

Site Details:

RECTORY LANE, RADCLIFFE,
M26 2QU

Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: County Series

Map date: 1929

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1929
Revised 1929
Edition N/A
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Site Details:

RECTORY LANE, RADCLIFFE,
M26 2QU

Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: County Series

Map date: 1937

Scale: 1:2,500

Printed at: 1:2,500



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Site Details:

RECTORY LANE, RADCLIFFE,
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Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

Map date: 1956

Scale: 1:1,250

Printed at: 1:2,000



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Surveyed 1956
Revised 1956
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Surveyed 1956
Revised 1956
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Levelled 1927

Surveyed 1956
Revised 1956
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Levelled 1927

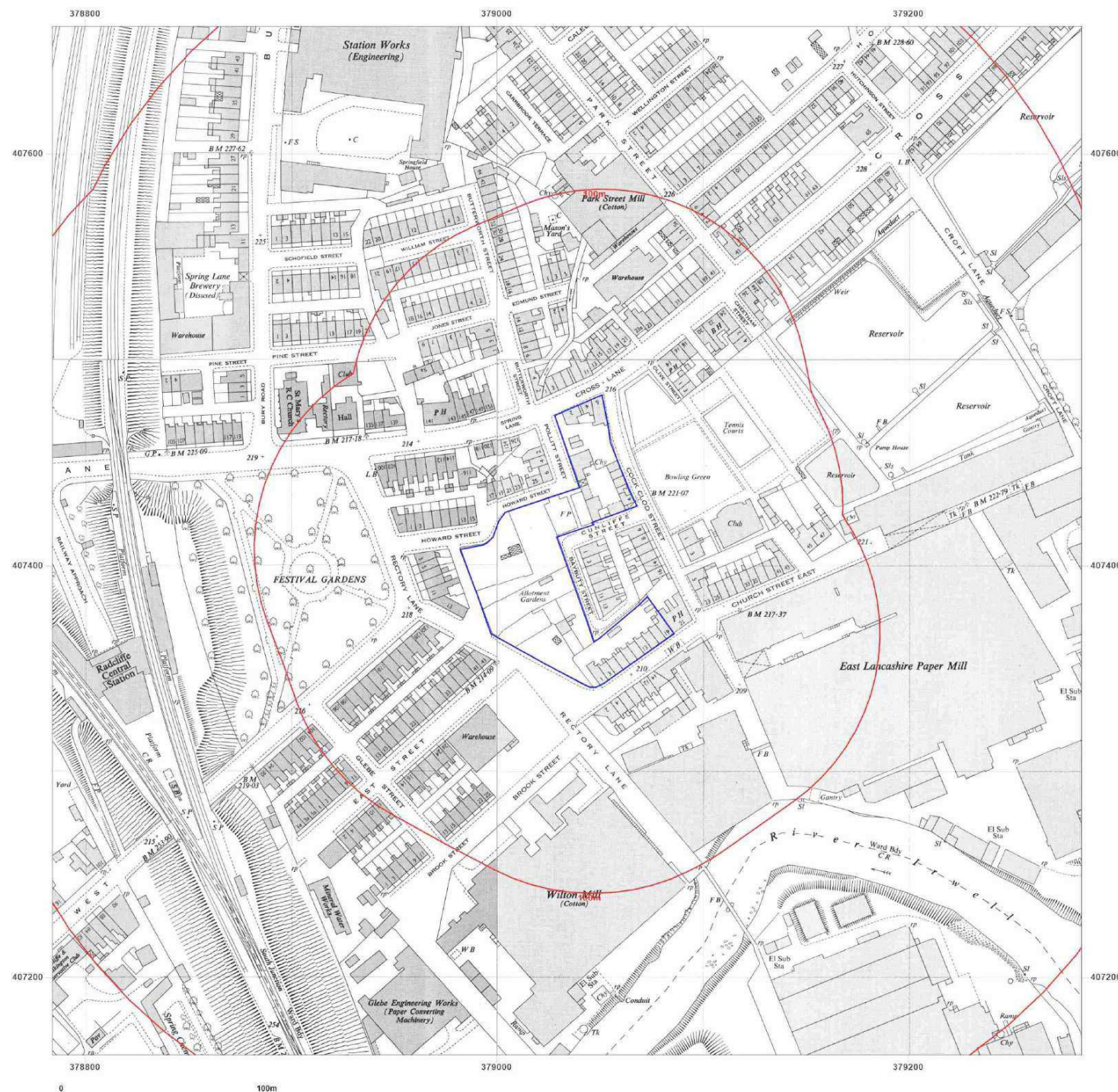


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Site Details:

RECTORY LANE, RADCLIFFE,
M26 2QU

Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

Map date: 1956

Scale: 1:2,500

Printed at: 1:2,500



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Site Details:

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M26 2QU

Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

Map date: 1957

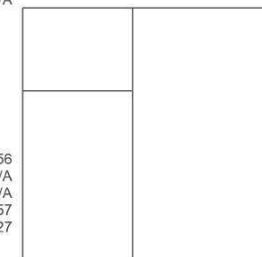
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Surveyed 1956
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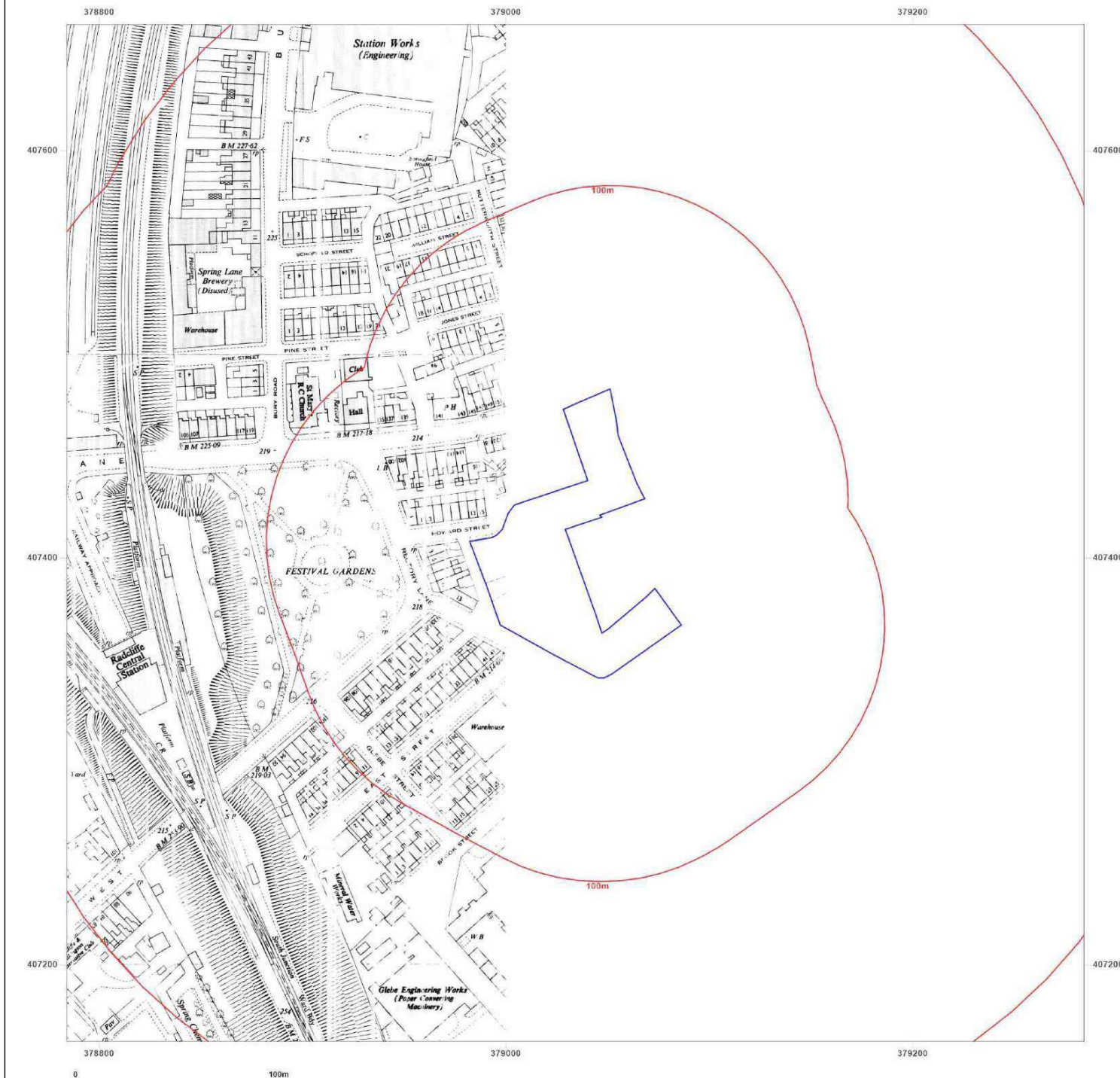


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Site Details:

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Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

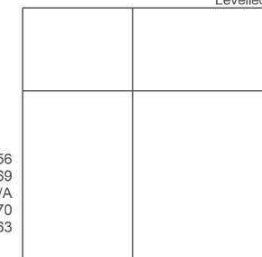
Map date: 1966-1970

Scale: 1:1,250

Printed at: 1:2,000



Surveyed 1956
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Edition N/A
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Levelled 1962



Surveyed 1956
Revised 1969
Edition N/A
Copyright 1970
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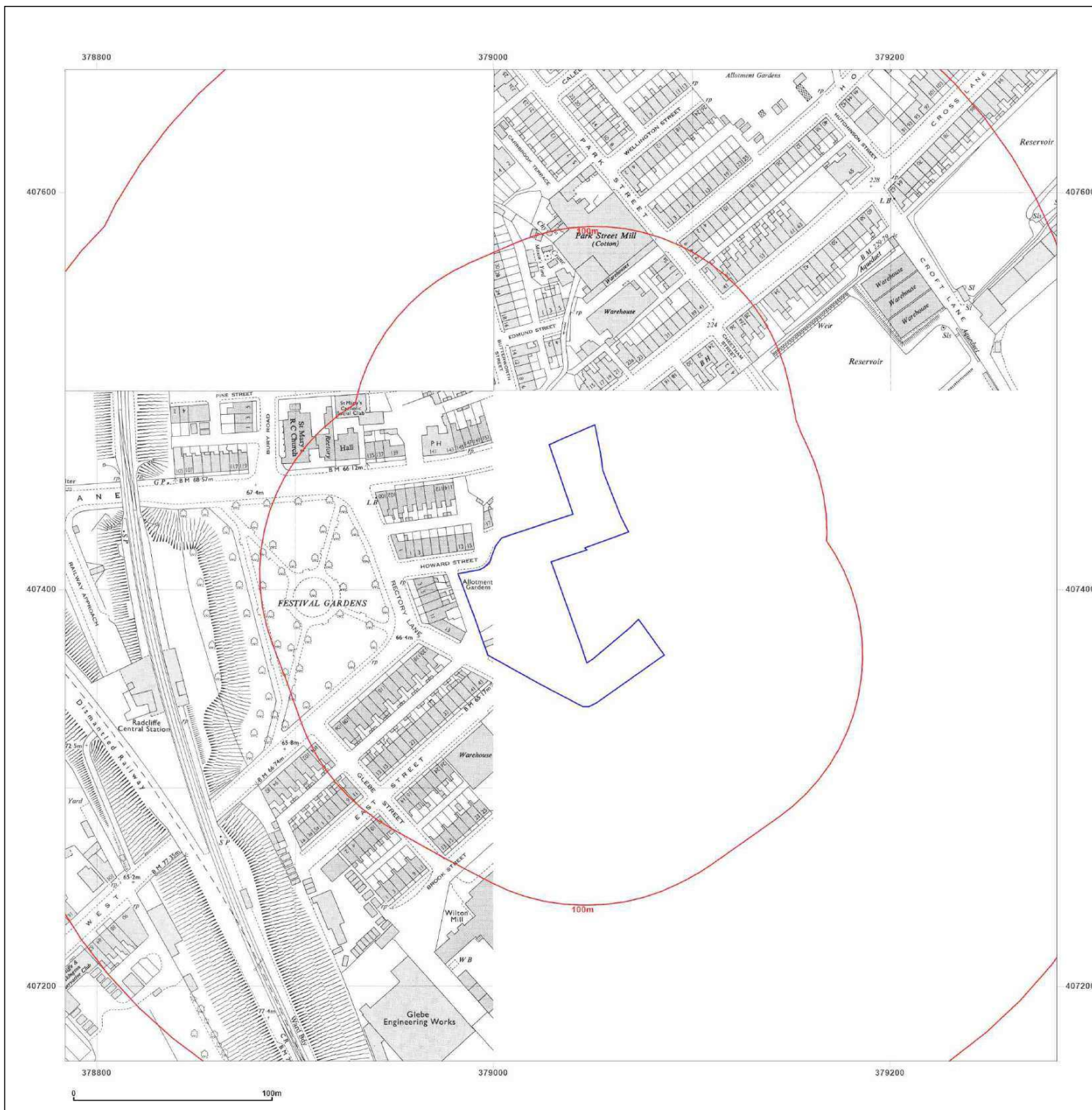


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Site Details:

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Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

Map date: 1976-1978

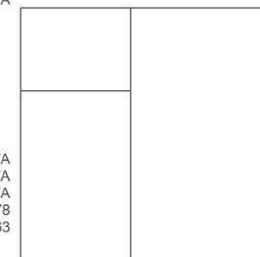
Scale: 1:1,250

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Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

Map date: 1984-1988

Scale: 1:1,250

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Surveyed 1963
Revised 1988
Edition N/A
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Revised 1984
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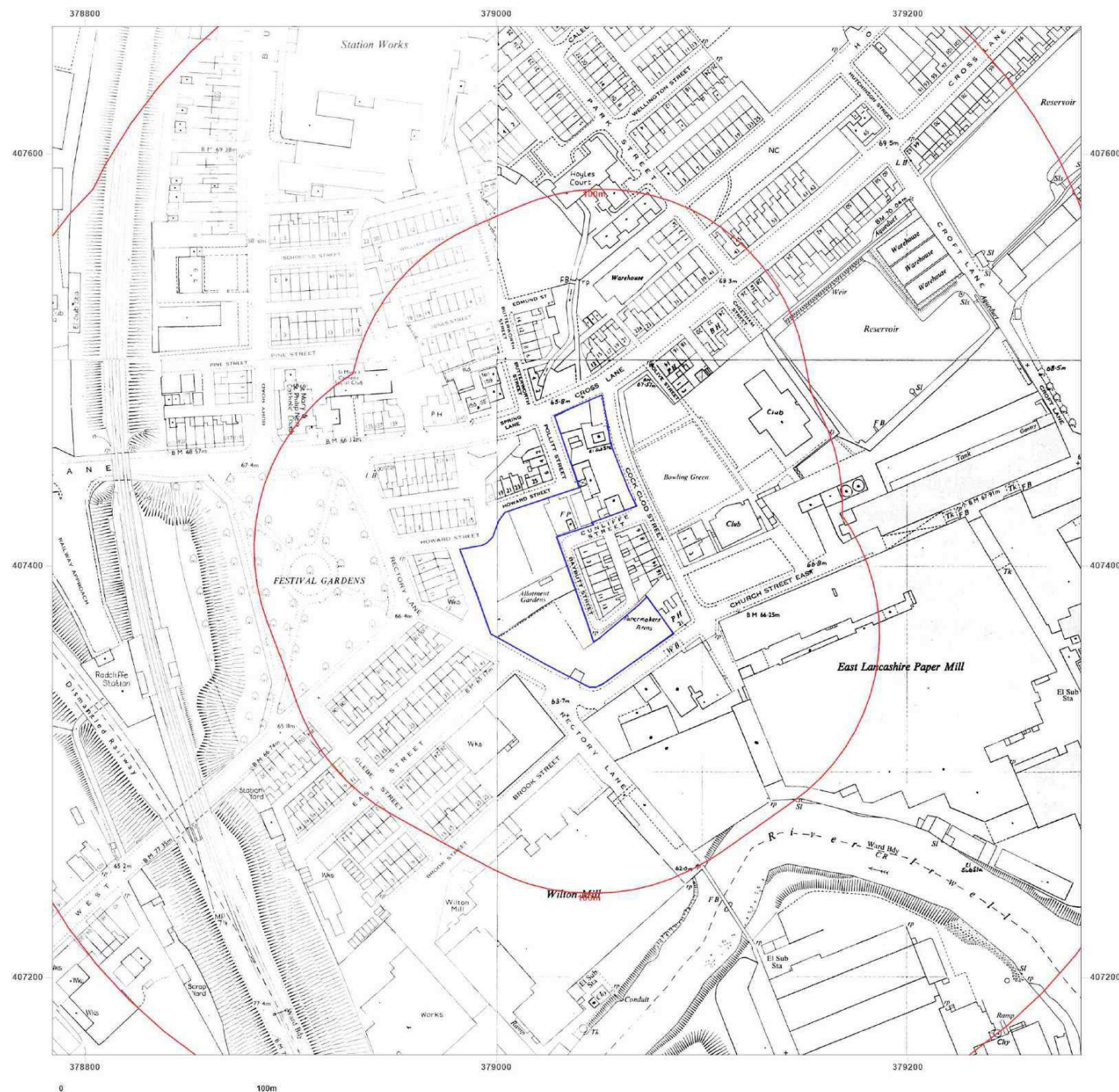


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Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

Map date: 1987-1992

Scale: 1:1,250

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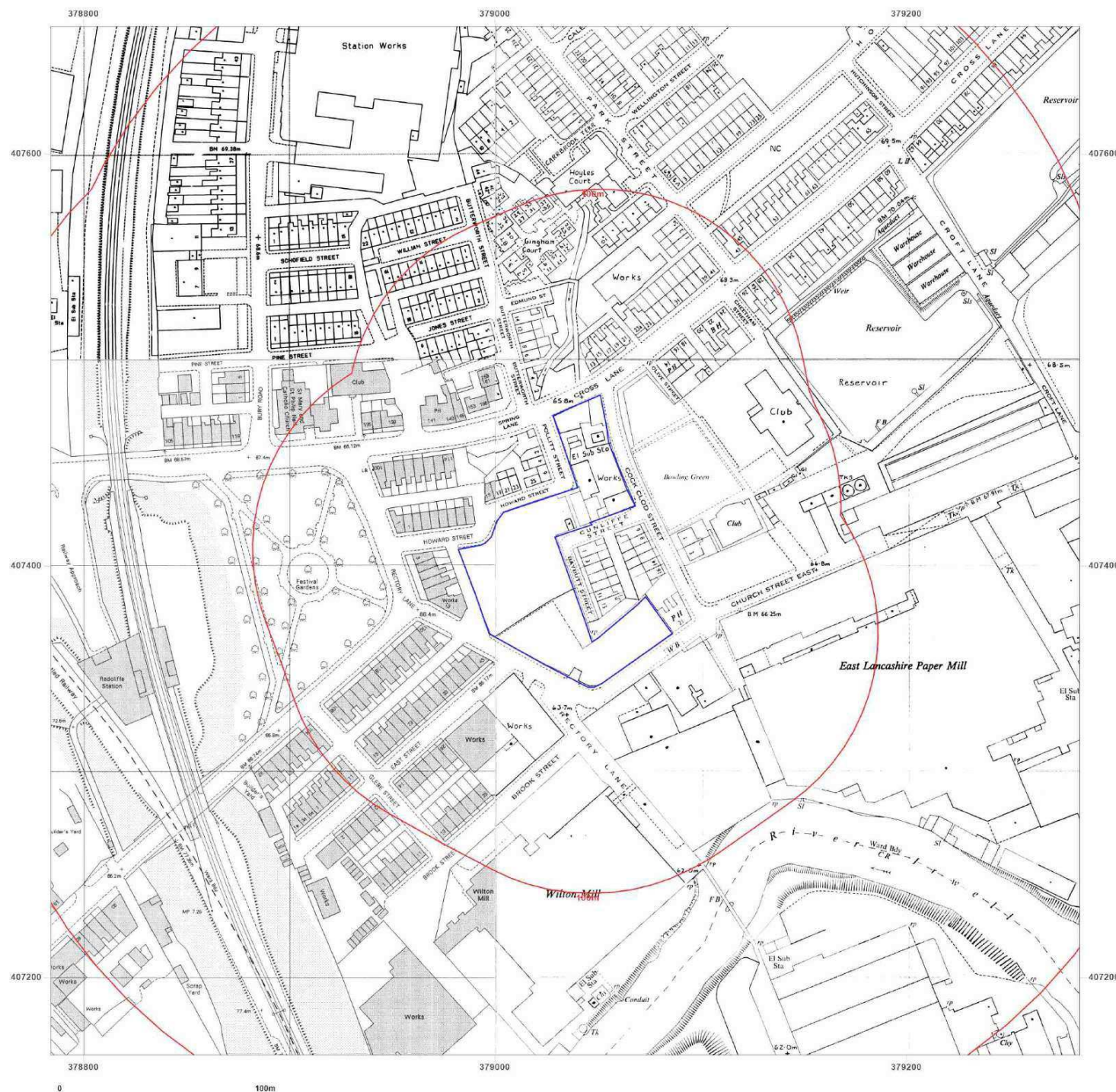


