SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH04	11	B	10.00	11.00	Brown very sandy GRAVEL.
BH04	14	B	13.00	14.00	White structureless CHALK.
BH04	16	SD	15.50	15.95	White structureless CHALK.
BH04	23	SD	24.50	24.95	White structureless CHALK.
BH05	3	SD	2.00	2.45	Brown slightly gravelly sandy CLAY.
BH05	6	B	9.00	9.95	Brown very gravelly very sandy CLAY.
BH05	7	SD	9.50	9.95	Brown gravelly slightly sandy CLAY.
BH05	18	B	23.00	24.00	White structureless CHALK.
BH05	19	SD	24.50	24.95	White structureless CHALK.
BH06	2	B	1.20	2.00	Brown gravelly slightly sandy CLAY.
BH06	9	B	5.00	6.00	Brown very gravelly silty SAND.
BH06	11	B	8.00	9.00	Light brown very gravelly sandy CLAY gravel is chalk and flint.
BH06	16	SD	12.50	12.95	White CHALK.
BH06	31	B	23.00	24.00	White CHALK.
BH07	7	D	3.00		Brown very gravelly sandy CLAY.
BH07	6	U	3.00	3.45	Very stiff brown very gravelly sandy CLAY.
BH07	10	B	4.00		Firm brown sandy CLAY.
BH07	11	U	5.00	5.45	Brown sandy CLAY.
BH07	12	D	5.60		Firm brown sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH07	14	B	7.00	8.00	Brown slightly gravelly sandy CLAY.
BH07	15	U	8.00	8.45	Stiff brown slightly gravelly sandy CLAY.
BH07	19	B	10.00	11.00	Firm brown slightly gravelly sandy CLAY.
BH07	20	SD	11.00	11.40	Brown slightly gravelly sandy CLAY.
BH07	29	B	19.00	20.00	White CHALK.
BH08	31	B	1.50	2.00	Brown very gravelly very sandy CLAY.
BH08	4	U	2.00	2.45	Brown very gravelly sandy CLAY.
BH08	8	B	3.50	4.00	Firm brown slightly gravelly sandy CLAY.
BH08	9	U	4.00	4.45	Brown slightly gravelly sandy CLAY.
BH08	12	SD	5.00	5.45	Firm brown sandy CLAY.
BH08	15	U	6.50	6.95	Stiff brown slightly sandy CLAY.
BH08	17	SD	8.00	8.45	Stiff brown sandy CLAY.
BH08	22	B	11.50	12.50	Brown very gravelly silty SAND.
BH08	25	B	14.00	14.50	Brown very sandy GRAVEL.
BH08	33	B	19.00	20.00	White CHALK.
BH08	37	B	22.00	23.00	White structureless CHALK.
WS03	-	-	1.20	2.00	Brown slightly gravelly very sandy CLAY.
WS03	-	-	3.00	4.00	Brown very gravelly SAND.
WS05	-	-	2.00	3.00	Brown gravelly very sandy CLAY.

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS08	-	-	2.00	2.90	Brown gravelly very sandy CLAY.
WS09	-	-	2.00	3.00	Brown slightly gravelly sandy CLAY.
WS10	-	-	6.00	7.00	Light brown sandy CLAY.
WS11	-	-	3.00	5.00	Brown slightly gravelly sandy CLAY.
WS12	-	-	2.00	2.60	Brown very sandy CLAY.
WS13	-	-	5.00	6.00	Brown slightly gravelly sandy CLAY.
WS14	-	-	4.00	5.00	Brown slightly gravelly sandy CLAY.
WS16	-	-	4.00	5.00	Brown slightly gravelly silty SAND.
WS18	-	-	2.00	3.00	Brown slightly gravelly sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

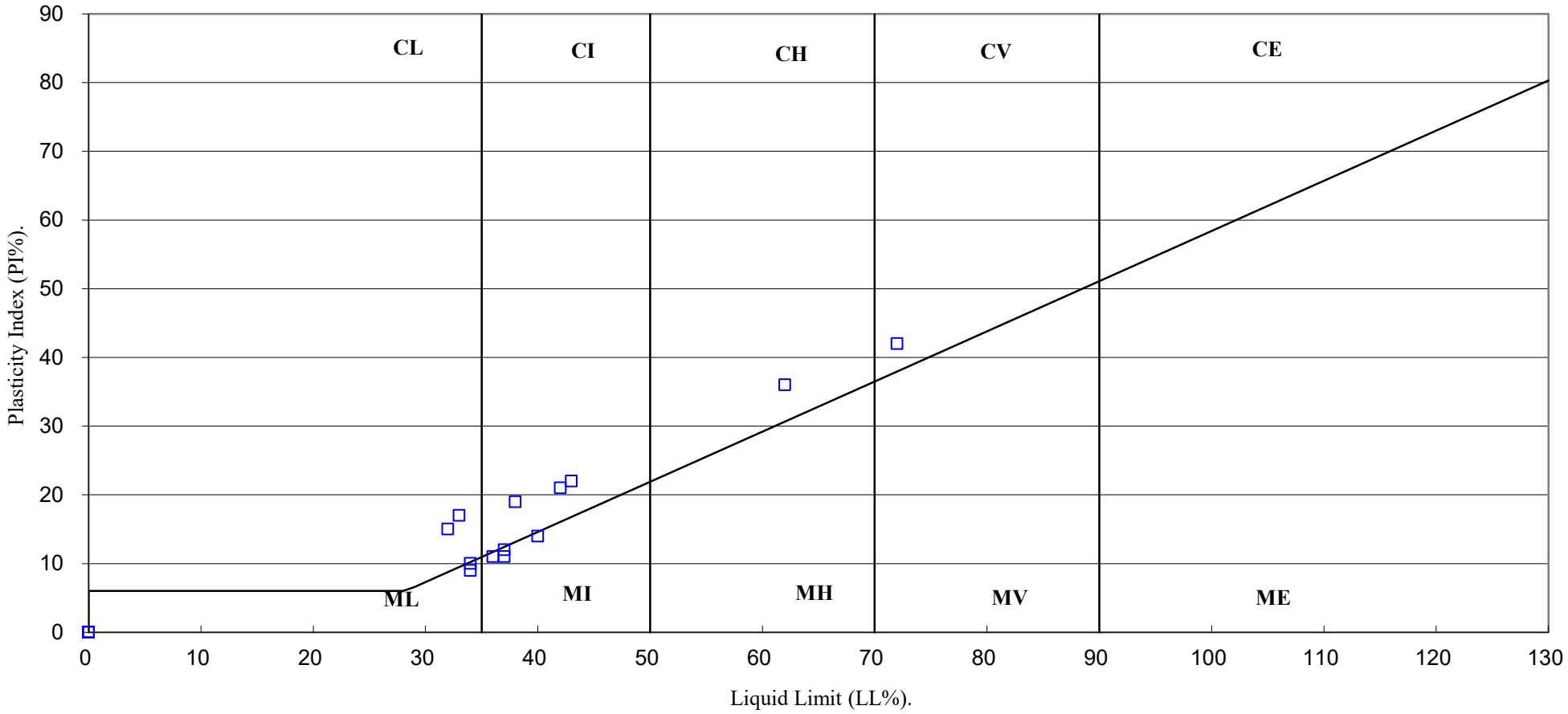
(BS1377 : PART 2 : 1990)

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
BH01	2	B	1.20	2.00	21			38	19	19	94	Intermediate plasticity CI.
BH01	15	B	8.00	9.00	16			33	16	17	69	Low plasticity CL.
BH01	27	B	16.00	17.00	33			37	26	11	94	Intermediate plasticity MI.
BH02	5	B	3.00	4.00	19			43	21	22	42	Intermediate plasticity CI.
BH02	22	B	16.00	17.00	29			36	25	11	89	Intermediate plasticity MI.
BH03	4	SD	3.00	3.45	7.7				NP			
BH03	5	B	3.50	4.00	10			32	17	15	52	Low plasticity CL.
BH03	19	B	14.00	15.00	30							
BH03	25	B	19.00	20.00	25			34	24	10	73	Low plasticity ML.
BH04	14	B	13.00	14.00	30							
BH04	16	SD	15.50	15.95	29			34	25	9	78	Low plasticity ML.
BH04	23	SD	24.50	24.95	35			40	26	14	71	Intermediate plasticity MI.
BH05	3	SD	2.00	2.45	20			42	21	21	95	Intermediate plasticity CI.
BH05	7	SD	9.50	9.95	37			72	30	42	81	Very high plasticity CV.
BH05	18	B	23.00	24.00	31			37	25	12	94	Intermediate plasticity MI.
BH05	19	SD	24.50	24.95	31							
BH06	2	B	1.20	2.00	18			62	26	36	84	High plasticity CH.
BH06	9	B	5.00	6.00	9.5				NP			
BH06	31	B	23.00	24.00	29							

SYMBOLS : NP : Non Plastic *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043	PSL Professional Soils Laboratory	Welwyn Garden City	Contract No: PSL19/7560
			Client Ref: A115249

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Welwyn Garden City	Contract No: PSL19/7560
			Client Ref: A115249

SUMMARY OF SOIL CLASSIFICATION TESTS

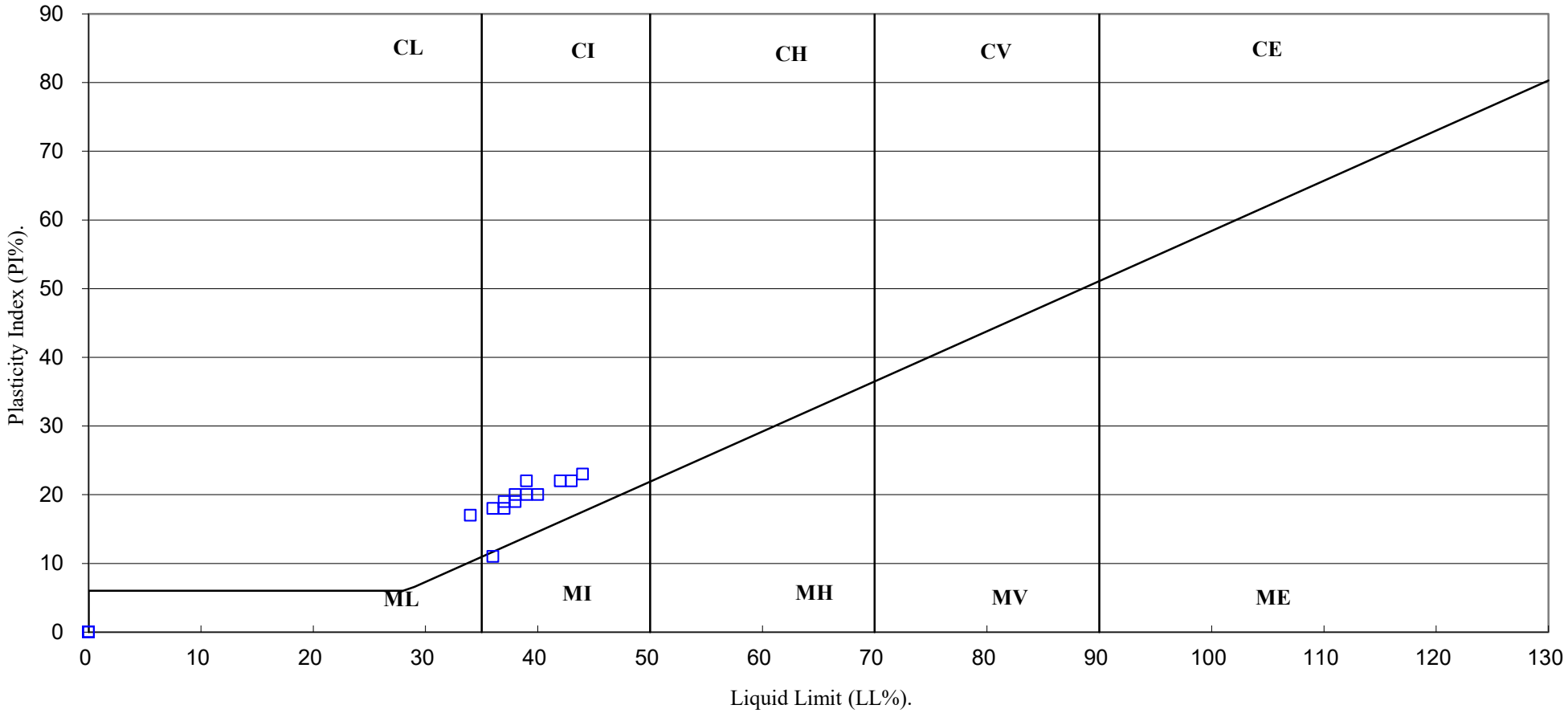
(BS1377 : PART 2 : 1990)

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
BH07	7	D	3.00		18			44	21	23	72	Intermediate plasticity CI.
BH07	11	U	5.00	5.45	18			38	19	19	100	Intermediate plasticity CI.
BH07	14	B	7.00	8.00	20			40	20	20	94	Intermediate plasticity CI.
BH07	20	SD	11.00	11.40	16			43	21	22	90	Intermediate plasticity CI.
BH08	31	B	1.50	2.00	15							
BH08	4	U	2.00	2.45	17			39	19	20	41	Intermediate plasticity CI.
BH08	9	U	4.00	4.45	19			37	18	19	95	Intermediate plasticity CI.
BH08	37	B	22.00	23.00	30			36	25	11	94	Intermediate plasticity MI.
WS03	-	-	1.20	2.00	15			36	18	18	90	Intermediate plasticity CI.
WS05	-	-	2.00	3.00	23			37	19	18	82	Intermediate plasticity CI.
WS08	-	-	2.00	2.90	15							
WS11	-	-	3.00	5.00	18			39	17	22	98	Intermediate plasticity CI.
WS12	-	-	2.00	2.60	19			34	17	17	100	Low plasticity CL.
WS13	-	-	5.00	6.00	18							
WS14	-	-	4.00	5.00	22			42	20	22	94	Intermediate plasticity CI.
WS18	-	-	2.00	3.00	25			38	18	20	91	Intermediate plasticity CI.

SYMBOLS : NP : Non Plastic *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043	PSL Professional Soils Laboratory	Welwyn Garden City	Contract No: PSL19/7560
			Client Ref: A115249

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Welwyn Garden City	Contract No:
			PSL19/7560
			Client Ref:
			A115249

SUMMARY OF CHALK TESTS

(BS1377 : PART 2 & 4 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content %	Saturated MC %	Dry Density Mg/m^3	Passing 10mm Sieve %	Chalk Crushing Value CCV	Remarks
BH02	2	B	1.20	2.00	19	26	1.58			
BH02	29	B	22.00	23.00	25	31	1.48			
BH02	37	B	28.00	29.00	32	30	1.49			
BH03	25	B	19.00	20.00	25	27	1.55			
BH04	16	SD	15.50	15.95	29	30	1.49			
BH04	23	SD	24.50	24.95	35	32	1.46			
BH06	16	SD	12.50	12.95	33	29	1.52			
BH07	29	B	19.00	20.00	27	29	1.51			
BH08	33	B	19.00	20.00	32	31	1.47			

* CCV testing is not UKAS accredited

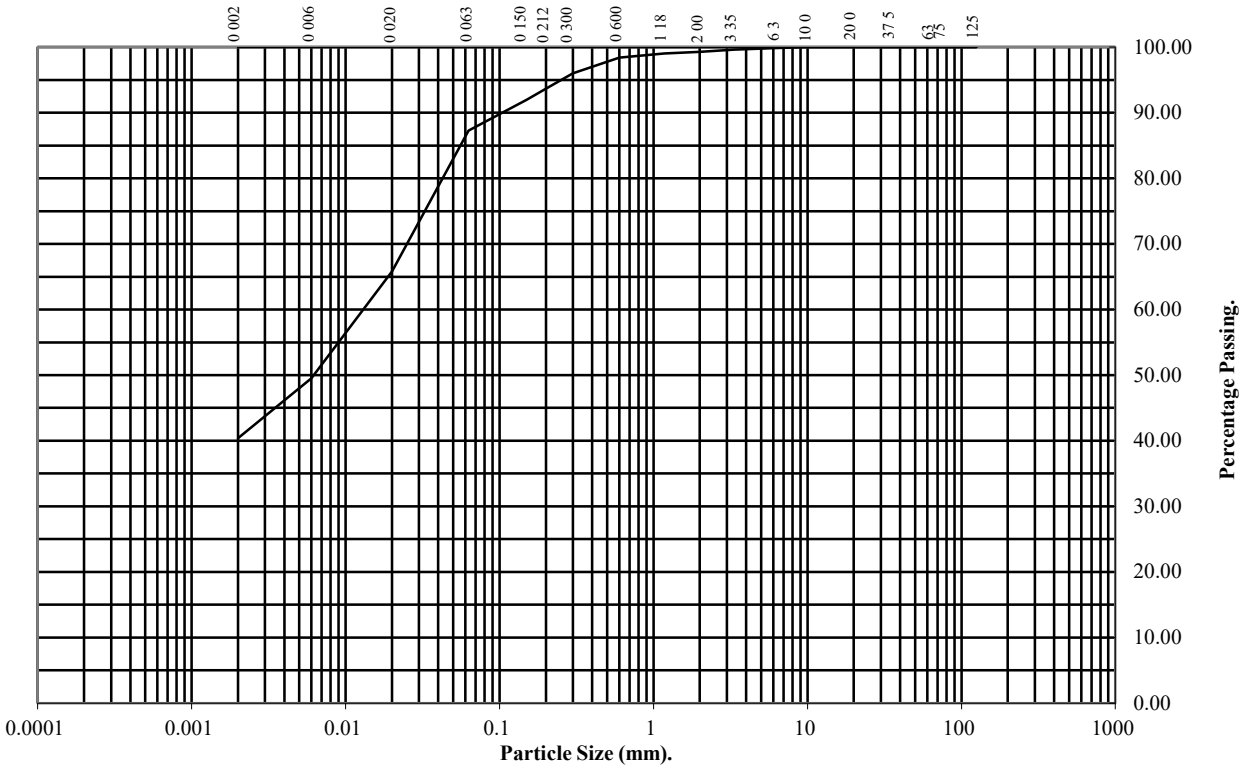
UKAS TESTING 4043	PSL Professional Soils Laboratory	Welwyn Garden City	Contract No: PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH01**	**Top Depth (m):**	**3.00**
Sample Number:	**6**	**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	100
3.35	100
2	99
1.18	99
0.6	98
0.3	96
0.212	94
0.15	92
0.063	87

Particle Diameter	Percentage Passing
0.02	66
0.006	50
0.002	40

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	12
Silt	47
Clay	40

Remarks:
See Summary of Soil Descriptions

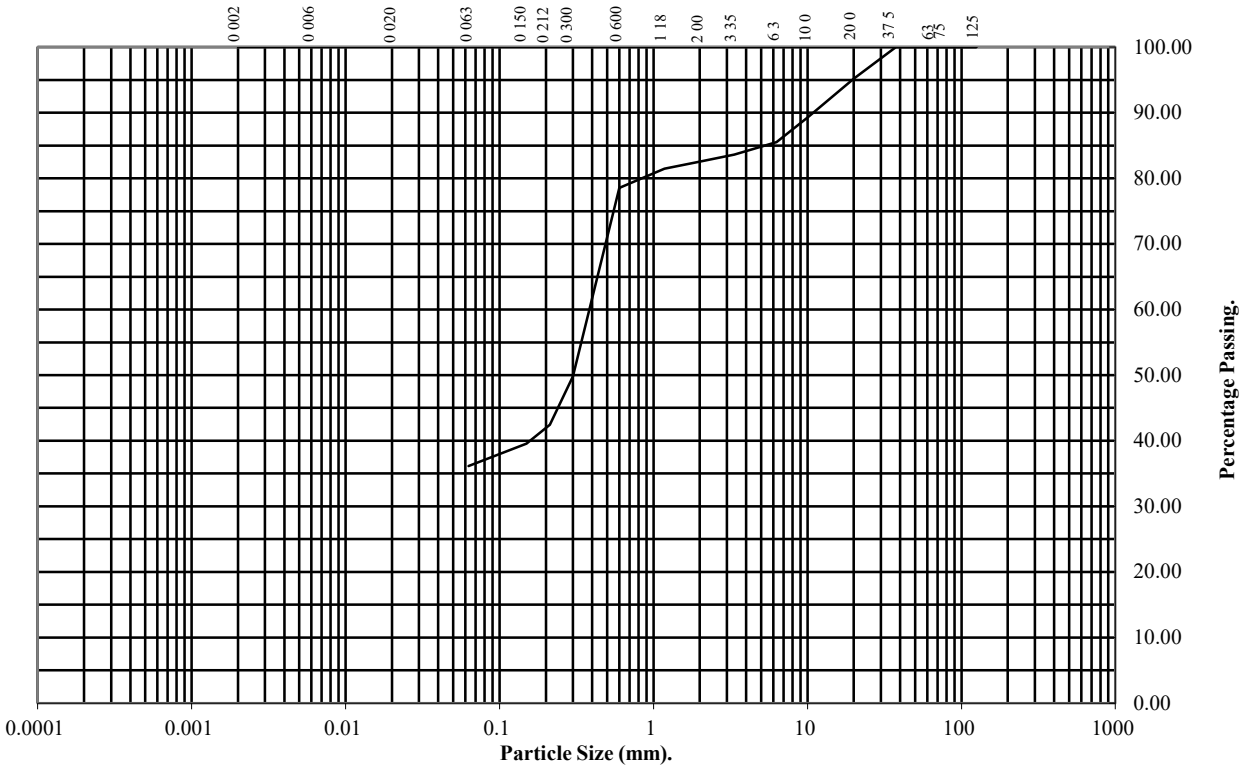
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH01**	**Top Depth (m):**	**8.00**
Sample Number:	**15**	**Base Depth(m):**	**9.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	95
10	89
6.3	86
3.35	84
2	83
1.18	81
0.6	79
0.3	50
0.212	42
0.15	40
0.063	36

Soil Fraction	Total Percentage
Cobbles	0
Gravel	17
Sand	47
Silt/Clay	36

Remarks:
See Summary of Soil Descriptions

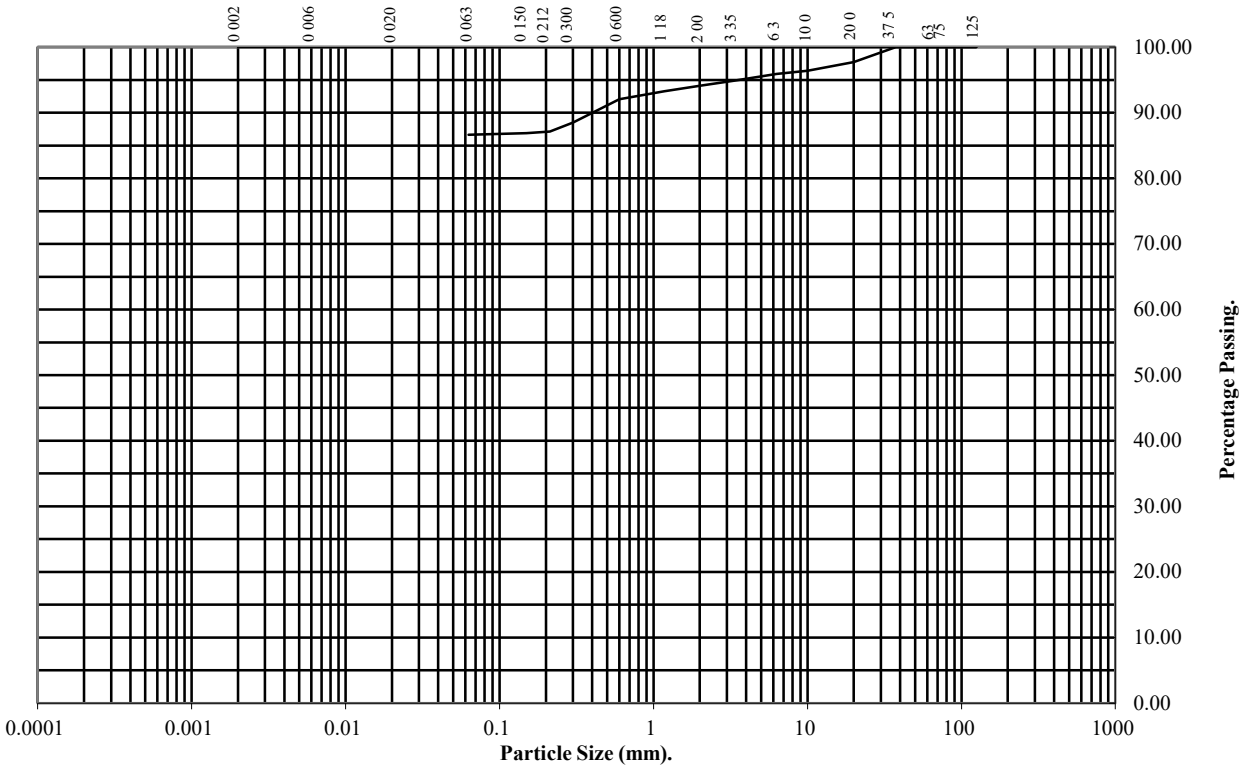
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH01**	**Top Depth (m):**	**14.00**
Sample Number:	**25**	**Base Depth(m):**	**15.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	98
10	96
6.3	96
3.35	95
2	94
1.18	93
0.6	92
0.3	89
0.212	87
0.15	87
0.063	87

Soil Fraction	Total Percentage
Cobbles	0
Gravel	6
Sand	7
Silt/Clay	87

Remarks:
See Summary of Soil Descriptions

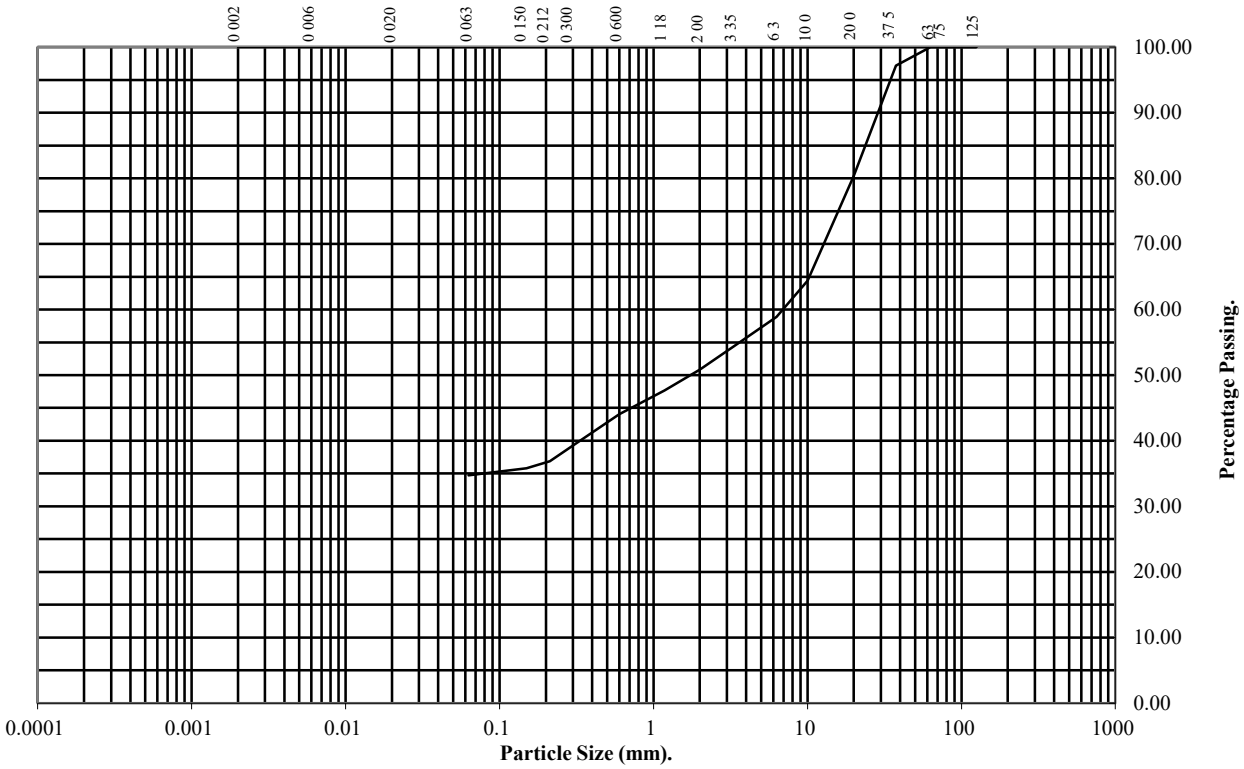
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH02**	**Top Depth (m):**	**3.00**
Sample Number:	**5**	**Base Depth(m):**	**4.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	97
20	80
10	64
6.3	59
3.35	54
2	51
1.18	48
0.6	44
0.3	39
0.212	37
0.15	36
0.063	35

Soil Fraction	Total Percentage
Cobbles	0
Gravel	49
Sand	16
Silt/Clay	35

Remarks:
See Summary of Soil Descriptions

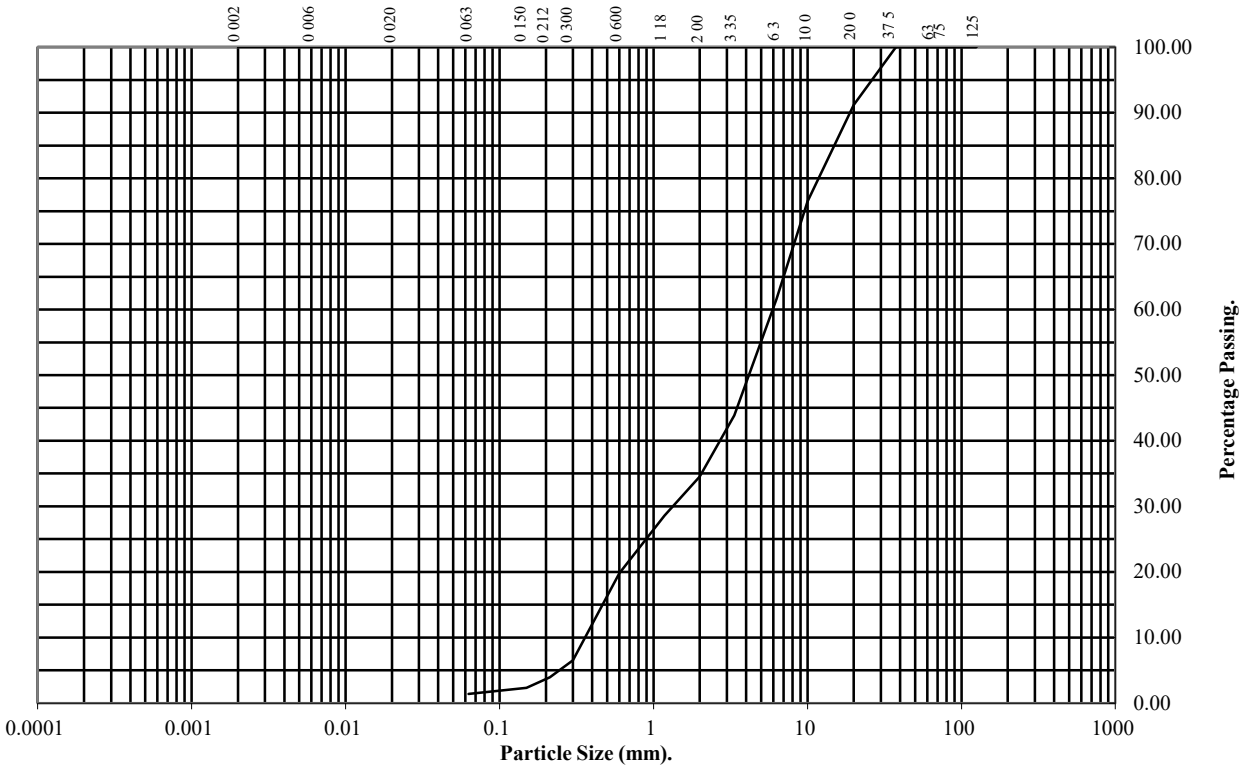
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH02**	**Top Depth (m):**	**6.50**
Sample Number:	**11**	**Base Depth(m):**	**7.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	91
10	76
6.3	62
3.35	44
2	35
1.18	29
0.6	20
0.3	7
0.212	4
0.15	2
0.063	1

Soil Fraction	Total Percentage
Cobbles	0
Gravel	65
Sand	34
Silt/Clay	1

Remarks:
See Summary of Soil Descriptions

4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

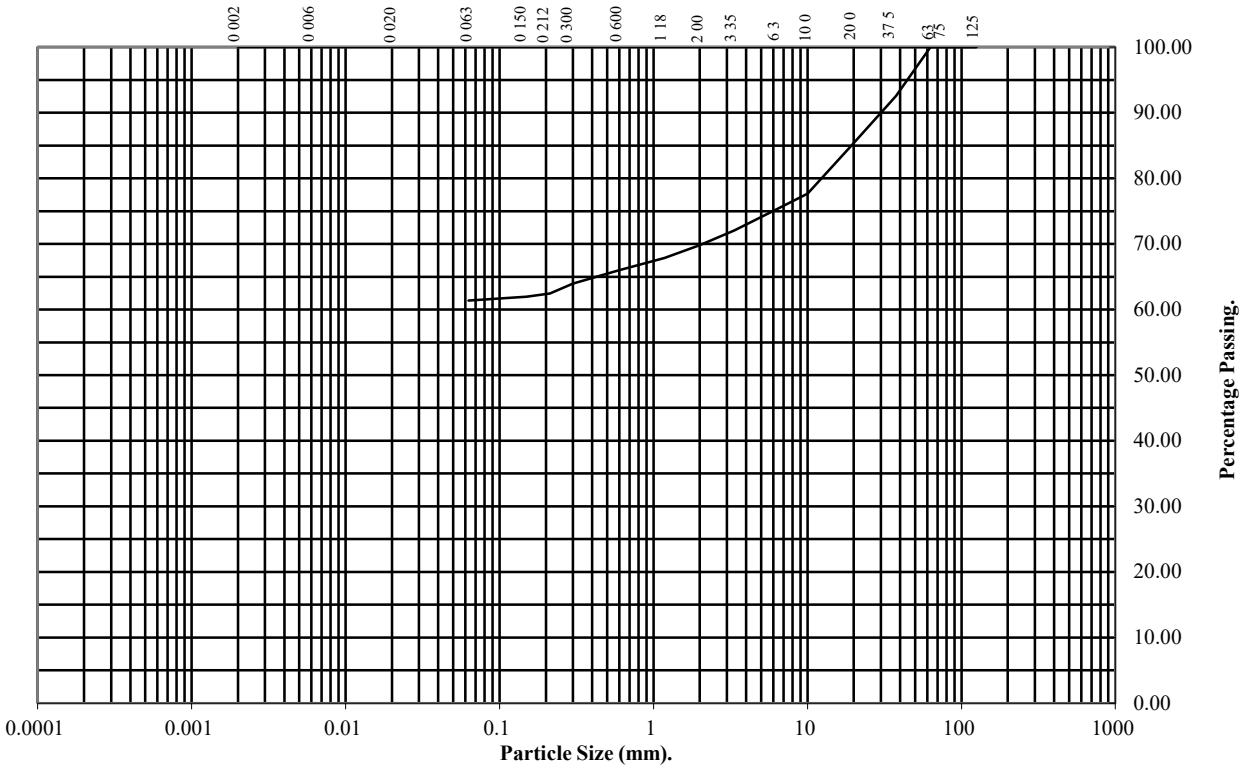
BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number: **BH02** **Top Depth (m):** **10.00**

Sample Number: **14** **Base Depth(m):**

Sample Type: **B**



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	93
20	85
10	78
6.3	75
3.35	72
2	70
1.18	68
0.6	66
0.3	64
0.212	62
0.15	62
0.063	61

Soil Fraction	Total Percentage
Cobbles	0
Gravel	30
Sand	9
Silt/Clay	61

Remarks:
See Summary of Soil Descriptions

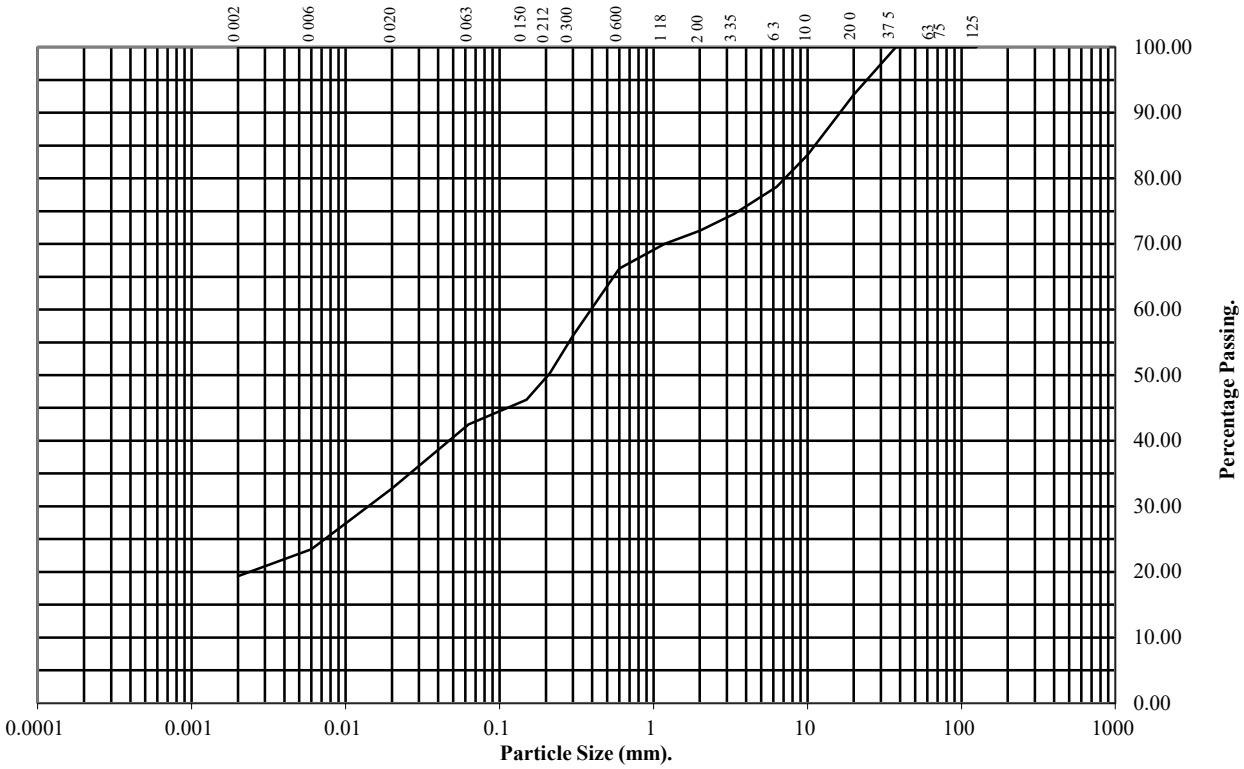
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH03**	**Top Depth (m):**	**2.00**
Sample Number:	**3**	**Base Depth(m):**	**3.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	93
10	84
6.3	79
3.35	75
2	72
1.18	70
0.6	66
0.3	56
0.212	50
0.15	46
0.063	42

