92 : 102.20	99.27 96.92 : 102.20	99.27 96.92 : 102.20	100.29 96.92 : 102.20

pH Value of Filtered Water

Component	Method Code	QC 2616	QC 2667
pH	TM256	101.2 99.20 : 102.41	100.27 99.20 : 102.41

Phenols by HPLC (S)

Component	Method Code	QC 2655	QC 2673
2,3,5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	53.9 69.38 : 125.27	53.9 69.38 : 125.27
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	48.54 69.79 : 122.84	47.37 69.79 : 122.84
Cresols by HPLC (S)	TM062 (S)	51.77 77.98 : 111.41	50.31 77.98 : 111.41
Phenol by HPLC (S)	TM062 (S)	54.97 67.94 : 117.69	52.98 67.94 : 117.69
Xylenols by HPLC (S)	TM062 (S)	51.87 82.04 : 108.38	50.52 82.04 : 108.38

Phenols by HPLC (W)



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Superseded Report:

Phenols by HPLC (W)

Component	Method Code	QC 2638
2,3,5 Trimethyl-Phenol by HPLC (W)	TM259	105.47 76.00 : 124.00
2-Isopropyl Phenol by HPLC (W)	TM259	103.25 76.00 : 124.00
Cresols by HPLC (W)	TM259	105.92 76.00 : 124.00
Napthol by HPLC (W)	TM259	95.7 76.00 : 124.00
Phenol by HPLC (W)	TM259	102.08 76.00 : 124.00
Xylenols by HPLC (W)	TM259	104.43 76.00 : 124.00

Total Organic Carbon

Component	Method Code	QC 2699	QC 2680	QC 2690
Total Organic Carbon	TM132	106.64 86.33 : 116.80	104.3 86.33 : 116.80	101.17 86.33 : 116.80

VOC MS (S)

Component	Method Code	QC 2683	QC 2601	QC 2690
1,1,1,2-tetrachloroethane	TM116	99.4 84.84 : 116.25	98.2 86.59 : 118.97	100.2 84.84 : 116.25
1,1,1-Trichloroethane	TM116	104.0 85.52 : 113.22	101.8 86.26 : 117.53	105.2 85.52 : 113.22
1,1,2-Trichloroethane	TM116	100.6 77.12 : 116.04	93.0 75.16 : 112.70	95.2 77.12 : 116.04
1,1-Dichloroethane	TM116	117.6 74.46 : 129.15	108.8 87.14 : 128.34	111.2 74.46 : 129.15
1,2-Dichloroethane	TM116	112.8 92.38 : 131.65	107.4 89.30 : 133.10	111.2 92.38 : 131.65
1,4-Dichlorobenzene	TM116	106.0 76.78 : 122.98	98.4 82.59 : 123.23	91.8 76.78 : 122.98
2-Chlorotoluene	TM116	103.8 68.55 : 109.58	96.4 66.81 : 118.43	87.0 68.55 : 109.58
4-Chlorotoluene	TM116	97.6 66.29 : 107.51	90.8 65.88 : 114.76	83.0 66.29 : 107.51
Benzene	TM116	110.0 88.60 : 113.80	103.0 93.16 : 123.63	103.2 88.60 : 113.80
Carbon Disulphide	TM116	98.8 74.91 : 122.14	94.6 75.11 : 124.81	92.4 74.91 : 122.14
Carbontetrachloride	TM116	105.0 80.31 : 124.50	103.6 82.06 : 121.42	105.0 80.31 : 124.50
Chlorobenzene	TM116	101.8 83.81 : 114.18	99.0 85.07 : 118.13	98.8 83.81 : 114.18
Chloroform	TM116	114.0 87.40 : 122.49	106.4 88.13 : 122.71	111.8 87.40 : 122.49
Chloromethane	TM116	106.2 63.11 : 124.36	108.0 61.62 : 145.66	102.6 63.11 : 124.36



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Superseded Report:

VOC MS (S)

		QC 2683	QC 2601	QC 2690
Cis-1,2-Dichloroethene	TM116	110.6 80.67 : 126.72	106.6 88.41 : 121.33	106.4 80.67 : 126.72
Dibromomethane	TM116	101.8 73.23 : 118.35	95.8 77.47 : 121.29	96.4 73.23 : 118.35
Dichloromethane	TM116	123.0 81.11 : 133.25	115.0 87.89 : 134.72	118.4 81.11 : 133.25
Ethylbenzene	TM116	98.0 75.92 : 110.41	95.0 76.29 : 106.31	86.2 75.92 : 110.41
Hexachlorobutadiene	TM116	91.2 12.82 : 152.73	95.4 16.78 : 153.29	36.0 12.82 : 152.73
Isopropylbenzene	TM116	95.0 54.30 : 105.91	95.0 59.16 : 110.07	68.8 54.30 : 105.91
Naphthalene	TM116	104.6 80.86 : 128.81	102.2 79.29 : 125.59	100.2 80.86 : 128.81
o-Xylene	TM116	93.6 69.99 : 108.74	92.2 72.86 : 102.10	82.8 69.99 : 108.74
p/m-Xylene	TM116	93.0 68.32 : 108.91	91.7 68.99 : 102.40	81.3 68.32 : 108.91
Sec-Butylbenzene	TM116	103.8 38.50 : 101.50	109.2 44.71 : 117.87	55.2 38.50 : 101.50
Tetrachloroethene	TM116	99.6 76.95 : 121.02	102.8 77.82 : 125.00	92.8 76.95 : 121.02
Toluene	TM116	99.2 74.24 : 107.42	93.8 87.82 : 116.21	93.2 74.24 : 107.42
Trichloroethene	TM116	97.4 85.28 : 109.36	92.8 79.80 : 112.33	97.0 85.28 : 109.36
Trichlorofluoromethane	TM116	105.0 81.46 : 120.52	104.6 80.52 : 132.12	107.2 81.46 : 120.52
Vinyl Chloride	TM116	106.8 68.02 : 143.37	103.0 74.57 : 146.88	102.6 68.02 : 143.37

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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Validated

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Location: Hill Top Farm

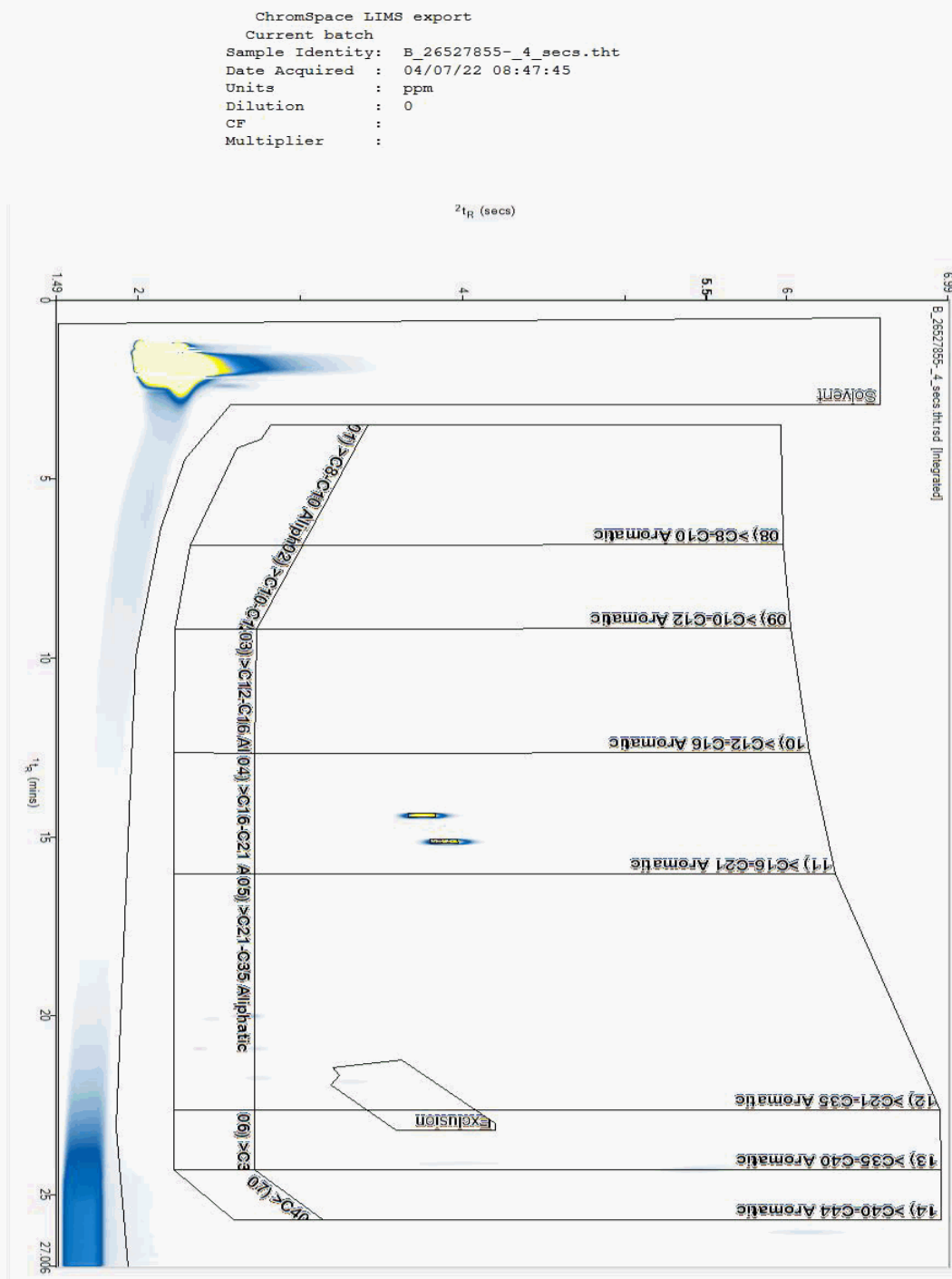
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26527855
Sample ID : BH104

Depth : 2.40 - 2.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

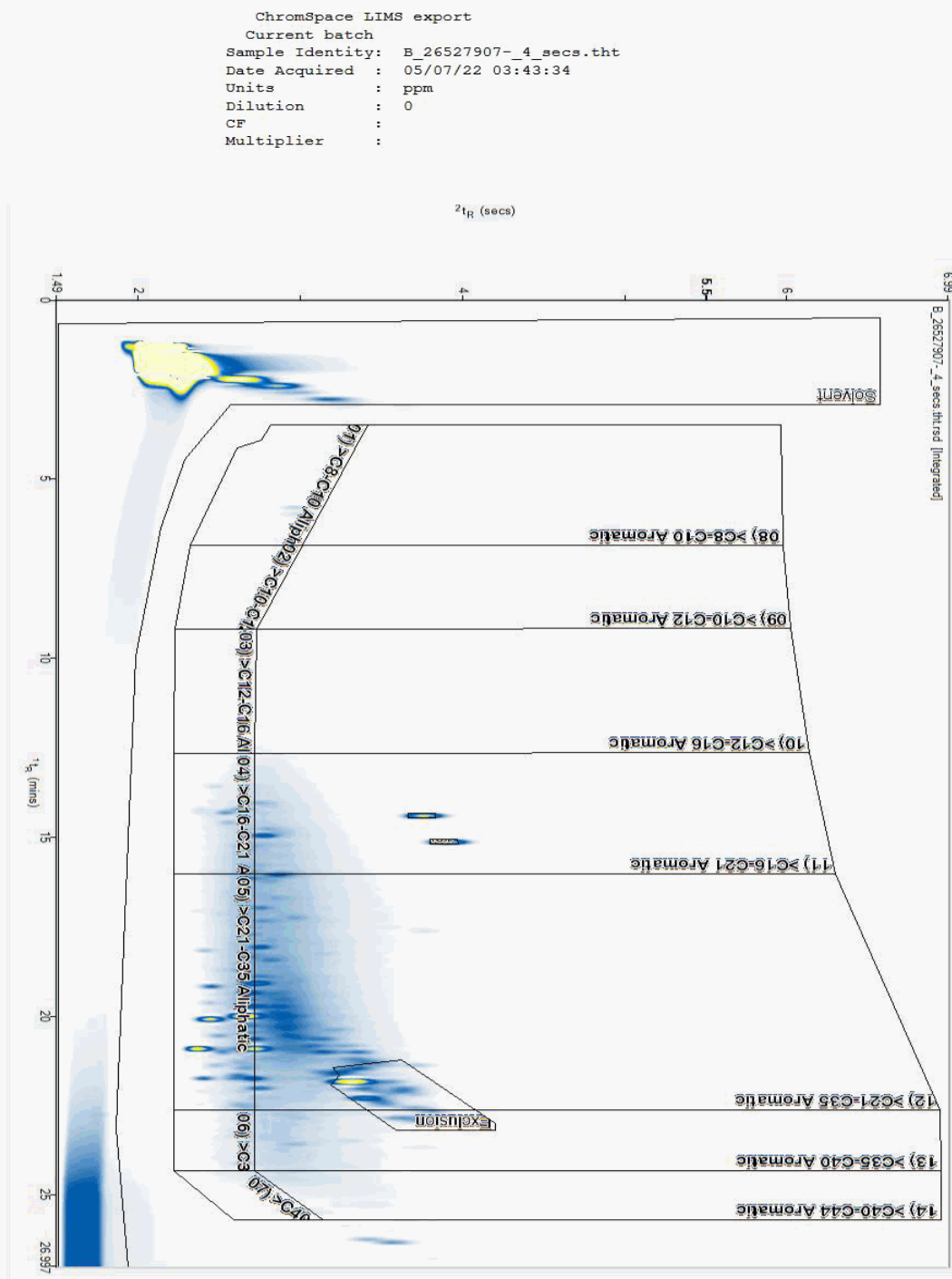
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26527907
Sample ID : HP105

Depth : 0.10 - 0.20





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

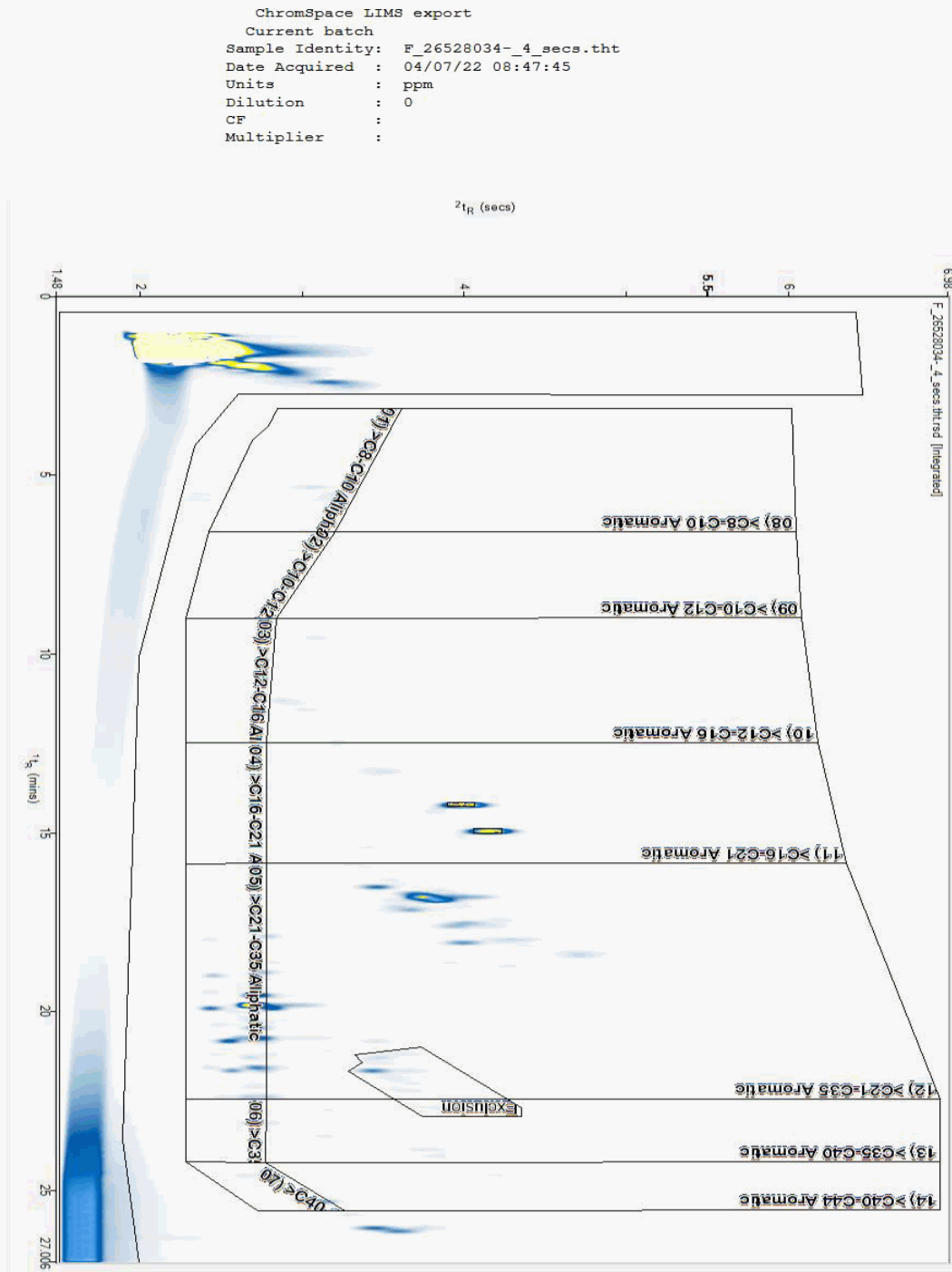
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26528034
Sample ID : HP107

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

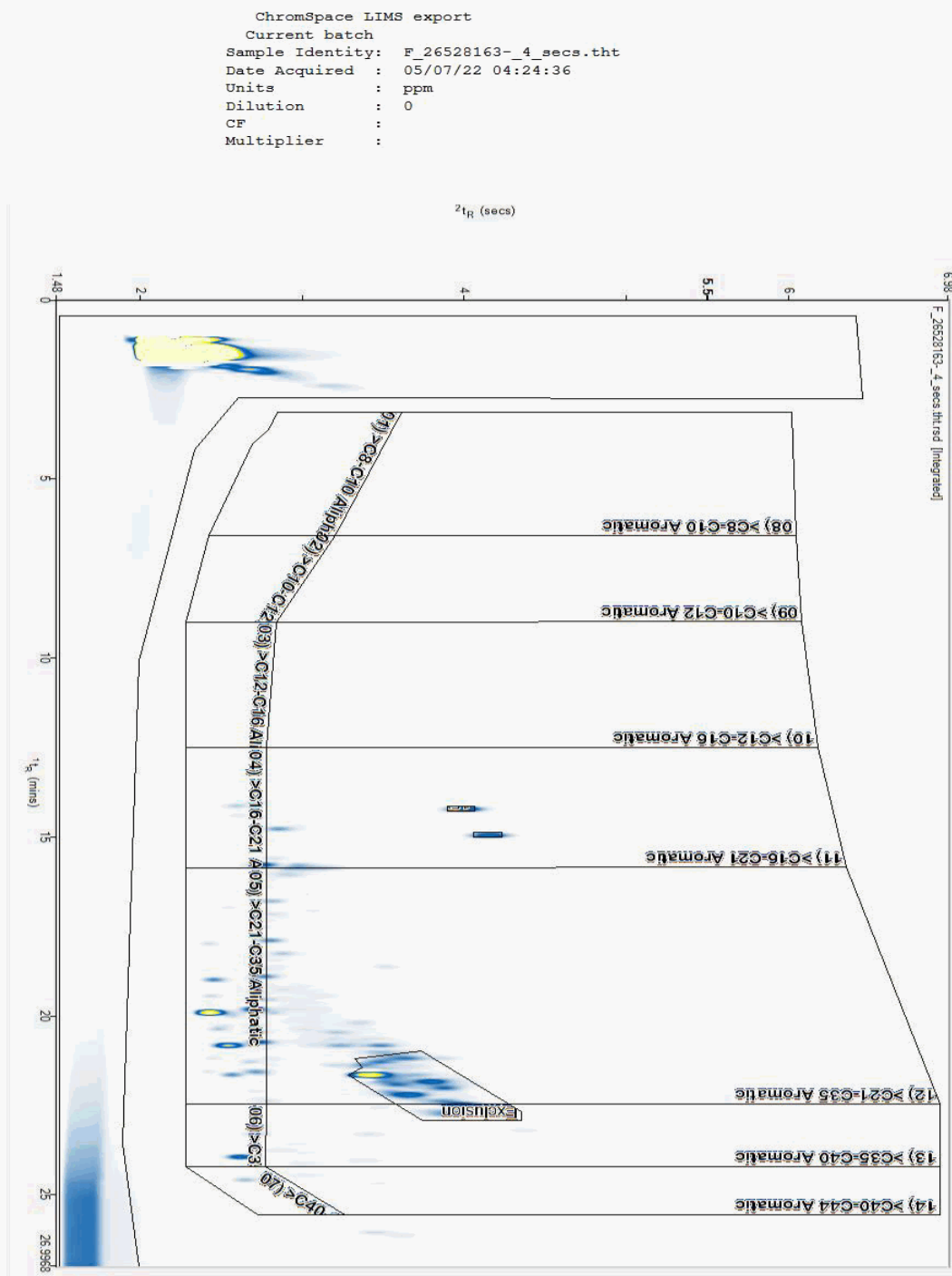
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26528163
Sample ID : HP106