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Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

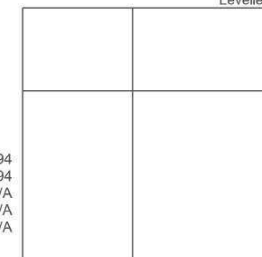
Map date: 1994

Scale: 1:1,250

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Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

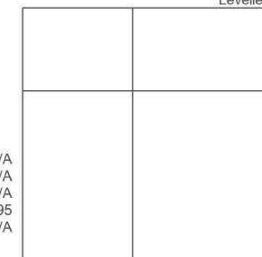
Map date: 1995

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Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

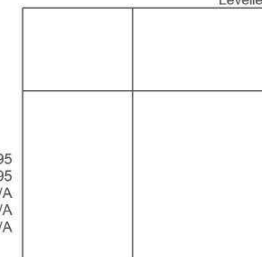
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M26 2QU

Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

Map date: 1992-1995

Scale: 1:1,250

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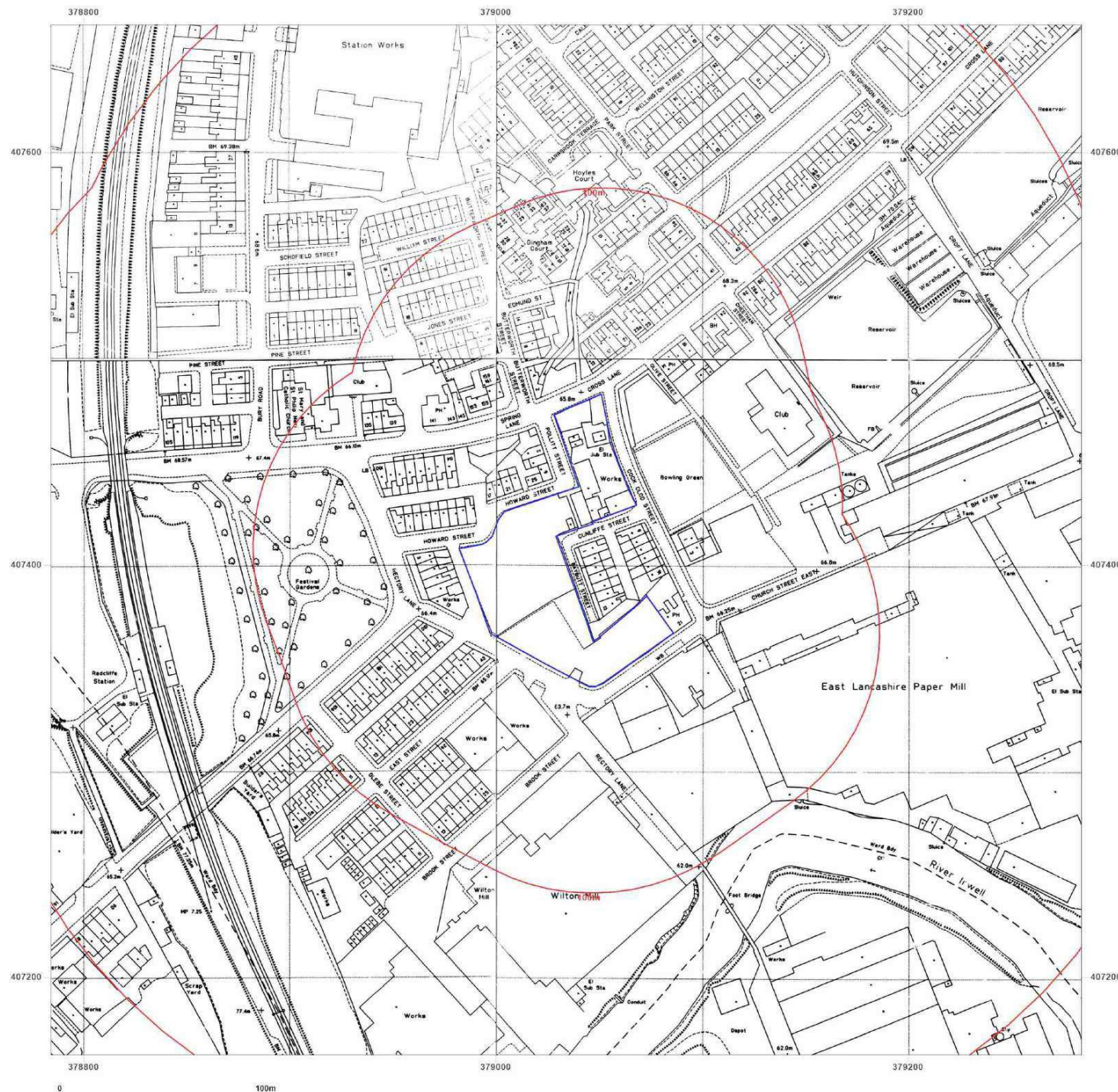


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Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: National Grid

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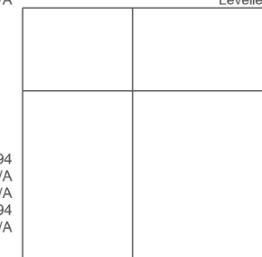
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M26 2QU

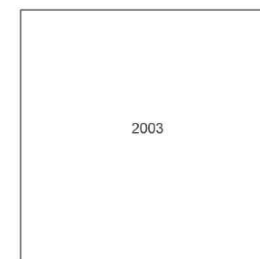
Client Ref: NX418
Report Ref: GS-7611303
Grid Ref: 379034, 407412

Map Name: LandLine

Map date: 2003

Scale: 1:1,250

Printed at: 1:1,250



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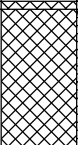
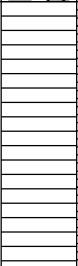
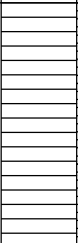


Appendix D - Exploratory Hole Logs

NX Consulting

ROTARY OPEN HOLE BOREHOLE LOG

Project East Lancashire Paper Mill Island				BOREHOLE No RBH01	
Job No NX418	Date 26-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet	1 of 3

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)		
						0.10 (1.70) 1.80	MADE GROUND: Grass/Topsoil (Drillers Description). MADE GROUND: Brick and Concrete (Drillers Description).	
						(1.20) 3.00	Light brown sand and gravel (Drillers Description).	
						(5.70) 8.70	Dark brown boulder clay (Drillers Description).	
						(3.30) 12.00	Grey/purple mudstone (Drillers Description).	
							Red/brown mudstone (Drillers Description).	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
26-04-21	00.00		6.00	200mm							No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No ground gas recorded at drill head.
All dimensions in metres Scale 1:93.75			Client Great Places Housing Group			Method/ Plant Used Commachio			Logged By DT		

AGS3 UK BH NX418 RECTORY LANE, RADCLIFFE.GPJ AGS 3 1.GDT 20/5/21

NX Consulting ROTARY OPEN HOLE BOREHOLE LOG

Project East Lancashire Paper Mill Island				BOREHOLE No RBH01	
Job No NX418	Date 26-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet	2 of 3

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						(9.20)	Red/brown mudstone (Drillers Description). <i>(continued)</i>		
						21.20			
						(4.30)	Light grey siltstone with occasional red bands (Drillers Description).		
						25.50			
						(3.50)	Dark grey siltstone (Drillers Description).		
						29.00			
							Dark grey siltstone with light grey sandstone bands (Drillers Description).		

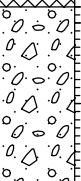
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No ground gas recorded at drill head.
All dimensions in metres Scale 1:93.75			Client Great Places Housing Group			Method/ Plant Used Commachio			Logged By DT		

AGS3 UK BH NX418 RECTORY LANE, RADCLIFFE GPJ AGS 3 1.GDT 20/5/21

[illegible]

AGS3 UK BH NX418 RECTORY LANE, RADCLIFFE.GPJ AGS 3 1.GDT 20/5/21

Project East Lancashire Paper Mill Island				BOREHOLE No RBH02	
Job No NX418	Date 27-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet	1 of 3

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	
						(0.80) 0.80	MADE GROUND: Black/brown fine to coarse slightly organic ashy sand with some fine to coarse subangular to angular gravel of brick, timber, concrete, stone, clinker and ash. Occasional plastic sheets/bags.	
						(2.20) 3.00	Light brown sand and gravel (Drillers Description).	
						(2.80) 5.80	Dark brown boulder clay (Drillers Description).	
						(0.90) 6.70	Very shaley intact coal seam (Drillers Description).	
							Interbedded light grey siltstone and sandstone with occasional dark grey shaley bands (Drillers Description).	

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
27-04-21	00.00		6.00	200mm							No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No ground gas recorded at drill head.
All dimensions in metres Scale 1:93.75			Client Great Places Housing Group			Method/ Plant Used Commachio			Logged By IT		

AGS3 UK BH NX418 RECTORY LANE, RADCLIFFE GPJ AGS 3 1.GDT 20/5/21

Project East Lancashire Paper Mill Island				BOREHOLE No RBH02
Job No NX418	Date 27-04-21	Ground Level (m)	Co-Ordinates ()	
Contractor Taylor Drilling Services Ltd				Sheet 2 of 3

[illegible]

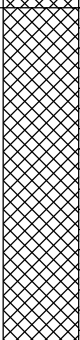
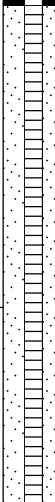
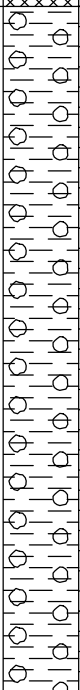
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No ground gas recorded at drill head.
All dimensions in metres Scale 1:93.75		Client	Great Places Housing Group			Method/ Plant Used	Commachio				Logged By IT

GS3 UK BH NX418 RECTORY LANE, RADCLIFFE.GPJ AGS 3 1.GDT 20/5/21

[illegible]

AGS3 UK BH NX418 RECTORY LANE, RADCLIFFE.GPJ AGS 3 1.GDT 20/5/21

Project East Lancashire Paper Mill Island				BOREHOLE No WS1	
Job No NX418	Date 26-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet	1 of 1

SAMPLES & TESTS			STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.40 0.50	CBR ES	5%				0.10	MADE GROUND: Black/brown fine to coarse slightly organic rooty sand with subrounded to subangular gravel of mixed lithology.		
				0.30		MADE GROUND: Light brown fine to coarse ashy sand with subangular to subrounded gravel and cobbles of brick, sandstone, slate, clinker and timber.			
1.00	SPT	9				(1.70)	MADE GROUND: Dark brown/red fine to coarse sand with some gravel and cobbles of subangular brick, clinker, ash, coal, sandstone and slate. Some subangular brick cobbles.		
1.50	ES								
2.00	SPT	13							
2.50 2.60	ES SV	40KPa				(3.45)	Firm to stiff, locally stiff, brown mottled yellow brown silty sandy CLAY with occasional fine gravel of coal, sandstone and mudstone and occasional subangular to subrounded cobbles of sandstone and mudstone.		
3.00-4.00 3.00	BULK SPT	12							
3.50	SV	54KPa							
4.00	SPT	21							
5.00 5.00	SPT SV	43 54KPa							
						5.45	5.00 ...Becoming very stiff.		
							...Borehole ended at 5.45m		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No groundwater recorded at end of drilling.
All dimensions in metres Scale 1:37.5			Client Great Places Housing Group			Method/ Plant Used Tracked Archway Dart			Logged By RL		

Project East Lancashire Paper Mill Island				BOREHOLE No WS2	
Job No NX418	Date 26-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.30	ES CBR	7%				0.15	MADE GROUND: Black/brown slightly organic sandy gravel of clinker, coal and sandstone		
0.40						(0.35)	MADE GROUND: Brown/ red fine to coarse sand with subangular gravel of coal, clinker, brick and sandstone, and angular brick cobbles.		
0.80	ES	9				0.50	Probable Made Ground: Yellow/brown silty clayey sand and gravel of sandstone, slate and coal.		
1.00	SPT					(1.80)			
2.00	SPT	8				2.30			
2.60	ES	11				(3.15)	Firm to stiff, locally stiff silty sandy CLAY with occasional fine gravel of coal, sandstone and mudstone and occasional subangular to subrounded cobbles of sandstone and mudstone.		
3.00	SPT								
3.50-3.90	BULK SV	54KPa							
3.50									
4.00	SPT	15							
5.00	SPT	14				5.45			
							...Borehole ended at 5.45m		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No groundwater recorded at end of drilling.
All dimensions in metres Scale 1:37.5			Client Great Places Housing Group			Method/ Plant Used Tracked Archway Dart			Logged By RL		

Project East Lancashire Paper Mill Island				BOREHOLE No WS3	
Job No NX418	Date 26-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.50	ES	15			0.10	MADE GROUND: Concrete Slab			
					(0.60)	MADE GROUND: Black/brown fine to coarse sand with much subangular gravel of coal, clinker, brick and sandstone.			
					0.70				
1.00	ES	15			(0.70)	Probable Made Ground: Yellow/brown silty clayey sand and fine to coarse angular to subrounded gravel of sandstone, mudstone and coal.			
1.00	SPT				1.40				
1.80	ES	12				Firm to stiff, locally firm, brown silty sandy CLAY with occasional fine gravel of coal, sandstone and mudstone and occasional subangular to subrounded cobbles of sandstone and mudstone.			
2.00-3.00	BULK								
2.00	SPT								
3.00	SPT	9 54KPa							
3.00	SV				(4.05)				
4.00	SPT	10 60KPa							
4.00	SV								
5.00	SPT	25				5.00 ...Becoming stiff to very stiff.			
					5.45	...Borehole ended at 5.45m			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No groundwater recorded at end of drilling.
All dimensions in metres Scale 1:37.5			Client Great Places Housing Group			Method/ Plant Used Tracked Archway Dart			Logged By RL		

Project East Lancashire Paper Mill Island				BOREHOLE No WS4	
Job No NX418	Date 26-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
0.05	ES					(0.30) 0.30	MADE GROUND: Black/brown fine to coarse slightly organic rooty sand with fine gravel of mixed lithology (TOPSOIL).		
0.40	CBR	7%				(1.00)	MADE GROUND: Black/brown fine to coarse slightly organic sand with much subangular to subrounded gravel of brick, coal, ash, clinker and mixed lithology. Some subangular to subrounded cobbles of mudstone, brick and sandstone.		
1.00 1.00	ES SPT	7				1.30			
1.50	ES					(0.60) 1.90	Soft to firm locally firm to stiff brown silty sandy CLAY with occasional fine subrounded to rounded gravel of coal and mixed lithology. Occasional subrounded cobbles of sandstone and mudstone.		
2.00	SPT	14				(3.55)	Firm to stiff locally stiff brown silty sandy CLAY with occasional fine gravel of coal, sandstone and mudstone and occasional subangular to subrounded cobbles of sandstone and mudstone.		
2.50 2.50	ES SV	60KPa							
3.00	SPT	9							
4.00-5.00 4.00	BULK SPT	8							
5.00	SPT	26				5.45	5.00 ...Becoming stiff to very stiff.		
							...Borehole ended at 5.45		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
26-04-21	00.00				3.97						No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. Groundwater recorded at end of drilling.
All dimensions in metres Scale 1:37.5			Client Great Places Housing Group			Method/ Plant Used Tracked Archway Dart			Logged By RL		

Project East Lancashire Paper Mill Island				BOREHOLE No WS5	
Job No NX418	Date 27-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet	1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.05	ES					(0.30) 0.30	MADE GROUND: Black/brown fine to coarse slightly organic rooty sand with fine subangular gravel of ash, brick and mixed lithology (TOPSOIL).		
0.40 0.50	CBR ES	15%				(0.70) 0.90	MADE GROUND: Black fine to coarse slightly organic ashy sand with some subrounded to subangular gravel of mixed lithology and subrounded cobbles of mixed lithology. 0.40 - 1.00 ...thick (800mm) roots from nearby tree ...angular brick cobble		
1.00 1.10	SPT ES	6				(0.40) 1.40	Loose yellow/brown fine to coarse sand with some subangular gravel of mixed lithology. Occasional subrounded cobbles of mixed lithology.		
1.60	ES					(0.60) 2.00	Firm to stiff light brown sandy CLAY with some fine subangular gravel of coal and mixed lithology		
2.00-3.00 2.00	BULK SPT	10				2.10 (0.80) 2.90	Medium dense light brown clayey SAND with fine subangular gravel of coal and mixed lithology Medium dense orange/brown fine to coarse SAND		
3.00	SPT	7				(1.10) 4.00	Firm locally soft to firm light brown wet sandy CLAY with fine subangular gravel of coal and mixed lithology.		
4.00	SPT	33				(0.45) 4.45	Dense red/brown silty sandy subrounded gravel of mudstone.		
							...Refusal at 4.45m. Possible bedrock.		