Particle Diameter	Percentage Passing
0.02	33
0.006	23
0.002	19

Soil Fraction	Total Percentage
Cobbles	0
Gravel	28
Sand	30
Silt	23
Clay	19

Remarks:
See Summary of Soil Descriptions

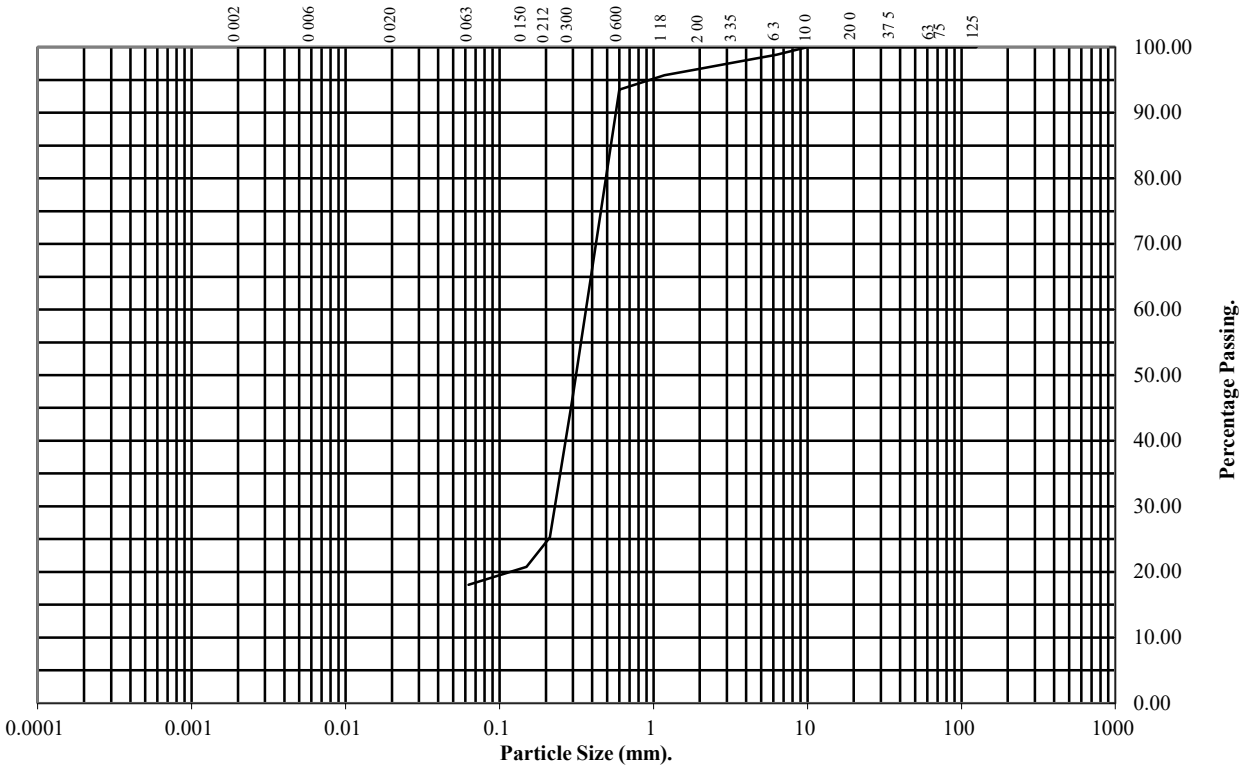
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH03**	**Top Depth (m):**	**3.00**
Sample Number:	**4**	**Base Depth(m):**	**3.45**
Sample Type:	**SD**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	99
3.35	98
2	97
1.18	96
0.6	94
0.3	47
0.212	25
0.15	21
0.063	18

Soil Fraction	Total Percentage
Cobbles	0
Gravel	3
Sand	79
Silt/Clay	18

Remarks:

See Summary of Soil Descriptions

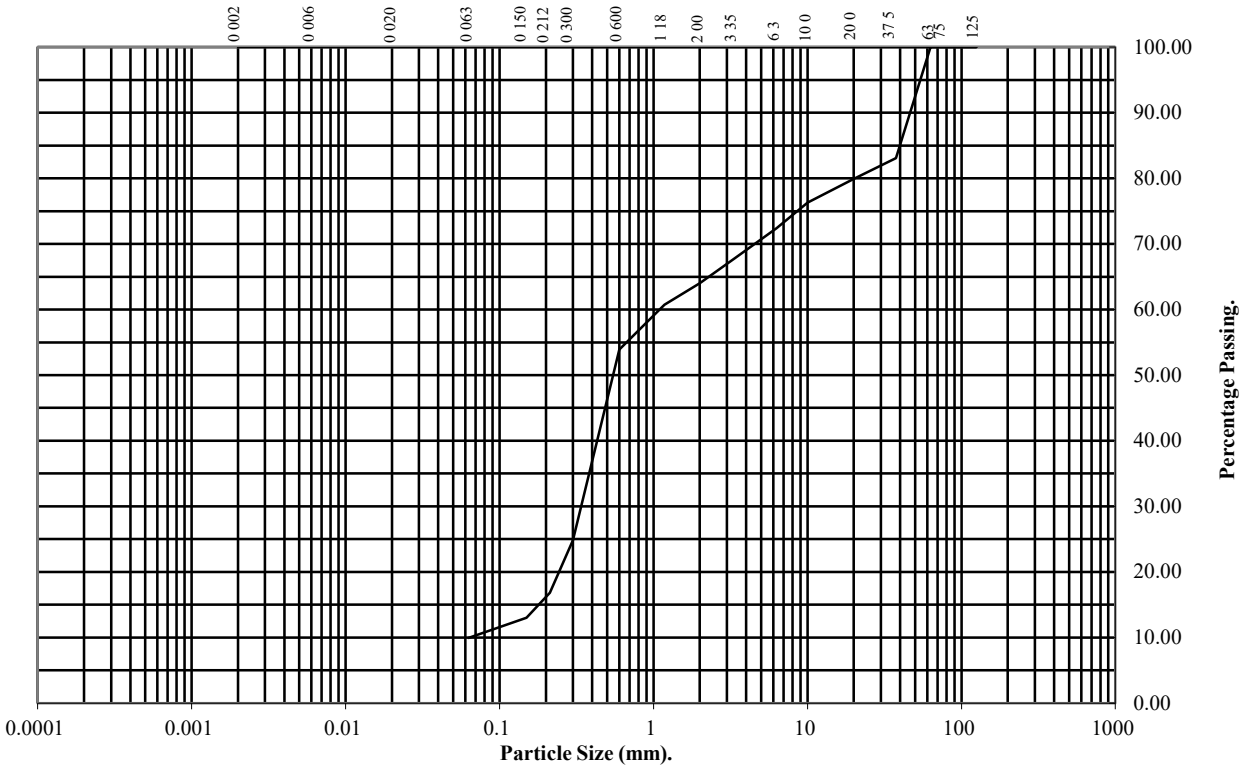
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH03**	**Top Depth (m):**	**7.00**
Sample Number:	**11**	**Base Depth(m):**	**8.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	83
20	80
10	76
6.3	72
3.35	68
2	64
1.18	61
0.6	54
0.3	25
0.212	17
0.15	13
0.063	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	36
Sand	54
Silt/Clay	10

Remarks:
See Summary of Soil Descriptions

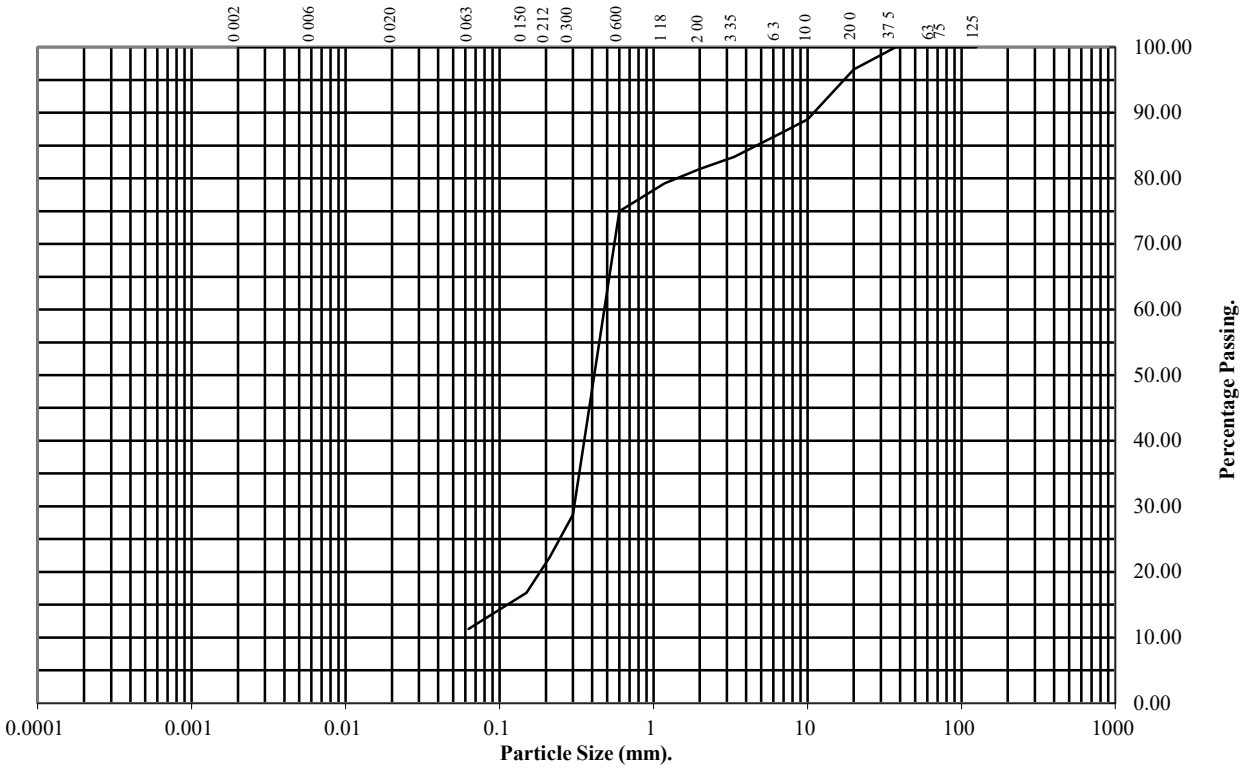
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH04**	**Top Depth (m):**	**2.00**
Sample Number:	**4**	**Base Depth(m):**	**3.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	97
10	89
6.3	87
3.35	83
2	81
1.18	79
0.6	75
0.3	29
0.212	22
0.15	17
0.063	11

Soil Fraction	Total Percentage
Cobbles	0
Gravel	19
Sand	70
Silt/Clay	11

Remarks:
See Summary of Soil Descriptions

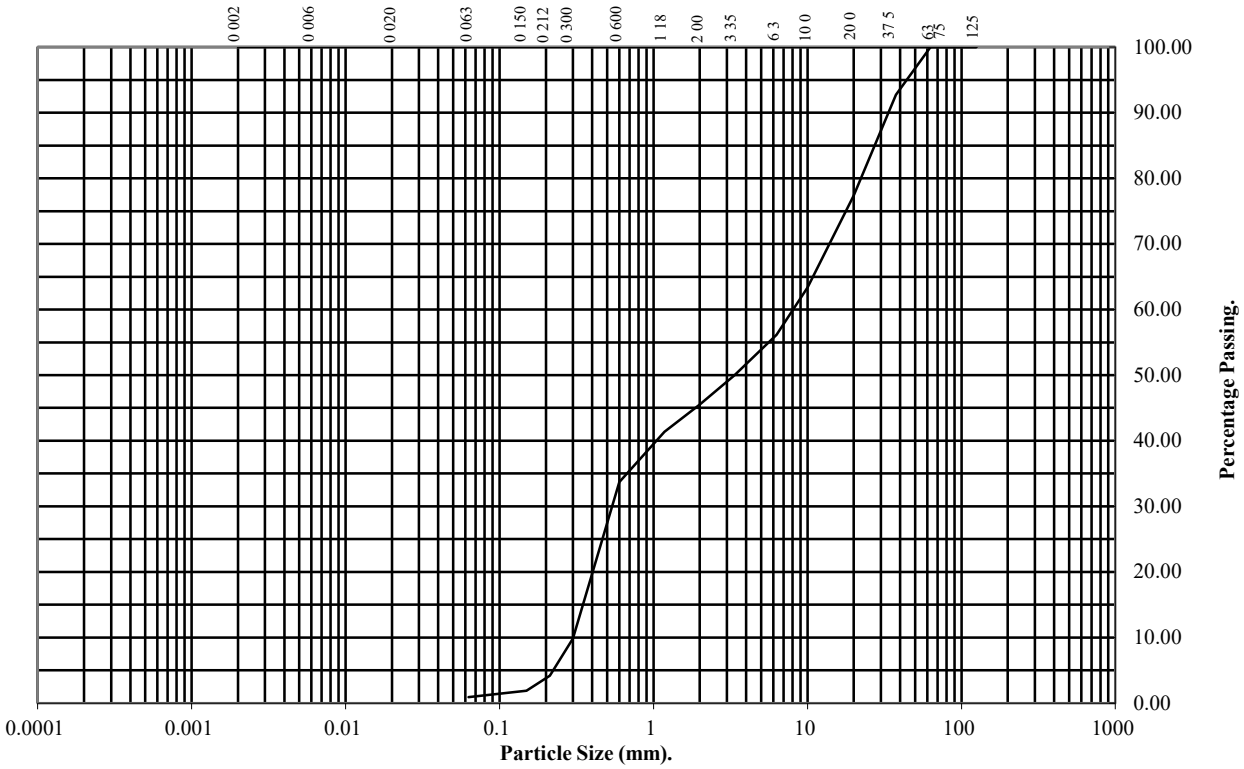
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH04**	**Top Depth (m):**	**10.00**
Sample Number:	**11**	**Base Depth(m):**	**11.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	93
20	77
10	63
6.3	56
3.35	50
2	46
1.18	41
0.6	34
0.3	10
0.212	4
0.15	2
0.063	1

Soil Fraction	Total Percentage
Cobbles	0
Gravel	54
Sand	45
Silt/Clay	1

Remarks:
See Summary of Soil Descriptions

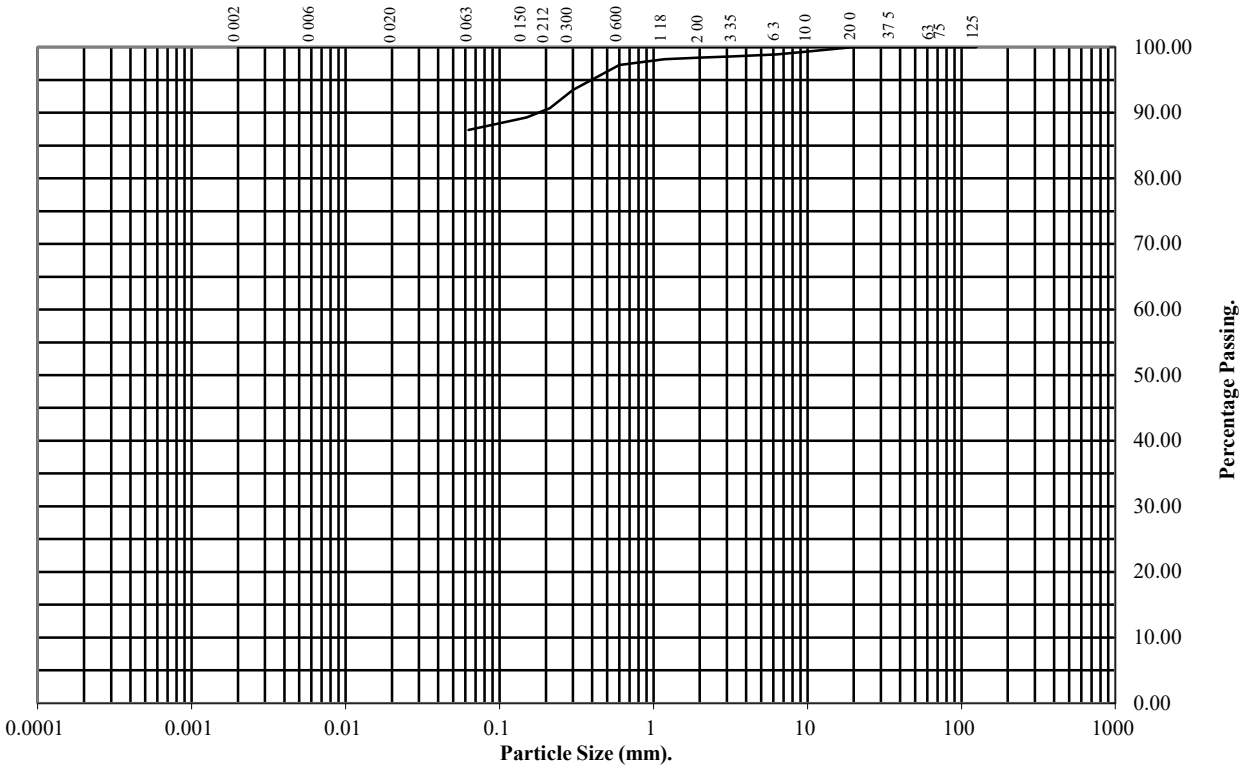
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH05**	**Top Depth (m):**	**2.00**
Sample Number:	**3**	**Base Depth(m):**	**2.45**
Sample Type:	**SD**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	99
6.3	99
3.35	99
2	98
1.18	98
0.6	97
0.3	94
0.212	91
0.15	89
0.063	87

Soil Fraction	Total Percentage
Cobbles	0
Gravel	2
Sand	11
Silt/Clay	87

Remarks:

See Summary of Soil Descriptions

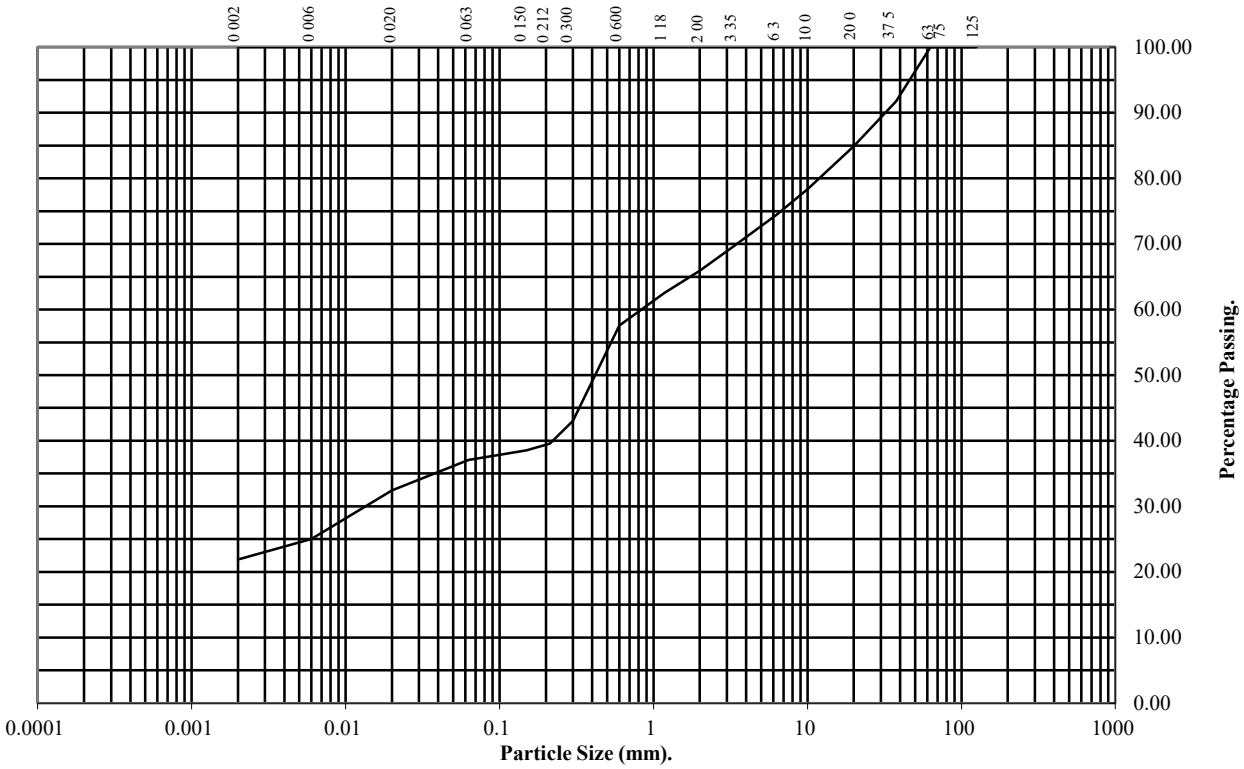
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Hole Number:	**BH05**	**Top Depth (m):**	**9.00**
Sample Number:	**6**	**Base Depth(m):**	**9.95**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	92
20	85
10	78
6.3	74
3.35	70
2	66
1.18	63
0.6	58
0.3	43
0.212	40
0.15	39
0.063	37

Particle Diameter	Percentage Passing
0.02	32
0.006	25
0.002	22

Soil Fraction	Total Percentage
Cobbles	0
Gravel	34
Sand	29
Silt	15
Clay	22

Remarks:
See Summary of Soil Descriptions

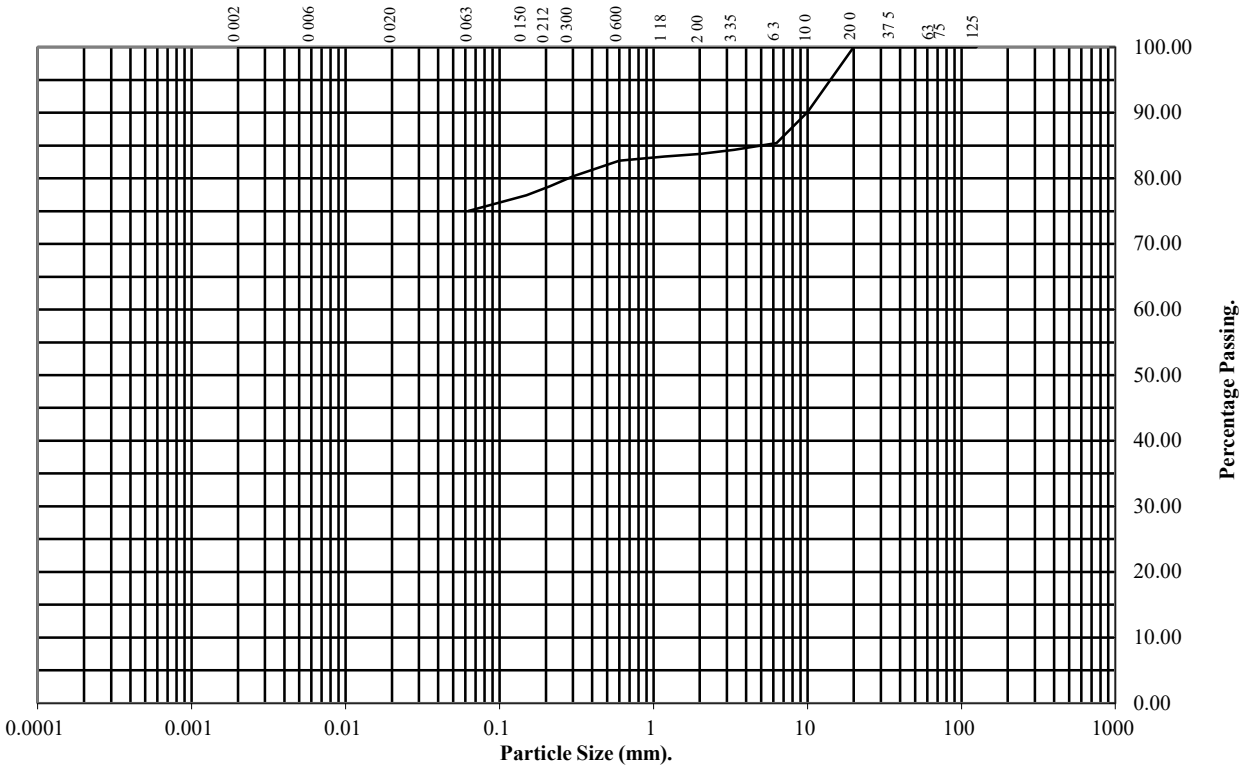
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH05**	**Top Depth (m):**	**9.50**
Sample Number:	**7**	**Base Depth(m):**	**9.95**
Sample Type:	**SD**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	90
6.3	85
3.35	84
2	84
1.18	83
0.6	83
0.3	80
0.212	79
0.15	77
0.063	75

Soil Fraction	Total Percentage
Cobbles	0
Gravel	16
Sand	9
Silt/Clay	75

Remarks:

See Summary of Soil Descriptions

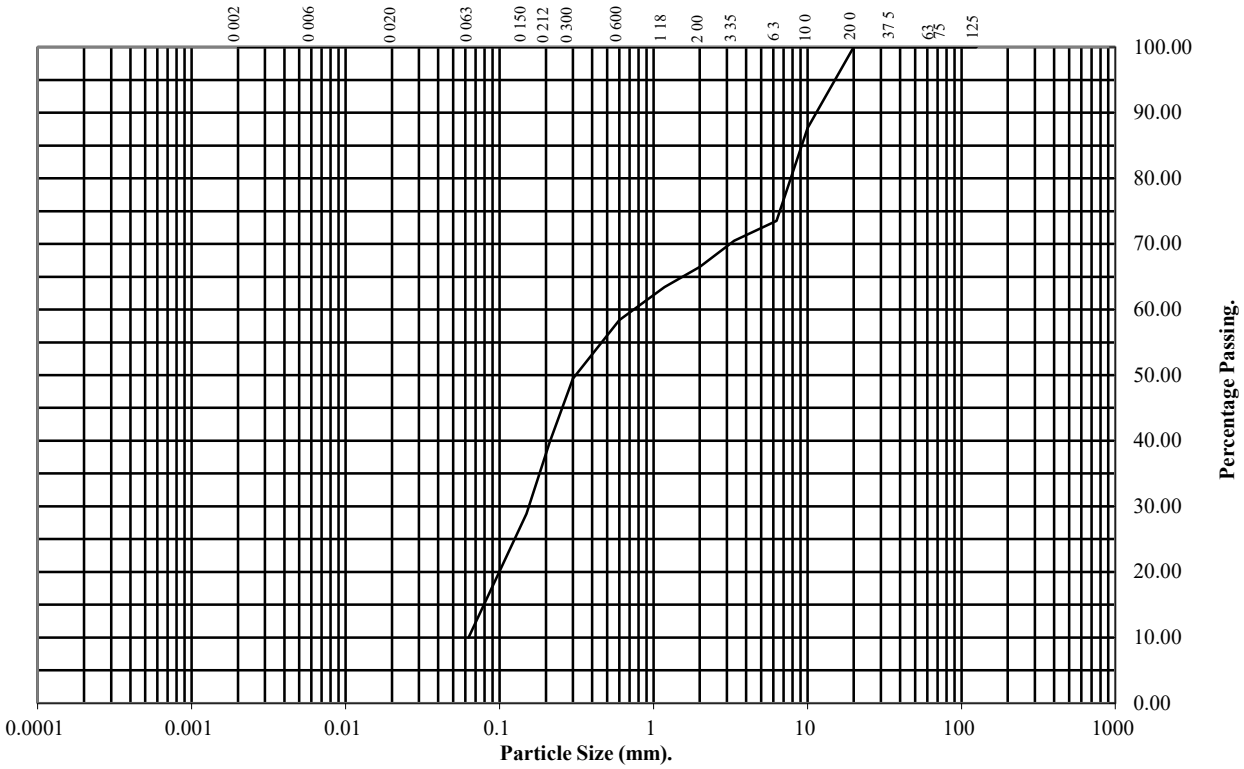
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH06**	**Top Depth (m):**	**5.00**
Sample Number:	**9**	**Base Depth(m):**	**6.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	88
6.3	74
3.35	71
2	66
1.18	63
0.6	58
0.3	49
0.212	40
0.15	29
0.063	10

Soil Fraction	Total Percentage
Cobbles	0
Gravel	34
Sand	56
Silt/Clay	10

Remarks:

See Summary of Soil Descriptions

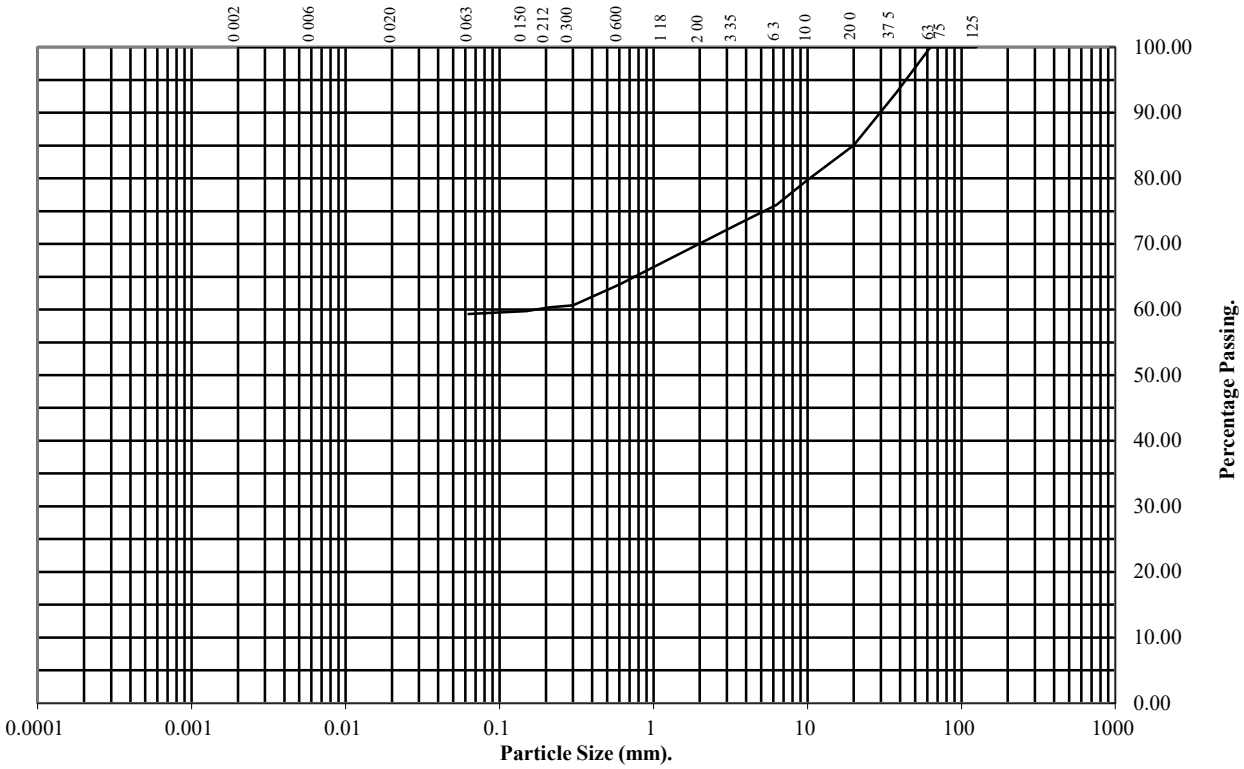
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH06**	**Top Depth (m):**	**8.00**
Sample Number:	**11**	**Base Depth(m):**	**9.00**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	93
20	85
10	80
6.3	76
3.35	73
2	70
1.18	67
0.6	64
0.3	61
0.212	60
0.15	60
0.063	59

Soil Fraction	Total Percentage
Cobbles	0
Gravel	30
Sand	11
Silt/Clay	59

Remarks:

See Summary of Soil Descriptions

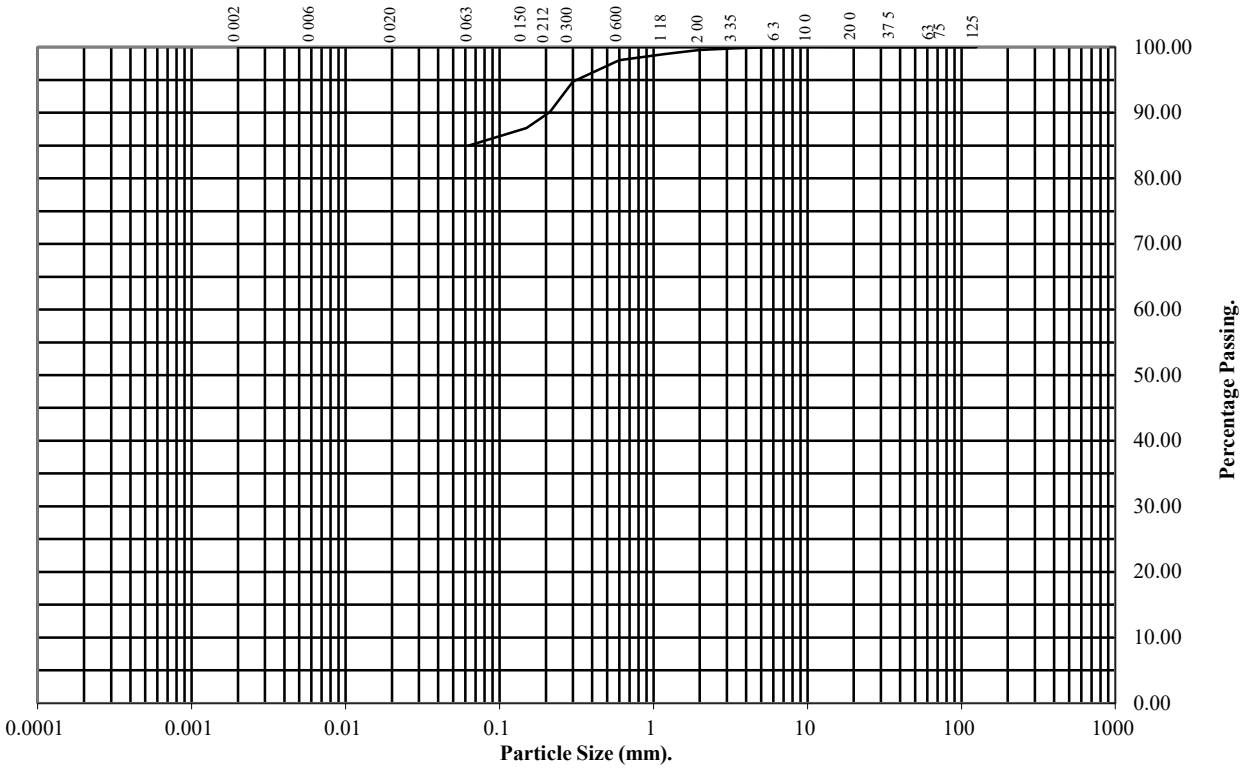
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH07**	**Top Depth (m):**	**5.00**
Sample Number:	**11**	**Base Depth(m):**	**5.45**
Sample Type:	**U**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	99
0.6	98
0.3	95
0.212	90
0.15	88
0.063	85

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	15
Silt/Clay	85

Remarks:

See Summary of Soil Descriptions

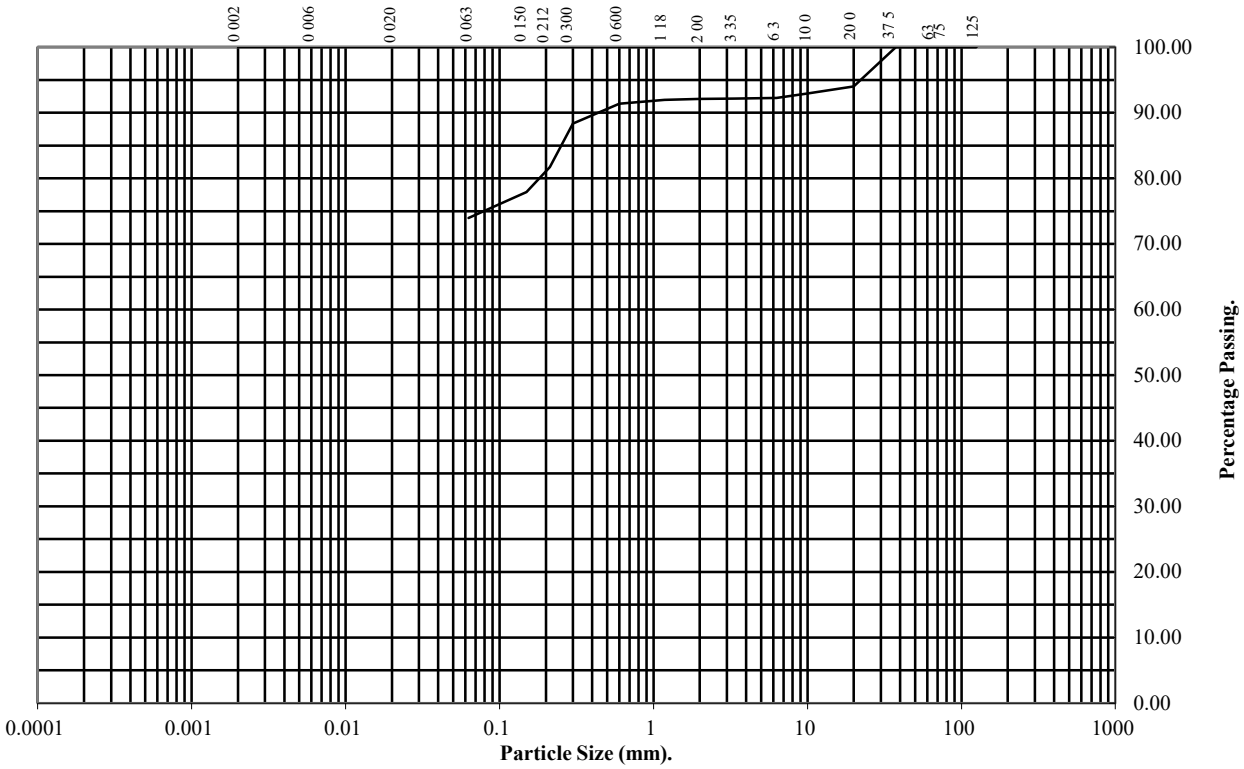
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH07**	**Top Depth (m):**	**11.00**
Sample Number:	**20**	**Base Depth(m):**	**11.40**
Sample Type:	**SD**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	94
10	93
6.3	92
3.35	92
2	92
1.18	92
0.6	91
0.3	88
0.212	82
0.15	78
0.063	74