Depth : 0.20 - 0.30



SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

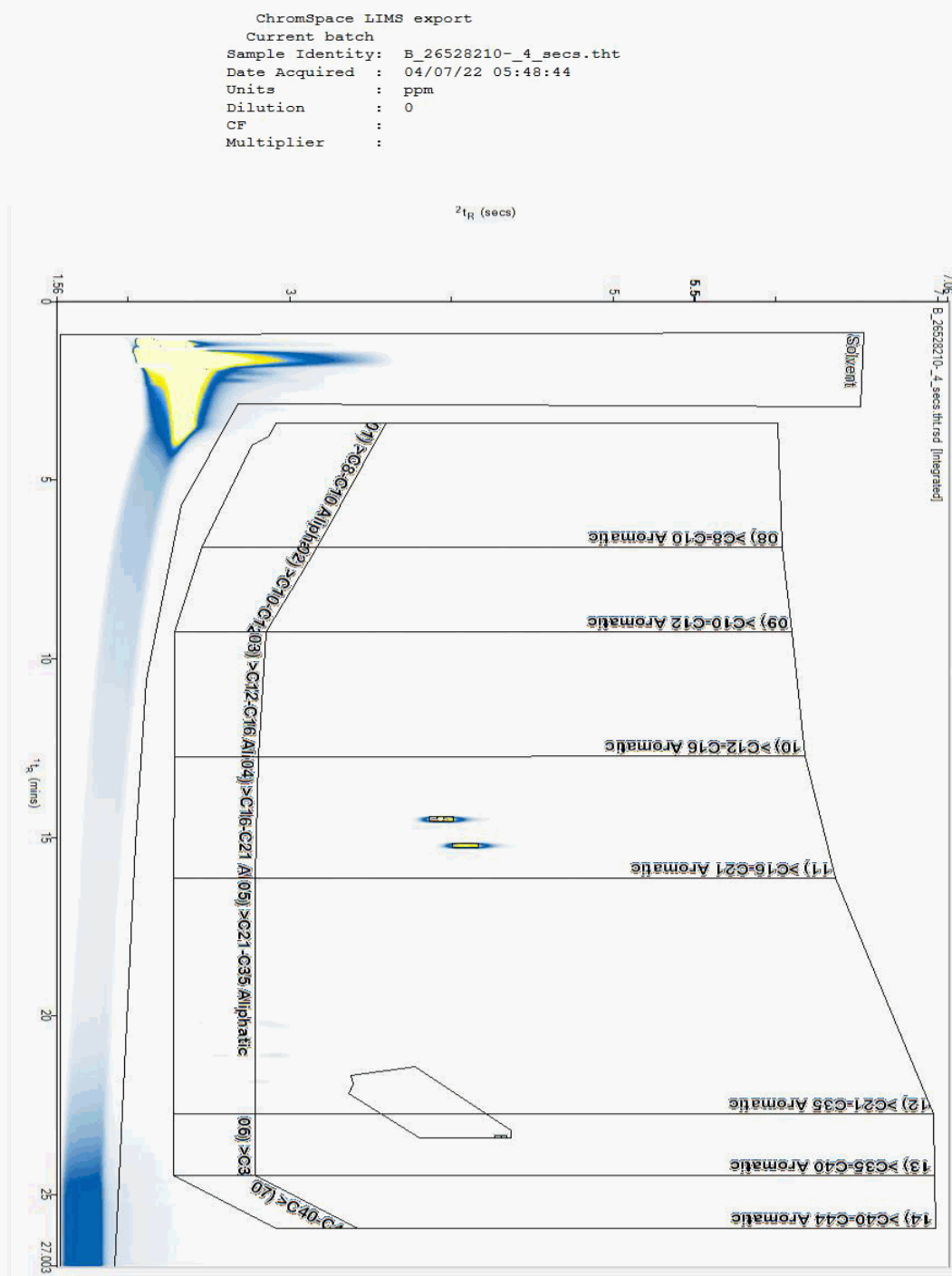
Superseded Report:

Chromatogram

Analysis: EPH CWG GC (S)

Sample No : 26528210
Sample ID : BH104

Depth : 4.00 - 4.00





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

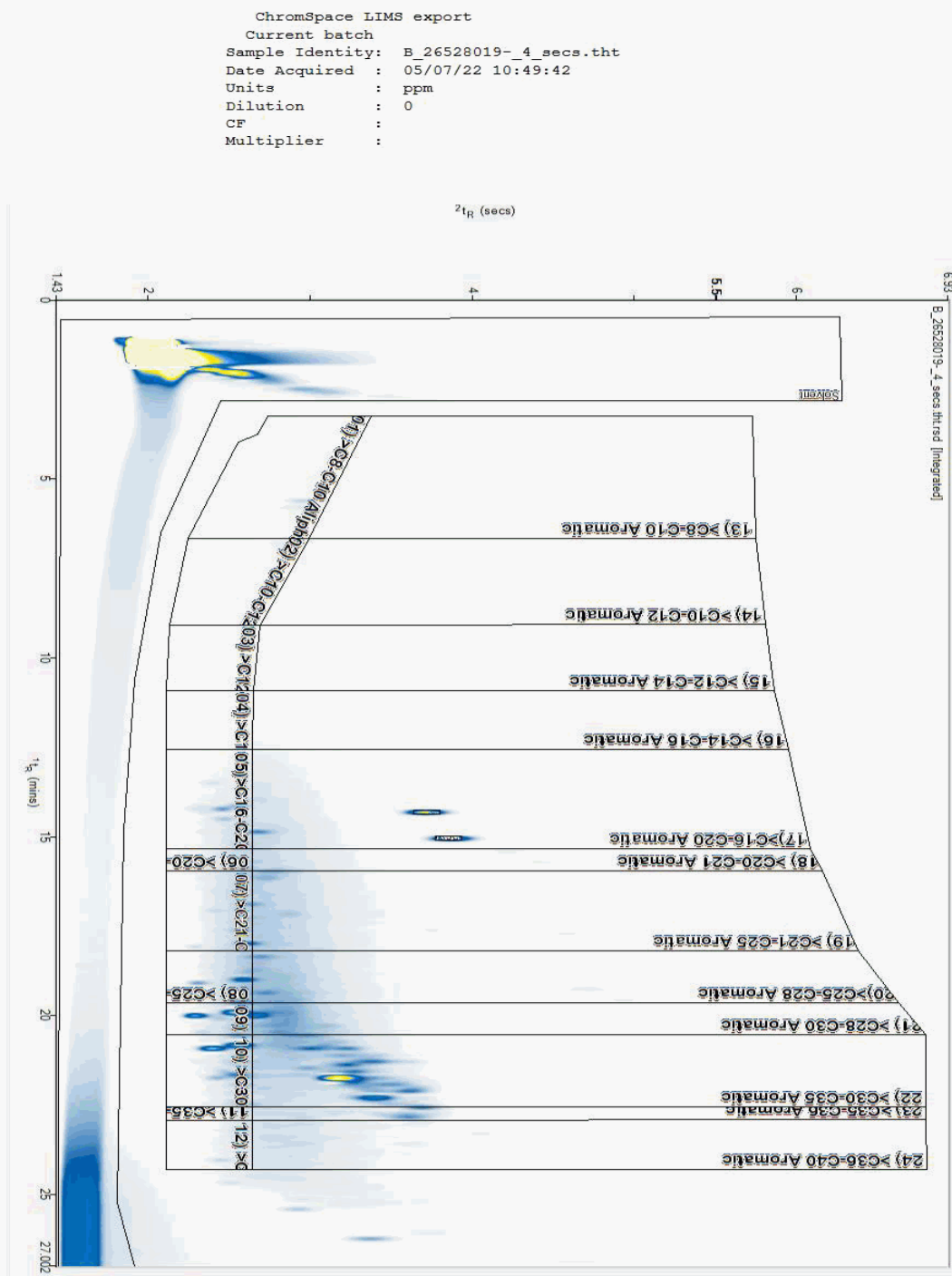
Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 26528019
Sample ID : HP105

Depth : 0.10 - 0.20



SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

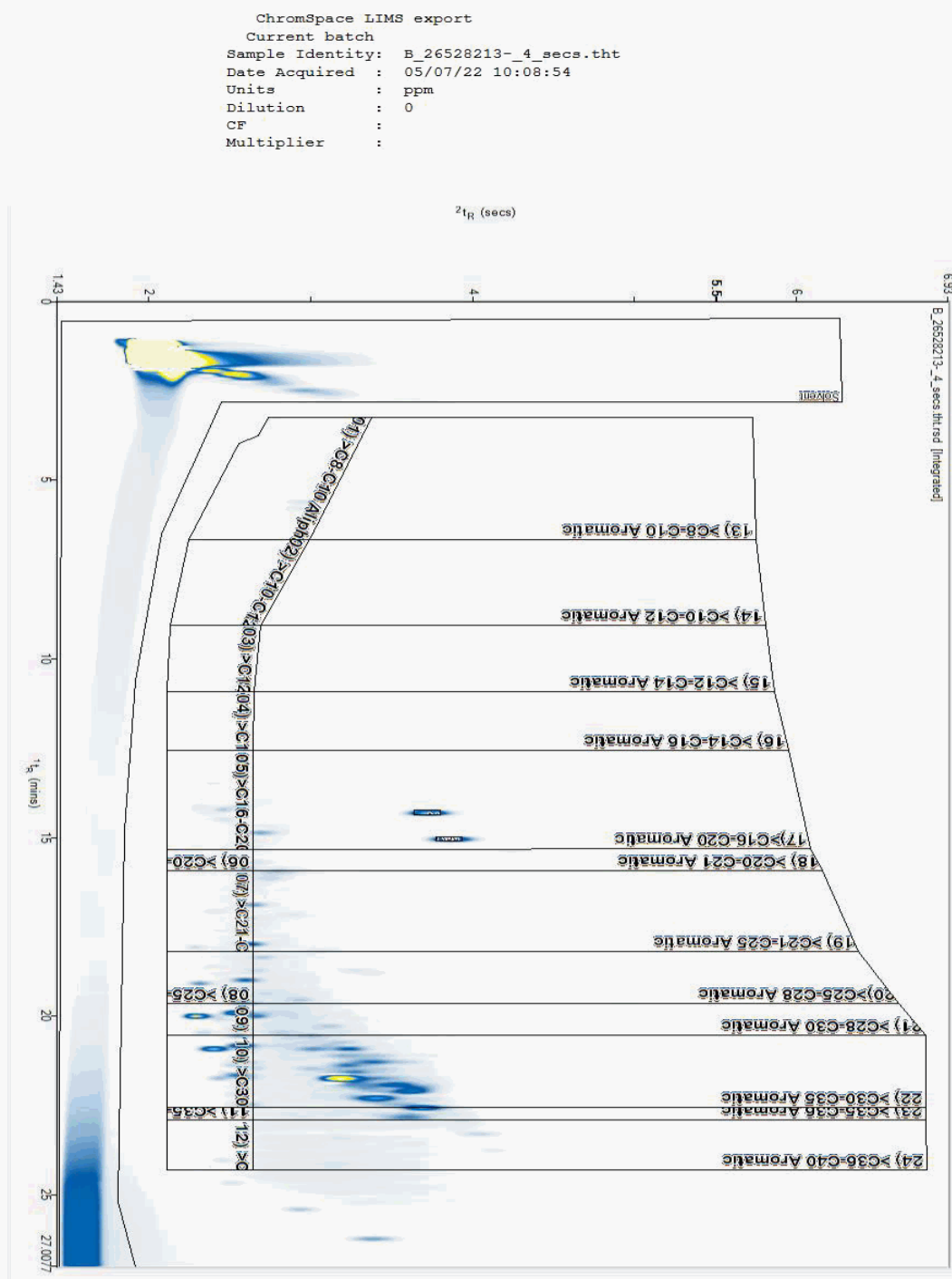
Superseded Report:

Chromatogram

Analysis: EPH by GCxGC-FID

Sample No : 26528213
Sample ID : HP106

Depth : 0.20 - 0.30





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

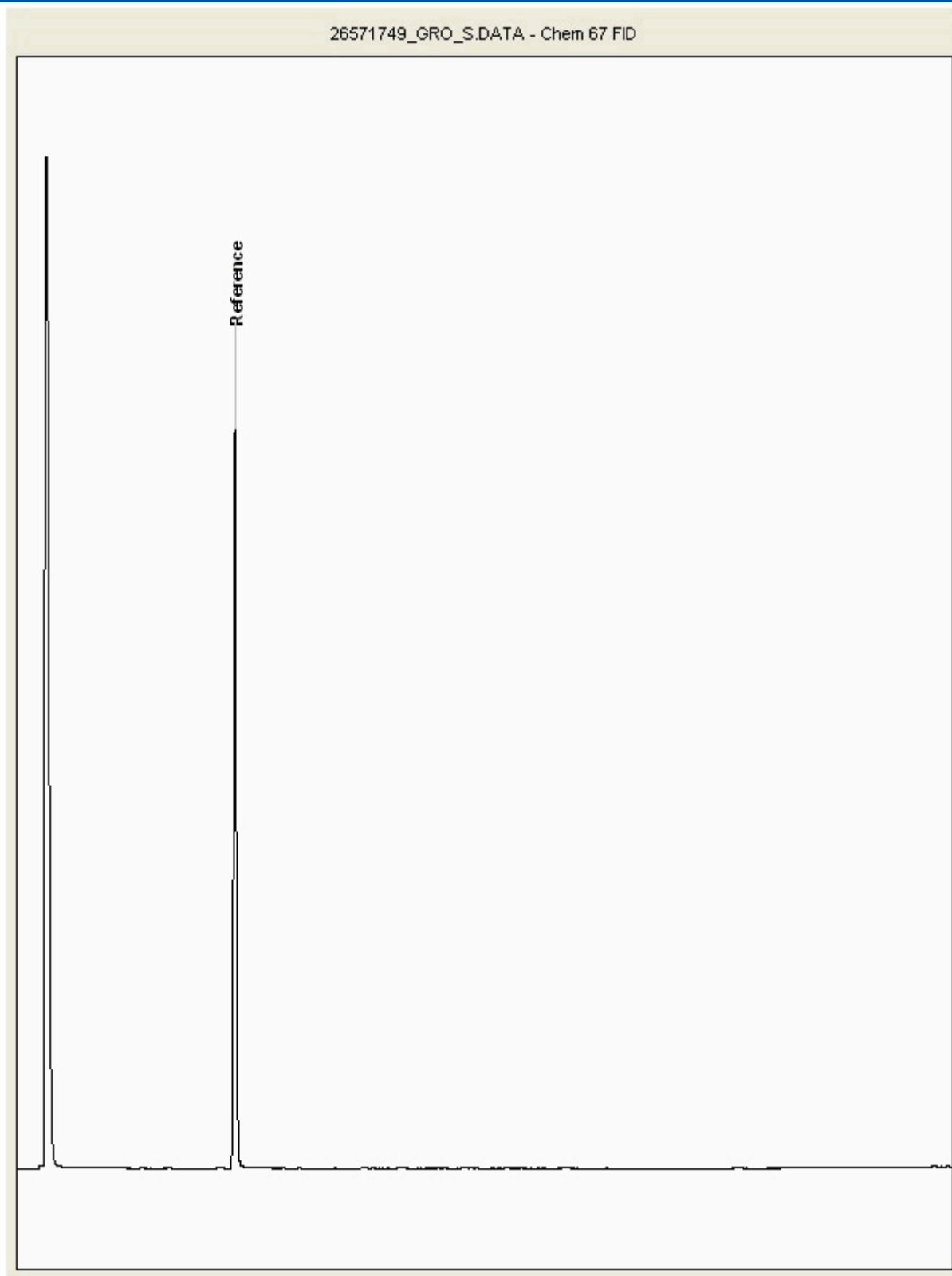
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26571749
Sample ID : BH104

Depth : 4.00 - 4.00

26571749_GRO_S.DATA - Chem 67 FID





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

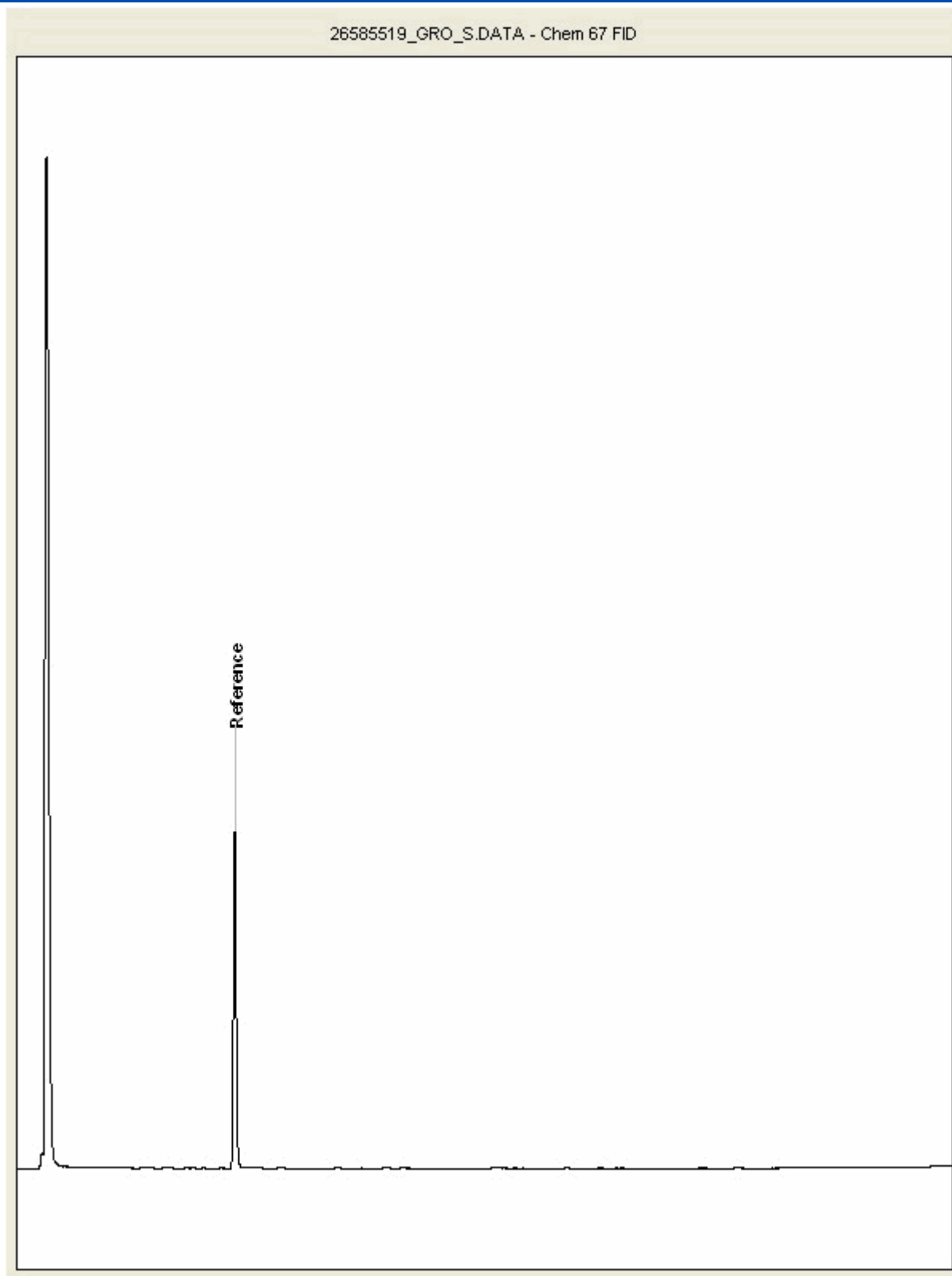
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26585519
Sample ID : HP105