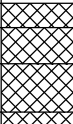
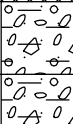
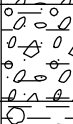
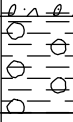
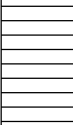
Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
27-04-21	00.00				1.94						No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. Groundwater recorded at 1.94mbgl at end of drilling.
All dimensions in metres Scale 1:31.25			Client Great Places Housing Group			Method/ Plant Used Tracked Archway Dart			Logged By RL		

Project East Lancashire Paper Mill Island				BOREHOLE No WS6	
Job No NX418	Date 27-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.40 0.40	CBR ES	3%				0.10 (0.30) 0.40	MADE GROUND: Black/brown fine to coarse slightly organic rooty sand with fine gravel of mixed lithology (TOPSOIL).		
						(0.40) 0.80	MADE GROUND: Brown/black fine to coarse slightly organic sand with fine subangular gravel of limestone and mixed lithology. Some angular cobbles of limestone.		
0.80	ES					1.00	MADE GROUND: Black fine to coarse slightly ashy sand with angular gravel of coal, clinker, brick, tiles and glass. Occasional angular brick cobbles.		
1.00	SPT	8				(0.30) 1.30	MADE GROUND: Brown fine to coarse sand with some fine subangular gravel of ash, clinker, coal and other mixed lithology		
1.20	ES					(0.70) 2.00	Loose yellow/brown silty clayey SAND and GRAVEL of sandstone, mudstone and coal. Firm to stiff light brown silty CLAY with subangular to subrounded gravel of coal and mixed lithology and subrounded to subangular cobbles of sandstone and slate.		
2.00 2.00	SPT SV	10 54KPa				(0.40) 2.40	Firm to stiff light brown sandy CLAY with occasional subangular gravel of mixed lithology		
3.00-4.00 3.00	BULK SPT	12				(1.20) 3.60	Medium dense light brown clayey fine to coarse SAND with fine some subangular gravel of mixed lithology.		
						(0.40) 4.00	Firm light brown sandy CLAY with some fine angular gravel. Occasional subrounded cobbles of mixed lithology.		
4.00	SPT	16				(1.00) 5.00	Medium dense light brown fine to coarse SAND with fine gravel of mixed lithology		
5.00	SPT	36				(0.45) 5.45	Mudstone in SPT sample. Possible bedrock at 5.0m		
							...Borehole ended at 5.45m		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No groundwater recorded at end of drilling.
All dimensions in metres Scale 1:37.5			Client Great Places Housing Group			Method/ Plant Used Tracked Archway Dart			Logged By RL		

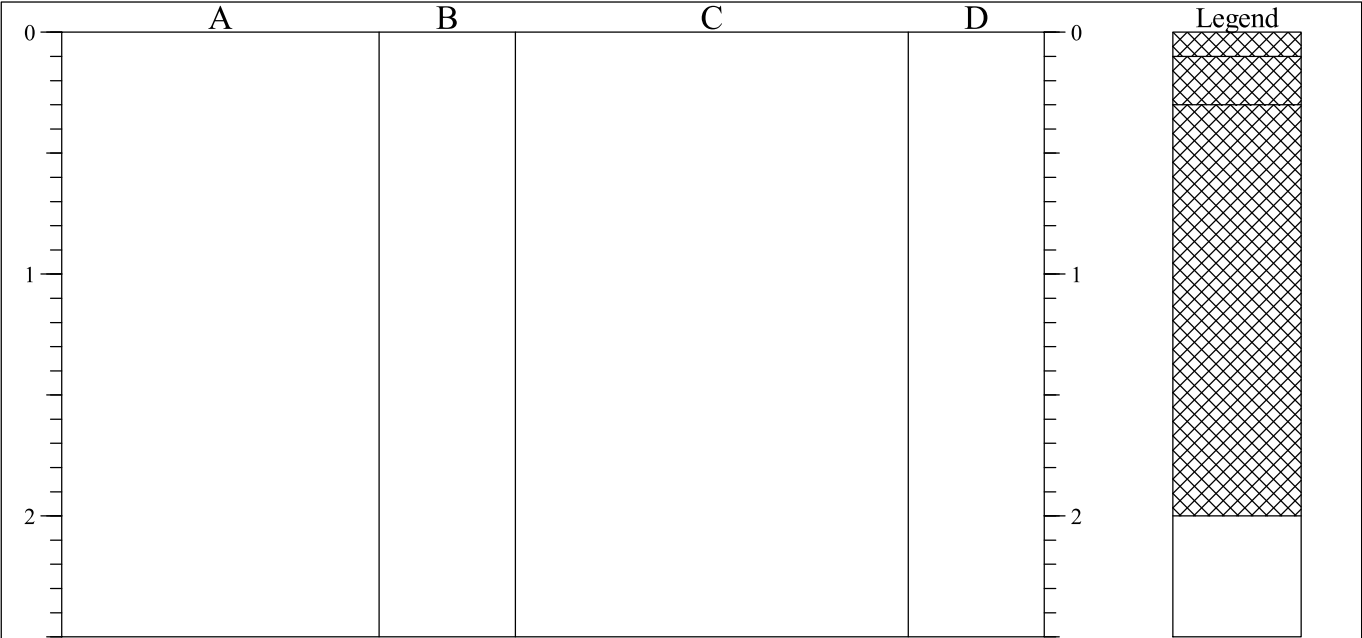
Project East Lancashire Paper Mill Island				BOREHOLE No WS7	
Job No NX418	Date 27-04-21	Ground Level (m)	Co-Ordinates ()		
Contractor Taylor Drilling Services Ltd				Sheet	1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill	
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION			
0.40 0.50	CBR ES	8%				0.10	MADE GROUND: Tarmacadam.			
						0.25	MADE GROUND: Grey fine to coarse sand with much angular gravel of mixed lithology and sandstone cobbles.			
						0.45	MADE GROUND: Grey fine to coarse sand with some fine to coarse subangular gravel of brick, coal, clinker and mixed lithology, and angular brick cobbles.			
						0.55				
		(0.25) 0.80		MADE GROUND: Concrete						
1.00 1.00	ES SPT	1				(0.30) 1.10	MADE GROUND: Brown/black fine to coarse sand with some fine to coarse subangular gravel of coal, clinker, ash, brick and mixed lithology. Occasional angular cobbles of mixed lithology.			
						1.20	MADE GROUND: Black coarse sand and fine to coarse angular gravel of coal, clinker and brick. Some fine to coarse angular cobbles of brick and mudstone.			
1.50	ES					(1.20)	MADE GROUND: Soft light brown/orange sandy clay with some subangular gravel of coal, brick and mixed lithology.			
							MADE GROUND: Dark grey/black soft silty clay with fine angular gravel of coal and clinker, and occasional subrounded mudstone cobbles			
2.00	SPT	11				2.40				
3.00-4.00 3.00	BULK SPT	19				(0.30) 2.70	Medium dense light grey sandy clayey fine to coarse subrounded GRAVEL of mixed lithology.			
						(0.40) 3.10	Medium dense light brown clayey sand and gravel with occasional subangular sandstone cobbles.			
						(0.40) 3.50	Firm to stiff red/grey clay with some fine to coarse subrounded gravel and cobbles of mixed lithology.			
3.40	SV	36KPa				(1.00) 4.50	Probable mudstone. No recovery in 4-5m due to possible cobble obstruction.			
4.00	SPT	24								
4.50	SPT	50				...Borehole ended at 4.5m				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
27-04-21	00.00				2.08						No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. Groundwater recorded at 2.08mbgl at end of drilling.
All dimensions in metres Scale 1:31.25			Client Great Places Housing Group			Method/ Plant Used Tracked Archway Dart			Logged By RL		

TRIAL PIT LOG

Project East Lancashire Paper Mill Island				TRIAL PIT No TP1
Job No NX418	Date 28-04-21	Ground Level (m)	Co-Ordinates ()	
Contractor TM Plant Hire				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Brown/black fine to coarse silty slightly organic rooty sand (TOPSOIL).	0.05	ES	
0.10-0.30		MADE GROUND: Yellow/brown silty sandy fine to coarse subrounded gravel of sandstone. Some subrounded cobbles of sandstone.			
0.30-2.00		MADE GROUND: Red/brown/grey fine to coarse ashy very sandy gravel and cobbles of subangular brick, slate, concrete, cement, sandstone and other mixed lithology. Occasional angular to subangular boulders of brick. Some relic brick footings (boulders 400mm x 250mm x 250mm in size. Occasional metal keg rings, plastic sheets, timber and glass. Tree roots present in the north face at 0.6mbgl.	0.50	ES	
2.00		...Trialpit ended at 2.0m due to spalling and collapse.			

Shoring/Support: None
Stability: Poor

The diagram shows a rectangular trial pit with dimensions: length A = 1.6m, width B = 0.8m, and depth D. A north arrow points upwards, labeled 'N'.

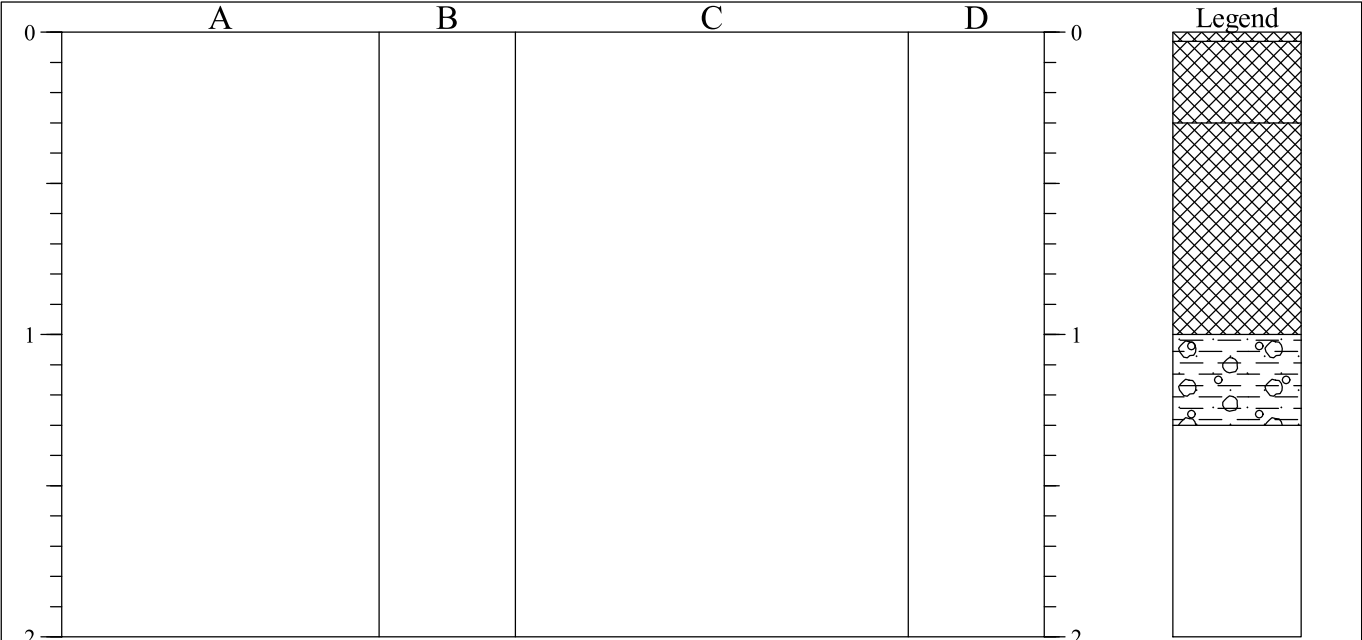
GENERAL REMARKS

No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No groundwater recorded in trial pit.

All dimensions in metres Scale 1:31.25	Client Great Places Housing Group	Method/ Plant Used Mini Excavator	Logged By RL
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TRIAL PIT LOG

Project East Lancashire Paper Mill Island				TRIAL PIT No TP2
Job No NX418	Date 28-04-21	Ground Level (m)	Co-Ordinates ()	
Contractor TM Plant Hire				Sheet 1 of 1



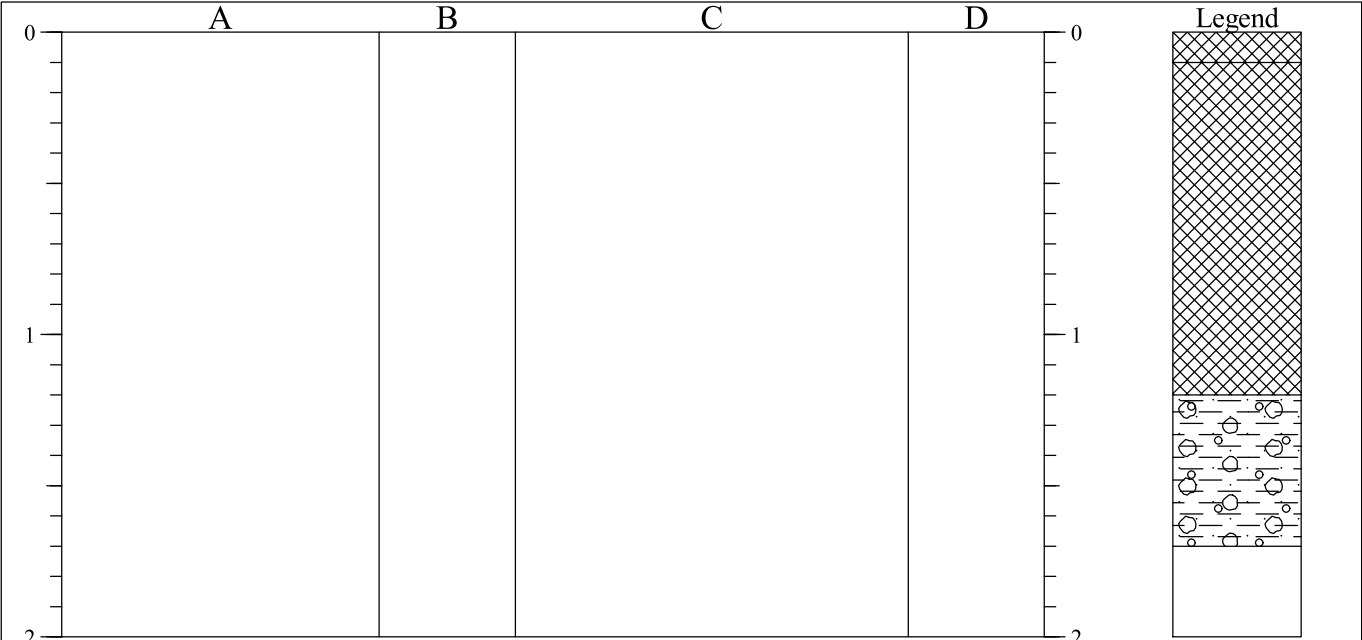
STRATA				SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests	
0.00-0.03		MADE GROUND: Paving slab				
0.03-0.30		MADE GROUND: Yellow/brown fine to coarse sand over compact grey/brown fine to coarse angular gravel of limestone (MOT type 1 gravel).				
0.30-1.00		MADE GROUND: Dark brownish black clayey silty fine to coarse sand with some subangular gravel of brick, coal, clinker, mudstone, bathroom tiles and other mixed lithology. Rare plastic bags and timber.	0.50	ES		
1.00-1.30		Soft to firm, locally firm to stiff, light brownish orange silty sandy CLAY with occasional subangular gravel of coal and other mixed lithology. Occasional subrounded sandstone cobbles.	1.10	BULK		
1.30		...Trial pit ended at 1.3m				

Shoring/Support: None Stability: Good		N	GENERAL REMARKS
			No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No groundwater recorded in trial pit.

All dimensions in metres Scale 1:25	Client Great Places Housing Group	Method/ Plant Used Mini Excavator	Logged By RL
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TRIAL PIT LOG

Project East Lancashire Paper Mill Island				TRIAL PIT No TP3
Job No NX418	Date 28-04-21	Ground Level (m)	Co-Ordinates ()	
Contractor TM Plant Hire				Sheet 1 of 1



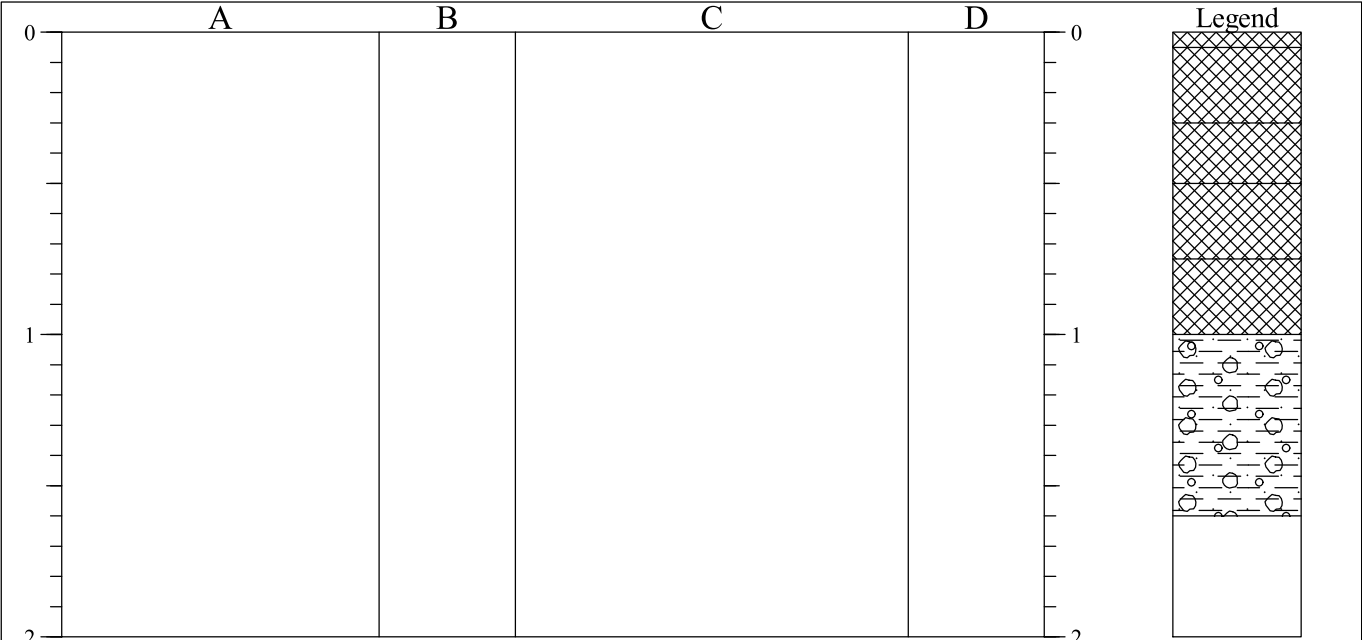
STRATA				SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests	
0.00-0.10		MADE GROUND: Dark brown silty sandy slightly organic rooty sand (TOPSOIL).				
0.10-1.20		MADE GROUND: Brown fine to coarse ashy sand with some subangular gravel of brick, concrete, coal, clinker, sandstone and mudstone. Occasional angular to subangular brick cobbles.	0.50	ES		
1.20-1.70		Firm light brownish orange sandy CLAY with some fine to coarse subangular to subrounded gravel of sandstone, coal and other mixed lithology. Occasional subrounded sandstone cobbles.	1.20	BULK		
1.70		...Trial pit ended at 1.7m				

Shoring/Support: None Stability: Good		1.2 A 0.5 B C D N	GENERAL REMARKS
			No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No groundwater recorded in trial pit.

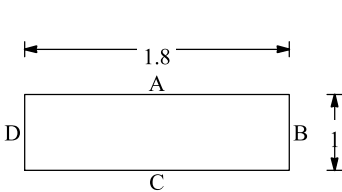
All dimensions in metres Scale 1:25	Client Great Places Housing Group	Method/ Plant Used Mini Excavator	Logged By RL
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TRIAL PIT LOG

Project East Lancashire Paper Mill Island				TRIAL PIT No TP4
Job No NX418	Date 28-04-21	Ground Level (m)	Co-Ordinates ()	
Contractor TM Plant Hire				Sheet 1 of 1



STRATA				SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests	
0.00-0.05		MADE GROUND: Tarmacadam over angular limestone gravel.			ES	
0.05-0.30		MADE GROUND: Yellow/brown/grey fine to coarse sand with much subangular to subrounded sandstone gravel. Occasional subangular to subrounded sandstone cobbles.				
0.30-0.50		MADE GROUND: Grey/red/brown fine to coarse sand with some subangular gravel of brick, coal, clinker, ash and other mixed lithology. Occasional subangular cobbles of brick and concrete.				
0.50-0.75		MADE GROUND: Orange/yellow/brown clayey ashy sand with much fine to coarse subangular to subrounded gravel of mixed lithology. Occasional subrounded cobbles of sandstone.	0.50			
0.75-1.00		MADE GROUND: Grey/red/brown fine to coarse sand with some fine to coarse subangular gravel of brick, coal, clinker and other mixed lithology. Occasional subangular to angular cobbles of brick.				
1.00-1.60		Firm light yellowish brown sandy CLAY with some subangular to subrounded gravel of coal, mudstone and sandstone. Occasional subangular to subrounded cobbles of coal, mudstone and sandstone.			BULK	
1.60		...Trial pit ended at 1.7m	1.50			

Shoring/Support: None Stability: Moderate			GENERAL REMARKS
			No visual or olfactory evidence of solvent and hydrocarbon contamination recorded. No groundwater recorded in trial pit.