Soil Fraction	Total Percentage
Cobbles	0
Gravel	8
Sand	18
Silt/Clay	74

Remarks:

See Summary of Soil Descriptions

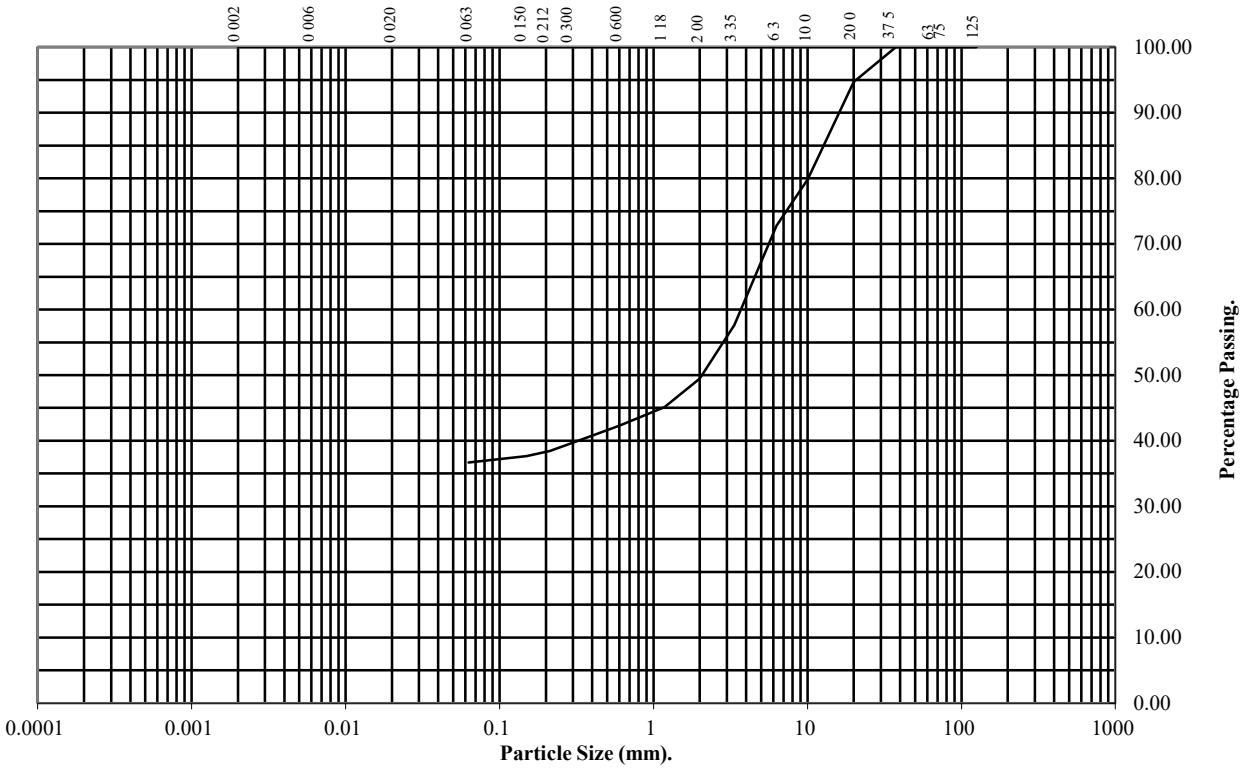
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH08**	**Top Depth (m):**	**2.00**
Sample Number:	**4**	**Base Depth(m):**	**2.45**
Sample Type:	**U**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	95
10	80
6.3	73
3.35	58
2	49
1.18	45
0.6	42
0.3	40
0.212	38
0.15	38
0.063	37

Soil Fraction	Total Percentage
Cobbles	0
Gravel	51
Sand	12
Silt/Clay	37

Remarks:
See Summary of Soil Descriptions

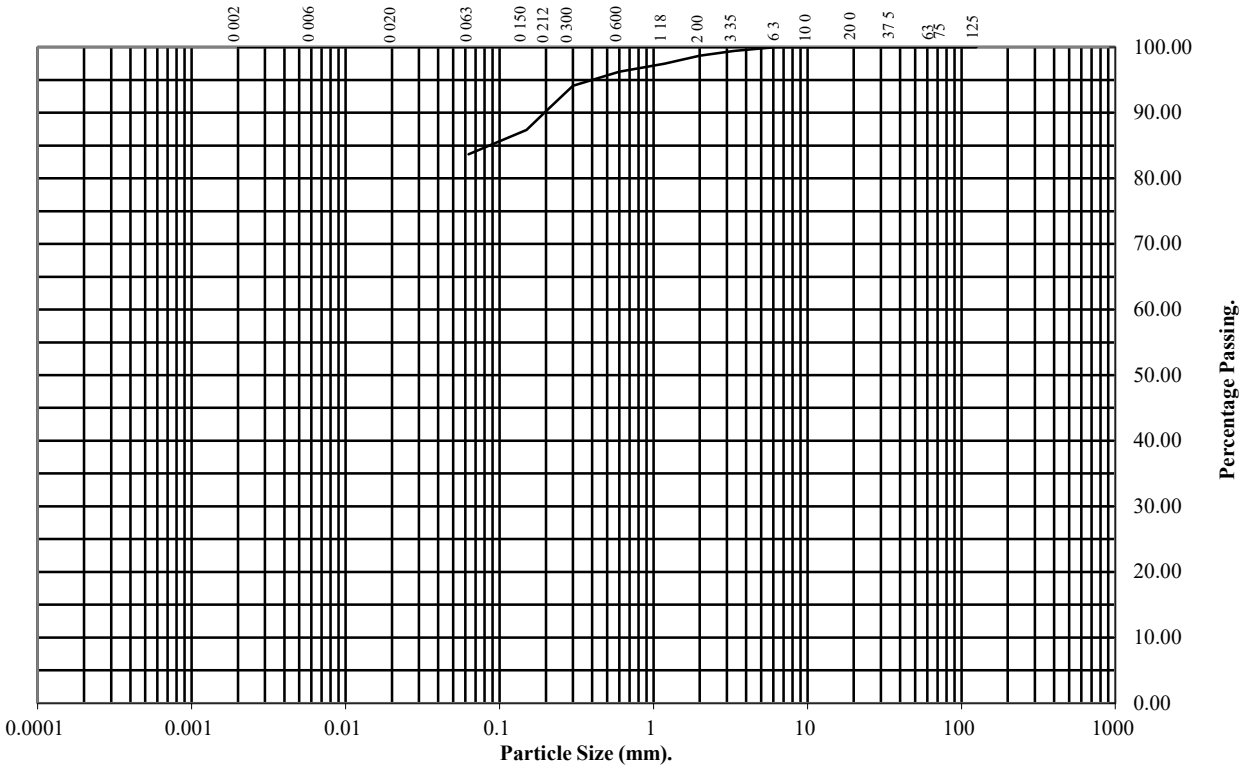
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH08**	**Top Depth (m):**	**4.00**
Sample Number:	**9**	**Base Depth(m):**	**4.45**
Sample Type:	**U**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	99
2	99
1.18	97
0.6	96
0.3	94
0.212	91
0.15	87
0.063	84

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	15
Silt/Clay	84

Remarks:
See Summary of Soil Descriptions

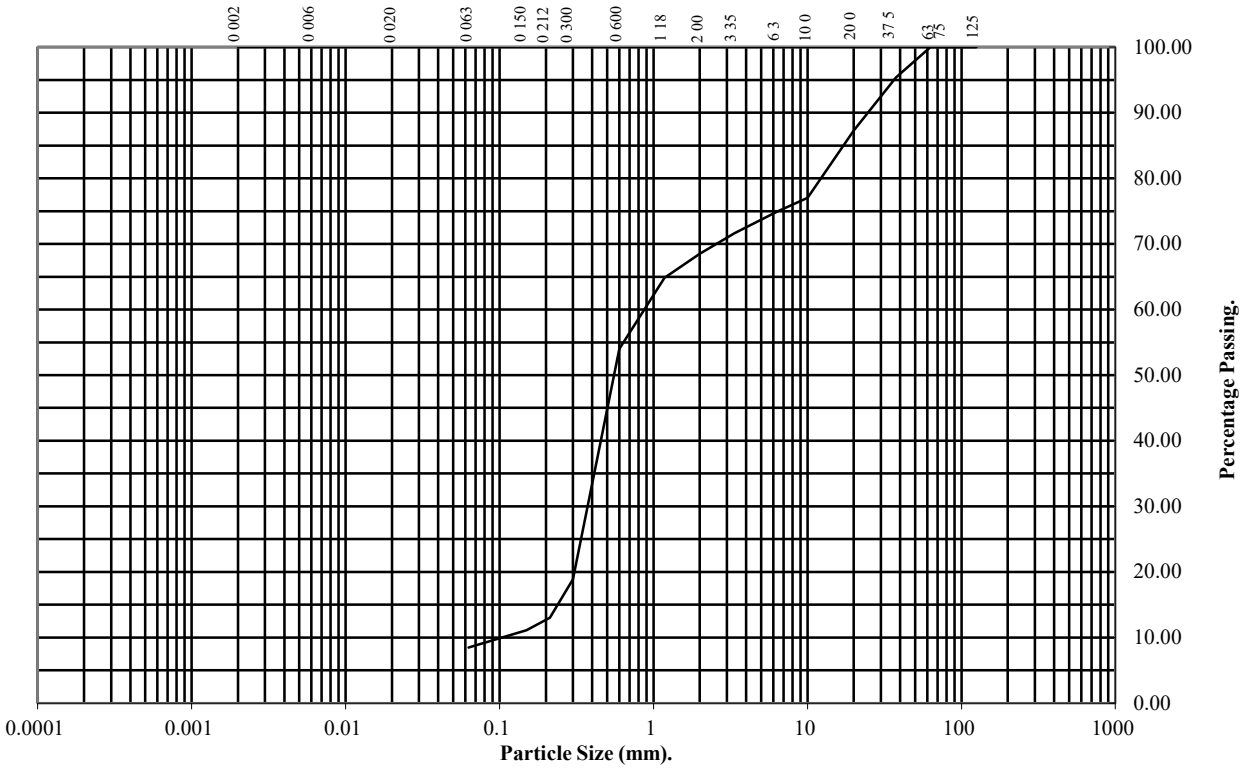
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH08**	**Top Depth (m):**	**11.50**
Sample Number:	**22**	**Base Depth(m):**	**12.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	95
20	87
10	77
6.3	75
3.35	72
2	68
1.18	65
0.6	54
0.3	19
0.212	13
0.15	11
0.063	8

Soil Fraction	Total Percentage
Cobbles	0
Gravel	32
Sand	60
Silt/Clay	8

Remarks:
See Summary of Soil Descriptions

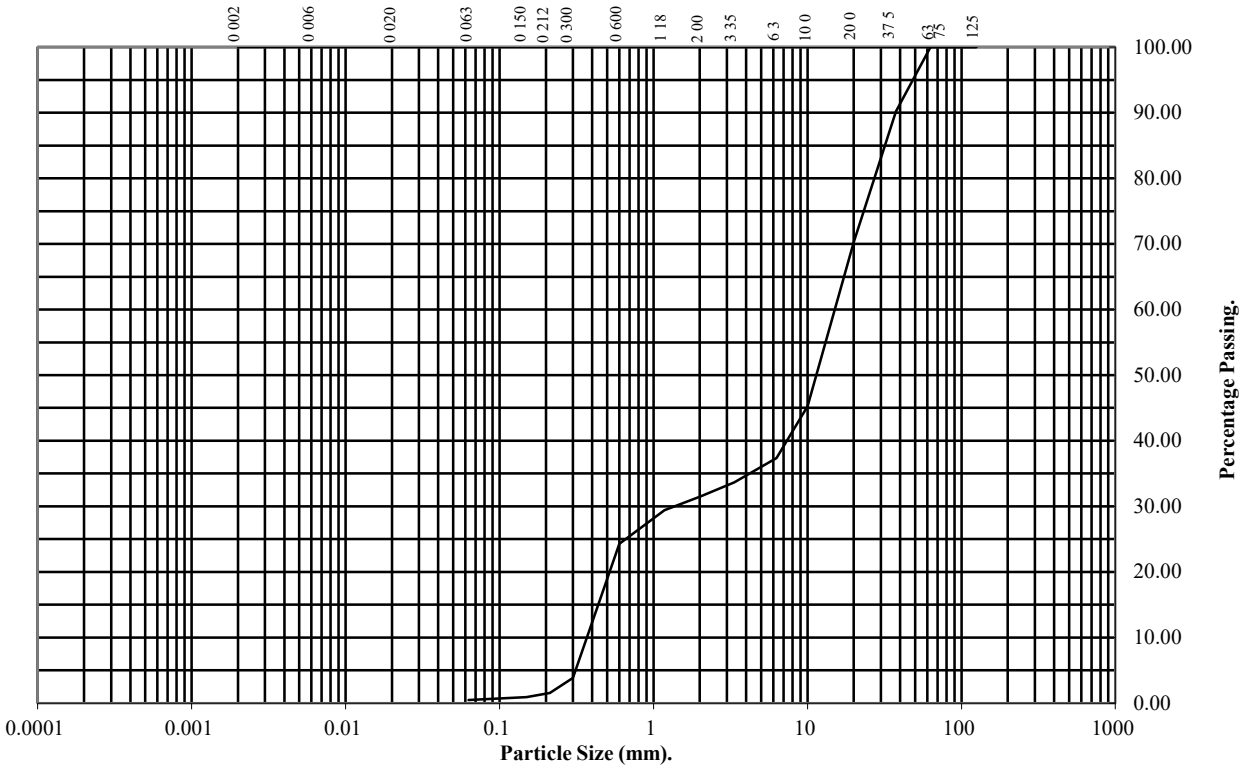
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**BH08**	**Top Depth (m):**	**14.00**
Sample Number:	**25**	**Base Depth(m):**	**14.50**
Sample Type:	**B**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	90
20	70
10	45
6.3	37
3.35	34
2	31
1.18	29
0.6	24
0.3	4
0.212	2
0.15	1
0.063	0

Soil Fraction	Total Percentage
Cobbles	0
Gravel	69
Sand	31
Silt/Clay	0

Remarks:
See Summary of Soil Descriptions

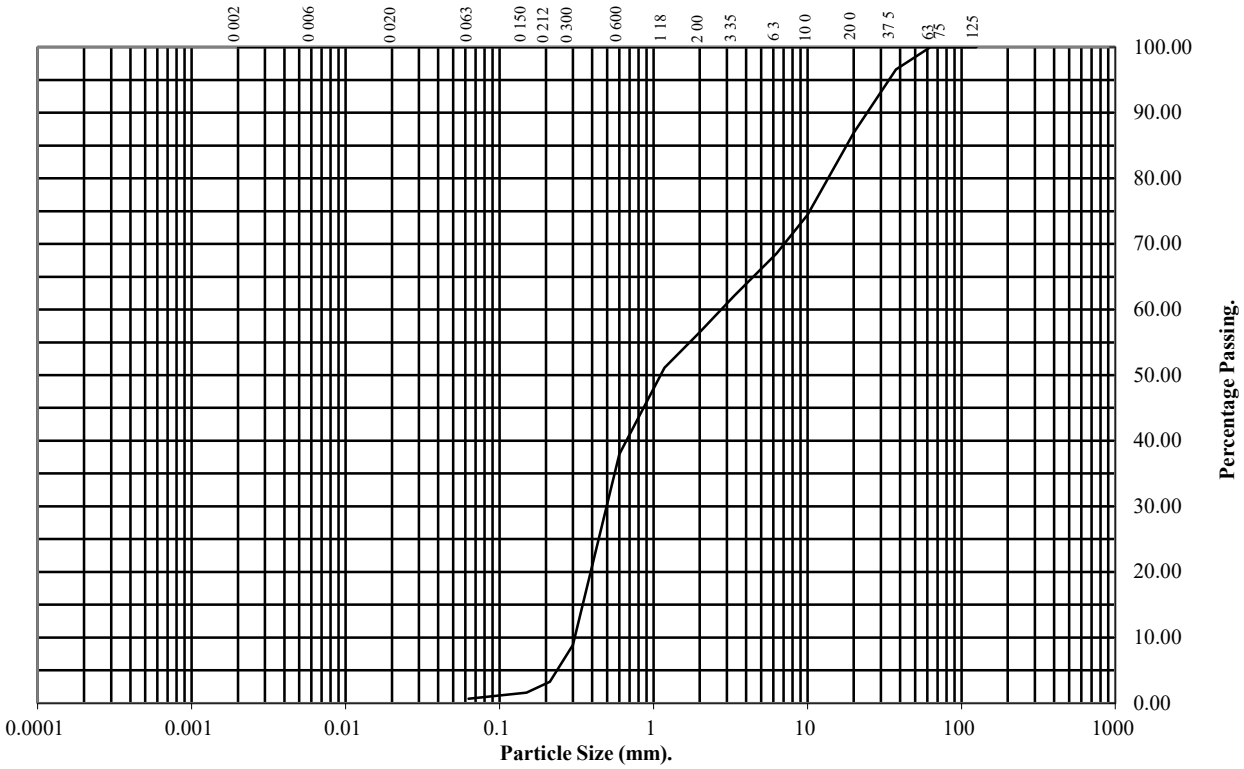
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**WS03**	**Top Depth (m):**	**3.00**
Sample Number:	**-**	**Base Depth(m):**	**4.00**
Sample Type:	**-**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	97
20	87
10	74
6.3	69
3.35	62
2	57
1.18	51
0.6	38
0.3	9
0.212	3
0.15	2
0.063	1

Soil Fraction	Total Percentage
Cobbles	0
Gravel	43
Sand	56
Silt/Clay	1

Remarks:
See Summary of Soil Descriptions

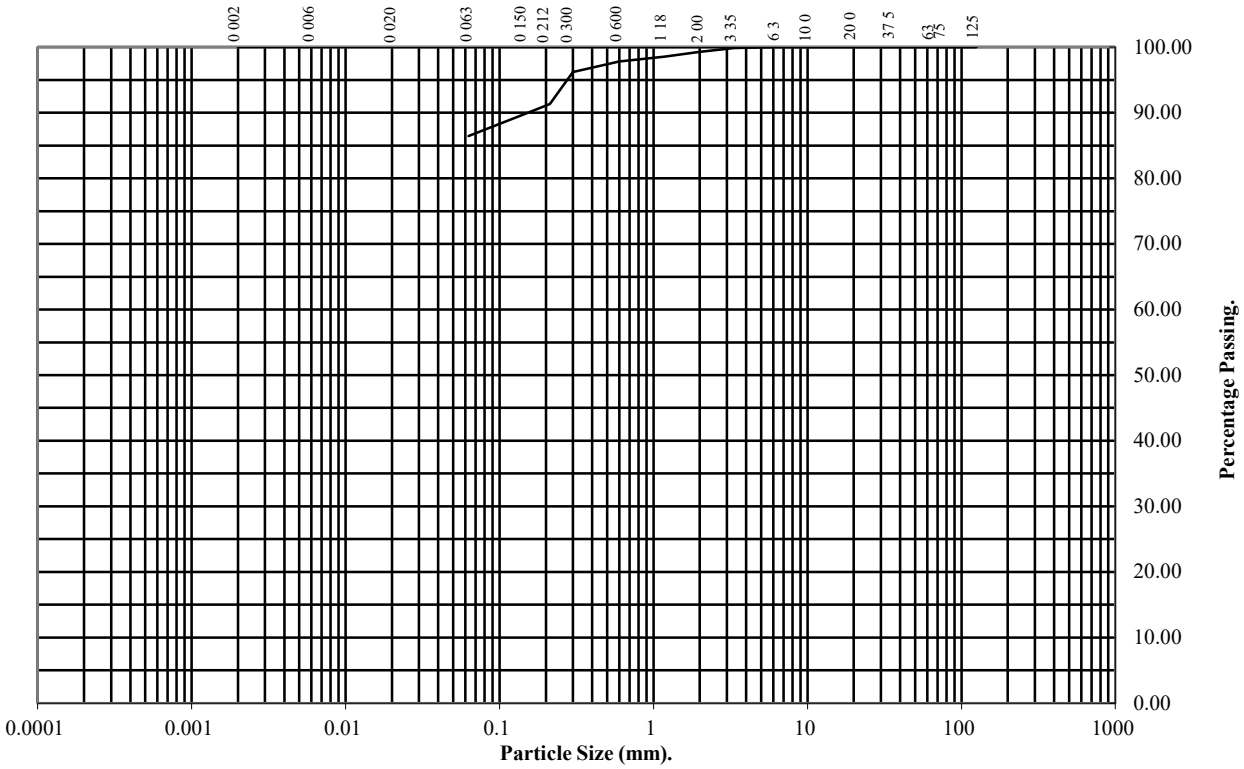
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**WS09**	**Top Depth (m):**	**2.00**
Sample Number:	**-**	**Base Depth(m):**	**3.00**
Sample Type:	**-**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	99
0.6	98
0.3	96
0.212	91
0.15	90
0.063	86

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	13
Silt/Clay	86

Remarks:

See Summary of Soil Descriptions

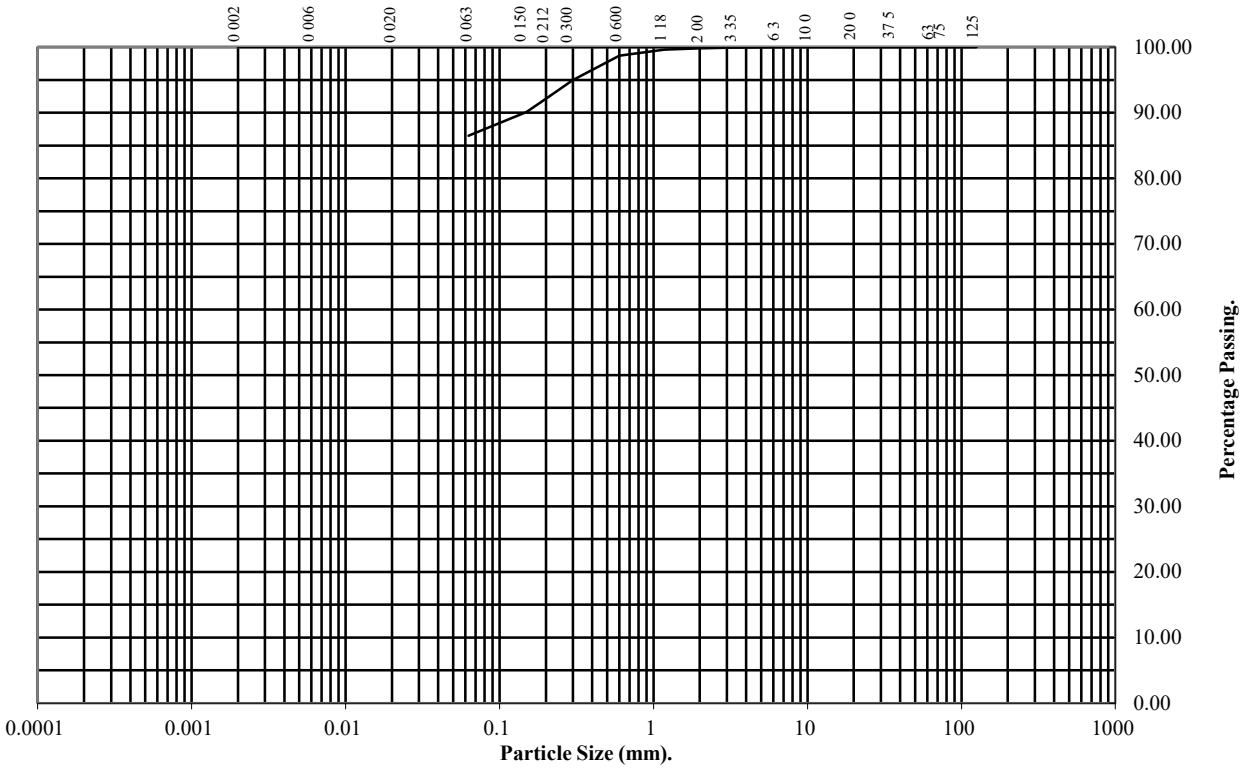
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**WS10**	**Top Depth (m):**	**6.00**
Sample Number:	**-**	**Base Depth(m):**	**7.00**
Sample Type:	**-**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	100
1.18	100
0.6	99
0.3	95
0.212	93
0.15	90
0.063	87

Soil Fraction	Total Percentage
Cobbles	0
Gravel	0
Sand	13
Silt/Clay	87

Remarks:

See Summary of Soil Descriptions

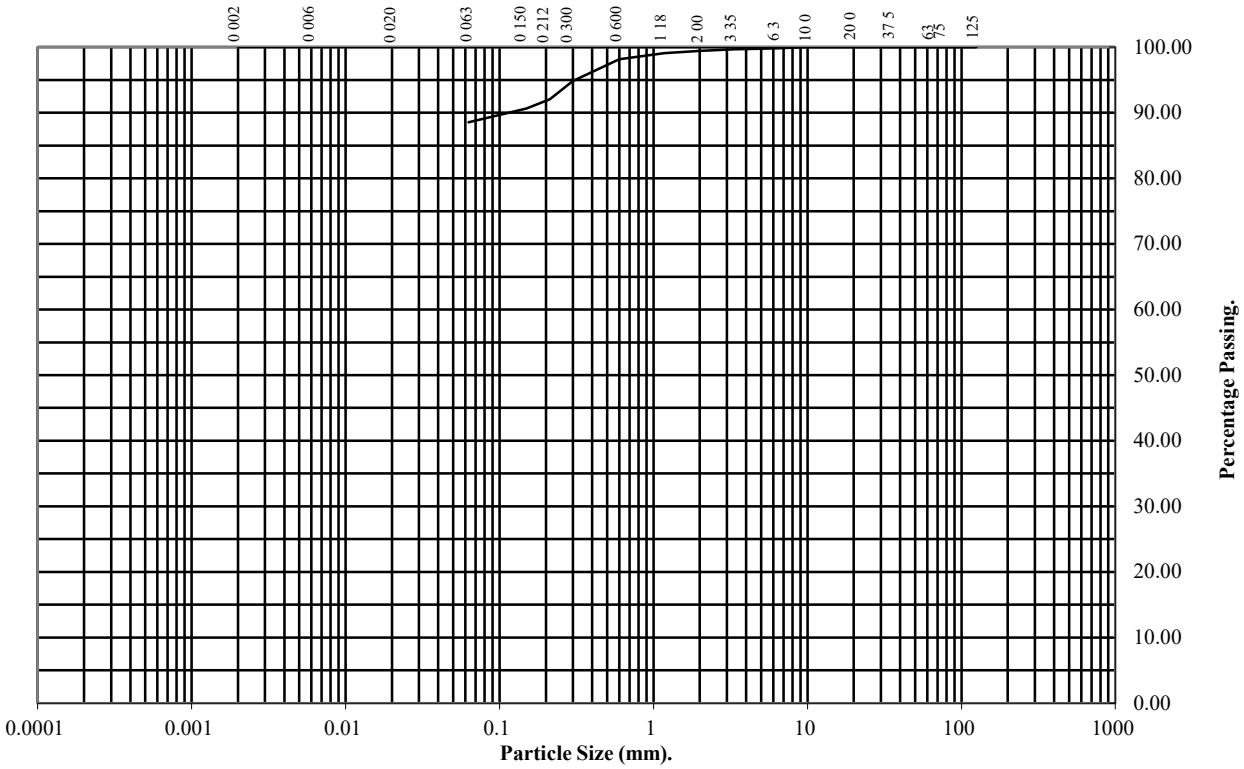
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**WS13**	**Top Depth (m):**	**5.00**
Sample Number:	**-**	**Base Depth(m):**	**6.00**
Sample Type:	**-**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	100
6.3	100
3.35	100
2	99
1.18	99
0.6	98
0.3	95
0.212	92
0.15	91
0.063	89

Soil Fraction	Total Percentage
Cobbles	0
Gravel	1
Sand	10
Silt/Clay	89

Remarks:

See Summary of Soil Descriptions

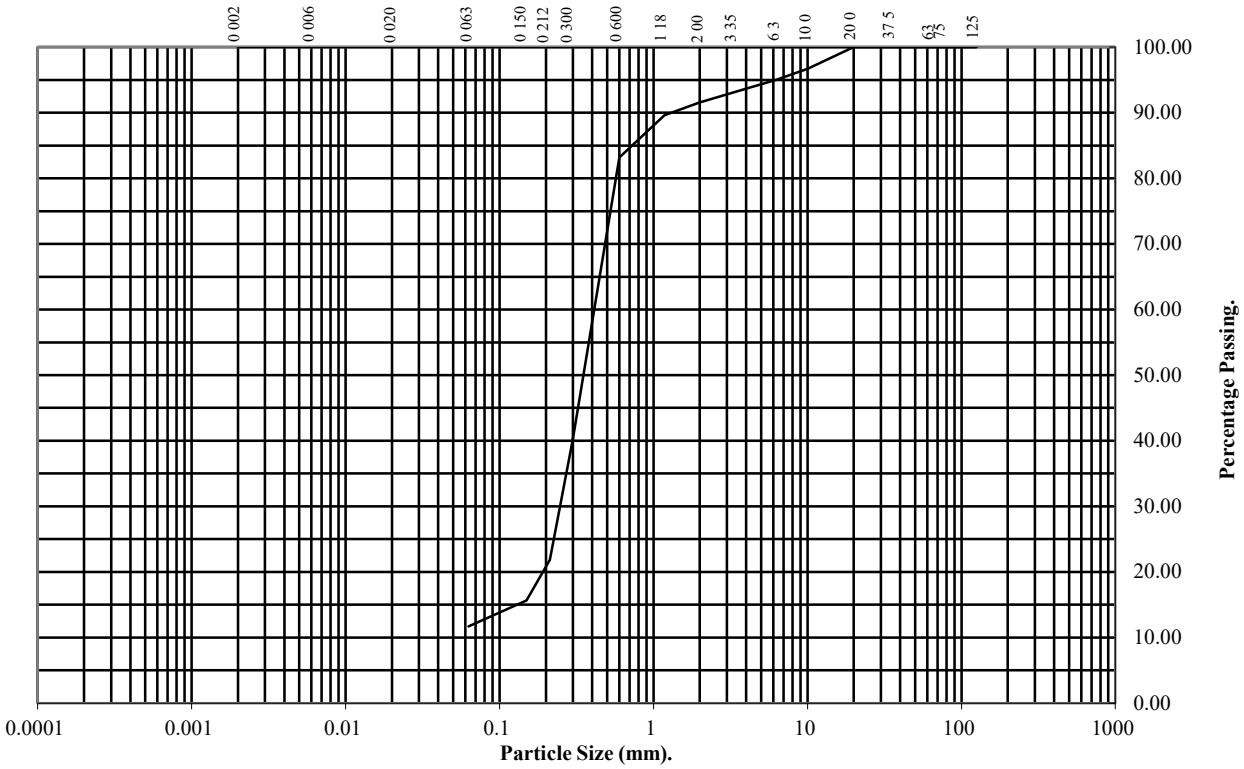
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

PARTICLE SIZE DISTRIBUTION TEST

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

Hole Number:	**WS16**	**Top Depth (m):**	**4.00**
Sample Number:	**-**	**Base Depth(m):**	**5.00**
Sample Type:	**-**		



BS Test Sieve (mm)	Percentage Passing
125	100
75	100
63	100
37.5	100
20	100
10	97
6.3	95
3.35	93
2	92
1.18	90
0.6	83
0.3	40
0.212	22
0.15	16
0.063	12

Soil Fraction	Total Percentage
Cobbles	0
Gravel	8
Sand	80
Silt/Clay	12

Remarks:
See Summary of Soil Descriptions

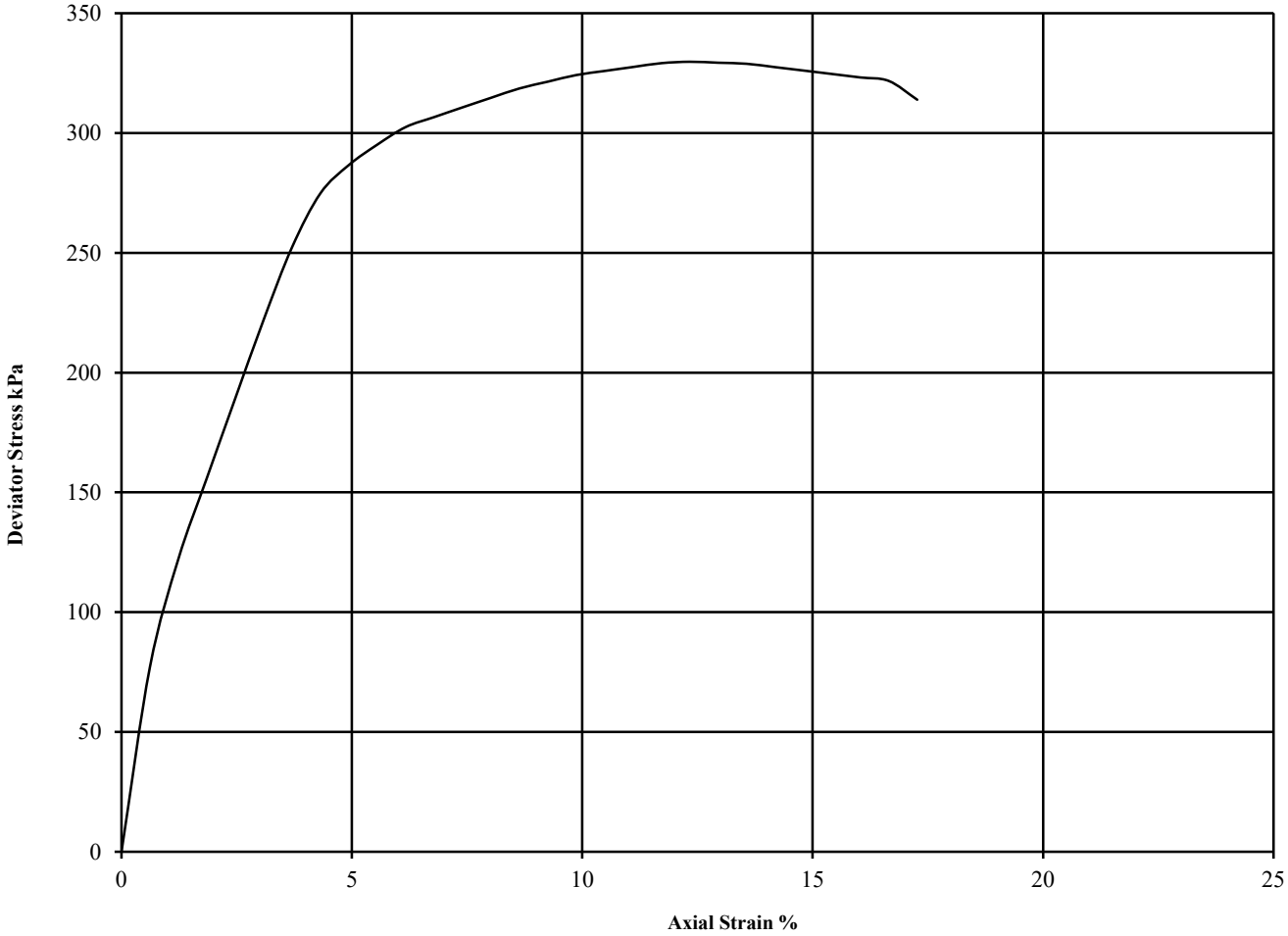
4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH07**	**Top Depth (m):**	**3.00**
Sample Number:	**6**	**Base Depth (m):**	**3.45**
Sample Type	**U**		



Diameter (mm):		103	Height (mm):		167	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	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, Correction applied 0.35
1	15	2.11	1.84	60	330	165	12.3	Brittle	See summary of soil descriptions