Depth : 0.10 - 0.20





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

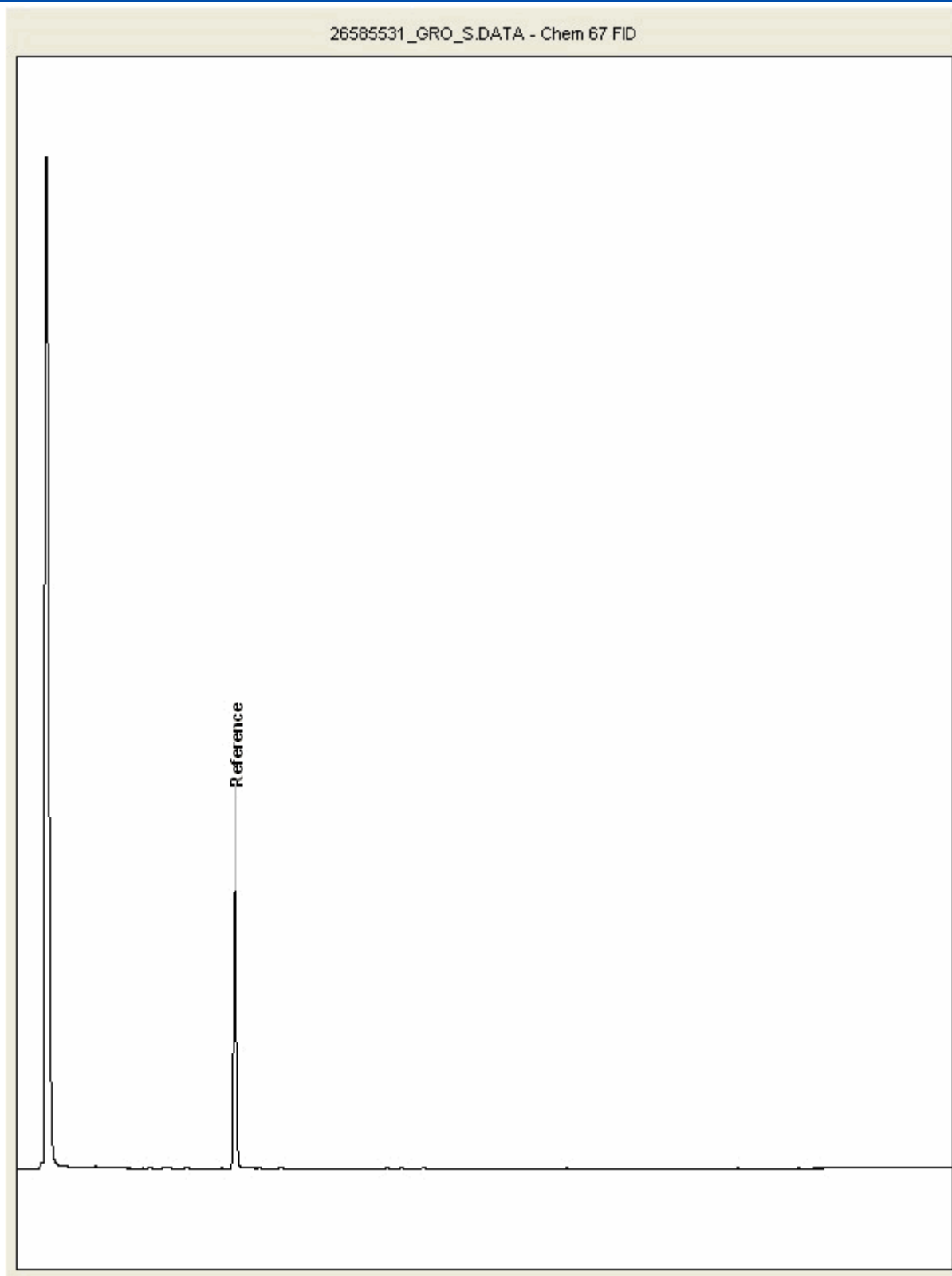
Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26585531
Sample ID : HP106

Depth : 0.20 - 0.30

26585531_GRO_S.DATA - Chem 67 FID





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

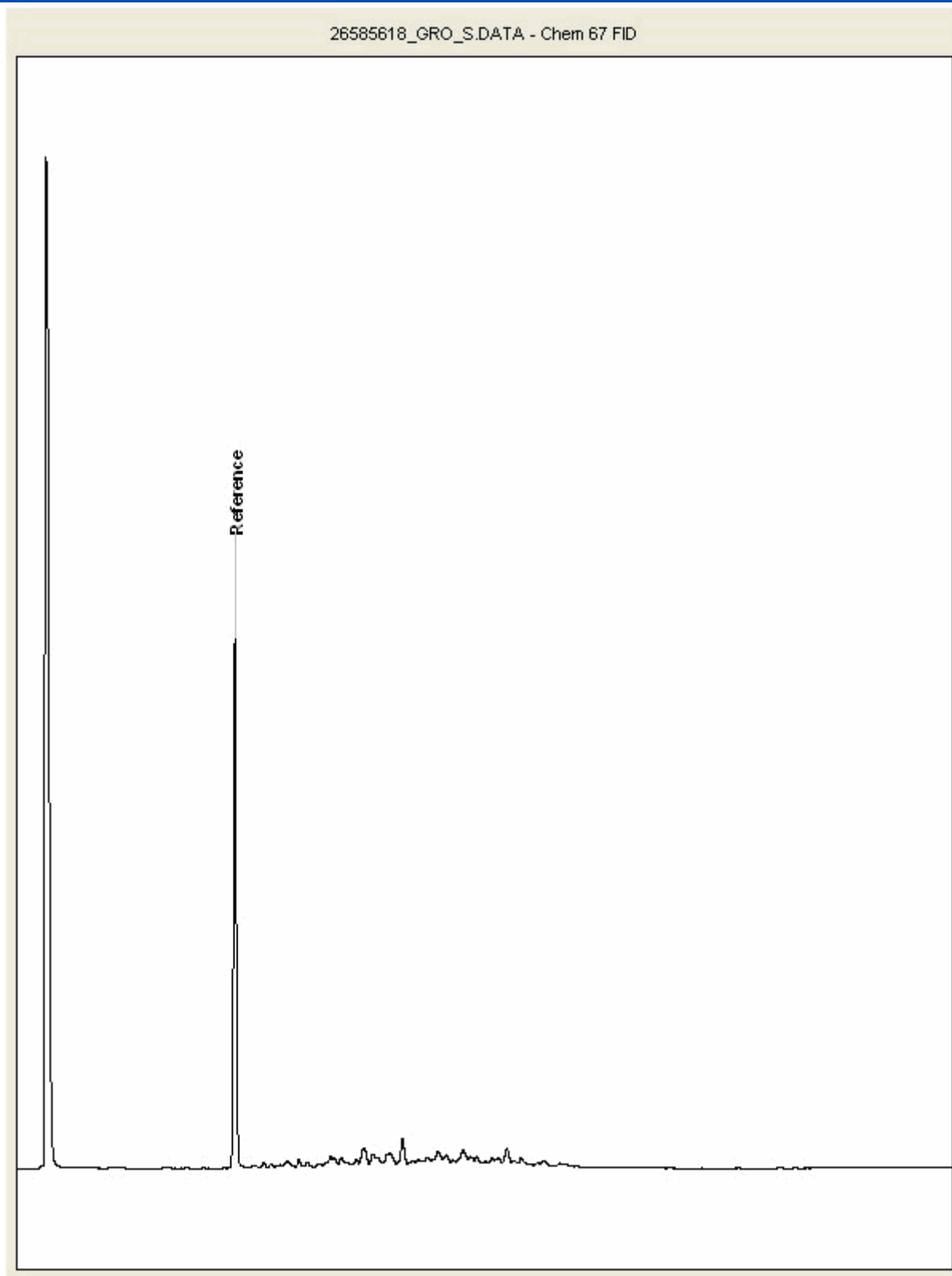
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26585618
Sample ID : BH104

Depth : 2.40 - 2.50





CERTIFICATE OF ANALYSIS

Validated

SDG: 220701-28
Client Ref.: 10056074

Report Number: 654418
Location: Hill Top Farm

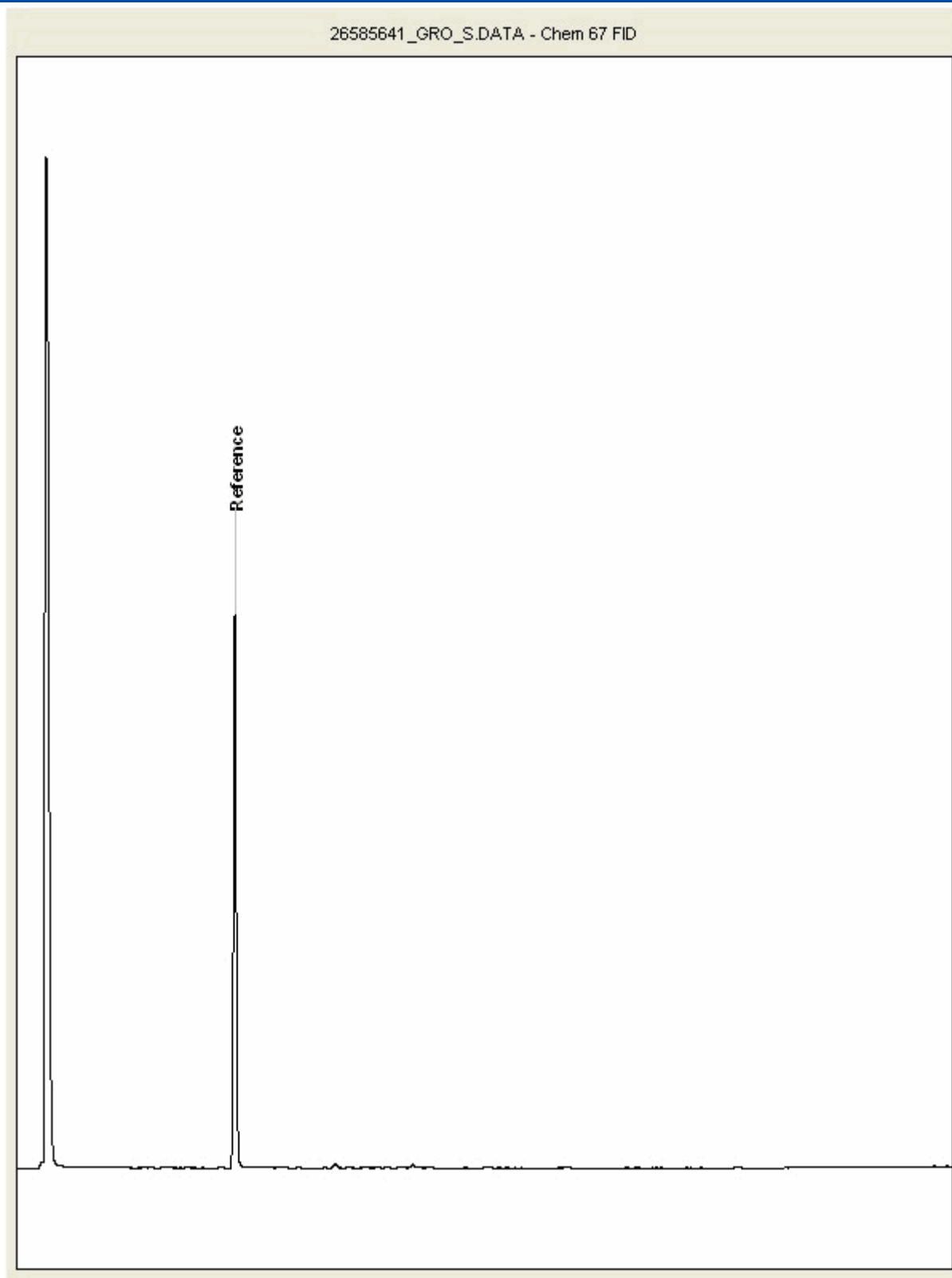
Superseded Report:

Chromatogram

Analysis: GRO by GC-FID (S)

Sample No : 26585641
Sample ID : HP107

Depth : 0.30 - 0.30





CERTIFICATE OF ANALYSIS

SDG: 220701-28
Client Ref: 10056074

Report Number: 654418
Location: Hill Top Farm

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Units 7-8 Hawarden Business Park
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Deeside
CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

ARCADIS UK Ltd
Suite 1A
4 Piccadilly Place
Manchester
M1 3BN

Attention: Daniel Russon

CERTIFICATE OF ANALYSIS

Date of report Generation: 24 August 2022
Customer: ARCADIS UK Ltd
Sample Delivery Group (SDG): 220804-61
Your Reference: 10056074
Location: HILLTOP FARM, EARL SHILTON
Report No: 658714
Order Number: 10056074

This report has been revised and directly supersedes 657159 in its entirety.

We received 6 samples on Thursday August 04, 2022 and 6 of these samples were scheduled for analysis which was completed on Tuesday August 23, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager



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CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26682978	BH101		1.10	03/08/2022
26682979	BH102		1.30	03/08/2022
26682980	BH103		2.90	03/08/2022
26682983	BH104			03/08/2022
26682995	BH105		4.00	03/08/2022
26682996	BH106			03/08/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



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Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Results Legend X Test N No Determination Possible Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)		Customer Sample Reference		AGS Reference		Depth (m)		Container										Sample Type	
	26682995		BH105				4.00		0.5l glass bottle (ALE227)										GW	
	26682983		BH104						Via (ALE297)										GW	
	26682980		BH103				2.90		Via (ALE297)										GW	
	26682979		BH102				1.30		Via (ALE297)										GW	
	26682978		BH101				1.10		Via (ALE297)										GW	
									0.5l glass bottle (ALE227)										GW	
Anions by Kone (w)	All	NDPs: 0 Tests: 6																		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 6																		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 6																		
EPH CWG (Aliphatic) Aqueous GC (W)	All	NDPs: 0 Tests: 6																		
EPH CWG (Aromatic) Aqueous GC (W)	All	NDPs: 0 Tests: 6																		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 6																		
Hexavalent Chromium (w)	All	NDPs: 0 Tests: 6																		
Mercury Dissolved	All	NDPs: 0 Tests: 6																		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 6																		
pH Value	All	NDPs: 0 Tests: 6																		
TPH CWG (W)	All	NDPs: 0 Tests: 6																		
VOC MS (W)	All	NDPs: 0 Tests: 6																		

[illegible]

CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714

Superseded Report: 657159

Location: HILLTOP FARM, EARL SHILTON

VOC MS (W)

[illegible]



CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Table of Results - Appendix

Method No	Reference	Description
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM241	Methods for the Examination of Waters and Associated Materials; Chromium in Raw and Potable Waters and Sewage Effluents 1980.	The Determination of Hexavalent Chromium in Waters and Leachates using the Kone Analyser
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Test Completion Dates

Lab Sample No(s)	26682978	26682979	26682980	26682983	26682995	26682996
Customer Sample Ref.	BH101	BH102	BH103	BH104	BH105	BH106
AGS Ref.						
Depth	1.10	1.30	2.90		4.00	
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Anions by Kone (w)	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022
Cyanide Comp/Free/Total/Thiocyanate	10-Aug-2022	10-Aug-2022	10-Aug-2022	10-Aug-2022	10-Aug-2022	10-Aug-2022
Dissolved Metals by ICP-MS	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022
EPH CWG (Aliphatic) Aqueous GC (W)	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022	23-Aug-2022	11-Aug-2022
EPH CWG (Aromatic) Aqueous GC (W)	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022	23-Aug-2022	11-Aug-2022
GRO by GC-FID (W)	08-Aug-2022	09-Aug-2022	09-Aug-2022	08-Aug-2022	08-Aug-2022	08-Aug-2022
Hexavalent Chromium (w)	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022
Mercury Dissolved	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022
PAH Spec MS - Aqueous (W)	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022
pH Value	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022
TPH CWG (W)	11-Aug-2022	11-Aug-2022	11-Aug-2022	11-Aug-2022	23-Aug-2022	11-Aug-2022
VOC MS (W)	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022	09-Aug-2022



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SDG: 220804-61
Client Ref.: 10056074Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

ASSOCIATED AQC DATA

Anions by Kone (w)

Component	Method Code	QC 2686
Chloride	TM184	108.0 97.18 : 113.20
Sulphate (soluble)	TM184	102.0 96.54 : 111.66

Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2627
Free Cyanide (W)	TM227	80.25 80.33 : 126.33
Thiocyanate (W)	TM227	104.5 87.50 : 116.00
Total Cyanide (W)	TM227	103.75 83.75 : 121.25

Dissolved Metals by ICP-MS

Component	Method Code	QC 2669
Aluminium	TM152	103.0 90.98 : 111.82
Antimony	TM152	106.33 90.44 : 113.04
Arsenic	TM152	105.83 94.33 : 107.73
Barium	TM152	103.83 90.20 : 111.19
Beryllium	TM152	101.83 87.77 : 113.97
Bismuth	TM152	105.17 91.90 : 112.20
Borate	TM152	101.85 88.00 : 112.00
Boron	TM152	101.67 92.27 : 112.40
Cadmium	TM152	104.83 94.93 : 106.93
Calcium	TM152	102.67 95.83 : 105.97
Chromium	TM152	102.67 91.84 : 108.67
Cobalt	TM152	103.5 90.72 : 109.61
Copper	TM152	105.67 94.47 : 109.05
Iron	TM152	103.33 94.40 : 107.90
Lead	TM152	104.5 93.55 : 109.46
Lithium	TM152	102.0 91.62 : 113.12



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SDG: 220804-61
Client Ref.: 10056074Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Dissolved Metals by ICP-MS