All dimensions in metres Scale 1:25	Client Great Places Housing Group	Method/ Plant Used Mini Excavator	Logged By RL
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Appendix E– Geotechnical Laboratory Test Results



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ

Contact: Mark Newton
Site Address: East Lancs Paper

Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 17/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

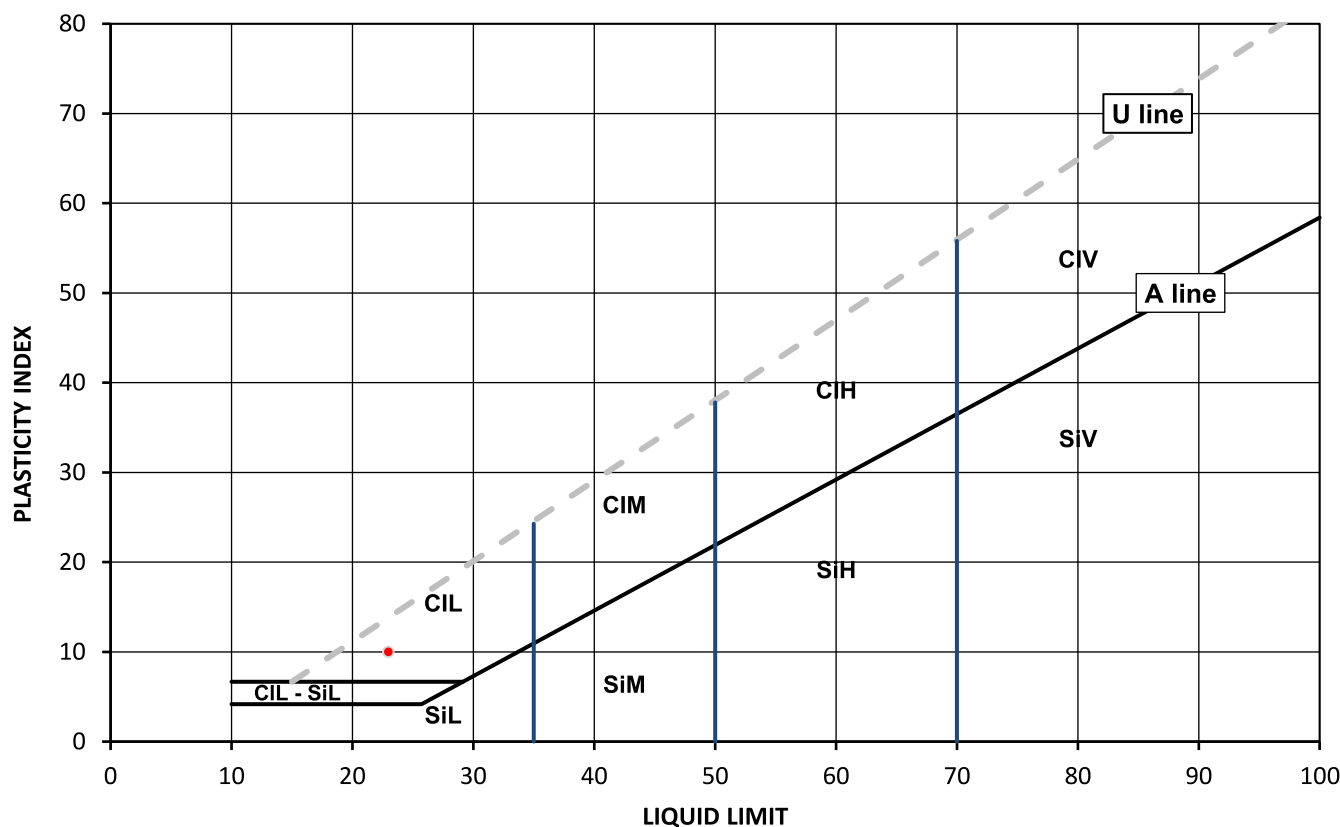
Test Results:

Laboratory Reference: 1862654
Hole No.: WS1
Sample Reference: Not Given
Soil Description: Brown slightly gravelly clayey SAND

Depth Top [m]: 3.00
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
12	23	13	10	91



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Date Reported: 07/06/2021

GF 236.10



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ
Contact: Mark Newton
Site Address: East Lancs Paper

Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 17/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

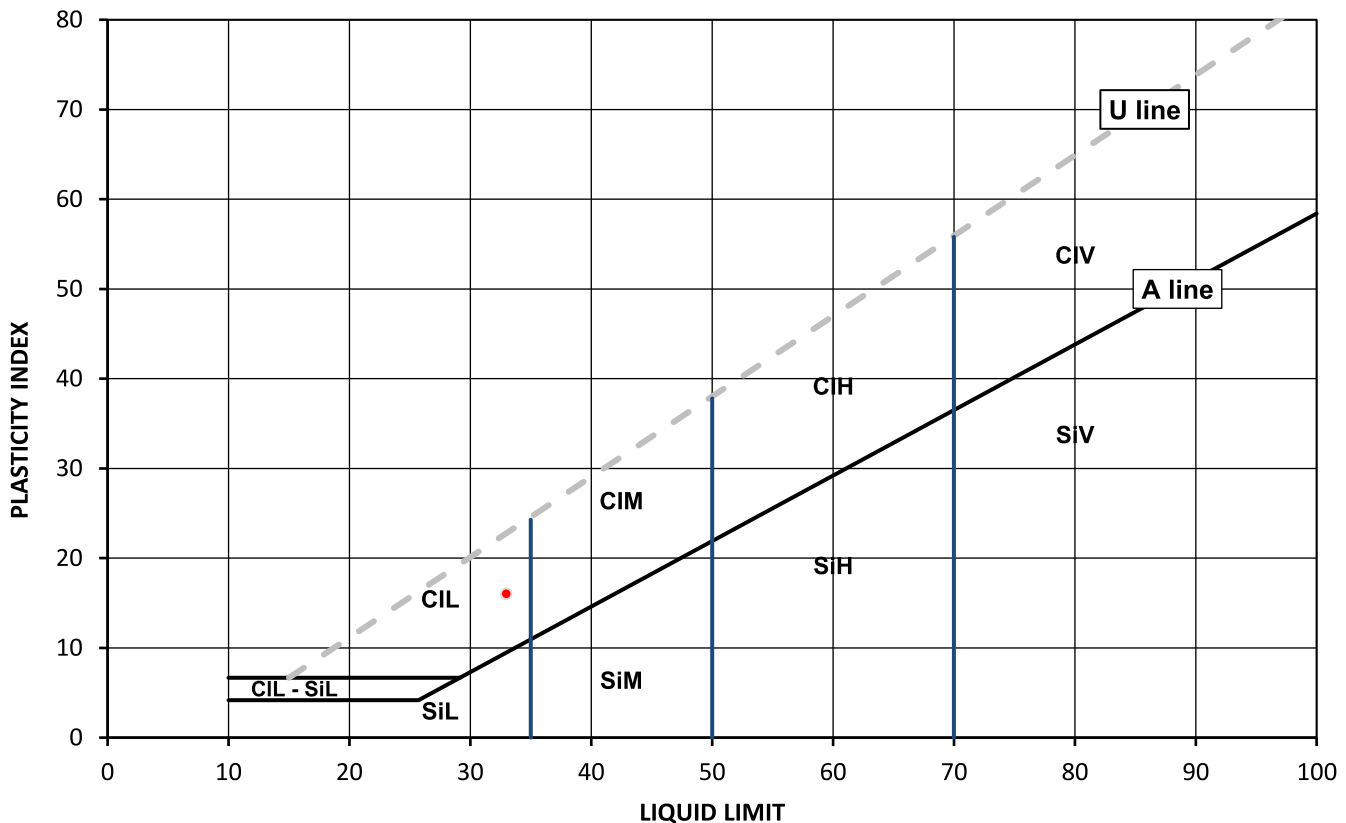
Test Results:

Laboratory Reference: 1862655
Hole No.: WS2
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly very sandy CLAY

Depth Top [m]: 2.70
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	33	17	16	68



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ

Contact: Mark Newton
Site Address: East Lancs Paper

Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 17/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

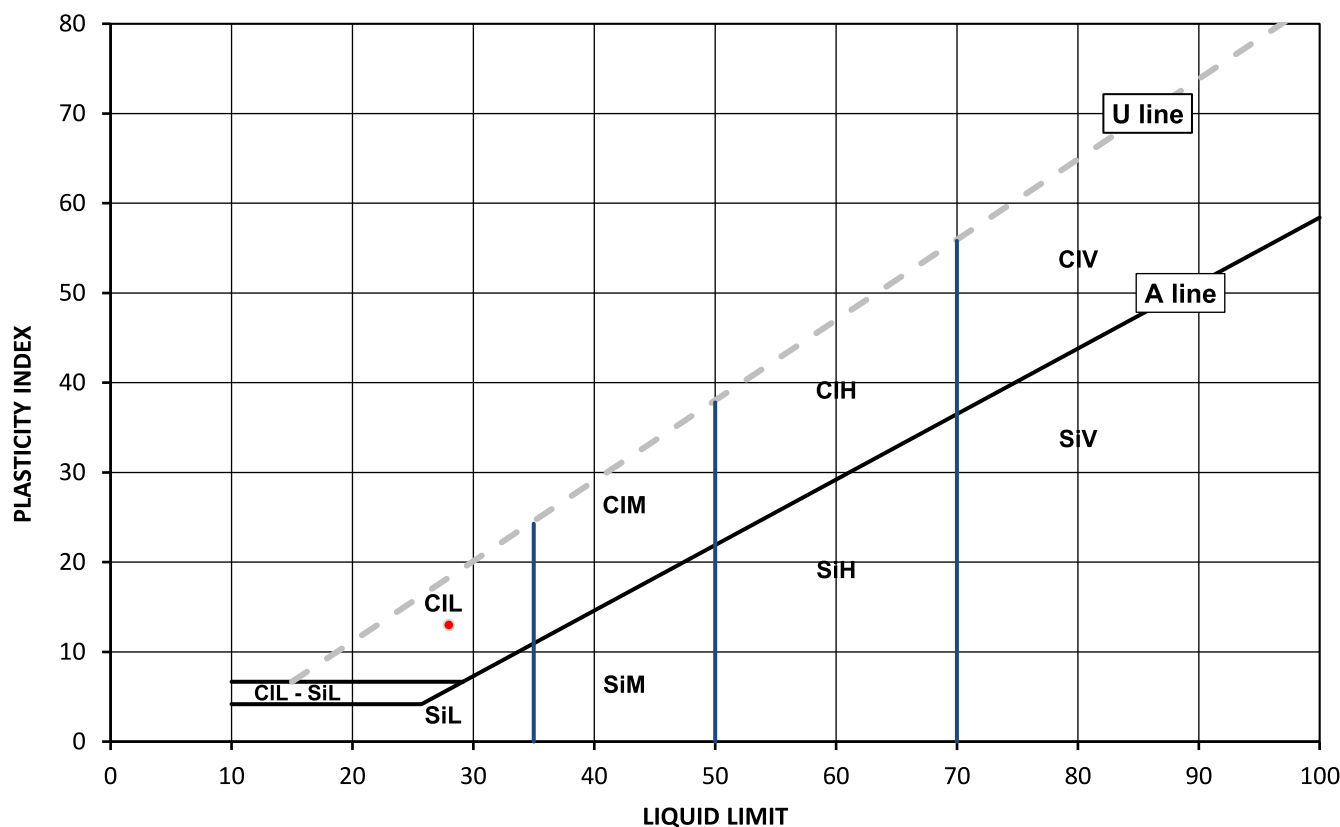
Test Results:

Laboratory Reference: 1862656
Hole No.: WS3
Sample Reference: Not Given
Soil Description: Greyish brown slightly gravelly very sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
11	28	15	13	85



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L Low	50 to 70
	M Medium	exceeding 70
	H High	append to classification for organic material (eg CIHO)
	V Very high	
	O Organic	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Date Reported: 07/06/2021

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ

Contact: Mark Newton
Site Address: East Lancs Paper

Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 17/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

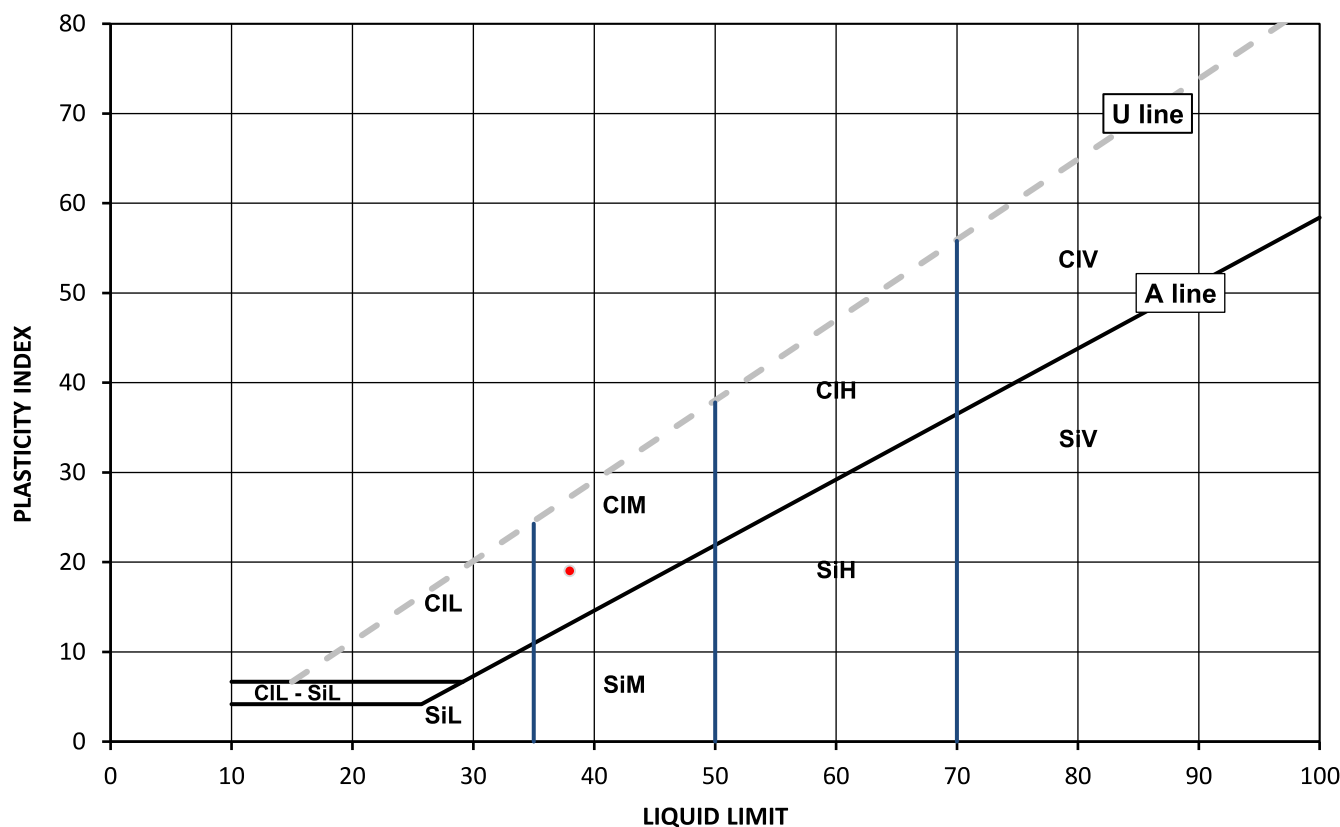
Test Results:

Laboratory Reference: 1862657
Hole No.: WS4
Sample Reference: Not Given
Soil Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	38	19	19	86



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Page 1 of 1

Date Reported: 07/06/2021

GF 236.10



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ
Contact: Mark Newton
Site Address: East Lancs Paper

Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 17/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

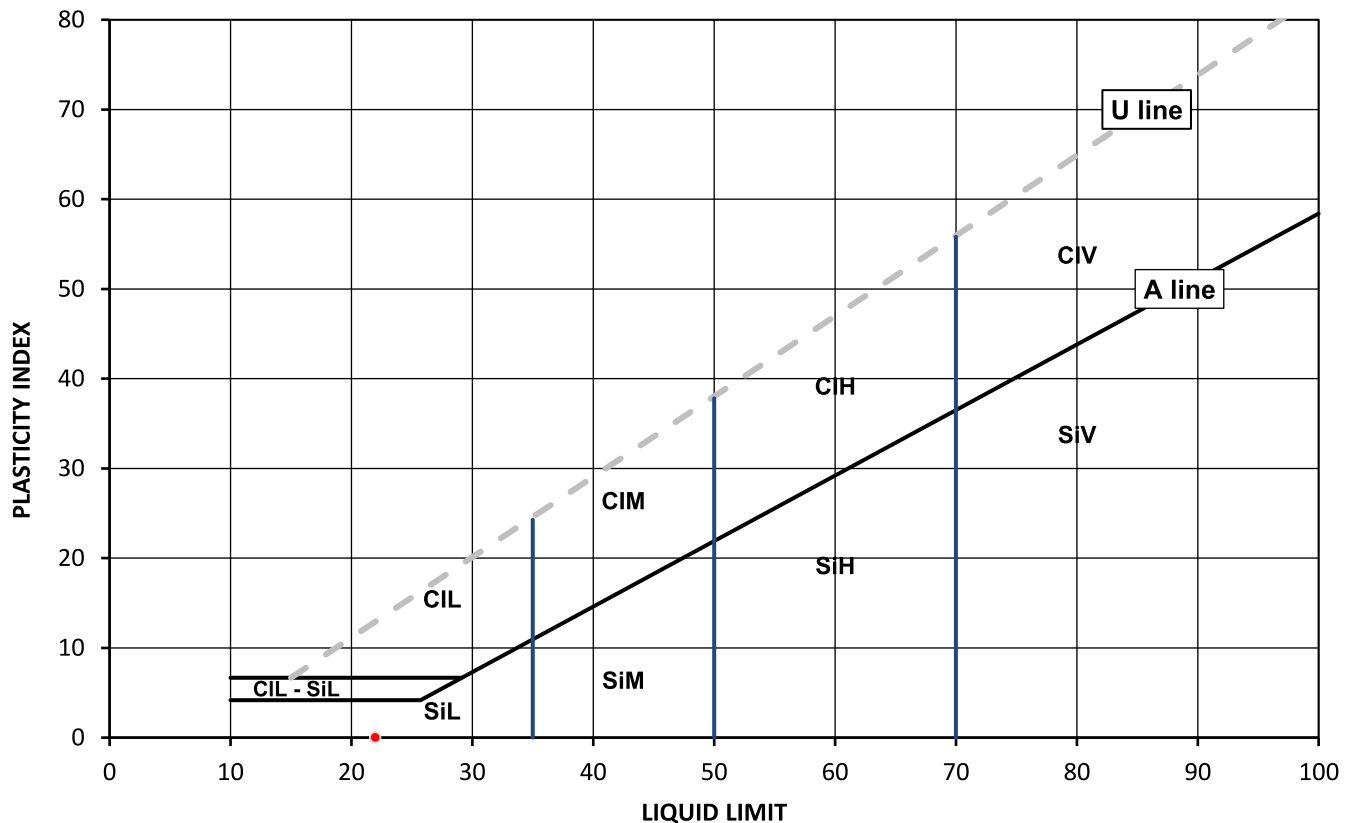
Test Results:

Laboratory Reference: 1862658
Hole No.: WS6
Sample Reference: Not Given
Soil Description: Brown slightly gravelly slightly clayey SAND

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after >425um removed by hand

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
13	22	NP	NP	97



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks: NP - non plastic

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Page 1 of 1

Date Reported: 07/06/2021

GF 236.10



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ

Contact: Mark Newton
Site Address: East Lancs Paper

Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 29/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