UKAS 4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

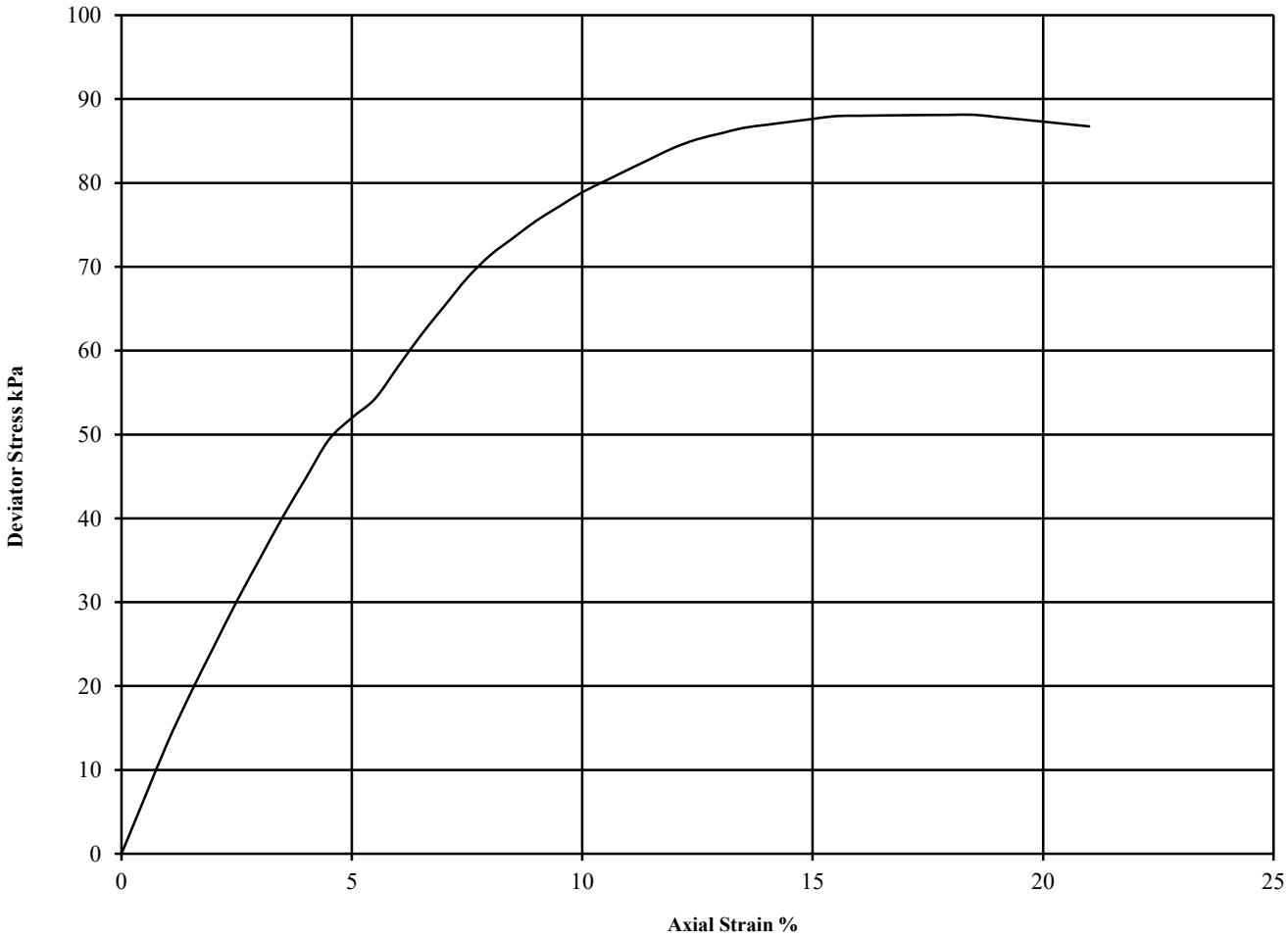
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: BH07 **Top Depth (m):** 4.00

Sample Number: 10 **Base Depth (m):**

Sample Type B



Diameter (mm):		100	Height (mm):		200	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Disturbed Sample Remoulded with 2.5kg effort Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.34
1	22	2.07	1.70	80	88	44	18.5	Plastic	See summary of soil descriptions

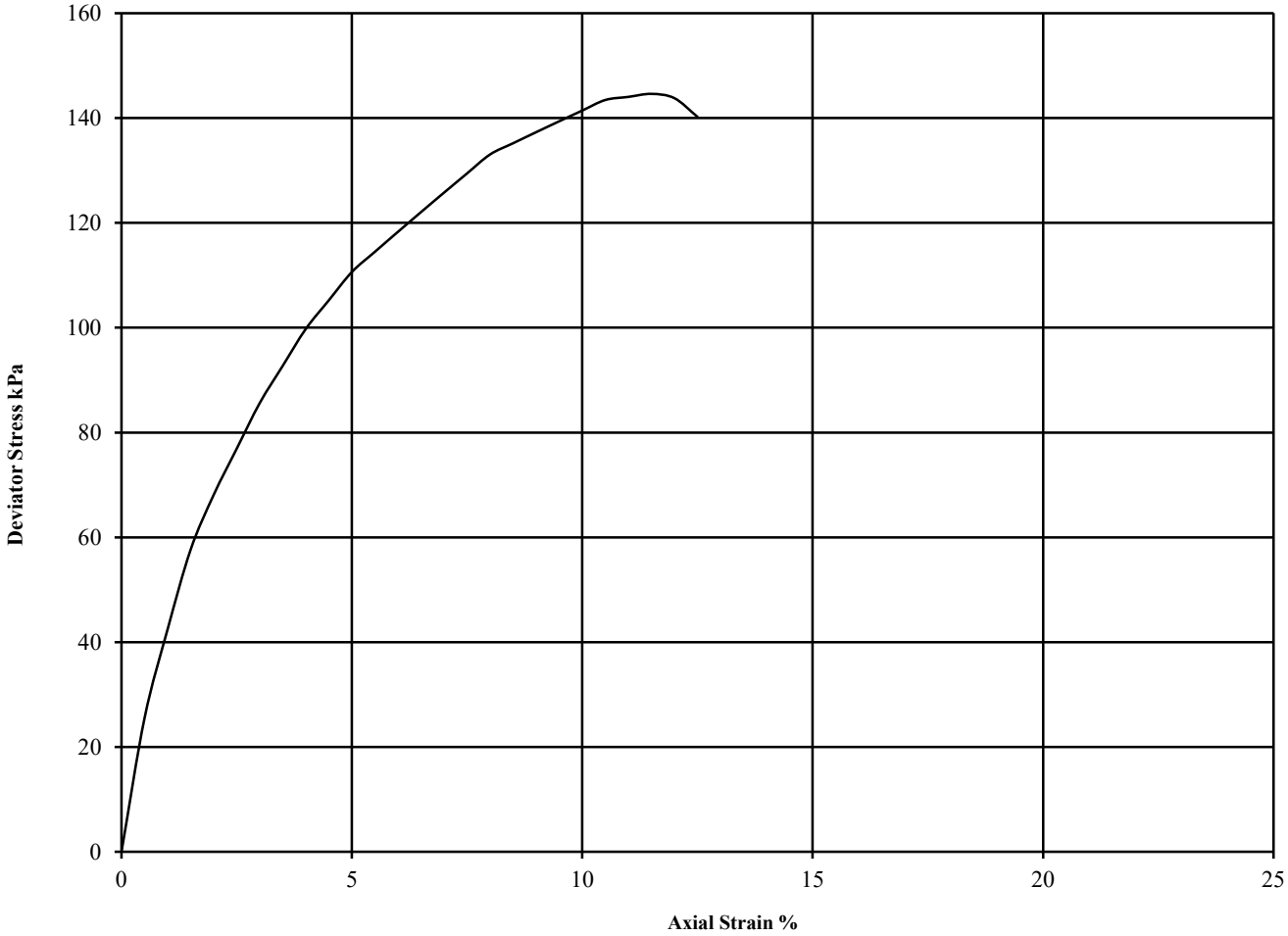
UKAS 4043	PSL Professional Soils Laboratory	Welwyn Garden City	Contract No: PSL19/7560 Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH07**	**Top Depth (m):**	**5.60**
Sample Number:	**12**	**Base Depth (m):**	
Sample Type	**D**		



Diameter (mm):		38	Height (mm):		76	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	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, Correction applied 0.84
1	18	2.00	1.69	112	145	72	11.5	Brittle	See summary of soil descriptions

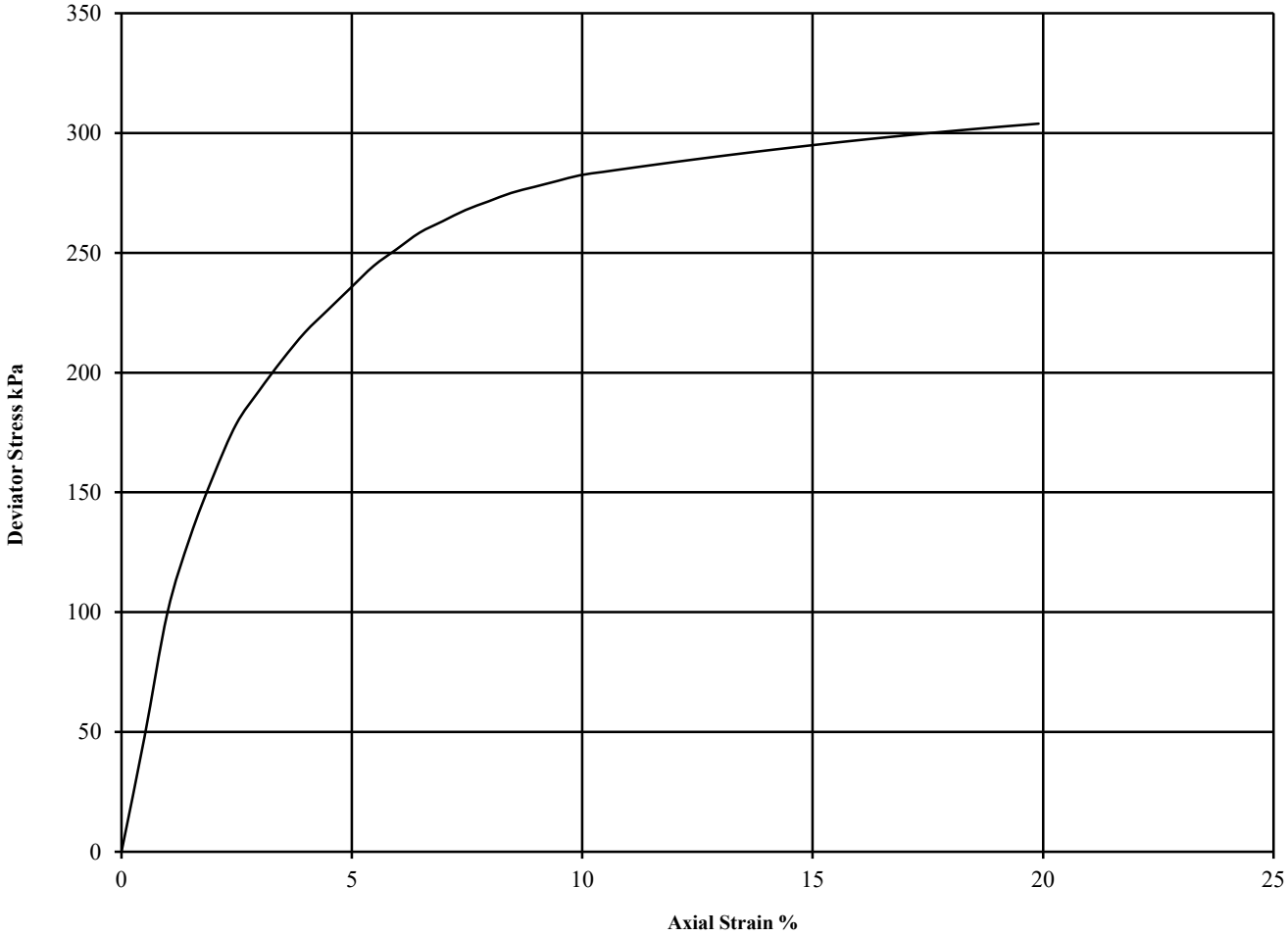
UKAS 4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH07**	**Top Depth (m):**	**8.00**
Sample Number:	**15**	**Base Depth (m):**	**8.45**
Sample Type	**U**		



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	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, Correction applied 0.33
1	19	2.05	1.71	160	304	152	19.9	Plastic	See summary of soil descriptions

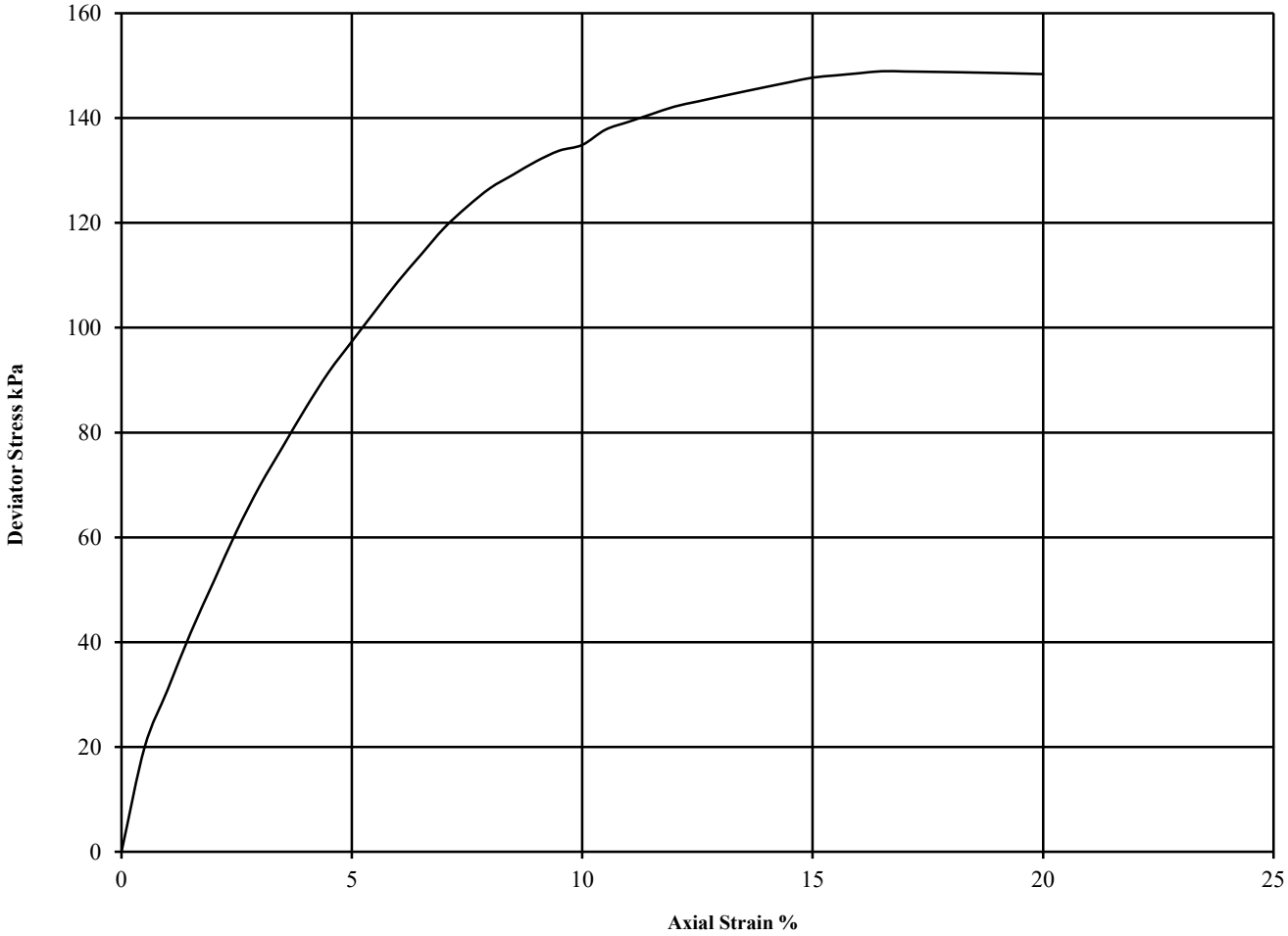
UKAS 4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH07**	**Top Depth (m):**	**10.00**
Sample Number:	**19**	**Base Depth (m):**	**11.00**
Sample Type	**B**		



Diameter (mm):		100	Height (mm):		200	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Disturbed Sample Remoulded with 2.5kg effort Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.35
1	19	2.05	1.72	200	149	74	16.5	Plastic	See summary of soil descriptions

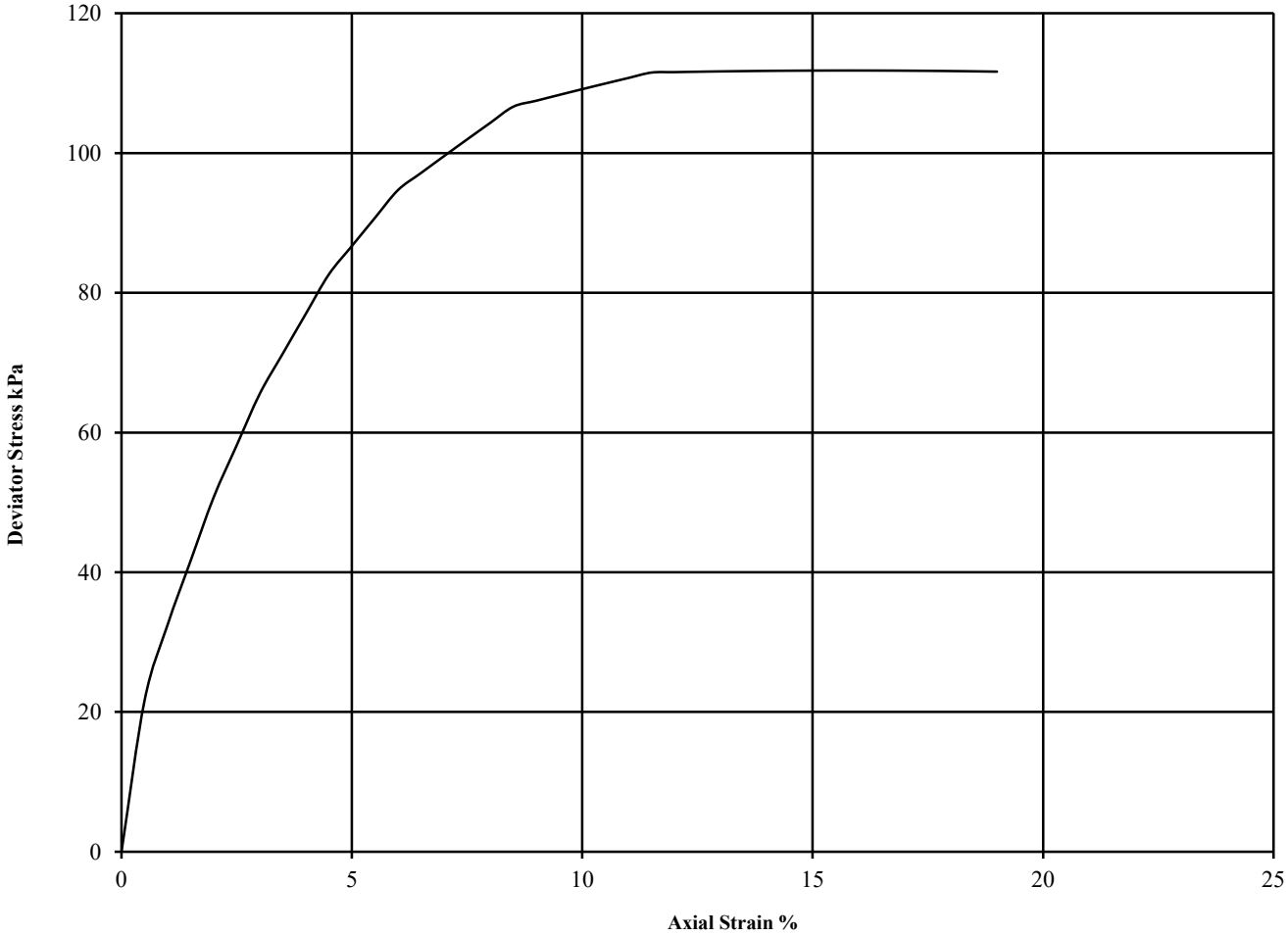
UKAS 4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH08**	**Top Depth (m):**	**3.50**
Sample Number:	**8**	**Base Depth (m):**	**4.00**
Sample Type	**B**		



Diameter (mm):		100	Height (mm):		200	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	Failure Strain (%)	Mode of Failure	Disturbed Sample Remoulded with 2.5kg effort Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.35
1	21	2.01	1.66	80	112	56	16.0	Plastic	See summary of soil descriptions

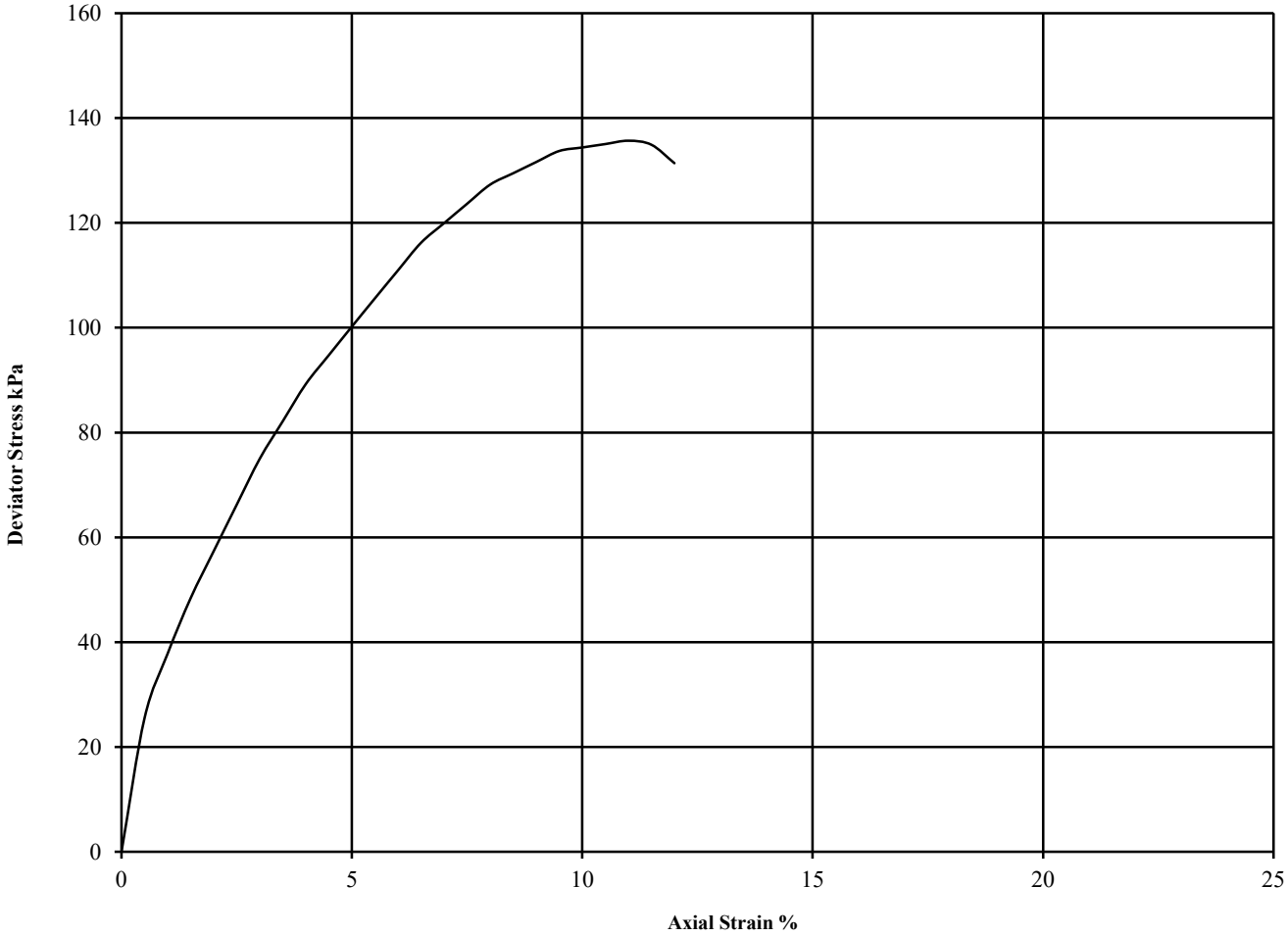
UKAS 4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH08**	**Top Depth (m):**	**5.00**
Sample Number:	**12**	**Base Depth (m):**	**5.45**
Sample Type	**SD**		



Diameter (mm):		38	Height (mm):		76	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	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, Correction applied 0.84
1	20	1.97	1.65	100	136	68	11.0	Brittle	See summary of soil descriptions

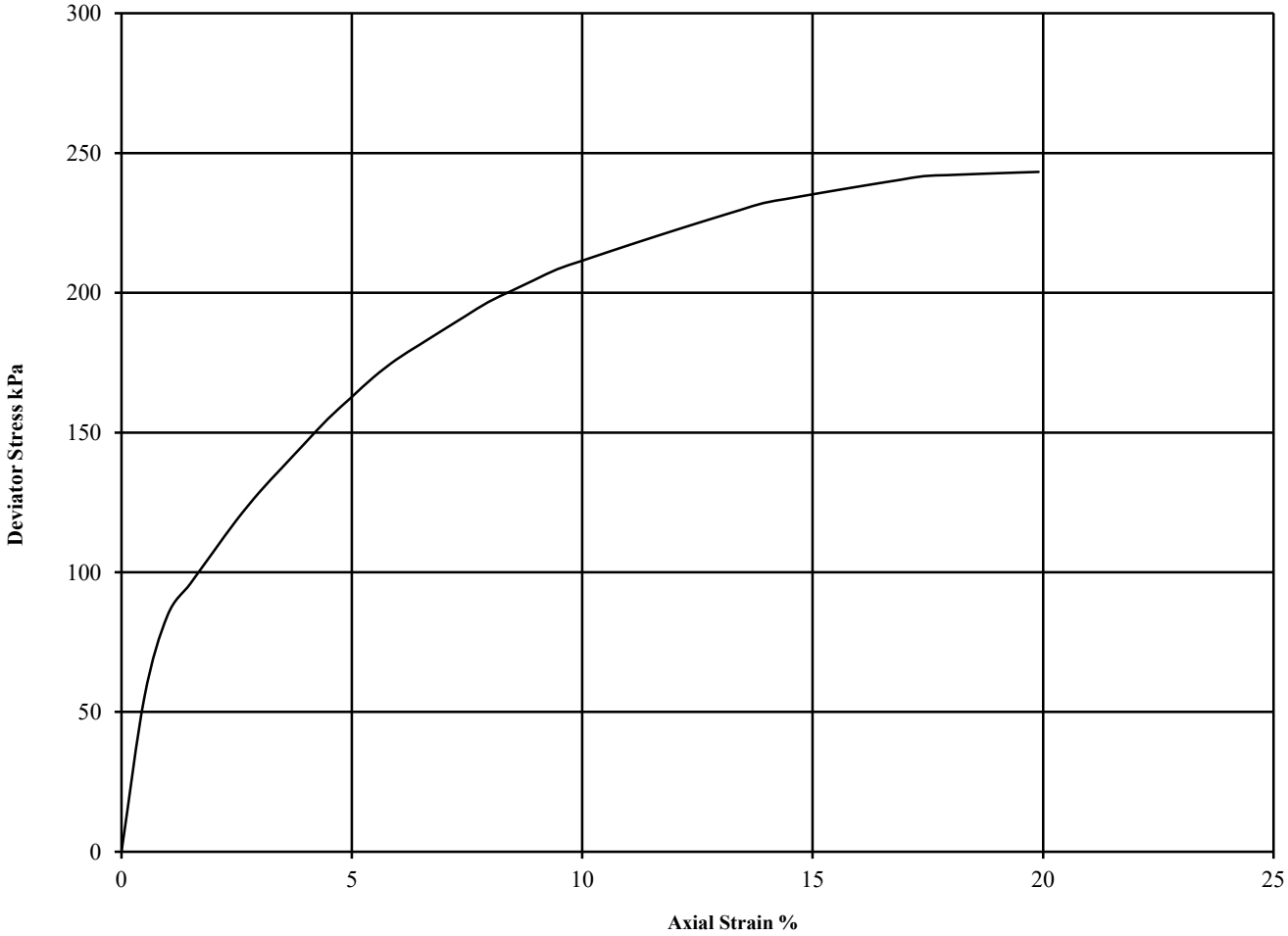
UKAS 4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH08**	**Top Depth (m):**	**6.50**
Sample Number:	**15**	**Base Depth (m):**	**6.95**
Sample Type	**U**		



Diameter (mm):		103	Height (mm):		207	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	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, Correction applied 0.33
1	20	2.02	1.68	130	243	122	19.9	Brittle	See summary of soil descriptions

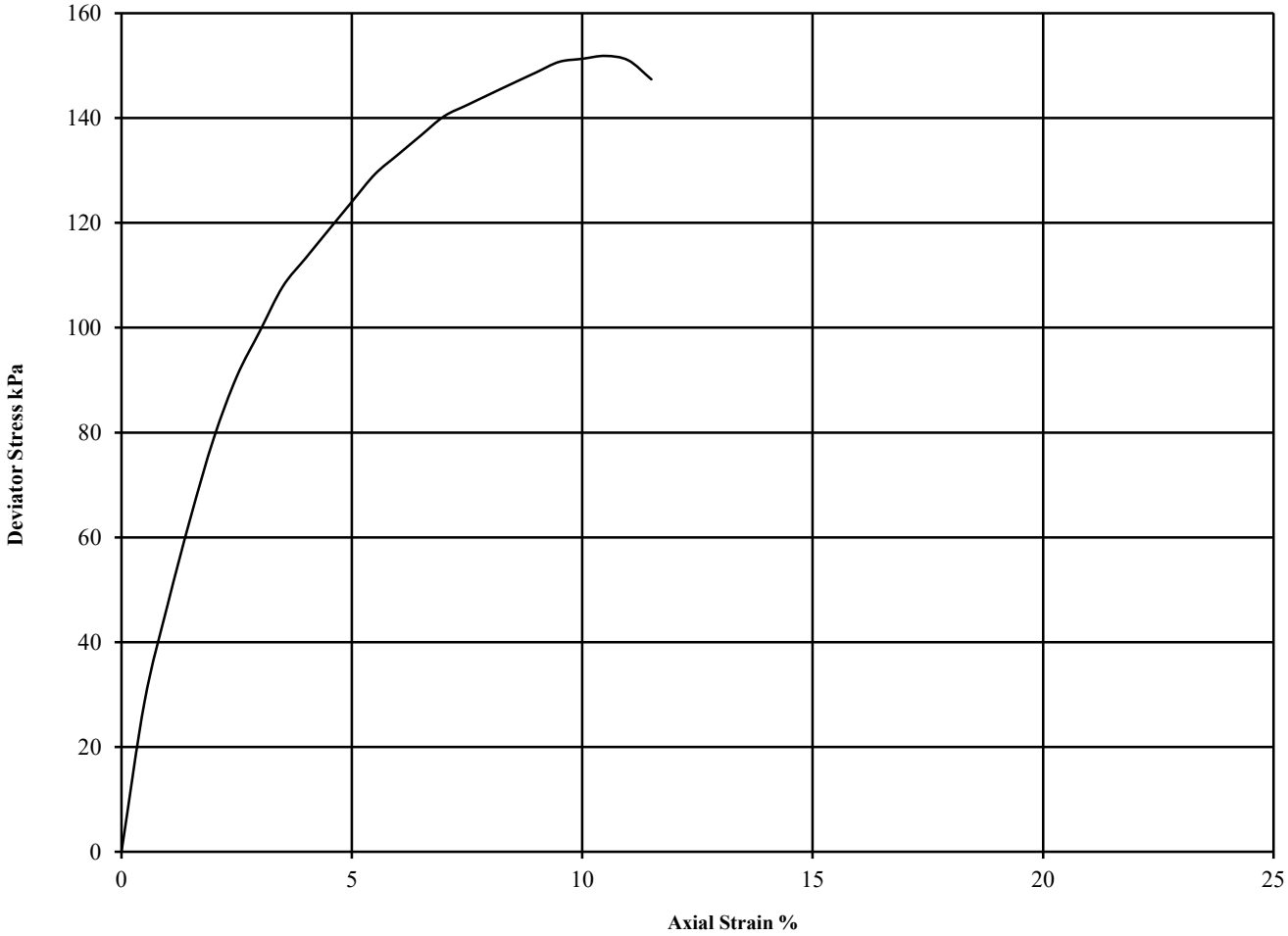
UKAS 4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number:	**BH08**	**Top Depth (m):**	**8.00**
Sample Number:	**17**	**Base Depth (m):**	**8.45**
Sample Type	**SD**		



Diameter (mm):		38	Height (mm):		76	Test:	UU Single Stage		Remarks:
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa) θ_3	Corr. Max. Deviator Stress (kPa) $(\theta_1-\theta_3)_f$	Shear Strength Cu (kPa) $^1/_2(\theta_1-\theta_3)_f$	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, Correction applied 0.85
1	17	2.03	1.73	160	152	76	10.5	Brittle	See summary of soil descriptions

UKAS 4043	PSL Professional Soils Laboratory	**Welwyn Garden City**	**Contract No:** PSL19/7560
			Client Ref: A115249

Certificate of Analysis

Certificate Number 19-25625-1

21-Jan-20

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

Our Reference 19-25625-1

Client Reference **PSL19/7560**

Order No **(not supplied)**

Contract Title **Welwyn Garden City**

Description **23 Soil samples.**

Date Received **13-Dec-19**

Date Started **13-Dec-19**

Date Completed **21-Jan-20**

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

Notes **This report supersedes 19-25625, extra testing.**

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 [redacted]

Adam Fenwick
Contracts Manager

UKAS TESTING
2139

Summary of Chemical Analysis
Soil Samples

Our Ref 19-25625-1
Client Ref PSL19/7560
Contract Title Welwyn Garden City

			Lab No	1613351	1613353	1613355	1613357	1613359	1613361	1617230	1617231	1617232	1617233
			Sample ID	BH01	BH01	BH02	BH03	BH04	BH05	BH02	BH03	BH04	BH05
			Depth	1.20-2.00	3.00-4.00	3.00-4.00	2.00-3.00	2.00-3.00	2.00-2.45	5.00-5.45	3.00-3.45	3.00-4.00	3.00-3.45
			Other ID	2	6	5	3	4	3	8	4	6	4
			Sample Type	B	B	B	B	B	D	D	D	B	D
			Sampling Date	11/12/19	11/12/19	11/12/19	11/12/19	11/12/19	11/12/19	18/12/19	18/12/19	18/12/19	18/12/19
			Sampling Time	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	< 10	< 10	< 10			< 10	
Inorganics													
pH	DETSC 2008#		pH	7.6	6.4	6.9	5.8	5.6	8.0	6.7	7.3	8.2	6.7
Organic matter	DETSC 2002#	0.1	%			0.7	< 0.1	0.2	0.3			0.2	
Chloride Aqueous Extract	DETSC 2055	1	mg/l			6.1	45	6.8	5.4			4.8	
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l			1.8	2.1	< 1.0	< 1.0			1.1	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	190	150	63	220	71	44	89	88	12	270
Sulphur as S, Total	DETSC 2320	0.01	%			< 0.01	0.03	0.02	< 0.01			< 0.01	
Sulphate as SO4, Total	DETSC 2321#	0.01	%			0.02	0.08	0.05	0.02			< 0.01	

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 19-25625-1
Client Ref PSL19/7560
Contract Title Welwyn Garden City

			Lab No	1617234	1617235	1617236	1617237	1617238	1617239	1617240	1617241	1617242	1617243
			Sample ID	BH06	BH07	BH07	BH08	BH08	WS08	WS10	WS10	WS12	WS18
			Depth	5.00-6.00	3.00	5.00-5.45	2.00-2.45	4.00-4.45	2.00-2.90	2.20-3.00	6.00-7.00	2.00-2.60	2.00-3.00
			Other ID	9	7	11	4	9					
			Sample Type	B	D	U	U	U	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	18/12/19	18/12/19	18/12/19	18/12/19	18/12/19	18/12/19	18/12/19	18/12/19	18/12/19	18/12/19
			Sampling Time	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		45	< 10			< 10
Inorganics													
pH	DETSC 2008#		pH	8.0	5.6	6.2	6.1	6.2	7.3	7.8		7.5	6.0
Organic matter	DETSC 2002#	0.1	%		0.6						0.1	0.4	
Chloride Aqueous Extract	DETSC 2055	1	mg/l				12		17	7.9			7.0
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l				< 1.0		< 1.0	< 1.0			< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	18	55	< 10	40	36	1400	31		28	26
Sulphur as S, Total	DETSC 2320	0.01	%				0.01		0.16	< 0.01			< 0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%				0.03		0.47	0.01			0.02

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 19-25625-1
Client Ref PSL19/7560
Contract Title Welwyn Garden City

			Lab No	1624270	1624271	1624272
			Sample ID	BH01	BH06	BH07
			Depth	3.00-4.00	1.20-2.00	4.00-5.00
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	14/01/2020	14/01/2020	14/01/2020
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
Metals						
Magnesium Aqueous Extract	DETSC 2076*	10	mg/l	< 10	< 10	< 10
Inorganics						
pH	DETSC 2008#		pH	6.2	6.2	6.2
Organic matter	DETSC 2002#	0.1	%			
Chloride Aqueous Extract	DETSC 2055	1	mg/l	9.8	11	12
Nitrate Aqueous Extract as NO3	DETSC 2055	1	mg/l	< 1.0	< 1.0	< 1.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	72	72	78
Sulphur as S, Total	DETSC 2320	0.01	%	0.01	0.01	0.01
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03	0.03	0.03

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Information in Support of the Analytical Results

Our Ref 19-25625-1
Client Ref PSL19/7560
Contract Welwyn Garden City

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1613351	BH01 1.20-2.00 SOIL	11/12/19	PT 500ml		
1613352	BH01 2.00-3.00 SOIL	11/12/19	PT 500ml		
1613353	BH01 3.00-4.00 SOIL	11/12/19	PT 500ml		
1613354	BH02 1.20-2.00 SOIL	11/12/19	PT 500ml		
1613355	BH02 3.00-4.00 SOIL	11/12/19	PT 500ml		
1613356	BH03 1.20-2.00 SOIL	11/12/19	PT 500ml		
1613357	BH03 2.00-3.00 SOIL	11/12/19	PT 500ml		
1613358	BH04 1.20-2.00 SOIL	11/12/19	PT 500ml		
1613359	BH04 2.00-3.00 SOIL	11/12/19	PT 500ml		
1613360	BH05 1.20-2.00 SOIL	11/12/19	PT 500ml		
1613361	BH05 2.00-2.45 SOIL	11/12/19	PT 1L		
1613362	BH06 1.20-2.00 SOIL	11/12/19	PT 500ml		
1613363	BH06 3.00-4.00 SOIL	11/12/19	PT 500ml		
1613364	BH07 1.50-2.00 SOIL	11/12/19	PT 500ml		
1613365	BH07 4.00 SOIL	11/12/19	PT 500ml		
1613366	BH08 1.50-2.00 SOIL	11/12/19	PT 500ml		
1613367	BH08 3.50-4.00 SOIL	11/12/19	PT 500ml		
1617230	BH02 5.00-5.45 SOIL	18/12/19	PT 500ml		
1617231	BH03 3.00-3.45 SOIL	18/12/19	PT 500ml		
1617232	BH04 3.00-4.00 SOIL	18/12/19	PT 500ml		
1617233	BH05 3.00-3.45 SOIL	18/12/19	PT 500ml		
1617234	BH06 5.00-6.00 SOIL	18/12/19	PT 500ml		
1617235	BH07 3.00 SOIL	18/12/19	PT 500ml		
1617236	BH07 5.00-5.45 SOIL	18/12/19	PT 500ml		
1617237	BH08 2.00-2.45 SOIL	18/12/19	PT 500ml		
1617238	BH08 4.00-4.45 SOIL	18/12/19	PT 500ml		
1617239	WS08 2.00-2.90 SOIL	18/12/19	PT 500ml		
1617240	WS10 2 20-3.00 SOIL	18/12/19	PT 500ml		
1617241	WS10 6.00-7.00 SOIL	18/12/19	PT 500ml		
1617242	WS12 2.00-2.60 SOIL	18/12/19	PT 500ml		
1617243	WS18 2.00-3.00 SOIL	18/12/19	PT 500ml		
1624270	BH01 3.00-4.00 SOIL	14/01/20	PT 500ml		
1624271	BH06 1.20-2.00 SOIL	14/01/20	PT 500ml		
1624272	BH07 4.00-5.00 SOIL	14/01/20	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.