		QC 2669
Magnesium	TM152	102.67 91.64 : 107.43
Manganese	TM152	104.0 94.75 : 108.21
Molybdenum	TM152	104.17 93.77 : 103.54
Nickel	TM152	104.67 93.65 : 106.90
Phosphorus	TM152	103.83 92.51 : 109.27
Potassium	TM152	103.33 92.16 : 109.93
Selenium	TM152	101.5 91.58 : 115.98
Silver	TM152	106.17 96.03 : 105.53
Sodium	TM152	102.0 89.47 : 109.62
Strontium	TM152	103.33 95.67 : 106.20
Tellurium	TM152	104.83 93.32 : 114.66
Thallium	TM152	95.17 88.00 : 112.00
Tin	TM152	105.5 92.63 : 109.70
Titanium	TM152	102.17 95.08 : 109.28
Tungsten	TM152	101.83 94.68 : 107.68
Uranium	TM152	103.33 93.63 : 105.43
Vanadium	TM152	99.83 88.00 : 112.00
Zinc	TM152	105.67 95.31 : 110.74

EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 2662	QC 2674
Total Aliphatics >C10-C40	TM174	107.26 65.58 : 141.57	110.56 65.58 : 141.57

EPH CWG (Aromatic) Aqueous GC (W)



CERTIFICATE OF ANALYSIS

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SDG: 220804-61
Client Ref.: 10056074Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 2673	QC 2680
Total Aromatics >EC10-EC40	TM174	77.56 60.75 : 129.09	90.98 60.75 : 129.09

GRO by GC-FID (W)

Component	Method Code	QC 2617	QC 2638	QC 2654
Benzene by GC	TM245	90.0 79.13 : 118.84	91.5 81.54 : 119.70	103.0 81.54 : 119.70
Ethylbenzene by GC	TM245	93.5 79.54 : 115.99	94.0 80.99 : 121.09	103.0 80.99 : 121.09
m & p Xylene by GC	TM245	93.75 78.44 : 116.32	94.5 82.77 : 123.19	103.5 82.77 : 123.19
MTBE GC-FID	TM245	87.5 81.43 : 120.09	89.0 80.06 : 123.27	101.0 80.06 : 123.27
o Xylene by GC	TM245	94.0 76.85 : 120.29	95.0 84.26 : 121.50	104.0 84.26 : 121.50
QC	TM245	73.27 59.97 : 121.29	61.02 54.34 : 130.48	72.09 54.34 : 130.48
Toluene by GC	TM245	92.5 79.00 : 121.96	93.5 82.78 : 121.99	103.5 82.78 : 121.99

Hexavalent Chromium (w)

Component	Method Code	QC 2684
Hexavalent Chromium	TM241	97.0 94.17 : 106.17

Mercury Dissolved

Component	Method Code	QC 2691
Mercury Dissolved (CVAf)	TM183	84.2 69.30 : 128.70

PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2682	QC 2623
Acenaphthene by GCMS	TM178	107.6 100.00 : 119.20	106.0 98.40 : 117.60
Acenaphthylene by GCMS	TM178	107.2 95.20 : 119.20	105.2 96.80 : 118.40
Anthracene by GCMS	TM178	107.2 91.60 : 113.20	104.0 94.40 : 116.00
Benz(a)anthracene by GCMS	TM178	106.8 90.40 : 119.20	99.6 92.80 : 116.80



CERTIFICATE OF ANALYSIS

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SDG: 220804-61
Client Ref.: 10056074Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

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PAH Spec MS - Aqueous (W)

		QC 2682	QC 2623
Benzo(a)pyrene by GCMS	TM178	106.0 92.80 : 119.20	100.8 89.43 : 118.57
Benzo(b)fluoranthene by GCMS	TM178	99.6 89.60 : 120.80	98.8 87.80 : 121.80
Benzo(ghi)perylene by GCMS	TM178	99.2 93.20 : 117.20	99.6 92.00 : 116.00
Benzo(k)fluoranthene by GCMS	TM178	104.0 96.40 : 120.40	100.8 88.72 : 111.28
Chrysene by GCMS	TM178	104.0 96.40 : 125.20	103.2 88.68 : 116.92
Dibenzo(ah)anthracene by GCMS	TM178	100.0 92.00 : 113.60	100.0 86.24 : 118.56
Fluoranthene by GCMS	TM178	108.0 91.20 : 117.60	102.4 91.20 : 117.60
Fluorene by GCMS	TM178	109.6 95.60 : 122.00	105.2 90.76 : 121.24
Indeno(123cd)pyrene by GCMS	TM178	108.4 90.40 : 112.00	96.8 88.39 : 119.61
Naphthalene by GCMS	TM178	116.8 98.00 : 122.00	108.8 98.00 : 119.60
Phenanthrene by GCMS	TM178	109.2 94.00 : 120.40	102.0 96.00 : 117.60
Pyrene by GCMS	TM178	106.4 92.40 : 118.80	104.0 91.00 : 120.20

pH Value

Component	Method Code	QC 2660	QC 2663
pH	TM256	100.53 99.20 : 102.41	100.53 99.20 : 102.41

VOC MS (W)

Component	Method Code	QC 2637
1,1,1,2-Tetrachloroethane	TM208	108.5 87.33 : 109.74
1,1,1-Trichloroethane	TM208	103.5 84.96 : 115.65
1,1-Dichloroethane	TM208	110.5 79.60 : 118.57
1,2-Dichloroethane	TM208	102.0 77.72 : 133.33
2-Chlorotoluene	TM208	108.0 82.89 : 116.61
4-Chlorotoluene	TM208	111.0 79.46 : 115.88
Benzene	TM208	105.0 88.14 : 120.48
Bromomethane	TM208	108.0 79.31 : 116.90



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SDG: 220804-61
Client Ref.: 10056074Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

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VOC MS (W)

		QC 2637
Carbontetrachloride	TM208	102.5 86.16 : 119.10
Chlorobenzene	TM208	112.0 89.56 : 113.29
Chloroform	TM208	106.0 83.01 : 121.64
Chloromethane	TM208	104.5 71.84 : 134.90
Cis-1,2-Dichloroethene	TM208	109.0 86.31 : 117.30
Dichloromethane	TM208	111.5 78.23 : 120.65
Ethylbenzene	TM208	105.0 79.55 : 110.51
Hexachlorobutadiene	TM208	109.0 68.58 : 117.78
o-Xylene	TM208	105.0 85.06 : 114.91
p/m-Xylene	TM208	104.25 85.78 : 109.72
Tert-butyl methyl ether	TM208	113.0 68.39 : 125.81
Tetrachloroethene	TM208	102.0 82.09 : 113.14
Toluene	TM208	104.5 79.88 : 116.83
Trichloroethene	TM208	97.5 82.30 : 112.45
Vinyl Chloride	TM208	107.5 71.34 : 122.34

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



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Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

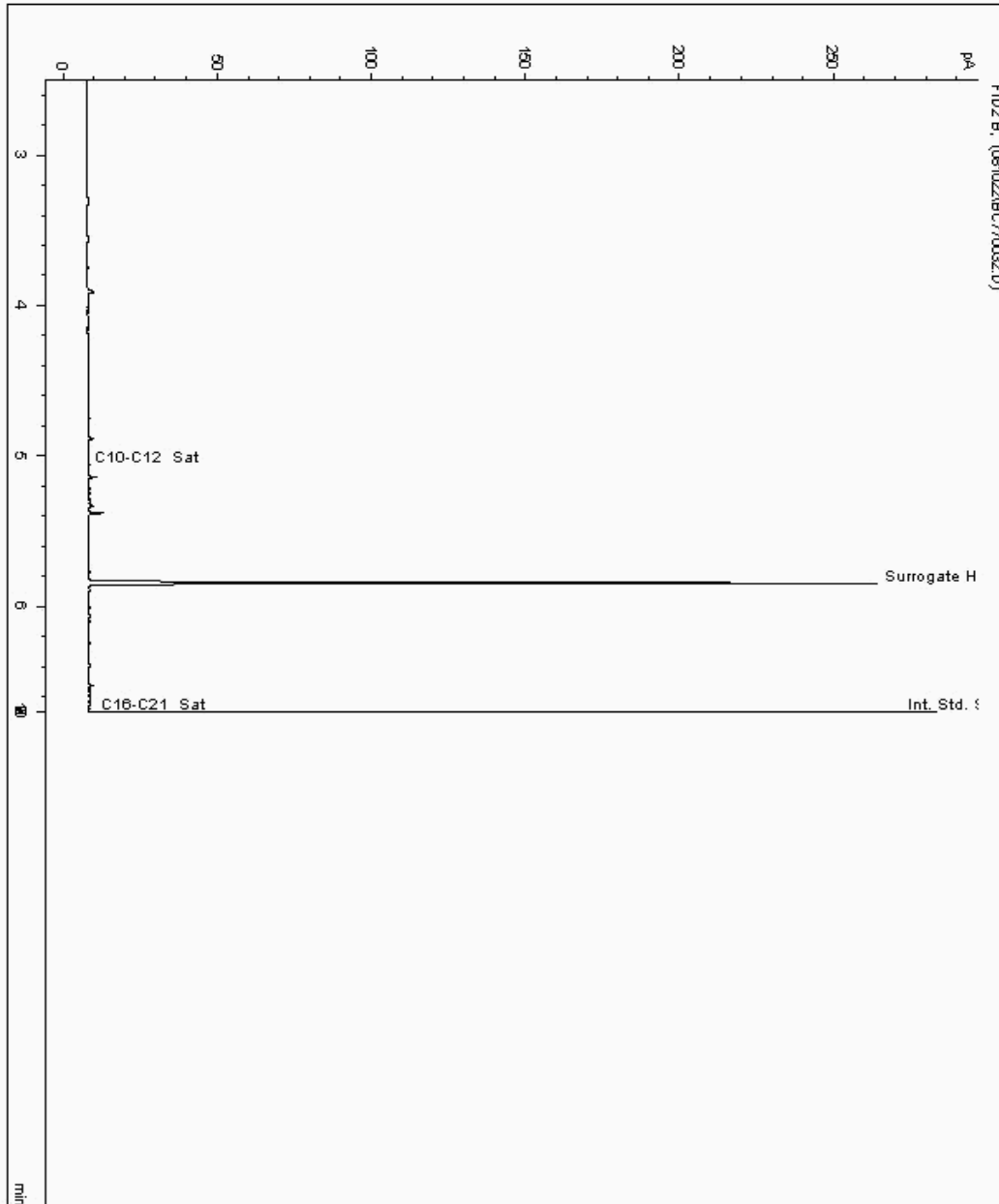
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26698908
Sample ID : BH104

Depth :

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876505-
Date Acquired : 8/11/2022 2:04:32 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

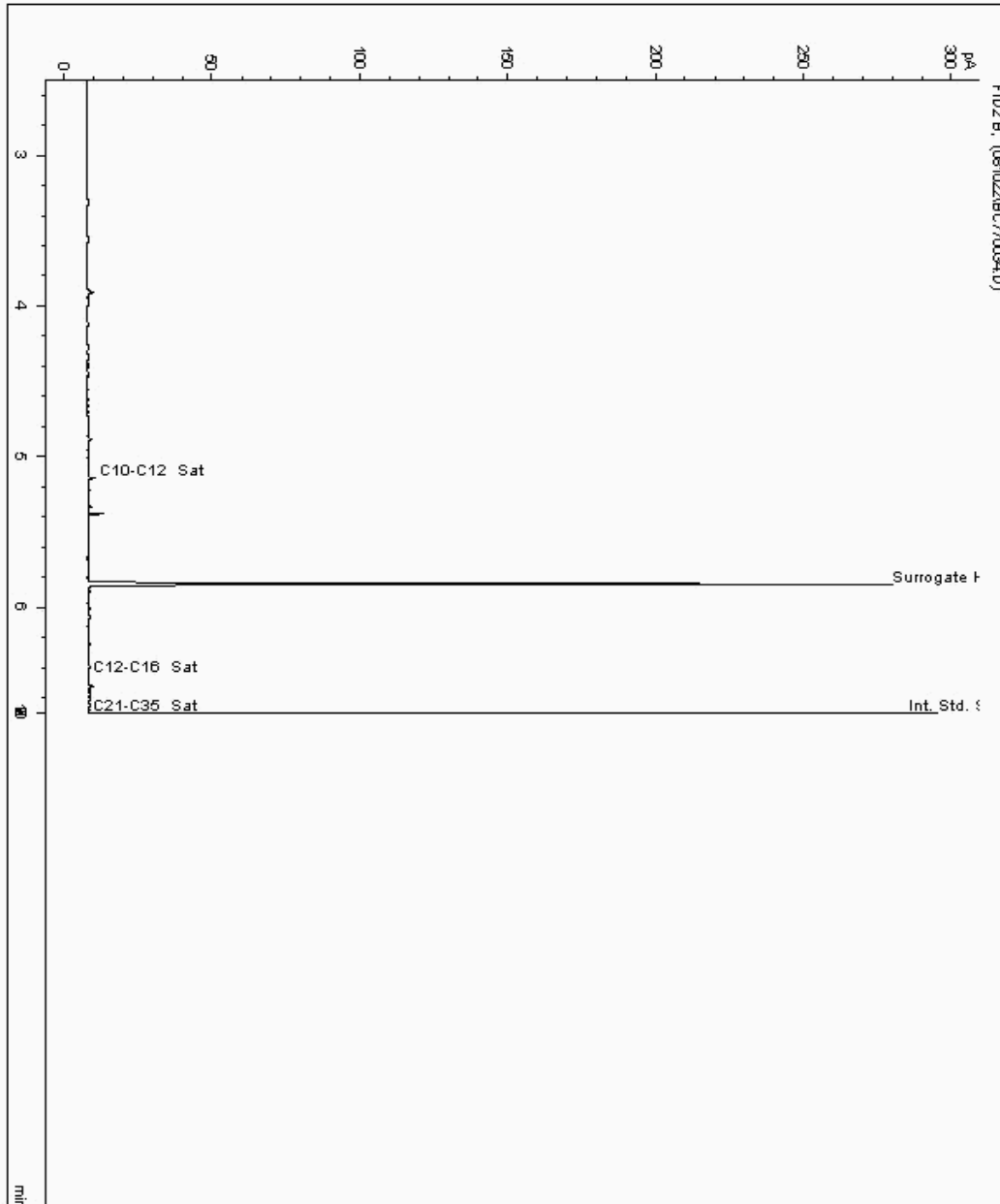
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26698911
Sample ID : BH101

Depth : 1.10

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876449-
Date Acquired : 8/11/2022 2:53:51 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

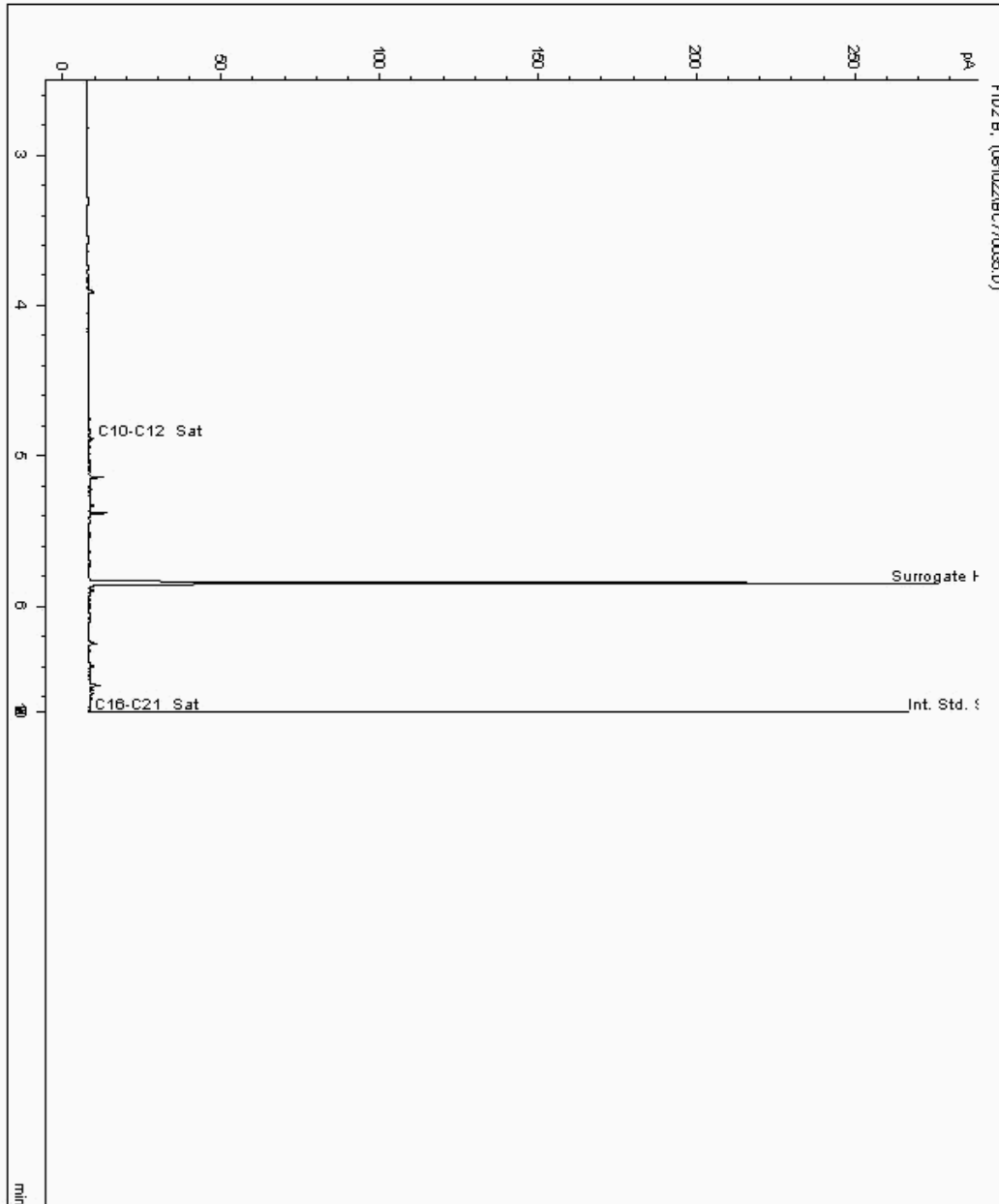
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26698913
Sample ID : BH103

Depth : 2.90

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876491-
Date Acquired : 8/11/2022 3:19:01 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