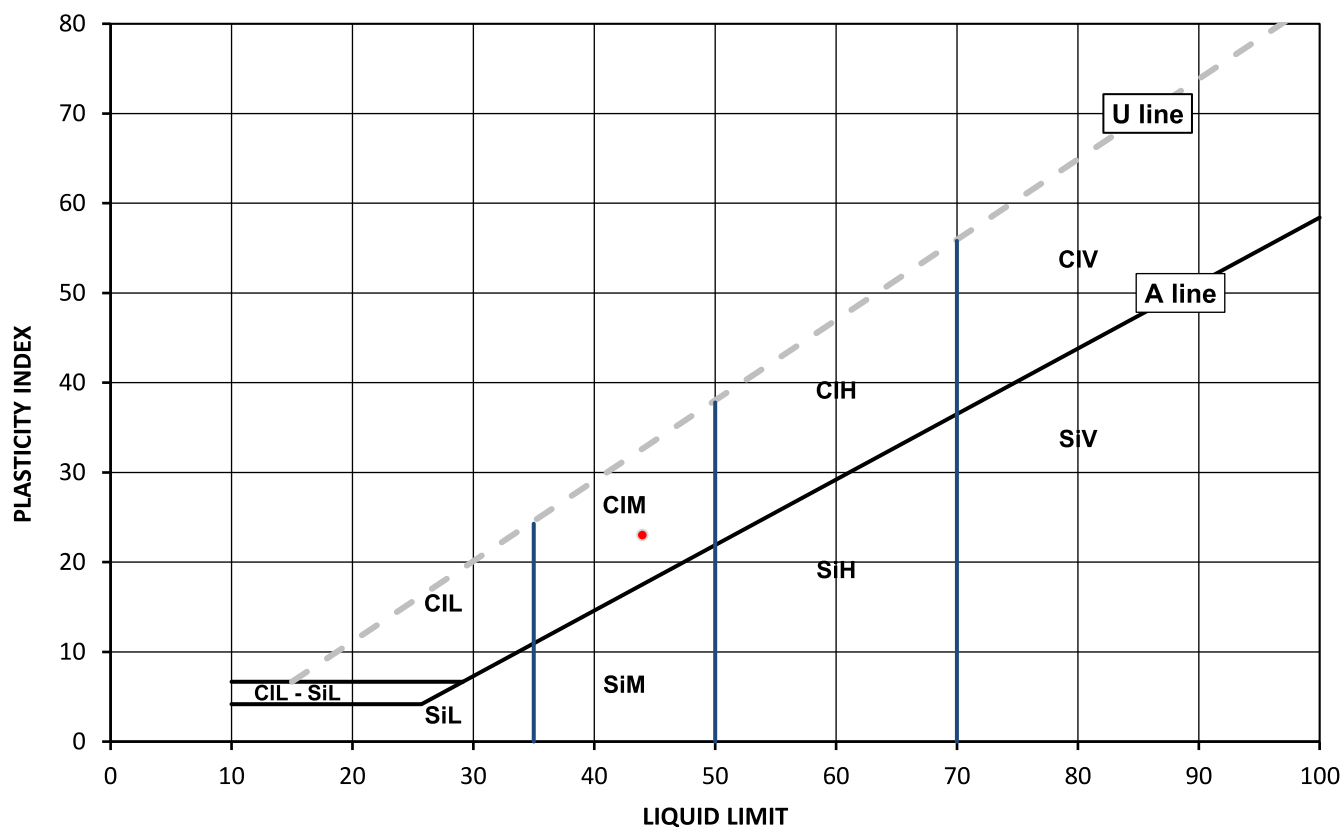
Test Results:

Laboratory Reference: 1862662
Hole No.: WS7
Sample Reference: Not Given
Soil Description: Grey mottled greyish brown slightly gravelly sandy CLAY

Depth Top [m]: 3.00
Depth Base [m]: 4.00
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	44	21	23	90



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Page 1 of 1

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GF 236.10



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ
Contact: Mark Newton
Site Address: East Lancs Paper

Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 29/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

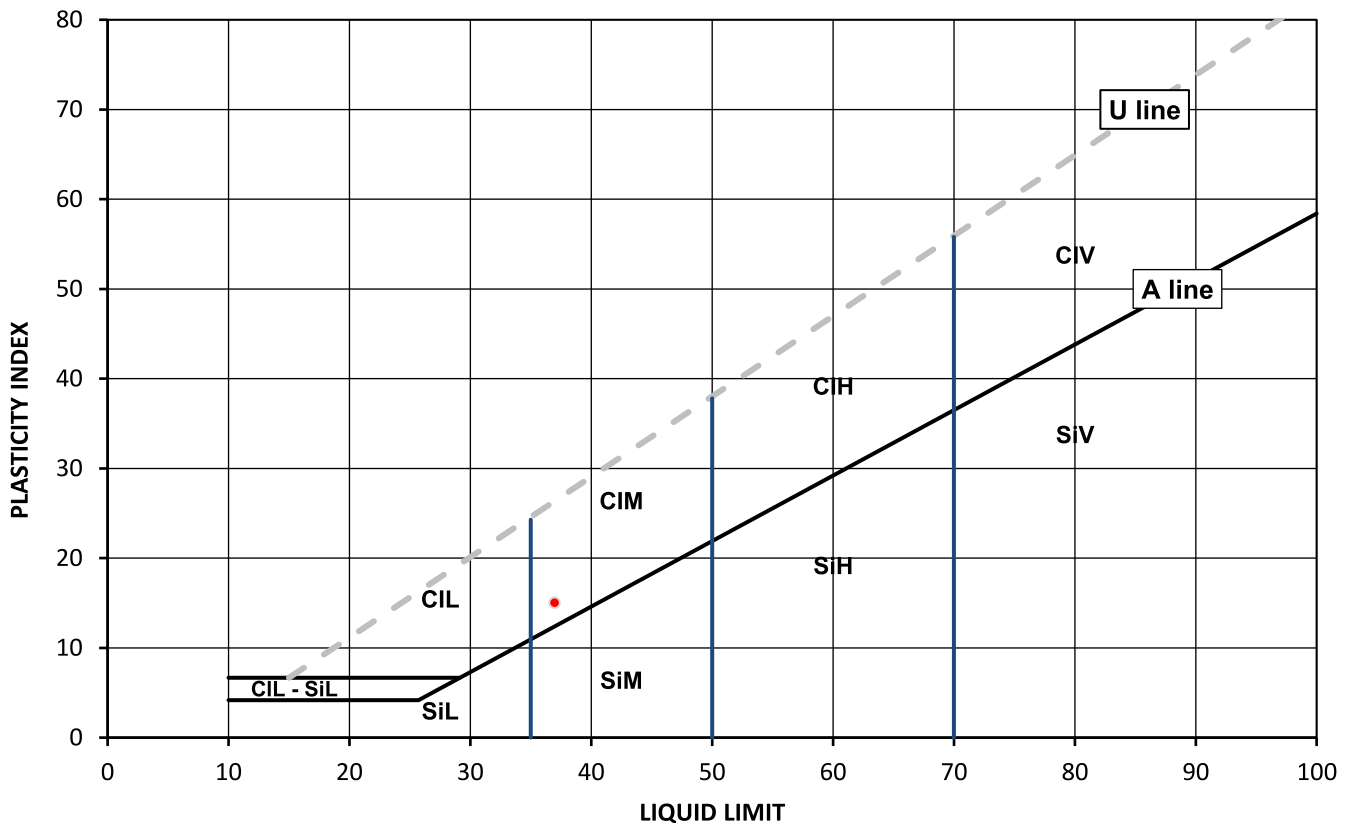
Test Results:

Laboratory Reference: 1862663
Hole No.: TP2
Sample Reference: Not Given
Soil Description: Brown slightly gravelly sandy CLAY

Depth Top [m]: 1.10
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
30	37	22	15	80



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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Page 1 of 1

Date Reported: 07/06/2021

GF 236.10



4041

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ

Contact: Mark Newton
Site Address: East Lancs Paper

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 17/05 - 29/05/2021
Sampled By: Client

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m															
1862663	TP2	Not Given	1.10	Not Given	B	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	30		80	37	22	15						
1862654	WS1	Not Given	3.00	Not Given	B	Brown slightly gravelly clayey SAND	Atterberg 4 Point	12		91	23	13	10						
1862655	WS2	Not Given	2.70	Not Given	B	Greyish brown slightly gravelly very sandy CLAY	Atterberg 4 Point	14		68	33	17	16						
1862656	WS3	Not Given	3.00	Not Given	B	Greyish brown slightly gravelly very sandy CLAY	Atterberg 4 Point	11		85	28	15	13						
1862657	WS4	Not Given	2.00	Not Given	B	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	17		86	38	19	19						
1862658	WS6	Not Given	2.00	Not Given	B	Brown slightly gravelly slightly clayey SAND	Atterberg 4 Point	13		97	22	NP	NP						
1862662	WS7	Not Given	3.00	4.00	B	Grey mottled greyish brown slightly gravelly sandy CLAY	Atterberg 4 Point	14		90	44	21	23						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ
Contact: Mark Newton
Site Address: East Lancs Paper

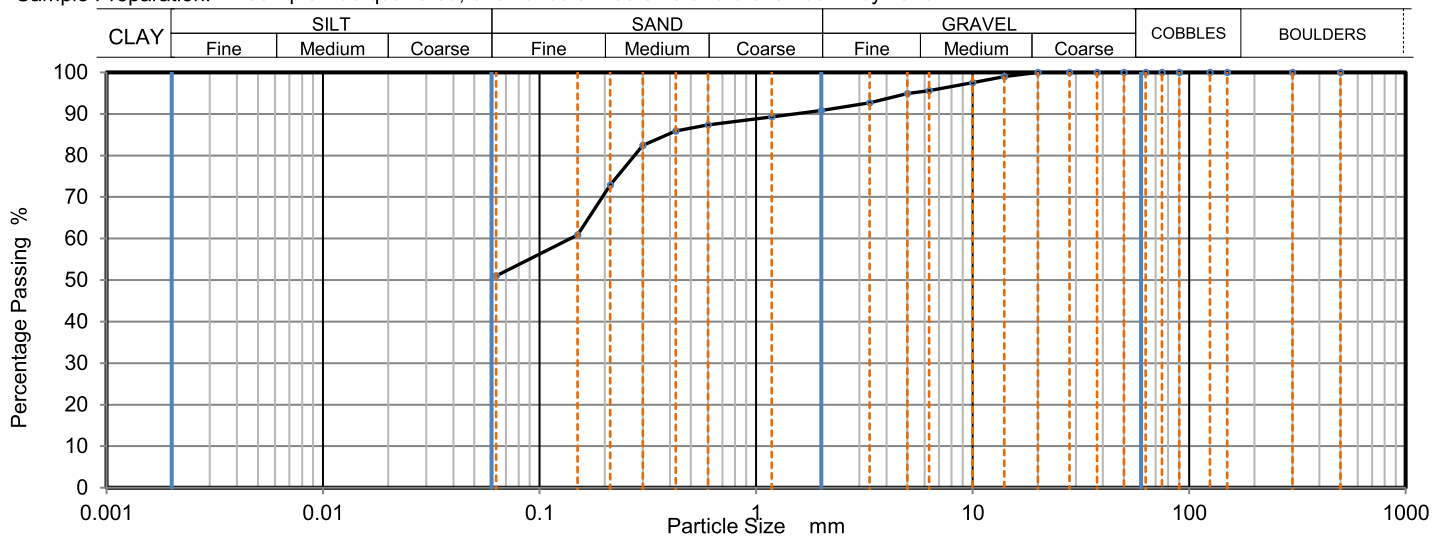
Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 29/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1862659
Hole No.: WS1
Sample Reference: Not Given
Sample Description: Brownish grey slightly gravelly very sandy CLAY
Sample Preparation: Sample was quartered, oven dried at 108.8 °C and broken down by hand.

Depth Top [m]: 3.00
Depth Base [m]: 4.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	96		
5	95		
3.35	93		
2	91		
1.18	89		
0.6	87		
0.425	86		
0.3	82		
0.212	73		
0.15	61		
0.063	51		

Sample Proportions	% dry mass
Very coarse	0
Gravel	9
Sand	39
Fines <0.063mm	51

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 2.2
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ
Contact: Mark Newton
Site Address: East Lancs Paper

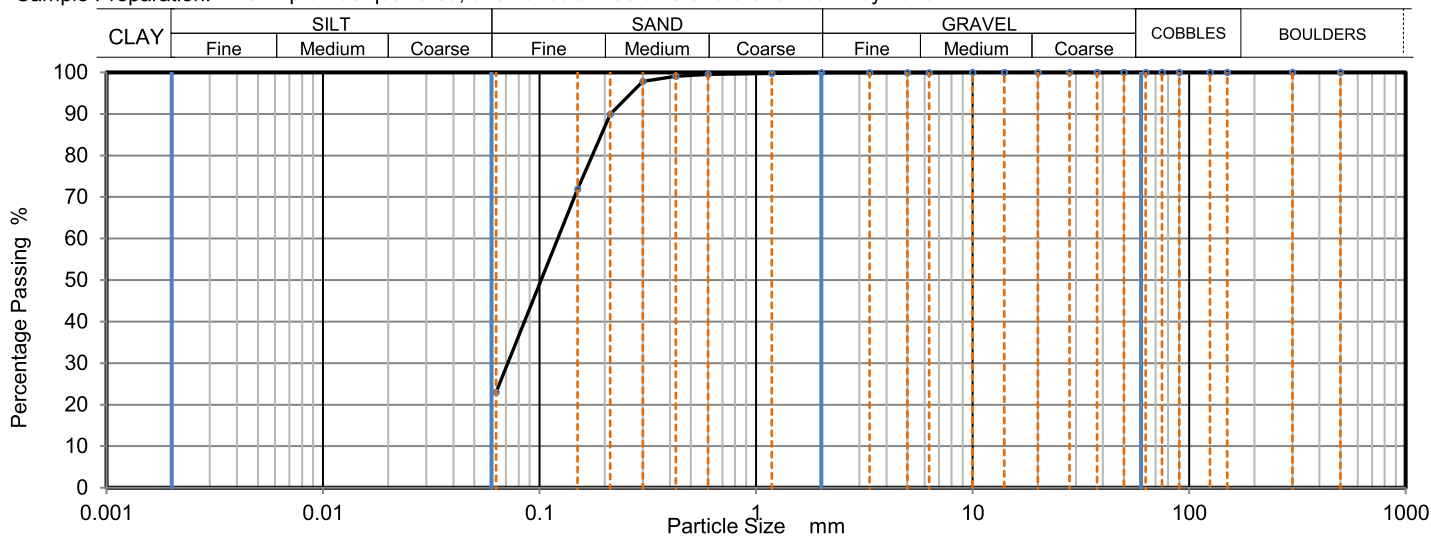
Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 29/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1862660
Hole No.: WS5
Sample Reference: Not Given
Sample Description: Brown clayey SAND
Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 2.00
Depth Base [m]: 3.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	98		
0.212	90		
0.15	72		
0.063	23		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	77
Fines <0.063mm	23

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 1.9
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
Timperley, Altrincham,
WA15 7WZ
Contact: Mark Newton
Site Address: East Lancs Paper

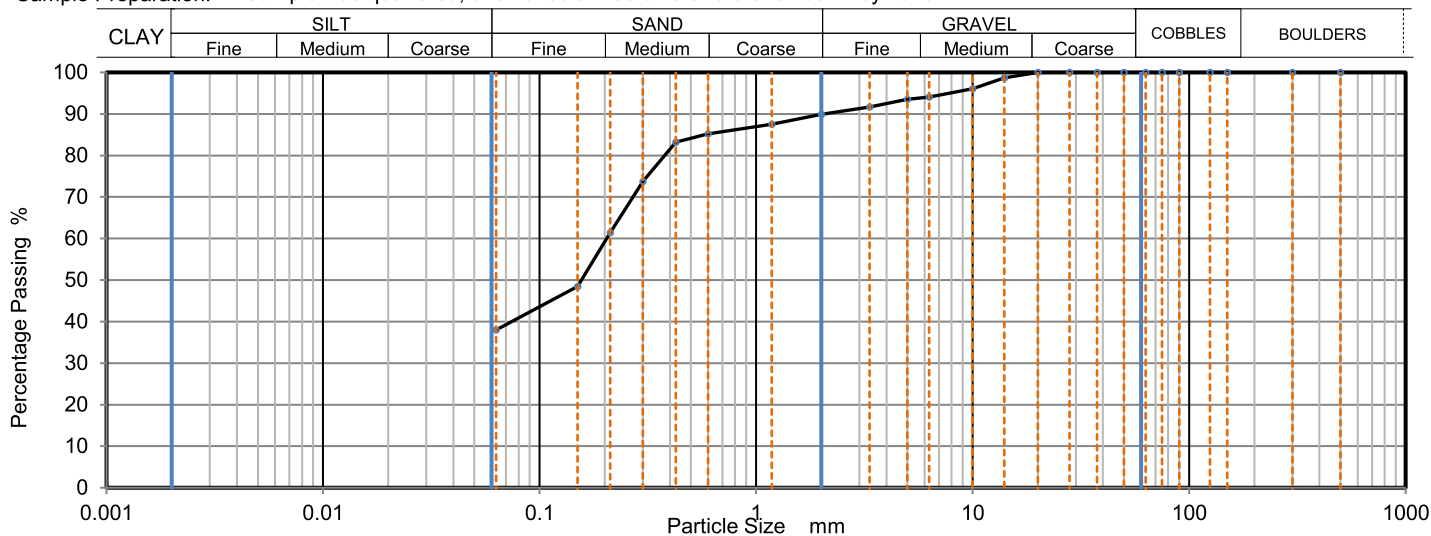
Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 31/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1862661
Hole No.: WS6
Sample Reference: Not Given
Sample Description: Brownish grey slightly gravelly clayey SAND
Sample Preparation: Sample was quartered, oven dried at 109.0 °C and broken down by hand.

Depth Top [m]: 3.00
Depth Base [m]: 4.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	96		
6.3	94		
5	94		
3.35	92		
2	90		
1.18	88		
0.6	85		
0.425	83		
0.3	74		
0.212	61		
0.15	49		
0.063	39		

Sample Proportions	% dry mass
Very coarse	0
Gravel	10
Sand	51
Fines <0.063mm	39

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 3.2
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

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PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
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WA15 7WZ
Contact: Mark Newton
Site Address: East Lancs Paper

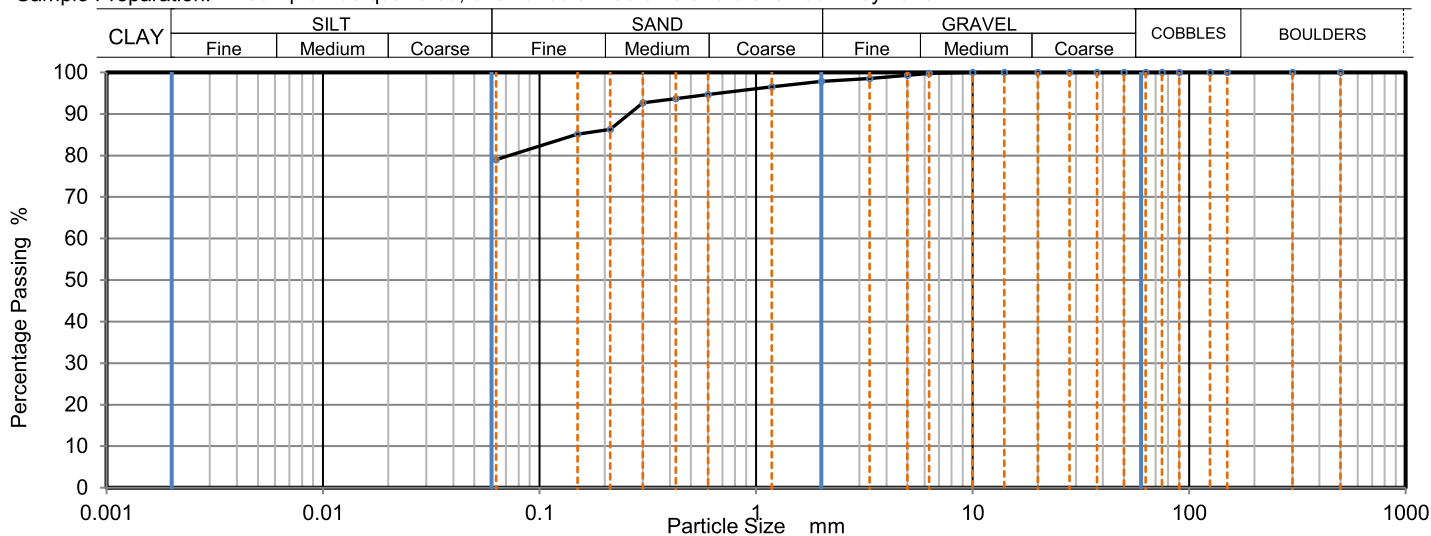
Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 29/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1862662
Hole No.: WS7
Sample Reference: Not Given
Sample Description: Grey mottled greyish brown slightly gravelly sandy CLAY
Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 3.00
Depth Base [m]: 4.00
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	98		
1.18	97		
0.6	95		
0.425	94		
0.3	93		
0.212	86		
0.15	85		
0.063	80		

Sample Proportions	% dry mass
Very coarse	0
Gravel	2
Sand	18
Fines <0.063mm	80

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	N/A
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

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PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

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Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
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Site Address: East Lancs Paper

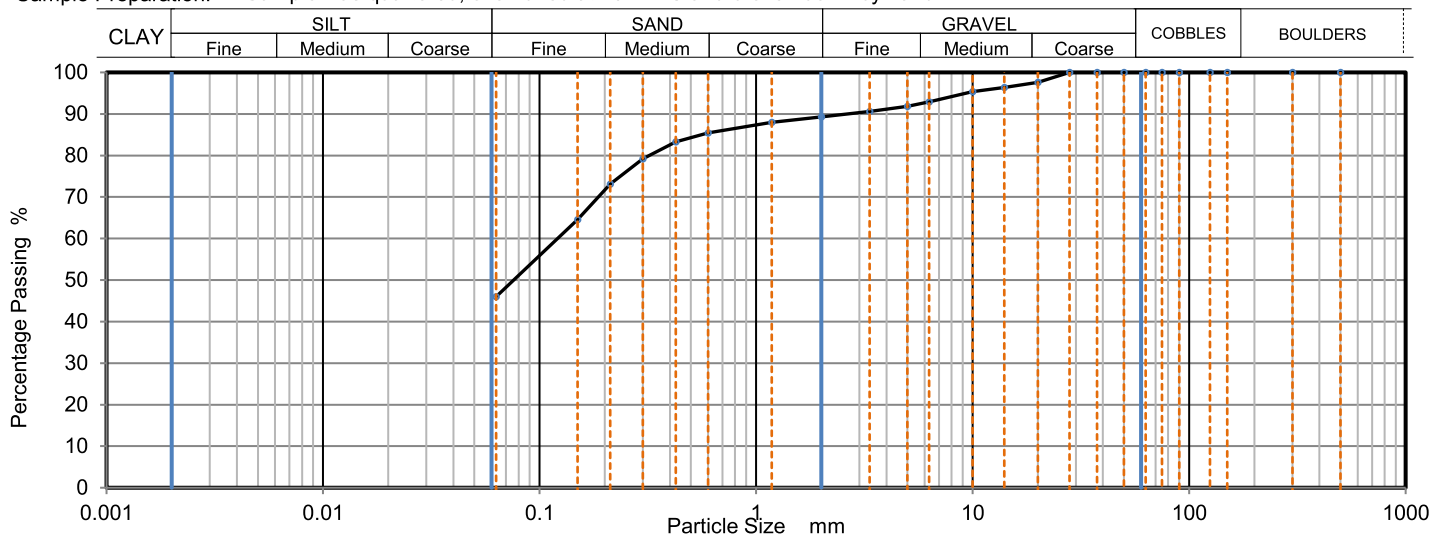
Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 29/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1862664
Hole No.: TP3
Sample Reference: Not Given
Sample Description: Greyish brown gravelly very sandy CLAY
Sample Preparation: Sample was quartered, oven dried at 107.7 °C and broken down by hand.