Information in Support of the Analytical Results

Our Ref 19-25625-1
Client Ref PSL19/7560
Contract Welwyn Garden City

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

Appendix H – Environmental Lab Certificates

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Post Certification Report

WYG Geo-Environment
11th Floor
1 Angel Court
London
Middlesex
EC2R 7HJ
Attention: Richard Tonge

Date:	31/01/2020	**Location:**	Welwyn Garden City - Town Centre North
Customer:	WYG Geo-Environment	**No. Of Samples Received:**	11
Your Reference:	A115249	**Samples Scheduled:**	11

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.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21199650	WS01	ES1	0.30	18/11/2019
21199652	WS01	ES3	1.10	18/11/2019
21199643	WS02	ES2	0.90	18/11/2019
21199646	WS03	ES1	0.40 - 0.50	20/11/2019
21199653	WS05b	ES1	0.70	20/11/2019
21199664	WS07	ES1	0.40 - 0.50	19/11/2019
21199665	WS07b	ES2	0.80 - 0.90	19/11/2019
21199644	WS08	ES1	0.57	18/11/2019
21199658	WS4	ES1	0.50	20/11/2019
Lab Sample No(s)	**Customer Sample Ref.**	**AGS Ref.**	**Depth (m)**	**Sampled Date**
21311722	WS09 ES1		0.30 - 0.40	19/11/2019
21311723	WS09 ES2		0.90 - 1.00	19/11/2019

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

- X Test
- N No Determination Possible

Lab Sample No(s)			21199650			21199652			21199643			21199646			21199658			21199653			21199664			21199665			21199644			21311722			21311723	
Customer Sample Reference			WS01			WS01			WS02			WS03			WS4			b			WS07			b			WS08			ES1WS9			ES2WS9	
AGS Reference			ES1			ES3			ES2			ES1			ES1			ES1			ES1			ES2			ES1							
Depth (m)			30.0			10.1			90.0			40.0 50.0-			50.0			70.0			40.0 50.0-			80.0 90.0-			57.0			30.0 40.0-			90.0 00.1-	
Container			HandjarwithTUB1kg	JarAmber250g	ALE26VOC80x	HandjarwithTUB1kg	JarAmber250g	ALE26VOC80x	HandjarwithTUB1kg	JarAmber250g	ALE26VOC80x	TUB1kg	JarAmber250g	ALE26VOC80x	HandjarwithTUB1kg	JarAmber250g	ALE26VOC80x	TUB1kg	JarAmber250g	ALE26VOC80x	TUB1kg	JarAmber250g	HandjarwithTUB1kg	JarAmber250g	ALE26VOC80x	HandjarwithTUB1kg	JarAmber250g	ALE26VOC80x	HandjarwithTUB1kg	JarAmber250g	ALE26VOC80x	HandjarwithTUB1kg	JarAmber250g
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 10	X			X			X			X			X			X			X			X			X			X				
Boron Water Soluble	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
Chromium III	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
EPH by FID	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 9			X			X			X			X			X			X						X			X			X		
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
Metals in solid samples by OES	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
PAH by GCMS	All	NDPs: 0 Tests: 9			X		X			X			X			X			X						X			X			X			
PFAS Solids	All	NDPs: 0 Tests: 3																			X						X						X	
pH	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
Phenols by HPLC (S)	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
Sample description	All	NDPs: 0 Tests: 10		X			X			X						X			X				X		X			X			X			X
Total Organic Carbon	All	NDPs: 0 Tests: 9		X			X			X			X			X			X						X			X			X			
VOC MS (S)	All	NDPs: 0 Tests: 9			X			X			X			X			X			X						X			X			X		

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend
- # 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 the individual compounds within the samples are not corrected for this recovery.
- 1-3+§@ Sample deviation (see appendix)

Customer Sample Ref.			WS01	WS01	WS02	WS03	WS4	WS07
Depth (m)			0.30	1.10	0.90	0.40 - 0.50	0.50	0.40 - 0.50
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled			18/11/2019	18/11/2019	18/11/2019	20/11/2019	20/11/2019	19/11/2019
Date Received			22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019
SDG Ref			191122-41	191122-41	191122-41	191122-41	191122-41	191122-41
Lab Sample No.(s)			21199650	21199652	21199643	21199646	21199658	21199664
AGS Reference			ES1	ES3	ES2	ES1	ES1	ES1
Component	**LOD/Units**	**Method**						
Moisture Content Ratio (% of as received sample)	%	PM024	15	11	16	13	12	16
EPH Surrogate % recovery**	%	TM061	66.1	88.1	81.4	87.9	84.1	
EPH Range >C10 - C40	<35 mg/kg	TM061	61 M	<35 M	<35 M	<35 M	<35 M	
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 M	<0.01 M	<0.01 M	<0.01 M	
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0212 #	0.0021 #	0.00558 #	<0.002 #	<0.002 #	
pH	1 pH Units	TM133	7.51 M	7.96 M	7.51 M	8.49 M	8.31 M	
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	
Cyanide, Easily liberatable (low level)	<0.5 mg/kg	TM153	<0.5	<0.5	<0.5	<0.5	<0.5	
Chromium, Trivalent	<0.9 mg/kg	TM181	13.9	26.3	21.8	18.6	17.5	
Arsenic	<0.6 mg/kg	TM181	12.9 M	15.9 M	11.4 M	22.7 M	12.2 M	
Beryllium	<0.01 mg/kg	TM181	0.857 M	1.38 M	1.16 M	1.22 M	1.01 M	
Cadmium	<0.02 mg/kg	TM181	0.203 M	<0.02 M	0.189 M	<0.02 M	<0.02 M	
Chromium	<0.9 mg/kg	TM181	13.9 M	26.3 M	21.8 M	18.6 M	17.5 M	
Copper	<1.4 mg/kg	TM181	15.9 M	16.9 M	9.41 M	15.7 M	12.2 M	
Lead	<0.7 mg/kg	TM181	56.8 M	10.8 M	19.3 M	14.5 M	11.4 M	
Mercury	<0.14 mg/kg	TM181	<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M	
Nickel	<0.2 mg/kg	TM181	16.7 M	34.6 M	24.7 M	28.4 M	21.2 M	
Selenium	<1 mg/kg	TM181	1.07 #	<1 #	1.89 #	<1 #	<1 #	
Vanadium	<0.2 mg/kg	TM181	29 #	51.9 #	42.5 #	43.7 #	37.6 #	
Zinc	<1.9 mg/kg	TM181	70 M	66.2 M	80.7 M	69.7 M	44.6 M	
Boron, water soluble	<1 mg/kg	TM222	<1 M	<1 M	1.22 M	<1 M	<1 M	
PFBA (357-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338						<3
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338						<3
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338						<2
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338						<1
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338						<1
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338						<1
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338						<1
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338						<1
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338						<1
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338						<1
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338						<1
Branched PFOS	<1 µg/kg	TM338						<1
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338						<1
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338						<1
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338						<1
6:2-PTS (27619-97-2)	<1 µg/kg	TM338						<1

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	ISO17025 accredited.
MmCERTS 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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS01	WS01	WS02	WS03	WS4	WS07
Depth (m)			0.30	1.10	0.90	0.40 - 0.50	0.50	0.40 - 0.50
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled			18/11/2019	18/11/2019	18/11/2019	20/11/2019	20/11/2019	19/11/2019
Date Received			22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019
SDG Ref			191122-41	191122-41	191122-41	191122-41	191122-41	191122-41
Lab Sample No.(s)			21199650	21199652	21199643	21199646	21199658	21199664
AGS Reference			ES1	ES3	ES2	ES1	ES1	ES1
Component	**LOD/Units**	**Method**						
Total PFOS	<1 µg/kg	TM338						<1

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS08	WS09 ES1	WS09 ES2	WS05b	WS07b
Depth (m)			0.57	0.30 - 0.40	0.90 - 1.00	0.70	0.80 - 0.90
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled			18/11/2019	19/11/2019	19/11/2019	20/11/2019	19/11/2019
Date Received			22/11/2019	04/12/2019	04/12/2019	22/11/2019	22/11/2019
SDG Ref			191122-41	191207-48	191207-48	191122-41	191122-41
Lab Sample No.(s)			21199644	21311722	21311723	21199653	21199665
AGS Reference			ES1			ES1	ES2
Component	**LOD/Units**	**Method**					
Moisture Content Ratio (% of as received sample)	%	PM024	16	12	16	13	16
EPH Surrogate % recovery**	%	TM061	83	77.8		87.1	79.1
EPH Range >C10 - C40	<35 mg/kg	TM061	<35 M	<35 @ M		67.6 M	<35 M
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 M	<0.01 @ M		<0.01 M	<0.01 M
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00324 #	0.00397 @ #		0.00867 #	0.00301 #
pH	1 pH Units	TM133	6.4 M	7.76 @ M		7.92 M	8.16 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #	<0.6 @ #		<0.6 #	<0.6 #
Cyanide, Easily liberatable (low level)	<0.5 mg/kg	TM153	<0.5	<0.5		<0.5	<0.5
Chromium, Trivalent	<0.9 mg/kg	TM181	25.1	18.6		46	28.7
Arsenic	<0.6 mg/kg	TM181	8.61 M	14.7 M		23.7 M	26.7 M
Beryllium	<0.01 mg/kg	TM181	0.931 M	0.786 M		1.19 M	1.86 M
Cadmium	<0.02 mg/kg	TM181	<0.02 M	0.537 M		<0.02 M	0.0748 M
Chromium	<0.9 mg/kg	TM181	25.1 M	18.6 M		46 M	28.7 M
Copper	<1.4 mg/kg	TM181	8.78 M	9.65 M		102 M	22.1 M
Lead	<0.7 mg/kg	TM181	15.2 M	18 M		93.9 M	15.1 M
Mercury	<0.14 mg/kg	TM181	<0.14 M	<0.14 @ M		<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181	16.7 M	22.9 M		27.4 M	72.7 M
Selenium	<1 mg/kg	TM181	<1 #	1.12 #		<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181	44.9 #	35.5 #		54.5 #	59.9 #
Zinc	<1.9 mg/kg	TM181	56.3 M	59.3 M		86.1 M	110 M
Boron, water soluble	<1 mg/kg	TM222	<1 M	<1 @ M		<1 M	<1 M
PFBA (357-22-4) Perfluoro-n-butanoic acid	<3 µg/kg	TM338	<3		<3		
PFPA (2706-90-3) Perfluoro-n-pentanoic acid	<3 µg/kg	TM338	<3		<3		
PFHxA (307-24-4) Perfluoro-n-hexanoic acid	<2 µg/kg	TM338	<2		<2		
PFBS (375-73-5) Perfluoro-1-butanesulfonate	<1 µg/kg	TM338	<1		<1		
PFHpA (375-85-9) Perfluoro-n-heptanoic acid	<1 µg/kg	TM338	<1		<1		
PFOA (335-67-1) Perfluoro-n-octanoic acid	<1 µg/kg	TM338	<1		<1		
PFHxS (355-46-4) Perfluoro-1-hexanesulfonate	<1 µg/kg	TM338	<1		<1		
PFNA (375-95-1) Perfluoro-n-nonanoic acid	<1 µg/kg	TM338	<1		<1		
PFHpS (375-92-8) Perfluoro-1-heptanesulfonate	<1 µg/kg	TM338	<1		<1		
PFDA (335-76-2) Perfluoro-n-decanoic acid	<1 µg/kg	TM338	<1		<1		
Linear PFOS(1763-23-1) Perfluoro-1-octanesulfonate	<1 µg/kg	TM338	<1		<1		
Branched PFOS	<1 µg/kg	TM338	<1		<1		
PFUnA (2058-94-8) Perfluoro-n-undecanoic acid	<1 µg/kg	TM338	<1		<1		
PFDoA (307-55-1) Perfluoro-n-dodecanoic acid	<1 µg/kg	TM338	<1		<1		
PFOSA (754-91-6) Perfluoro-octanesulfonamide	<1 µg/kg	TM338	<1		<1		
6:2-PTS (27619-97-2)	<1 µg/kg	TM338	<1		<1		

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS08	WS09 ES1	WS09 ES2	WS05b	WS07b	
Depth (m)			0.57	0.30 - 0.40	0.90 - 1.00	0.70	0.80 - 0.90	
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
Date Sampled			18/11/2019	19/11/2019	19/11/2019	20/11/2019	19/11/2019	
Date Received			22/11/2019	04/12/2019	04/12/2019	22/11/2019	22/11/2019	
SDG Ref			191122-41	191207-48	191207-48	191122-41	191122-41	
Lab Sample No.(s)			21199644	21311722	21311723	21199653	21199665	
AGS Reference			ES1			ES1	ES2	
Component	**LOD/Units**	**Method**						
Total PFOS	<1 µg/kg	TM338	<1		<1			

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS01	WS01	WS02	WS03	WS4	WS08
Depth (m)			0.30	1.10	0.90	0.40 - 0.50	0.50	0.57
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled			18/11/2019	18/11/2019	18/11/2019	20/11/2019	20/11/2019	18/11/2019
Date Received			22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019
SDG Ref			191122-41	191122-41	191122-41	191122-41	191122-41	191122-41
Lab Sample No.(s)			21199650	21199652	21199643	21199646	21199658	21199644
AGS Reference			ES1	ES3	ES2	ES1	ES1	ES1
Component	**LOD/Units**	**Method**						
GRO TOT (Moisture Corrected)	<100 µg/kg	TM089	<100 M	<100 M	<100 M	<100 M	<100 M	<100 M

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS09 ES1	WS05b	WS07b			
Depth (m)			0.30 - 0.40	0.70	0.80 - 0.90			
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
Date Sampled			19/11/2019	20/11/2019	19/11/2019			
Date Received			04/12/2019	22/11/2019	22/11/2019			
SDG Ref			191207-48	191122-41	191122-41			
Lab Sample No.(s)			21311722	21199653	21199665			
AGS Reference				ES1	ES2			
Component	**LOD/Units**	**Method**						
GRO TOT (Moisture Corrected)	<100 µg/kg	TM089	<100 @ M	<100 M	<100 M			

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS01	WS01	WS02	WS03	WS4	WS08
Depth (m)			0.30	1.10	0.90	0.40 - 0.50	0.50	0.57
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled			18/11/2019	18/11/2019	18/11/2019	20/11/2019	20/11/2019	18/11/2019
Date Received			22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019
SDG Ref			191122-41	191122-41	191122-41	191122-41	191122-41	191122-41
Lab Sample No.(s)			21199650	21199652	21199643	21199646	21199658	21199644
AGS Reference			ES1	ES3	ES2	ES1	ES1	ES1
Component	**LOD/Units**	**Method**						
Naphthalene-d8 % recovery**	%	TM218	87.2	93.2	91.1	91.6	89.9	89.2
Acenaphthene-d10 % recovery**	%	TM218	85	98.3	93.5	94.9	95.8	90.8
Phenanthrene-d10 % recovery**	%	TM218	82.4	104	94.6	96.9	101	95.5
Chrysene-d12 % recovery**	%	TM218	75	95.8	90.9	90.9	95.7	94.3
Perylene-d12 % recovery**	%	TM218	75.9	95.1	85.3	90	93	92
Naphthalene	<9 µg/kg	TM218	<9 M	<9 M	<9 M	<9 M	<9 M	<9 M
Acenaphthylene	<12 µg/kg	TM218	<12 M	<12 M	<12 M	<12 M	<12 M	<12 M
Acenaphthene	<8 µg/kg	TM218	<8 M	<8 M	<8 M	<8 M	<8 M	<8 M
Fluorene	<10 µg/kg	TM218	<10 M	<10 M	<10 M	<10 M	<10 M	<10 M
Phenanthrene	<15 µg/kg	TM218	114 M	<15 M	<15 M	<15 M	<15 M	<15 M
Anthracene	<16 µg/kg	TM218	22.7 M	<16 M	<16 M	<16 M	<16 M	<16 M
Fluoranthene	<17 µg/kg	TM218	341 M	31 M	38.6 M	<17 M	<17 M	<17 M
Pyrene	<15 µg/kg	TM218	291 M	29.3 M	34.7 M	<15 M	<15 M	<15 M
Benz(a)anthracene	<14 µg/kg	TM218	152 M	<14 M	<14 M	<14 M	<14 M	<14 M
Chrysene	<10 µg/kg	TM218	135 M	<10 M	<10 M	<10 M	<10 M	<10 M
Benzo(b)fluoranthene	<15 µg/kg	TM218	159 M	<15 M	<15 M	<15 M	<15 M	<15 M
Benzo(k)fluoranthene	<14 µg/kg	TM218	78.8 M	<14 M	<14 M	<14 M	<14 M	<14 M
Benzo(a)pyrene	<15 µg/kg	TM218	151 M	<15 M	<15 M	<15 M	<15 M	<15 M
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	102 M	<18 M	<18 M	<18 M	<18 M	<18 M
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23 M	<23 M	<23 M	<23 M	<23 M	<23 M
Benzo(g,h,i)perylene	<24 µg/kg	TM218	126 M	<24 M	<24 M	<24 M	<24 M	<24 M
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	1670	<118	<118	<118	<118	<118

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS09 ES1	WS05b	WS07b			
Depth (m)			0.30 - 0.40	0.70	0.80 - 0.90			
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
Date Sampled			19/11/2019	20/11/2019	19/11/2019			
Date Received			04/12/2019	22/11/2019	22/11/2019			
SDG Ref			191207-48	191122-41	191122-41			
Lab Sample No.(s)			21311722	21199653	21199665			
AGS Reference				ES1	ES2			
Component	**LOD/Units**	**Method**						
Naphthalene-d8 % recovery**	%	TM218	99.7	93.1	89.1			
Acenaphthene-d10 % recovery**	%	TM218	104	95.3	89.5			
Phenanthrene-d10 % recovery**	%	TM218	106	101	88.5			
Chrysene-d12 % recovery**	%	TM218	79.3	89.8	85.6			
Perylene-d12 % recovery**	%	TM218	79.3	87.2	85.8			
Naphthalene	<9 µg/kg	TM218	<9 @ M	<9 M	<9 M			
Acenaphthylene	<12 µg/kg	TM218	<12 @ M	<12 M	<12 M			
Acenaphthene	<8 µg/kg	TM218	<8 @ M	<8 M	<8 M			
Fluorene	<10 µg/kg	TM218	<10 @ M	<10 M	<10 M			
Phenanthrene	<15 µg/kg	TM218	<15 @ M	85.6 M	<15 M			
Anthracene	<16 µg/kg	TM218	<16 @ M	24.1 M	<16 M			
Fluoranthene	<17 µg/kg	TM218	35.4 @ M	239 M	<17 M			
Pyrene	<15 µg/kg	TM218	30.8 @ M	220 M	<15 M			
Benz(a)anthracene	<14 µg/kg	TM218	16.3 @ M	88.1 M	<14 M			
Chrysene	<10 µg/kg	TM218	14.1 @ M	82.6 M	<10 M			
Benzo(b)fluoranthene	<15 µg/kg	TM218	<15 @ M	91 M	<15 M			
Benzo(k)fluoranthene	<14 µg/kg	TM218	<14 @ M	42 M	<14 M			
Benzo(a)pyrene	<15 µg/kg	TM218	<15 @ M	104 M	<15 M			
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218	<18 @ M	71.6 M	<18 M			
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23 @ M	<23 M	<23 M			
Benzo(g,h,i)perylene	<24 µg/kg	TM218	<24 @ M	92.4 M	<24 M			
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	<118	1140	<118			

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS01	WS01	WS02	WS03	WS4	WS08
Depth (m)			0.30	1.10	0.90	0.40 - 0.50	0.50	0.57
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled			18/11/2019	18/11/2019	18/11/2019	20/11/2019	20/11/2019	18/11/2019
Date Received			22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019	22/11/2019
SDG Ref			191122-41	191122-41	191122-41	191122-41	191122-41	191122-41
Lab Sample No.(s)			21199650	21199652	21199643	21199646	21199658	21199644
AGS Reference			ES1	ES3	ES2	ES1	ES1	ES1
Component	**LOD/Units**	**Method**						
Dibromofluoromethane**	%	TM116	104	113	103	104	98.1	101
Toluene-d8**	%	TM116	98.1	97.3	96.3	97.5	98.7	96.2
4-Bromofluorobenzene**	%	TM116	98.2	102	85.7	99.6	95	95.7
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<200 M	<10 M	<10 M	<10 M	<10 M	<10 M
Benzene	<9 µg/kg	TM116	<180 M	<9 M	<9 M	<9 M	<9 M	<9 M
Toluene	<7 µg/kg	TM116	<140 M	<7 M	<7 M	<7 M	<7 M	<7 M
Ethylbenzene	<4 µg/kg	TM116	<80 M	<4 M	<4 M	<4 M	<4 M	<4 M
p/m-Xylene	<10 µg/kg	TM116	<200 #	<10 #	<10 #	<10 #	<10 #	<10 #
o-Xylene	<10 µg/kg	TM116	<200 M	<10 M	<10 M	<10 M	<10 M	<10 M

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Results Legend

#	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 the individual compounds within the samples are not corrected for this recovery.
1-3+§@	Sample deviation (see appendix)

Customer Sample Ref.			WS09 ES1	WS05b	WS07b			
Depth (m)			0.30 - 0.40	0.70	0.80 - 0.90			
Sample Type			Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)			
Date Sampled			19/11/2019	20/11/2019	19/11/2019			
Date Received			04/12/2019	22/11/2019	22/11/2019			
SDG Ref			191207-48	191122-41	191122-41			
Lab Sample No.(s)			21311722	21199653	21199665			
AGS Reference				ES1	ES2			
Component	**LOD/Units**	**Method**						
Dibromofluoromethane**	%	TM116	110 @	103	99.8			
Toluene-d8**	%	TM116	96.7 @	93.5	97.5			
4-Bromofluorobenzene**	%	TM116	87.8 @	85.5	95.2			
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 @ M	<10 M	<10 M			
Benzene	<9 µg/kg	TM116	<9 @ M	<9 M	<9 M			
Toluene	<7 µg/kg	TM116	<7 @ M	<7 M	<7 M			
Ethylbenzene	<4 µg/kg	TM116	<4 @ M	<4 M	<4 M			
p/m-Xylene	<10 µg/kg	TM116	<10 @ #	<10 #	<10 #			
o-Xylene	<10 µg/kg	TM116	<10 @ M	<10 M	<10 M			

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Extractable Petroleum Hydrocarbons (EPH) By GC-FID

EPH (DRO) (C10-C40)

Sample No	Customer Sample Ref.	Depth	Matrix (mg/kg)	EPH	Interpretation
21215567	WS02 SOLID2	0.90	SOLID	<35.0	No interpretation possible
21215552	WS08 SOLID1	0.57	SOLID	<35.0	No interpretation possible
21215540	WS03 SOLID1	0.40 - 0.50	SOLID	<35.0	No interpretation possible
21210749	WS01 SOLID3	1.10	SOLID	<35.0	No interpretation possible
21215021	WS05b SOLID1	0.70	SOLID	67.6	No interpretation possible
21210618	WS4 SOLID1	0.50	SOLID	<35.0	No interpretation possible
21210656	WS07b SOLID2	0.80 - 0.90	SOLID	<35.0	No interpretation possible
21240537	WS01 SOLID1	0.30	SOLID	61.0	No interpretation possible
Sample No	**Customer Sample Ref.**	**Depth**	**Matrix (mg/kg)**	**EPH**	**Interpretation**
21385949	WS09 ES1	0.30 - 0.40	SOLID	<35.0	No interpretation possible

Extractable Petroleum Hydrocarbons (formally Diesel Range Organics) :- Any compound extractable in n-hexane within the carbon range C10-C40, includes Aliphatic (Min Oil), Aromatic (PAHs) and naturally occurring compounds.

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Asbestos Identification

Asbestos Identification - Soil

Results Legend
ISO17025 accredited.
M *m*CERTS accredited.
* Subcontracted test.
(F) Trigger breach confirmed
1-5&+§@ Sample deviation (see appendix)

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non Asbestos Fibre
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS01 ES 1 0.30 SOLID 18/11/2019 00:00:00 23/11/2019 09:55:30 191122-41 21,199,650 TM048	27/11/2019	James Richards	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS01 ES 3 1.10 SOLID 18/11/2019 00:00:00 23/11/2019 09:13:50 191122-41 21,199,652 TM048	27/11/2019	James Richards	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS02 ES 2 0.90 SOLID 18/11/2019 00:00:00 23/11/2019 16:09:01 191122-41 21,199,643 TM048	27/11/2019	James Richards	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS03 ES 1 0.40 - 0.50 SOLID 20/11/2019 00:00:00 23/11/2019 16:05:36 191122-41 21,199,646 TM048	27/11/19	Christian Hallam	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Received SDG Original Sample Method Number	WS05b ES 1 0.70 SOLID 20/11/2019 00:00:00 23/11/2019 09:03:45 191122-41 21,199,653 TM048	27/11/2019	James Richards	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS07 ES 1 0.40 - 0.50 SOLID 19/11/2019 00:00:00 10/01/2020 15:49:19 191122-41 21,199,664 TM048	13/01/2020	James Richards	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS07b ES 2 0.80 - 0.90 SOLID 19/11/2019 00:00:00 23/11/2019 09:55:36 191122-41 21,199,665 TM048	27/11/2019	James Richards	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS08 ES 1 0.57 SOLID 18/11/2019 00:00:00 24/11/2019 07:30:42 191122-41 21,199,644 TM048	27/11/2019	James Richards	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS09 ES1 NS Z 0.30 - 0.40 SOLID 19/11/2019 00:00:00 17/12/2019 12:26:04 191207-48 21,311,722 TM048	19/12/19	Christian Hallam	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS4 ES 1 0.50 SOLID 20/11/2019 00:00:00 23/11/2019 09:50:00 191122-41 21,199,658 TM048	28/11/19	Christian Hallam	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Table of Results - Appendix

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description
ASB_PREP		
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
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
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
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
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM338		

Method No	Reference	Description
ASB_PREP		
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
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
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
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
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM338		

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Test Completion Dates

Lab Sample No(s)	21199650	21199652	21199643	21199646	21199658	21199664	21199644	21311722	21199653	21199665
Customer Sample Ref.	WS01	WS01	WS02	WS03	WS4	WS07	WS08	WS09 ES1	WS05b	WS07b
AGS Ref.	ES1	ES3	ES2	ES1	ES1	ES1	ES1		ES1	ES2
Depth	0.30	1.10	0.90	0.40 - 0.50	0.50	0.40 - 0.50	0.57	0.30 - 0.40	0.70	0.80 - 0.90
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Asbestos ID in Solid Samples	27-Nov-2019	27-Nov-2019	27-Nov-2019	27-Nov-2019	28-Nov-2019	13-Jan-2020	27-Nov-2019	19-Dec-2019	27-Nov-2019	27-Nov-2019
Boron Water Soluble	27-Nov-2019	27-Nov-2019	28-Nov-2019	28-Nov-2019	27-Nov-2019		28-Nov-2019	19-Dec-2019	28-Nov-2019	27-Nov-2019
Chromium III	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019		28-Nov-2019	24-Dec-2019	28-Nov-2019	28-Nov-2019
Cyanide Comp/Free/Total/Thiocyanate	27-Nov-2019	27-Nov-2019	27-Nov-2019	26-Nov-2019	26-Nov-2019		27-Nov-2019	19-Dec-2019	27-Nov-2019	27-Nov-2019
EPH by FID	29-Nov-2019	27-Nov-2019	27-Nov-2019	27-Nov-2019	27-Nov-2019		27-Nov-2019	19-Dec-2019	27-Nov-2019	27-Nov-2019
GRO by GC-FID (S)	26-Nov-2019	26-Nov-2019	26-Nov-2019	26-Nov-2019	26-Nov-2019		26-Nov-2019	18-Dec-2019	26-Nov-2019	26-Nov-2019
Hexavalent Chromium (s)	28-Nov-2019	28-Nov-2019	26-Nov-2019	28-Nov-2019	28-Nov-2019		28-Nov-2019	24-Dec-2019	28-Nov-2019	28-Nov-2019
Metals in solid samples by OES	28-Nov-2019	29-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019		27-Nov-2019	20-Dec-2019	27-Nov-2019	28-Nov-2019
PAH by GCMS	29-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019	28-Nov-2019		28-Nov-2019	19-Dec-2019	29-Nov-2019	28-Nov-2019
PFAS Solids						10-Jan-2020	10-Jan-2020			
pH	29-Nov-2019	29-Nov-2019	29-Nov-2019	29-Nov-2019	29-Nov-2019		29-Nov-2019	23-Dec-2019	29-Nov-2019	29-Nov-2019
Phenols by HPLC (S)	27-Nov-2019	27-Nov-2019	27-Nov-2019	27-Nov-2019	27-Nov-2019		27-Nov-2019	19-Dec-2019	27-Nov-2019	27-Nov-2019
Sample description	23-Nov-2019	23-Nov-2019	24-Nov-2019	24-Nov-2019	23-Nov-2019	17-Dec-2019	24-Nov-2019	17-Dec-2019	23-Nov-2019	23-Nov-2019
Total Organic Carbon	27-Nov-2019	27-Nov-2019	27-Nov-2019	27-Nov-2019	28-Nov-2019		28-Nov-2019	20-Dec-2019	28-Nov-2019	27-Nov-2019
VOC MS (S)	27-Nov-2019	27-Nov-2019	26-Nov-2019	27-Nov-2019	27-Nov-2019		26-Nov-2019	18-Dec-2019	26-Nov-2019	27-Nov-2019

Lab Sample No(s)	21311723
Customer Sample Ref.	WS09 ES2
AGS Ref.	
Depth	0.90 - 1.00
Type	SOLID
PFAS Solids	10-Jan-2020
Sample description	17-Dec-2019

Post Certification Report

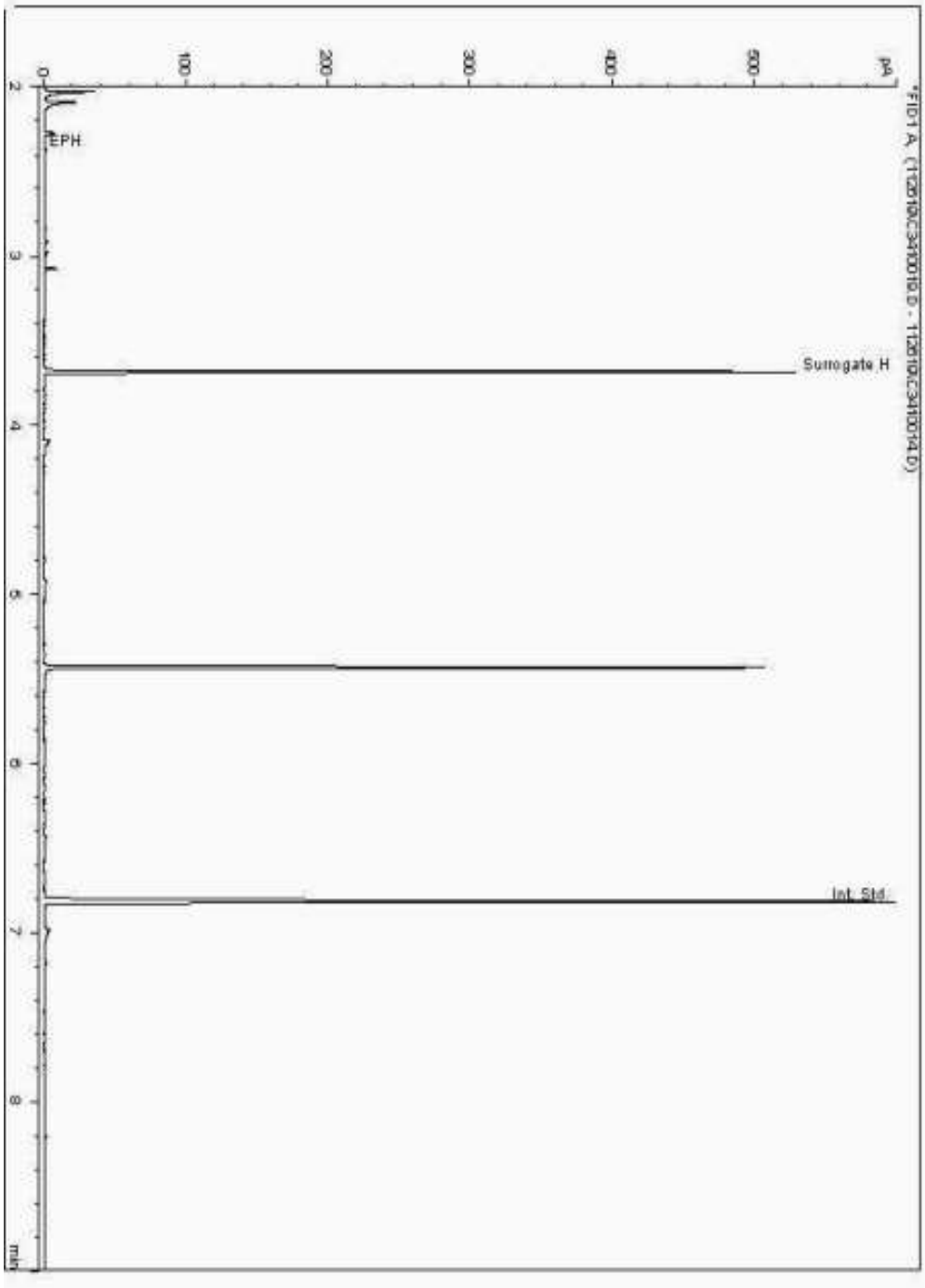
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,210,618 **Depth :** 0.50
21210618 **Sample ID :** WS4

EPH Range Organics (C10 - C40)

Sample Identity : 19920798-
Date Acquired : 26/11/2019 12:30:17 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



Post Certification Report

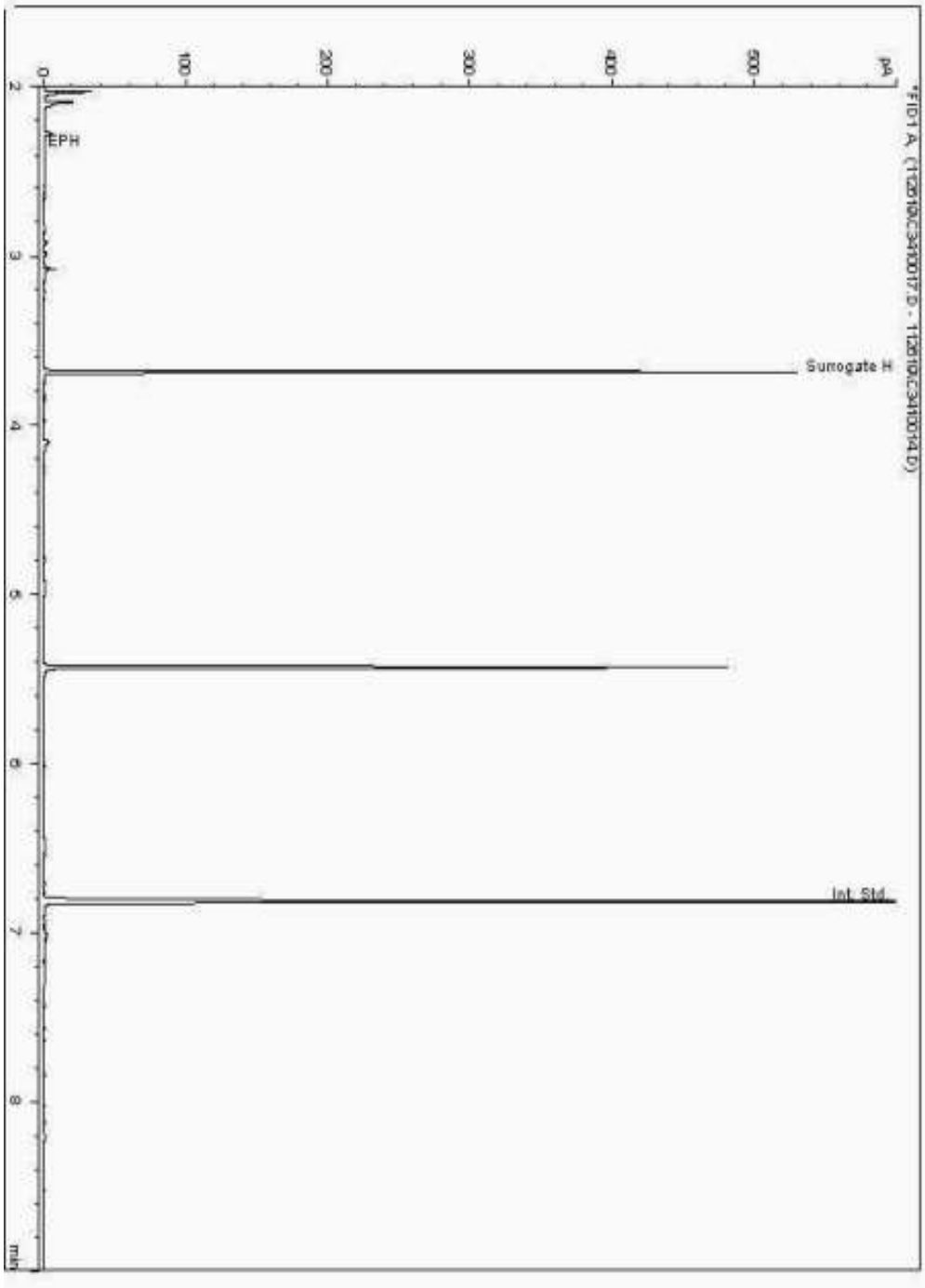
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,210,656 **Depth :** 0.80 - 0.90
21210656 **Sample ID :** WS07b