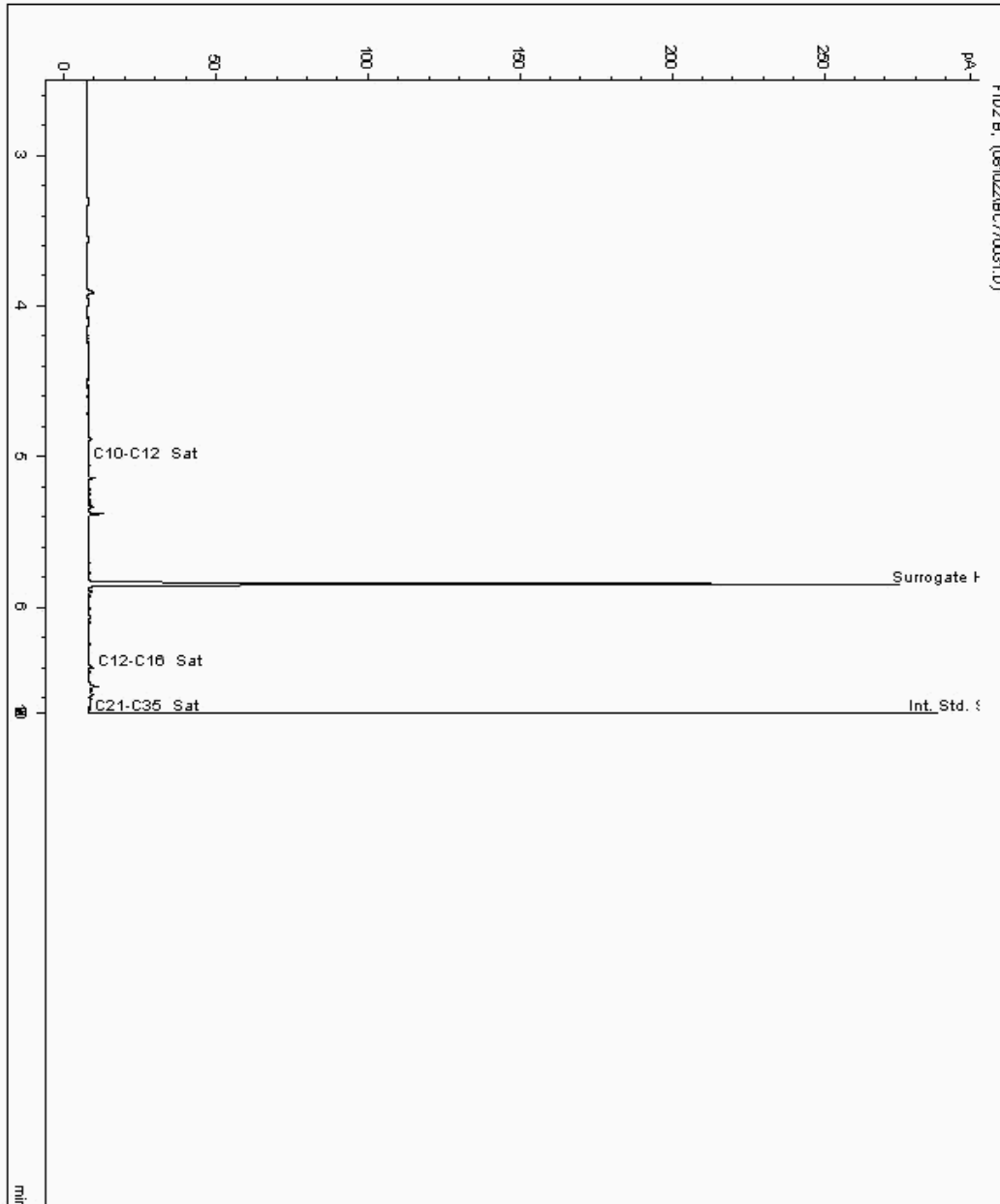
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26698916
Sample ID : BH102

Depth : 1.30

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876463-
Date Acquired : 8/11/2022 1:39:45 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

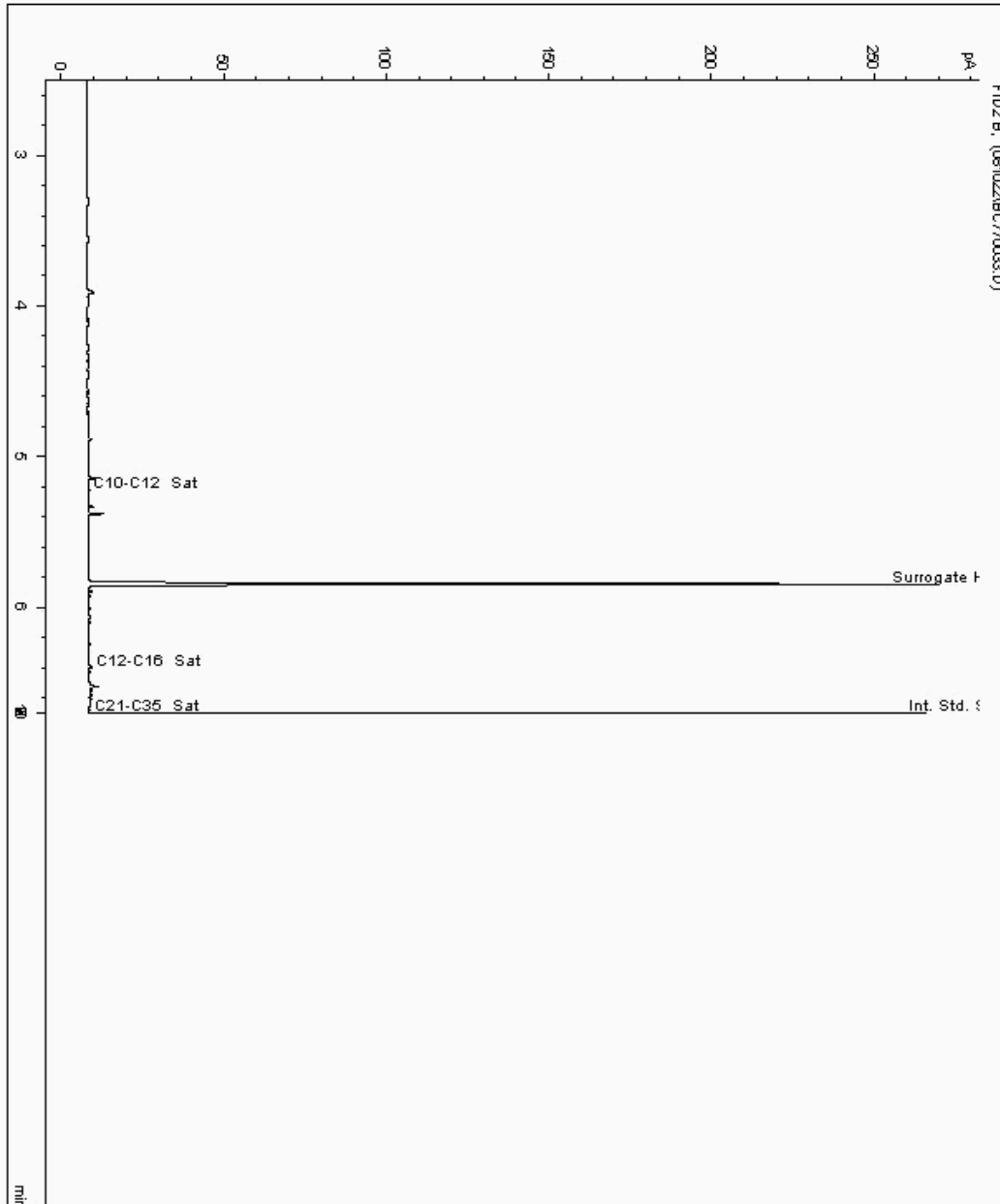
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26698921
Sample ID : BH106

Depth :

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876533-
Date Acquired : 8/11/2022 2:29:13 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

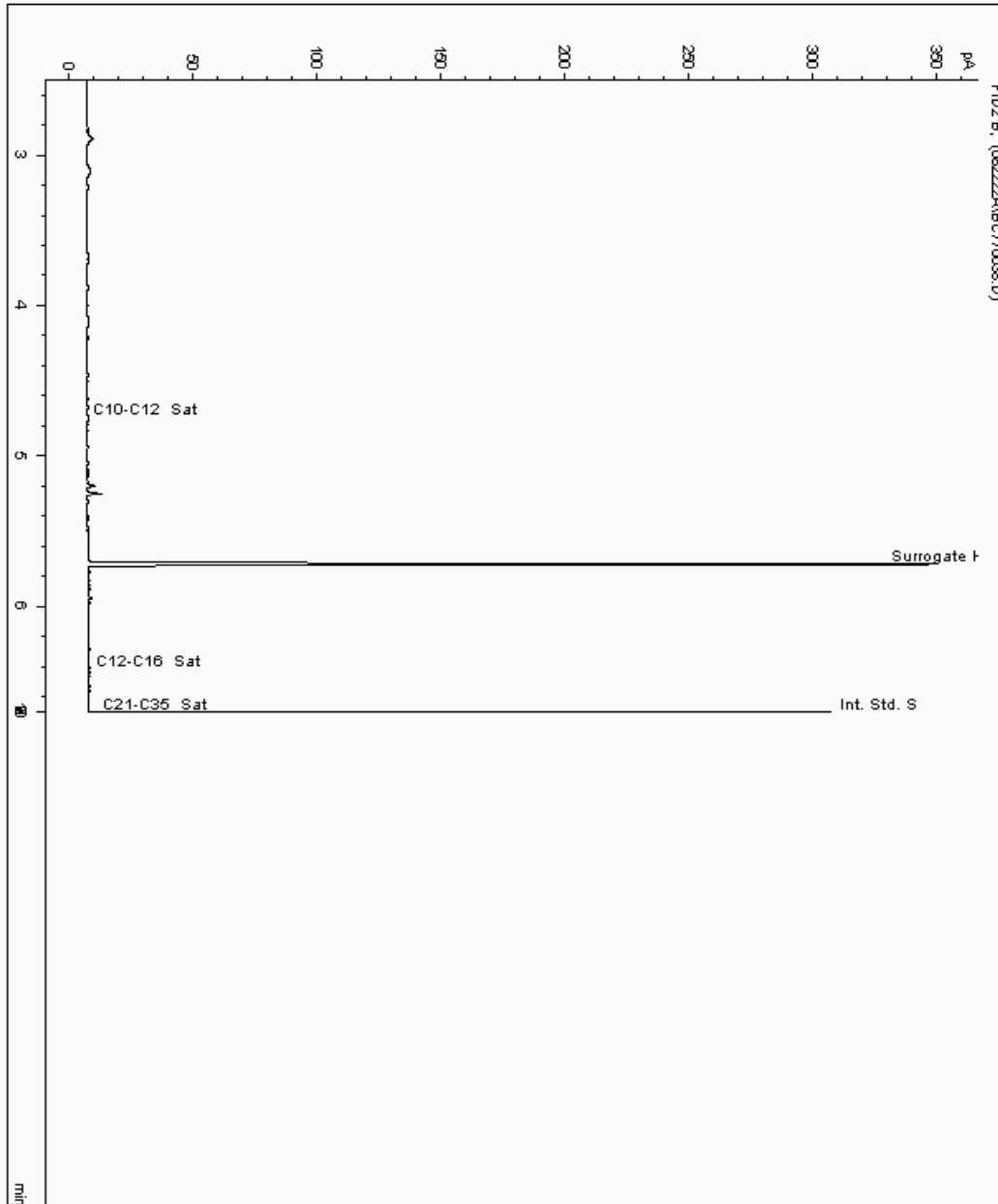
Analysis: EPH CWG (Aliphatic) Aqueous GC (W)

Sample No : 26763606
Sample ID : BH105

Depth : 4.00

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24933881-
Date Acquired : 8/23/2022 12:05:30 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

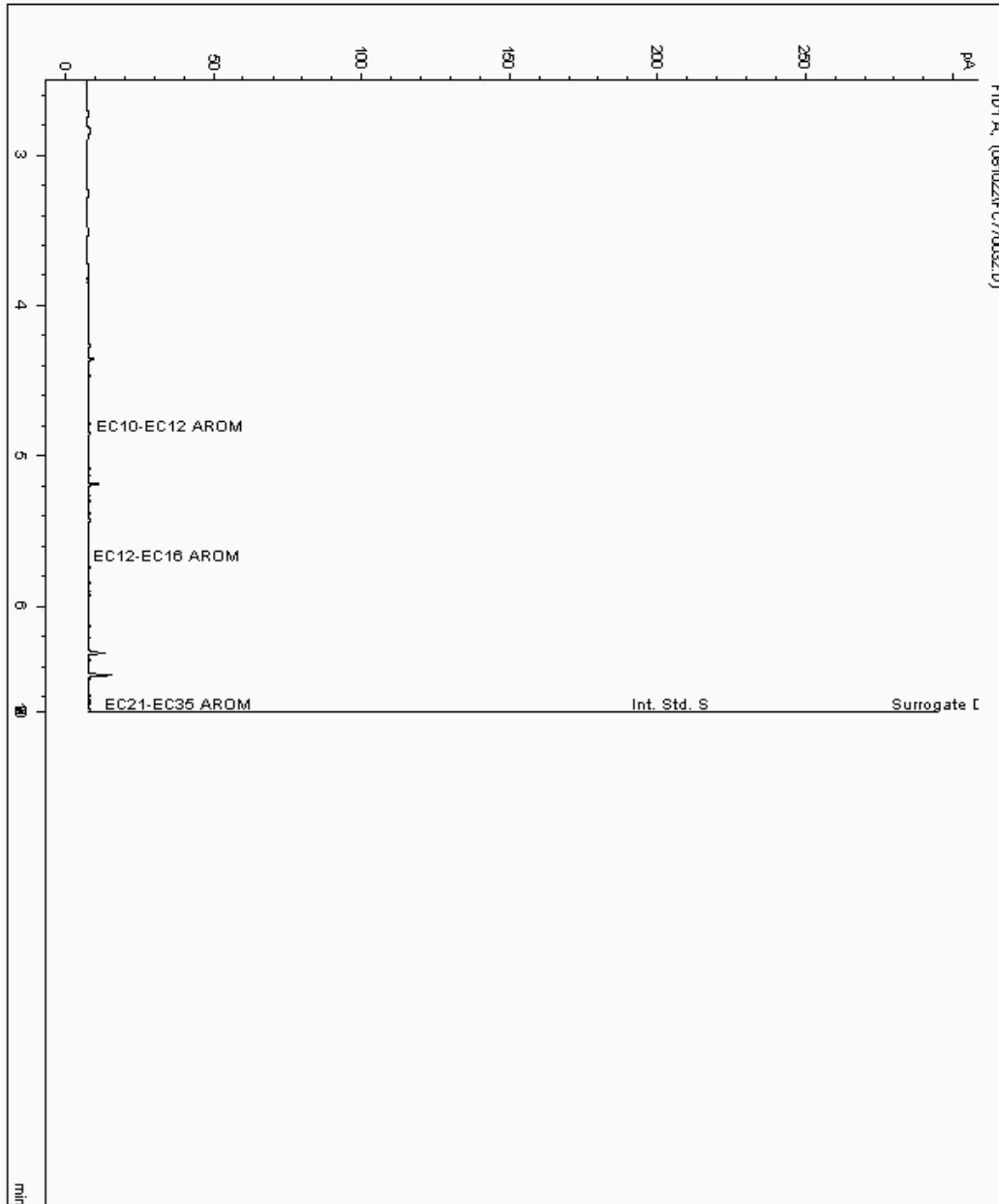
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26698908
Sample ID : BH104

Depth :

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876506-
Date Acquired : 8/11/2022 2:04:32 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

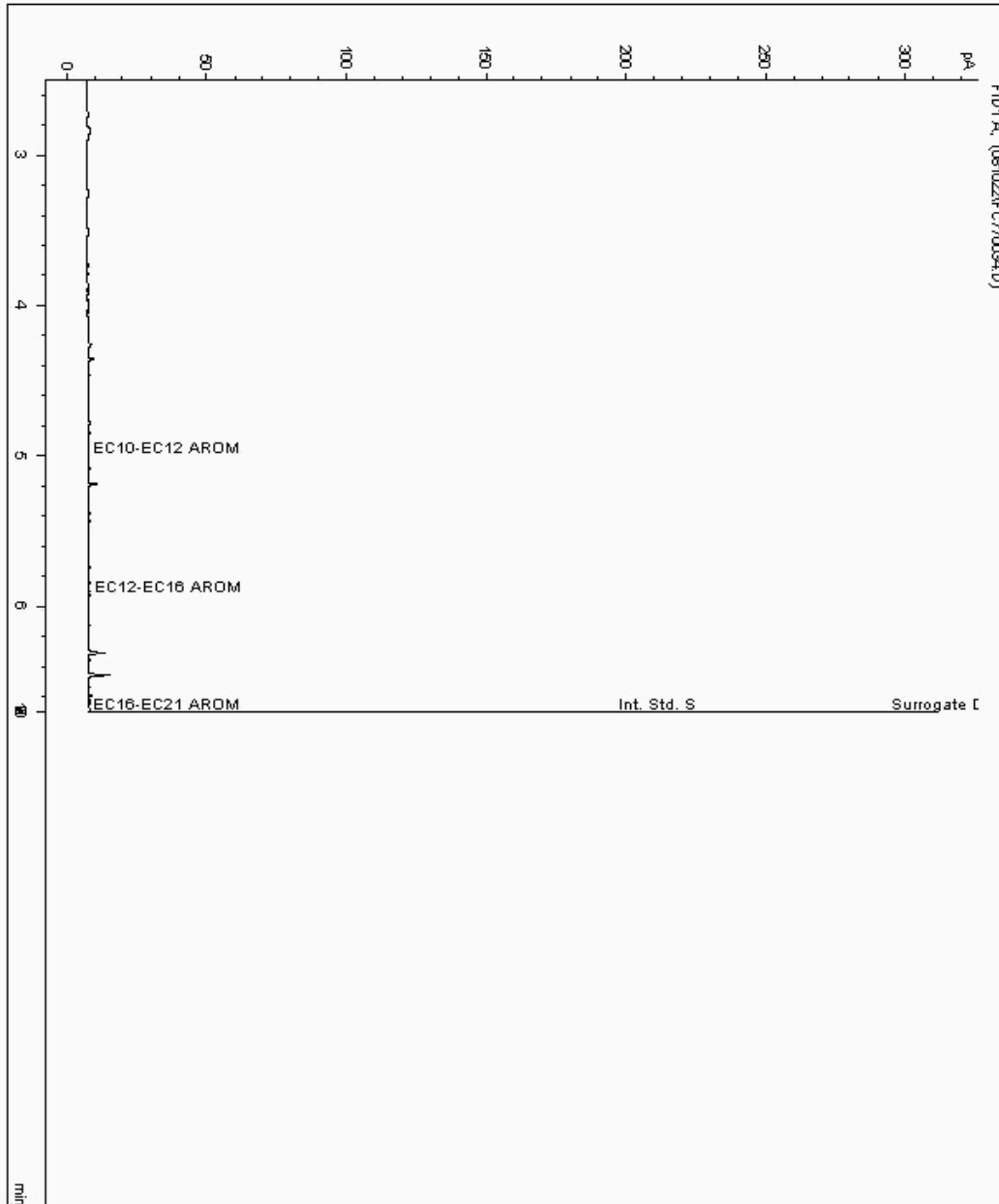
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26698911
Sample ID : BH101

Depth : 1.10

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876450-
Date Acquired : 8/11/2022 2:53:51 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