Depth Top [m]: 1.20
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	96		
10	95		
6.3	93		
5	92		
3.35	91		
2	89		
1.18	88		
0.6	85		
0.425	83		
0.3	79		
0.212	73		
0.15	65		
0.063	46		

Sample Proportions	% dry mass
Very coarse	0
Gravel	11
Sand	43
Fines <0.063mm	46

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 1.9
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: NX Consulting
Client Address: Thorpe House, 11 Thorpe Close,
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WA15 7WZ
Contact: Mark Newton
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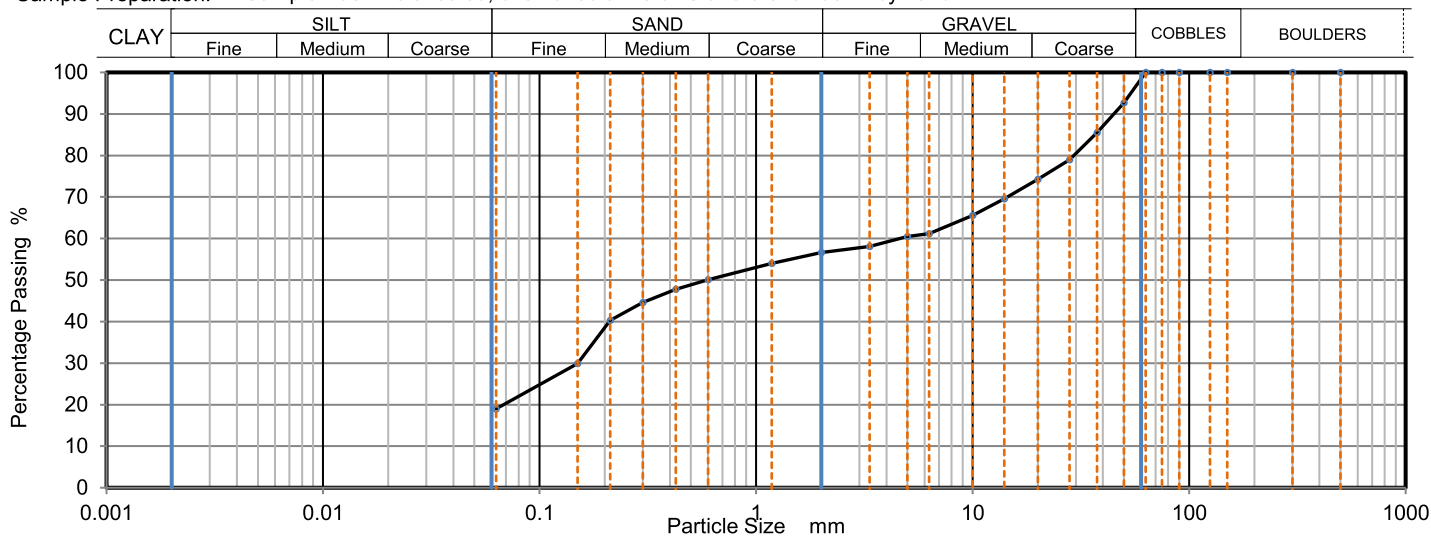
Client Reference: NX418
Job Number: 21-73447
Date Sampled: Not Given
Date Received: 30/04/2021
Date Tested: 31/05/2021
Sampled By: Client

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1862665
Hole No.: TP4
Sample Reference: Not Given
Sample Description: Dark brown clayey very sandy GRAVEL with asphalt
Sample Preparation: Sample was whole tested, oven dried at 40.0 °C and broken down by hand.

Depth Top [m]: 1.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	86		
28	79		
20	74		
14	70		
10	66		
6.3	61		
5	61		
3.35	58		
2	57		
1.18	54		
0.6	50		
0.425	48		
0.3	45		
0.212	40		
0.15	30		
0.063	19		

Sample Proportions	% dry mass
Very coarse	0
Gravel	43
Sand	37
Fines <0.063mm	19

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 73
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Aleksandra Jurochnik
PL Technical Reviewer
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Appendix F – Chemical Test Results



Mark Newton
NX Consulting
Thorpe House
11 Thorpe Close
Timperley
Altrincham
WA15 7WZ

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404

e: marknewton@nxconsulting.org.uk

e: reception@i2analytical.com

Analytical Report Number : 21-73279

Project / Site name: Land at East Lancashire Paper Mill
Island, Radcliffe

Your job number: NX418

Your order number: NX418

Report Issue Number: 1

Samples Analysed: 2 10:1 WAC samples

Samples received on: 30/04/2021

**Samples instructed on/
Analysis started on:** 06/05/2021

Analysis completed by: 18/05/2021

Report issued on: 18/05/2021

Signed:

Izabela Wójcik
Izabela Wójcik
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

i2 Analytical

7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email: reception@i2analytical.com

Waste Acceptance Criteria Analytical Results													
Report No:		21-73279											
						Client: NXCONSULTI							
Location		Land at East Lancashire Paper Mill Island, Radcliffe											
Lab Reference (Sample Number)		1861681 / 1861682				Landfill Waste Acceptance Criteria							
Sampling Date		28/04/2021				Limits							
Sample ID		TP2				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill					
Depth (m)		0.50											
Solid Waste Analysis													
TOC (%)**		2.4				3%		5%		6%			
Loss on Ignition (%) **		6.4				--		--		10%			
BTEX (µg/kg) **		< 10				6000		--		--			
Sum of PCBs (mg/kg) **		< 0.007				1		--		--			
Mineral Oil (mg/kg)		< 10				500		--		--			
Total PAH (WAC-17) (mg/kg)		2.56				100		--		--			
pH (units)**		7.3				--		>6		--			
Acid Neutralisation Capacity (mol / kg)		0.83				--		To be evaluated		To be evaluated			
Eluate Analysis													
		10:1				10:1		Limit values for compliance leaching test					
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)		mg/l				mg/kg		using BS EN 12457-2 at L/S 10 l/kg (mg/kg)					
Arsenic *		0.115				0.995		0.5		2		25	
Barium *		0.0197				0.171		20		100		300	
Cadmium *		< 0.0001				< 0.0008		0.04		1		5	
Chromium *		0.0015				0.013		0.5		10		70	
Copper *		0.010				0.087		2		50		100	
Mercury *		< 0.0005				< 0.0050		0.01		0.2		2	
Molybdenum *		0.0047				0.0405		0.5		10		30	
Nickel *		0.0036				0.032		0.4		10		40	
Lead *		0.024				0.21		0.5		10		50	
Antimony *		< 0.0017				< 0.017		0.06		0.7		5	
Selenium *		< 0.0040				< 0.040		0.1		0.5		7	
Zinc *		0.0094				0.082		4		50		200	
Chloride *		1.2				10		800		15000		25000	
Fluoride		0.55				4.7		10		150		500	
Sulphate *		4.2				36		1000		20000		50000	
TDS*		31				270		4000		60000		100000	
Phenol Index (Monohydric Phenols) *		< 0.010				< 0.10		1		-		-	
DOC		7.82				67.7		500		800		1000	
Leach Test Information													
Stone Content (%)		< 0.1											
Sample Mass (kg)		0.80											
Dry Matter (%)		80											
Moisture (%)		20											
Results are expressed on a dry weight basis, after correction for moisture content where applicable.										**= UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation										** = MCERTS accredited			
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.													
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.													

i2 Analytical

7 Woodshots Meadow
Croxley Green Business Park
Watford, WD18 8YS

Telephone: 01923 225404
Fax: 01923 237404
email: reception@i2analytical.com

Waste Acceptance Criteria Analytical Results										
Report No:		21-73279								
						Client: NXCONSULTI				
Location		Land at East Lancashire Paper Mill Island, Radcliffe								
Lab Reference (Sample Number)		1861683 / 1861684				Landfill Waste Acceptance Criteria				
Sampling Date		28/04/2021				Limits				
Sample ID		TP3				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill		
Depth (m)		0.50								
Solid Waste Analysis										
TOC (%)**		1.7				3%	5%	6%		
Loss on Ignition (%) **		4.3				--	--	10%		
BTEX (µg/kg) **		< 10				6000	--	--		
Sum of PCBs (mg/kg) **		0.028				1	--	--		
Mineral Oil (mg/kg)		< 10				500	--	--		
Total PAH (WAC-17) (mg/kg)		38.8				100	--	--		
pH (units)**		8.2				--	>6	--		
Acid Neutralisation Capacity (mol / kg)		13				--	To be evaluated	To be evaluated		
Eluate Analysis										
		10:1			10:1	Limit values for compliance leaching test				
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)		mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)				
Arsenic *		0.0153			0.132	0.5	2	25		
Barium *		0.0108			0.0933	20	100	300		
Cadmium *		< 0.0001			< 0.0008	0.04	1	5		
Chromium *		0.0013			0.011	0.5	10	70		
Copper *		0.0058			0.050	2	50	100		
Mercury *		< 0.0005			< 0.0050	0.01	0.2	2		
Molybdenum *		0.0004			< 0.0040	0.5	10	30		
Nickel *		0.0022			0.019	0.4	10	40		
Lead *		< 0.0010			< 0.010	0.5	10	50		
Antimony *		< 0.0017			< 0.017	0.06	0.7	5		
Selenium *		< 0.0040			< 0.040	0.1	0.5	7		
Zinc *		0.0084			0.072	4	50	200		
Chloride *		1.4			12	800	15000	25000		
Fluoride		0.28			2.4	10	150	500		
Sulphate *		5.7			49	1000	20000	50000		
TDS*		56			490	4000	60000	100000		
Phenol Index (Monohydric Phenols) *		< 0.010			< 0.10	1	-	-		
DOC		6.18			53.3	500	800	1000		
Leach Test Information										
Stone Content (%)		< 0.1								
Sample Mass (kg)		0.80								
Dry Matter (%)		87								
Moisture (%)		13								
Results are expressed on a dry weight basis, after correction for moisture content where applicable. * = UKAS accredited (liquid eluate analysis only)										
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited										
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.										
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.										



Analytical Report Number : 21-73279

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1861681	TP2	None Supplied	0.5	Brown sandy clay with gravel.
1861683	TP3	None Supplied	0.5	Brown loam and clay with gravel and brick.

Analytical Report Number : 21-73279

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance"	L046-PL	W	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025



Analytical Report Number : 21-73279

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



Mark Newton
NX Consulting
Thorpe House
11 Thorpe Close
Timperley
Altrincham
WA15 7WZ

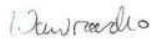
i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

e: marknewton@nxconsulting.org.uk

Analytical Report Number : 21-73274

Project / Site name:	Land at East Lancashire Paper Mill Island, Radcliffe	Samples received on:	30/04/2021
Your job number:	NX418	Samples instructed on/ Analysis started on:	06/05/2021
Your order number:	NX418	Analysis completed by:	13/05/2021
Report Issue Number:	1	Report issued on:	13/05/2021
Samples Analysed:	22 soil samples		


Signed:

Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861650	1861651	1861652	1861653	1861654
Sample Reference				WS1	WS1	WS1	WS2	WS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.50	2.50	0.30	0.80
Date Sampled				26/04/2021	26/04/2021	26/04/2021	26/04/2021	26/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	0.01	NONE	9.4	7.6
Total mass of sample received				kg	0.001	NONE	1.2	7.6

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	8.2	8.5	8.4	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	630	-	-	-	-
Water soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.13	0.11	0.018	-
Sulphide	mg/kg	1	MCERTS	10	-	-	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.8	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	0.69	-	-	-	-
Fluorene	mg/kg	0.05	MCERTS	0.30	-	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	5.1	-	-	-	-
Anthracene	mg/kg	0.05	MCERTS	1.1	-	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	11	-	-	-	-
Pyrene	mg/kg	0.05	MCERTS	11	-	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.3	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	5.6	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	8.9	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	2.7	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	6.7	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.1	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.1	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.2	-	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	70.4	-	-	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	200	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	-	-	-	-

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861650	1861651	1861652	1861653	1861654
Sample Reference				WS1	WS1	WS1	WS2	WS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.50	2.50	0.30	0.80
Date Sampled				26/04/2021	26/04/2021	26/04/2021	26/04/2021	26/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	16
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	26

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	-	-	-	< 0.001

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	< 0.007	-	-	-	< 0.007
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U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861655	1861656	1861657	1861658	1861659
Sample Reference				WS3	WS3	WS3	WS4	WS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.00	1.80	0.05	1.00
Date Sampled				26/04/2021	26/04/2021	26/04/2021	26/04/2021	26/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	0.01	NONE	15	12
Total mass of sample received				kg	0.001	NONE	0.70	0.70

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	6.8	7.1	7.2	7.2	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	-	5.4	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	640	-	-	1100	1300
Water soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.024	0.036	-	-
Sulphide	mg/kg	1	MCERTS	< 1.0	-	-	2.4	3.9
Total Organic Carbon (TOC)	%	0.1	MCERTS	4.3	-	-	2.0	1.6

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	0.73	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	-	0.22	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	-	1.5	0.31
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	-	1.1	0.22
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	-	11	2.9
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	2.5	0.67
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	16	3.5
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	15	3.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	8.0	1.9
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	6.4	1.5
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	7.4	1.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	-	4.0	0.91
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	6.8	1.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	-	3.8	0.82
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	-	1.1	0.27
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	4.7	1.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	-	-	89.4	20.7
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	30	-	-	58	74
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	-	-	0.7	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.2	-	-	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	-	-	81	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	220	-	-	110	120
Lead (aqua regia extractable)	mg/kg	1	MCERTS	260	-	-	250	2500
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	< 0.3	1.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	53	-	-	15	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	320	-	-	220	210

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861655	1861656	1861657	1861658	1861659
Sample Reference				WS3	WS3	WS3	WS4	WS4
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.00	1.80	0.05	1.00
Date Sampled				26/04/2021	26/04/2021	26/04/2021	26/04/2021	26/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861660	1861661	1861662	1861663	1861664
Sample Reference				WS4	WS4	WS5	WS5	WS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	2.50	0.05	1.10	1.60
Date Sampled				26/04/2021	26/04/2021	27/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	0.01	NONE	22	9.8
Total mass of sample received				kg	0.001	NONE	0.70	0.70

Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	Not-detected	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	7.0	6.5	6.9	7.2
Total Cyanide	mg/kg	1	MCERTS	-	-	6.0	< 1.0	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	-	-	1100	500	-
Water soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.026	0.052	-	-	0.026
Sulphide	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	-	-	3.3	1.2	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	1.2	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	0.24	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	2.9	0.41	-
Fluorene	mg/kg	0.05	MCERTS	-	-	2.1	0.23	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	21	2.9	-
Anthracene	mg/kg	0.05	MCERTS	-	-	4.9	0.52	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	29	4.3	-
Pyrene	mg/kg	0.05	MCERTS	-	-	26	4.0	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	14	2.2	-
Chrysene	mg/kg	0.05	MCERTS	-	-	13	1.9	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	14	2.7	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	7.4	0.63	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	13	2.0	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	7.5	1.2	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	2.1	0.32	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	9.1	1.4	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	166	24.6	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	710	61	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	0.8	0.6	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	140	26	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	260	45	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	580	85	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	1.2	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	39	24	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	760	170	-

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861660	1861661	1861662	1861663	1861664
Sample Reference				WS4	WS4	WS5	WS5	WS5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	2.50	0.05	1.10	1.60
Date Sampled				26/04/2021	26/04/2021	27/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic								
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	13	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	24	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	40	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	76	-
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861665	1861666	1861667	1861668	1861669
Sample Reference				WS6	WS6	WS7	WS7	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.20	0.50	1.00	1.50
Date Sampled				27/04/2021	27/04/2021	27/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	0.01	NONE	12	24
Total mass of sample received				kg	0.001	NONE	0.70	1.0

Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	-	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.4	7.2	9.2	7.4	6.7
Total Cyanide	mg/kg	1	MCERTS	2.8	< 1.0	< 1.0	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	760	260	2000	-	-
Water soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.11	0.15
Sulphide	mg/kg	1	MCERTS	1.8	7.0	14	-	-
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.5	0.3	0.9	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	4.6	< 0.05	< 0.05	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	8.6	< 0.05	0.32	-	-
Fluorene	mg/kg	0.05	MCERTS	5.6	< 0.05	0.24	-	-
Phenanthrene	mg/kg	0.05	MCERTS	48	< 0.05	2.1	-	-
Anthracene	mg/kg	0.05	MCERTS	10	< 0.05	0.51	-	-
Fluoranthene	mg/kg	0.05	MCERTS	52	< 0.05	2.9	-	-
Pyrene	mg/kg	0.05	MCERTS	47	< 0.05	2.9	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	25	< 0.05	1.7	-	-
Chrysene	mg/kg	0.05	MCERTS	22	< 0.05	1.5	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	23	< 0.05	1.8	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	14	< 0.05	0.84	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	23	< 0.05	1.7	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	13	< 0.05	0.90	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	3.8	< 0.05	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	15	< 0.05	1.1	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	314	< 0.80	18.5	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	190	6.5	21	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	0.4	1.2	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	41	20	18	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	170	8.0	42	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	560	25	190	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.8	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	36	18	16	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	360	51	110	-	-

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861665	1861666	1861667	1861668	1861669
Sample Reference				WS6	WS6	WS7	WS7	WS7
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.20	0.50	1.00	1.50
Date Sampled				27/04/2021	27/04/2021	27/04/2021	27/04/2021	27/04/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic								
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	-
PCBs by GC-MS								
PCB Congener 28	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-	-	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-	-	-	-
Total PCBs by GC-MS								
Total PCBs	mg/kg	0.007	MCERTS	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861670	1861671
Sample Reference				TP1	TP4
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.50
Date Sampled				28/04/2021	28/04/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	16
Total mass of sample received	kg	0.001	NONE	1.0	0.70