EPH Range Organics (C10 - C40)

Sample Identity : 19920866-
Date Acquired : 26/11/2019 11:48:10 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



Post Certification Report

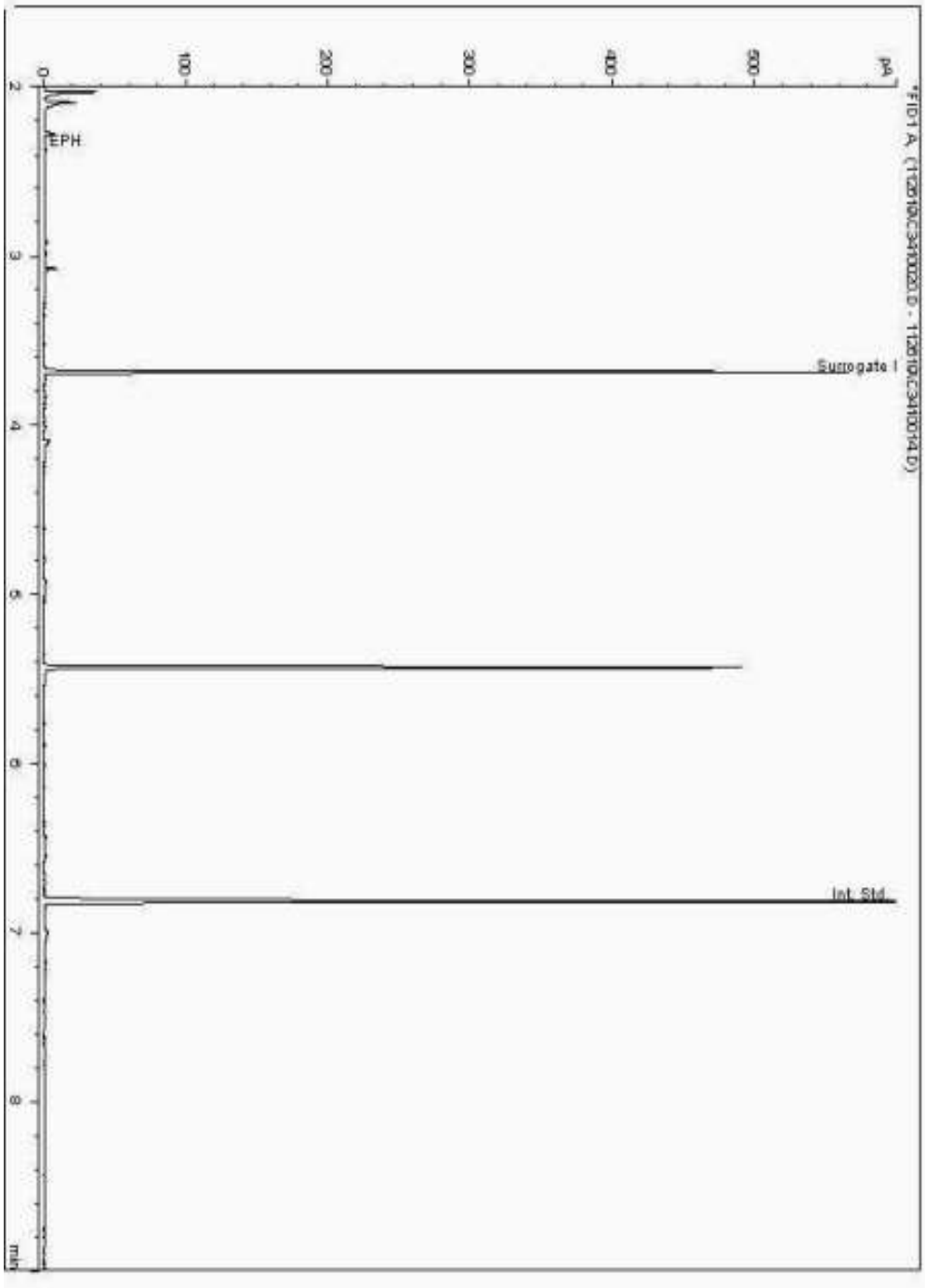
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,210,749 **Depth :** 1.10
21210749 **Sample ID :** WS01

EPH Range Organics (C10 - C40)

Sample Identity : 19920726-
Date Acquired : 26/11/2019 12:51:18 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



Post Certification Report

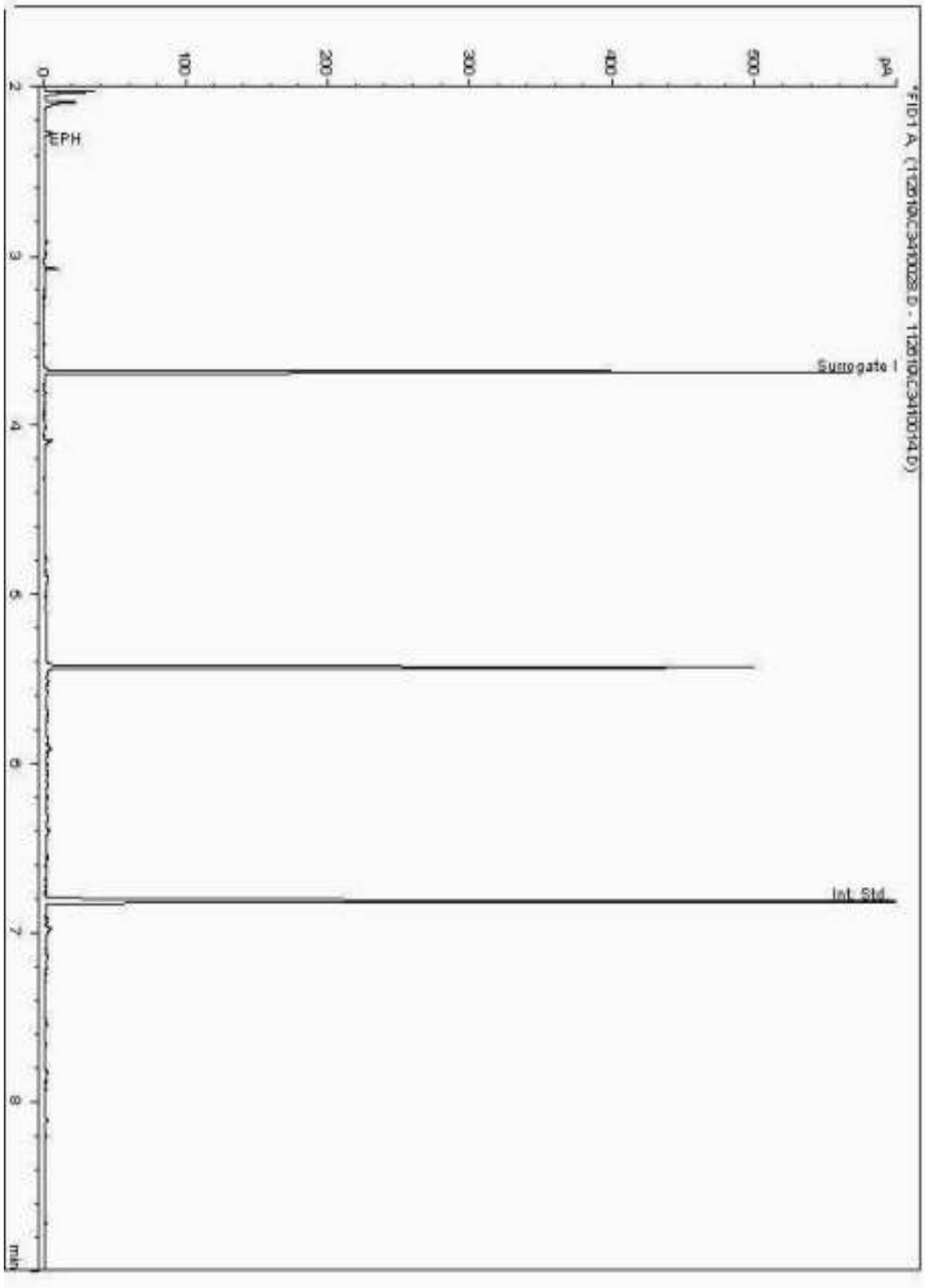
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,215,021 **Depth :** 0.70
21215021 **Sample ID :** WS05b

EPH Range Organics (C10 - C40)

Sample Identity : 19920754-
Date Acquired : 26/11/2019 15:40:18 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



Post Certification Report

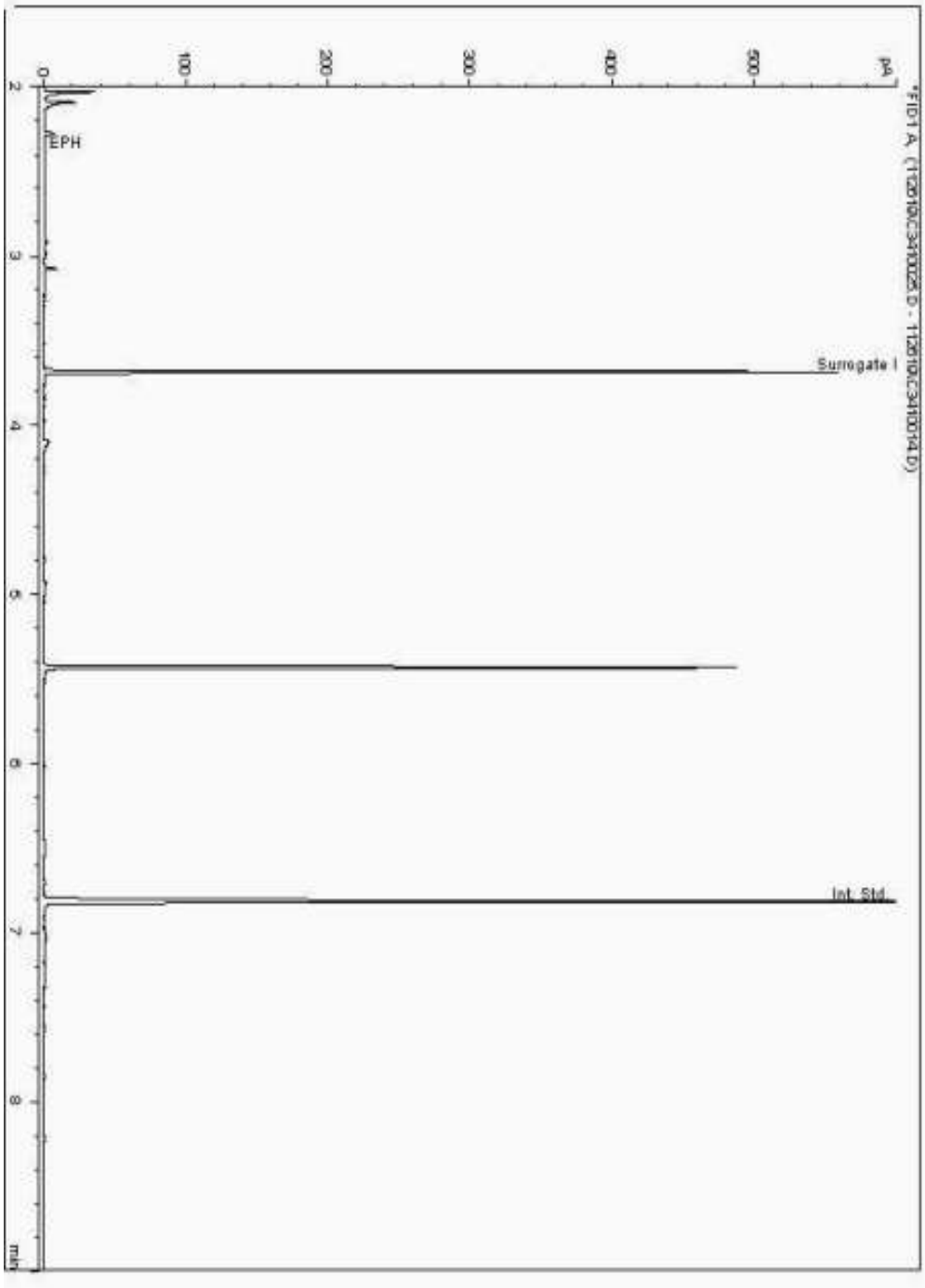
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,215,540 **Depth :** 0.40 - 0.50
21215540 **Sample ID :** WS03

EPH Range Organics (C10 - C40)

Sample Identity : 19920682-
Date Acquired : 26/11/2019 14:36:46 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



Post Certification Report

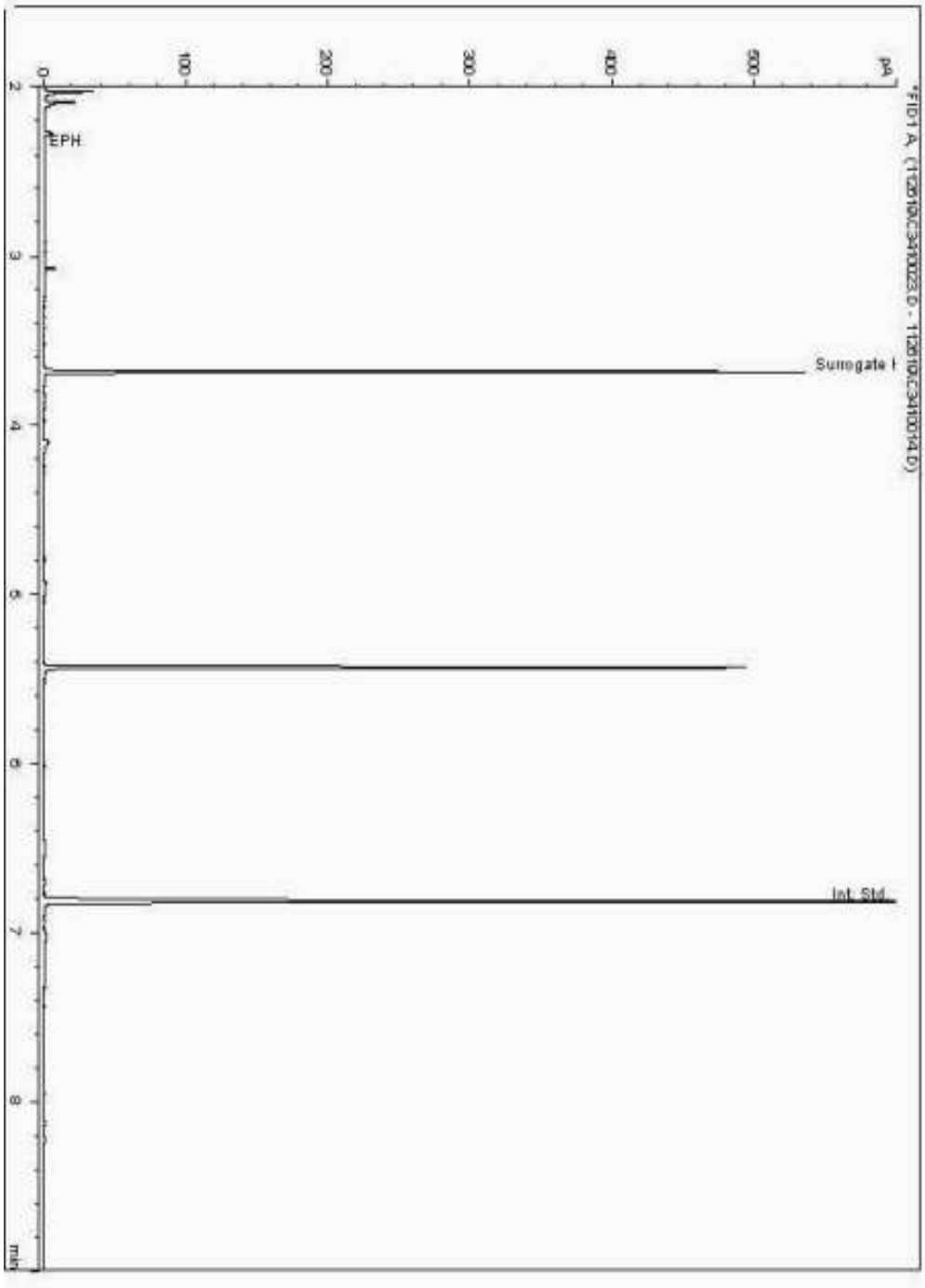
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,215,552 **Depth :** 0.57
21215552 **Sample ID :** WS08

EPH Range Organics (C10 - C40)

Sample Identity : 19920626-
Date Acquired : 26/11/2019 13:54:30 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



Post Certification Report

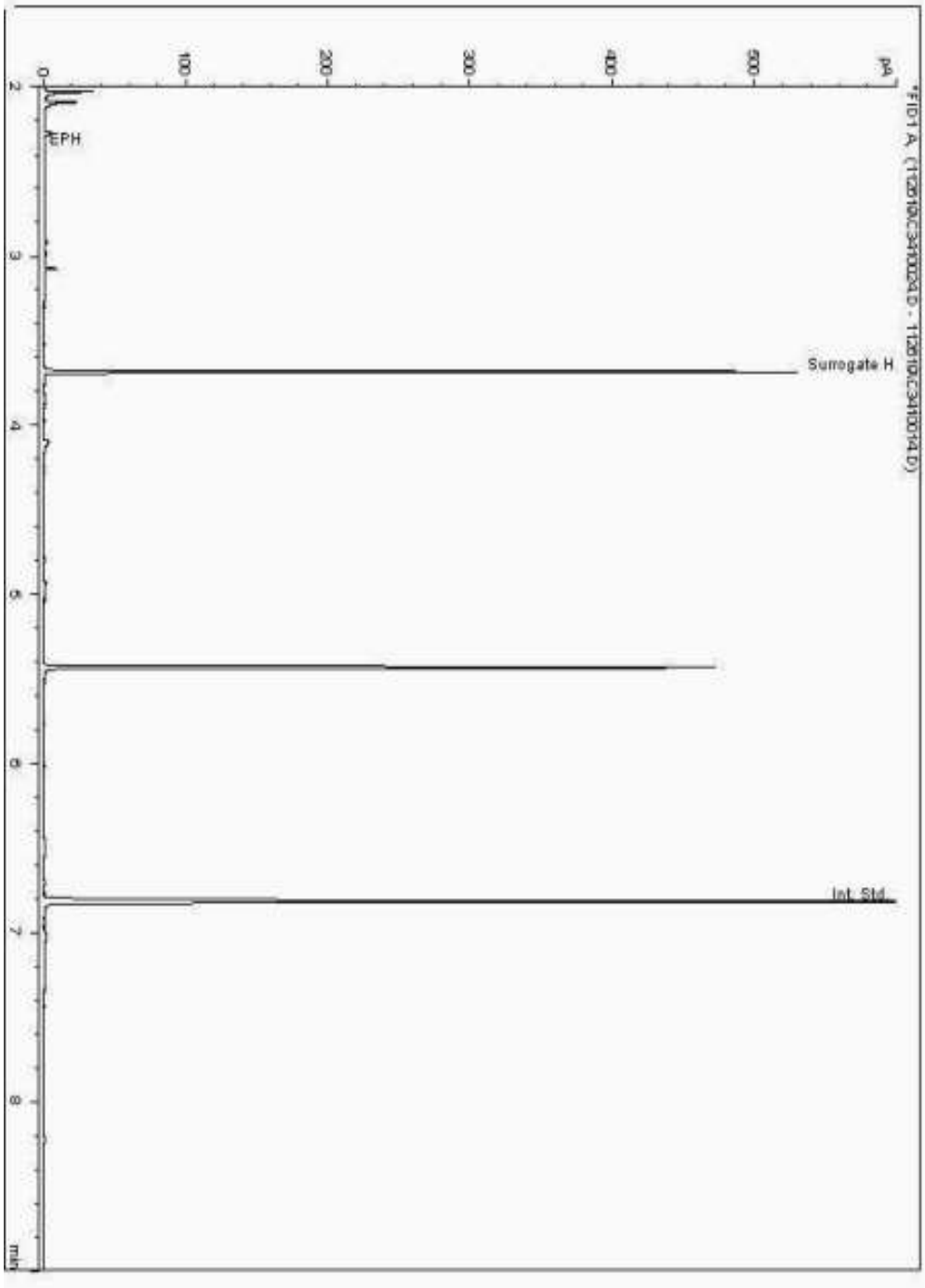
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,215,567 **Depth :** 0.90
21215567 **Sample ID :** WS02

EPH Range Organics (C10 - C40)

Sample Identity : 19920570-
Date Acquired : 26/11/2019 14:15:41 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



Post Certification Report

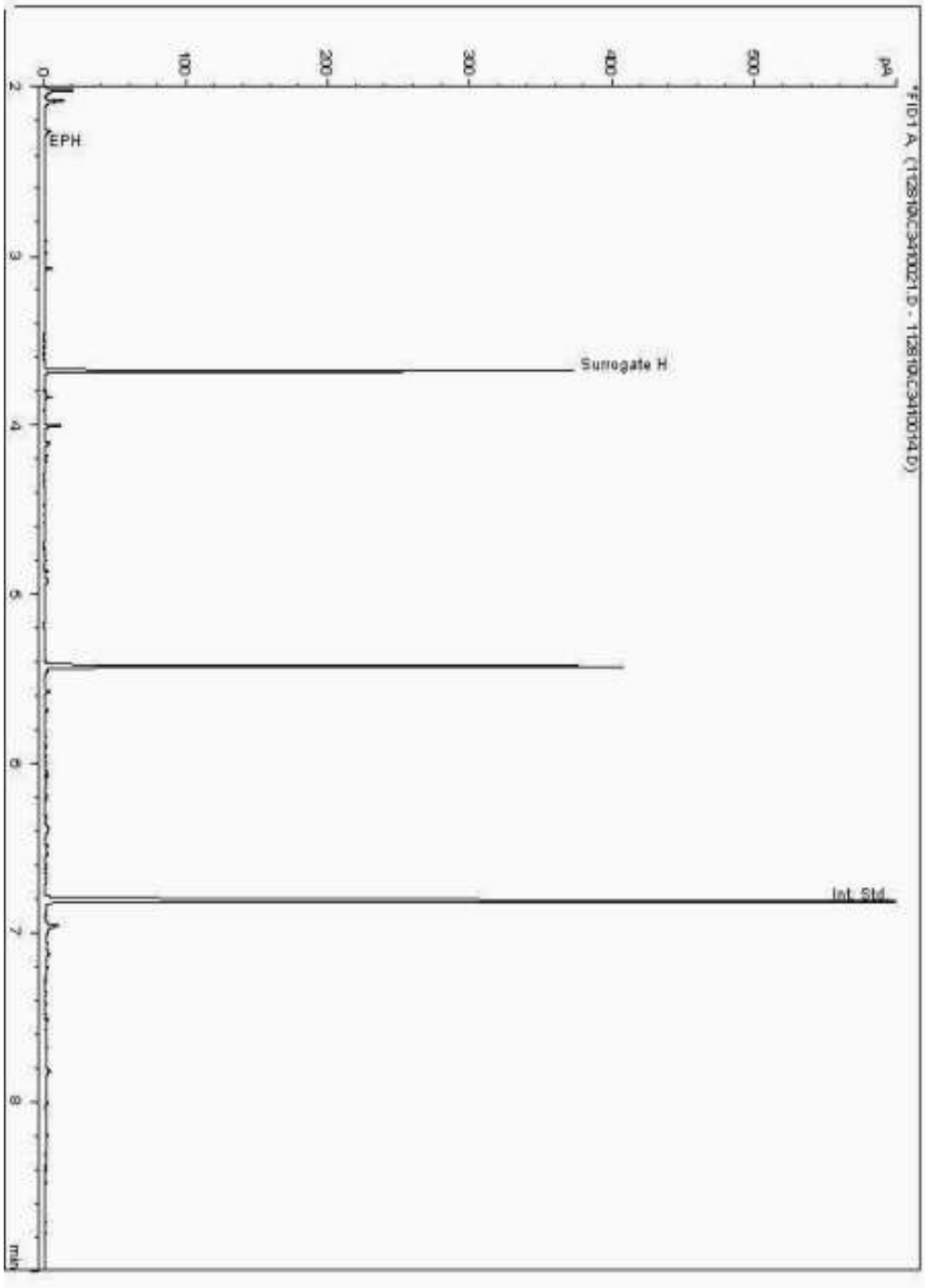
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,240,537 **Depth :** 0.30
21240537 **Sample ID :** WS01

EPH Range Organics (C10 - C40)

Sample Identity : 19946213-
Date Acquired : 28/11/2019 15:14:17 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :



Post Certification Report

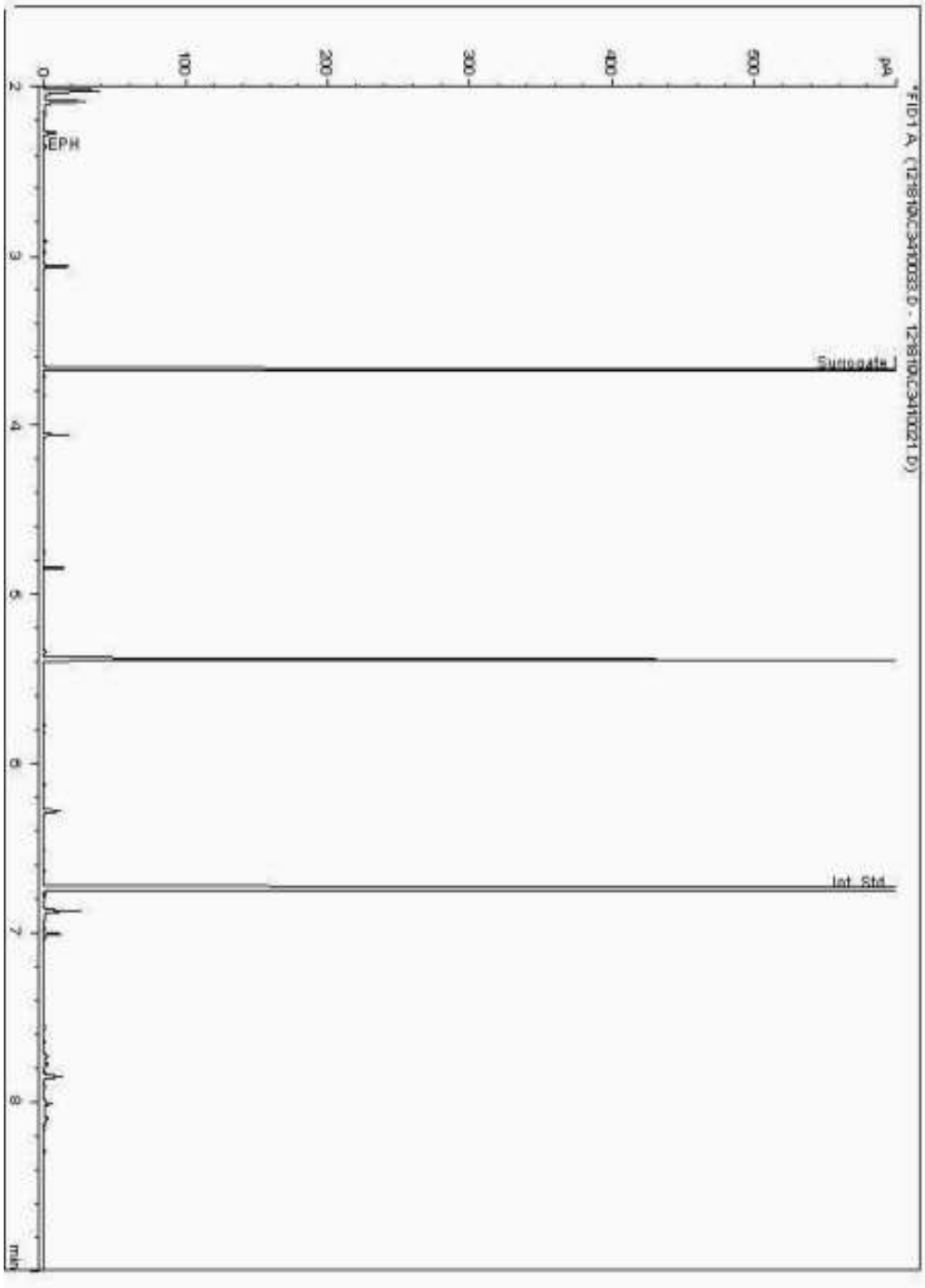
Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: EPH by FID **Sample No :** 21,385,949 **Depth :** 0.30 - 0.40
21385949 **Sample ID :** WS09 ES1

EPH Range Organics (C10 - C40)

Sample Identity : 20077154-
Date Acquired : 18/12/19 21:55:22 PM
Units : mg/kg
Sample Multiplier : 0.000
Dilution :

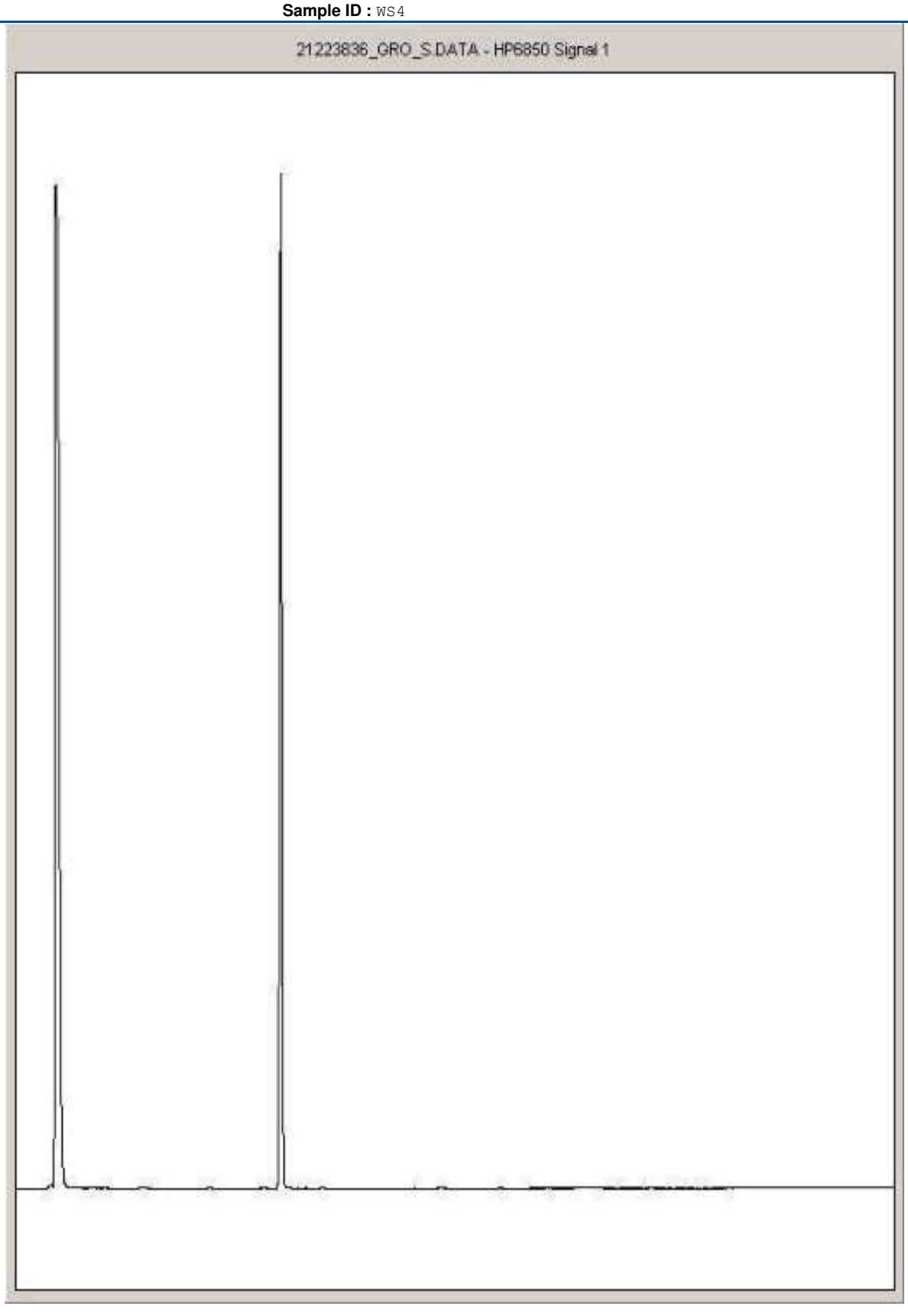


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,223,836 **Depth :** 0.50
21223836 **Sample ID :** WS4

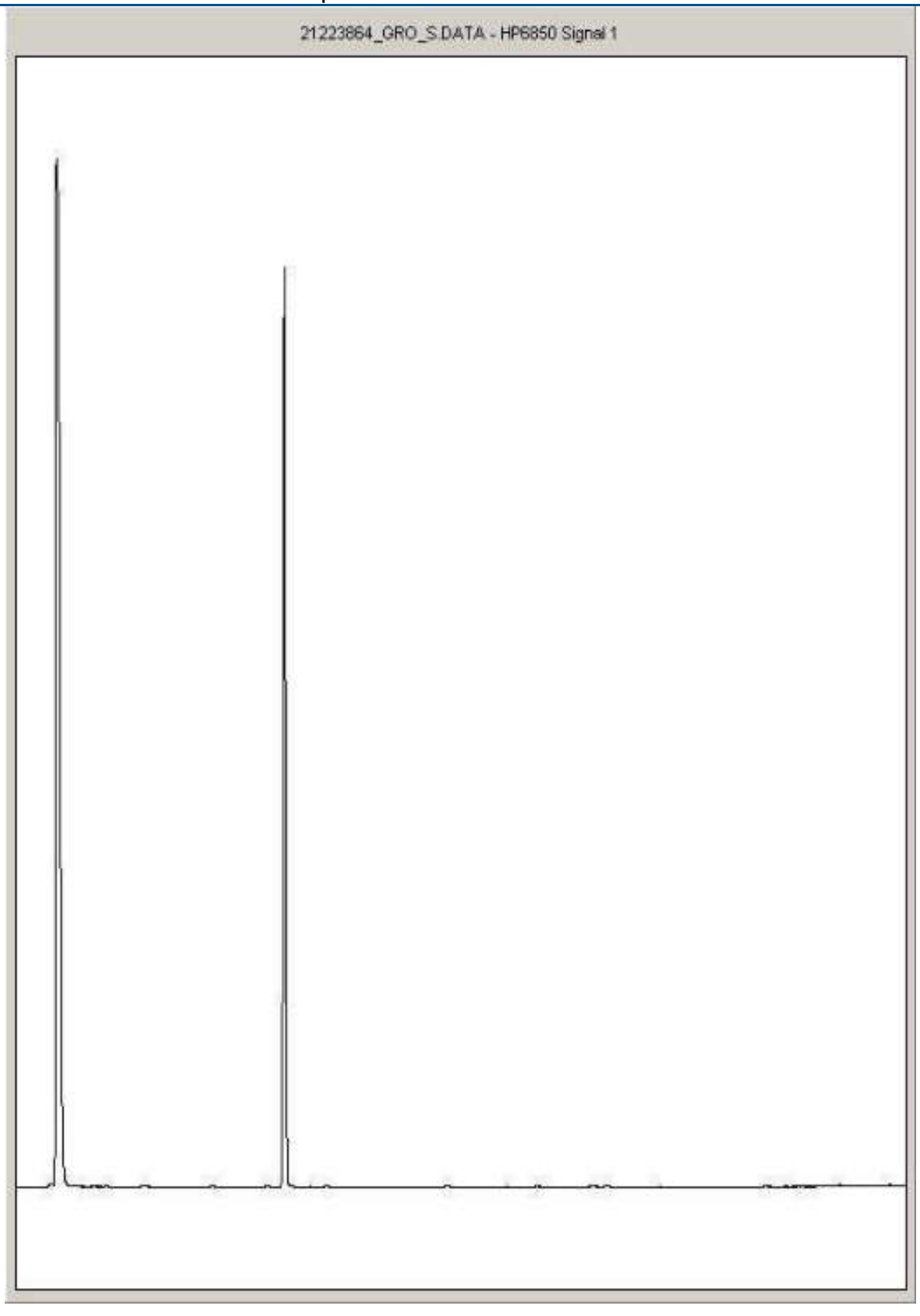


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,223,864 **Depth :** 0.40 - 0.50
21223864 **Sample ID :** WS03