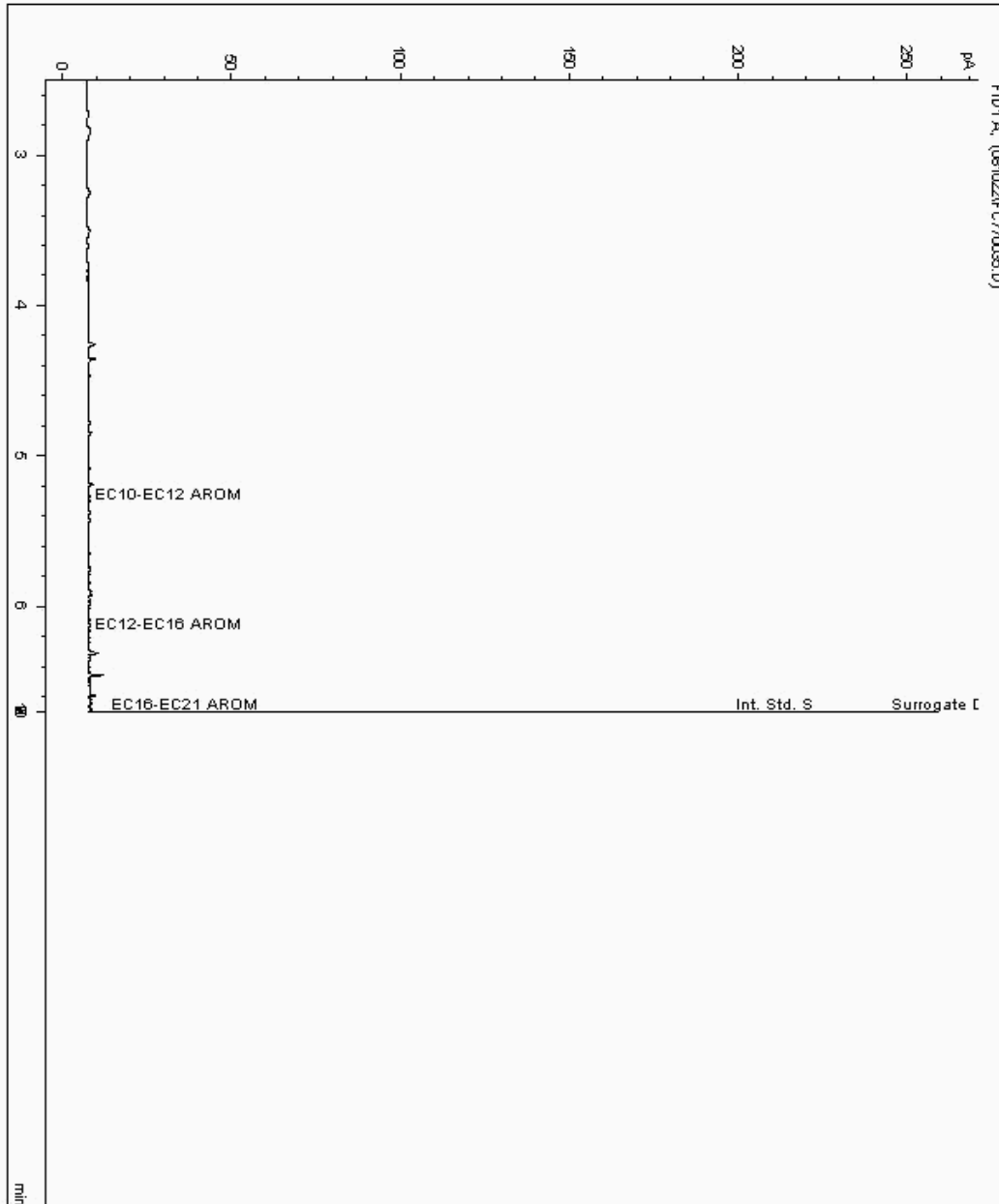
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26698913
Sample ID : BH103

Depth : 2.90

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876492-
Date Acquired : 8/11/2022 3:19:01 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

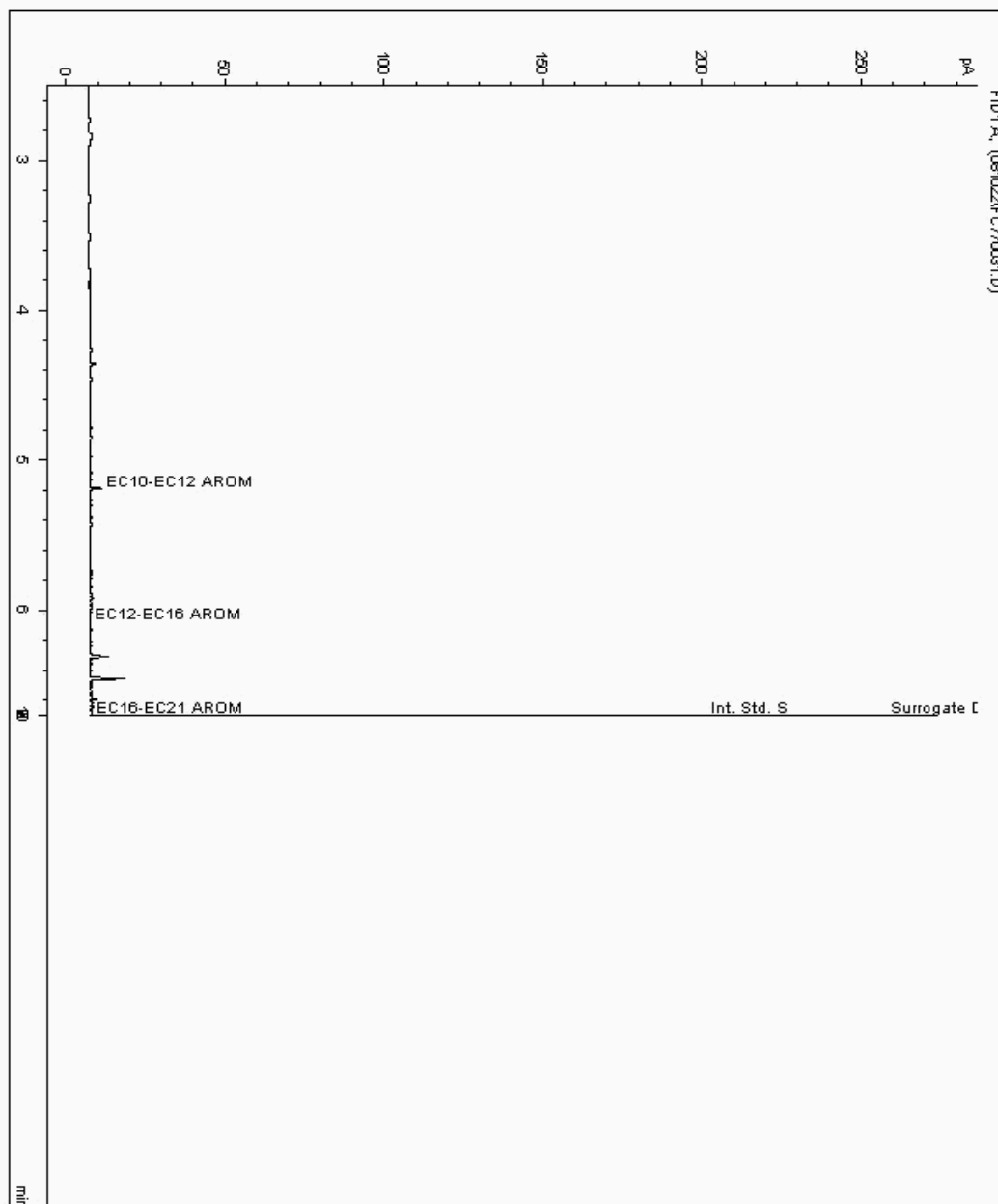
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26698916
Sample ID : BH102

Depth : 1.30

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876464-
Date Acquired : 8/11/2022 1:39:45 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

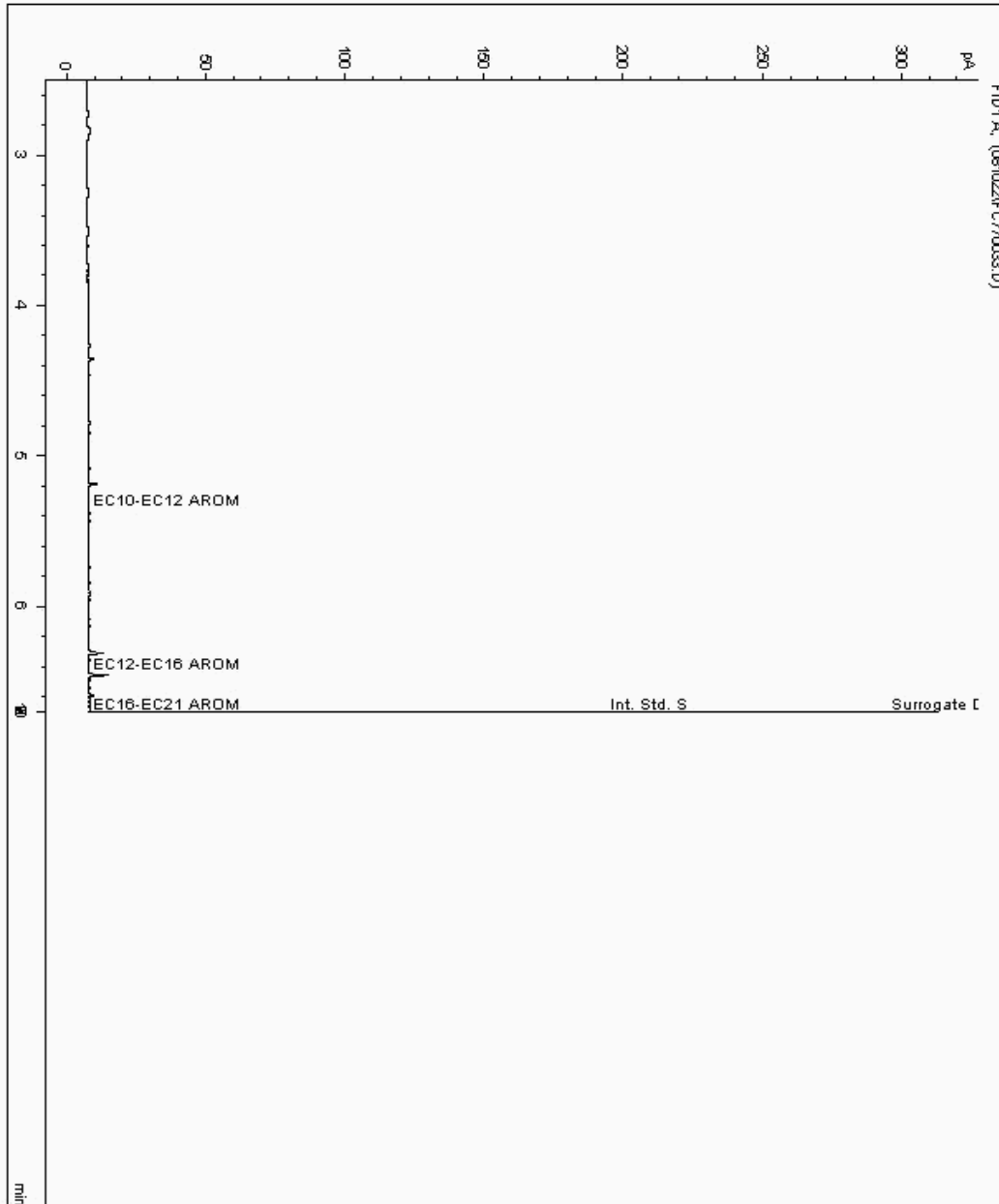
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26698921
Sample ID : BH106

Depth :

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24876534-
Date Acquired : 8/11/2022 2:29:13 AM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Chromatogram

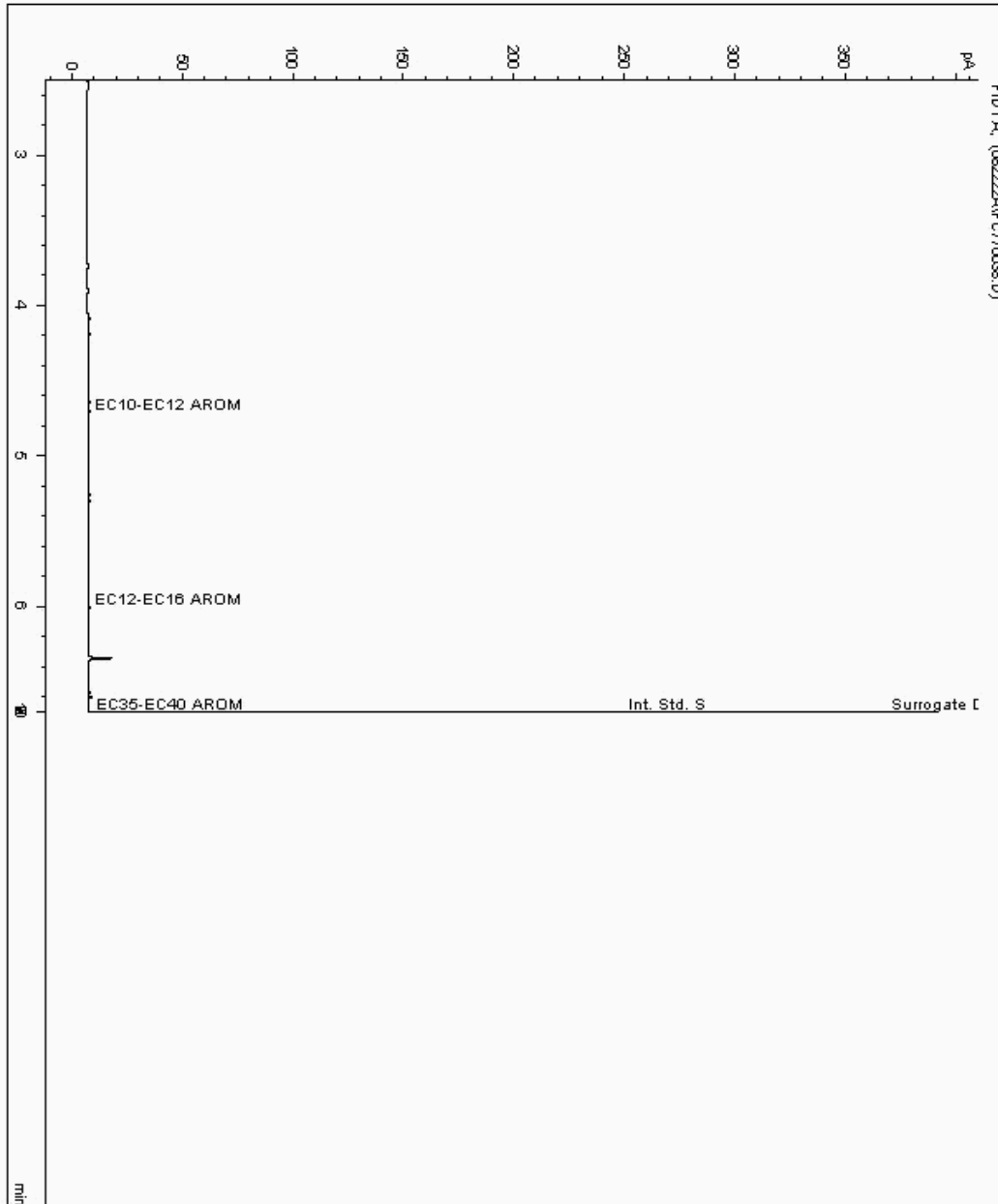
Analysis: EPH CWG (Aromatic) Aqueous GC (W)

Sample No : 26763606
Sample ID : BH105

Depth : 4.00

Alcontrol/Geochem Analytical Services
Speciated TPH - SATS (C12 - C40)

Sample Identity: 24933883-
Date Acquired : 8/23/2022 12:05:30 PM
Units : ppb
Dilution :
CF : 1
Multiplier : 0.025





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

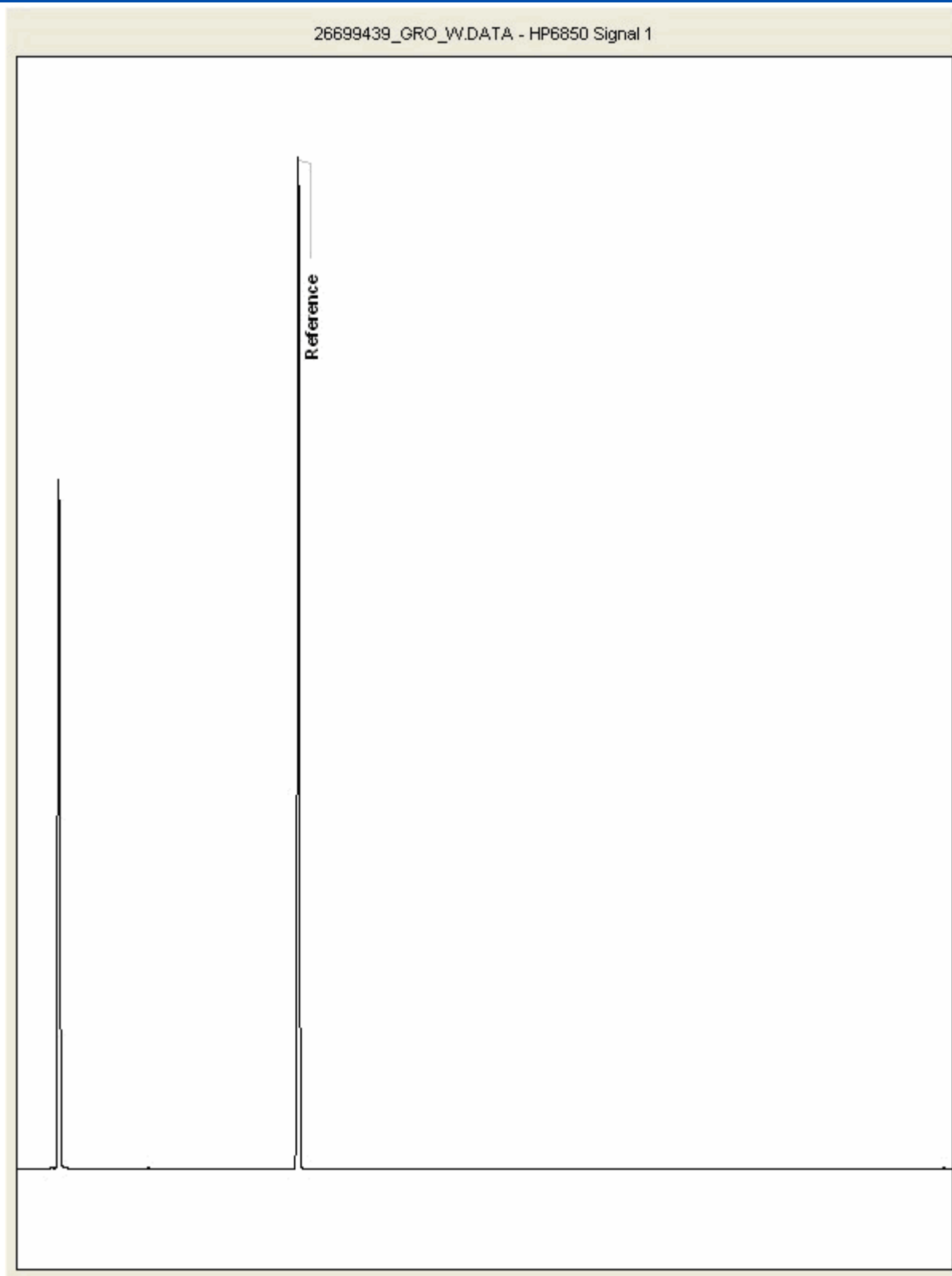
Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26699439
Sample ID : BH103