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	8.5
Total Cyanide	mg/kg	1	MCERTS	2.3	< 1.0
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1700	910
Water soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-
Sulphide	mg/kg	1	MCERTS	17	36
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.8	0.9

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.73	0.34
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.3	0.49
Pyrene	mg/kg	0.05	MCERTS	1.2	0.41
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.72	0.33
Chrysene	mg/kg	0.05	MCERTS	0.63	0.26
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.78	0.38
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.40	0.18
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.68	0.26
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.40	0.21
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.52	0.28

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	7.28	3.14
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	11
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.5
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	12
Copper (aqua regia extractable)	mg/kg	1	MCERTS	43	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6000	270
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.2	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	8.7
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	140

Analytical Report Number: 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Your Order No: NX418

Lab Sample Number				1861670	1861671
Sample Reference				TP1	TP4
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.50
Date Sampled				28/04/2021	28/04/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	-	-
Toluene	µg/kg	1	MCERTS	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-
o-xylene	µg/kg	1	MCERTS	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	-	-
PCB Congener 52	mg/kg	0.001	MCERTS	-	-
PCB Congener 101	mg/kg	0.001	MCERTS	-	-
PCB Congener 118	mg/kg	0.001	MCERTS	-	-
PCB Congener 138	mg/kg	0.001	MCERTS	-	-
PCB Congener 153	mg/kg	0.001	MCERTS	-	-
PCB Congener 180	mg/kg	0.001	MCERTS	-	-

Total PCBs by GC-MS

Total PCBs	mg/kg	0.007	MCERTS	-	-
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1861650	WS1	None Supplied	0.5	Brown loam with gravel and vegetation.
1861651	WS1	None Supplied	1.5	Brown loam with gravel and vegetation.
1861652	WS1	None Supplied	2.5	Brown clay and loam with gravel.
1861653	WS2	None Supplied	0.3	Brown loam with coal.
1861654	WS2	None Supplied	0.8	Brown loam with gravel and vegetation.
1861655	WS3	None Supplied	0.5	Brown loam with gravel and vegetation.
1861656	WS3	None Supplied	1	Brown clay and loam with gravel.
1861657	WS3	None Supplied	1.8	Brown clay and loam with gravel and vegetation.
1861658	WS4	None Supplied	0.05	Brown loam with gravel.
1861659	WS4	None Supplied	1	Brown loam with gravel.
1861660	WS4	None Supplied	1.5	Brown loam and clay with gravel and vegetation.
1861661	WS4	None Supplied	2.5	Brown clay and loam with gravel and vegetation.
1861662	WS5	None Supplied	0.05	Brown loam with gravel and vegetation.
1861663	WS5	None Supplied	1.1	Brown loam and clay with gravel.
1861664	WS5	None Supplied	1.6	Brown clay and loam with gravel and vegetation.
1861665	WS6	None Supplied	0.4	Brown loam with gravel and vegetation.
1861666	WS6	None Supplied	1.2	Brown loam and clay with gravel.
1861667	WS7	None Supplied	0.5	Brown loam with gravel.
1861668	WS7	None Supplied	1	Brown loam and clay with gravel.
1861669	WS7	None Supplied	1.5	Brown clay and loam.
1861670	TP1	None Supplied	0.5	Brown loam with gravel.
1861671	TP4	None Supplied	0.5	Brown loam and clay with gravel.

Analytical Report Number : 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS



Analytical Report Number : 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report



Analytical Report Number : 21-73274

Project / Site name: Land at East Lancashire Paper Mill Island, Radcliffe

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP1	None Supplied	S	1861670	c	Sulphide in soil	L010-PL	c
TP1	None Supplied	S	1861670	c	Total cyanide in soil	L080-PL	c
TP4	None Supplied	S	1861671	c	Sulphide in soil	L010-PL	c
TP4	None Supplied	S	1861671	c	Total cyanide in soil	L080-PL	c
WS1	None Supplied	S	1861650	c	Sulphide in soil	L010-PL	c
WS1	None Supplied	S	1861650	c	Total cyanide in soil	L080-PL	c
WS3	None Supplied	S	1861655	c	Sulphide in soil	L010-PL	c
WS3	None Supplied	S	1861655	c	Total cyanide in soil	L080-PL	c
WS4	None Supplied	S	1861658	c	Sulphide in soil	L010-PL	c
WS4	None Supplied	S	1861658	c	Total cyanide in soil	L080-PL	c
WS4	None Supplied	S	1861659	c	Sulphide in soil	L010-PL	c
WS4	None Supplied	S	1861659	c	Total cyanide in soil	L080-PL	c
WS5	None Supplied	S	1861662	c	Sulphide in soil	L010-PL	c
WS5	None Supplied	S	1861662	c	Total cyanide in soil	L080-PL	c
WS5	None Supplied	S	1861663	c	Sulphide in soil	L010-PL	c
WS5	None Supplied	S	1861663	c	Total cyanide in soil	L080-PL	c
WS6	None Supplied	S	1861665	c	Sulphide in soil	L010-PL	c
WS6	None Supplied	S	1861665	c	Total cyanide in soil	L080-PL	c
WS6	None Supplied	S	1861666	c	Sulphide in soil	L010-PL	c
WS6	None Supplied	S	1861666	c	Total cyanide in soil	L080-PL	c
WS7	None Supplied	S	1861667	c	Sulphide in soil	L010-PL	c
WS7	None Supplied	S	1861667	c	Total cyanide in soil	L080-PL	c

Appendix G – Gas monitoring Record Sheet



Next Generation Engineering Consultancy Services

Job No:	NX418
Date:	28.07.2021
Engineer:	MN/RL

Site:	Rectory Ln Radcliffe
Client:	Great Places HG
Equipment:	GA2000

WS1	Flow Rate (l/h)	Pressure Differential	Gas Concentration										Water		Start	Finish	
			Peak					Steady									
Date			CH ₄ %	CO ₂ %	O ₂ %	LEL %	H2S/ CO (ppm)	CH ₄ %	CO ₂ %	O ₂ %	LEL %	H2S/ CO (ppm)	Depth to Water	Depth to Base	Barometric Pressure		Barometric Pressure
13/05/2021	0	0	0	0.7	19.9	0	0	0	0.7	19.9	0	0	2.7	4.37	998		998
21/05/2021	0.1	0.01	0	0.6	20	0	0	0	0.6	20	0	0	2.75	4.37	990		990
28/05/2021	0	0	0	1.6	18.5	0	0	0	1.6	18.5	0	0	2.2	4.38	1019		1019
04/06/2021	0	0	0	2.5	17.9	0	0	0	2.5	17.9	0	0	2.21	4.34	1016		1016
09/06/2021	0	0.02	0	0.2	20.3	0	0	0	0.2	20.3	0	0	2.15	4.36	1014		1014
16/06/2021	0	0.01	0.1	0.6	20.1	2	0	0.1	0.6	20.1	2	0	2.1	4.32	1002		1002
02/07/2021	0	0	0.1	2.2	19.7	1	0	0.1	1.9	19	2	0	2.48	4.37	1010		1010
06/07/2021	0	0.1	0	0.2	20.7	0	0	0	0.2	20.7	0	0	2.68	4.37	993		993
27/07/2021	0	0.02	0	0.2	20.6	0	0	0	0.2	4.2	0	0	2.47	4.38	1000		999

WS3	Flow Rate (l/h)	Pressure Differential	Gas Concentration										Water		Start		Finish	
			Peak					Steady										
Date			CH ₄ %	CO ₂ %	O ₂ %	LEL %	H2S/ CO (ppm)	CH ₄ %	CO ₂ %	O ₂ %	LEL %	H2S/ CO (ppm)	Depth to Water	Depth to Base		Barometric Pressure		Barometric Pressure
13/05/2021	0.1	0	0	4.1	15.5	0	0	0	4.1	15.5	0	0	2.03	4		997		997
21/05/2021	0	0	0	3.8	16.1	0	0	0	3.8	16.1	0	0	2.08	4		990		990
28/05/2021	0	0	0	0.3	20	0	0	0	0.3	20	0	0	1.88	4.02		1019		1019
04/06/2021	0	0	0	0.4	20.5	0	0	0	0.4	20.5	0	0	2.16	3.98		1016		1016
09/06/2021	0	0.01	0	0.3	20.4	0	0	0	0.3	20.4	0	0	2.1	4		1014		1014
16/06/2021	0	-0.04	0	0.2	20.6	2	0	0.1	0.2	20.6	2	0	2.05	3.97		1002		1002
02/07/2021	0	0.01	0	0.2	20.8	0	0	0.1	0.2	20.8	0	0	2.67	4		1010		1010
06/07/2021	0	0.01	0	0.2	20.6	0	0	0	0.2	20.6	0	0	2.6	3.99		993		993
27/07/2021	0	0.02	0	0.1	20.7	0	0	0	0.1	20.7	0	0	2.61	3.99		1000		999

WS4	Flow Rate (l/h)	Pressure Differential	Gas Concentration										Water		Start		Finish	
			Peak					Steady										
			Date	CH ₄ %	CO ₂ %	O ₂ %	LEL %	H2S/ CO (ppm)	CH ₄ %	CO ₂ %	O ₂ %	LEL %	H2S/ CO (ppm)	Depth to Water	Depth to Base	Barometric Pressure		Barometric Pressure
13/05/2021	0.01	0	0	2.2	17.7	0	0	0	2.2	17.7	0	0	2.06	4		998		998
21/05/2021	0	0	0	2.1	18	0	0	0	2.1	18	0	0	2.1	4.01		990		990
28/05/2021	0	0.1	0	2.7	16.8	0	0	0	2.7	16.8	0	0	2.02	4		1019		1019
04/06/2021	0	0	0	2.6	18	0	0	0	2.6	18	0	0	2.3	3.94		1016		1016
09/06/2021	0	0.01	0	2.5	18.4	0	0	0	2.5	18.4	0	0	2.15	3.97		1014		1014
16/06/2021	0	0.01	0.1	2.7	18.7	2	0	0.1	2.7	18.7	2	0	2.18	3.99		1002		1002
02/07/2021	0	0.01	0.1	2.4	20.3	2	0	0.1	2.4	20.3	2	0	2.34	3.92		1010		1010
06/07/2021	0	0.01	0	0.1	20.6	0	0	0	0.1	20.6	0	0	2.2	3.92		993		993
27/07/2021	0	0.02	0	0.4	4.2	0	0	0	0.4	4.2	0	0	1.51	2.94		1000		999

WS7	Flow Rate (l/h)	Pressure Differential	Gas Concentration										Water		Start		Finish	
			Peak					Steady										
			Date	CH ₄ %	CO ₂ %	O ₂ %	LEL %	H2S/ CO (ppm)	CH ₄ %	CO ₂ %	O ₂ %	LEL %	H2S/ CO (ppm)	Depth to Water	Depth to Base	Barometric Pressure		Barometric Pressure
13/05/2021	0.2	0	0	2.4	10.1	0	0	0	2.4	10.1	0	0	1.64	2.75		999	999	
21/05/2021	0	0	0	2.1	11.9	0	0	0	2.1	11.9	0	0	1.69	2.74		990	990	
28/05/2021	0	0	0	3.8	9.4	0	0	0	3.8	9.4	0	0	1.55	2.75		1019	1019	
04/06/2021	0	0	0	3.5	9.9	0	0	0	3.5	9.9	0	0	1.59	2.75		1016	1016	
09/06/2021	0	0	0	3.2	10.6	0	0	0	3.2	10.6	0	0	1.52	2.73		1014	1014	
16/06/2021	0	0.01	0.1	6.1	6.9	2	0	0.1	6.1	6.9	2	0	1.58	2.71		1002	1002	
02/07/2021	0	0	0	7.4	5.1	0	0	0	7.4	5.1	0	0	1.44	2.63		1010	1010	
06/07/2021	0	0.01	0	9.0	3.6	0	0	0	9.0	3.6	0	0	1.5	2.63		993	993	
27/07/2021	0	0.02	0	8.2	4.2	0	0	0	8.2	4.2	0	0	1.51	2.65		1000	999	

CH ₄	Above the 1.0% v/v guideline value in Waste Management Paper no 27 (WMP27).		CO ₂	Above the 1.5% v/v guideline value given in WMP27.	
Date	Weather	Pressure Trend		Ground Conditions	
13/05/2021	Raining	Low and steady		Wet	
21/05/2021	Raining	Low and rising		wet	
28/05/2021	Overcast	High and Steady		Dry	
04/06/2021	Sunny	High and Steady		Dry	
09/06/2021	Sunny	High and Steady		Dry	
02/07/2021	Sunny	High and falling		Dry	
06/07/2021	Cloudy with rain	Low and falling		Wet	
27/07/2021	Heavy rain	Low and falling		Wet	

Appendix H – Conceptual Models & Risk Assessments

PRINCIPLES OF RISK ASSESSMENT

MONITORING AND ASSESSMENT CRITERIA

C 1.0 GENERAL

- C 1.1 The purpose of this appendix is to describe in detail the concepts underlying the risk-based approach to assessing potentially contaminated land, introduce the roles of key legislation and describe the qualitative methodology adopted for evaluating and characterising risk.
- C 1.2 Current best practice in the UK promotes a risk-based approach to dealing with both soil and groundwater contamination. The principal aim of the approach is to ensure protection of human health and the environment in a thorough, transparent and cost-effective manner.
- C 1.3 Fundamental to the risk-based approach is the concept that for 'Contaminated Land' to be designated, as a consequence of historic activities, a pathway for contamination must be shown to exist between a source of contamination and a receptor. The combined presence of a source, pathway and a receptor is described as a 'pollutant linkage'.
- C 1.4 The concepts associated with a contaminant source, pathway and receptor are defined in DETR Circular 02/2000 'Contaminated Land Environmental Protection Act 1990: Part II A'. A **source** of contamination may be considered as a 'substance which is in, on or under land that has the potential to cause harm or to cause pollution of controlled waters'. A **receptor** can be considered as either 'a living organism, a group of living organisms, an ecological system or a piece of property which is being, or could be harmed, by a contaminant or controlled waters which are being, or could be, polluted by a contaminant'. A **pathway** may be considered as one or more routes by, or through, which a receptor is being, or could be, exposed to or affected by a contaminant. Typical pathways may include migration in groundwater, surface water run-off or infiltration, inhalation, dermal contact and ingestion.
- C 1.5 The risks posed by an identified pollutant linkage can often be mitigated by removing the source of contamination, treating the source of contamination, blocking the relevant pathway(s) or by protecting the receptor.

C 2.0 PRINCIPLES OF RISK EVALUATION

- C 2.1 The risk evaluation methodology presented below is qualitative in nature, and is therefore a subjective method. It is based upon guidance presented in CIRIA publication referenced C552, 'Contaminated land risk assessment ~ A guide to good practice', 2001 and involves the classification of the following.
- C 2.2 The magnitude of the potential **consequence** (severity) of risk occurring (Table C 1).
- C 2.3 The magnitude of the **probability** (likelihood) of the risk occurring (Table C 2).
- C 2.4 These are then considered in conjunction to give a risk matrix (Table C 3)

Classification	Definition	Examples
Severe	Short-term (acute) risk to human health likely to result in 'significant harm' as defined by the Environmental Protection Act 1990, Part II A. Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource. Catastrophic damage to buildings/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem (note the definitions of ecological systems within the Draft Circular on Contaminated Land, DETR, 2000).	High concentrations of cyanide on the surface of an informal recreation area. Major spillage of contaminants from site into controlled water. Explosion, causing building collapse (can also equate to a short-term human health risk if buildings are occupied).
Medium	Chronic damage to Human Health ('significant harm' as defined in DETR, 2000). Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution). A significant change in a particular ecosystem, or organism forming part of such ecosystem. (Note: the definitions of ecological systems within Draft Circular on Contaminated Land, DETR, 2000).	Concentrations of a contaminant from site exceed the generic, or site-specific assessment criteria. Leaching of contaminants from a site to a major or minor aquifer. Death of a species within a designated nature reserve.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in the <i>Draft Circular on Contaminated Land</i> , DETR, 2000). Damage to sensitive buildings/structures/ services or the environment.	Pollution of non-classified groundwater. Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
Minor	Harm although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.	The presence of contaminants at such concentrations that protective equipment is required during site works. The loss of plants in a landscaping scheme. Discolouration of concrete.

Table C 1: Classification of Consequence

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Table C 2: Classification of Probability

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

Table C 3: Comparison of Consequence Against Probability

Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Table C 4: Description of the classified risks and likely action required

Refined Conceptual Site Model (CSM) and Risk Assessment Table 2.0 (Phase 2)

SOURCE -PATHWAY -RECEPTOR LINKAGE				QUALITATIVE RISK ASSESSMENT		
Contaminant	Location	Receptors	Pathways to Receptors	Associated Hazard (Potential Severity)	Likelihood of Occurrence	Risk*
Potential contaminants may be present beneath the site - Heavy metals, sulphates and PAHs. - Hydrocarbons - Asbestos Containing Material (ACM). - PCBs	Possibly within sub surface strata & Groundwater.	Ground water (Secondary A Aquifers)	Vertical percolation to groundwater	Groundwater (Medium – pollution of sensitive water resource)	Unlikely based upon concentrations of contaminants recorded and cover of Glacial Clay.	Low Post Construction
		Surface Water – Culverted Brook	Lateral percolation & Surface Run-off to surface water	Groundwater (Medium – pollution of sensitive water resource)	Low – Brook that runs through site is culverted, the possibility for flow pathway from the site unlikely based on concentrations recorded	Low Post Construction
		End user of site (Staff and patrons)	Direct contact, Ingestion, Inhalation (Dust and Vapours)	Human Health (Medium)	Unlikely based upon concentrations of contaminants. 600mm cover system recommended for new gardens/ landscaped areas and basic asbestos control measures adopted.	Low Post Construction
		Humans – site workers, neighbouring properties/site workers, maintenance & construction staff,	Direct contact, Ingestion, Inhalation (Dust and Vapours)	Human Health (Minor – providing suitable PPE equipment is worn)	Unlikely based upon concentrations of contaminants. 600mm cover system recommended for new gardens/ landscaped areas and basic asbestos control measures adopted.	Low risk (if PPE equipment worn and mitigation measures adopted)
	phytotoxic contaminants	Risk to plants/trees	Root Uptake	Inhibition of plant growth	Unlikely based upon concentrations of contaminants	Low Post Construction
	Water Supply Pipework	Future site users. Water pipes.	Ingestion of tainted water supply.	Human Health (Medium)	UU Risk assessment is required, and possible specialist protection required.	Low to moderate.

* Risk refers to the potential risk that the Source, Pathway, Receptor linkage is complete and is used to determine if any further investigation/measures are required. It does not indicate immediate emergency risk to any individual or feature present on the site unless specifically noted.

Table and Summary of Potential Risks, Sheet 2

SOURCE -PATHWAY -RECEPTOR LINKAGE				QUALITATIVE RISK ASSESSMENT		
Contaminant	Location	Receptors	Pathways to Receptors	Associated Hazard (Potential Severity)	Likelihood of Occurrence	Risk*
Off site contaminants from surrounding land use including; former colliery/infilled land/paper mill.	Possibly within made-ground surrounding site.	End user of site (Staff and patrons)	Direct contact, Ingestion, Inhalation (Dust and Vapours)	Human Health (Medium)	Low likelihood, given concentrations recorded	Low Post Construction
		Construction workers if applicable	Direct contact, Ingestion, Inhalation (Dust and Vapours)	Human Health (Minor – Providing suitable PPE equipment is worn)	Low likelihood, given concentrations recorded.	Low risk (if PPE equipment not worn)
Hazardous Ground Gas associated with potential Made Ground in filled ground off site as well as Coal Measures strata.	Possibly within strata beneath the site.	End user of site (Staff and patrons)	Migration through strata and accumulation under buildings of explosive and asphyxiating gases.	Human Health (Severe)	Low likelihood given concentrations recorded to date and presence of underlying Glacial Clay. Ground gas monitoring ongoing. No radon protection required.	Low/Moderate Amber 1 Protection Measures Required
		Buildings & Infrastructure	Coal mining beneath the site causing surface ground instability causing building subsidence	Buildings & Infrastructure (Medium)	Low Likelihood. Mining from past or present below likely depth of influence. Foundations to be developed in line with CIRIA guidance.	Low to Moderate Low Post Construction

* Risk refers to the potential risk that the Source, Pathway, Receptor linkage is complete and is used to determine if any further investigation/measures are required. It does not indicate immediate emergency risk to any individual or feature present on the site unless specifically noted.