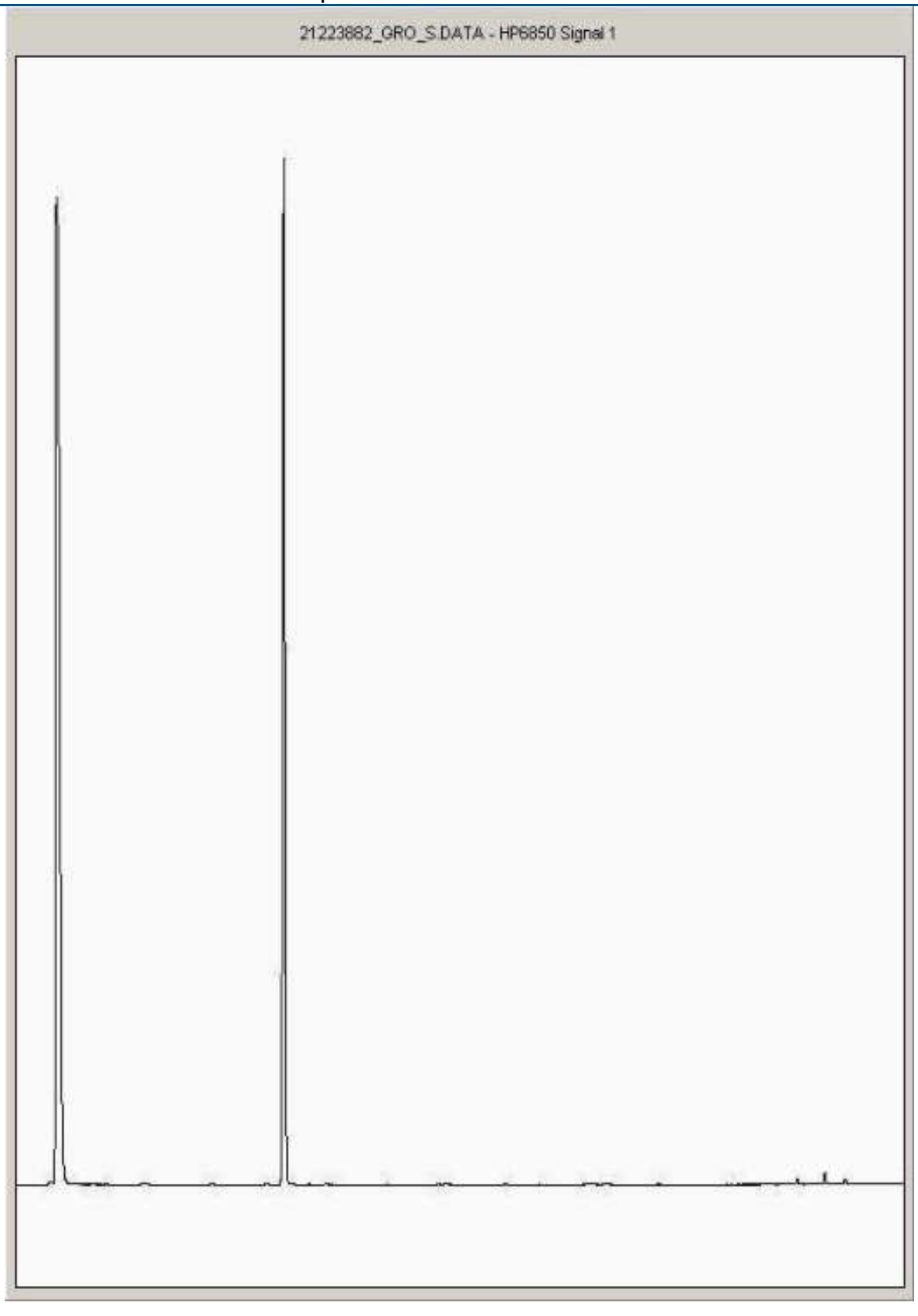


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,223,882 **Depth :** 1.10
21223882 **Sample ID :** WS01

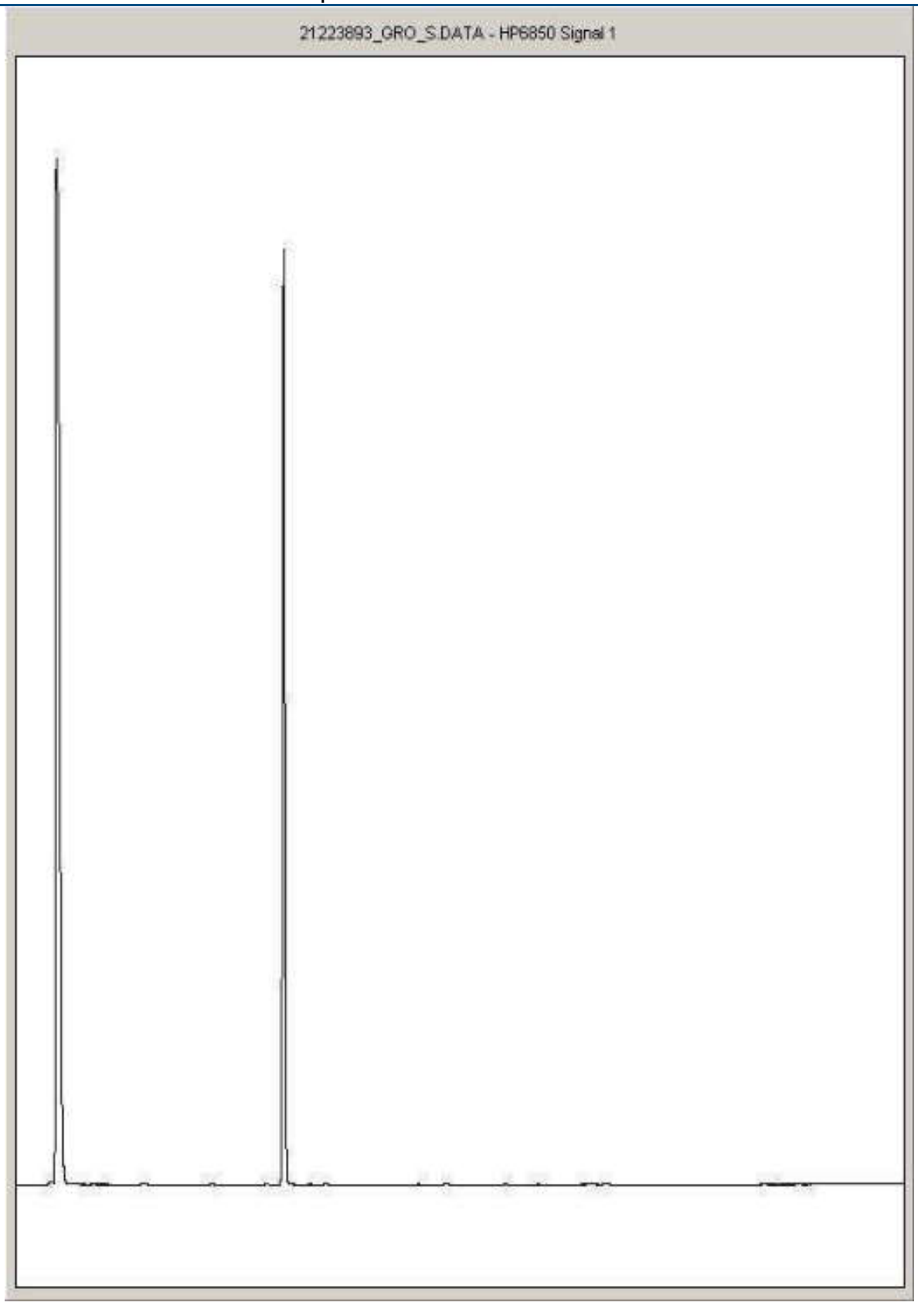


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,223,893 **Depth :** 0.80 - 0.90
21223893 **Sample ID :** WS07b

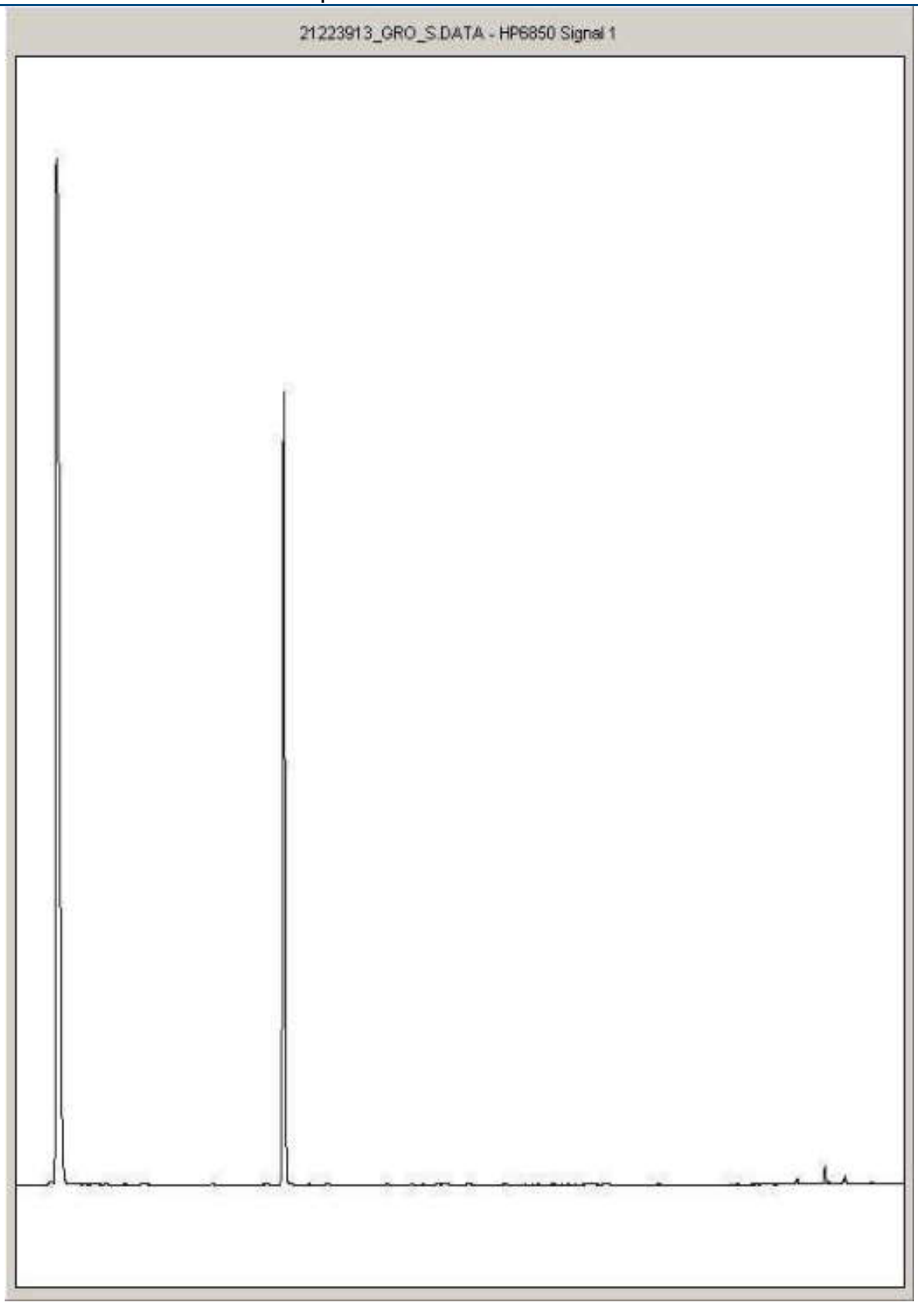


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,223,913 **Depth :** 0.30
21223913 **Sample ID :** WS01

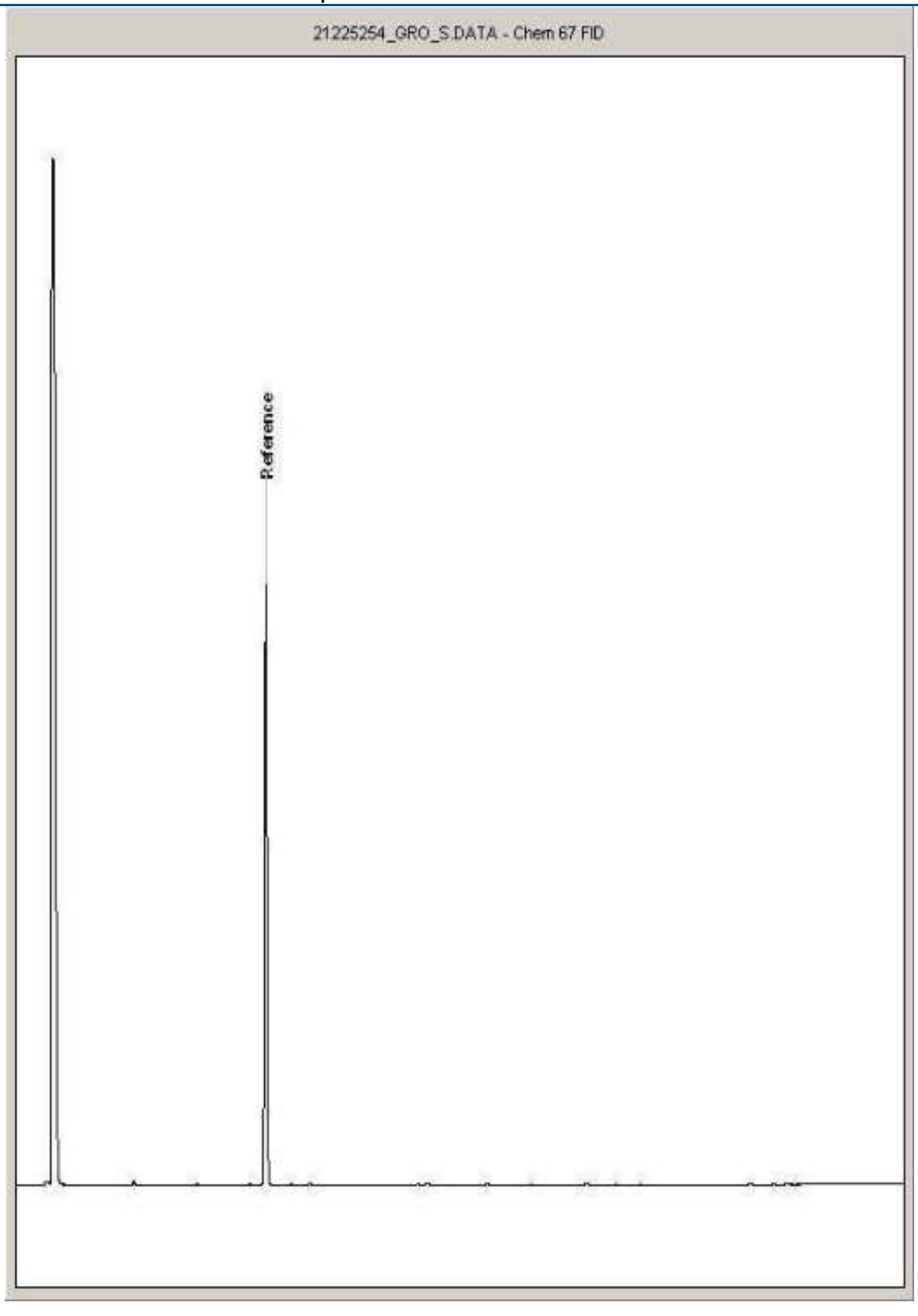


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,225,254 **Depth :** 0.90
21225254 **Sample ID :** WS02

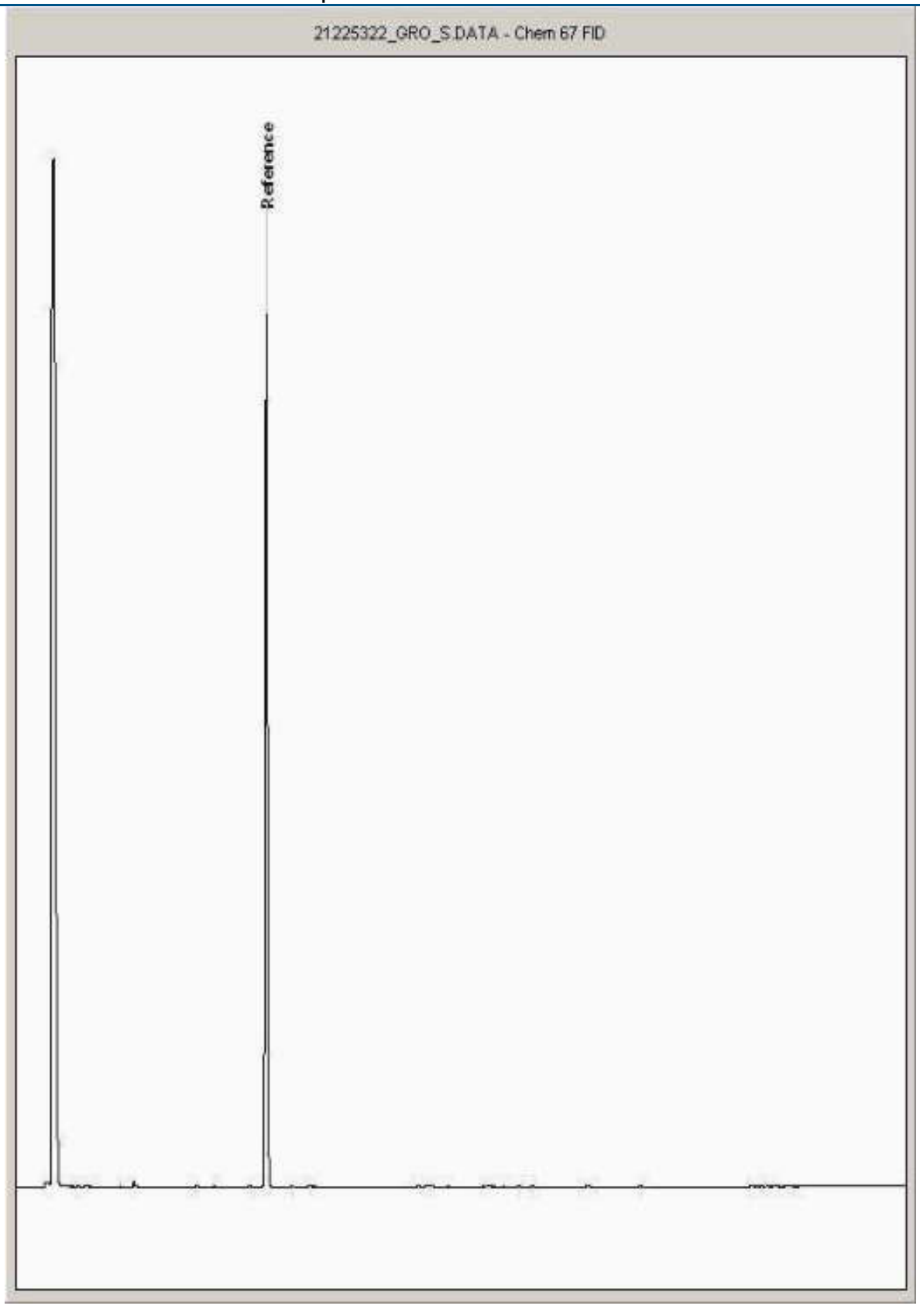


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,225,322 **Depth :** 0.57
21225322 **Sample ID :** WS08

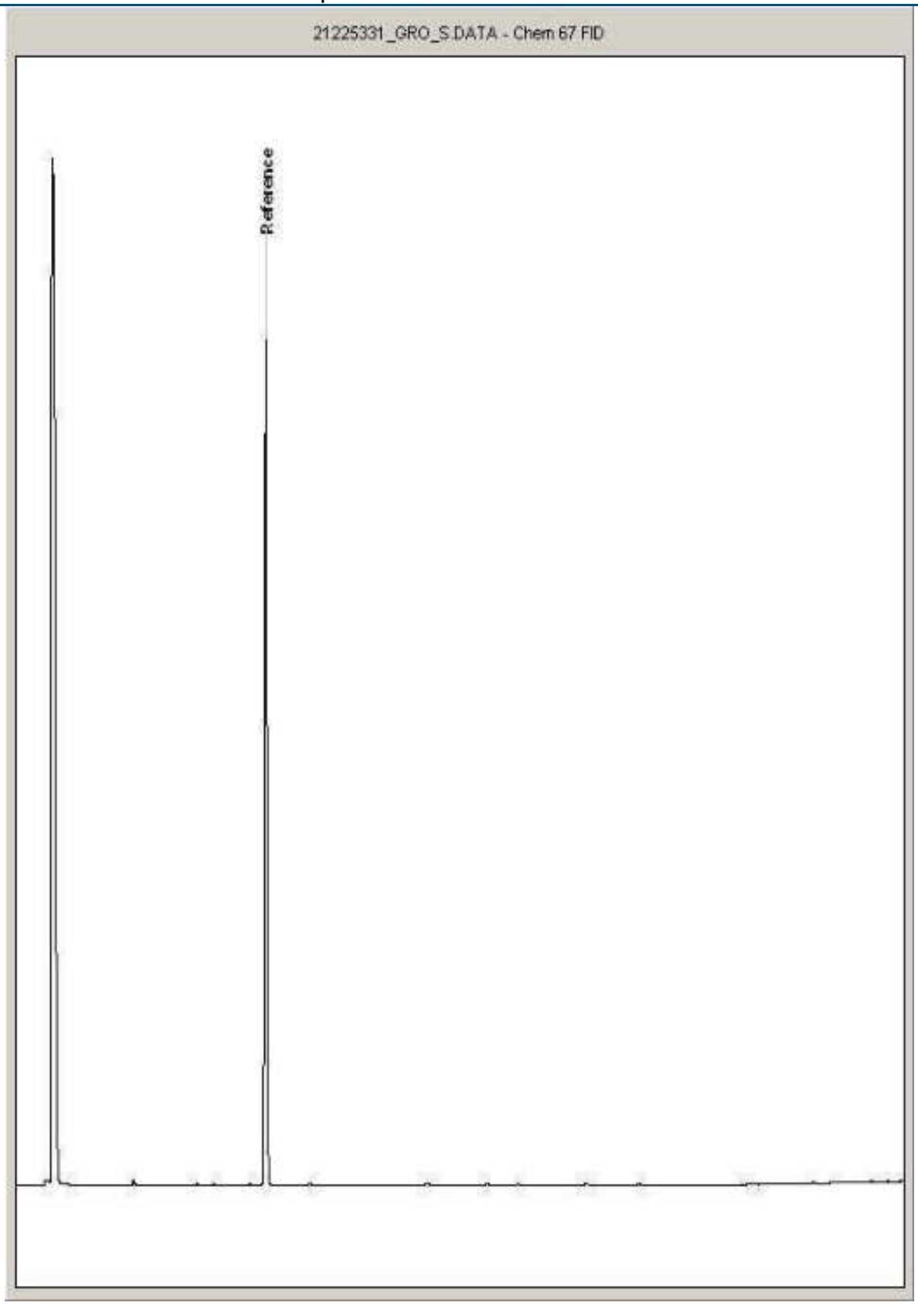


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,225,331 **Depth :** 0.70
21225331 **Sample ID :** WS05b

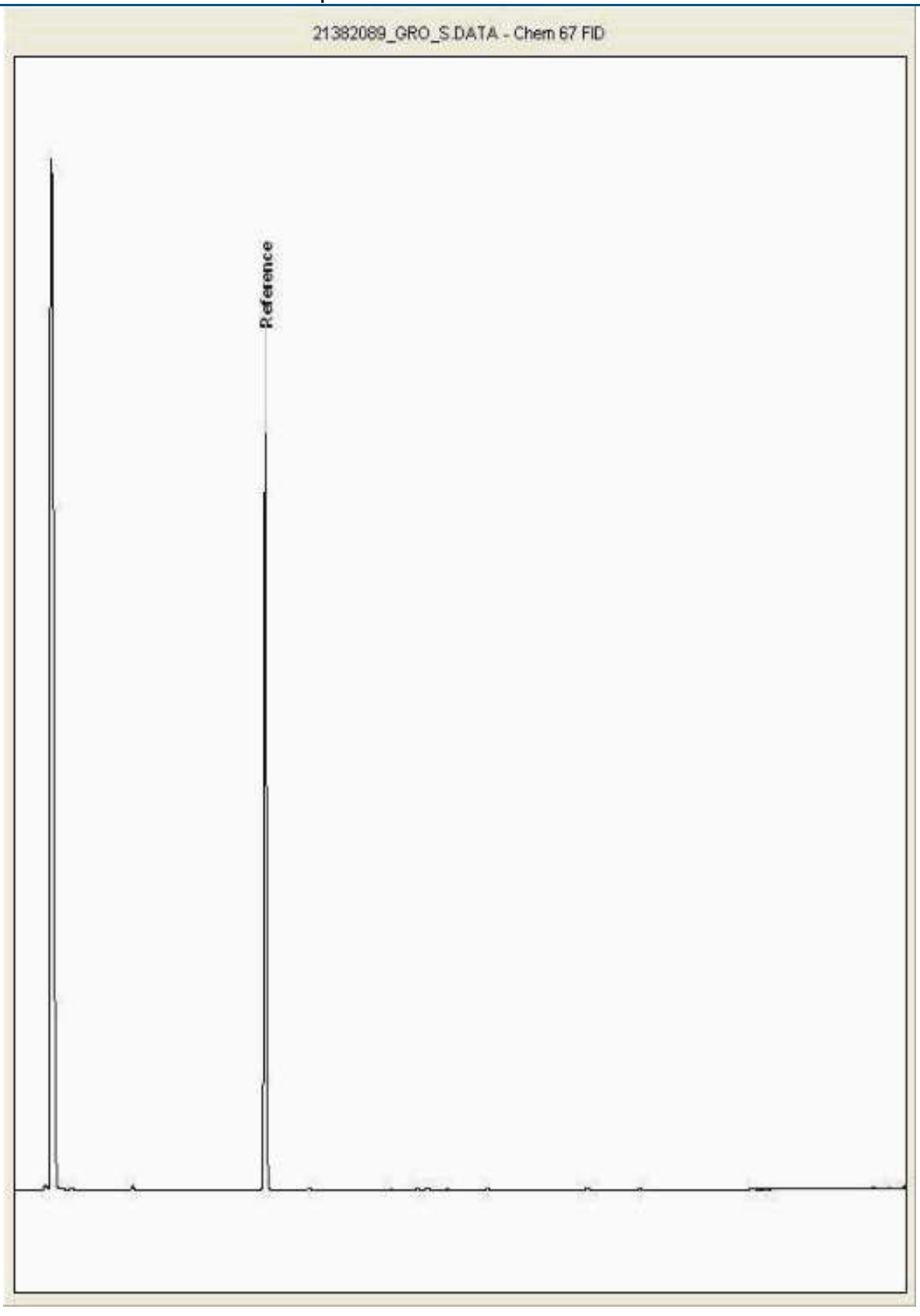


Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

Chromatogram

Analysis: GRO by GC-FID (S) **Sample No :** 21,382,089 **Depth :** 0.30 - 0.40
21382089 **Sample ID :** WS09 ES1



Post Certification Report

Customer : WYG Geo-Environment
Client Reference : A115249 **Location :** Welwyn Garden City

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. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. 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. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. 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.

5. 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.

6. 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 (2005), 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.

7. 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.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

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

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

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

13. **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%, they are generally wider for volatiles analysis, 50-150%. 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.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

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

18. 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.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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

General

21. 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.

22. 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.

23. 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.

24. **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.

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	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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 ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

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.

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.

Tier 1 - Soil Screening Values (TSVs)

Sample Identity		England and Wales (mg/kg) where	BH03 ES1	BH03 ES2	HP03 ES2	HP04 ES1	WS05b	WS07b	WS09 ES1	WS09 ES2	BH01	BH01	HP01	HP01	WS01	WS01	BH02	BH02	HP02	HP02	WS02	WS03	WS4	BH06	WS07	WS08
Depth (m bgl)		Soil Organic Matter <1%	0.60	2.00	1.00	0.30	0.70	0.80 0.90	0.30 0.40	0.90 1.00	2.50 2.50	4.00	0.15	1.00	0.30	1.10	1.00	2.50	0.15 0.20	0.90 1.00	0.90	0.40 0.50	0.50	0.25 0.25	0.40 0.50	0.57
Reference		Screen Value	1	2	2	1	1	2				4	1	2	1	3	2	3	1	2	2	1	1		1	1
Sample Date	Units	Residential (without plant uptake)	14/11/2019	14/11/2019	13/11/2019	13/11/2019	20/11/2019	19/11/2019	19/11/2019	19/11/2019	07/11/2019	08/11/2019	02/12/2019	02/12/2019	18/11/2019	18/11/2019	11/11/2019	12/11/2019	02/12/2019	02/12/2019	18/11/2019	20/11/2019	20/11/2019	04/11/2019	19/11/2019	18/11/2019
pH		<5 >9	8 15	8 1	8 1	8 39	7 92	8 16	7 76		8 09	8 22	8 15	7 62	7 51	7 96	8 38	8 22	7 89	8 31	7 51	8 49	8 31	7 99		6 4
Asbestos	%	Presence	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present		Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present	Not Present
HEAVY METALS/METALLOIDS																										
Arsenic	mg/kg	40	15 7	14	12 6	14 3	23 7	26 7	14 7		11 2	9 92	16 5	22 4	12 9	15 9	16 2	20 1	18 8	36 4	11 4	22 7	12 2	13 9		8 61
Cadmium	mg/kg	150	<0 02	<0 02	0 129	<0 02	<0 02	0 0748	0 537		0 0736	<0 02	0 437	0 23	0 203	<0 02	0 17	0 0399	0 375	0 273	0 189	<0 02	<0 02	0 332		<0 02
Chromium (III)	mg/kg	910	16 8	18 4	15 9	19 1	46	28 7	18 6		15 6	23 5	14 5	23 7	13 9	26 3	13 9	14 5	10 7	13 1	21 8	18 6	17 5	18 8		25 1
Chromium (VI)	mg/kg	21	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6		<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6	<0 6		<0 6
Lead	mg/kg	310	17 5	12 3	21	17 7	93 9	15 1	18		19 3	11 2	116	25 5	56 8	10 8	15 7	24 6	93 1	39 4	19 3	14 5	11 4	23 3		15 2
Mercury (Elemental)	mg/kg	1 2																								
Mercury (Inorganic)	mg/kg	56	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14		<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14	<0 14		<0 14
Mercury (Methyl)	mg/kg	15																								
Nickel	mg/kg	180	17 6	26	20 5	17 4	27 4	72 7	22 9		18 4	19 6	16 8	26 9	16 7	34 6	19 1	23	14 2	33 3	24 7	28 4	21 2	25 1		16 7
Selenium	mg/kg	430	<1	<1	<1	<1	<1	<1	1 12		<1	<1	<1	<1	1 07	<1	<1	<1	<1	<1	1 89	<1	<1	<1		<1
Beryllium	mg/kg	1 7	0 872	1 17	0 945	1 13	1 19	**1.86**	0 786		0 904	0 892	0 74	1 08	0 857	1 38	0 96	0 944	0 654	1 23	1 16	1 22	1 01	1 05		0 931
Boron	mg/kg	11,000	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	1 14	<1	1 22	<1	<1	<1		<1
Vanadium	mg/kg	1,200	31	43	34 5	45 9	54 5	59 9	35 5		30 5	37 6	35 2	34 5	29	51 9	33	33	32 6	41 2	42 5	43 7	37 6	40 5		44 9
Copper	mg/kg	7 100	10	15 7	24 9	9 35	102	22 1	9 65		10 4	11 5	16 8	18	15 9	16 9	19 2	13	16 8	19 7	9 41	15 7	12 2	12 3		8 78
Zinc	mg/kg	40 000	50 4	59 2	61 5	45 8	86 1	110	59 3		47 4	38	80 3	91 7	70	66 2	52 2	56 4	64 6	144	80 7	69 7	44 6	73 8		56 3
US EPA PRIORITY PAHs																										
Acenaphthene	mg/kg	3 000 (57 0)sol	<0 016	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008		<0 008	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008	<0 008		<0 008
Acenaphthylene	mg/kg	2 900 (86 1)sol	<0 024	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012		<0 012	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012	<0 012		<0 012
Anthracene	mg/kg	31,000 (1 17)vap	<0 032	<0 016	<0 016	<0 016	0 0241	<0 016	<0 016		<0 016	<0 016	<0 016	<0 016	0 0227	<0 016	<0 016	<0 016	<0 016	<0 016	<0 016	<0 016	<0 016	<0 016		<0 016
Benzo(a)anthracene	mg/kg	11	<0 028	<0 014	0 016	0 0318	0 0881	<0 014	0 0163		<0 014	<0 014	0 0658	<0 014	0 152	<0 014	0 0251	<0 014	0 0676	0 0368	<0 014	<0 014	<0 014	<0 014		<0 014
Benzo(b)fluoranthene	mg/kg	3 9	<0 03	<0 015	<0 015	0 0329	0 091	<0 015	<0 015		0 0173	<0 015	0 0988	<0 015	0 159	<0 015	0 0278	<0 015	0 108	0 0504	<0 015	<0 015	<0 015	0 0196		<0 015
Benzo(k)fluoranthene	mg/kg	110	<0 028	<0 014	<0 014	<0 014	0 042	<0 014	<0 014		<0 014	<0 014	0 0285	<0 014	0 0788	<0 014	<0 014	<0 014	0 0372	0 0169	<0 014	<0 014	<0 014	<0 014		<0 014
Benzo(g h i)perylene	mg/kg	360	<0 048	<0 024	<0 024	<0 024	0 0924	<0 024	<0 024		<0 024	<0 024	0 0576	<0 024	0 126	<0 024	<0 024	<0 024	0 0565	<0 024	<0 024	<0 024	<0 024	<0 024		<0 024
Benzo(a)pyrene	mg/kg	5 3	<0 03	<0 015	<0 015	0 0263	0 104	<0 015	<0 015		<0 015	<0 015	0 0633	<0 015	0 151	<0 015	0 0204	<0 015	0 0642	0 0329	<0 015	<0 015	<0 015	<0 015		<0 015
Chrysene	mg/kg	30	<0 02	<0 01	0 0126	0 0277	0 0826	<0 01	0 0141		0 0137	<0 01	0 0754	<0 01	0 135	<0 01	0 0231	<0 01	0 0651	0 0373	<0 01	<0 01	<0 01	0 014		<0 01
Di benzo(a h)anthracene	mg/kg	0 31	<0 046	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023		<0 023	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023	<0 023		<0 023
Fluoranthene	mg/kg	1 500	<0 034	<0 017	0 0295	0 0559	0 239	<0 017	0 0354		0 0335	<0 017	0 133	<0 017	0 341	0 031	0 0435	<0 017	0 135	0 0721	0 0386	<0 017	<0 017	0 0251		<0 017
Fluorene	mg/kg	2,800 (30 9)sol	<0 02	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01
Indeno(1,2,3 cd)pyrene	mg/kg	45	<0 036	<0 018	<0 018	<0 018	0 0716	<0 018	<0 018		<0 018	<0 018	0 0503	<0 018	0 102	<0 018	<0 018	<0 018	0 0466	0 0224	<0 018	<0 018	<0 018	<0 018		<0 018
Naphthalene	mg/kg	2 3	<0 018	<0 009	<0 009	<0 009	<0 009	<0 009	<0 009		<0 009	<0 009	<0 009	<0 009	<0 009	<0 009	0 0119	<0 009	<0 009	<0 009	<0 009	<0 009	<0 009	<0 009		<0 009
Phenanthrene	mg/kg	1 300 (36 0)sol	<0 03	<0 015	<0 015	0 0191	0 0856	<0 015	<0 015		<0 015	<0 015	0 0532	<0 015	0 114	<0 015	0 024	<0 015	0 0567	0 03	<0 015	<0 015	<0 015	<0 015		<0 015
Pyrene	mg/kg	3,700	<0 03	<0 015	0 0259	0 0497	0 22	<0 015	0 0308		0 0278	<0 015	0 111	<0 015	0 291	0 0293	0 0378	<0 015	0 118	0 0593	0 0347	<0 015	<0 015	0 0217		<0 015
BTEX																										
Benzene	mg/kg	0 89	<0 009	<0 009	<0 009	<0 009	<0 009	<0 009	<0 009		<0 009	<0 009	<0 09	<0 009	<0 18	<0 009	<0 009	<0 009	<0 09	<0 009	<0 009	<0 009	<0 009	<0 009		<0 009
Toluene	mg/kg	880vap (869)	<0 007	<0 007	<0 007	<0 007	<0 007	<0 007	<0 007		<0 007	<0 007	<0 07	<0 007	<0 14	<0 007	<0 007	<0 007	<0 07	<0 007	<0 007	<0 007	<0 007	<0 007		<0 007
Ethylbenzene	mg/kg	83	<0 004	<0 004	<0 004	<0 004	<0 004	<0 004	<0 004		<0 004	<0 004	<0 04	<0 004	<0 08	<0 004	0 00678	<0 004	<0 04	<0 004	<0 004	<0 004	<0 004	<0 004		<0 004
m Xylene	mg/kg	82	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01	<0 01	<0 1	<0 01	<0 2	<0 01	<0 01	<0 01	<0 1	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01
o Xylene	mg/kg	88	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01	<0 01	<0 1	<0 01	<0 2	<0 01	<0 01	<0 01	<0 1	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01
p Xylene	mg/kg	79	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01	<0 01	<0 1	<0 01	<0 2	<0 01	<0 01	<0 01	<0 1	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01
Xylenes (mixed isomers)	mg/kg	79	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01	<0 01	<0 1	<0 01	<0 2	<0 01	<0 01	<0 01	<0 1	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01