Depth : 2.90

26699439_GRO_W.DATA - HP6850 Signal 1





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

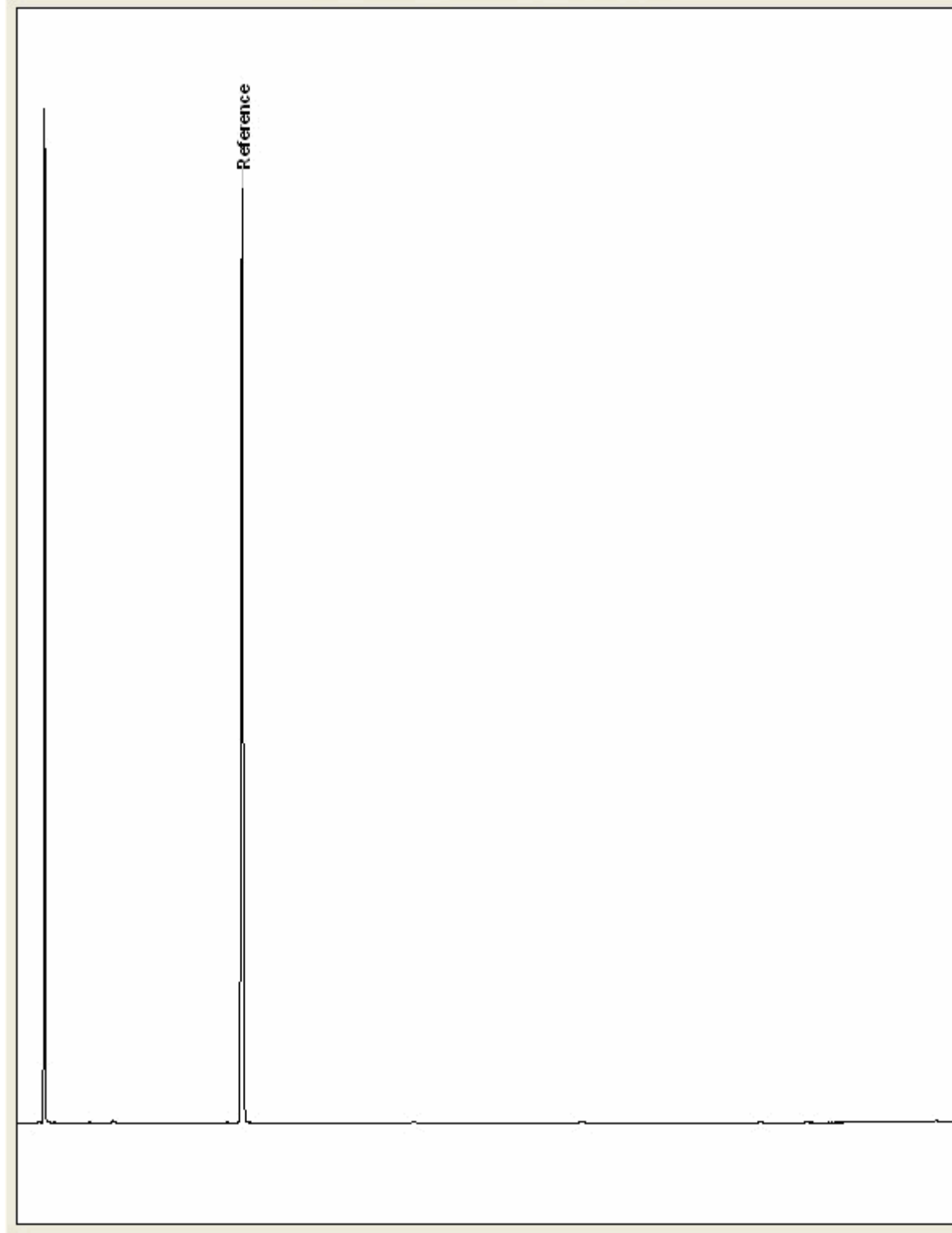
Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26699615
Sample ID : BH101

Depth : 1.10

26699615_GRO_W.DATA - HP6890 Signal 2





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

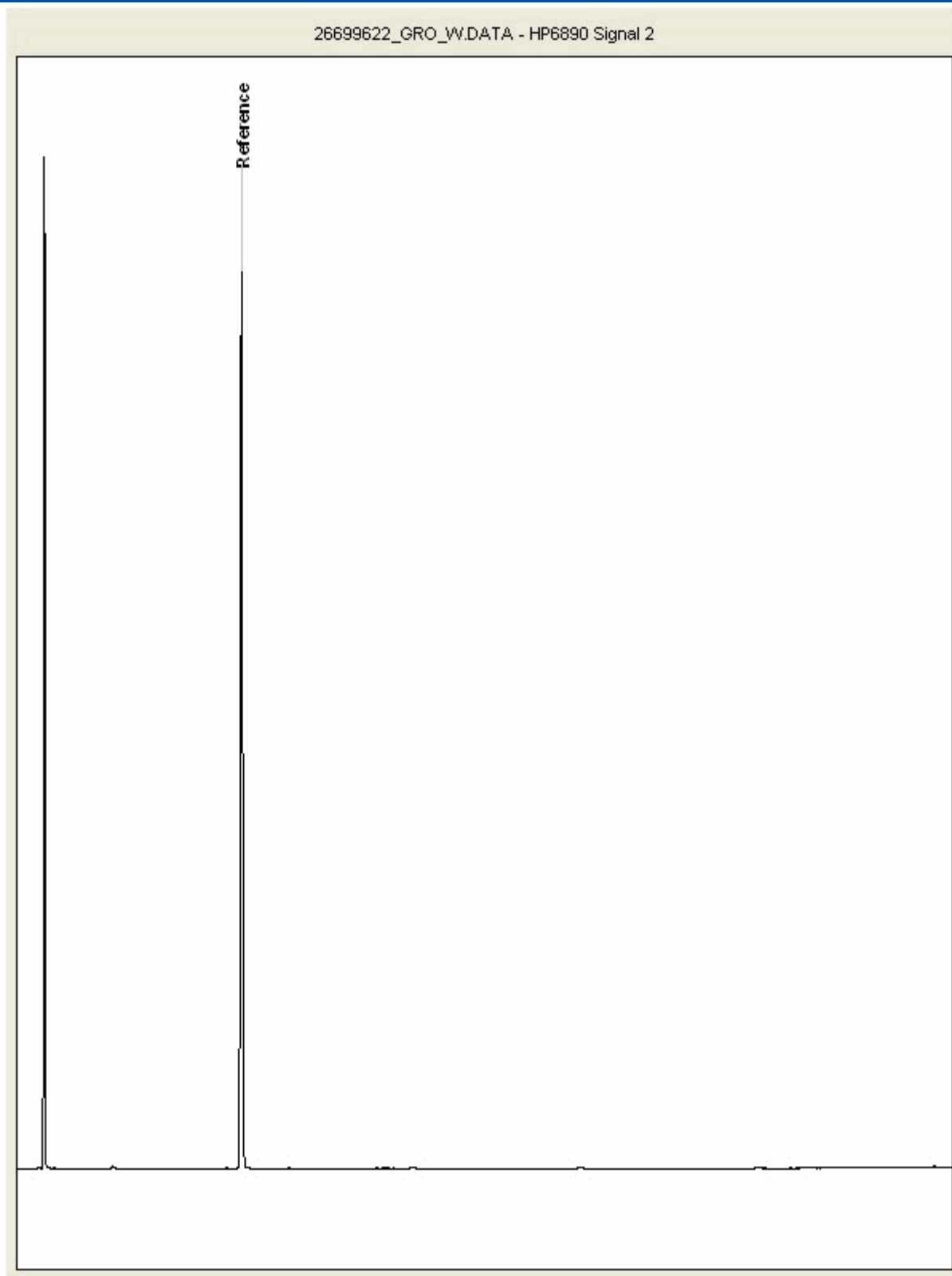
Superseded Report: 657159

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26699622
Sample ID : BH104

Depth :





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

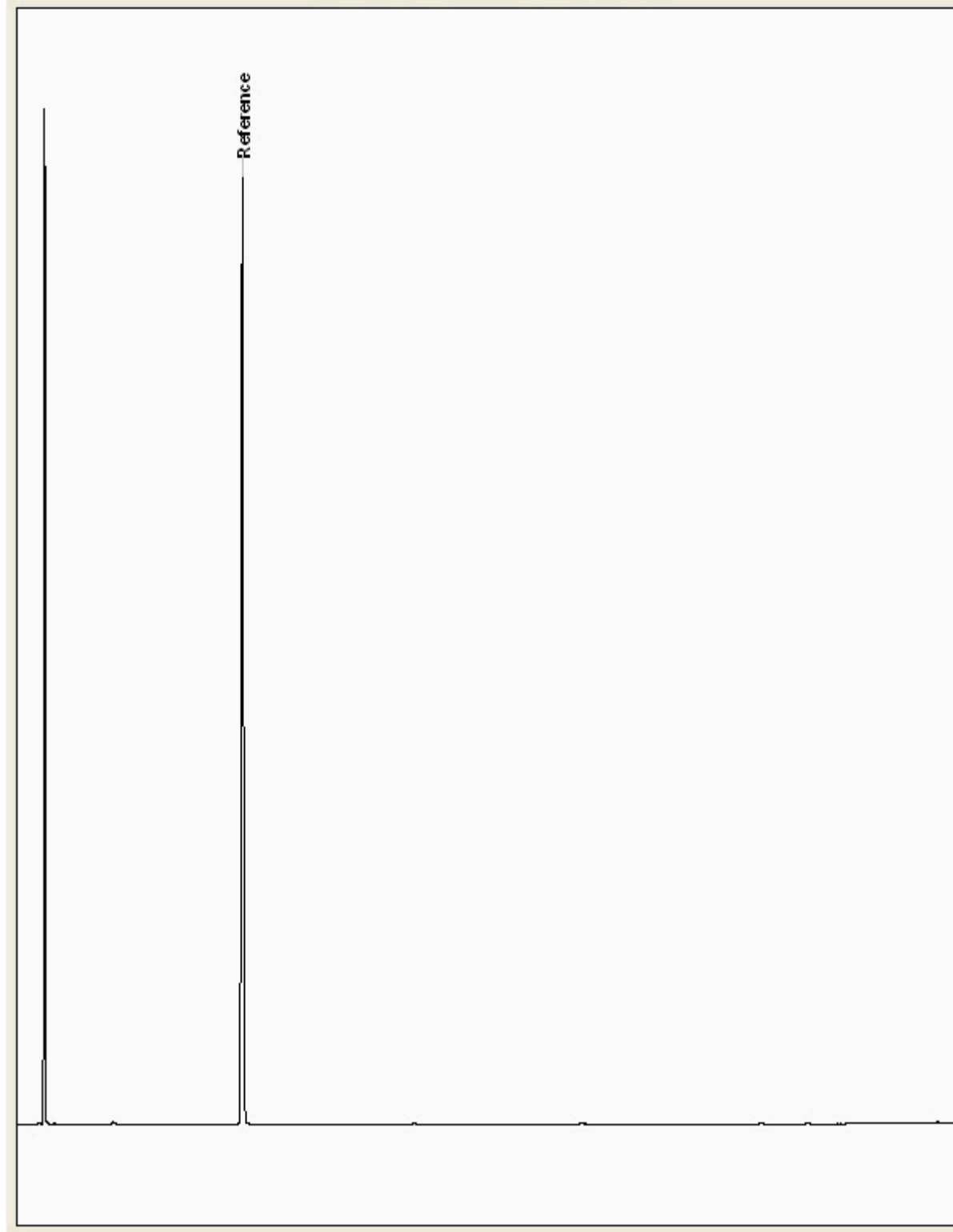
Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26699624
Sample ID : BH105

Depth : 4.00

26699624_GRO_W.DATA - HP6890 Signal 2





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

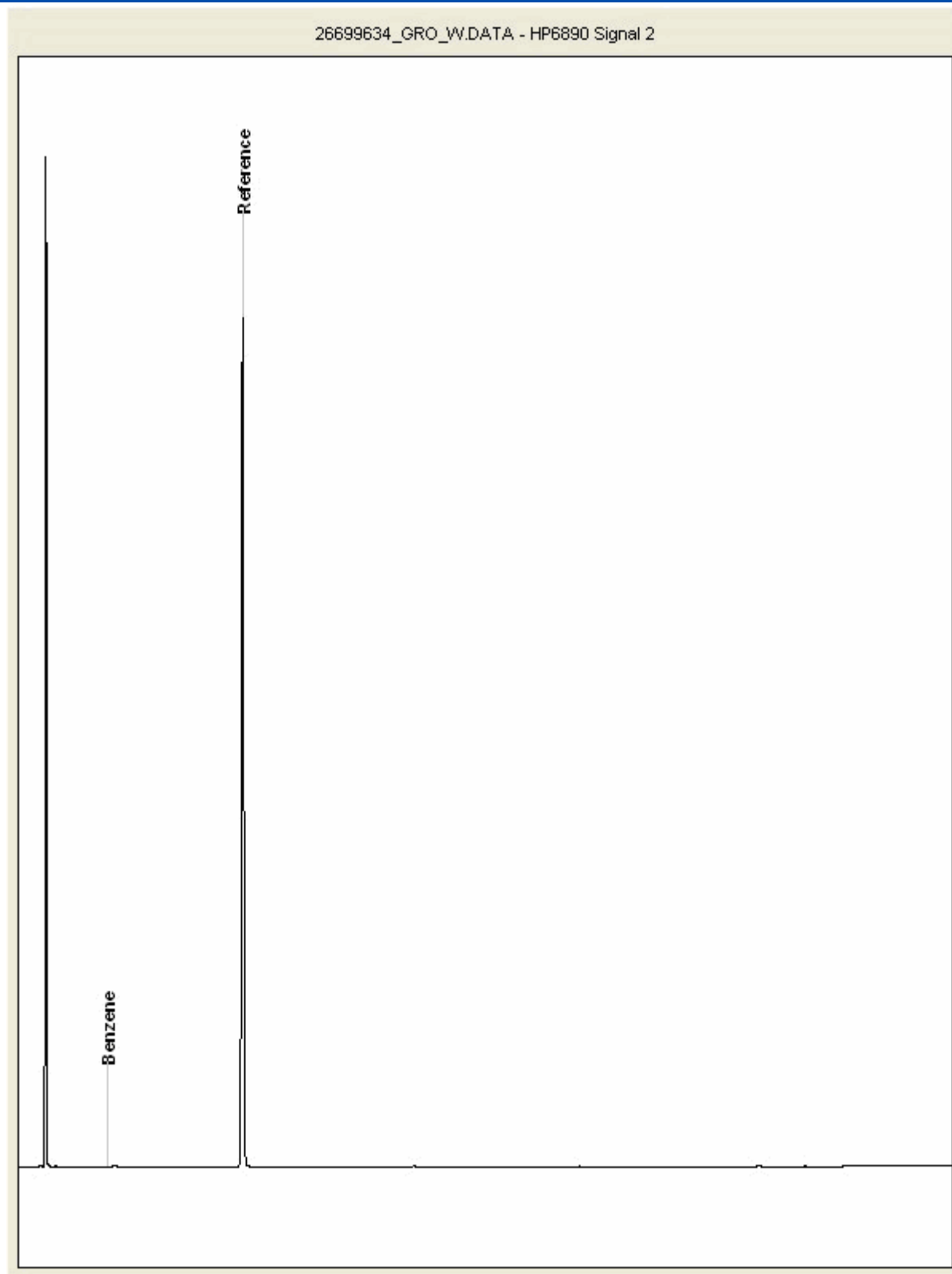
Superseded Report: 657159

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26699634
Sample ID : BH106

Depth :





CERTIFICATE OF ANALYSIS

Validated

SDG: 220804-61
Client Ref.: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

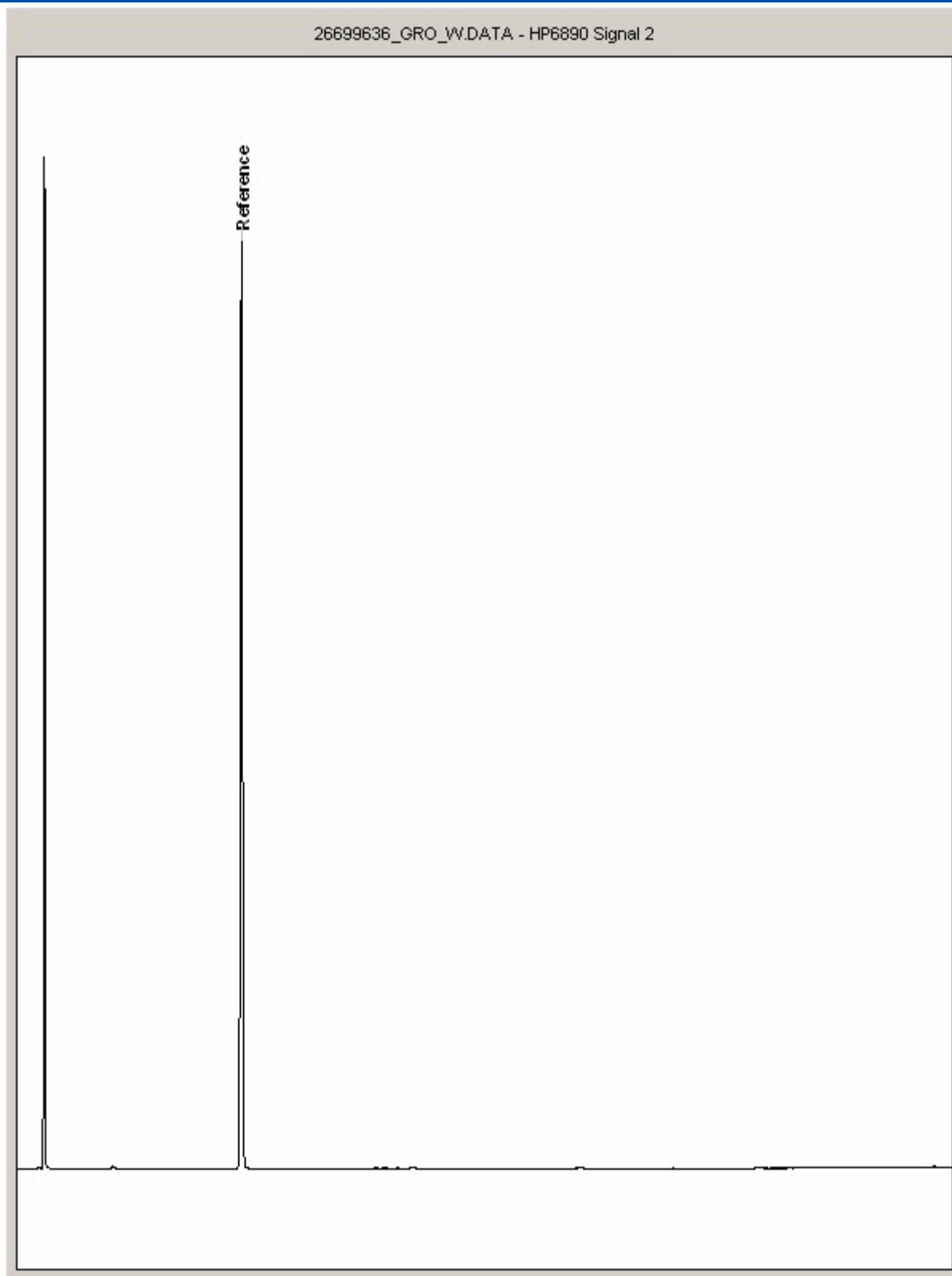
Superseded Report: 657159

Chromatogram

Analysis: GRO by GC-FID (W)

Sample No : 26699636
Sample ID : BH102

Depth : 1.30





CERTIFICATE OF ANALYSIS

SDG: 220804-61
Client Ref: 10056074

Report Number: 658714
Location: HILLTOP FARM, EARL SHILTON

Superseded Report: 657159

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix I

Arcadis GAC Derivation

SUMMARY

The purpose of this document is to describe the general principles adopted in the derivation of the Arcadis' Generic Assessment Criteria (GAC). The document and associated GAC underpins the generic quantitative risk assessments Arcadis undertakes for its clients and is not intended for any other use or use by others. Guidance has been provided by the EA to aid development of GAC which are appropriate for a typical England or Wales site, incorporating conservatism where warranted. Arcadis has used the EA guidance to develop in-house GAC to aid assessment of land contamination sites, and in particular to assess risks to human health receptors from chronic health effects and risks to water resource receptors. The GAC do not consider potential risks to ecological receptors, which may need to be assessed on specific sites. The following non-statutory technical guidance has been referred to in deriving the GAC.

- EA Science Reports SC050021/SR2, SC050021/SR3 and SC050021/SR7.
- Related Toxicity and Soil Guideline Value reports
- EA Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination
- EA. Groundwater Protection and Water Quality, March 2017 (accessible online <https://www.gov.uk/government/collections/groundwater-protection>)
- SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination

The GAC used within this report have been derived for "low density residential end use". Low density residential end use assumes small terraced houses without basements, which may include gardens and/or other open areas.

Arcadis has undertaken environmental works on hundreds of potentially contaminated sites across the UK. The typical shallow geology encountered comprises granular soils or made ground, with a low organic matter content. As such, Arcadis has taken the decision to derive in-house GAC for a *sand* rather than sandy loam soil-type used by the EA to derive Soil Guideline Values, with an organic matter content of 0.34% (fraction of organic carbon content 0.002, typical of many sites).