Appendix C – NX Consulting Protocol for Validation of Soil Cover Systems

NX Consulting Limited Protocol for Validation of Soil Cover

Isolation of potentially contaminated or unsuitable materials in garden and landscaped areas beneath a cover of “clean” subsoil, and topsoil is often recommended on developments to allow safe use and/or occupation of the land; most notably when it contains inorganic contaminants at concentrations above guidance threshold values.

A cover is only required in proposed garden and/or landscaped areas (i.e. not beneath drives, garages or houses). The soil cover, hard standing breaks direct contact pollutant linkages between the potentially contaminated soils and future residents or end users.

The CML initiative requires house builders to submit to the NHBC (or other warranty providers) a validation report confirming the thickness and chemical suitability of the soil cover.

Validation reports are normally prepared by independent geoenvironmental consultants such as NX Consulting. Soil cover validation requires independent assessment of the chemical suitability of the soil and the thickness of the placed subsoil and topsoil.

Inspection and Sampling of cover soil at source

Soil quality is best determined by sampling at the **source** at least 7 working days before importation to the development site. If this is achieved, further, on-site (post-placement) quality testing should not usually be necessary providing that confirmation can be given that the material arriving at site is the same soil as that tested.

Inspection and Sampling of cover soil following import to site

In some cases, soil is often delivered to site prior to sampling and chemical testing. Such soils should be stockpiled in a secure location on site and NX Consulting should be contacted to arrange for visual inspection, sampling and chemical testing. It is strongly recommended that soils should not be placed in garden and landscaped areas, prior to confirmation of the suitability of the soil by NX Consulting. This normally takes two weeks from initial notification.

Suitable soil material should:

- be clean and free of foreign debris, building waste materials or contaminants;
- not have a stone content of greater than 20% by visual estimation
- have a maximum stone size of 150mm in any one direction.
- not have been sourced from an area within 7m laterally, or 3m vertically, of Japanese Knotweed plants, and not contain any Japanese Knotweed fragments (rhizomes, leaves, stems etc).

The number of samples taken will be dependant on the nature of the source and the quantity of material to be imported and the testing ratio should be agreed with the Local Authority (EHO) before testing is undertaken. However, as a guide, a **minimum** of 6 samples of each soil type should be tested, with a further sample for each 250m³ of subsoil, where the quantity exceeds 1,500m³; and a further sample for each 50m³ topsoil, where the quantity exceeds 300m³.

A less frequent sampling rate may be appropriate for soils from a greenfield source or where large volumes (say > 5,000m³) of soil are imported from a single, relatively homogenous source. Each sample taken should be forwarded to an analytical laboratory for testing in accordance with the following schedule:

Soils from a bona fine **Greenfield** source:

- PH and metals (*Cu, Ni, Zn, Cr, As, Hg, Se, Cd & Pb*)

Where soils are from a **Brownfield** source chemical analysis should ideally be determined by appropriate level of desk study to determine likely contaminants. However, as a minimum the following testing should be undertaken:

- PH, metals (*Cu, Ni, Zn, Cr, As, Hg, Se, Cd & Pb*), *speciated PAH, banded TPH and BTEX*.

Cover layers can often include a “difficult to dig” or capillary break layer of coarse natural or recycled aggregate. Where this aggregate is sourced from recycled materials (such as crushed demolition arisings) asbestos screening tests should also be undertaken.

The Client\Contractor will be notified of the soil’s suitability (or otherwise) immediately following receipt of the results (typically taking 7 working days). Chemical assessment (Tier 1) criteria for imported soils are presented below.

On receipt of written confirmation from NX Consulting, the Client should instruct his Contractor to commence importation. It will probably be necessary to stockpile the cover prior to placement in garden\landscaped areas. NX Consulting should inspect the stockpiled material prior to placement, to confirm that it is the same material as previously tested, **and** the Contractor should provide the Client with appropriate haulage notes.

Cover Thickness Validation

Soil **thickness** can only be checked after placement, but should be done before turfing, fencing etc. Thickness could be checked via the excavation of an appropriate number of inspection trial pits. Typically one trial pit for every two gardens will be required.

The thickness of cover is dependant on the nature and degree of contamination (and often the Local Authority whose area the site lies within), but typically between 600mm and 1,000mm is required. Where underlying materials do not contain contaminants above critical concentrations but contains materials generally considered undesirable as a near-surface material in garden areas (colliery spoil, construction\demolition rubble etc) then a 300mm thick cover, in accordance with NHBC Standards, Chapter 9.2, should be adequate.

Soil cover is usually placed many weeks after completion of the preparatory\remedial works, and issue of the associated Verification Report. Consequently, site visits, to generate supplementary

letter reports, are typically required after soil cover has been placed in the gardens of each plot, or set of plots.

Cover material can sometimes be sourced on-site from foundation\drainage excavations in natural in-situ strata, but import is often necessary.

Issue of Soil Cover Validation Reports

Validation reports will be issued by NX Consulting following the confirmation of the placed thickness within each plot, or set of plots. Each report will contain the following information;

- details of the provenance of the subsoil and topsoil,
- chemical test data,
- an interpretation of the chemical data indicating whether the soils are suitable for use in a clean cover layer,
- a drawing indicating the location of cover thickness validation trial pits,
- photographs of the excavated trial pits confirming the thickness of placed soils,
- a data table indicating the thickness of cover soils within each trial pit excavated.

Soil Cover Validation Reports will be issued to the Local Authority and to the NHBC by email.

NX Consulting Tier 1 Values Version 1 - CLEA 2009 (Software Version 1.06)

	Residential with Homegrown Produce.	Residential without Homegrown Produce.	Commercial Industrial with Landscaping
Active Pathways	• Direct Ingestion • Dermal Contact • Consumption of Vegetables and Attached Soil • Inhalation of Indoor Vapour and Dust • Inhalation of Outdoor Vapours and Dust	• Direct Ingestion • Dermal Contact • Inhalation of Indoor Vapour and Dust • Inhalation of Outdoor Vapours and Dust	• Direct Ingestion • Dermal Contact • Inhalation of Indoor Vapour and Dust • Inhalation of Outdoor Vapours and Dust
Critical Receptors	Female Child 0-6yrs Old	Female Child 0-6yrs Old	Female Adult Worker >17 years old.

Determinand/Units	mg/kg	Source	mg/kg	Source	mg/kg	Source
Arsenic	37	LQM / CIEH S4ULs	40	LQM / CIEH S4ULs	640	LQM / CIEH S4ULs
Cadmium	11	LQM / CIEH S4ULs	85	LQM / CIEH S4ULs	190	LQM / CIEH S4ULs
Mercury (inorganic)	40	LQM / CIEH S4ULs	56	LQM / CIEH S4ULs	1,100	LQM / CIEH S4ULs
Nickel	180	LQM / CIEH S4ULs	180	LQM / CIEH S4ULs	980	LQM / CIEH S4ULs
Selenium	250	LQM / CIEH S4ULs	430	LQM / CIEH S4ULs	1,200	LQM / CIEH S4ULs
Chromium III	910	LQM / CIEH S4ULs	910	LQM / CIEH S4ULs	8,600	LQM / CIEH S4ULs
Chromium VI	6	LQM / CIEH S4ULs	6	LQM / CIEH S4ULs	33	LQM / CIEH S4ULs
Lead	450	C4SLs	450	C4SLs	750	C4SLs
Copper	2,400	LQM / CIEH S4ULs	7,100	LQM / CIEH S4ULs	68,000	LQM / CIEH S4ULs
Zinc	3,700	LQM / CIEH S4ULs	40,000	LQM / CIEH S4ULs	730,000	LQM / CIEH S4ULs
Boron	290	LQM / CIEH S4ULs	1100	LQM / CIEH S4ULs	240,000	LQM / CIEH S4ULs

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Standard Land Use Scenario	Residential with Homegrown Produce			Residential without Homegrown Produce			Commercial			Source
Determinand/SOM	1% SOM	2.5% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM	
<i>Naphthalene</i>	2.3	5.6	13	2.3	5.6	13	190	460	1100	LQM / CIEH S4ULs
<i>Acenaphthylene</i>	170	420	920	2900	4600	6000	83000	97000	10000	LQM / CIEH S4ULs
<i>Acenaphthene</i>	210	510	1100	3000	4700	6000	84000	97000	10000	LQM / CIEH S4ULs
<i>Fluorene</i>	170	400	860	2800	3800	4500	63000	68000	71000	LQM / CIEH S4ULs
<i>Phenanthrene</i>	95	220	440	1300	1500	1500	22000	22000	23000	LQM / CIEH S4ULs
<i>Anthracene</i>	2400	5400	1100	31000	35000	37000	520000	540000	540000	LQM / CIEH S4ULs
<i>Fluoranthene</i>	280	560	890	1500	1600	1600	23000	23000	23000	LQM / CIEH S4ULs
<i>Pyrene</i>	620	1200	2000	3700	3800	3800	54000	54000	54000	LQM / CIEH S4ULs
<i>Benzo(a)anthracene</i>	7.2	11	13	11	14	15	170	170	180	LQM / CIEH S4ULs
<i>Chrysene</i>	15	22	27	30	31	32	350	350	350	LQM / CIEH S4ULs
<i>Benzo(b)fluoranthene</i>	2.6	3.3	3.7	3.9	4	4	44	44	44	LQM / CIEH S4ULs
<i>Benzo(k)fluoranthene</i>	77	93	100	110	110	110	1200	1200	1200	LQM / CIEH S4ULs
<i>Benzo(a)pyrene</i>	2.2	2.7	3	3.2	3.2	3.2	35	35	35	LQM / CIEH S4ULs
<i>Indeno(1,2,3-cd)pyrene</i>	27	36	41	45	46	46	500	510	510	LQM / CIEH S4ULs
<i>Dibenz(a,h)anthracene</i>	0.24	0.28	0.3	0.31	0.32	0.32	3.5	3.6	3.6	LQM / CIEH S4ULs
<i>Benzo(ghi)perylene</i>	320	340	350	360	360	360	3900	4000	4000	LQM / CIEH S4ULs
<i>Benzene</i>	0.087	0.17	0.37	0.38	0.7	1.4	27	47	90	LQM / CIEH S4ULs
<i>Toluene</i>	130	290	660	880	1900	3900	55,600	11000	18000	LQM / CIEH S4ULs
<i>Ethylbenzene</i>	47	110	260	83	190	440	5,700	13000	27000	LQM / CIEH S4ULs
<i>Xylenes</i>	56	130	310	79	180	430	5,900	14000	30000	LQM / CIEH S4ULs
<i>Aliphatic C5-C6</i>	42	78	160	42	78	160	3200	5900	12000	LQM / CIEH S4ULs

Standard Land Use Scenario	Residential with Homegrown Produce			Residential without Homegrown Produce			Commercial			Source
<i>Aliphatic C6-C8</i>	100	230	530	100	230	530	7800	17000	40000	LQM / CIEH S4ULs
<i>Aliphatic C8-C10</i>	27	65	150	27	65	150	2000	4800	11000	LQM / CIEH S4ULs
<i>Aliphatic C10-C12</i>	130	330	760	130	330	770	9700	23000	47000	LQM / CIEH S4ULs
<i>Aliphatic C12-C16</i>	1100	2400	4300	1100	2400	4400	59000	82000	90000	LQM / CIEH S4ULs
<i>Aliphatic C16-C35</i>	65000	92000	110000	65000	92000	110000	1600000	1700000	1800000	LQM / CIEH S4ULs
<i>Aliphatic C35-44</i>	65000	92000	110000	65000	92000	110000	1600000	1700000	1800000	LQM / CIEH S4ULs
<i>Aromatic C5-C7</i>	70	140	300	370	690	1400	26000	46000	860000	LQM / CIEH S4ULs
<i>Aromatic C7-C8</i>	130	290	660	860	1800	3900	56000	110000	180000	LQM / CIEH S4ULs
<i>Aromatic C8-C10</i>	34	83	190	47	110	270	3500	8100	17000	LQM / CIEH S4ULs
<i>Aromatic C10-C12</i>	74	180	380	250	590	1200	16000	28000	34000	LQM / CIEH S4ULs
<i>Aromatic C12-C16</i>	140	330	660	1800	2300	2500	36000	37000	38000	LQM / CIEH S4ULs
<i>Aromatic C16-C21</i>	260	540	930	1900	1900	1900	28000	28000	28000	LQM / CIEH S4ULs
<i>Aromatic C21-C35</i>	1100	1500	1700	1900	1900	1900	28000	28000	28000	LQM / CIEH S4ULs
<i>Aromatic C35-C44</i>	1100	1500	1700	1900	1900	1900	28000	28000	28000	LQM / CIEH S4ULs
<i>Aromatic+aromatic EC>44-70</i>	1600	1800	1900	1900	1900	1900	28000	28000	28000	LQM / CIEH S4ULs
<i>Phenol</i>	280	550	1100	750	1300	2300	760	1500	3200	LQM / CIEH S4ULs
<i>Cyanide</i>	527			527			1400			CLEA 2009

Standard Land Use Scenario	Residential with Homegrown Produce	Residential without Homegrown Produce	Commercial	Source
PCBs	1.7	1.8	1.8	CLEA 2009

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Appendix D – Summary of Guidance Relating to Ground Gas

Summary of guidance relating to ground gas

In response to incidents of methane explosions in the mid 1980's guidance documents were produced in the UK for both planning authorities and the construction industry to allow safe development of sites located on or adjacent to gassing sites. There is a wealth of guidance and gas protection measures are now routinely included in engineering designs on gassing sites, eg former landfills, mineworkings, estuarine and fenlands and limestone or chalk areas.

The guidance does, however recognise that the risks posed by the presence of gas are not the same for all sites. The risk posed by the presence of gas in the ground below an actively generating recent domestic landfill is far greater than the negligible levels of risk that are posed by small pockets of material that are generating gas at very low levels. On sites such as former docklands, infilled ponds or reclaimed riverside or estuarine sites gas is generated very slowly from localised sources such as wood fragments or organic Alluvium deposits and is characterised by low volumes of gas generation and very low surface emission rates. Such sites have a long history of redevelopment for residential use without incidents from gassing ground (eg along the River Thames, London Docklands, a former landfill site in Warwickshire approved by the Environment Agency). As such they represent lower risk sites in terms of the presence of methane gas.

The type of development also needs to be taken into account in any assessment. Individual houses with gardens are the most sensitive development with flats being less sensitive and commercial and industrial developments being the least sensitive to the risks posed by gas in the ground.

The guidance and statutory requirements (Building Regulations) discussed below also recognises that the provision of gas protection measures is a valid method of mitigating the risks posed by the presence of gas in the ground. Indeed there are many thousands of both residential and commercial developments in the UK that have been constructed over gassing sites and that have been successfully provided with gas protection measures. Post construction gas monitoring on many of these sites has demonstrated that the protection measures are successful in preventing gas migration into the buildings.

Building Regulations

The Building Regulations Approved Document Part C 2011 requires that the risks posed by the presence of methane and carbon dioxide in the ground are assessed and appropriate protection measures provided. These latest amendments to the Building Regulations have moved away from specifying trigger concentrations and recommend that the risks are assessed and protection measures designed in accordance with Environment Agency and CIRIA guidance.

This report follows the guidance in the Building Regulations by assessing the risks posed by the presence of the gas and providing recommendations on suitable protection measures.

The Building Regulations also emphasise the need to measure borehole emission rates so that the gas generation and migration potential can be assessed. The investigation data together with the gas monitoring undertaken by Clarkebond and NX Consulting satisfies these requirements.

CIRIA

The Construction Industry Research and Information Association (CIRIA) provides comprehensive guidance in a series of guidance documents relating to the construction of new developments over sites where methane is present.

The most recent guidance from CIRIA was published in 2007. In summary the CIRIA guidance recommends that the provision of gas protection measures should be based on a comprehensive desk study, ground investigation and gas monitoring, including measurement of borehole flow rates. This will help identify ground conditions, potential sources of gas, migration pathways and

generation potential. The level of risk may then be assessed and an appropriate gas protection system designed. Account should also be taken of the sensitivity of the proposed end use.

The latest CIRIA guidance incorporates the risk assessment method proposed by Wilson and Card. Table 1.2 summarises the method for characterising gassing sites for developments other than low rise housing, using the gas screening value (borehole flow rate x gas concentration) in addition to total gas concentrations.

Table 1.2 - Modified Wilson and Card classification, (CIRIA 2007)

Characteristic Situation (CIRIA 149)	Gas screening value (l/hr) ¹	Additional limiting factors	Typical source of generation
1	<0.07	Typically methane not to exceed 1% by volume and carbon dioxide not to exceed 5% by volume otherwise consider increase to Situation 2	Natural soils with low organic content "typical" Made Ground
2	<0.7	Borehole air flow rate not to exceed 70l/hr otherwise consider increase to characteristic situation 3	Natural soil, high peat/organic content "typical" Made Ground
3	<3.5		Old landfill, inert waste, mine working flooded
4	<15	Quantitative risk assessment required to evaluate scope of protection measures.	Mine working – susceptible to flooding, completed landfill, inert waste (WMP 26B criteria)
5	<70		Mine working unflooded inactive with shallow workings near surface
6	>70		Recent landfill site

In addition use of the table requires sufficient gas monitoring data as shown in Table 1.3.

Table 1.3 Typical minimum periods and frequency of monitoring (CIRIA 2007)

		Generation potential of source				
		Very low	Low	Moderate	High	Very high
Sensitivity of development	Low	4/1	6/2	6/3	12/6	12/12
	Moderate	6/2	6/3	9/6	12/12	24/24
	High	6/3	9/6	12/6	24/12 ³	24/24 ³

Notes

1. First number is minimum number of readings and second number is minimum period, for example 4/1 – Four sets of readings over 1 month

2. At least two sets of readings must be at low and falling atmospheric pressure (<1000mb)
3. The acceptability of placing high sensitivity end use on a high gas hazard site is not normally acceptable unless source is removed or treated to reduce gassing potential

There are many techniques to protect development from methane and associated gases Card (1993). Each measure has its own advantages and disadvantages and may be more suitable in certain situations and types of development. Furthermore no protective measure on its own is immune from factors unknown to or out of the control of the designer. Such factors might lead to failure and for this reason it is normal practice to combine individual protection measures to form a gas control system. In this way the probability of failure or of gas passing each individual protection measure in the system is minimised.

CIRIA Report 665 reflects current building industry practice more closely than Waste Management Paper 27 and ICRCL Guidance Note 17/78 (last updated in 1990) with regard to development on gassing sites.

Construction (Design and Management) Regulations

The presence of the gas in the ground poses a potential risk to the development. Under the requirements of the Construction (Design and Management) Regulations, 1994, this risk should be designed out to minimise risks to the occupiers.

Partners in Technology

At the time of preparing CIRIA Report 149 borehole flow rates were generally not capable of being measured with great accuracy, therefore the requirement for assessing the gas regime based on the maximum parameter was adopted. However, the standard of measuring gas concentrations and particularly borehole flow rates has improved greatly in recent years. This is due to environmental legislation associated with the waste management industry and the requirements of WMP 26A for landfill completion. It is now standard practice to assess gas regimes on the basis of the volumes of gas flowing from the ground, i.e. a combination of the gas concentrations and borehole flow rates. This principal is used in the DETR/ Partners in Technology report, *Passive venting of soil gases beneath buildings*, which considers both concentrations and flow rates to define characteristic gas situations, although these were not meant to be used to classify sites, but merely to define a set of specific design situations.

The Partners in Technology Research Report also provides criteria for the assessment of passive underfloor ventilation systems. For methane a passive ventilation system is deemed to have very good performance characteristics when the equilibrium concentrations of methane are maintained below 1% by volume in air at wind speeds of 0.3 m/s and 3 m/s (at the height of the vents).