Additional Tests																										
CWG																										
GRO TOT (Moisture Corrected)	µg/kg		<100	<100	<100	<100	<100	<100	<100		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100		<100
INORGANICS																										
Amosite (Brown) Asbestos	No units		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Analysed By	No units		James Richards	Andrzej Ferfecki	Andrzej Ferfecki	Andrzej Ferfecki	James Richards	James Richards	Christian Hallam		ieszka Chelmow	Andrzej Ferfeck	Marcin Magdzia	bara Urbanek W	James Richards	James Richards	Marcin Magdziare	Andrzej Ferfecki	Andrzej Ferfecki	James Richards	James Richards	Christian Hallam	Christian Ha lam	ieszka Chelmow	James Richards	James Richards
Chrysotile (White) Asbestos	No units		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Colour	No units		Light Brown	Light Brown	Light Brown	Light Brown	Dark Brown	Light Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Light Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Dark Brown	Light Brown	Dark Brown	Light Brown	Dark Brown
Comments	No units																									
Crocidol te (Blue) Asbestos	No units		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Cyanide Easily I beratable (low level)	mg/kg		<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5		<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5	<0 5		<0 5
Date of Analysis	No units		21/11/2019	21/11/19	21/11/19	21/11/19	27/11/2019	27/11/2019	19/12/19		19/11/2019	19/11/19	24/12/2019	24/12/2019	27/11/2019	27/11/2019	19/11/2019	19/11/19	24/12/19	24/12/2019	27/11/2019	27/11/19	28/11/19	19/11/2019	13/01/2020	27/11/2019
Description	No units		Sandy Loam	Clay Loam	Loamy Sand	Clay Loam	Clay Loam	Clay Loam	Loamy Sand	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Loamy Sand	Loamy Sand	Sandy Loam	Loamy Sand	Sandy Loam	Sandy Loam	Sandy Clay Loam	Sandy Clay	Clay Loam	Sandy Loam	Clay	Clay
Fibrous Actinol te	No units		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Fibrous Anthophyllite	No units		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Fibrous Tremolite	No units		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Inclusion 1)	No units		Stones	Stones	Stones	Stones	Vegetation	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Vegetation	Stones	Vegetation	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Brick	Crushed Brick
Inclusion 2)	No units		Vegetation	None	Vegetation	Vegetation	Stones	N/A	Vegetation	Vegetation	None	None	Vegetation	None	Stones	Vegetation	Stones	None	Vegetation	None	Vegetation	Vegetation	N/A	Vegetation	Stones	Stones
Non Asbestos F bre	No units		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
METALS																										
Chromium	mg/kg		16 8	18 4	15 9	19 1	46	28 7	18 6		15 6	23 5	14 5	23 7	13 9	26 3	13 9	14 5	10 7	13 1	21 8	18 6	17 5	18 8		25 1
ORGANIC																										
6 2 PTS (27619 97 2)	µg/kg									<1															<1	<1
Branched PFOS	µg/kg									<1															<1	<1
Fraction Organic Carbon (FOC)	No units		0 00309	<0 002	0 00394	0 0024	0 00867	0 00301	0 00397		0 00374	<0 002	0 0163	0 00204	0 0212	0 0021	0 00631	<0 002	0 0189	0 00497	0 00558	<0 002	<0 002	0 0108		0 00324
Linear PFOS(1763 23 1) Perfluoro 1 octanesulfonate	µg/kg									<1															<1	<1
PFBA (357 22 4) Perfluoro n butanoic acid	µg/kg									<3															<3	<3
PFBS (375 73 5) Perfluoro 1 butanesu fonate	µg/kg									<1															<1	<1
PFDA (335 76 2) Perfluoro n decanoic acid	µg/kg									<1															<1	<1
PFDoA (307 55 1) Perfluoro n dodecanoic acid	µg/kg									<1															<1	<1
PFHpA (375 85 9) Perfluoro n heptanoic acid	µg/kg									<1															<1	<1
PFHpS (375 92 8) Perfluoro 1 heptanesulfonate	µg/kg									<1															<1	<1
PFHxA (307 24 4) Perfluoro n hexanoic acid	µg/kg									<2															<2	<2
PFHxS (355 46 4) Perfluoro 1 hexanesulfonate	µg/kg									<1															<1	<1
PFNA (375 95 1) Perfluoro n nonanoic acid	µg/kg									<1															<1	<1
PFOA (335 67 1) Perfluoro n octanoic acid	µg/kg									<1															<1	<1
PFOSA (754 91 6) Perfluoro octanesulfonamide	µg/kg									<1															<1	<1
PFPA (2706 90 3) Perfluoro n pentanoic acid	µg/kg									<3															<3	<3
PFUnA (2058 94 8) Perfluoro n undecanoic acid	µg/kg									<1															<1	<1
Total PFOS	µg/kg									<1															<1	<1
PAH																										
Acenaphthene d10 % recovery**	%		93	94 2	93 8	93 9	95 3	89 5	104		89 2	85 7	81 9	81 9	85	98 3	88 3	90 6	81 7	84 7	93 5	94 9	95 8	86 2		90 8
Chrysene d12 % recovery**	%		78 5	84 8	85 3	80 3	89 8	85 6	79 3		81	84 5	74 2	68	75	95 8	83	83	73	75 6	90 9	90 9	95 7	74 2		94 3
Naphthalene d8 % recovery**	%		80 8	79 8	80 7	80 2	93 1	89 1	99 7		85 7	91	78 5	87 4	87 2	93 2	92 3	88 3	79 1	84 6	91 1	91 6	89 9	85 4		89 2
PAH, Total Detected USEPA 16	µg/kg		<236	<118	<118	243	1140	<118	<118		<118	<118	737	<118	1670	<118	214	<118	755	358	<118	<118	<118	<118		<118
Perylene d12 % recovery**	%		78 8	87 3	87 6	83 5	87 2	85 8	79 3		73 5	85 7	73 2	67 2	75 9	95 1	83 1	83 4	71 1	75 6	85 3	90	93	70 1		92
Phenanthrene d10 % recovery**	%		94 2	99 6	99 3	94	101	88 5	106		86	82 2	85 7	81 3	82 4	104	83 5	86	85 4	87 8	94 6	96 9	101	82 8		95 5
PHENOLS																										
Phenol	mg/kg		<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01	<0 01		<0 01
PHYSICAL																										
Moisture Content Ratio (% of as received sample)	%		3 4	12	11	15	13	16	12	16	12	15	18	14	15	11	10	5 6	17	15	16	13	12	16	16	16
TPH																										
EPH Range >C10 C40	mg/kg		71 8	<35	<35	<35	67 6	<35	<35		<35	<35	47 9	<35	61	<35	<35	<35	46	<35	<35	<35	<35	<35		<35
EPH Surrogate % recovery**	%		91 7	81 6	76 1	80 3	87 1	79 1	77 8		89 2	89	79	89 9	66 1	88 1	92 7	98 2	77 3	83 8	81 4	87 9	84 1	76 1		83
Interpretation	No units		nterpretation pos	nterpretation po	nterpretation po	nterpretation pos	nterpretation pos	nterpretation pos	nterpretation pos		nterpretation pos	nterpretation po	nterpretation po	nterpretation po	nterpretation pos	nterpretation pos	NIP	NIP	NIP	NIP	NIP	NIP	NIP	NIP		NIP
VOC																										
4 Bromofluorobenzene**	%		89 4	95 5	91	83 7	85 5	95 2	87 8		95 3	102	92 8	91 8	98 2	102	96	101	89 4	91 8	85 7	99 6	95	82 5		95 7
Dibromofluoromethane**	%		111	105	106	104	103	99 8	110		103	109	107	105	104	113	105	105	104	103	103	104	98 1	104		101
Methyl Tertiary Butyl Ether	µg/kg		<10	<10	<10	<10	<10	<10	<10		<10	<10	<100	<10	<200	<10	<10	<10	<100	<10	<10	<10	<10	<10		<10
Toluene d8**	%		95 8	98 5	98 6	97 2	93 5	97 5	96 7		97 8	103	98 4	97 7	98 1	97 3	100	101	97 6	98 8	96 3	97 5	98 7	97		96 2

Notes:

NIP No interpretation possib e

sol Analyte not tested or
Suitable 4 Use Level exceeds soil saturation limit which is given in brackets
(note that if soil data exceeds the so ubil ty l mit ree product may be present) For screening consider appl cab lity of both so ubi lity imit and soil saturation limits

vap Suitable 4 Use Level exceeds vapour saturation limit which is given in brackets

Appendix I – Photographic Plates

Plate 1 Rig Setup

Plate 2 Setting up at the hole location

WYG Environment
11th Floor,
One Angel Court,
London
EC2R 7HJ

Tel: 020 7250 7500

Environmental Consultancy
Ground Technologies & Investigation

Project :-
Welwyn Garden City Town Centre GI

Client: Welwyn Hatfield Borough Council

Project No.: A115249

Date : November 2019

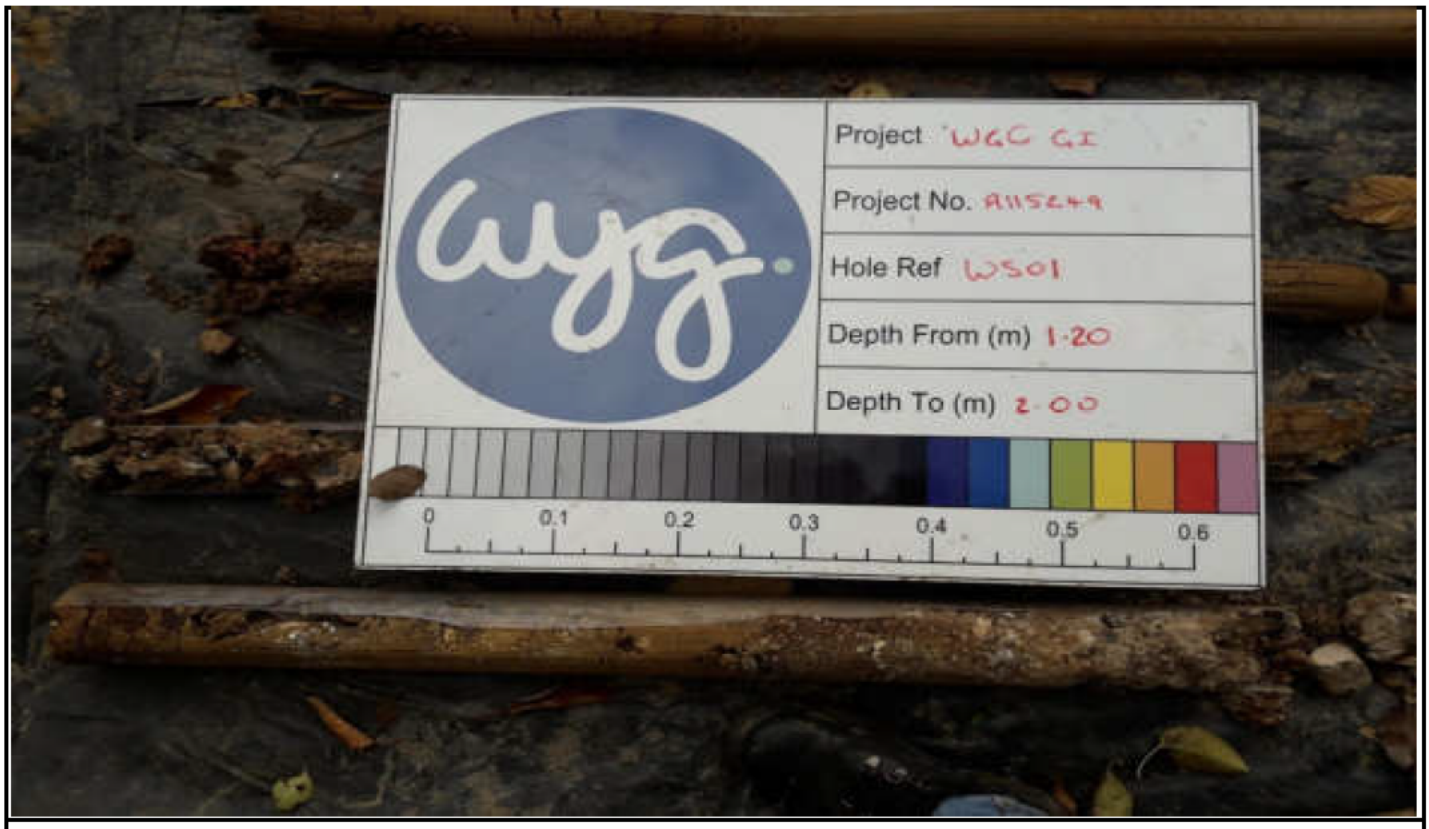


Plate 3 WS01 - 1.20 to 2.00 m bgl

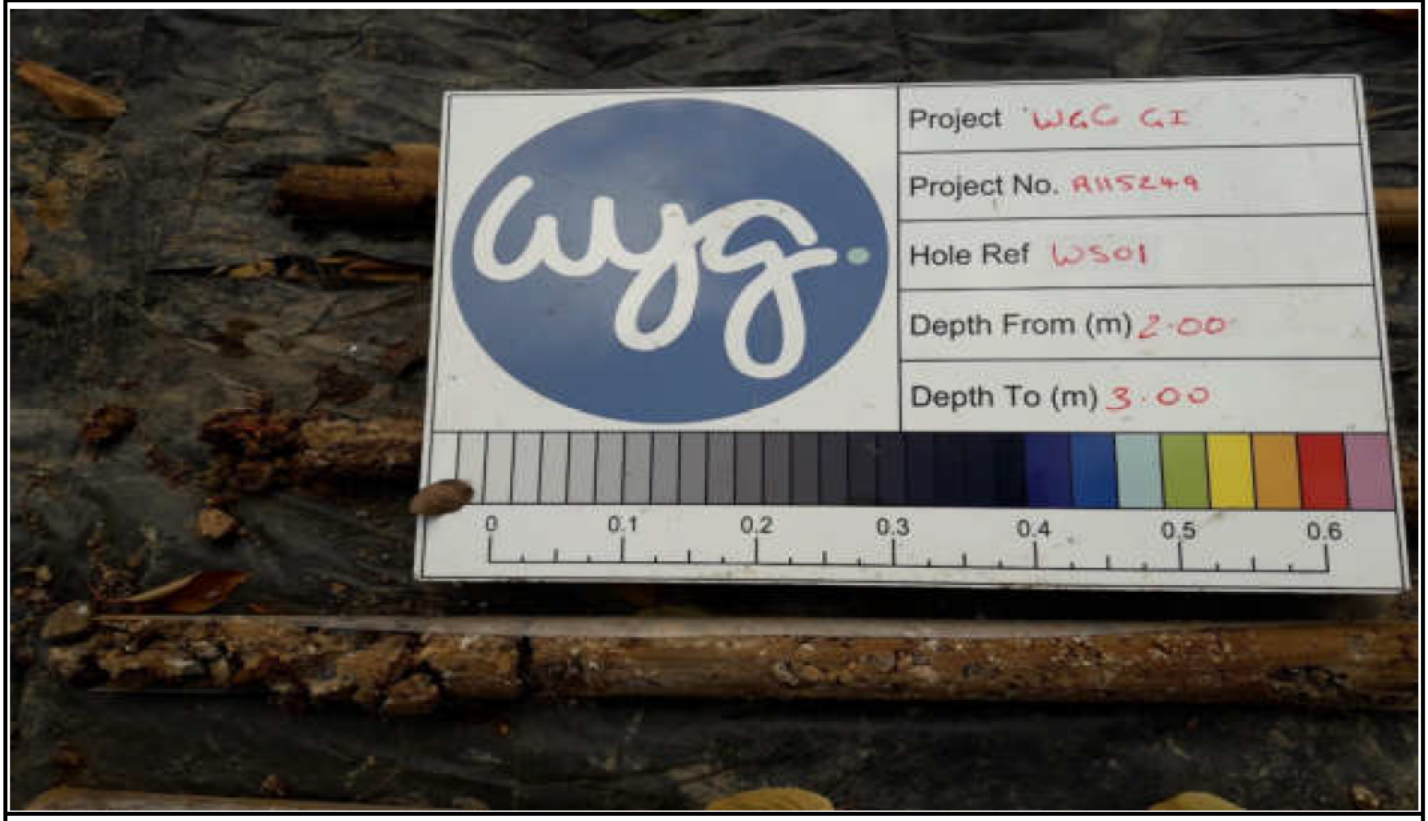


Plate 4 WS01 - 2.00 to 3.00 m bgl

WYG Environment
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One Angel Court,
London
EC2R 7HJ

Tel: 020 7250 7500

Environmental Consultancy
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Project :-
Welwyn Garden City Town Centre GI

Client: Welwyn Hatfield Borough Council

Project No.: A115249

Date : November 2019

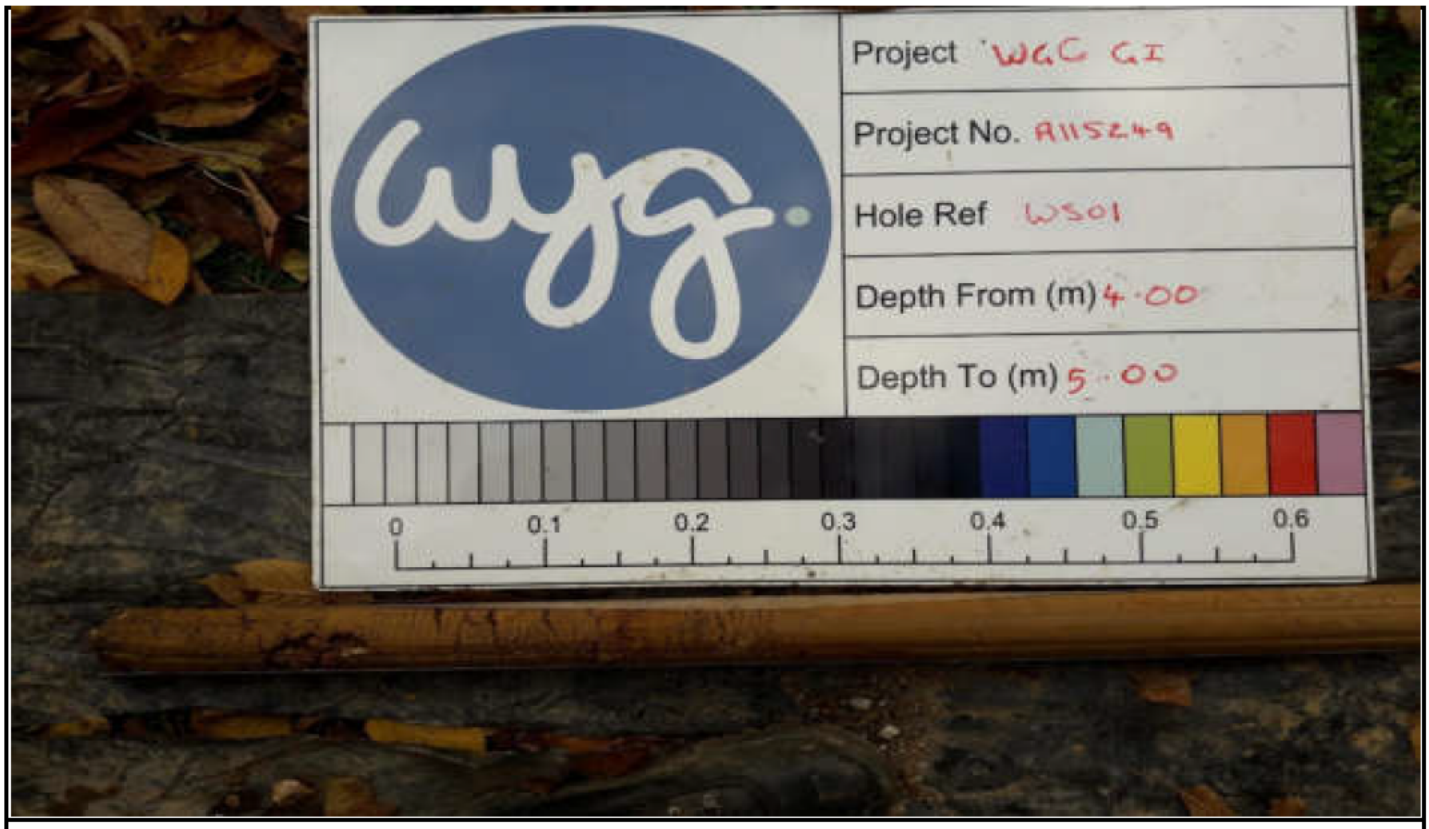

Plate 5 WS01 - 4.00 to 5.00 m bgl

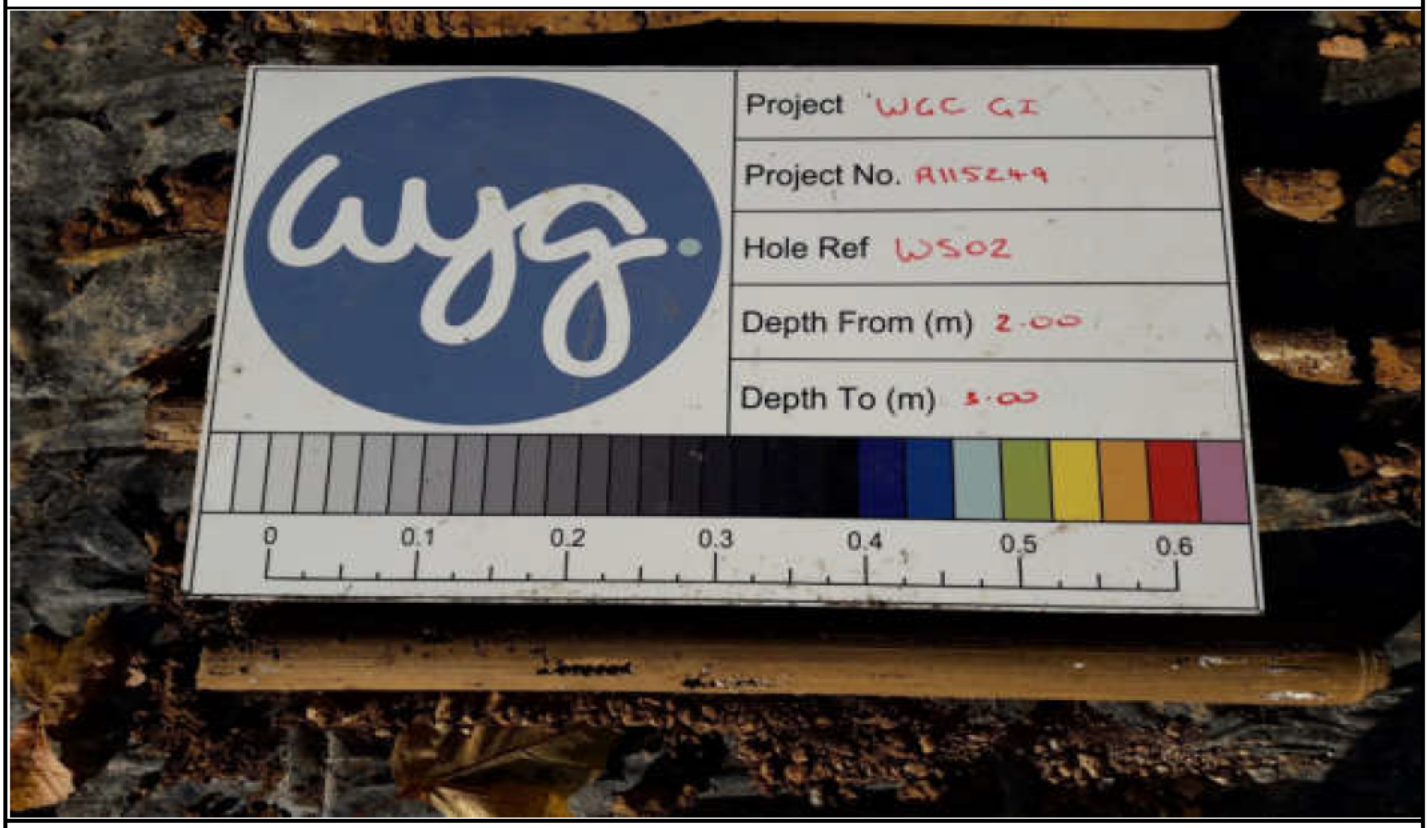

Plate 6 WS02- 2.00 to 3.00m bgl

WYG Environment
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London
EC2R 7HJ

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Client: Welwyn Hatfield Borough Council

Project No.: A115249

Date : November 2019

Plate 7 WS01- Reinstated

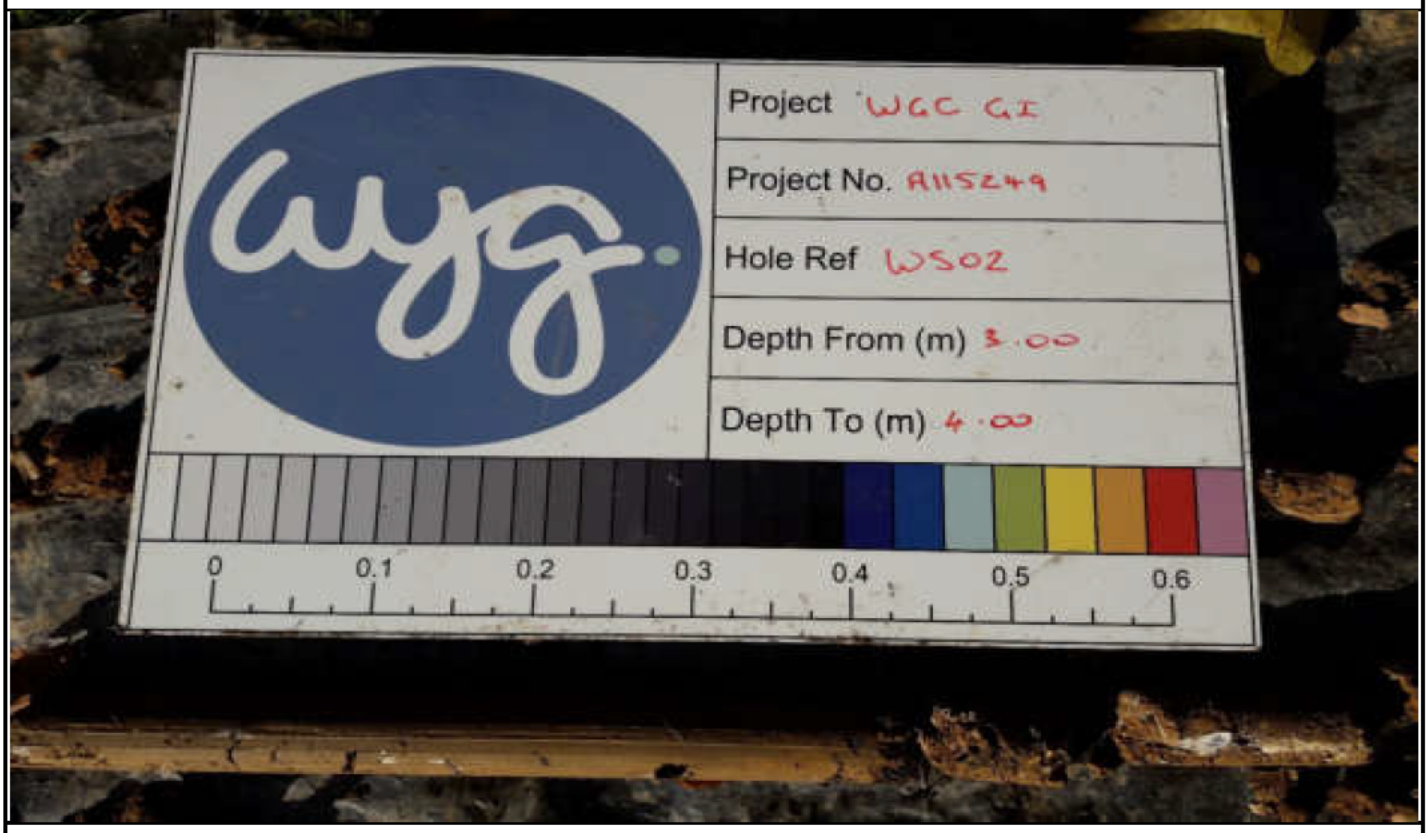

Plate 8 WS02 -3.00 to 4.00m bgl

WYG Environment
11th Floor,
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London
EC2R 7HJ

Tel: 020 7250 7500

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Welwyn Garden City Town Centre GI

Client: Welwyn Hatfield Borough Council

Project No.: A115249

Date : November 2019

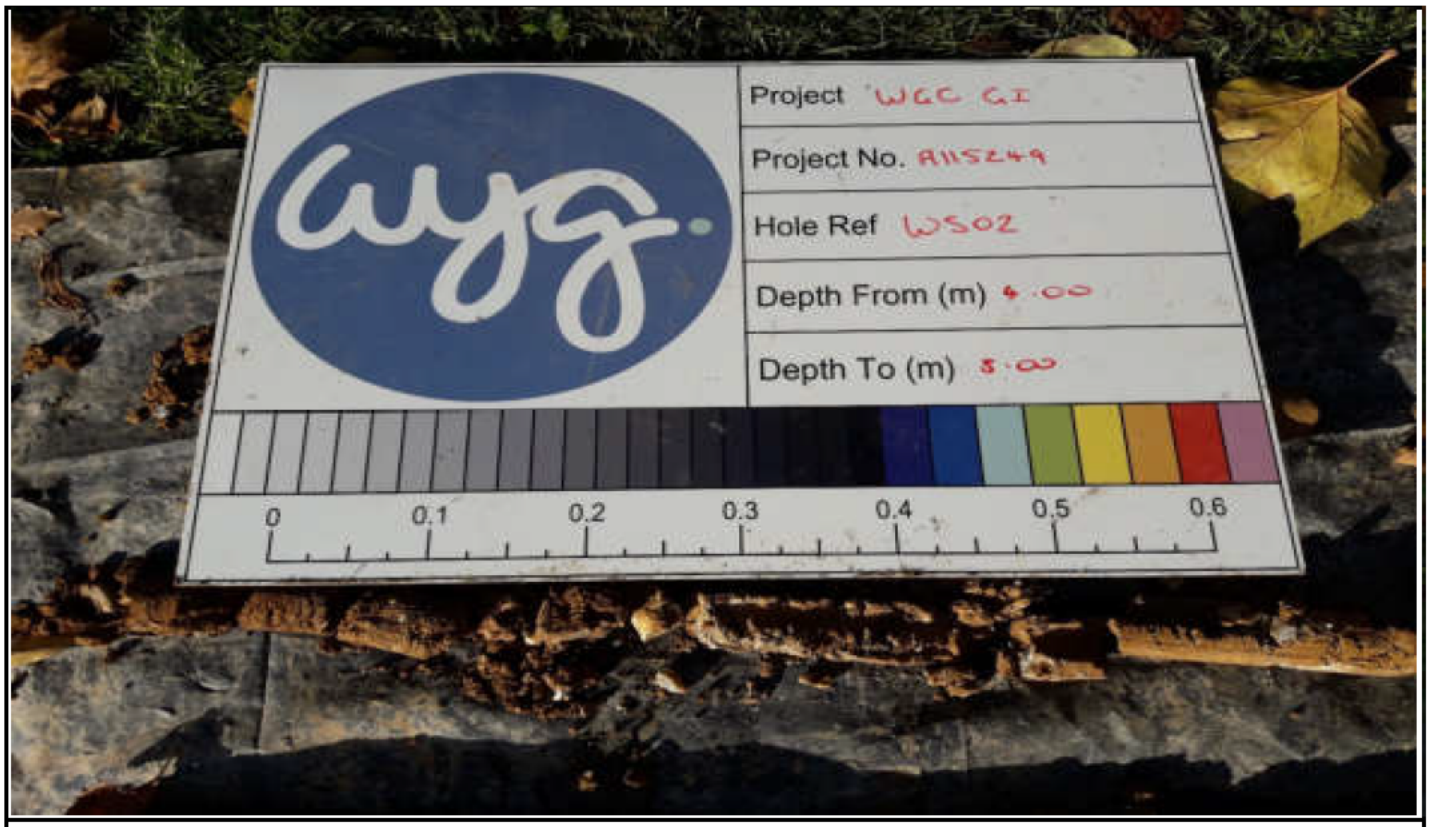

Plate 9 WS02 - 4.00 to 5.00m bgl

Plate 10 WS02 - 5.00 to 6.00m bgl

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Project No.: A115249

Date : November 2019

Plate 11 WS03 - 1.00 to 3.00m bgl

Plate 12 WS03 - 3.00 to 4.00m bgl

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EC2R 7HJ

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Environmental Consultancy
Ground Technologies & Investigation

Project :-
Welwyn Garden City Town Centre GI

Client: Welwyn Hatfield Borough Council

Project No.: A115249

Date : November 2019

Plate 13

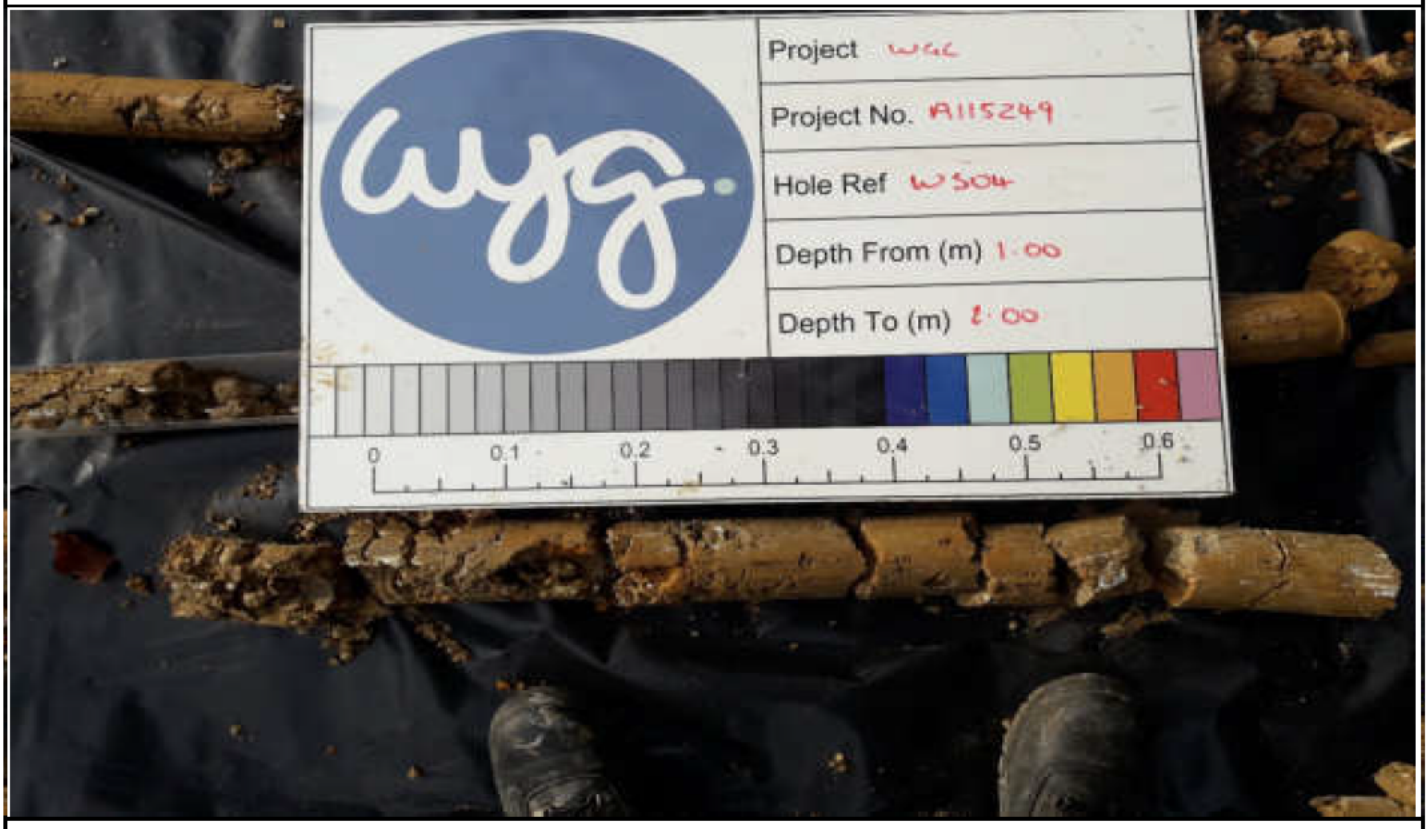

Plate 14 WS04 - 1.00 to 2.00m bgl

WYG Environment
11th Floor,
One Angel Court,
London
EC2R 7HJ

Tel: 020 7250 7500

Environmental Consultancy
Ground Technologies & Investigation

Project :-
Welwyn Garden City Town Centre GI

Client: Welwyn Hatfield Borough Council

Project No.: A115249

Date : November 2019

Plate 15 WS04 - 2.00 to 3.00m bgl

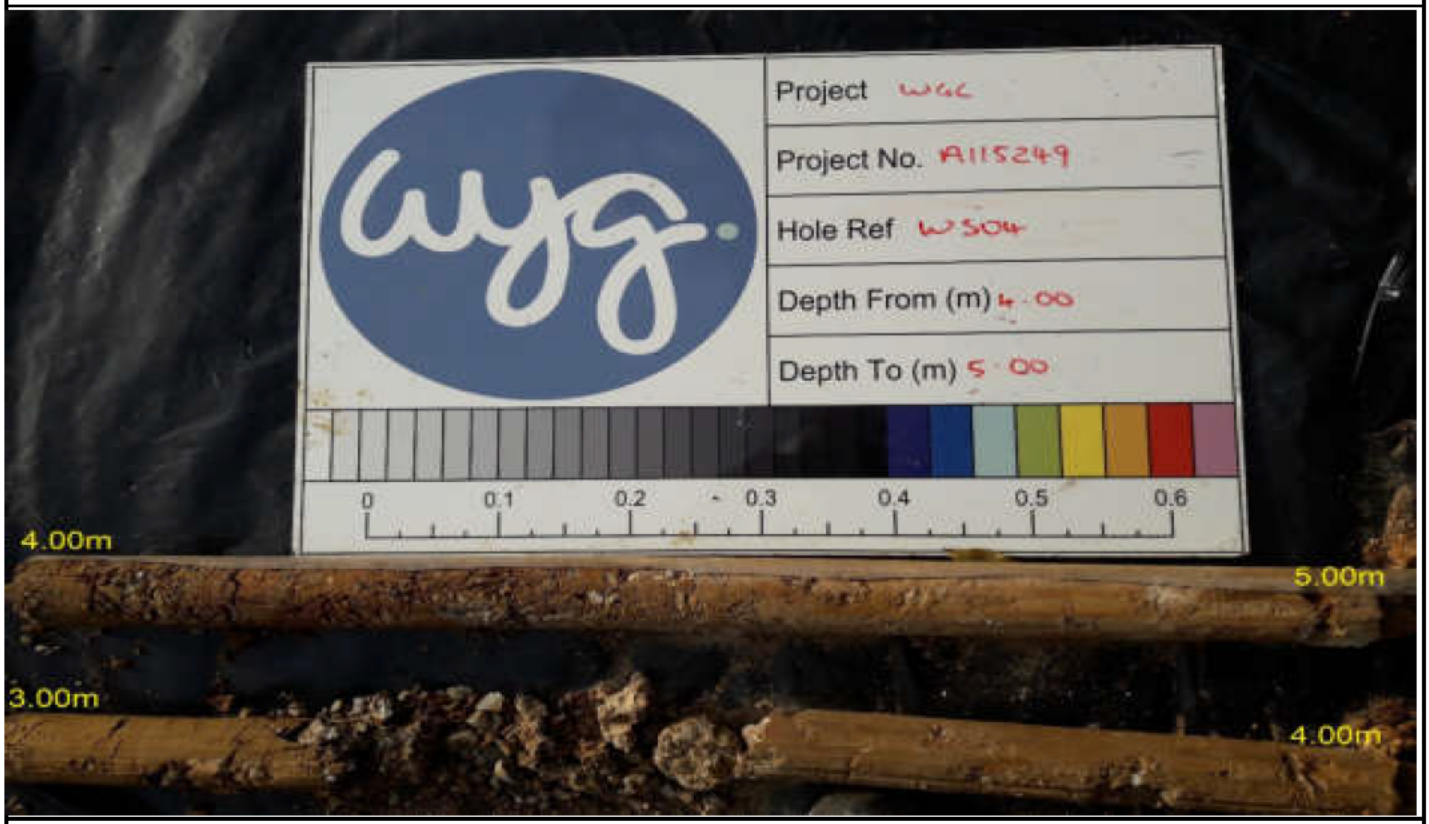

Plate 16 WS04 - 3.00 to 5.00m bgl

Project :-
Welwyn Garden City Town Centre GI

Client: Welwyn Hatfield Borough Council

Environmental Consultancy
Ground Technologies & Investigation

Project No.: A115249

Date : November 2019