To derive Human Health GAC (HH-GAC), the following exposure pathways are considered active for potential soil, groundwater or soil gas exposures:

Site End-Use	On-Site Pathways
Low Density Residential (0–6-year-old female child)	• Incidental ingestion of soil or dust • Ingestion of vegetables grown in contaminated soil • Incidental dermal contact with soil or dust • Inhalation of dusts inside or outside • Inhalation of vapours outside from a soil or groundwater source • Inhalation of vapours inside from a soil, groundwater or soil gas source

Two levels of water quality standard have been considered to enable Water Resource GAC (WR-GAC) to be developed depending on the environmental setting of a site. The WR-GAC have been derived based on adopted Environmental Quality Standards and Drinking Water Standards. No attenuation with transport off-site is assumed.

The following modelling tools have been utilised in the derivation of the GAC:

HH-GAC (on-site):	CLEA 1.07 and RBCA Toolkit v2.6
HH-GAC (off-site):	CLEA 1.07 RBCA Toolkit v2.6 and Remedial Targets Worksheet v3.2
WR-GAC:	Remedial Targets Worksheet v3.2

Example model inputs are presented in the following tables, alongside the CLEA modelling outputs.

	Air-water partition co-efficient		Diffusion co-efficient in air		Diffusion co-efficient in water		Relative molecular mass		Vapour pressure		Water solubility		Koc	Notes
	cm ³ cm ³	Notes	m ² s ⁻¹	Notes	m ² s ⁻¹	Notes	g mol ⁻¹	Notes	Pa	Notes	mg L ⁻¹	Notes	Log (dimension)	
Benzene	1.16E-01	Science Report – SC050021/SR7	8.77E-06	Science Report – SC050021/SR7	6.64E-10	Science Report – SC050021/SR7	78.11	Science Report – SC050021/SR7	6.24E+03	Science Report – SC050021/SR7	1.78E+03	Science Report – SC050021/SR7	1.83E+00	Science Report – SC050021/SR7
Toluene	1.15E-01	Science Report – SC050021/SR7	7.78E-06	Science Report – SC050021/SR7	5.88E-10	Science Report – SC050021/SR7	92.14	Science Report – SC050021/SR7	1.73E+03	Science Report – SC050021/SR7	5.90E+02	Science Report – SC050021/SR7	2.31E+00	Science Report – SC050021/SR7
Ethylbenzene	1.39E-01	Science Report – SC050021/SR7	7.04E-06	Science Report – SC050021/SR7	5.31E-10	Science Report – SC050021/SR7	106.17	Science Report – SC050021/SR7	5.53E+02	Science Report – SC050021/SR7	1.80E+02	Science Report – SC050021/SR7	2.65E+00	Science Report – SC050021/SR7
Sum xylenes	1.04E-01	Average for three xylenes	7.03E-06	Average for three xylenes	5.3E-10	Average for three xylenes	106.17	Average for three xylenes	4.52E+02	Average for three xylenes	1.91E+02	Average for three xylenes	2.66E+00	Average for three xylenes
MTBE	2.04E-02	Literature review	7.10E-06	Literature review	9.00E-10	Literature review	88.17	Literature review	3.45E+04	Literature review	4.80E+04	Literature review	1.08E+00	Literature review
Aliphatic >C5-6	3.40E+01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	81	Literature review	3.60E+04	Literature review	3.60E+01	Literature review	2.90E+00	Literature review
Aliphatic >C6-8	5.10E+01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	100	Literature review	6.40E+03	Literature review	5.40E+00	Literature review	3.60E+00	Literature review
Aliphatic >C8-10	8.20E+01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	130	Literature review	6.40E+02	Literature review	4.30E-01	Literature review	4.51E+00	Literature review
Aliphatic >C10-12	1.30E+02	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	160	Literature review	6.50E+01	Literature review	3.40E-02	Literature review	5.40E+00	Literature review
Aliphatic >C12-16	5.40E+02	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	200	Literature review	4.80E+00	Literature review	7.60E-04	Literature review	6.70E+00	Literature review
Aliphatic >C16-35	6.40E+03	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	270	Literature review	7.70E-01	Literature review	1.30E-06	Literature review	9.00E+00	Literature review
Aromatic >C8-10	4.90E-01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	120	Literature review	6.40E+02	Literature review	6.50E+01	Literature review	3.20E+00	Literature review
Aromatic >C10-12	1.40E-01	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	130	Literature review	6.40E+01	Literature review	2.50E+01	Literature review	3.40E+00	Literature review
Aromatic >C12-16	5.40E-02	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	150	Literature review	4.80E+00	Literature review	5.80E+00	Literature review	3.70E+00	Literature review
Aromatic >C16-21	1.30E-02	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	190	Literature review	7.70E-01	Literature review	5.10E-01	Literature review	4.20E+00	Literature review
Aromatic >C21-35	6.80E-04	TPHCWG	1.00E-05	Literature review	0.000000001	Literature review	240	Literature review	4.40E-04	Literature review	6.60E-03	Literature review	5.11E+00	Literature review

Chemical Name	Chemical Type	Oral HCV						Inhalation HCV						Combine oral and Inhalation AC	Oral MDI for adults		Inhalation MDI for adults	
		Type	µg kg ⁻¹ BW day ⁻¹	Notes	Oral exposure	Dermal exposure	Inhalation exposure	Type	µg kg ⁻¹ BW day ⁻¹	Notes	Oral exposure	Dermal exposure	Inhalation exposure		µg kg ⁻¹ BW day ⁻¹	Notes	µg kg ⁻¹ BW day ⁻¹	Notes
Benzene	organic	ID	2.90E+01	UK TOX (March 2009)	Yes	Yes	No	ID	1.40E+00	UK TOX (March 2009)	No	No	Yes	Yes	NR	NA	NR	NA
Toluene	organic	TDI	2.23E+02	UK TOX (March 2009)	Yes	Yes	No	TDI	1.40E+03	UK TOX (March 2009)	No	No	Yes	Yes	1.00E+01	UK TOX (March 2009)	5.20E+02	UK TOX (March 2009)
Ethylbenzene	organic	TDI	1.00E+02	UK TOX (March 2009)	Yes	Yes	No	TDI	7.43E+01	Literature review	No	No	Yes	Yes	5.00E+00	UK TOX (March 2009)	1.30E+02	UK TOX (March 2009)
Sum xylenes	organic	TDI	1.80E+02	UK TOX (March 2009)	Yes	Yes	No	TDI	6.00E+01	UK TOX (March 2009)	No	No	Yes	Yes	1.10E+01	UK TOX (March 2009)	1.40E+02	UK TOX (March 2009)
MTBE	organic	TDI	8.60E+02	Literature review	Yes	Yes	No	TDI	8.60E+02	Literature review	No	No	Yes	Yes	3.00E+01	EU Risk Assessment Report	1.89E+02	EU Risk Assessment Report
Aliphatic>C5-6	organic	TDI	5.00E+03	TPHCWG	Yes	Yes	No	TDI	5.26E+03	TPHCWG	No	No	Yes	Yes	3.50E+05	TDI x 70kg (MDI unknown)	3.68E+05	TDI x 70kg (MDI unknown)
Aliphatic>C6-8	organic	TDI	5.00E+03	TPHCWG	Yes	Yes	No	TDI	5.26E+03	TPHCWG	No	No	Yes	Yes	3.50E+05	TDI x 70kg (MDI unknown)	3.68E+05	TDI x 70kg (MDI unknown)
Aliphatic>C8-10	organic	TDI	1.00E+02	TPHCWG	Yes	Yes	No	TDI	2.70E+02	TPHCWG	No	No	Yes	Yes	7.00E+03	TDI x 70kg (MDI unknown)	1.89E+04	TDI x 70kg (MDI unknown)
Aliphatic>C10-12	organic	TDI	1.00E+02	TPHCWG	Yes	Yes	No	TDI	2.70E+02	TPHCWG	No	No	Yes	Yes	7.00E+03	TDI x 70kg (MDI unknown)	1.89E+04	TDI x 70kg (MDI unknown)
Aliphatic>C12-16	organic	TDI	1.00E+02	TPHCWG	Yes	Yes	No	TDI	2.70E+02	TPHCWG	No	No	Yes	Yes	7.00E+03	TDI x 70kg (MDI unknown)	1.89E+04	TDI x 70kg (MDI unknown)
Aliphatic>C16-35	organic	TDI	2.00E+03	TPHCWG	Yes	Yes	No	NR			NR	NR	NR	NR	1.40E+05	TDI x 70kg (MDI unknown)		
Aromatic >C8-10	organic	TDI	4.00E+01	TPHCWG	Yes	Yes	No	TDI	5.50E+01	TPHCWG	No	No	Yes	Yes	2.80E+03	TDI x 70kg (MDI unknown)	3.85E+03	TDI x 70kg (MDI unknown)
Aromatic >C10-12	organic	TDI	4.00E+01	TPHCWG	Yes	Yes	No	TDI	5.50E+01	TPHCWG	No	No	Yes	Yes	2.80E+03	TDI x 70kg (MDI unknown)	3.85E+03	TDI x 70kg (MDI unknown)
Aromatic >C12-16	organic	TDI	4.00E+01	TPHCWG	Yes	Yes	No	TDI	5.50E+01	TPHCWG	No	No	Yes	Yes	2.80E+03	TDI x 70kg (MDI unknown)	3.85E+03	TDI x 70kg (MDI unknown)
Aromatic >C16-21	organic	TDI	3.00E+01	TPHCWG	Yes	Yes	No	NR			NR	NR	NR	NR	2.10E+03	TDI x 70kg (MDI unknown)		
Aromatic >C21-35	organic	TDI	3.00E+01	TPHCWG	Yes	Yes	No	NR			NR	NR	NR	NR	2.10E+03	TDI x 70kg (MDI unknown)		

PHYSICAL PROPERTIES

		Commercial Land Use	Source
Soil type	na	Sand	Professional experience
Porosity (total)	cm3 cm-3	0.54	SC050021/SR3
Porosity (air-filled)*	cm3 cm-3	0.30	SC050021/SR3
Porosity (water-filled)*	cm3 cm-3	0.24	SC050021/SR3
Capillary fringe porosity (air-filled)	cm3 cm-3	0.01	Literature value
Capillary fringe porosity (water-filled)	cm3 cm-3	0.53	Literature value
Thickness of capillary fringe	m	0.1	Literature value
Residual soil water content	cm3 cm-3	0.07	SC050021/SR3
Saturated hydraulic conductivity	cm s-1	7.36E-03	SC050021/SR3
van Genuchten shape parameter	dimensionless	3.51E-01	SC050021/SR3
Bulk density	g cm-3	1.18	SC050021/SR3
Soil organic matter content	%	0.34	Professional experience
Threshold value of wind speed at 10m	m s-1	7.20	SC050021/SR3
Empirical function for dust model	dimensionless	1.22	SC050021/SR3
Ambient soil temperature	K	283	SC050021/SR3
Mean annual windspeed (10m)	m s-1	5.00	SC050021/SR3
Air dispersion factor at 0.8m	g m-2 s-1 per kg m-3	68.0	SC050021/SR3
Air dispersion factor at 1.6m	g m-2 s-1 per kg m-3	120.0	SC050021/SR3
Fraction of site with hard or vegetative cover	m2 m-2	0.80	SC050021/SR3
Depth to groundwater (RBCA)	m	1	Assumption
Infiltration rate in vadose zone	m day-1	6.80E-04	Likely worst-case
Aquifer type**	na	Sand	Assumption
Source width	m	40	Likely worst-case
Source length	m	40	Likely worst-case
Saturated aquifer thickness	m	10	Assumption
Mixing zone depth	m	5.5	Calculated in RTW
Hydraulic conductivity	m day-1	20	Literature value
Hydraulic gradient	m m-1	0.001	Typical value for sand
Aquifer soil organic matter content	%	0.34	Professional experience
Effective Porosity (total)**	cm3 cm-3	0.3	Literature value
Aquifer bulk density**	g cm-3	1.18	SC050021/SR3
Distance to neighbouring resident**	m	5	Likely worst-case

Notes:

* Assumed to be present in foundation cracks when modelling in RBCA Toolkit

** Only used to generate GAC for neighbouring residents through off-site migration of impact in groundwater

For the purpose of assessing the risk to on-Site residents from impacts in soil it is assumed that the soil source is present 65cm below the grounds surface. For soil gas it is assumed that the source is present 20cm beneath the grounds surface.

BUILDING PROPERTIES

		Residential (neighbouring resident)	Commercial (on-site)	Source
Building footprint	m2	2.80E+01	4.24E+02	SC050021/SR3
Living space air exchange rate	hr-1	0.50	1.00	SC050021/SR3
Living space height (above ground)	m	4.8	9.6	SC050021/SR3
Living space height (below ground)	m	0.0	0.0	SC050021/SR3
Pressure difference	Pa	3.1	4.4	SC050021/SR3
Foundation thickness	m	1.50E-01	1.50E-01	SC050021/SR3
Floor crack area	cm2	4.23E+02	1.65E+03	SC050021/SR3
Dust loading factor	µg m-3	5.00E+01	1.00E+02	SC050021/SR3

CLEA 1.07 EXPOSURE DATA

		Age Class						
		Residents						Commercial Worker
Age class	-	1	2	3	4	5	6	17
Frequency of inhalation (dust and vapour indoors)	days yr-1	365	365	365	365	365	365	230
Frequency of inhalation (dust and vapour outdoors)	days yr-1	365	365	365	365	365	365	170
Occupancy period (indoors)	hr day-1	23	23	23	23	19	19	8.3
Occupancy period (outdoors)	hr day-1	1	1	1	1	1	1	0.7
Body weight	kg	5.6	9.8	12.7	15.1	16.9	19.7	70
Body height	m	0.7	0.8	0.9	0.9	1	1.1	1.6
Inhalation rate*	m3 day-1	5.4	8	8.9	10.1	10.1	10.1	15.7

* Inhalation rate adopted from Category 4 Screening Levels

RBCA Toolkit EXPOSURE DATA		Age Class	
		0-6	17
Averaging time	yrs	6	49
Body weight	kg	13.3	70
Exposure duration	yrs	6	49
Averaging time (vapour flux)	yrs	6	49
Exposure frequency (indoors)*	days yr-1	365	29.9
Exposure frequency (outdoors)*	days yr-1	16.8	1.87

Notes:

Time-weighted average used for 0-6 year old female child

* RBCA Toolkit compares an acceptable air concentration to a predicted air concentration. Only the exposure frequency can be modified (i.e. inhalation rate, time exposed cannot). As such, the TDSI (or ID) was converted to an acceptable indoor air concentration using the time-weighted properties for a 0-6 year old female child as defined within the Category 4 Screening Levels. The exposure frequency for other scenarios was modified to account for the differing exposure scenarios for the remaining pathways, to be equivalent to modifying the inhalation rate and time exposed.

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STEP 5: RESULTS

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Number	Chemical	Ratio of ADE to relevant Health Criteria Value			Soil Assessment Criteria			SAC Flag	Soil Saturation Limit	Pathway Contributions (%)						
		oral HCV	inhal HCV	Combined	oral HCV	inhal HCV	Combined			direct soil ingestion	sum of consumption of homegrown produce and attached soil	dermal contact (indoor)	dermal contact (outdoor)	inhalation of dust (indoor)	inhalation of dust (outdoor)	inhalation of vapour (indoor)
		(dimensionless)	(dimensionless)	(dimensionless)	mg kg ⁻¹	mg kg ⁻¹	mg kg ⁻¹	(unitless)	mg kg ⁻¹	%	%	%	%	%	%	%
1	Benzene	0.01	0.99	1.00	5.53E+02	7.43E+00	7.33E+00	Combined	6.52E+02	0.24	0.00	0.02	0.02	0.00	0.00	99.55
2	Toluene	0.03	0.97	1.00	4.25E+05	1.35E+04	1.31E+04	Combined	3.74E+02	0.43	0.00	0.03	0.04	0.00	0.00	99.16
3	Ethylbenzene	0.01	0.99	1.00	1.91E+05	1.07E+03	1.07E+03	Combined	2.01E+02	0.65	0.00	0.04	0.06	0.00	0.00	98.53
4	Sum xylenes	0.00	1.00	1.00	3.43E+05	1.15E+03	1.14E+03	Combined	2.16E+02	0.85	0.00	0.06	0.08	0.01	0.00	95.99
5	MTBE	0.00	1.00	1.00	1.64E+06	1.76E+03	1.75E+03	Combined	1.11E+04	0.09	0.00	0.01	0.01	0.00	0.00	99.50
6	ETBE	0.04	0.96	1.00	1.91E+03	7.69E+01	7.39E+01	Combined	3.50E+03	0.04	0.00	0.00	0.00	0.00	0.00	99.93
7	TBA	0.10	0.90	1.00	1.72E+05	1.86E+04	1.68E+04	Combined	2.35E+05	8.73	0.00	0.58	0.86	0.06	0.00	89.42
8																
9	Aliphatic >C5-C6	0.00	1.00	1.00	4.77E+06	1.31E+03	1.31E+03	Combined	3.75E+02	0.01	0.00	0.00	0.00	0.00	0.00	49.96
10	Aliphatic >C6-C8	0.00	1.00	1.00	4.77E+06	1.76E+03	1.76E+03	Combined	1.12E+02	0.02	0.00	0.00	0.00	0.00	0.00	49.95
11	Aliphatic >C8-C10	0.00	1.00	1.00	9.53E+04	2.26E+02	2.26E+02	Combined	3.65E+01	0.04	0.00	0.00	0.00	0.00	0.00	49.90
12	Aliphatic >C10-C12	0.00	1.00	1.00	9.53E+04	8.88E+02	8.86E+02	Combined	1.80E+01	0.15	0.00	0.01	0.01	0.00	0.00	49.73
13	Aliphatic >C12-C16	0.02	0.98	1.00	9.53E+04	4.04E+03	4.00E+03	Combined	7.57E+00	0.66	0.00	0.04	0.07	0.00	0.00	49.01
14	Aliphatic >C16-C35	1.00	NR	NR	1.91E+06	NR	NR	Oral	2.57E+00	42.91	0.00	2.86	4.23	0.00	0.00	0.00
15	Aromatic >EC5-EC7	0.00	1.00	1.00	1.91E+05	1.62E+02	1.62E+02	Combined	7.53E+02	0.07	0.00	0.00	0.01	0.00	0.00	49.85
16	Aromatic >EC7-EC8	0.00	1.00	1.00	1.91E+05	2.53E+02	2.53E+02	Combined	3.99E+02	0.10	0.00	0.01	0.01	0.00	0.00	49.79
17	Aromatic >EC8-EC10	0.00	1.00	1.00	3.81E+04	3.14E+02	3.13E+02	Combined	2.24E+02	0.25	0.00	0.02	0.03	0.00	0.00	49.57
18	Aromatic >EC10-EC12	0.02	0.98	1.00	3.81E+04	1.64E+03	1.63E+03	Combined	1.30E+02	1.30	0.00	0.09	0.13	0.01	0.00	48.17
19	Aromatic >EC12-EC16	0.11	0.89	1.00	3.81E+04	8.22E+03	7.73E+03	Combined	5.72E+01	5.81	0.00	0.39	0.57	0.04	0.00	42.60
20	Aromatic >EC16-EC21	1.00	NR	NR	2.86E+04	NR	NR	Oral	1.60E+01	42.91	0.00	2.86	4.23	0.00	0.00	0.00
21	Aromatic >EC21-EC35	1.00	NR	NR	2.86E+04	NR	NR	Oral	1.68E+00	42.91	0.00	2.86	4.23	0.00	0.00	0.00
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Development of GAC_March 2022

